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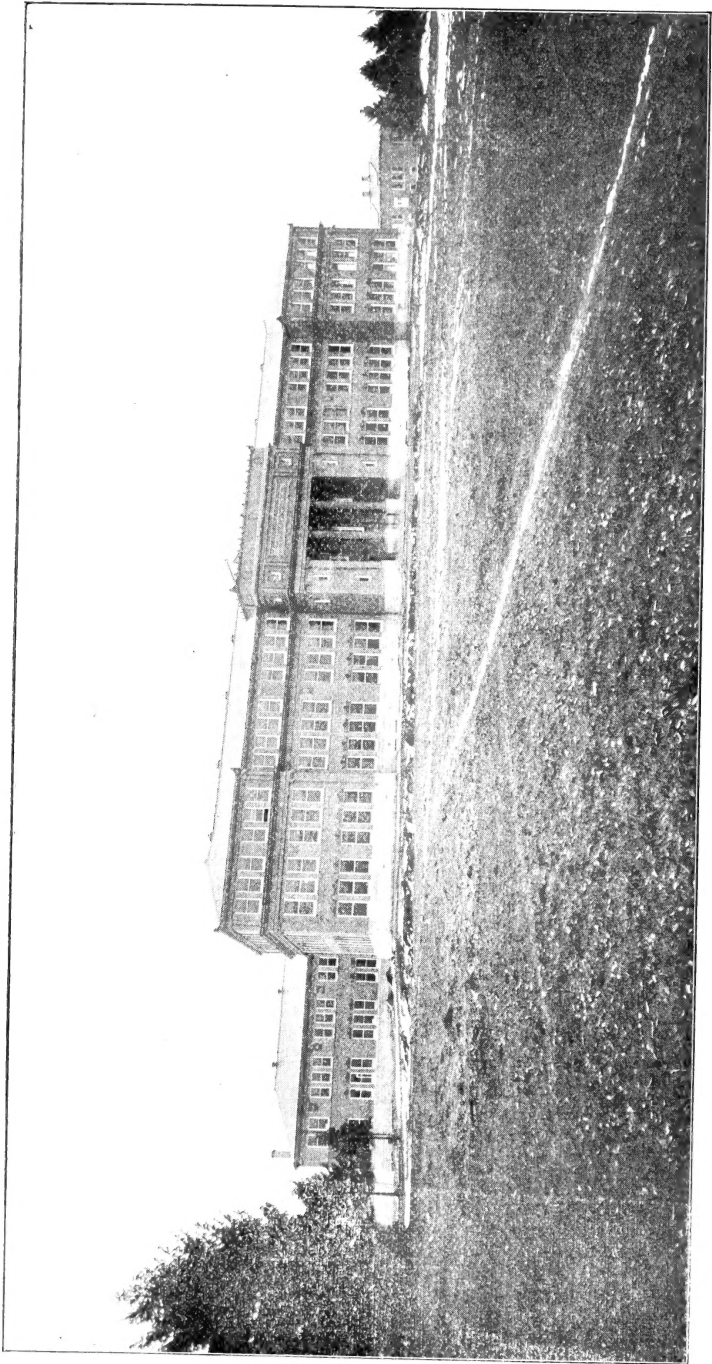
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Where next State Convention of Illinois State Dairymen's Association will be held on Tuesday, Wednesday and Thursday, Jan. 6, 7, 8, 1913.

Twenty = Eighth Annual Report

of the Illinois State Dairymen's Association



*Convention held at Freeport, Illinois,
January 7th, 8th and 9th, 1902*

COMPILED BY GEO. CAVEN, SECRETARY

Stenographic Report by Miss E. Emma Newman

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LETTER OF TRANSMITTAL.

Office of Secretary
Illinois State Dairymen's Association.
Chicago, Ill., 1902

To His Excellency Richard Yates, Governor of the State of Illinois:

I have the honor to submit the official report of the Illinois State Dairymen's Association, containing the addresses, papers, and discussions at its twenty-eight annual meeting, held at Freeport, Illinois, Jan. 7, 8, and 9, 1902.

Respectfully,

GEO. CAVEN, Secretary.

LIST OF OFFICERS, 1902.

President—

JOSEPH NEWMAN, Elgin.

Vice President—

J. R. BIDDULPH, Providence.

Directors—

GEO. H. GURLER, DeKalb.

JOSEPH NEWMAN, Elgin.

F. A. CARR, Aurora.

JOHN STEWART, Elburn.

IRVIN NOWLAN, Toulon.

R. R. MURPHY, Garden Plain.

J. R. BIDDULPH, Providence.

Treasurer—

H. H. HOPKINS, Hinckley.

Secretary—

GEO. CAVEN, Chicago.

By-Laws of the Illinois State Dairymen's Association.

OFFICERS.

Section 1.—The officers of this Association shall consist of a President, Vice President, Secretary, Treasurer, and Board of Directors, composed of seven members, of whom the President and Vice President of the Association shall be members and the President ex-officio Chairman.

DUTIES OF THE PRESIDENT.

Sec. 2.—The President shall preside at the meetings of the Association and of the Board of Directors. It shall be his duty, together with the Secretary of the Board of Directors, to arrange a program and order of business for each regular annual meeting of the Association and of the Board of Directors, and upon the written request of five members of the Association it shall be his duty to call such special meetings. It shall be his further duty to call on the State Auditor of Public Accounts for his warrant on the State Treasurer, for the annual sum appropriated by the Legislature for the use of this Association, present the warrant to the Treasurer for payment and on receiving the money receipt for the same, which he shall pay over to the Treasurer of the Association, taking his receipt therefor.

DUTIES OF THE VICE PRESIDENT.

Sec. 3.—In the absence of the President his duties shall devolve upon the Vice President.

DUTIES OF THE SECRETARY.

Sec. 4.—The secretary shall record the proceedings of the Association and of the Board of Directors. He shall keep a list of the members, collect all the moneys due the Association (other than the legislative appropriations), and shall record the amount with the name and postoffice address of the person so paying, in a book to be kept for that purpose. He shall pay over all such moneys to the Treasurer, taking his receipt therefor. It shall also be his duty to assist in making the program for the annual meeting and at the close of the said meeting compile and prepare for publication all papers, essays, discussions, and other matter worthy of publication, at the earliest day possible, and shall perform such other duties pertaining to his office as shall be necessary.

DUTIES OF THE TREASURER.

Sec. 5.—The Treasurer shall, before entering on the duties of his office, give a good and sufficient bond to the Directors of the Association, with one or more sureties, to be approved by the Board of Directors, which bond shall be conditioned for a faithful performance of the duties of his office. He shall account to the Association for all moneys received by him by virtue of said office and pay over the same as he shall be directed by the Board of Directors. No moneys shall be paid out by the Treasurer except upon an order from the Board, signed by the President and countersigned by the Secretary. The books of account of the Treasurer shall at all times be open to the inspection of the members of the Board of Directors, and he shall, at the expiration of his term of office make a report to the Association of the conditions of its finances, and deliver to his successor the books of account together with all moneys and other property of the Association in his possession or custody.

DUTIES OF THE BOARD OF DIRECTORS.

Sec. 6.—The Board of Directors shall have the general management and control of the property and affairs of the Association, subject to the By-Laws.

Four members of the Board shall constitute a quorum to do business.

The Board of Directors may adopt such rules and regulations as they shall deem advisable for their government, and may appoint such committees as they shall consider desirable.

They shall also make a biennial report to the Governor of the State of the expenditures of the money appropriated to the Association by the Legislature.

It shall be their further duty to decide the location, fix the date, and procure the place for holding the annual meeting of the Association, and arrange the program and order of business for the same.

ELECTION OF OFFICERS.

Sec. 7.—The President, Vice President, and Board of Directors shall be elected annually by ballot at the first annual meeting of the Association.

The Treasurer and Secretary shall be elected by the Board of Directors.

The officers of the Association shall retain their offices until their successors are chosen and qualify.

A plurality vote shall elect.

Vacancies occurring shall be filled by the Board of Directors until the following annual election.

MEMBERSHIP.

Sec. 8.—Any person may become a member of this Association by paying the Treasurer such membership fee as shall from time to time be prescribed by the Board of Directors.

QUORUM.

Sec. 9.—Seven members of the Association shall constitute a quorum for the transaction of business, but a less number may adjourn.

ANNUAL ASSESSMENT.

Sec. 10.—One month prior to the annual meeting in each year the Board of Directors shall fix the amount, if any which may be necessary to be paid by each member of the Association as an annual due.

Notice of such action must be sent to each member within ten days thereafter, and no member in default in payment thereof shall be entitled to the privileges of the Association.

AMENDMENT OF BY-LAWS.

Sec. 11.—These By-Laws may be amended at any annual meeting by a vote of not less than two-thirds of the members present. Notice of the proposed amendment must be given in writing, and at a public meeting of the Association, at least one day before any action can be taken thereon.

PROCEEDINGS

OF THE

Twenty-Eighth Annual Meeting

OF THE

Illinois State Dairymen's Association

Held at Freeport, Illinois, January 7, 8 and 9, 1902

The Illinois State Dairymen's Association met in annual session in Germania hall at Freeport, January 7th, 1902, at 1:30 o'clock p. m.

President Joseph Newman in the chair.

PRAYER

REV. MR. C. E. DUNN.

Let us pray.

O God, our gracious, heavenly Father, we invoke Thy blessing on this assembly. Thou art the seat of all that is good, and we ask our Creator to draw near to us and bless us. Be with them through their several sessions, and bless their efforts, both of those who speak and those who listen.

There is no interest of men but that Thy interest is with them. We pray that all the plannings of these Thy servants may be right in Thy sight and that Thou wilt publicly bless them. We rejoice in this great land of ours which Thou hast given us. We pray that these Thy servants who till the soil and are interested in the extension of agriculture, may be guided by Thee.

May the blessings of the Most high rest upon them and strengthen them in the conduct of these meetings. Like the cattle upon the thousand hills, guide us we beseech Thee, and comfort us with Thy blessing and bring us to Thy heavenly kingdom. We ask it in Christ's name. Amen.

By the President: The Elgin Butter Tub Company has seen fit to furnish us with a beautiful gavel. We never have had one before and I am sure it will be appreciated, and return thanks to the Elgin Butter Tub Company for it.

ADDRESS OF WELCOME

MAYOR HUENKEMEIER, FREEPORT, ILL.

Mr. Chairman and Ladies and Gentlemen of this Convention:

It affords me great pleasure to see you here in our city for the purpose of holding your annual convention.

Many of you have left your offices, your farms and creameries to take part in this convention. Many of you have come to seek knowledge as to the best practical way of running your creameries and farms, and how to get the best results for making high grade butter, which will be demonstrated within the next few days. Men will address you that have had years of practical experience in the dairy business, and good will come of these meetings. We hope you will never regret your visit to our city.

You have shown great wisdom in selecting Freeport to hold your annual convention. Freeport can accommodate you much better than any other city of its size in this great State of Illinois, and I assure you no other city would accord you a more hearty welcome. You have done us great honor and we appreciate it. Freeport is delighted to see you here today. The city is yours and the heart and hand of every citizen is open to you and we welcome you with joy.

RESPONSE

GEORGE CAVEN, CHICAGO.

By the President: We had upon our program, to answer Mr. Huenkemeier, our old president, Mr. George H. Gurler. But I saw him in Elgin yesterday and he said that he was afraid he could not be present on account of business. His son was going to Iowa and he would be left at home alone.

Mr. Caven, your worthy secretary, will speak for him.

Mr. Chairman:

Although I am not capable of responding for Mr. Gurler, so famous a dairyman as he is, I can express the thanks of the Association for the kind words of welcome the Mayor has given us today.

Most of us have attended conventions, both in Illinois and other states, so that we know just how far we can go, and for that reason, I assure the Mayor we will not violate the ordinances and not get into serious difficulty.

But seriously speaking, when we selected Freeport for our convention, we knew that we were coming into one of the famous dairy sections of the country; to one of the famous dairy districts of the world, and on account of this location we expect to have a successful convention.

I can assure you all, that what the Mayor said about the open-hearted kindness of the people of Freeport, has been demonstrated to me during the time that I have been here at work preparing for this convention. I never went to a place where every one seemed to be so anxious to grant favors, and for that reason, as well as for the favorable location, I think we are going to have a good convention.

We certainly have as fine, if not finer, display of dairy machinery in Armory Hall that we have ever had at any state convention, and if the sessions are as good comparatively as the machinery exhibit, we will break all our records in state dairy conventions.

I thank you and I thank the Mayor.

By the President: It now becomes my duty to appoint committees. For the Committee on Resolutions I will appoint:

Mr. M. Long of Woodstock.

Mr. Irving Nowlan of Toulon.

Mr. George Caven of Chicago.

For Committee on Memberships, I will appoint:

Mr. J. P. Younger of Freeport.

Mr. Grant Mallory of Freeport.

Mr. F. W. Woodring of Chicago.

The Committee on Nominations I will hold until more will be here on the next train or two, and will notify you tomorrow.

It is understood of course that all resolutions, before they can be read in the house, must go to the committee. Any one having resolutions wishing to be acted on, will hand them to the Secretary, so they can go to the committee, and be acted upon from that committee.

By the Vice President: The next thing on the program is the address from our worthy president.

I wish to introduce Mr. Joseph Newman.

Mr. Chairman, Ladies and Gentlemen:—

When this association came into life, 28 years ago, at Woodstock, Elgin furnished its first president in Dr. Jos. Tefft. The growth during

the intervening years has been a natural one; the interest in it developed more in the northwestern counties, and seeming to remain there—Freeport, being almost the center of the Elgin district.

The officials, the past ten years, have tried to encourage dairying in the center and southern part of the state, but have met with little success. The great drawback seems to be, the trouble of obtaining the necessary help to milk the cows, and we invite mechanical scientists to turn their attention to a milking machine which will meet the requirements of an up-to-date dairyman, as we have over a million cows in this state alone, and all need milking, as Col. Sellers said of his Eyewater, "There's millions in it," for the ingenious American who perfects one, this one thing will do more to get and hold the world's markets than anything else.

We appreciate the fact that dairymen generally are holding back from increasing the number of milch cows on account of the high price of other farm products. This is a serious menace to dairying, but we regard it as only a temporary one, and before we could safely change our herds and manner of conducting a dairy farm, this inequality will pass away; hence the old adage of "Shoemaker, stick to your last" holds good, and it will be wisest to hold on to the best cows and stay at the business. The man who is eternally changing his business because he thinks the other is making a better living than he is, is generally the one to get left, by changing at the wrong time.

Of course we all admit that the main reason why dairy products are so very low when compared with other commodities raised on the farm, is the fact that the market value of milk is gauged by the price of creamery butter, and this is held down by the masquerading of "Butterine and Oleo" as "Elgin Creamery" and "Wisconsin Dairy," colored to deceive the best judges, and which should sell at about 9c a pound, but on account of its deceptive color is able, in large cities, to fetch nearly 20c.

Our state law seems to be a dead letter, and our National Dairy Union is now working at Washington to secure national legislation,

putting butterine and oleomargine, colored to resemble butter, under a tax of 10c per pound, and when not colored as such, then put it on the free list, or taking off the present tax of 2c per pound, because we believe if the working people want to eat butterine, they should not be taxed, and without any tax they should buy the best for 10c to 12c per pound, with hogs at 6c this would give a living profit to all who handle it, and no one be deceived as they now are. This association should urge, and we do urge, all members and its friends to assist the National Dairy Union in their estimable work all that lays in their power. In this connection, one of the things would be to make this association stronger by joining it; each county in the state should be well represented in this dairy association, and thus be a power for good along dairy lines. This can only be accomplished by organized effort. All breeders of dairy cattle should be with us and act with us, and then we in turn should act with the different associations relating to farm stock and products of the farm, giving and receiving knowledge by the exchange of ideas that will be a great benefit and help to all. We all have problems that must be faced and worked out, and these will be found easy to accomplish by pulling together. The cattle and hog men may think they are gainers in this oleo fight at the expense of the dairymen, but we can assure them, that when one branch of the producers suffer, all will suffer by it. So let's start in this century by joining this organization and getting our friends to do likewise.

The markets for dairy products the past year were good as usual, to a large extent, the home market was the best, with Elgin in the lead, The prosperous condition of the country being such that all who wanted work, and were able to do it, could get it. The foreign markets are before us, and our government, through the agricultural department, guided by that worthy son of our sister state, Iowa, Secretary Wilson, is making it plain and easy for all to reach them, and the transportation companies are providing refrigeration to all parts of the world as fast as business warrants.

We find plenty of competition and with modern Russia opening up her vast empire, it will need all the American ingenuity and brains to be able to produce cheap enough and live, when the season comes that we will need to export our surplus. The home market is in splendid shape. We would urge our manufacturers to keep up the high quality of their products, especially cheese. More cheese could be sold in America today than is made, providing you will give the people a full cream, close made, meaty cheese, rich in flavor. Wisconsin and New York are making some of this kind. If we could all do it, the demand would exceed the supply.

Since we last met together, the nation has been plunged into deep sorrow through a mistaken, misguided, unbalanced wretch, who took the life of our beloved president, Wm. McKinley, whose personality and life was an inspiration to those around and about him, in fact the nation. Always full of hope and faith that the right would prevail, and by working with that faith he secured for us the first place among the nations. His successor will be a worthy one, full of strength and courage to carry out the wishes of the American people.

I would call your attention to the Machinery hall, where may be seen the newest and latest devices for the farm, dairy, creamery and cheese factory, and gentlemanly attendants who will be pleased to explain their working.

As president of your association, I have had the pleasure of meeting with the directors of the State Farmers Institute the past year, and I can assure you I was warmly welcomed, and found the work performed by the Institute certainly to be worth many times its cost to the state in an educational way.

The state furnishes us the usual appropriation, and we have had printed and distributed throughout the entire state 3000 copies of our annual report, which, if carefully read and digested, would be worth its weight in gold, and we believe it is money well spent. Besides, the communities in which the meetings are held receive ideas and information that cannot be computed in value. We hope Freeport, surrounded as

she is by a magnificent country and rich farmers, may also be profited—as they will be if they will only turn out and fill this hall at every session. You can't afford to miss one, for we have on the program eminent men in their several lines, and after hearing them and the discussions that follow, we hope you will start right away and weed out the poor unprofitable cows, and begin to think what protein crop you can put in next spring to balance up the corn. You must join in the discussions, ask questions on any or all subjects and feel free to offer ideas and suggestions, and thus make this convention an ideal one and profitable to you.

Buffalo gave us a test of the different dairy breeds, and while the other dairy show was not large, the next one at St. Louis, in 1903, can be, if the dairymen will interest themselves in it as other classes of producers do. The best thing that could happen to the dairyman is, that the president of the fair appoint Mr. Sudendorf superintendent of the dairy department. He would wake up the dairymen of these United States as they never have been before, and the world would know it too.

Your directors have held several meetings the past year endeavoring to watch your interests. They have thought that a few smaller meetings might be beneficial as aids to this general convention, and instructed me to try one at Elgin. The time set was December 14th, and as fate would have it, it was our first cold day, and the thermometer by noon was below zero, and at meeting time 16 below. Hence the attendance was very slim, but Prof. Fraser entertained us for an hour showing us views and telling us of his trip through England, Denmark and Holland. The idea was to inculcate cleanliness in the dairy, which we all need to improve.

I will close by calling your attention to your agricultural college at Champaign. Do you farmers realize what you have there? There should be at least 25 young men and women there from this county. The cost is very little and the advantages to be gained are beyond computation. We realize that your farming community here is rich, but

that does not always furnish brains to the next generation. Hence give the boys and girls a chance for themselves, and what better foundation than a good practical education, so they can know the soil, not guess at it; pick out the best heifer, steer or pig in the bunch; then know how when and what to feed them to produce the most for the least expense. Intelligence is needed as much today on the farm, as it is to combine railroads. Write Prof. Davenport for further information or see any of the professors here with us.

I hope the work put upon this year's program by your officers, and especially your most able and faithful secretary, Mr. Caven, will be like the bread of old, cast upon the waters that will return to bless and prosper you and yours for all future time.

CARE, FEED AND FEEDING OF DAIRY COWS.

SUPERINTENDENT OF FEEDS, MODEL DAIRY, PAN-AMERICAN
EXPOSITION, MR. J. FRED SCHLAPPI, CONSTABLE-
VILLE, NEW YORK.

Mr. President, Ladies and Brother Dairymen:

Among the wonders of the Pan-American, but few attracted more attention than did the dairy test at the Model Dairy.

From one end of our nation to the other, many watched for the reports from week to week. This was not confined to our own country. The Central and South Americans watched and inquired into this dairy test. The farmers of those nations are anxious to improve their dairy stock, and this was really the first opportunity they had to see a thorough test of the different breeds.

Up to this time, every breeder declared that his particular breed was the breed above all others, which made it nearly impossible to decide

which was the best breed. But the Pan-American test practically settled this.

Placed in the hands of men who are raised above all petty jealousies, it was carried on successfully and the result has been surprising to most of us.

Nearly a year ago, Mr. Converse, the superintendent of the agricultural and dairy products at the Pan-American conceived the idea of having a model dairy. He invited the different breeders to meet him at Buffalo, if possible, which was done some time in February a year ago.

At that time there were ten representatives of as many different breeds present, and they all agreed to bring five cows of their respective breeds.

In the meantime, after this meeting was over and the members had returned to their homes and began to think about the test more than they had done before, the American Jersey Cattle Club, also the American Holstein Cattle Club decided they would not enter the test under the rules laid down at the meeting. The Canadian government had a representative at Buffalo nearly all last winter. He came in contact with Mr. Converse and told him that if the American Jersey people, and the American Holstein people were not willing to enter the test under the rules, they would bring five cows of any breed that would refuse to go into this model dairy. There you will see the wisdom of those Canadians in making this proposition. They are reaping a good harvest from it now, selling breeding stock to people who came there to investigate. On the 26th of April, just before this dairy was opened, and the Canadians then had five breeds of theirs represented there, a meeting was held, and it was brought to such a pass that the Canadians really had the power to decide what should be done and what should not be done; and they decided it should be a dairy breed test pure and simple. None of the American breeders—some of them not being present personally—had any objections to that, except the Guernseys. They all agreed to go in

and get all they could out of it, but Mr. Caldwell, the secretary of the Guernsey cattle breed, he objected.

He protested and said he would not enter that test under any circumstances. He was determined not to go in at all, but was finally persuaded to go in, and did go in under protest. And the funny side of that was, as you all know, the Guernseys finally came out on top of the heap. Mr. Caldwell's objection was that the cows he had selected to be represented there at the Pan-American were not cows fitted to go into such a test; that he had much better individual cows that he could not get at that time. So he entered the test under protest; said he did not know it was to be a test, or he would not have brought the cattle at all.

We were asked probably a thousand times which were the best breed of cattle. No answer could be given to that question definitely. Every one claimed he had the best breed of cattle. They all have their good points, but none have all the desirable qualifications, and then, too, it depends what the intentions are.

To show you why I take this ground, I have a list here of all the cows in the Model Dairy. I have listed them according to the amount of profit they had made on estimated butter. I will not give you the profit of them all, the list being too long, but will take the first ten cows.

The first one is Mary Marshall, a Guernsey, that made a net profit on estimated butter of \$59.40.

The second was a great surprise to us all, and it may be a surprise to you. It was a red Polled cow, Mayflower, with a net profit on estimated butter of \$52.10.

The third one is Cassiopia, a Guernsey, which made a net profit on estimated butter of \$50.35.

The fourth, Primrose, a Jersey, with a net profit on estimated butter of \$50.25.

The fifth, Procius of Pastang, a Guernsey, with a net profit on estimated butter of \$49.49.

The sixth, Beauty of Norval, a Holstein, with a net profit on estimated butter of \$49.43.

The seventh, Queen May, a Jersey, with a net profit on estimated butter of \$47.46.

The eighth, Betsey I., an Ayshire, with a net profit on estimated butter of \$46.07.

The ninth, Pearl of Woodside, an Ayshire; profit \$45.46.

And tenth, Kersty Wallace, a Jersey, with a profit of \$45.34.

So here they are. In the first ten we find three Guernseys, three Ayrshires, two Jerseys, one Red Polled, and one Holstein. Here are five breeds in those first ten cows of the fifty that were there. I think that shows pretty clearly the ground I take in saying it was hard to answer the question, "Which were the best breed of cattle at the Pan-American in the Model Dairy?" We cannot say that there is any one breed that has all the good points.

Now as to care. I would like to ask how many horsemen here in Freeport, or in the State of Illinois, would think of going out to do a day's work with their horses, or driving for pleasure, or using their horses for any purpose they may see fit, would think of going out without giving their horses a thorough grooming. Not one I think. But how many of us dairymen do give our cows one bit of care. We simply take the feed and throw it before them; let them eat what they like, and throw the rest out; and perhaps don't give them enough to sustain the body, say nothing of giving milk; don't know whether they are feeding a balanced ration or any other ration, just so they eat. It is not all in feeding, not by any means. Feed alone won't make a cow do her best. You can't get the best out of a cow by feed alone. You take some care of her and you will get much better results. Don't just throw some kind of food to her. See that she is fed, and fed the right kind of food, and keep her clean.

It is said a good many times things are not appreciated because they are cheap, and I think that is true, and it reminds me of a man in our

town. There was a carpenter in our town, a good workman, but always poor. He could never go to the stores without having to have things charged. One time, as he was going out of the store, the proprietor called to him and said: "Anthony, I want to see you." Anthony stepped back and was heard to say: "Well, Mr. Miller, I haven't any money, but if you have got work I am chuck full of that." It is the same with us; care don't cost anything. A little elbow grease and a little time will work wonders. If we have put ten pounds of feed in a cow to get certain results, it has been my experience that if you feed that cow seven pounds of feed and give her three minutes extra care you will get just as good results and much more satisfaction.

The feeds at the Model Dairy were not provided for as well as they could have been. That is, it had not been looked out for properly. Mr. Converse got a gentleman to put up some silage for them the year previous. This silage was put up seventeen miles away from the grounds. We could not get any one any nearer. They could have done it on the exposition grounds if they had looked into it sooner, and saved a whole lot of money. We had silage like most of you farmers have. We had clover hay, although I found it difficult to find the kind I would liked to have had. I made several trips to the hay market and found it fairly good. Clover hay and silage constituted the roughage until we got green food—green clover, oats, millet and fresh green corn.

The supplementary feeds, the protein feeds. Let us see how we can raise our protein feed next year. That is the hardest problem, to raise protein feed, but it can be raised. We can get it in clover hay. Clover hay is a perfectly balanced ration, but it takes so much to make a cow do her best; she cannot digest it all. We must give concentrated feeds. The carbohydrates, on the other hand we can raise to perfection. I noticed the corn fields as I came through this grain valley. In traveling through the west one takes a sleeper at night and goes to bed, and looks out in the morning on corn fields, and then still more corn fields. There is no

trouble through here, or in the east, to raise all the carbohydrates we want, but it is the protein that is expensive.

The feeding at the Model Dairy was entirely optional with the herdsmen. They had a reputation at stake, and it was made entirely optional with them to feed what they liked. Any feed they asked for was given them, and it was weighed out to them right to the ounce. Not only was the concentrated foods weighed out to them, but the silage as well; weighed out as close as your grocer weighs out your sugar.

These feeds were all charged to the cows, and it behoved them to get the best results; put them on their mettle. They were trying to get the most for the least outlay of money, and how well they succeeded, I am going to tell you. Some of you have probably read the dairy papers and therefore know.

It would be useless for me to go into detail on the ration each cow received during the six months they were there. There was hardly any two cows that got the same ration during that time. We were not feeding those cows as a herd, which we generally do on the farm. Those cows—and those on the farm as well—should be treated individually. You know there are hardly any two cows that have the same capacity. If you want to get the very best results you should treat each cow individually.

A good deal is said about balanced rations. I think it an imposition on you to explain what a balance ration is. You all know it. However, if there is any one here who does not know what a balanced ration means, I will say to them that it means feeds that contain one part protein to five and one-half parts of carbohydrates. This should be fed to cows, or to any animal; I mean for milk. One part protein to five or five and one-half of carbohydrates would constitute a balance ration. That is a standard ration. Less than one, five, five is considered a narrow ration. Anything above that is a wide ration, which means more carbohydrates in proportion to the protein.

There were the Guernsey herds, the Jersey herds, the Holstein herds and the Ayrshires. I have divided the feeding into three periods and given you the average. In order to cut down the figures, I will give you the average of each breed, not what each individual cow has done. So we will take the Guernseys first. They got 25 $\frac{1}{4}$ pounds dry matter, 1-5-4 nut. ratio. Grain ration eleven pounds per day. It cost 17.3 cents per day to feed each one of the cows during the first period. The second period they got 18 $\frac{1}{2}$ pounds dry matter. The Nutra ratio was 1-5-8, a little wider than the first period. The grain feed was 12.3 pounds per day, and a cost of 14.6 cents per day. The last period they had 23 pounds dry matter. Nutra ratio was 1-5. They were fed narrow. When Prof. Caldwell left the grounds, I think it was the first week, he said to Mr. Murphy, the herdsman, "I want you to feed those cows so they give as much milk with as little cost as you can possibly make it." And those cows did remarkably well on a narrow ration. Some of the other herdsmen tried to follow his example, and the result was that the Guernseys took the lead at the start, and the other herdsmen thought Murphy had a cinch on a narrow ration, but they fell down when they tried it, some of them.

The Jerseys were fed a little over 26 pounds dry matter and same nutra ratio, 1-5-3. Narrow, as you see. The grain ration was considerable more than the Guernseys. It cost to feed them 17.4 cents a day. They used 14 pounds of grain. The second period they fed 21 pounds dry matter a day. The nutra ration was 1-4, which is very narrow. The Jersey herdsmen said if the Guernseys could get better results by feeding a narrow ration, they were going to make it narrow too, and he did, and consequently could not keep up his cows. They did not keep up in the test nor in milk. So they changed again and the next week their cows would be up again. He seemed to have no hold on them. Two-thirds of the time the first four months those cows were up and down and every way; did not seem to know what to do with them. The last period was when the Jerseys did their best. We could depend on them to do right from week to week. He was feeding these cows a wide ration. He got an idea

in his head that if he would feed a wide ration—that is more carbohydrates in proportion to the protein—that he would get better results, and he did. There is a point for you dairymen where you raise more carbohydrates. The nutra ration at the last period was 1-6-3, which was wide. It cost 15.8 cents per day.

The Ayrshires fed about 25 pounds dry matter the first period and they had identically a standard ration, 1-5-5; grain feed 12.8 pounds per day, and it cost them 16.4 cents per day.

The second period of the Ayrshires they fed 18 pounds dry matter. The nutra ratio 1-4-6, which was narrow. They were trying to follow the example of the Guernsey man with a narrow ration. But some of them found it did not work. I would say right here that the Ayrshire herd was not handled as intelligently as some others.

The Guernsey cows were fed a narrow ration; some of them narrower than others. I give this as an average, but not of the individual cow.

As I said, the second period of the Ayrshires they fed 18 pounds dry matter, ratio of 1-4-6, at a cost of 13.8 cents per day. He was feeding a good deal of green food, and it was charged to them at \$1.75 a ton, whereas the silage was charged at \$2.00 a ton. His cows did remarkably well.

The last period they fed 24½ pounds dry matter and 11 pounds grain a day, at a cost of 14 cents a day. The Ayrshires cost the most; higher than the Holsteins.

The Holsteins in the first feeding period had 29 pounds dry matter. Nutra ratio 1-5-1, with 14 pounds grain feed a day at a cost of 18 cents a day.

The second period they had 24½ pounds dry matter. The nutra ratio 1-4-2, which was very narrow as you see. Thirteen pounds of grain feed and it cost 18 cents per day.

In the last period they used 29 pounds dry matter. The nutra ratio was 1-5-9, somewhat wider than the last. They fed 13.1 pounds of grain a day, but the cost, instead of going down, went to 19 cents a day.

There is a good lesson in those figures and especially as it was in a year when protein was so high.

At the meetings that were held in February, it was decided what should be charged for the feeds. We could not have one amount of feed at the market price and another at another price. It was necessary, in order not to get too large or too small a price to have a permanent price for the feeds. They decided to take the average of the five years past, and the feed was charged to them all at the average of the last five years. Bran, \$15.00; oats, \$16.00; corn meal, \$16.00; linseed meal, \$25.00; cotton seed meal, \$25.00; pea meal, \$25.00. I think those are the prices without having the figures just at hand.

Now the lesson to be gained from these computations is this: If we can not raise the protein feeds, have to buy a large portion of them when they are so excessively high as this year, and the price of products not correspondingly high, would it not be a good plan to feed a wider ration, although we can't get quite as much milk? I would be understood, that we can get more milk by feeding a narrow ration than a wide one. We can do that. Is it not more profitable to feed a wider ration with such feeds as we can raise on the farm, and get less milk at a less cost? I think that is what we are after—raise more and buy less.

You probably noticed that during the second period that they used less dry matter. The total of dry matter on the second period was less than the first or the third. We fed a good deal of green clover, green oats and green millet. The first load of green clover that we had brought in, why, the herdsmen were so tickled. They were going to have green clover right along, and calculated they would drop the grain feed. It was the prevailing idea they could now drop their grain feed. When we turned the cows out in pasture we do not need to supplement with grain feed, but they were greatly mistaken. The cows went down, down, down. And they, too, thought it was not necessary to feed them any grain.

The clover looked nice when we got it, and it was nice. The cows liked it too, but the nutriment in it had not fully developed. It was no

doubt about 90 per cent water, and the cows would not give milk on that. They had to feed the concentrated feeds at that time the same as any other time. Would it be profitable for us to do that? Is it? I say it is. If we have land that is tillable and we can raise on one acre grains enough to feed two cows, it is profitable to feed them and feed them in the barn and feed grain food. On the other hand, the dairyman who has a lot of rough land, isn't it better to turn his cows out and let them pick their feed? They do better, and why? I don't know why it is, but I will give you my reasons why I think it is. You turn the cows out into the pastures and you will see that they go for just what she wants. She takes the best. She knows what she wants, and she takes the most nutritious part of the feed only. Now, when we give it to them some of it is good, some of it not so much so but still they eat it, and they usually eat it all up. It is not very nutritious on the whole, and for that reason we have to feed them the more concentrated foods to keep up the flow of milk.

I have not done a great deal of soiling myself; just started a year ago. But I mean to keep a great many more cows on the same number of acres than I have done before, and have practically accomplished that now.

It depends a good deal on what you are going to do with your milk after you get it, as to the kind of cow you should keep. Some want to make butter, some send it to the cheese factory or the city customer; it depends on what you are going to do with the milk as to the kind of cattle you should keep.

I have selected the four special dairy breeds, the Guernseys, Jerseys, Ayrshires and Holsteins, and the amounts of estimated butter they have made. We speak of estimated butter and it may not be quite plain to you what we mean by that. To have kept and churned the cream separate from all that milk, and keep it separated every day from 50 cows, ten different breeds, and five cows in a breed would have been an amount of work impossible to do with the means we had. There was one day in the week

that each herd's milk was separated. We took two herds each day. That made it five days in each week we got around and separated the milk. The cream from that milk was ripened and churned, and from that churning the butter was estimated. We did not do as usual, take say 12 pounds of butter a churn and multiply that by seven, because you know that would not be fair. For on the day we separated the milk they might have done remarkably well, or the herdsmen might, if they knew when their time came, have played a little trick that would have shown them up much better. So the milk was weighed separately, and from that the number of pounds of butter it had made, from so many pounds of milk, the rest of the week was estimated. That's what we called estimated butter.

Here I will give you the amount of milk they gave. Will give the Guernseys first: Estimated butter, 1429.43 pounds; value, \$357.36; cost of feed, \$136.99; net profit, \$220.37.

Jersey—Estimated butter, 1409.15 pounds; value, \$352.25; cost of feed, \$137.78; net profit, \$214.51.

Ayrshires—Estimated butter 1415.57 pounds; value, \$353.89; cost of feed, \$140.98; net profit, \$212.91.

Holsteins—Estimated butter, 1439.28; value, \$357.57; cost of feed \$164.69; net profit, \$192.88.

There were four prizes offered at the Model Dairy. First prize for net profit on butter fat. Second prize for net profit in churned butter. Third prize, net profit in total solids, and fourth prize, net profit in total solids and gain in live weight. Each cow was weighed once each day for five days at beginning of test, and also weighed at the last of the test, and if there was a loss in weight that was deducted at the rate of 3 cents a pound, and if they gained they were credited with 3 cents a pound.

The Guernseys produced 1248.09 pounds of butter fat at a cost of feed of \$136.99, gives a net profit of \$230.10.

The Jerseys produced 1234.96 pounds of butter fat at a cost of feed of \$137.78. That made a net profit of \$225.44.

The Ayshires stood third in butter fat. They made 1219 pounds of butter fat at a cost of \$140.98, a net profit of \$217.58.

Now comes the Holsteins. They made 1275.85 pounds of butter fat at a cost of feed of \$164.69, with a net profit of \$210.56.

There you have it. The Holsteins made 27 pounds more of butter fat than did the Guernseys, but it was made at a large expense. It has gone through the dairy press quite extensively that the Guernseys made the most butter fat. That is not true; it is a mistaken idea. They did not, the Holsteins made the most; but at an increased cost.

We want the most for the least money. Well, the Jerseys and the Guernseys are pre-eminently the butter breeds. If you want to make butter, and you want to get the breed that will do it for the least money, they are the ones to get. There is no question about it. The tests have demonstrated this.

There is another thing about the Jerseys. The cream was ripened and treated under the same conditions. We had two churns running right side by side. Whenever we have a Guernsey or a Jersey, and then one of the other breeds churning at the same time, they could churn the Channel Island cream at a temperature of 56 degrees, whereas it was necessary for other breeds to cool the cream down to 48. After it was worked we could take the butter from the Channel Island breeds, print it at once, and it could be sold at once without it running all over. The other breeds it was necessary before it was printed to cool it, and it had to be returned to the cooler again before we could sell it out. This too is in favor of the Channel Island breeds. But, as I said before, if you want cows that give you a large amount of milk, give you milk solids, the products of milk solids, the Holsteins stand first. They are way above all the rest of them. They produced 4742 pounds of milk solids that was valued at \$426.83 at a feed cost of \$164.69, and the next profit in milk solids of the Holsteins was \$262.14.

The Ayshires were next with 4185 pounds of milk solids with a net profit of \$235.70. I have three other breeds here that come in here on

milk solids which we have not talked about at all, as their place on butter is much lower than in the proportion of milk solids. Here is the Brown Swiss that has a net profit of \$207.69, and the Red Polled, their net profit on milk solids is \$201.65. Then comes the Jerseys with only 13 cents less than the Red Polled, \$201.52. I think this is a fair sample of those cows.

It has been stated very freely and very often by visitors at the Model Dairy that the prices that we got for our products were too excessive; that the ordinary dairyman could not get them. I presume a good many of you were at the Pan-American. Those of you who visited the Model Dairy probably noticed above each cow a history—a bulletin, recording for the first week, and from that on, and from the first of May and so on. There were two records showing just what each cow had done. They have said that the price of 25 cents per pound for butter was too high. We had no trouble in selling the butter, and a good share of it went at 35 cents, and if we had had fifty times as much as we had we could have sold it all.

Why I allude to this is for this reason: That a dairyman that will take care of the cows as those cows were taken care of, will feed the cows as they were fed, will treat the milk as that was treated, in fact, will go through the whole thing and keep that old thing with the new name, bacteria or microbes—I call it dirt—keep that out, there is no reason why every one of us can't get more than 25 cents a pound for butter.

I had an experience that I must tell you about. It will be 21 years next spring that I bought a farm. I had a few hundred dollars to pay down and good health and lots of gumption. I also had a better half and we worked together and we managed to get along, but I tell you the first four or five years was up hill work. I got discouraged and would probably have thrown it up but for better advice from the better half. I made up my mind that I had got to make some changes; that I must get out of that rut or I would not succeed. I timed my cows so they would come in in the fall, and began to make butter on the farm, as the cheese

factory was too far away. I began to look into this dairy question. I gave those cows just as good care as I knew how, and I had been taught how to take care of cows in Switzerland. The first year the butter was very low, and I looked with longing eyes for the Elgin prices, but instead of coming up they went down. I had a good many tubs of butter at that time and didn't want to sell it when it was down. I wanted to get a better price. Our local buyer offered me 20 cents a pound for it. He told me he was only paying 19 cents, but would give me 20 cents for mine, but I didn't sell. I took that butter and sent it to the city of Utica and went there myself; loaded it on a truck and went from store to store. I didn't have any success at first. When we got in front of a grocery store my man said: "Here's a man that handles lots of butter." I went in and asked him if he wanted to buy some butter. He didn't encourage me, and I started to go out when he stopped me and said he would like to see the butter. I brought it in and he passed it over to his son, who said "I will keep this butter." He paid me for it and said: "Wouldn't you like to sell your butter as fast as you can make it?" I said "Yes." He offered to draw up a contract for a year if I would make butter as good as that I had sold him. He drew up a contract and when I read it I nearly fainted. I thought he was trying to sell me a gold brick. I was a little suspicious and wouldn't sign it then and went to see a friend of mine and asked him about the man, and he said: "He's been in business for years and is good," and I went back and signed the contract. He said in that contract: "I will pay you the highest quotation in the New York market for Elgin butter; I will furnish the packages; I will pay the express." I sent him butter that year and also for six years afterwards. You can do the same thing if you will take pains to make the best. There is no need for dairymen to sell their butter if they have the right kind, as the president said this morning, selling it to the process butter manufacturer at 5, 6 and 7 cents per pound. Let them make a good article and you and I won't have to contend with such a fraud as this Wisconsin creamery and Elgin creamery, so-called, process butter.

If you don't want to make butter, you can sell your milk if made as I have indicated here. You have a man around here in Illinois who sells milk at 12 cents a quart in the Chicago market, when most of the men at the milk stations are getting \$1.40 a hundred pounds at this time when it is scarce; quite a difference from 12 cents a quart—at least that's what they are getting in my section. Could Mr. Gurler get 12 cents a quart if he was not giving a good article? This man I sold the butter to came to my house and I asked him how he could pay me the price. He said: "Price cuts no figure. There are hundreds of people in every city who have nothing to do under the sun except to think what they would like to eat, and when they find what they want the price cuts no figure." So lets work for a good article, there's lots of room on top.

There has been lots said about large cows and little cows. I don't know which is best. Some people think there is more profit in large cows, and some in little cows. It isn't the amount of feed you give a cow that is going to give you the most profit. It is the amount that cow can assimilate. If the cow is giving 40 pounds of milk a day, and if you feed her 40 pounds silage, 10 pounds grain feed, and you go and double her feed she isn't going to give double the amount of milk. She will give just as much in return as she can assimilate, the rest of the food is wasted; yes! more. It injures the cow.

I have here two cows. A Holstein cow called Meg. You have heard at her probably. The Canadian people have just simply lauded that cow. She did nobly at first; weighed 1262 pounds; and another Holstein cow, Mercedes, that weighed 951 pounds. The first cow, Meg, ate \$34.00 worth of feed and made 282.61 pounds of estimated butter that was worth \$70.71, or 900 pounds milk solids at 9 cents a pound or \$81.00, a difference of \$11.00 between butter and milk solids on that cow.

Mercedes ate \$32.00 worth of feed and made 288.34 pounds estimated butter worth \$72.08, or 943.43 solids worth \$84.90. The large cow, Meg, gained only 27 pounds more than did the small cow, in flesh, at 3c per pound or 87 cents. But the little cow made more milk solids yet she con-

sumed less feed. So you see the little cow has the advantage of the large cow of 5.73 pounds of estimated butter, yet the little cow ate less feed. What did the large cow do with that other feed? I was talking to Prof. Wing about it one day, and he said that feed just passed through; it was so much loss.

Take that Guernsey cow, Mary Marshall, she made 354 pounds butter at a feed cost of \$29.00. Medora Fern made 139 lbs. of butter less than did Mary Marshall at a feed cost of \$4.80 less than Mary Marshall. What did Medora Fern do with that food? As I said before, a good deal of that passed off; she didn't have the assimilating power. Medora Fern was a beautiful cow, a typical Guernsey. You dairymen that go on dairy type would not have liked that cow. She had a good uder, a thick neck, and her abdomen small. Mary Marshall had a fine neck and head, but she had a black nose—this is a point against the Guernsey in the show ring. She was built so that she had lots of room inside for assimilation. You have a man out here in the west who is almost perfect in picking out the dairy type, Prof. Haecker of Minnesota, so I don't need to tell you anything about dairy type.

If you haven't any of those bulletins that give you the values of the different breeds, I think you can get them from Cornell University. I don't know whether they give them free or not outside of New York; if not, you can procure them for a sma'l cost. I believe you can get them in Hoard's Dairyman also.

I would say to you, brother dairymen, that the deeper we look into this matter of feeding the dairy cow, the more interested we become. It will lead us on to better care and more judicious feeding, and take it all together, it will culminate into better productions. Dairying is the grandest occupation in the world, especially where we can raise the feeds so abundantly in this the grandest country in the world, so let's stick to dairing. Use more brains and success is ours. Where is there a merchant or professional man who succeeds in his especial calling who does not put as much, yes more, labor in his business than a dairyman?

By the president:—Now gentlemen, you are privileged to ask any questions you wish.

DISCUSSION.

Mr. Stewart:—You have given us a good explanation of milk cows, now I would like to ask you, if you are going to turn your cows into beef, would you take Jerseys or Guernseys or Holsteins or Ayreshires, what cows would you take; you know it is the end of all cows.

A:—Death is the end of all cows. You know the little Jersey cows are not wanted in the Chicago stock yards. You have made profit enough out of that little cow, you ought to be able to give her a decent burial at the end of her usefulness; she has made more money for you each year than the other cows will bring when your butcher them. But if you have cows that you want to keep a certain length of time, they are the Red Polleds, the Brown Swiss and the Shorthorns, all of which answer better for the dual purpose cow. When you get ready to turn them into beef, they will do it more profitably.

Mr. Stewart:—In my experience I have found that any cow will make nicer beef than the Jerseys, they don't make nice beef. If you are going to keep a cow for ten years, that's different, but the average life of a cow is a very short number of years, and I find the Jerseys are not much longer lived than the other cows, but beef is the end and that ought to be counted in.

Mr. Nowlan:—I was at the Pan-American for some time, and I would like to ask him if the method used there in getting the amount of butter, the estimated amount of butter, is the practical method for the average farmer to use. Can he afford to put that much time into it. Hadn't we better assimilate the whole matter, weigh each cow's milk every night a certain amount, and then one week out of a month take a composite test. It seems to me if we try to follow out their method it will take more time than we can give?

A:—You can tell in a very few minutes with a Babcock test of what value that cow is. Find out the value of the individual cow and weed out the unprofitable ones; test what I did years ago.

Mr. Glover:—What ration were they feeding to those herds at the time he noticed the difference in the firmness of the butter?

A:—When we fed considerable gluten feed, it was rather soft. Perhaps all of you know that gluten feed will produce soft butter. Feed bran and you get a firm butter. Bran has a tendency to produce firmness in the butter; so has cottseed meal, but that is not a very safe meal to feed; you have to feed it carefully. Linseed meal you can feed almost ad libitum and you won't hurt the cows.

Q:—Are we to understand all these cows were fed alike?

A:—No sir, not by any means. The time is getting short, so I cannot give you the details.

Mr. Long:—Is the report of these tests published in pamphlet form. If so, where can we get it?

A:—On my way up here, I stopped off at Buffalo to see Mr. Converse and he has just about completed a book on that very thing, and you will be able to get it soon.

Mr. President:—In that connection, if they would like to look up Hoard's Dairyman they will find all these facts there.

Mr. Crozier:—In connection with gluten feed, how much gluten meal is it safe to feed a cow without making too soft butter in the summer time?

A:—If you feed about one-third your ration gluten feed you will be perfectly safe.

Q:—One-third grain?

A:—One-third of the grain ration. We fed two bran to one the gluten. We fed three times a day. If we found the ration was too wide, we fed more Protein feed such as cottonseed meal. We bought two tons of gluten feed just to please one of the Buffalo manufacturers. He said he would put it in at \$17.00 a ton. I was out in the country when they

brought it in, and just as I got back to the barn I was notified that they were unloading the gluten feed. I went and took one of the bags off one of the wagons and saw at a glance it was a low grade of gluten feed. It had only 18 or 19 per cent of protein in it, when it should have had 28 or 30 per cent.

Q:—Some run as high as 36 per cent.

A:—Not gluten feed, but gluten meal. There is a difference between the two. You have got to go very carefully in feeding it. With us in New York state the manufacturers have got to guarantee the amount of protein it contains. I don't know whether the law is the same here or not.

Mr. Crozier:—What I want to know, is whether the danger is to the cow or the product; would it hurt the cow?

A:—Both.

Q:—If limited to five pounds?

A:—That would be perfectly safe for a large cow, if mixed as indicated before. I would say not to get too narrow a ration; that would run a cow down. Keep as near the standard ration as possible.

SOY BEANS AND VETCH—THEIR GROWTH AND FEEDING VALUE.

BY A. A. HINKLEY, DUBOIS, ILL.

Mr. President, Ladies and Gentlemen :

I have here samples of Soy beans. This last season was pretty dry and they did not grow as tall as usual, but these will show you how they grow for seed. (Shows samples.)

It seems as though I, a fruit grower, was a little out of place before a convention of dairymen; but on second thoughts, the difference in our interests is but slight. We are both working on the same line, which

is to retain or increase the fertility of our soil while converting some of the elements into valuable foods—peaches and cream, for instance. You dairymen produce the golden butter; we the golden apple (Grimes Golden), and in doing so, remove very little fertility from our farms.

The Soy bean is a native of China, or some other of the far eastern countries, where it has been grown for ages. The plant is stocky and branching in growth, with numerous large leaves. The flower is small and close to the stem of stalk and branch, where it is well protected from unfavorable weather conditions by the dense foliage.

The large main root penetrates deep into the soil, while numerous rootlets fill the surface soil. The extensive root system with the nitrogen gathering bacteria makes it one of the most valuable plants for soil renovation.

To grow this crop, the ground should be well prepared. I prefer to plow the ground some time before planting, and work it over with the cultivator to produce a firm bed below with a loose surface on top.

Although this crop will stand more unfavorable weather conditions and produce more desirable returns for labor, etc., than the cow pea and others of the bean family, it is better to wait until the ground is warm before planting, to insure quick germination of the seed.

If grown for seed, plant in rows 34 inches apart more or less as it is more convenient; cultivate until the plants shade the ground. When the leaves and pods begin to turn yellow, the crop should be cut. After wilting, put in small shocks until well cured. Then they are ready to thresh or haul into the barn. The seed is very liable to heat when stored in bulk, and for that reason it is difficult to keep it from one season to another.

The seed is very rich in protein; equal to oil meal in that respect. When grown on land that will produce 50 bushels of corn, the Soy bean should yield 35 to 40 bushels of seed, which I think is the cheapest way to obtain protein. A bushel containing as much of that element as three bushels of corn, or, in other words, 50 bushels of corn contains about 420 lbs. of protein, and 35 bushels of Soy beans contains about 714 lbs.; a

difference of nearly 300 lbs. from one acre in favor of the latter. The Soy bean is also more than three times richer in fat (ether extract) than corn.

After threshing, the straw makes a good feed, nearly equal to timothy.

For hay, the seed is generally sown at the rate of a bushel to the acre, without any further cultivation, but this crowds the plants and produces smaller stalks. It should be cut when in full bloom, or before the seed has developed much, when it makes a most excellent hay for growing animals, or milk production, and it has not the objectionable dust of red clover.

There are many varieties of this Soy bean. They are divided into three classes according to their growth, Mammoth, Medium and Dwarf.

The Mammoth will not mature seed in Illinois, but makes a heavy growth for hay.

The Medium requires the full season to mature seed.

The Dwarf will ripen seed in 60 to 70 days. There is a variety with green seed that grows nearly as large as the medium, and matures about the same time as the dwarf, which makes it more valuable in other respects than either of these, and I think it is the most promising variety for northern Illinois. I know of no growing crop that wild rabbits like better than the Soy bean. Chickens and turkeys are also fond of them, so that a small experimental lot must be put where they will not get at and destroy them.

I understand that in some places the dairymen are restricted from using the concentrated wild feeds, or any feed likely to taint the milk or its products. There can be no such objection to the Soy bean.

The Sand Vetch, or Winter Vetch, is a native of Europe, and in some sections is extensively grown for feed. It is of slender growth and while quite young lies close to the ground. As it grows, the vines run over each other until there is a mass of loose vegetation knee deep or more. Each plant stools or makes several vines which grow from 2 to 5 feet in length. The bloom is profuse; the individual flower is small,

purple in color, and grows in racemes which stand above the foliage so that a field of it in bloom presents a solid purple surface to view, which is maintained for a week or longer.

It makes a hay rich in protein, but as it lies on the ground much is damaged. Best results for hay will be obtained by sowing it in the fall with rye.

The rye is a good support, and both mature about the same time. It is claimed by some that wheat is better than rye for this purpose on account of the straw being not quite so stiff, and the wheat having a little longer season, gives the vetch a chance to grow more; but it seems to me that the vetch will be apt to overgrow the wheat and cause it to lodge, but either plan will make a hay rich in protein.

There is much to learn of the different leguminous plants regarding their growth and feeding values. The great diversity of the soil and climate of our state is such that we must not jump at conclusions from favorable or unfavorable reports from any one section. Even results from adjoining farms are often conflicting.

It would be well to experiment for a series of years in a small way with a number of these crops. They cover such a wide range of conditions, and their uses are so varied, that they possess an important place in our agricultural interests.

For early spring planting, the Canada peas are a valuable feed when grown with oats or barley; their growth is suited to the cooler months.

The Soy bean and cow pea require the hot summer months for their best development. The vetch does best sown in the fall. With me, it will stand as much unfavorable weather conditions as rye. This is the fourth winter I have had it growing, and it has not been killed by cold. I think it one of the most promising leguminous crops we have.

As to feeding the grain of the Soy bean, the little I have used in that way has been fed whole with other grains to horses and cows; to sheep and hogs I have fed it alone.

For milch cows, it is recommended to have it ground and mixed with other feeds, or it can be fed in the pod, in which shape the cattle will eat

the seed with the pods and stems, but the ration cannot be balanced accurately that way.

The ration for a milch cow, I think, is 1 lb. protein to 5 or 6 lbs. carbohydrates, which is a narrow one and requires a concentrated feed to produce economically. The need of the Soy bean contains 34 per cent protein and 33.6 carbohydrates and fat, which you see is a very strong feed.

	Protein.	Carbohydrates.	Fat.
Soy bean hay contains.....	15.4	61	5.2
Vetch hay contains.....	17	61	2.3

In heat and energy 1 per cent of fats is equal to 2 of carbohydrates. Taking this value of the fats and adding to the carbohydrates, we still have a very narrow ration in these hays—Soy being 1 lb. protein to 4.65 of carbohydrates and Vetch 1 lb. protein to 4.9 of carbohydrates.

DISCUSSION.

Q. Is that the early kind?

A. No, this is the medium.

Q. Is that the green seed?

A. No, the yellow seed.

By the President—Any one wishing to ask questions on this subject, Mr. Hinkley will tell you all about it.

Mr. Campbell:—Q. Do you think we can grow those things in northern Illinois? We claim we cannot.

A. I think the green variety and the dwarf. In Antioch they tried to grow it, but they did not succeed that year. I don't know if they tried it again.

Q. What variety is this?

A. Medium, yellow.

Mr. Glover:—Q. How many bushels did you say you could get per acre?

A. Thirty-five bushels per acre.

Q. Are your cows fond of it?

A. Yes, sir, very fond of it; would frather have a bunch of that than anything else to eat.

Q. When you feed this to your cows, do you use it with other feeds?

A. You know I am not in the dairy business. I am feeding it mostly to sheep.

Q. How do you keep your seed; how do you prepare for it?

A. We put it in an ordinary threshing machine and keep it in small bulk; 6 or 8 inches deep on a dry floor.

Q. Can you keep it in summer?

A. All right to keep through the summer.

Mr. Glover:—Q. Do you grind it?

A. I have never tried it. It can't be ground by itself, unless in doing that they will cut and not press it.

Q. Don't that become hard when lying on the floor and drying?

A. No harder than here in the pod.

Q. Can the cow chew that?

A. If you feed that alone it gums in the cows' teeth; it is very oily. It should be fed in connection with something else.

Q. I suppose it is the question whether we had better raise Soy beans to feed the stock instead of corn; that's the question I believe. I have read the reports and a number of experiments have been made, and only last week I read a report from one of one of the Experiment Stations giving the experience of the farmers in Kansas, and they had not found it profitable to raise it in place of corn for fodder; and it is a question with us, and we want to know whether we had better stop raising corn for fodder for the stock or in connection with other stuff raise Soy beans. How far north can that be raised in Illinois?

A Member:—A. In Carroll county. I was surprised to see it, too, this dry weather. The cattle like it very well. They will pick that up before corn every time. I feed it in the straw; feed it as hay, and I noticed that they picked that up first. It will grow as far north as Carroll county. My soil is not sandy; it is a clay soil, hilly, poor land: it is hilly and rough.

Mr. Hinckley:—It is not recommended as stock growing corn. The idea is to try these plants to supplement those crops and increase the protein ration. It leaves the ground in fineshape for a crop after.

Mr. Heine:—Q. How does it crop with clover for renovating land?

A. It is better because we cannot grow clover. This plant I have here, it grew up to about three feet.

Q. How would it do to plant this with corn and cultivate it together?

A. I rather think the corn would shade it too much. That will not make as good ensilage as the corn plant.

A Member:—I tried that plant. I found it very good and put the corn up over it; had the corn outside of mine and I found it a very good plan. Cut it up in the silo.

Mr. Crozier:—My idea is to increase the protein in the ensilage. I tried that a year ago, but got hold of some that was not good; it matured to seed. I tried it alone and it was the same. I know the cows eat it splendidly.

A. There are so many varieties of Soy beans, and are liable to be unsuccessful unless you can get them to guarantee it to be the Soy bean. It is hard to know the difference. I had one variety that did not produce one-third the amount my last crop did. This has been grown in southern Illinois for fifteen years.

Mr. President:—Who has this for sale?

A. I don't know anyone at present.

Q. How does this compare with the vetch?

A. Vetch is just a winter plant.

Q. Is this vetch you have here a winter plant?

A. Late fall and early winter.

Mr. Long:—What do you use to cut that stuff with?

A. A mower. I cut it when the stalk is green. If you leave it until ripe it would be pretty hard work to cut. Another thing, the seed should be sown a peck to the acre, that is what I sow. There is a cow pea for the north that is good to grow.

Q. What's the name, please?

A. The New Era.

Q. I have tried the black eye.

A. It is not as early as the new pea, and it makes a good deal more vine.

Q. Did you ever have a failure with Soy beans?

A. Not a failure in five years that I have been growing it. This has been the hardest season and then it was a better crop than corn. The corn was not nearly as good as this.

Q. Give us the particulars and how many bushels per acre.

A. I could not say from the way I cut it this year. I don't believe there were over 15 bushels to the acre. But you take an acre, if you get rows like this (showing ear), you would get nearer 40 bushels or more.

Q. What kind of soil?

A. The stronger the soil the better.

Q. Does that require any mowing?

A. No; cut it with a machine.

Q. No hoeing?

A. No; a two-horse cultivator, the same as I use for corn. Masses it up so as to cultivate it.

Q. For hay or for seed?

A. I don't take any chances on these plants; to cultivate this is a benefit to the soil.

Q. When is the proper time to plant it?

A. First of May to last of June cow peas; last of May to first of August.

Q. That's down in Egypt?

A. Yes, sir; but you can take dwarf and plant it in corn time, May to June. Plant dwarf at about first of June and it will mature in 60 days, and this green variety will mature in two or three days later, probably a week later.

I think it will be a good idea to experiment with it. If you can get it to grow here in northern Illinois, you can beat your corn crop.

The President:—I would say in connection with this talk, that this gentleman went from this section; that it would be a good idea to try an acre next year and you will see that it is something you can use in connection with your corn and thus save your money and be able to produce milk cheaper.

Q. Do you feed it in the hay or grain?

A. Feed it mostly in the hay just as it is, but I am feeding it mostly to sheep.

The President:—In regard to this paper. It will be in our annual report, and it would be a good thing for you all to belong to this Dairy Association, and a copy of this book will be sent you through the mail. This season's report will be published in August.

Mr. Crozier:—I would like to ask what he considered a good crop for hay; how many tons to the acre?

A. I could not answer that; never had it weighed. I have a good deal of mine in the pasture and orchard and paid very little attention to the amount it turned off, but I think it depends; probably three tons of dry hay per acre. The medium would make from two to three tons I should think.

Q. How does it compare with clover hay?

A. It is a richer hay than clover and there is not the objectionable dust that clover hay often has. The hard main stem the cattle don't eat very well, if fed in large quantities. But my experience has been in feeding sheep. I feed them the Mammoth Soy bean and hay and let the sheep have all they wanted and then turn it over to the horses along with timothy hay. They would leave the timothy hay and eat this. They would not eat any great quantity of it, but a little at a time in preference to good timothy hay.

The President:—Let me call your attention to the excellent program tonight.

Adjourned until 7:30 p. m.

Tuesday Evening, Jan. 7th, 1902.

Convention called to order by the President.

Music by the Wangdoodle Quartette. Encored.

Music by Gibler's Orchestra.

By the President:—We have with us tonight one of our old friends, who has come all the way from Omaha to help entertain us; one whom no state or national convention would be all right without. Allow me to introduce Hon. Jules Lumbar d, of Omaha.

Song:—I shall have to ask your pardon for singing sacred music.

By the President:—I would like to say, Mr. Lumbar d, all the dairy-men are religious.

Mr. Lumbar d:—I know they are all very devout.

Encored.

HOW TO EDUCATE OUR SONS AND DAUGHTERS TO REMAIN ON THE FARM.

BY. W. R. KIMZEY, TAMAROA, ILL., PRESIDENT ILLINOIS
FARMERS' INSTITUTE.

Mr. President:—This is a very important subject and Mr. Kimzey will tell us something that will be good for us to hear.

Mr. Chairman, Ladies and Gentlemen:—I was somewhat surprised at being asked to come here and tell how to keep the boys and girls on the farm, a person who lives nearly 400 miles from here, but I think that probably the president knew I was raised on a farm, still lived there, and

was educated in the country schools, and probably more in touch with the country children.

My idea of an address may not be what yours is. When I see the word "address," it makes me think of the long speeches, probably one, two, three hours in length that we listened to when attending school. That is not my idea. I want to have just a plain common talk. I may talk shop some, but that is the talk we need to get, and if certain things may appeal to you, some of which you have thought of before, some that which may be new, I hope they will be discussed or thought of, and when you go back home that your influence in the country will be such as will tend to keep the boys and girls where nature intended them to be kept—at home on the farm, near to nature.

There are several causes that lead to the boys and girls leaving the farm. You, who are farmers, who were born and raised on the farm, doubtless remember how, when going to the city, probably to some society, some entertainment, or, if not, in walking along the streets, how the dudish boys and girls passed you by, looking down upon you, and you had a feeling of envy and jealousy that your lot was not like theirs. Is that not one of the strong reasons of bringing the country boys first toward looking to city life as the ideal life?

So many of the country communities had no society. I am glad to say that now in many of the communities the country society, the country entertainments and the country literary work is as good as in the city. It is part of the training to make the boys and girls true citizens of this country.

You also doubtless remember how hard it was at four o'clock in the morning in the summer time or harvest time or extra seeding time to get up. The cows had to be milked and the horses had to be cared for. After that the long hours in the field and coming in at night tired, probably would be eight or nine o'clock, without any recreation. Their work is not easy. In farm work it is necessary at certain seasons of the year for these long hours; do not let us overlook the social feature of the boys and girls. It is drudgery from morning until night until the boys leaves

home to get away from it all. Now, if the boy was taken as a partner with his father, his wishes consulted a little as to planning the different work and how to raise stock. If he felt he was consulted in this work, would he not have much more direct interest in the work? If the girls were allowed an interest in the poultry, and her wishes were consulted about the house by her mother, would she not take a greater interest in her work? The only way for conscientious earnest work is to get them interested, to have them feel they are a part of it; not a mere servant. Let them know you want their interest.

Then these long winter evenings—keep them interested. Usually the father and mother, as soon as the supper is over, the mother probably gets her knitting and the father gets the paper and settles down to their own work, and the boys and girls are left probably to study their school work or go to bed. Can't you mothers and fathers look more to the evening enjoyment of these children? Why not try once a week probably, or twice, to have the evening, after the supper work is done, devoted to the children's amusement. Invite some of the neighbors' children in; have the boys and girls feel you are interested in their pleasures. We hear the cry raised every year of the boys going to the saloons and going to the cities to saloons, there, probably to destruction, while the father and mother at home never once think of providing for their pleasant social evenings, entertainments, etc., at home. It seems to me it is one of the vital points to be looked at in this country life; that is, if we wish them to like farm work.

The Farmers' Institute, as many of you know, first started I believe the original bill introduced by Mr. Curtis and your Senator Aspinwall and also the additional bill for the free library. This Farmers' Institute is reaching the farmers, and through them the young people, the boys and girls, in a way that no other movement has ever done. The Domestic Science part of our College is reaching the ladies and the girls on improved cookery, improved household work and home decorations. These two institutions are awakening the farmers.

It has gone farther; in addition the County Institute, farmers' clubs are being organized. In Illinois that movement is quite in its infancy, but in some of the other states it has been followed for some time and the improvements on farms in those sections are great.

The plan as followed by them is largely that of social gatherings. Probably once a month the farmers' club has a meeting at one of the homes of the neighbors. The forenoon is devoted to the farm inspection, looking at the barns, stock and premises, condition of the fences, the way the machinery is cared for, and all that sort of thing, and they talk it over. The women in the house are inspecting the housewife's work, her preserves, fruit, the various kind of housework is discussed. In the afternoon a joint program of men and women is held together, and at night the young people come in and have a social evening. In that way you arouse the boys and girls to study farm conditions, and the first part of the evening is devoted to a written review of some of the books in the library, so that it is not wholly social, but some literary work is done as a general finish. This kind of work will put the young folks to studying as well as the old people. In villages under township organization, these meetings can be held at the town hall say once a month. Have your club work first and the social work afterwards. Get the young people to have papers on subjects, and prepare them gradually to appear in public before others; teach them parliamentary rules and work of that kind, and encourage the social feature. This will interest the boys and girls, and the older people, too, and show them the beauty of farm life.

In many of the counties, the country telephone is proving a thing especially beneficial to the women and girls of the farm, for through the bad weather they are not as independent in traveling as their brothers and fathers, but with a country telephone with so many of the farmers in the county on the line, the evenings can be spent with a social chat with their neighbors. In some counties this telephone scheme is working successfully, with from 20 to 500 farmers on the line, and it is found to be a great improvement to the home life on the farm.

In addition to the social side of the matter, we have to take into consideration the size of the farm. The work on the farm is considerably les-

sened with the improved machinery of today. Formerly, when a man started out to harrow it took three men and three or four horses to do the work, that now one man with the new improved gang plows can do in less time, and with all the other improved machinery, there is less need of so much help on the farm, especially where the farmer has two or three boys. And the land is so settled now that it is well nigh impossible to buy farms for our boys—it is too expensive. Is it not more intensive farming instead of extensive farming? If greater study was put to the soil conditions, to the climatic conditions existing in the various counties, instead of having fences with ten to fifteen acres of waste ground on each side of it, we could have small fields divided up and have a closer system of farming and tillage, would it not give employment to more boys on the farm today?

About two weeks ago this question came up of keeping the boys on the farm, and a number of the farmers present got up and said it was not keeping them there so much, as it was furnishing them land to work, if they stayed there. They were driven away because of no work for them.

In this matter of intensive farming, it dissolves itself into one of two things, more especially on the question of truck work near cities. Next comes the dairy work, whereby closer soiling and building up of the lands are thought of.

A small farm will support a family in abundance nowadays, when it formerly required three or four times as large an acreage under the old systems. It seems to me the dairy work is specially adapted to this intensive work, when conducted along the modern methods of soiling and forrage crops. Do away with large fields of pasturage as formerly used.

Now let me talk "shop" a little. Does not our present system in the public schools, where we urge our children to finish the country school, complete the examinations, pass the final country examination and from them to the high school, and then from there to the universities or some colleges—all the work being away from the farm—does that not draw our boys and girls from the farm into the various so-called professions of life? The majority of our teachers in the country schools—I say "our"—

I mean more especially in Perry county; in your county it may be different—but a majority of the teachers are from city homes or the towns and villages. If they are ladies going to the country schools, they dress probably nicer than the country girls, with probably a little more of the frills of fashion; use a little smoother language. All this appeals to the country girls as being something above them. If it is the city men teachers, the same holds good. Every teacher, if he or she is a true teacher, is an example that is followed by the children under them. With so many city teachers there is a tendency to draw the boys from the farm into the city, instead of keeping them at home. Other conditions being equal, always favor a country teacher for a country school. They know your conditions at home and can get into that country school and interest the children in their work so much better than a person probably better educated can go into the same district, but who is unfamiliar with those conditions. This seems to be one of the features that is very frequently overlooked in this educating the boys and girls. You ask the most of these city teachers about the different breeds of horses, or the difference between a beef or dairy type, or the difference between the kinds of sheep, they will tell you "I don't know." And the greater per cent of the teachers in the Teachers' Institutes would have to acknowledge they do not know what hame strings are, or else would have to make a guess at it. A country teacher can understand the boys and girls of the country in their home work and can interest them as they should be interested.

How, then, can we interest them? How reach them in their own lines of work? I think not by making any additions to the present course of instruction, but by causing them to open their eyes to the every day things about them in the country schools. Every school has thirty minutes' time of so-called "observation work." If the teachers, during that period, not of course all at once, but scattered through the school term, would bring in questions of soil, a study of the soil in the locations where they live; whether sandy soil or loam, or whether acid matter. Let them illustrate it, and would not that get the children to studying their

home conditions, the conditions in the district where they live, and make true farm life seem to them something more than mere drudgery? If studying horticulture during this period, especially in the spring, there are lots of subjects that would keep them more than interested if they had teachers who understood the subjects themselves. Would not this also interest the parents in the schools; they would say "That teacher knows what she's doing." If later the work was cultivation of the orchard, showing how to prevent the dust muck from forming on the trees and prevent them from withering, as in orchards not cultivated; would that not raise them in their estimation? In northern Illinois, if the question of corn raising was considered, showing the difference between two ears; taking a typical ear, well filled at each end, and explaining about the rows being close together or apart, would that not be another feature in the farm life? Not until we began talking at the Farmers' Institute and hearing the matter discussed, had I realized the great difference in the quality of corn planted from ears which had a large space between the rows, in the deep-grained cob; is not that a thing that would appeal to the boy and his father at home? Then, again, in oat producing counties, the simple treatment for oat smut would reach a large percentage of the farmers, and a talk on this line given at length would be worth hundreds of dollars, not only in the district where they live, but to the farmers throughout the state of Illinois. All this could be carried on indefinitely.

In talking of stock raising, the types of beef animals with the square flat back and the flat under lines, etc.; then the dairy lines and the balanced rations, of which we heard so much today; and the carbo-hydrates and the protein—it is all Greek to them—but if brought in these lessons, after a few lessons bringing up the various kinds of foods and the feeding of the animals at home, would they not become interested and get them to looking at the significance of the farm work? The main thing is not all technical work, but to open their eyes to see what there is round about them.

In only one way can this be secured, and this is through your help. I am County Superintendent of Perry County schools and Brother Burton

in your county, but we cannot put these into the schools unless you fellows of the country want it and demand it. In some of the counties it has been called for; in Wayne county, through agitating the cause in the convention at Appleton, it has been placed in the schools there and the results are very satisfactory. In Champaign county, out of 1,600 papers filed for examination, all but less than a dozen took lessons on agricultural science. These things are what we must demand. You must help to have them taught and it will tend in a large measure to increase the interest of the boys and the girls in the farm work.

In Wisconsin, your neighbor state here, so much stress has been given to this subject, that it is now required as one of the branches in teachers' examinations.

In New York state, the state that probably has been following it longer than any other state, instead of requiring it says it must be taught. The State University is taking it up and through New York state bulletins are furnished the country teachers and clubs are organized to study it in nearly every country district in the state of New York. The children are interested and the result is, when they leave the country school, instead of going to a medical or some other college, they go to the agricultural college at Cornell. If this was carried out in Illinois, it would bring the same results.

The University of Illinois has been issuing circulars, and if the farmers would call for them, the teachers here would gladly provide these bulletins to you or send them throughout Illinois. Formerly when other states inquired of us concerning this subject, Illinois had to hang her head, but now she has cause to hold her head as high as any state; they are second to no one. Four years ago our Agricultural College was held in a basement of a number of other buildings at Champaign, with cracks in the walls, but today a college building, second to none, stands there with nearly two hundred students in the agricultural course. It is not alone for the boys, but there is the domestic feature for the girls. There is no reason why our college, instead of 200 boys and girls, should

not have 2000 boys and girls. It is not always necessary to stay the full two years, or four years for a degree. Go and stay one year, two years, or even four months if you can't stay any longer. All gained in this way will make the boy and girl more contented with the farm life and give them an object to attain.

At the present time, the great power of the United States lies in her agricultural population. If the boys and girls were properly educated, would they not feel that the agricultural work, the farm work, instead of being something to be ashamed of and being called clodhoppers, was the future of the country in which they could have a share. I trust with your help that this will all come to pass, and that our country boys and girls will stay on the farm.

Recitation by Elmer Thayer. Encored.

Music by Bibler's orchestra.

Song by Mr. Bagley. Encored.

THE CREAMERY PATRON'S COW.

PROF. E. H. FARRINGTON, MADISON, WIS.

Ladies and Gentlemen:—

It is a great pleasure to attend one of these conventions. The first dairy convention I ever attended was in this state about ten years ago, and I think I have attended more dairy conventions in Illinois than any other state. Prof. Morrell was one of the leading members of the association; L. M. Potter and several others who passed away. And some of the men have left the association and do not attend any longer; still there are some that I recognize, so that I always feel at home to come to the Illinois State Dairy Association conventions.

I have a certain program I want to carry out this evening and the first thing is to read some few feeble remarks I have written and then I

will give you a few pictures on the screen. I will try and not speak too long. A short time ago I was attending a meeting, and a man got up and he talked over two hours and when he finally quit, a man said that the speaker reminded him of a horse he had, they had to pull his nose to make him drink and pull his tail off to make him stop.

In discussing this important factor of the dairy industry, I wish to make it plain at the beginning that I am not the champion of any particular breed of cows; my knowledge of the different strains or types of dairy cows is not sufficient to enable me to enlarge on the advantages of a long horned cow over a short horn, neither do I pretend to say that a Guernsey, a Jersey, a Holstein, or an Ayrshire is the best cow for a creamery patron to keep. My information on the cow question is confined to observations made at some of the 95 farms that are supplying milk to the Wisconsin Dairy School.

In visiting these farms during the past seven years, I have not attempted to train myself so that I might become sufficiently expert to tell a farmer all about the different cows in his herd by simply looking them over while sitting in a buggy in the highway, but my efforts have all been directed towards trying to induce the farmer to keep a record of what his cows are doing. This it seems to me is going to help him, and I am afraid if I tried to discuss the points of a cow with a patron, that I would be in the plight of the professor of agriculture who was once talking with a young lady and she suddenly turned on him and asked: "Professor, can you tell a good cow?" The professor, without any hesitation, replied: "Why, yes, I think I can." "Then what would you tell her?" said the young lady. I did not wait to hear the rest of this interesting conversation, but without further delay I wish to say that my position on the cow question is expressed in the text, "By their fruits ye shall know them." If a cow gives milk and butter enough in a year to pay for her keep and a profit besides, she is worth telling something of a story about, but if her production is less than the cost of her food then the less told about her the better; it is encouraging, however, once in a while to hear

some one report that an unprofitable cow has been disposed of, and to know that such an animal is no longer being bought and sold among creamery patrons.

The lack of exact knowledge regarding the annual production of each cow in a creamery patron's herd is in some cases rather surprising. It often happens that the cows are milked and fed in the same routine way every year, and if the check from the creamery is not large enough to suit the patron—and it never is—then a great many complaints are heard about the price of butter, or the cost of feed, and very little if any effort is made to find out whether or not the cows are what they should be.

An illustration or two will serve to show the extent to which some creamery patrons make an effort to think, or how well informed they are, about their cows and their business affairs. I once asked a farmer, who was bringing milk to the creamery, what breed of cows he kept, and he said, "Oh, I don't know, I guess they are Poland China cows." Another patron, who was drawing his own and some of the neighbor's milk to the factory, came to see me one day about the price he was receiving for his work. He said he had come to the conclusion that he could not afford to make the trip unless he was paid a dollar and a half a day; I asked him what he was getting and he said he didn't know, but it wasn't enough. I looked up the record showing how much he had received for several months and found from his own creamery checks that he had been paid \$1.75 per day for drawing milk. This was twenty-five cents more than he said he wanted, but he had not taken the trouble to find out how much he was receiving before he came in to make his complaint and demand of \$1.50 per day.

It is too often the case that creamery patrons keep no records whatever, and do not have the slightest idea as to where they are at. They look at the amount of their check without thinking that the size of their cows, and their own size, is responsible for the size of their monthly check. Many of them talk like a woman I met on the streets Decem-

ber 23rd. As I passed her I said, ' Good morning Mrs. Blank, I suppose you are out buying Christmas presents this morning.' "No," she said, "it's too hard times to buy Christmas presents this year; the creamery don't pay enough for the milk." Now that woman keeps nine cows, and the creamery paid her \$250.00 in a year for the milk she sent to it. This is between \$25.00 and \$35.00 per cow per year that she receives, and she never once thinks that it is the cow's fault, or her own fault, that she does not get more money but according to her way of thinking, —and there are others that are of the same opinion—the fault lies in the price of butter, the creamery management, or the hard times.

There is such a tendency in human nature "to look out and not in," as the Sunday school teacher use to tell us; to think that the causes of our hard lot are all outside our own door-yard instead of in it; that we are sometimes helped by being reminded that a little investigation at home may be a profitable undertaking. This sort of an inquiry would be very helpful to many farmers, if they can be led to realize what a difference there is in the earning capacity of the cows in their own herds, and then be induced to part with those that eat more than they produce; when they have done this the prices of butter and the "hard times" will not be continually worrying them. There's nothing like the inspiration of playing a winning game to make us forget our troubles, and this being true, the most cheerful dairyman ought to be the one who knows the most about his cows.

It was with the hope of helping creamery patrons and of illustrating the conditions of some dairy herds to the dairy interests of that state that we undertook, some four years ago, to begin testing the cows of the patrons supplying milk to the Wicnsin Dairy School. These patrons keep cows and deliver milk to the factory in the same way as is customary at the creameries and cheese factories throughout the state. They do not have large herds, and it was observed during the past year that the cows owned by one hundred of them were probably similar to the one million in the state. Only eight out of one hundred patrons kept more

than twenty cows, and there were thirty-five who each owned from two to five cows only. This shows that the majority of our patrons do not pretend to be dairymen in the sense of making the production of milk a serious business, and I fear that there are many other creamery patrons in so-called dairy districts who do not allow the cows to make much of an impression on their minds; other lines of farming crowds the cows out, so that they receive only a little attention at milking time.

During the past year we have, like other creameries, urged our patrons to take samples of each cow's milk and allow us to test them, as this will aid in obtaining definite knowledge of the amount of milk and butter each cow produces. The patron's usual reply to these suggestions is that he "supposes it would be a good plan to test his cows," or he plainly states that "it is too much bother to take samples." He is either so much attached to his cows that he does not care to take part with any of them even if it is proved that some cows do not produce milk enough to pay for their feed, or he seems to think that he knows enough about his cows without having their milk tested. No one of our patrons during the past seven years has voluntarily brought samples of milk to us for any length of time with the request that we test them for him. This indifference to an exact knowledge of the profit or loss from cows is common among farmers, and on account of it they suffer annually very large financial losses. It is therefore plain that the possessor of such a disposition is as worthy a subject for investigation as are the cows he owns; and it was with the hope of convincing our patrons that cow records are valuable that we began a systematic testing of a number of herds in August, 1897.

In preparation for these tests we had boxes made for carrying four-ounce sample bottles of milk from the farms to our creamery. Small books in which might be recorded the weight of each cow's milk once a week, and accurate weighing scales were also provided. We offered this outfit to our patrons and agreed to test all samples they would send us if these were taken for one day at regular intervals of one, two or four weeks during the year.

Some patrons inquired how much we would pay them for the extra work of weighing each cow's milk once a week, and this suggestion proved to be the only way in which we could get the work started, so we finally agreed to pay \$1.00 per cow to such patrons as would weigh and sample the milk of each cow in their herds at least once a month for one year. Even this inducement did not make much impression on the patrons, and we were able to test six herds only the first year, beginning August 1st, 1897. These tests included the weighing, sampling and testing of the milk of forty cows once every week through one complete period of lactation; eleven more cows were tested for a part of the year. Since that time the testing of patrons' herds has continued. During the year, beginning April 1, 1899, sixty-two cows of nine farms were tested through one complete period of lactation and fifty-four cows for only part of the year. The following year fifty cows on six farms were tested, and up to the present time 217 cows on thirteen of our patrons' farms have been tested. These tests represented 135 complete and 98 partial periods of lactation. The cows in three herds were tested for three years consecutively, and four other herds were tested for two years.

During the first year of testing, the milk of each cow was weighed and tested once each week, but it was impossible to get this done so often after the first year. Some patrons were willing to weigh and sample the milk of each cow once in two weeks and others could only be induced to do this "extra work" once a month.

The results obtained by this three years of testing have shown that farmers may gain a great deal of useful information by such work, and that it is one of the most profitable fields for careful observation in the whole domain of agriculture.

A description of our methods of making the tests and some of the results obtained may be of interest to other creamery patrons.

METHOD OF MAKING THE FARM TEST.

The milk of each cow was weighed and sampled at the morning and night milking one day in each week, every two weeks or once a month, as

the patron desired. The testing day was selected by the patron.

Each dairy was supplied with a pair of scales for weighing the milk, a box of bottles for milk samples, a small 1-ounce tin sampling dipper and a record book. Each cow was given a number which was also placed on the label of a 2-ounce sample bottle, the cow being given a number which was only known by this number throughout the test. About $\frac{1}{2}$ gram of potassium bichromate was added to each sample bottle to keep the milk sweet until tested. The box of samples and the record books were sent to the University creamery, where the samples were tested; the tests were recorded in the patron's book as well as in the permanent record at the creamery, after which the book and box of sample bottles were returned to the farm.

The following instructions were plainly written on the first few pages of the record book sent with each box of sampling bottles:

DIRECTIONS.

1. Give each cow a permanent name or number.
2. Provide a place for using the scales at milking time.
3. Select a milk-weighing pail or bucket.
4. Record the weight of this empty pail, or provide some sure way of deducting its weight from each lot of milk.
5. After milking a cow dry, pour all her milk into the weighing pail.
6. Record the weight of this milk in the proper place in the book.
7. Pour milk from weighing pail into milking bucket and immediately dip a sample from it into a bottle having the number of this cow.
8. The sample from the first milking should only fill the bottle one-half full.
9. At the next milking repeat the weighing and sampling and pour the second sample into the same bottle that was previously half filled.

10. Each sample bottle should contain a mixture of milk from two consecutive milkings of one cow.
11. Cork the same bottles to prevent evaporation.
12. Weigh and sample the milk of each cow once, twice or four times per month.
13. Note time of each milking.
14. Record the date each cow calves.
15. State how many days each calf was fed its mother's milk.
16. How did you dispose of each calf.
17. Weekly statement of cow's feed, including the weight, price and kind of grain, if any, with the amount and kind of hay, cornstalks or other coarse fodder.
18. Health of cows.
19. Note of any change of milkers.
20. Record date when cow was dry.

One farmer, with twelve cows, estimated that fifteen minutes extra time was required to weigh, sample and record the milk of his cows on testing days. At another place the records were taken by a boy who was too young to milk, but capable of doing the extra work required at milking time on testing day. At one farm this work was done by the women, who strongly objected to it, especially when it was necessary to use a lantern at the barn in winter.

ACCURACY OF THE RECORDS.

The accuracy of such records as these is necessarily influenced by conditions common to nearly all farms. Milking is usually done with more or less haste, especially at the planting, haying or harvesting seasons. The milkers, as a rule, are not accustomed to the use of scales, and often consider a weight within one pound of the true figure to be "near enough." They do not understand the necessity of promptness in sampling milk after it has been poured from one pail to another before the cream has begun to separate. In spite of these and other disturbing

factors, our results show that tests of dairy cows can be made by the farmers themselves with sufficient accuracy to give a very satisfactory knowledge of the performance of each cow.

From these weights and samples taken at the farm, the total annual production of a cow is found by multiplying the average of the daily weights of milk and of butter fat taken each month by the number of days in the month and adding the products together. The money value of the milk of each cow is found by multiplying the monthly weight of butter fat by a certain figure which, during the year ending August 1, 1898, was one-half cent less than the average Elgin market price of butter for that month; in 1900 and 1901 it was the average Elgin price. (These are the prices which the creamery paid all its patrons for milk.) The figures obtained for each month are added together to find the production for a year.

FEED AND CARE OF THE HERDS.

The cows at each farm were fed and cared for during the entire year according to the usual practice of their owners. As far as we could ascertain, all the cows at one farm were fed in the same way. No attempt was made to vary the feed of each cow excepting that where grain feeding was practiced, it was usually stopped while a cow was giving little or no milk.

At farm "C," the owner kept a careful record of all grain bought and fed to his cows during 1898. His estimate of this feed is given below: (The grain feed consists of corn and oats ground together, corn meal and bran, of about 15 tons of grain at \$12.00 per ton.)

ESTIMATED FEED COST AND RECEIPTS FROM TWELVE COWS.

EXPENSES.

Grain bought during the year	\$180.00
30 acres cornstalks, \$2.00 per acre	60.00

10 tons of hay at \$5.00	50.00
10 acres good pasturage and 15 acres woodland	65:00
	<hr/>
Total cost of feed	\$355.00

RECEIPTS.

Received for milk at creamery.....	\$572.00
Sold 12 calves at \$5.50	66.00
	<hr/>
Total	\$638.00
60,000 pounds of skim milk, 10c per 100 pounds	60.00
Receipts exceed feed cost	\$343.00
	<hr/>
	\$698.00 \$698.00

This shows that the estimated cost of feed at Farm "C" was nearly \$30.00 per cow and the average receipts per cow were a little over \$58.00. Assuming that the manure will pay for the care of the cow, the owner of this herd received an average profit of \$28.00 per cow.

Each cow at this farm was fed about the same amount of grain and hay during the period of stable-feeding—November 1 to May 1. The grain was fed dry just before milking, 10 to 14 lbs. per head being fed per day to cows in milk. Hay was fed the last thing at night after milking. During daytime the cows were turned into a sheltered yard where they were fed cornstalks that had been stacked near the barn at husking time. The cornstalks were well eaten, and it is probable that the cows satisfied their differences in appetite on the cornstilk, if, as stated each one was given the same amount of hay and grain. The cows had access to well water during the entire year, and were in pasture from May to November. When cows were fresh the calf was allowed to have its mother's milk for about three weeks, when it was sold for veal.

No exact feeding record could be obtained, except at this farm; at the other farms corn, bran or shorts, ground oats, pasture grass and a very

little hay were fed in uncertain amounts, and apparently with no definite plan. At one farm no money was spent for feed during the year, but the corn and oats were raised at home supplied all the grain the cows received, except that some oats were exchanged for bran to give the cows a variety of feed.

Although there was quite a contrast in the feeding and management at the different farms, the method of weighing and testing the milk of each cow was the same in each case.

These tests are of course of more value to the owners of the herds tested than to anyone else, but some illustrations of general interest may be drawn from them.

The cows on one farm were tested for three years. The average receipts per cow in 1898, from the creamery, were \$36.30; in 1900, \$39.20; and in 1901, \$38.92. In 1898, seven of the twelve cows produced less than the average of the herd; in 1900 seven of the eleven were below the average, and in 1901, there were six cows under the average production of the herd. The figures do not show much indication that the owner has profited by the tests. The cows that did not produce enough milk to pay a profit on their feed were kept in the herd for three years, and five other cows produced less than \$30.00 worth of butter in a year.

The annual production of the mature cows during the three years shows that the poor cows did not improve from year to year, but continued to give less milk than required to pay for the feed consumed. The one good cow was equally persistent in doing well. The creamery value of her milk for three years was \$200.00. This is \$110.00 more than the cost of her feed when we take \$30.00 per year as the value of a cow's feed. The butter produced by the other five cows tested for three years amounted to only \$114.00 more than the cost of their feed during the same time. The milk of one cow, therefore, paid the owner within four dollars as much profit in three years, as the milk of five cows in the same herd for the same length of time.

In another herd, the excess of butter over cost of feed of two cows

was worth \$60.00, while that of five other cows was worth only \$58.00.

Thus the owner received at the creamery \$2.00 less for the milk of five cows than he did for that of two cows in the same herd.

The entire herd of twelve cows owned by one farmer only paid a profit of \$75.00 in a year, and three of the twelve cows paid \$50.00 of this amount, leaving \$25.00 as the combined profit of the other nine cows in the herd.

Another herd of twelve cows paid a profit of \$228.00 in a year, but in this herd there was one cow that earned only \$8.00 profit, and another that earned \$31.00 profit, a difference of about 400 per cent in the annual butter value of these two cows to their owner.

Many more startling illustrations might be given from the records of the different herds, but a summary statement of the best and the poorest cows is sufficient to show the value of this kind of work to the farmer.

Table showing variations during one year in the butter value of the cows in each herd:

Patron	No. of Cows in herd.	CREAMERY PAID			CREAMERY VALUE OF		
		Total Cash.	Average per cow.	Best Cow.	Poorest Cow.	Average Cow.	
A-1898	12	\$421	\$35.11	\$53.35	\$28.72	\$36.30	
A-1900	11	405	36.82	82.23	20.18	39.20	
A-1901	11	424	38.56	64.93	23.51	38.92	
B-1898	5	..(1)	.....	58.21	44.83	50.00
C-1898	12	572	47.70	60.72	37.96	48.83	
D-1898	6	228	38.00	55.49	39.60	44.12	
D-1900	6	...	.....	51.28	28.40	44.42
E-1898	5	227	45.40	67.47	44.40	58.40	
F-1900	5	...	.....	68.16	43.47	61.20
E-1901	4	...	.....	70.72	59.47	62.11
F-1898	9	...	.....	60.29	34.00	.....
F-1900	7	...	.....	58.70	31.90	44.00
G-1900	14	563	40.00	72.21	39.32	56.57	
H-1900	8	358	44.75	66.08	17.23	50.00	
H-1901	8	332	41.50	62.71	46.65	56.00	
I-1901	24	...	.....	67.85	14.56	39.00
J-1901	7	270	38.60	51.14	37.58	46.00	
K-1900	8	293	37.00	54.61	22.35	39.00	
L-1901	8	248	31.00	46.81	36.69	42.00	

(1.) Figures are not obtained because patrons did not bring milk to the creamery during the entire year; samples of each cow's milk were, however, tested.

If, as stated, each farmer fed all his cows in the same way, and the time and labor of milking and feeding the cows was approximately the same for both good and poor cows, it follows that it did not cost any more to feed the best than the poorest cows in the herd. The information furnished by such tests as these may be very valuable to the owner of the cows, and it should be of vital importance to the cow as her life ought to depend upon the record she makes. Previous to making the tests, the owners of these cows had very little, if any, accurate idea of the relative value of their cows, but the records show that the information gained is worth many times the cost of a milk weighing scale, a Babcock milk test and the time necessary to use them.

(Then shows pictures of different cows.)

By the president:—Before leaving, I would like to ask the citizens of Freeport to help fill these seats. We shall have excellent programs both day time and evening tomorrow.

Wednesday Morning, January 8th, 1902

President in the chair.

Convention called to order 10 o'clock a. m.

**POULTRY CULTURE AS AN ADJUNCT TO
DAIRYING.**

BY B. F. WYMAN, SYCAMORE, ILLINOIS.

Mr. President, Ladies and gentlemen:

If I have anything in my paper that anyone takes exceptions to, you may interrupt me at any time, and I will make any explanation needed.

Dairying as an industry has not and is not proving as profitable a business as the hard, laborous burdens it places upon those engaged therein, demand that it should be. One of the greatest profits derived from the industry, is in its retention of soil fertility. A kind of an invisible profit, many people will say, but, nevertheless, one of the greatest advantages over other farming, is, that it removes so little of the fertility of our farms that is so absolutely necessary for the production of good crops. For this reason we are loath to give up the business, although the visible profits are small. We believe radical changes are pending in our methods of dairying, and that the time is not far distant when a better product will be demanded of the dairyman, and a better product will demand better prices, and better prices may insure better profit.

In the meantime, however, the average dairyman needs an additional income to add to the small profits for his dairy. An industry that requires but little outlay, and one that returns a large and constant per cent of profit should be selected, and in this connection "Poultry as an adjunct to the dairy" seems to fit most admirably.

Poultry culture is susceptible of being made a profitable business by itself, but it requires an aptitude for the business and considerable special training besides, for one to embark in the field of poultry culture, to the exclusion of other work. There are, however, several very good reasons why it is especially adapted to chink in as a very profitable aid to the dairy. First, because it is on a farm where there is always plenty of room for a free range. As a dairy farm is also a grain farm for the production of food for the cow, there is always more or less waste of grain that poultry would gather and convert into one of the most necessary and luxurious products, without expense. Innumerable insects are also converted by poultry into the same valuable product. Skim milk, a product of the dairy, when fed to poultry has been made to produce more than 40 per cent more profit than grain fed alone. Many dairies require more milkers than are necessary to do the other work, and the utilizing of such labor can be made a valuable factor of profit, by its being systematically used in caring for poultry. The cost to the dairy farmer of installing a poultry plant would be little, because of the many barns, sheds, cribs, stacks, etc., upon so many dairy farms. They make ideal places for biddy to deposit her egg, and I believe tend to a large production.

The natural instinct of the domestic fowl to hide her nest is not yet entirely eradicated, and I am not sure but that it should be observed as an important factor in egg production, and in but few places would the opportunity be so favorable as upon the dairy farm. When such exceptional conditions exist, and the systematic care is given the hen, that should be given the cow, the dairy farmer may reasonably expect a much larger per cent of profit from his fowls than from his cows.

The average dairyman and farmer prefers to keep a large number of cows and cultivate large areas of ground, so that when his products are sold, he will get large sums of money for them. It matters but little to him whether there is much profit above the cost of production, so long as he has the pleasure and satisfaction of handling the large sums of money. He is not, in most instances, keeping an account of the cost of production, but assumes, because he has received considerable sums of money, that there must be a good profit, but when his expenses are all paid, cannot understand where his profits are. There should be more pleasure in making two dollars, and keeping one of them as profit, than in making two hundred without any profit.

And right in this connection is where the "Chicken business" comes in. It is not an industry in which one can get large sums of money at any one time. But like the pennies that are indispensable factors in making up the dollars that constitutes the wealth of the millionaires, so the daily sums received for poultry and its production, exceed in value every other agricultural production of the nation.

Poultry culture has had so little thought bestowed upon it as a commercial industry, that but comparatively few people are aware of the magnitude and the wonderful possibilities of its development as a branch of farm production. If every farmer would keep a strict account with every crop produced, and every kind of stock and poultry raised, they would be astonished at the result, and many would find that after due credit had been given their poultry for all the eggs, feathers and increase produced, at market rates, it would save them a larger profit than some of their most important crops. It is a branch of farm industry that, until recently has always occupied a position far in the rear of all other farm industries, but it is at the present time fast forcing itself upon the notice of the farmers of the country, as a branch of their business that demands better treatment at their hands. The very fact of its having survived the long years of oppression to which it has been subjected, is a strong exemplification of the law of the survival of the fittest, and

should be the strongest possible evidence that the farmer needs to induce him to give it a fair trial under favorable conditions, and not compel his poultry at all times to "scratch" for a living. The farm is the ideal place for poultry, and the only place where it can be made to reach its greatest development and perfection, and when the farmer applies the same business prudence in the management of his poultry that he should exercise in all his business affairs, then he will be able to fully appreciate its value.

The culinary value and importance of eggs could only be fully appreciated by being deprived of them in all their different methods of cookery, and their entire absence in pies, cakes, custards, puddings, confectionery, etc., and in all the innumerable ways in which they are used by nearly every family in the land. That they are a delicious wholesome and valuable adjunct to every table, all will admit. Then the toothsome roast duck and goose always create a wonderful sense of satisfaction and comfort in ones gastronomic region about holiday time, and should be much more liberally used at all other times of the year than they now are. Turkeys and chickens are always in order, most always cheap, are delicious and appetizing, and always a standby for the preacher's periodical visit, and almost as indispensable to the health, comfort and happiness of the family.

For many years, it has been said that corn was king, but poultry has been a close competitor, some years heading the list, and is certainly entitled to be considered the "queen of farm products."

The consumption of eggs and poultry in the state of New York, exclusive of her transient population, is said to amount to nine dollars per capita. Applying that as a basis for the 75 millions of our population at the present time, we have an aggregate of 675 millions, as the total consumption for one year. Taking the census figures of 1880 and 1890, and it is an easy matter figuring on a moderate estimate of production, to make nearly as large a showing.

The Statistician of the U. S. Dept. of Agriculture, in his official report

for 1900, gives the following figures as the production and cash value of some of the leading farm crops:

	Production	
	Bushels.	Value.
Corn	2,105,102,516	\$751,220,034
Wheat	522,229,505	323,515,177
Oats	809,125,989	208,669,233
	Tons.	
Hay	50,110,908	445,538,870
Cotton		334,847,868

Poultry at 600 million exceed all other products except corn, by more than 150 million dollars. It exceeds the dairy, beef, pork and sheep products. The corn crop has exceeded it in value 10 times in the last sixteen years.

Until recent years, we have annually imported millions of dozens of eggs from other countries, but the growth of the industry has been so great that in the year 1900, our imports were only 135,038 dozens, while our exports for same year were 5,920,725 dozens valued at \$984,081.00. The value of the imports were only \$8,741.00.

As before remarked, it is the small items in the poultry business that makes such an enormous aggregate in the whole, and insured the large profits of the business. If each one of the 75 million inhabitants of the United States had eaten one egg for breakfast this morning, at the wholesale price of 24 cents per dozen, it would amount to \$1,500,000.00. The average wholesale prices for eggs in New York, Cincinnati, St. Louis and Chicago for the year 1900 was almost exactly 15 cents per dozen. If every person in the United States should eat one egg per day for one year at that price, their value would be \$342,000,000.00. The city of St. Louis consumes on an average 432,036 per day every day in the year, or nearly one per day for each inhabitant. If the city of St. Louis consumes that number, it is only fair to assume that all other cities will consume as many per capita. If the cities consume nearly one egg per day per

capita, the country will do much better than that, for on nearly all farms they are used in the greatest profusion, and must largely exceed the city consumption.

Galen Wilson, in "Farm and Fireside" requested an old crippled soldier, engaged in poultry raising, to give his views, and received the following: "Eggs are always cash; they are ready for market the minute laid, and the sooner they are sent to market the better. They require no cultivation, pruning or harvesting, but are at once in salable condition. With plenty of eggs on the farm there is a host of good things in the kitchen and money in the family purse. Gathering up eggs is like picking up dimes and dollars. Great is the hen that produces them. When everything else is dull in winter the egg basket has wonderfully helped out many a poor farmer. The crops may be poor, the provisions low, the family cow dry, with a long wait for the next growing season, but the hen comes up smiling, and is ready to get a pound of tea or a sack of flour. If treated well, she will respond as readily when the snow is on the ground as when the fields are green. She is a friend to the rich and poor alike."

As stated above, the farm is the place of all others where poultry culture can be made the most profitable. It is the place of all others where it can obtain its greatest development at the least care and expense. In no other places are the facilities for improvement in fowls so great. In the development of speed in the horse; in the development of the productive powers of the cow, and in the fattening of beeves and swine, wonderful results have been achieved. Breeding for speed, for form, for color, for fat, butter, milk and cheese in farm stock has been reduced to a science, and the results of the work of poultry fanciers is as susceptible of improvement in breeding for form, for type in feather and marking as any kind of farm stock, when the same rules are applied in their management. The results of the work of the poultry fancier in the improvement of poultry in recent years has been marvelous. The work has been accomplished at the expense of great care and patience and accompanied

with many failures. The increased interest in poultry raising during the past few years has resulted in a perfection of breeds that has put the American poultry breeder at the head of all the nations.

Only a few years ago there were no pure bred fowls worth mentioning, while at this time there are men in nearly all the states who are widely known because of their skill and success in breeding poultry. The fanciers work, when thoroughly learned, with the present large demand for pure bred poultry, must of all necessity prove much more remunerative than the production of poultry and eggs for market. From competent authority we learn that two or three hundred dollars are sometimes realized as the result of a single setting of eggs of some of the highly prized breeds. Such prices are, of course, exceptional, and should not be considered by any one contemplating engaging in the business. The cost of keeping fowls, in proportion to their income, as compared with other stock, is small. We should take into consideration the fact that for a large portion of the year they not only obtain their living, but do an immense amount of good in the destruction of noxious insects.

Mr. J. R. Brahazon of Wisconsin, a successful breeder of many years experience, gives the cost at 95c a year to keep a hen in a good thrifty condition, and the same authority figures a profit of \$1.21, or more than 100 per cent.

While it is not our purpose in this paper to figure the profits of the business, yet the showing of what some have done and what others may accomplish, cannot be out of place, and if a profit of over 100 per cent can be made by one person in the production of eggs and poultry, it is a practical demonstration of the fact that others can do equally as well, although it must not be assumed that every kind of fowl will make such a showing.

The best pure breeds or their crosses should be selected, and every person must determine for themselves by the circumstances surrounding them which of the breeds are best adapted to their wants. While it

would not be advisable for every one to attempt to raise fancy or pure bred poultry for breeding purposes, there can be no mistake made by any one in their efforts to improve their stock by the introduction of pure blood.

Poultry raising is an occupation that is not confined to men and boys, but is a light, agreeable and profitable occupation for women and girls as well, and until recent years, the care and management of poultry was almost entirely given over to them. Very many women love the work, and when the surroundings are favorable, they frequently become enthusiastic in it, and the results accomplished by them furnish a prolific source for "pin money" for themselves, and aid very materially to the living of the family and income of the farm.

The question of marketing poultry and its products is an important one and should not be lost sight of in determining the profits of the business, for the attractiveness of all produce and add much to their value and insure ready sales at an advanced price, as evidenced by this extract from the "Wisconsin Farmer:"

"My seventeen-year old daughter has an eye to business, and, noting the very tidy and attractive style in which many articles of merchandise are put up now-a-days, she concluded the scheme was applicable to many farm products as well, and when fitting a lot of poultry for market, she gave it a trial. She marketed 40 dressed chickens the last week in December, selling them through a Chicago commission house. The November lot was dry-picked, drawn and the skin of the neck tied with a common string. They were packed in the ordinary way in a barrel, and shipped. The net returns were 8¼ cents per pound. The December lot was from the same flock and no better and no fatter. They were dressed precisely the same, but the neck and the skin was carefully trimmed with shears, and tied with a cheap, narrow blue ribbon in a double bow knot. The feet were thoroughly cleaned, and each fowl placed in a sitting position, and when cold the same kind of ribbon was tied around the body, over the feet, with a bow knot on the back. She

obtained a store box of sufficient size and plained off all lettering. A row of unbroken rye straw, the length of the height of the inside of the box was placed on and around the ends and sides of the box about one and one-half inches thick, with a layer of straw on the bottom. This was covered with fowls placed closely together with their backs up. A course of straight rye straw was put over these, followed by more birds, and so on until the box was full. The box was then shipped to the same firm and the net return was 13 cents per pound, while the market quotations were a quarter of a cent per pound less than in November. A letter accompanying the remittance said it was the most attractive lot of dressed poultry ever seen in that market, and that 100 boxes like it could have been sold in one hour."

There are many rocks upon which the hopes of the poultry raiser sometimes get wrecked.

In-breeding is one of the most prolific sources of danger, and is far too prevalent in the country at the present time, and to insure strong, healthy fowls and a plentiful supply of eggs, should be studiously avoided.

Keeping a large number of fowls together has proven another fruitful source of danger, and has resulted disastrously to many who have made the attempt. To insure success in raising poultry on a large scale, separate runs should be provided and there is practically no limit to the number which can be kept except lack of space.

Another error frequently made is that of keeping fowls until they are past their usefulness. They should be disposed at two years or three at the most. If kept longer they will not sell for "spring chickens."

In raising poultry for market, chickens should always be sold as broilers when hatched early and are large enough to realize the high prices nearly always prevalent in the early part of the season. The net returns are usually much larger, and it saves the cost of extra growth, and the danger of loss by death is avoided.

Finally, to insure success, provide your fowls with good warm houses, with plenty of sunshine. Give them pure water and a generous supply of

food of a suitable kind, and in every way exercise such care as will insure the greatest comfort to your fowls and in return the law of reciprocity will be fully carried out, and they cannot help a liberal response in the way of eggs and chickens to the generous treatment accorded them. Unlike nearly every other farm product that is cultivated only in certain sections, poultry is susceptible of culture throughout the land. All classes of people participate in its benefactions. The growth of the demand for poultry and its products insures liberal markets. It is one of the most inviting fields of all farm culture, and to the dairyman who intelligently incorporates it as a branch of his business, it offers the grandest and most fruitful possibilities.

The wide-awake hustling people of Kansas, through their State Board of Agriculture, express the following opinion of the hen, entitled:

THE KANSAS HEN.

We have read of Maud, on a summer day,
Who raked barefooted, the new-mown hay;
We have read of the maid in the early morn,
Who milked the cow with the crumpled horn.
And we've read the lays that the poets sing
Of the rustling corn and the flowers of spring,
But of all the lays of tongue or pen
There's naught like the lay of the Kansas Hen.
Long, long before Maud rakes her hay
The Kansas hen has begun to lay.
And ere the milkmaid stirs a peg,
The hen is up and has dropped her egg:
The corn must rustle and the flowers spring
If they hold their own with the barn yard ring.
If Maud is needing a hat and gown
She doesn't hustle her hay to town,
But goes to the store and obtains her suit

With a basketful of her fresh hen fruit.
If the milkmaid's beau makes a Sunday call
She doesn't feed him on milk at all,
But works up eggs in a custard pie,
And stuffs him full of a chicken fry.
And when the old man wants a horn,
Does he take the druggist a load of corn?
Not much!. He simply robs a nest,
And to town he goes—you know the rest:
He hangs around with the cliques and rings,
And talks of politics and things,
While his poor wife stays at home and scowls,
But is saved from want by these selfsame fowls;
For, while her husband lingers there,
She watches the cackling hen with care,
And gathers eggs, and the eggs she'll hide
Till she saves enough the stem to tide.
Then hail! All hail! the Kansas hen,
The greatest blessing of all to men;
Throw up your hats and emit a howl
For the persevering barn yard fowl!
Corn may be King, but its plainly seen,
The Kansas hen, is the Kansas Queen.

DISCUSSION.

Mr. Johnson: Did you ever take a number of fowls and chickens and feed them, keeping track of the cost to you, and know what the profit to you was on the chickens? My experience has been if you keep a certain number, and beyond that there is no profit unless you are so situated that you can steal feed from the neighbors.

A. Unfortunately farmers are so far off the chickens get away and stay there. I started the attempt of keeping large numbers together, but it was disastrous.

Q. My point is, that it does not pay to keep a large number of fowls together and feed them. The best way is to have a certain number?

A. Yes, sir.

A Member: I want to say for Mr. Johnson's information that four years ago I lived in Chicago and I had 35 brown Leghorn hens. I kept them in the yard and never let them out. I charged them with everything that went into the yard except the care. I cannot give you the figures of the production. I fed about five pecks of wheat in a year. I have kept poultry for 20 years, fancy poultry, and it is possible, without going to any particular trouble, to make money and make it easy off chickens. The kind of food which will produce the most milk will produce the most eggs. They are largely albumen and the food for use for your cattle is the kind that makes your hens lay best—oats, corn, wheat and bran, and skim milk takes the place of a whole lot of other things. I met a man in Springfield the other day and he was telling me his experiences. He keeps a dairy farm and gives his chickens skim milk, all they will take. He goes to market twice a week and gets two dollars for every one of the hens, and he's got 300 on his farm, and he takes care of them all and feeds them. That is a clear profit of \$1.00 each on the 300 with their productions.

Mr. Wyman: I have here a piece I would like you to hear.

AN AVERAGE OF 247 EGGS PER HEN.

"The average of 235 eggs per hen was made in our money-in-poultry contest by L. E. Dimock of Tolland County, Conn., with 100 hens of five breeds. There were 20 of each breed and an average egg record as follows: Rose Comb White Leghorns, 247; Single Comb Brown Leghorns, 241; Single Comb White Leghorns, 240; Buff Wyandottes, 226; Barred Plymouth Rocks, 221. Mr. Dimock obtained the highest record of the 500 contestants.

It is also the best average from a large flock we have ever seen published. The 100 hens entered were hatched in March, 1899, and marketed

in October, 1899, being replaced at this time by 100 pullets hatched in March 1900. Thus the system for constant flow of eggs 365 days in the year is by hatching the stock in March and marketing them in the fall of the following year, replacing them by the early hatched pullets. In this he gets a constant flow of eggs during the molting period when eggs bring a high price.

In feeding for egg production he gives early in the morning a warm mash made of equal parts corn, oats and wheat ground together. To sufficient quantity of this is added 5 oz. Pratt's hen food for 100 hens. The mash is mixed with hot water and as dry as possible. Don't overfeed. At 10 a. m. scatter a little cracked corn in the litter to keep the hens scratching. The noon feed (12 m.) is oats soaked in hot water. At 3 p. m. scatter cracked corn in the leaves. At 5 p. m. in winter and 7 o'clock in summer give some oats and cracked corn. Steamed cut clover rowen is fed each day and boiled potatoes once in three days. Shells are kept constantly before them. A little meat, and but a little, is fed three times a week. Fresh water is given twice a day and is warmed in winter.

Each compartment of the hen house is 10x12 feet, with two for each flock of 20 hens. One is used for scratching. A window in front of each compartment at the bottom set at an angle of 45 degrees gives the hens a warm place in the sun. A three-foot walk in the back runs the length of the house. Eggs are gathered by opening trap doors. The roosts are three feet from the ground with drop boards underneath for catching the manure, which is cleaned off every morning. There is a yard 50x20 feet in front of each pen, set with fruit trees for shade, which is so much needed in summer. Clean sand covers the ground, which makes it dry at all times.

The houses are built high, of cottage style, which Mr. Dimock considers much more healthy for fowls than low roofed houses. There are ventilators in each gable. The houses are double boarded with paper between. There are board platforms over the roosts from which cloth cur-

tains are dropped down in extremely cold weather to protect the Leghorn hens from freezing their combs. No males are allowed with the laying hens. Another flock is kept to raise the stock from and to do the hatching and rearing as the chicks are raised in the natural way. Mr. Dimock submits the following financial statement: Cost of feed etc., \$94.34; labor (one hour per day) 54.75; 100 pullets \$85.01; total \$234.11; sold eggs \$421.30; 100 hens \$54.00; 10 pounds manure \$10.00; total \$485.30, which gives a profit of \$251.19, or an average of \$2.51 per hen. Below is given the monthly egg record of each pen to show how uniformly the laying has been.

	Buff Wyandotts.	Barred Plymouth Rocks.	S. C. White Leghorns.	R. C. White Leghorns.	S. C. Brown Leg's.
April	478	445	468	470	429
May	423	427	468	457	449
June	422	372	442	444	383
July	349	354	438	404	402
August	343	373	394	383	385
September	262	337	357	421	344
October	375	355	392	426	380
November	374	331	364	384	395
December	478	345	392	360	414
January	301	350	377	341	386
February	292	326	320	320	347
March	342	413	393	522	507
Total	4529	4428	4895	4932	4821
Average	226	221	240	247	241

I have also a little demonstration in regard to the amount of poultry produced in the United States. This is the result of a test that the "Orange Judd Farmer" had with 500 poultry raisers in the United States:

"THE HEN AS MONEY MAKER."

The earning capacity of the American hen has never been carefully determined. Like all other lines of business, farming and stock hus-

bandry, the results are dependant largely upon individuality of the animal and of the attention given by the owner. Long experience of farmers and poultry keepers has shown that a flock of hens may be kept so as to give a return ranging from a considerable net loss on food consumed and labor, to a profit of as much as \$5.00 per fowl. Yet under good average conditions, with fair fowls, suitable food and a reasonable amount of intelligent care, it ought not to be difficult to arrive at a basis which will show what a flock of hens are capable of earning.

There were entered in our money-in-poultry contest, which closed April 1, 1901, over 500 contestants who sent in their reports. These came from every state and territory in the union. The flocks varied in size from 10 to 500 fowls. All manner and sizes of houses and yards were used and every condition presented which is likely to be found on this continent so that an average taken from the figures given will necessarily show what the American hen can and is doing, under average conditions. In computing these results we used the records of 365 poultry keepers who supplied all the figures called for in the record, the others being incomplete in some one or more details.

The contest year was started with 24,345 fowls and closed with 27,268, there being a gain during the year of 2,923. As these represent almost entirely pullets hatched during the spring, they effect the income only part of the time—that is, after they reached maturity and began to lay, which we have assumed at eight months of age. Therefore we have added one-third of this increase to the original number and figured that 25,340 fowls were the number kept during the year. There was invested in these fowls, in the poultry houses, yards, fixtures, etc., the sum of \$43,987.52, or an average investment of \$1.81 per hen. Figuring that each hen is worth about 50 cents, there would be required an investment of about \$1.30 in the way of buildings, land, etc., to keep her. During the year there was expended for food and supplies, which included grit, green done, condition powers, medicines and the like, \$23,712.34 or 94c per hen. This is very close to the usual estimate of \$1 per year as the cost of keep of a hen.

An accurate count was kept by each contestant of the amount of time expended in the care of poultry and a fair valuation was placed upon this, which amounted to 34c per hen each year, or \$23.96 per flock, there being an average of 69 fowls in each flock. During the year these hens laid an average of 82 eggs each. The best record was 247 eggs from a flock of 20 Rose Comb White Leghorns by a Connecticut poultry keeper, as published before. The smallest egg record was from another Connecticut poultryman who obtained 485 eggs from 49 fowls, or about 10 eggs per hen per year. While this average record may seem small, it must be born in mind the number of fowls given also includes the roosters which would make a slight difference in the average yield.

The eggs sold for \$1.15 per hen, showing a fair profit on eggs alone over cost of feed. A considerable portion of the income was derived from the sale of poultry, either young stock or the original fowls, which were turned and replaced by young stock raised uring the year. This amounted to \$17,118.81 or 68c per hen. Making no estimate for stock raised, but charging the entire food cost to eggs, makes eggs cost \$1.15 each for food consumed, but as nearly 1-3 of the food used was consumed by young stock, the net food cost per egg was about $\frac{3}{4}$ c each. This must of course vary largely with locality, as food costs more than double in some sections what it does in others. It can safely be assumed, however, that the food cost of eggs is in the neighborhood of $\frac{1}{2}$ their market value.

The total receipts per fowl amounted to \$1.95 each, leaving a profit of \$1.01 over the cost of feed and 67 cents net over cost of food and labor. This gives a net income of \$46.23 per flock and a gross income of \$135.40. The gross income is actually much nearer the profit derived from the fowls in the contest than the net figures for nearly all the labor given was that employed at odd intervals, which would otherwise be of small value, while a good proportion of the food was that produced on the farms and gardens or refuse from the table which would otherwise go to waste. As a basis for future figuring in the poultry industry, a cost

of food of \$1 per hen and a return over feed of \$1 are pretty safe figures to tie to. These figures are briefly summarized as follows:

INCOME AND PRODUCTION OF AN AVERAGE HEN.

Eggs laid in a year.....	82
Value of eggs sold and used.....	\$1.15
Value of chickens sold.....	.68
Gross income	1.95
Cost of food .....	.94
Cost of labor.....	.34
Profit over food cost.....	1.01
Net profit .....	.67
Investment, including hens, buildings, etc.....	1.81

By the president.—The committee on resolutions will meet at the Brewster House at 11.30, and all resolutions wished to be considered at this convention must be in their hands by that time. No resolution can be laid before the house unless it comes from the committee's hands.

The committee to whom you can hand the resolutions are Mr. M. Long, Mr. I. Nowlan and Mr. George Caven.

—————
BALANCED RATIONS FOR MILK AND MEAT PRODUCTION.
 —————

W. C. DA VJS, FAIRFIELD, ILL.

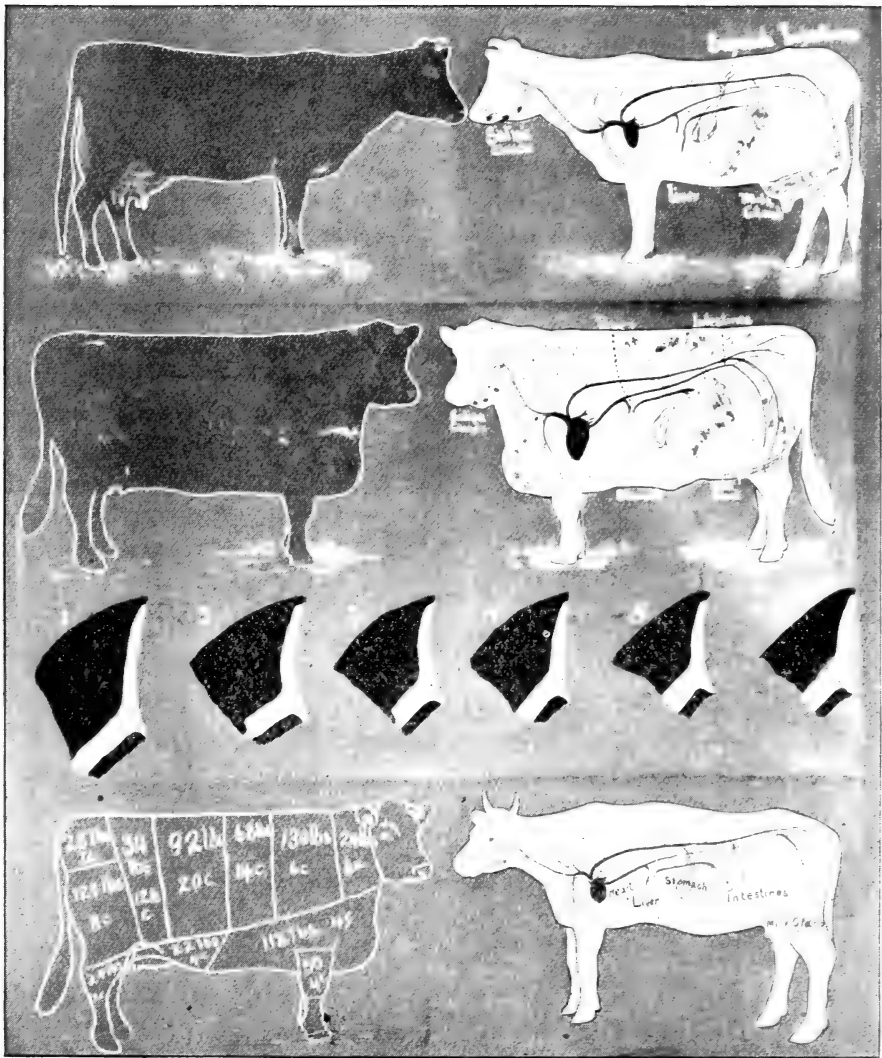
Ladies and gentlemen:—

Two years ago at the Dairy Association, Prof. Henry of Wisconsin asked us to teach balanced rations in the public schools. He even outlined lessons for us that he wished would be taught and they were practical. A little investigation in Illinois soon convinced us that we were

getting ready to teach balanced rations in our public schools, probably not just as he outlined them, but in a rational way, and the Teachers' Association of Illinois has been preparing the way for teaching that very thing. It provides that besides the regular recitations in Physiology, Botany and Zoology, special recitations for the whole school shall be given each week in observation work from these and kindred agricultural and horticultural subjects, in which are taught composition and food value of plants for animal and human use, and composition and value of animal products for food. This year Prof. Davenport, dean of agriculture, of the University of Illinois, is furnishing lessons on animal husbandry, which assures us that the proper matter will be taught. Very few county superintendents or teachers now neglect this work. It has advanced more than any other improvement in the whole public school system, and well it should, for does not our future existence on the earth depend on our ability to produce our food. Dairy products and high-class lean meat (steak) are the choicest food of the highest types of civilization. The dairymen of Illinois should be very much interested in the management of her public schools, from teacher to State Superintendent. As much depends on the sympathy that those in charge have for agriculture and the dairymen's interests.

I shall call your attention now to some of the matter now being taught in our public schools as relates to balanced rations for milk and meat production. The chart here was prepared by one of our school teachers. It is not perfect in all details, but will help us to understand the use of physiology to the dairymen.

At the top of the chart we have the outward form of the \$2,700.00 Jersey cow of the T. S. Cooper sale last May. Opposite is the same outline showing the circulation of the blood through the entire system. The upper lines from the heart represent the arteries carrying the blood out; the lower ones, the veins returning it again to the heart. You notice that these arteries are small to the head, limbs, loins, etc., but much enlarged to the udder to carry supplies for the numerous glands in the udder that change it into milk.



Lungs

Lungs

Heart
Liver
Stomach
Intestines

25 1/2	34	92 1/2	68 1/2	130 1/2	20 1/2
12 1/2	12 1/2	20 C	18 C	18 C	18 C
18 C	12 1/2				
18 1/2	18 1/2	112 1/2	45		
18 1/2					

The animal lower down to the left represents the first prize beef cow of 1901, Imp Sicely, sold for \$500.00. Observe the difference in this and the dairy cow above, especially the backs—not so much in width of hips, but in the back from hip to shoulders. Then the other figures showing blood circulation. Centuries of feeding and selections have produced arteries enlarged mostly to the back.

The lower righthand figure show the circulation of the scrub cow. That has been under fed for generations. Her arteries are only sufficient to carry blood to the members of her body to build up a structure to carry her around on summer pasture, feed her calf three months and store enough fat to help make the fuel her winter's feed will supply. She neither makes much meat or milk, surely not much surplus for her owner. She has not been bred or fed to produce a surplus above maintenance, and no dairyman can afford to try to develop her. A balanced ration for her would 1.12. But as meat and milk products mean a surplus stored up for man above the requirements of the animal, we will turn to the left hand lower figure that shows the different cuts of beef, number of pounds and price at wholesale in Chicago.

It is always easiest to build where there is the least resistance and wear of parts. So here in the beef animal the highest priced cuts (20c) are on the upper parts where little used; the lower priced cuts on limbs, lower parts and neck (most used.) The glands we will refer to later.

We will now turn to to the other chart, that shows the composition of feeds. But first let us understand the use made of foods by animals. The first use is to supply fuel used or stored for future use; second, to repair waste and build new structure. The chemist divides them into two heads represented here by the words "protein" and "carbohydrates."

The protein column represents all of the digestible animal structure making material in the plants named. It is about half carbon and has the same fuel value as the true carbohydrates, starch, etc., but not so much as fat, so the chemist has made two divisions of the carbohydrates as

the fat has $2\frac{1}{2}$ times the fuel value as the starch etc. We show on this chart a day's food supply for 1000 pound animal from pasture grass, timothy hay, clover pasture, clover hay, soy bean, hay, silage, etc., also amount of grain required to make a full day's balanced ration with corn and, say, bean silage.

COMPOSITION AND FEEDING VALUE OF CORN CROPS.

Kinds	Amt. in Pounds	Dry Subst.	Protein	Carbo-hydrates	Fat	Heat Units
Timothy .....	..	..	....	....	..	35,000
						Ratio 1:48
Pasture grass	60	23	1.68	7.38	.36	30,554
						Ratio 1:18
Timothy Hay	20	17.1	.57	9.78	.24	18,545
						Ratio 1:5
Clover grass	80	23.3	2.45	11.28	.56	28,947
Clover hay	20	16.9	1.31	6.98	.32	16,999
Soy bean hay	20	17.7	2.15	8.40	.34	19,713
Soy bean silage	50	12.9	1.53	4.46	.79	
Corn cob meal	6	....	.39	3.78	.21	
Bean	5	....	.63	1.93	.15	28,699
Total	61		2.55	10.17	1.16	Ratio 1:05
Corn silage	50	13.20	.66	7.00	.36	.....
Corn and cob meal.....	4	.....	.26	2.52	.14	.....
Bean	4	.....	.50	1.54	.12	.....
Cotton seed meal	3	.....	1.12	.51	.25	30,020
Total	61	24	2.54	11.57	.87	Ratio 1.53
Hay	10	.....	.30	4.63	.12	9,665
Ear corn	25	.....	1.60	14.75	.73	33,491
Total	35	22.01	1.90	19.48	.85	43,156

Notice composition of the 60 pounds of timothy grass that a cow would eat in a day. It contains 23.7 pounds dry matter, 1.68 pounds protein, 7.38 carbohydrates, 36 pounds fat, making a balanced ration of about 1 part protein to 5 of carbohydrates and fat, showing 30,554 heat units. Cure the 60 pounds of grass into hay and we have about 20 pounds, all a cow would eat on an average for five months, containing 17 pounds dry matter instead of 23 in the grass, .57 pounds protein instead of 1.68; .24

of fat instead of .36 making a ratio of structure to fuel of 1 to 18, but only 18,545 heat units. Only 3-5 as much grass that we used for summer fuel when we had heat and to spare. We all know that the cow loses weight right along on 20 pounds of timothy hay per day. But we want to learn why she gains on grass when giving milk.

The composition and structural growth of plants helps us to understand the reason. Most feeders say grass and silage are most valuable because of their succulent or appetizing properties. But we should say more. That grass and other plants grow by the circulation of water carrying the mineral matter and nitrogen in compounds from the soil through their roots up to the leaves, where carbon enters. Plant material is thus formed in liquids and carried to all parts of the plant, as blood is in the body, only plants have no pumping engine, and the circulating tubes are divided into small cells that enlarge and fill up as the process of growth goes on. New cells are formed adjacent and the old ones filling up become inactive, dead, ready to be cured as hay. The fluid in the undeveloped cells then evaporate and leave some of the minerals. But, as the chart shows, they lose about 2-3 of their nitrogen compounds when cured as hay. When cured as silage the most of this is retained, as in grass shown on the chart. Grass and green cured feeds are worth more because they retain more digestible nutriment.

The long sunshiny hours of July evaporate more water from fresh cut grass, than the shorter hours of June or October, therefore use plants that are ready to be cured in these months for hay, and have a narrower ration in the forage.

According to Prof. Haecker's Bulletin No. 71 (which is simply more deduction from the records of the herd of cows he has been working with at the Minnesota Station for some years, and has been telling us about at our conventions) figures out the average protein, carbohydrates and fat the cow used in these tests to make a pound of milk and a pound of butter fat.

Taking 3.85 per cent milk as a standard, he recommends .046 protein

above maintenance for each pound of milk the cow will give, and that by increasing or decreasing the amount of protein .004 pounds for each .5 pounds increase or decrease of butter fat in the milk, will meet the requirements—allowing, 7 pounds protein for maintenance for a 1000 pound cow.

Briefly stated, the figures require one pound protein for 22 1-5 pounds standard milk or each pound of butter produced counting 1-6 over-run for the churn. Then we have it 1.7 pounds digestible protein for a 1000 pound cow, giving 22 1-5 pounds of milk per day, testing 3.85 per cent fat, or, making 1 pound of butter, 2.7 pounds protein for 2 pounds butter per day, etc.

Taking the next day's feed on the chart, which is 80 pounds clover pasture, we have 2.45 pounds protein, enough for a 650 pound cow to make 2 pounds of butter per day and hold her flesh, or 1 $\frac{3}{4}$ pounds butter for a 1000 pound cow.

The next, clover hay, 20 pounds, 1.31 pounds protein, less .7 for maintenance for 1000 pound cow, leaves only .61 pounds butter per day. Twenty pounds soy bean hay, 2.15 pounds protein, 1.45 pounds butter per day, as against .61 pounds butter in clover hay and .98 pounds on 60 pounds Timothy pasture above maintenance.

These are deductions from Prof Haecker's Bulletin No. 71 and Farm Bulletin No. 22, and our dairy herd confirm them by our records of feeds, milk and butter.

We do not claim that every cow should have 2.50 pounds protein per day when in milk, or that she needs or can use 10 to 15 pounds carbohydrates and $\frac{1}{2}$ to 1 pound fat in making milk. But we do claim that a cow produces the most economically when fed to her capacity of digestion and assimilation for milk or meat. Feeding beyond that is wasteful and dangerous to the health and life of the animal. Feeding a fresh milk cow less protein than she is putting in her milk is simply carrying off her structure in the pail, no matter how much excess of carbohydrates and fat she gets. She may store up fat from the starch and fat in a wide ra-

tion while losing her lean structure and still look plump and well outside, yet her feeder and her milker are as surely killing her as tuberculosis would.

They say that they get all the milk out of her in two or three years. We think they do. They ship her fat carcass to Chicago and she sells for about 4 cents, when lean meat cattle sell at 6 and 7 cents. She, as tallow and blue meat, is run through the rendering vat and sausage mill, and the retailer of oleomargarine and sausages get the profit out of her.

We next call your attention to two balanced rations; one using soy beans for forage, and the other corn silage; both have practically the same amount of protein, 2.55 pounds, and the same ratio, 1 to 5, yet 50 pounds of soy bean silage shows 1.52 pounds protein, while 50 pounds corn silage shows .66 pounds protein. It requires that some of the corn and bran be dropped out and 3 pounds cotton seed oil meal be added to bring up the amount of protein which adds about one-fifth to the cost of the grain in this ration. The last figures on chart show a heavy steer feeding ration—10 pounds hay, 25 pounds corn, 35 pounds; 31 dry substance, 1.90 pounds protein, 19.38 pounds carbohydrates, .85 pounds fat, 43,156 heat units. This is a fattening ration for mature animals. Yet, who wants two-thirds tallow and one-third lean meat served as steak? Then why fatten grown steers? Why not rather feed a lean meat or milk ration to a growing calf or steer, and produce lean meat at about half the cost in grain.

Before leaving this chart, we call your attention again to the comparative protein values of Timothy grass and hay, clover grass and hay, and soy bean and hay; also to sorghum hay being about the same in composition as Timothy; pearl millet hay about the same as clover. Pearl millet grows sown broadcast three to four pounds per acre, where sorghum takes 50 pounds of seed per acre. It will grow a smany tons per acre, 10 to 30 tons cuts two or three crops per year for soiling, a sure grower on all soils. Soy beans for hay or silage needs to be the mammoth variety that grows 5 feet high, instead of 3½ feet for medium, or 2½ for dwarfs. Corn

makes good silage, but needs to be cut and put in the silo at just the right ripening stage, while sorghum, pearl millet and soy beans make perfect silage from bloom to hard grain stage.

We have tried to learn something of the composition of plants and grains used for feeding from this chart; let us turn again to the animal chart and see how the animal converts them into food for human consumption.

Taking the right hand figure at the top, we notice the words "saliva glands" in back of mouth. That secretes a fluid called saliva and is used to moisten the material while being ground by the cows teeth. Small balls are formed with the aid of the tongue and passed into the swallow and are pushed on into the first stomach. Thus the first stage of digestion (separating) and assimilating (taking into the circulation) is begun. Some of the starch is turned into sugar in the mouth and enters the circulation by diffusion. The first, second and third stomachs are merely soak vats with the saliva as liquid, and so far the process has been much the same as the glucose factory uses to get the starch out of corn. But when the rechewed material enters the fourth stomach, another liquid is secreted, called gastric juice, that acts on the protein, and most of it is digested in the stomach. Hence the importance of a high per cent of protein in our roughage, as in grass, soy bean, hay and clover. As dry matter does not pass through the walls of the throat, stomach and intestines, fluids must be secreted by the proper glands to put all the material into the right solution before it can enter the circulation. Therefore, grass with its 60 to 90 per cent of moisture, is more easily digested than hay or whole grain, with only 10 to 15 per cent of moisture. The former requires 3 to 5 per cent to digest it, and the latter 15 to 22 per cent. But it is not entirely water in the plant that makes it digestible. Much of the plant structure is still in solution in the growing plant cells and almost ready to go to the animal circulation, while hay and grain are composed mostly of dead cells, especially hay. The true fat is mostly digested in the intestines by help of the fluids from the gall duct. Four digestive

fluids are secreted by the intestines to complete the work of digestion and assimilation is completed by the lacteals.

How much of the plants have been digested and taken up by the animal depends on two conditions, i. e., structure of the plant and capacity of the animal's digestive glands to secrete the proper fluids. For these glands while unseen by us, differ as much in their working power as the animals do in size, color and form. The breeder and feeder have truly developed the digestive glands, the blood circulation and the storing of the surplus milk, lean meat and fat in the animal as they have their size and place of storing it.

Animals reared largely on carbohydrates and fat have those digestive functions most developed, while those reared mostly on protein feeds have better protein digestive power. So a balanced ration for meat and milk production is first, maintenance, and the then amount of protein, carbohydrates and fat it has capacity to digest and store up in milk, heat and fuel (fat). A grown animal's productive capacity is rarely changed, though their appetite is increased. They may eat a large amount of a well-balanced ration, digest much of it that passes through the entire circulation and be carried off as other waste matter, by the lungs, kidneys and skin, and yet there may be no extra milk or meat stored. While the high bred animal eating the same feed would have digested all the protein, carbohydrates and fat, and stored it as meat and milk of the highest quality. The one used feed at a loss to the owner, who condemns the balanced ration theory, the latter making a good profit, and confirms balanced rations.

This statement is well proven at our State Experiment Station by Prof. Frazier in Bulletin No. 66, with the cows Rose and Nora. Rose is reported as a grade cow of unknown breeding, yet she is truly a high bred dairy cow as if we had the tabulated pedigree tracing back 100 years. And the breeders of dairy cattle in Illinois, who have been striving to improve the dairy breeds of the state should have had the credit due them for producing this extra cow. Many thoroughbred cows have

exceeded this cow's record and such could be in the Illinois Experiment Station barns.

A balanced ration for the scrub cow, making 100 pounds of butter per year, as some dairy farmers did thirty years ago in the eastern states on grass and hay, needed .7 pounds protein for maintenance, .5 pounds for the $\frac{1}{2}$ pound butter a day, 10.68 pounds carbohydrates and fat with a ratio of 1:88, while the high bred cow making 600 pounds of butter per year needs .7 pound protein for maintenance, 3 pounds for 3 pounds butter (for best days), 3.7 pounds protein, 16.45 pounds carbohydrates and fat, with a ration of 1:44. They are both well.

	Per day	Protein.	Carb.	Ratio
Scrub cow, 100 lbs. butter per year	$\frac{1}{2}$ lb.	1.2 lbs.	10.68	1:88
High bred, 600 lbs. butter per year	3 lbs.	3.7 lbs.	16.45	1:44

Balanced rations for butter production. The former could be made from grass and hay, no grain. The latter requires grass, hay, silage, roots and ground grains with high per cent of protein 365 days in the year. One hundred pounds of butter (\$20.00) might pay for grass and hay used and interest and loss on a \$40.00 cow, but no profit. Six hundred pounds of butter (\$120.00) would pay for a large amount of high priced grain with interest and loss of a \$500 cow, and then leave 100 per cent profit.

The scrub cow is usually fed much more than she can use, while the high bred cow is rarely fed enough. The records of the few cows that are fed up to their capacity are disbelieved as much by the low bred cow owner as the balanced rations are.

Let us try to get closer together on this balanced ration question, and then we can better understand wherein she is profitable, and more of us get the benefit of her.

The dairyman that is content with 150 to 200 pounds of butter or its equivalent in milk per annum may feed a wide ration, using corn, oats, fodder and hay, with summer pasture. The winter feed showing a ratio of 1:10 and the summer feed 1:4. But the 300 pounds or 400 pounds of

butter per annum dairymen must feed a narrower ration, as the product above maintenance is doubled, requiring twice as much protein above maintenance, or 2.7 pounds of protein per day as against 1.7 pounds. The 200 pound cow got enough carbohydrates to feed the 400 pound cow, but lacked the protein. One uses a ratio of 1:10, the other 1:5.

So far we have spoken only of the dairy cows used as strictly dairy cows up to her capacity. As many dairymen in this part of the state milk their cows two or three years, feed them to fatten and selling them and then replace them with fresh cows, they try to select cows of the beef type tendencies, so as to get their money back when ready to sell. Let us then turn to the animal chart again and examine the beef type and dairy types in form and circulation of blood. When they have the beef type and dairy type combined, then the product will be divided into meat and milk. As we have stated before, milk is made only to the amount of protein in the feed of the cow, while body gain may be lean meat or wholly fat.

Feeding too wide a ration, too much carbohydrates and fat for milk production, will only make tallow in the beef cow. It may be stored on the back, inside or outside of the ribs. Yet it is only worth 3 cents per pound in the market, while butter is worth 20 cents. This cow may make 200 pounds of butter per annum for two years and 100 pounds body fat; 400 pounds of butter, \$80.00; 200 pounds body fat, \$6.00, that helped to bring her cost price, \$50.00. A 1250 pound cow at 4 cents gross, dressed 500 pounds; of this 150 pounds is bone and waste, 200 pounds tallow, 150 lean table meat, having a wholesale value of about \$25.00, a 50 per cent loss to the slaughter house to be made up from the high quality steers and other products. Would it not be better to have a 300 pound per annum butter cow at a \$100.00 value, feed her more protein and less carbohydrates; a ration balanced to her production, and milk her ten years. You would lose \$10.00 a year on her and gain \$20.00 a year and make less poor beef, less tallow for oleomargarine products, and help raise the dairy cow's capacity to 400 pounds per annum of butter, or its equivalent in

milk; help raise the price of the high grade beef steers by not having to pay the 50 per cent tax the tallow cow dairyman is putting on him.

Can we blame the meat man for helping the oleomargarine manufacturers to put their fraud butter in the retail dealers hands to make 100 per cent profit on, so long as we put the old cow beef up against them?

The lower left hand figure on the chart shows the difference in the prices of meat from a beef animal from 4 to 20 cents per pound wholesale. The small cuts above show why these back cuts are more valuable. The one to the left from a steer dressing 60 per cent, has 4.2 inches lean meat and .8 bone, 1 tallow. A pound of this cut at 23 cents would make the lean meat cost 30 cents per pound. So a steer dressing 40 per cent has 2 inches lean meat, 1 inch bone, 1 inch tallow. A pound of this cut at 15 cents would make the edible lean meat cost 30 cents per pound.

Then the lean meat from an old dairy cow showing twice this amount of fat at 12 cents per pound, costs 20 cents per pound for edible portion. Thus the 60 per cent carcass beef animal would be worth 6 cents gross, the 40 per cent one 3 cents gross, and 1½ cents for the dairy cow. That is all she is worth today and all she will bring on the market in a year or two more. The breeders of high class beef and dairy cattle have not pushed them as they should. The dairymen have not used them as they should, but the laws of production will bend us at its will. If we feed a goose Indian corn it will grow some feathers and store up fat, but will grow better feathers and more of them if fed on grass and corn. Feed a dairy cow what you will, her arteries will carry most of it towards her udder. She will change into milk what protein she can with enough carbohydrates and fat to make a ratio with the protein of about 1:4, and the balance will be stored as fat or wasted. Fed to a beef steer it would be made into lean meat to his ratio of lean to fat. Fed to the scrub cow her arteries are enlarged more to feed her neck, limbs, body than her udder, so she feeds her self and wastes most of the balance and gives but little returns to her owner.

The Red woman of 400 years ago fed her household a balanced ration, Indian corn and lean meat and wild game. She taught us how to

raise corn, and we have learned very little about it since, except to use it to make fat meat animals. The eastern dairyman made milk from grass and hay for winter maintenance. He came west and raised corn instead of grass and hay and feeds it because it is handier. He keeps no record of pounds of milk per cow or per cent of fat in milk, so is beyond the help of students of the feed problem. The weight of milk and per cent of fat is as essential to rational feeding as the weight of forage and grain. A ration cannot be balanced without the scales and test by Babcock or churn.

Two cows stand in adjacent stalls, each weigh 1000 pounds, have been fresh about the same time, are registered A. J. C. C. One gives 10 pounds milk per day, testing 8 per cent, the other 20 pounds, testing 4 per cent. Without these weights and tests who could balance a ration or feed them intelligently?

To sum up this talk let me say, use the highest quality beef and dairy cattle you can get; feed and breed them better. Feed a ration balanced to their capacity and production (and a little more for improvement), be it a ratio of 1 to 1 or 1 to 20. Grow forage with a high per cent of protein; produce meat and milk for food not tallow and oleo.

DISCUSSION.

Mr. Long: I want to make an exception to one thing Mr. Davis said, and that is that this tallow out of these animals went to make oleomargarine. The manufacture of oleo consists of oleo oil; they can't make oleomargarine out of tallow. I have a paper here—

A. I think about 15 per cent of suet enters into the composition of oleomargarine.

By the President: Bring that piece of paper up front here Mr. Long and read it.

Mr. Long: Present cost of oleomargarine, January 18, 1901: This is taken from Hoard's Dairyman.

Cost: Shows proportion used for each hundred pounds.

Oleo oil, 32 lbs., at 9½c per lb.....	\$3.04
Neutral lard, 17 lbs., at 8½c per lb.....	1.44½
Cotton oil, 17 lbs., at 5c per @.....	.85
Milk, 17 lbs., at 1c per lb.....	.17
Salt, 7 lbs., at ½c per lb.....	.03½
	<hr/>
100 lbs.....	\$5.54
Labor, parchment paper, etc.....	1.38
	<hr/>
	\$6.92
Internal revenue tax, 2c per lb.....	2.00
	<hr/>
Total cost, F. O. B., Washington.....	\$8.92

We wish we could get that great host of dairymen who have done nothing to help along the cause to read the foregoing statement.

They are taking it very comfortably these winter evenings, while a few are paying their own expenses at Washington fighting against this great fraud. They can read the future fate of the dairy industry in the fact that more of such concerns are spring up in various parts of the country.

Mr. Johnson: I would like to know why that tallow is quoted today for 4c to 6c per pound, when before oleomargarine was made it was quoted at from 7c to 9c, and lard is higher than before oleomargarine was discovered. There is very little lard oil used in the manufacture of oleomargarine. Isn't it true, that instead of the tallow being used to make oleomargarine, that there is more lard and less tallow used, and should we have those scruples you speak of.

A. Yes, I think we should have these scruples. It will take a bigger man than I am to answer those questions.

Q. What county did you say was teaching those lessons in the common schools?

A. Wayne county.

Q. Is that the only one?

A. No sir.

Q. Well, I live in the country and never heard of it there?

A. Go to the school teachers and talk about it; take some of those government bulletins and read them and you will find they are all getting that way.

Q. I understand they don't teach that in the schools, but have physiology classes.

A. Yes they are and have heard many of them. They are doing it in Wayne county and will be doing it in all counties soon.

By the President: Mr. Davis comes from the center of the State and is well posted on the growing of this soy bean and protein feeds. Any questions on them as to the kind to grow, when to sow, etc., he is ready and willing to answer.

Q. What is the cost of cultivating that compared with corn?

A. This mammoth kind we plant early as corn; it will stand as much cold and dampness as anything else. We drill it with a driller. It costs a little more for the seed. We cultivate it about the same as corn. This mammoth kind we drill thick, a bushel to the acre or more, and don't cultivate it. We can cut two or three crops if we wait.

Q. Is it possible to feed too much protein to the dairy cow. What amount of protein ought we to feed?

A. According to the per cent of protein there is in the milk they produce. I will just read here a ration:

2.08 protein, 16 pounds carbohydrates, 69 fat; ratio 1 to 8. More carbohydrates needed and enough to make a pound of butter. Here is what I was feeding and didn't feed enough protein. She made 20 pounds in the week and according to Prof. Haecker she ought to have had 3.76 protein. I was only feeding 3.30. It depends on what your cows are doing. She only gives 39 pounds of milk, while a cow giving only 3 per cent milk wouldn't need so much protein. We need a Babcock test and the scales. That is the only rational way to feed.

Q. Should the roughage be better?

A. Yes sir, we use all the higher amount of protein or roughage and feed all the roughage they will eat, and then give them grain after her first calf.

Q. Then it don't make so much difference what you feed them as long as you feed enough?

A. She will just put in circulation what you feed her and store in her body or make milk.

Q. He thought it would give good milk no matter what you fed her?

A. No, I don't know about that.

Q. Prof. Haecker told us about that and I believe he is right and I believe a whole lot of us have gone dead blind.

By the President: Just explain yourself.

Mr. Davis: I will explain myself later on. We must not teach as we have been teaching on this feeding question.

Mr. Glover: May be I can clear up this. I have worked in the Minnesota Experiment Station with Prof. Haecker, and the whole tone of his bulletins, and his last work is that we have been feeding too much protein to the average cow. We have been feeding protein to cows, enough of it to a cow that should make 400 pounds of butter a year, and instead of making that amount the cow is only making probably 150 a year. Therefore we are feeding too much protein. She did not have the capacity for that amount of protein. The cow that is making 400 pounds of butter in a year naturally needs more protein than the cow that is only making 100 pounds a year. That is the object of Prof. Haecker's bulletin. The cow that is making 350 pounds of butter only requires $1\frac{1}{2}$ pounds protein a day, but the cow that is making 500 pounds of butter requires $2\frac{1}{2}$ pounds protein a day, and a cow that is only making 150 or so pounds of butter requires less than $1\frac{1}{2}$ pounds of protein. That I think is the object of this bulletin.

Mr. Davis: If she is a beef animal, she will put that protein on her back. So don't feed a beef animal too much protein.

Q. How many years have you been raising that soy bean?

A. Nine years.

Q. How much to the acre?

A. About five tons. We thought six, but they pack so tight. I will know better when we are feeding it out. I can't tell you until spring. But I rather think six tons to the acre.

Q. Do your cows eat this bean?

A. Yes, sir; everything eats it. The chickens eat it. The dry stalks we grind.

Q. Can it be placed together in bulk?

A. Yes, sir; as hay.

Q. How do you cure it?

A. Just like cow peas; cut it down in small shocks and let it wilt.

Q. Where do you place it in bulk?

A. Stack it outside or put it in the barn as any other hay. It cures better than cow peas.

Q. Is it better than corn fodder?

A. Yes sir, better than corn fodder.

Q. Do they eat the pod as well as the bean?

A. Yes sir, but not all the stalks.

Q. How about seed?

A. This mammoth does not mature seed. But if you plant it in July it blossoms before frost, just matures then, and will not have much pod on it. We run it through a shredder, which makes it very fine and use it as bran.

Q. Consume the stalks?

A. Yes sir. It is quite equivalent to bran. That is how we are feeding it.

Q. Is it equal to clover hay?

A. Yes sir, lots better and costs about half as much. That has only 6 or 7 protein and this has 10½ to 11.

Q. Does it produce more milk?

A. Yes sir, a better ration.

Q. Is it because they haven't anything better to eat down there?

A. That is part of it.

Q. Is it difficult to obtain this bean for seed?

A. Yes sir, when you get the bean properly it is. And when you plant it, don't plant down over two inches deep.

Buff Jersey: I planted some this year and I think by next year they will come up all right.

By the President: We will now adjourn and I hope to see you all here this afternoon and more too.

FARM BUTTER MAKING

W. R. HOSTETTER, MT. CARROLL, ILL.

There is quite a difference between what farm buttermaking is, and what farm buttermaking ought to be. I am informed by the leading grocers in my town that 25 per cent of the dairy butter that comes to their stores is all right and can be sold to their best trade; that another 25 per cent can be sold, and that the balance, 50 per cent, is thrown into a box, and they generally lose money on it.

It might be as useful to know how the poorest, as well as the best grade of dairy butter is made, that we may know what to avoid as well as to know what to do.

I think that lack of conveniences for making butter is one of the greatest causes for poor dairy butter. Another reason for poor dairy butter is, that the quantity is usually so small that a person cannot take the time necessary to properly care for it.

Farm buttermaking should be creamery buttermaking on a smaller scale.

Two essentials to fine butter-making are good drainage and sunshine where the dairy building is located. It is possible to make good butter in

a cellar, but it will take less work if your dairy room is above ground, where fresh air and sunshine can help you keep things fresh and sweet. There are few, if any, injurious microbes that the sun will not destroy if it has an opportunity.

The farm butter-maker should have a power of some kind. A tread power is very convenient, and gasoline or steam engines are not expensive. There is no doubt but what the farm separator has come to stay. The prices are now where almost every one making butter can afford to have it.

The tinware used in the dairy should be carefully selected. Have all the corners and crevices filled with solder. It is better to buy tinware of a firm who makes it especially for dairy use. I have some samples here that I would like to show you afterwards.

Very often a milk pail is washed and turned upside down to drain. The water runs down and gathers around the wire in the rim of the pail and soon becomes foul. A very little tin and solder would prevent the water getting in. It would make the pail or strainer last twice as long, and make one place less for injurious bacteria to grow.

There are many little details in feeding and milking cows that may spoil the butter before the milk reaches the separator. When the milk reaches the separator, the dairymen's work ends and the buttermaker's commences.

The main points in a separator are, thoroughness of skimming, ease of care and simplicity of cleaning.

As the cream comes from the separator it should run into a can standing in cold water. The quick cooling prevents the growth of injurious bacteria. As a rule it is not practicable for the private dairyman to churn every day. The cream should be kept at a low and uniform temperature until ready to cure or sour for churning.

Where the churning is done every day, I think it better to use a starter. A good starter can be made by taking sour skim milk from separator, cooling to 50 degrees, then warming it to 98 or 100 degrees and standing it in warm place, in covered can, for 24 hours. At that length of

time it should be sour and thick lobbered. A pint of this is enough for 10 gallons of cream. If the starter should be very thick, I think it better to warm it to 90 or 100 degrees and use whey only.

No fixed degree of temperature can be set for warming cream. Much depends upon the temperature of the dairy room in which it stands, and the vat that holds it and quantity of cream. I think a very good rule for separator cream is to cure at a high temperature, and churn at a low one.

In very cold weather, in my dairy room, it is necessary to warm the cream to 90 or 100 degrees twenty-four hours before churning. If a starter is used, it will not be necessary to warm the cream to more than about 80 degrees. The age of the cream will also make a difference. Cream 48 hours from the separator will sour sufficiently in 24 hours, at a lower temperature, than cream 12 or 24 hours. These little matters making the difference between a high and low flavored butter, can only be gained by experience and judgment.

Aside from the matter of fresh cows, which gives the finest flavored butter, the curing of the cream has the greatest effect on flavor. Of the two extremes, cream had better be under sour than over sour. I think much of the poor dairy butter in winter is caused by the cream becoming very cold and then allowed to stand in warm rooms. The warm air condenses on top of cream with the odors it contains, and they are absorbed by the cream. Cream should be kept covered, unless in a room well ventilated.

Separator cream must be churned at a much lower temperature than cream raised from deep cans set in water, or from shallow pans. I think 55 about the right temperature for 25 per cent cream from Jersey cows. I have churned at 45 to 48 summer. Of course ice must be used to reach this temperature. Of the two extremes, it is better to have cream too cold than too warm. The churn should be stopped at the proper time to get a fine flavored butter. If you churn it too much you will injure not only the flavor, but also the grain. Stop when it is nicely granulated.

I have a sample here that is granulated just right. The butter rises readily to the top. Get the buttermilk all out.

I think a good plan when your churning reaches that stage, to put a little salt in your churn and turn it quickly a few times, then draw off the buttermilk. Salt the butter at least twice. At the second washing the water should run out clear.

Here is a sample of butter that is too fine. The cream was the right temperature when it went to the churn, but the room was too cold. The thermometer outside registered 15 below zero, and the cream got cold after it got to churning, and although the butter came in after it reached that stage, it would not gather any more and had to draw the water off when it was that fine, and that is the way you waste your butter.

Here is another sample of butter where the cream was too warm when it was churned, and the granulation is large. Butter when it comes in that shape, if you pour water on that and let it cool, when you go to work that butter those chunks being irregular in size, the salt will not get to the rest, and when you come to cut it you will see white streaks that comes from the salt not being in those places that are white.

I have another sample here where half is granulated too fine and half the chunks too large. Those large chunks will leave white streaks in the butter.

Here is another sample that is very much too fine, and it is almost impossible to handle butter that is as fine as this. If your butter comes in like that, and so cold you cannot gather it, the best way is to pour lukewarm water into your churn, enough to warm it, then it will gather.

Here are some samples that were churned at too high a temperature. If you have butter as it should be, properly worked, churned at the right temperature, it should break off like a piece of steel; able to take a roll and break it off.

As to selling the butter—you want to sell it to suit your customers. I had a customer that wanted to buy butter of me, and it was not salt enough to suit him. After I had made the second sale I asked how it was then, and was told it was pretty near it, but needed it just a little saltier. The next time I was told it was all right. But it had been salted the same all the time. You can cultivate your customers' tastes to suit your butter,

and after they get used to it, nobody else's butter will suit. If you should try to salt to suit everybody you would never suit. The way is to cultivate their tastes to suit your butter.

There is a good deal in putting up the butter; having it in a neat package. Most of the creamery men use paraffin paper. It is a good plan to take paraffin and put your butter up in packages in good shape.

Most of the best butter is sold in prints or in small packages. The grocers who have the best trade have practically stopped cutting butter out of tubs; the majority of them want print butter.

Another thing, cultivate the taste of your customers for fresh butter. I have a family who have bought butter of me for 15 years who want it packed in bulk, and this winter is the first year they have bought it every week. They wanted grass butter in the fall and used to keep it till spring. Of course the butter would deteriorate, and they couldn't tell the difference. It is better to cultivate the habit for fresh butter for your customers.

If you should have a batch of bad butter, the best thing to do is to make it into soap.

As to this tin business—there is the greatest difference in the world in tin. I have some samples here of tin and solder that I will show you. When you get solder, be sure you get solder, not lead.

By the President: This afternoon we have a long program, and a good one, and we will try and commence promptly at 1:30 o'clock.

Committee on Nominations:

H. E. Hopkins of Kinkley.

L. Johnson of Stillman Valley.

F. A. Carr of Aurora, Illinois.

Convention adjourned until 1:30 p. m.

Wednesday Afternoon, January 8, 1902

Convention called to order for the afternoon session.

President in the chair.

By the President: Mr. Schlappi, who gave us the talk yesterday afternoon on the test of the different breeds at the Pan-American Exposition at Buffalo, is under the impression that some of you understood him to say that the amount of the profits he gave were for the year. That is not correct; they were for the period he was testing there at Buffalo.

We will now have a paper by Prof. Erf.

DIFFERENT METHODS OF CREAM SEPARATION.

BY PROF. OSCAR ERF, UNIVERSITY OF ILLINOIS.

Gentlemen:

I am very glad to meet the dairymen of Illinois again, and I want to say that I have a subject today which is a little bit sensitive in certain communities of the State. You know you are liable to tread on somebody's bunions when you talk of cream separation. But I think that the dairymen are perfectly familiar with the separation, so that I won't have to hesitate in this community, at any rate, to talk on the subject.

Of the many inquiries that we receive at the State University, pertaining to dairying, the most of them of recent years have been questions relating to the control and economy of cream separation. Since the introduction of the farm separator or cream gathering system in creameries, the problem often occurs to many dairymen whether it pays to purchase



W. R. KIMZEY, TAMAROA, ILLINOIS.
President Illinois Farmers' Institute.

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expensive centrifugal machines when we have cheap gravity machines on the market at the present day.

The principle of cream separation is a simple one, when we do not take too many details into consideration, but it is certainly very confusing when we learn of the statements made by many of the would-be creaming machine promoters.

At present there are four methods of creaming; the shallow pan, the deep-setting, dilution and centrifugal. It, no doubt, might be interesting as well as making it more comprehensive to review the principles of creaming.

Milk is composed of five constituents, namely: Water, milk, sugar, casein, fat and ash. We have here the five constituents (shows samples)—the water and the casein, the fat and the ash, and this is the milk sugar. The fat is the highest when we put these four together and mix them in with water, we call them milk serum. All these tend to increase the specific gravity or the heft of the milk. The fat tends to lighten it.

The creaming of milk is merely the concentration of fats. Cream contains all the constituents of milk, in approximately the same per cent except that the fat replaces the water to a certain extent. The composition of cream is influenced by the method and condition of creaming and varies with wide limits. The per cent of fat may vary from 8 to 78 per cent. Ordinarily a mixture containing less than 8 per cent of fat is known as milk, or more than 78 per cent, as butter.

The fat in milk exists in minute globules suspended in the milk. The size of the globules varies according to breed of cows, the period of lactation, the kind of feed and other factors. To illustrate their approximate minuteness, we might state as an average estimate, that there are two million globules in a quart of milk, or, if these globules be laid side by side, 25 would equal the thickness of medium letter paper. The separation of these globules in creaming may be effected in several different ways, but the general principle depends upon the difference in the specific gravity of the fat globules and that of the water containing the

other milk constituents. Milk fat being relatively lighter or lower in specific gravity than water increased by the other milk solids, would naturally rise, and anything which tends to increase the difference in specific gravity aids creaming. Milk containing large fat globules will cream more rapidly and completely than milk with small globules, because the volume of the globules compared to surface is much greater than that of the small, thereby reducing the friction of the fat rising through the milk, and lessening the surface tension, both of which acts similarly to that of an increase of specific gravity. The fat in the skim milk is made up very largely of small globules which fail to separate or raise as soon as the others. For this reason, milk creams more thoroughly from certain breeds of cows, or more likely from certain individual cows. The Jerseys and the Guernseys are generally considered to have the larger fat globules, therefore the cream rises more easily from Jersey or Guernsey milk. However, this is not always true. It depends entirely upon the individual cow. We have some Short Horns where the cream rises equally as well, and has equally as large fat globules. We hear of the iron-clad rule that the Jerseys have the largest, and the Holsteins the smallest, but it all depends upon the individual animal.

The shallow and the deep setting systems are familiar to all, and probably need no explanation as to the method of procedure. We take it for granted that at the present day every dairyman accepts the fact that the deep setting system is far more efficient than the shallow setting system, and the efficiency is decidedly increased by a temperature of about 100 degrees to begin with in milk, and then suddenly immersed in ice water. This will naturally lower the temperature and make the water or the serum specifically heavier. Besides, the cooling of the outer layer of the milk will increase the density, causing it to fall and displace the warm milk, thereby creating a current which seems to greatly facilitate the separating of the cream in the deep setting system.

The so-called dilution or hydraulic method of cream separation is comparatively an old process of raising cream. The process has fallen

into disuse, but occasionally it appears as a new and improved method. This is largely due to the efforts of concerns which are selling a specially constructed can known as a hydraulic cream separator. These cans vary more or less in minor details, some of which have a somewhat complicated internal construction, which, however, does not appear to have affected the efficiency of the machine, but the principle is the same in each case. In the operation, the milk is diluted with an equal, or with a greater, bulk of water and the mixture is allowed to stand from one-half to twelve hours, and is then skimmed by drawing off the skim milk. The supposition is, that by diluting the milk, the water being lighter than skim milk, and heavier than cream it would rise and take a position between the skim milk and the cream, and while assuming this place, it would thereby facilitate the rising of the fat globules. This, however, is not the case, for if water is added to milk it uniformly mixes with the skim milk and merely lessens the specific gravity between the fat and the water by diluting the remaining constituents of the milk, which tends to lessen the difference. The advantages claimed for this method are, small cost for the can, lessened labor, durability, and requires neither ice nor the storage of such. Sometimes it is mentioned that a cleaner cream is produced than by any other system, and if the machine is properly manufactured all the cream can be obtained. From the results obtained at the Illinois Experiment Station and others, we believe that the claims for the hydraulic separator can be equalled by the deep setting system, not taking the centrifugal system into consideration at all, and the thoroughness of the separation will be far superior to any hydraulic separator if milk is set at a temperature below 40. To prove the correctness of this statement, I compiled the result of a series of experiments which have recently been carried on at our station. For the shallow setting, we have an average of .84 of 1 per cent. of fat left in the skim milk. For the deep setting .62 per cent. and for the dilution system .81 per cent., an approximate gain of 25 per cent. of fat with the deep setting system over the dilution system. These show the relative amount of fat left

in the skim milk. I met a gentleman from Kansas the other day and he said that they could not hardly use the hydraulic system down there. I asked him why, and he said they hadn't got the water. It was so dry down there last summer they had to drive hoops on the pigs noses to keep them from eating the soil.

It is evident that a large number of these hydraulic separators are still being sold at price far above their actual worth, on the pretext that they have all the advantages as heretofore stated. This is apparently a part of the dairy business which is infected with dry rot, and it is our purpose to do all that we can for its destruction, and especially since our modern centrifugal separators are so efficient. There remains no reason to believe that the centrifugal method does not pay better in every case than the dilution system. The profitableness is not only due to the fact that a larger per cent. of fat is recovered from the skim milk, but also that the feeding value of the skim milk is far superior to that of the dilution system.

Another phase of cream separation which needs to be considered is occasionally brought up and apparently agitated in favor of the dilution system, and that is the question of how to obtain a uniform per cent. of fat in cream from day to day with the centrifugal system. The variations in the test of the hand separator cream is no doubt very great, and on an average is probably more uniform than with the dilution system, but if users of hand separators are careful in operating their machines uniformly, this difficulty may be avoided. There are several things that influence the test of cream of hand separators. The first and probably one of the most important causes of the variation of the richness of cream is the speed of the bowl. Anything that tends to change the speed from one separation to another must necessarily influence the test of the cream by its irregularity. Second, the temperature of the milk has considerable influence on the richness of the cream. A difference of 8 or more degrees during the time of separation will cause a decided. If milk is warm, the cream will be thicker; if cold, it will be

thinner, other conditions being equal. Third, the per cent. of fat changes with the amount separated per hour. Milk should be run through the separator at a constant stream. If milk is fed at an uneven rate, or the flow of milk is stopped, the thickness of the cream will be vastly influenced. Fourth, the amount of water or skim milk used to flush out the bowl will naturally tend to affect the cream test. It is always well to use a uniform quantity. And lastly, there is a ceram screw, in the separator bowl, for the purpose of changing the thickness of the cream when desired. By this it can be so regulated as to make thin or thick cream, and when once set, if all the other conditions of the separation are kept uniform, it will produce nearly a constant per cent. of cream. These principles hold true in all centrifugal separation, and if such precautions are taken, a cream quite uniform in test can be depended upon; at any rate, far more uniform than can be obtained from the dilution system.

The idea of this paper is principally to discourage the use of the dilution system. I hope that some day that it will be eradicated from the state. It is an ineffectual way of separating cream. But there are many people today in the business who are attempting to sell these separators throughout the state. We occasionally hear of the large numbers being sold in a certain county for sums vastly greater than they ought to be sold at. When I hear of it, I feel like saying, like the boy said when his father had served him with three or four servings and asked him if he cared for a fifth he answered, "No, not another darned bit," and I hope the time will come when we can say that to the dilution cream separator in Illinois.

DISCUSSION.

Q.—What about the calves and pigs where using the dilution separator?

A.—I am afraid they would have to live on pretty poor material.

Q.—Have you the differences in per cent. between the separator systems and the hydraulic?

A.—Yes. The the average of our calculations are .84 per cent for the shallow setting; .81 per cent. for the hydraulic; .62 per cent for the deep setting. Of course the separator system varies anywhere from .02 to 1-10. This is taken on the basis of .02 of 1 per cent.

Q.—I would like to ask if these tests were all made at the University?

A.—Yes sir

Q.—Did you use different makes of machines?

A.—We just have one machine, but the rest are practically on the same basis. I have tried several of them. But this experiment was run on one machine only.

Q.—I would like to ask where we are most likely to lose cream. Have a small separator?

A.—Most likely to lose cream with slow speed; irregularity of turning a small separator. You know a person gets tired and naturally turns slower, and one revolution makes a vast difference at the bowl. It is quite essential that we stir at a uniform speed on a hand separator. I think it is necessary almost to have something else besides a hand power to turn a hand separator.

Q.—Havn't you found that a man will usually pull down and not pull up so much?

A.—Yes sir.

Q.—If you have a fly wheel it won't make so much difference?

A.—Yes sir that is the customary way of turning a hand separator especially when a person gets tired he drops on the handle and when it is coming up again it is pretty hard work to pull, and he don't pull so hard.

Q.—What power would you recommend for a farm separator?

A.—Why I like the gasoline power engine, or a gas engine. But where you have a boiler which you really need in a dairy, why a steam

engine will do just as well. The advantage of a gasoline engine, you can stop it or start it almost any time when ready for milk, and in case of a steam boiler we have to wait. And then if you have a small boiler you don't necessarily have to heat your water up so high as if runing with power. A gasoline engine has a little the advantage over the steam engine for cream separation.

Q.—I think I have heard complaint about gasoline engines giving uniform speed?

A.—No sir. That depends on the gasoline engine somewhat. What we call the one cycle engine is very ununiform speed, but the modern size, the two cycle engine gives a regular speed, and are used often for lighting plants which requires a steady kind of speed. Quite a number of gasoline engines operate electric light plants; that is the most sensitive apparatus that we can get, requiring the least variation.

Q.—Why would it not be a good plan, in the use of a farm separator by hand, to have some sort of a time-keeper, a pendulum, or rather a cyclometer; why wouldn't that be a good idea?

A.—I should think some of you would have trouble in persuading the man to keep an eye to the pendulum all the time.

Q.—It would not be necessary to keep an eye all the time, an ear would do it?

A.—Yes sir. There is a little scheme invented especially for large machines, by which they had a little governor on the spindle, and this governor would open by an increase of speed and would strike a little bell if opened a certain distance; and then it would come back again the opposite way and open up and strike another bell which would indicate a slow speed. But the trouble is with this high speed, and on such a small circumference, to keep that governor in shape. It will indicate speed sometimes twice before the bell rings, and for that reason it really is not successful. There is a need of an apparatus to determine the speed of a separator bowl on both kinds of separators, that is if the invention can be made simple enough and accurate enough.

Q.—How would tread power do? There are a large number of dairymen who don't feel as though they could afford to buy any machine, gasoline engine or other powers than the tread power, small tread power. I know a great many who use that. Some have a large dog to do this work. The best idea of all is, use a bull on the tread power.

A.—Yes, the tread power is a a very good machine, if you get the right kind of an animal. It all depends on the bull or other animal you get in there. The trouble is in starting out. You have got to teach this animal, and the first thing he will do, will be to jump and land on the other side of the tread power, and considerable difficulty in getting such an animal trained, but a bull is really the steadiest power. I have never had any experience with a dog. It may be a dog may be more regular, but I have never had any experience; sheep are not very regular. The proper way to overcome all this is with a large balance wheel. I have seen this worked successfully. Build the tread power to a large balance wheel and the belt from the balance wheel to the separator. The governor on the separator will tend to check the speed when it comes over a certain point, and the balance wheel will tend to keep it in motion when it falls below. But an animal can be used if it is not too lazy. Sometimes they lean back and then come forward gradually; they do it so nicely you don't realize it at all. It is a pretty hard matter to govern it. I know it has been successful in some localities or in some barns where they have the animal nicely trained.

Q.—Just a word on tread power. I can't see how an animal can shirk, unless he has some way of stopping himself; from getting off behind. He can't run it faster or slower, and if governed by a governor on the fly wheel or balance wheel of the tread power, because when it runs above a certain place it locks itself?

A.—That's true, the tread power is a gravity machine. If you can keep that bull on the gravity all the time, but you can't keep them on that incline. If he is a new animal he is apt to come down, unless you have a bar back of him; and if you have a bar he will rest on that bar a little

bit, and I wonder if it doesn't make a little difference; just makes his feet go. He will just stop the machine, and he is propping it up instead of letting it run.

Q.—I wonder if a row of spikes round the animal might keep even power?

Laughter.

A Member.—I have used a tread power for 15 years, and we have always used horses and have had grand success. A belt from the tread power to shaft and a heavy wheel on the shaft, and I believe I get as steady power as any engine can produce. I must say I undertook to try bulls, and it took one man with an ox goad, and I decided I would rather pay for shoeing horses.

A Member.—We use steam power because we are too poor to buy tread power. Can get a 15-horse power horizontal tubular boiler and a 10-horse horizontal engine for \$75.00, and tread power of even two horses would cost \$150.00, and so we got the steam plant and have the exact speed at all times.

Q.—Have used tread power and of course in breaking in a new animal you have a little trouble, but take a bull on the separator when he gets used to it, he rather enjoys the work. Put him on the churn and he will hang back, but he will run the separator a reasonable length of time.

Prof. Erf.—It is as I say, that depends entirely on the animal.

By the president.—While at dinner the Stover Manufacturing Company sent an invitation to us, which I will read:

Freeport, Ill., Jan. 8, 1902.

J. W. Newman, Esq.

President of the Illinois Dairymen's Association,

Freeport, Ill.

Dear Sir:—

We desire to extend to the members of your Association, through you, a cordial invitation to visit and inspect our factories, both the old

and the new—the former in full working operation, the latter about completed and in readiness for occupation.

If you will kindly inform us when we may expect a visit from your members, we will have an officer of the company in attendance.

Yours truly,

The Stover Manufacturing Co.,

D. C. Stover, Pres.

We have no open session tomorrow morning, to allow the members to inspect the butter room and machinery hall. I think between ten and eleven o'clock tomorrow morning would be very convenient to visit the Stover Manufacturing Company's plant, and there will be some one there to show you through. I am sure we thank them for their very cordial invitation.

CREAMERY BUTTERMAKERS AS SEEN BY THE TRAVELING SALESMAN

BY F. A. LEIGHTON, NEW HAMPTON, IOWA.

Mr. President, Ladies and Gentlemen of the Illinois State Dairy Association:

It was with a great deal of timidity that I consented to read a paper at this convention. The State of Illinois, and especially this Elgin district, is so far advanced in dairying that it would be presumptuous for a resident of Iowa to come here and attempt to tell you how to improve your butter, and for that reason I shall not be able to give you any points which will enable you to make better butter than you are making at present. However, I am of the opinion that not all of the Illinois creameries or Illinois buttermakers are as good as they could be made, and as my subject is butter making from a travelingman's standpoint, I shall

have to take the creameries and buttermakers west of the Mississippi river as a basis on which to make my observations, for none of the Illinois creameries have ever come under my travels.

There is a great deal of sameness about this big world, travel where you will, and there is a great deal of sameness in dairy methods, be it in the Elgin district, or on the praries of Iowa and other Western States. Your buttermakers have their weak and strong points as well as those of other states. It may be possible that the butter makers or Illinois have more latent energy than those of other states, for every once in a while they wake up and make a tub of butter that sweeps everything before it.

It has been said that the buttermakers of the Elgin district are resting on their laurels, or rather living on the reputation that they made years ago. This, perhaps, is not true. It might have been the case a few years ago, but since the dairy business has taken such vast strides in the west, and Iowa and Minnesota butter has made a reputation for itself, the people who own and operate the creameries of Illinois realize that the states west of them are no mean competitors.

One large creamery operator in this district informed me that the buttermakers of this district are taking a greater interest in dairy matters than they did a few years ago. Elgin butter has an enviable reputation everywhere that butter is made, and I believe that this reputation has been well earned. I do not believe you have any better buttermakers than we have, but I do think you have better patrons, or, in other words, you have educated your patrons to produce better milk than they do further west, but as the western dairymen are directing all their energy in the direction of getting better milk, we are in hopes that before long Iowa milk will equal Elgin milk, and when that time comes, we give you warning that you will have to watch that special "Elgin Brand" or it will be lost in the shuffle.

It is not my intention to criticise the Illinois buttermakers; they are beyond criticism from me. The best buttermakers in Iowa originally

came from Elgin—that is, they tell me they came from Elgin, but I suppose that means the Elgin district. I do not just exactly know what territory composes the Elgin district, but I should judge that it extended away over into Iowa, as I often see Iowa butter branded “Elgin,” but I can state that this practice is being done away with to some extent, and in time, possibly, we will not have to use your brand in order to sell our goods.

The State of Minnesota is talking of having their own Minnesota brand. We have not quite got to that yet over in Iowa; there are many improvements to be made in our buttermaking methods before we can adopt an Iowa brand. We must get to a point where an Elgin butter-maker can not come to our conventions and carry away the sweepstakes.

The traveling man, who has had experience as a buttermaker, and who is familiar with creamery machinery and all up-to-date methods, has a good chance to observe and note right and wrong methods used by the buttermakers with whom he comes in contact. One of the most noticeable things which comes under his eye is the general appearance of the interior of the creamery. Do you know if there is any place in the wide world that should be free from reproach, it is the factory where the butter is made. It is the most delicate and wholesome article of food on the market, and no other article of food needs the constant care to keep it up to its standard as does butter.

I am not of the opinion that it takes as much skill to make a pound of flour as it does to make a pound of butter; neither do I know of any other article of food that a little neglect in its manufacture would cause it to deteriorate so fast. The interior of a flour mill if not perfectly clean would not, perhaps, injure the quality of the flour; at any rate the consumer would probably never know the difference, but with butter it is different. The consumer is being educated to tell whether the milk and cream was perfectly clean from which their butter was made, and when any impurities get into the milk, no known method will eliminate them, they will remain until the butter is consumed. So for this reason it

takes more care and skill to make butter than any other article of food that I know of, and every thing must be perfect in the creamery.

My observation shows me that there are some buttermakers who expect too much from patrons; too much, for the reason that they do not set them a good example. There is no better example, and no better way to educate patrons than to have your factory in such a condition that when they come into it they will stand in admiration of its purity and neatness. And then the traveling man likes to see a nice, well kept factory, and when they go to one they go away and talk about it. The buttermaker who does not visit other factories and has no chance to compare his factory with others, does not perhaps realize the great difference there is in the condition of these factories. Now we notice the round corners in the factory; we used to make them when as boys we did the fall plowing, and had to go over them again. We notice the oil on the engine and separators; the bunch of waste in the corner; the rubbish in the engine room, and the pieces of belt and other articles on the window sill. These are very little things, but they count largely in the appearance of the factory. Again, we notice the appearance of the buttermaker. It is not necessary that the buttermaker wear a white collar and cuffs while at work in the factory, but it is essential that his clothing is clean.

Let me give you an illustration of what I mean: One time a large creamery company wanted a foreman, and their manager was sent to another county to hire a buttermaker who had quite a good reputation, but unfortunately that buttermaker's appearance, in the matter of cleanliness of his wearing apparel, disgusted the manager, and he came away without making him an offer. The buttermaker was out six hundred dollars, as that was the difference between the salary he was getting and that he would have been offered. Six hundred dollars would have done a lot of washing.

Buttermaking is not just being able to make a fancy article of butter: there are hundreds of buttermakers out of a job who can make

fancy butter. One of the most essential things is knowing how to get along with people with whom you have to deal, and this is the hardest thing for us all to learn. That buttermaker who has the faculty of smoothing the ruffled feelings of a patron or a patron's wife, and sending them on their road rejoicing is a jewel; and yet there are plenty of these buttermakers. This is what is called tact, and tact commands a bigger salary than anything else in business. Business men are always looking for men of tact, and in no place is it more essential than in creamery buttermaking.

Out in California, they call the creamery buttermakers "Creamery Operators," and I like this name, for a man may be the best of buttermakers and still not be a successful creamery operator. They used to tell us that a buttermaker should have a musical ear so he could tell when the separators were at the right speed. These fellows, however, have gone the way of those who guessed at the right amount of salt, and those who color their cream by pouring the color out of the can until they think they have enough; those who guess at the acidity of the cream; the richness of the cream; the amount of fat lost in the skim milk; those who can not tell within a ton of how much coal they burn in a week—those are the fellows who are "going away back and sitting down," and the fellows who are taking their places are the ones who weigh the salt, who measure the color, who test the cream for acid and butter fat, who know exactly what kind of work the separators are doing each day, and who also knows just what it costs to make a pound of butter in his factory; these are the buttermakers who are not looking for jobs; there is always one waiting for them.

In our travels among the creameries we find buttermakers who say, "Well, those butter exhibits may be all right, but I don't take any stock in them." Another one says, "I don't believe starters will help to produce better butter." Another does not read the dairy papers because some one writes something that he does not believe. These fellows will perhaps flourish for a while, but mark my word, there will be a time

when these buttermakers will have to leave the business simply for the reason that better educated men will step into their places; it has happened every week, you know of cases as well as I do.

The creamery business is taking great strides; changes are coming fast; what will be the methods five years hence, we know not. It may be that the large syndicates and firms will control the creamery business. Perhaps they will be able to make butter cheaper than the small creamery companies, and if so, the little fellows will have to quit the business, for the milk producer will sell his milk to the creamery who pays the highest price. Or again, the farmers may get the co-operative fever and drive the big concerns off the face of the earth. They did that once, and whether history will repeat itself we know not, but whatever change comes, one thing will remain the same, if the big firms make the butter they will want the best skilled labor they can get, for their butter must be fancy; if the co-operative creamery is to remain, then they must have the best talent. So in face of these facts, it remains for the buttermaker to be prepared to fill any position in his line of work, so that he may be ready for any change that may come.

We believe the wages of buttermakers will never be any lower than now. In fact there is a tendency toward better wages and better buttermakers. This is especially true in the State of Minnesota—that state which is setting such a fast pace for other states. We must keep an eye on Minnesota, or they will distance us and we will be left at the pole.

Did you ever stop and think why Minnesota is making such rapid strides? It is because every person who lives there, from the governor down, takes an interest in creamery buttermaking. They talk about the quality of Minnesota butter at home and away from home, and they are convincing some people that there is merit in Minnesota butter. Of course, we, who live in other states, know better, but I want to whisper to you that Minnesota buttermakers will bear watching, for they are out for blood and they are determined to put their state at the head, and I guess they will succeed if Illinois and Iowa do not wake up and head them off.

It is the buttermaker of the future that we must think of today, not those of the past. If you are to stay in the business, then be the best buttermaker in your state. Don't consent to be the second best. There is only one way, and that is to meet every new buttermaking problem and be ready to solve it when it comes. Make yourself valuable to your employers so that they can not get along without you, and when this is accomplished you will be successful.

Song by Mr. Bagley. Encored.

By the President: We expected to have Prof. G. L. McKay, who is at the head of buttermakers, with us today, to give us a talk on "Starters in Buttermaking," but he is unable to be present and your worthy Secretary, Mr. Caven, will read his paper.

STARTERS IN BUTTERMAKING

BY PROF. G. L. MCKAY, AMES DAIRY SCHOOL, IOWA.

(Paper read by Secretary.)

That Prof. McKay expected to be present is proved by the first sentence of his paper, which reads: "I am pleased to be here at the meeting of the Illinois Association." The interchange of ideas and sometimes the interchange of prizes do good. We get a chance to find out what the other fellows are doing. I am decidedly in favor of interstate contests. As we all sell on the same markets, it is just and right that we should come together in competition. The time is coming when all butter will be sold on its merits. I think if butter was sold in this country the same as it is in England, we would see a variation in prices of several cents per pound. Whenever this time comes we will find many changes in our creameries; good buttermakers will be at a premium and the poor ones will be forced to the wall.

I spent eight days last winter at the National Convention at St. Paul, examining butter with judges. I must say I never saw a greater variation in quality than was displayed at that meeting. If prices were paid for this butter according to quality, there would certainly be a variation of from five to six cents per pound.

What is the meaning of this wide range in quality? It cannot be the feed, as most all cows in the western states have very much the same kind of food. The difference cannot be due to the period of lactation, as most all our creamerymen have many fresh cows. If the trouble is not due to the cow, nor the food consumed by the cow, we must look elsewhere for it and try to find a solution for the same. It is true that some foods have a decided effect on the flavor, such as wild onions, cabbage and turnips. These foods seem to be largely charged with volatile acids and when they are fed, pasteurization of the cream will largely remove the obnoxious flavors.

We have two periods in the year when the makers have trouble in producing fine flavored butter. In the winter months the buyers complain of winter flavor, and during the dry period in the summer they complain of summer conditions.

Now I believe it is possible to make fine butter during either period, or to make good butter the year around.

In the month of June, when nature has covered the earth with loveliness, the right kind of fermentation seems to be everywhere. Most anyone can make fine flavored butter at this time; but when the kind of bacteria that we have to deal with changes to the undesirable kind, it will then require skill.

At our school, our bacteriologist made a number of tests to determine the kind of bacteria that milk contains during the different months of the year. In March, when it is quite difficult to make fine butter, one hundred samples from different patrons' milk were taken. Only 12½ per cent showed pure acid flavor; 48 per cent impure acid flavor, and 39½ per cent rapid decomposition of the curd. Samples taken April 8th. showed 50 per

cent pure acid flavor; 27.7 impure acid flavor, and 22.3 rapid decomposition of the curd. In April we found a decided improvement in the kind of bacteria present. Samples taken on May 10 showed 90 per cent pure acid flavor and 10 per cent impure. This largely explains why it is easy to get good flavors at some times of the year and not at other times. Samples taken in June and July showed about the same results as in May. Now if we could get our patron to exercise more care in regard to cleanliness, a lot of this trouble might be obviated. Still, at certain periods, makers will have to combat undesirable fermentation.

In winter months when cows are milked in the stable, most of the germs that get in the milk are of an undesirable kind, or what might be termed putrefactive bacteria. These germs are found in the manure and come mostly from the intestines. Particularly do they abound in warm, unventilated barns; so great care should be taken by the patron to have their udders well cleansed before the milk is drawn, and to have the milk removed from the stable as quickly as possible.

In the summer months, during a dry period, frequent complaints are heard from butter dealers of what they term summer conditions or weedy flavors. These flavors are undoubtedly caused by a species of bacteria. As many of you no doubt have observed that the next morning after a good heavy rain, your flavor will change and improve. Many attribute this to the fresh grass, but fresh grass does not grow in a night. Our bacteriologist found by experimenting with a species of bacteria, that he could produce this same weedy flavor.

I do not like to use the term "starter" during the winter period, nor during the dry period in the summer. I would sooner use the term "controller," as I would use heavy enough starter to control the flavor. The lactic acid bacteria seems to be a very important factor in cream ripening.

When traveling through Europe I found that acid cultures were universally used for ripening cream. This is not to be wondered at when we examine the kind of bacteria that well ripened cream of a good quality

contains. We find that good cream contains 90 to 95 per cent of lactic acid bacteria.

To illustrate more thoroughly the effect of a good starter, I will quote, if you will pardon me, some work done at the Iowa Dairy School. at the meeting of the National Dairy Association held at Topeka, Kansas, one of our students, Mr. Mortensen, scored the highest on flavoring, 48½ out of a possible 50 points. The following year Mr. Evans, from our school, was tied for second place at the Sioux Falls meeting. At Lincoln meeting, Mr. Mortensen again was second, and last year our man Webster scored one point the highest. Here we find that butter made at our school secured the highest twice in four consecutive scorings and occupied second place at the other two scorings. Do you suppose we could make that kind of a record showing butter in the summer months? I would without any hesitation say, No. Our success was brought about by using heavy enough starters to control the ripening, and thus overcome the effect of the stable fermentation. As I said before, at certain periods of the year you should use enough starter to control the flavor. The best way to do this is to use 20 to 25 percent starter, and put this in your cream vat with a few good cans of milk before you begin to separate. Then skim a good heavy cream so that you will have a 25 or 30 per cent cream when you are through separating; that is starter and all. If you ripen this until the cream begins to thicken and then cool you will invariably have fine flavored butter. I am a thorough believer in the use of acid tests for cream ripening, but where a maker has no acid test, I would advise cooling cream as soon as it begins to thicken. One great drawback to starters, in many cases, is the work of preparing them and carrying them forward in a practical manner.

It is true that we have many good starter cans on the market. Some of our makers, however, demand a more practical method. I find for the everyday maker that a tank 3 to 3½ feet wide and 6 feet long and 18 inches deep, or big enough to hold a number of starter cans desired, constructed of 1½ inch lumber, with steam and cold water connections.

serves the purpose well. With this you need some cooling cans, or cans constructed by a tinner on the same principle. By placing these cans of skim milk in a tank of hot water you can soon pasteurize them.

It is not necessary to stir the milk all the time while it is heating. Turning the cans around occasionally will be sufficient. A little cooked taste will do no particular harm. There should be a number of strings or wires put over the tank and fastened to the ceiling, having hooks on the ends to fasten in handles of cans so as to prevent them from tipping over in the water.

It is better to heat the skim milk to 180 or 200 degrees and keep it at this temperature for 15 to 20 minutes. The hot water should then be removed and cold water run around the cans. This will quickly cool the milk down to a temperature of 75 to 80 degrees, when it is ready to be inoculated with 2 per cent of the mother starter. In this manner two or three starters can be carried on with very little trouble. We get the best results when preparing a new starter from pure culture, to start it with about a quart of pasteurized milk. When it begins to coagulate or has an acidity of about 35 to 40 degrees, Mann's test, or from .5 to .7 of one per cent by Farrington's test, it is in the best condition for adding to a large starter.

If a starter is carried too far the excretion thrown off by the bacteria destroys them. There are more bacteria present at the degrees I mentioned than at any other period.

One advantage in using a tank for holding the starter cans, is that you can quickly cool your starters down as soon as they begin to coagulate, by adding crushed ice to the water in the tank. Starters cannot only be cooled, but they can be kept at a low temperature with very little trouble in the tank. The covers on the Cooley cans prevent any impurities from falling into the milk.

It is just as necessary to carefully observe the ripening of the starter as it is the ripening of the cream. With good can, a starter should be carried forward for at least a month. The old saying that "As

you sow, so shall you reap," comes true in buttermaking, as in any other place. If we use over ripe starters, we will certainly get an undesirable flavor in our cream.

The Danes claim to carry the same starter for more than a year without changing. The average maker will get better results with a commercial starter during the winter months; however, with little care, good natural starters can be secured. The system that has been mentioned so frequently through the press is a good one. Take a number of samples of best milk in sterilized glass fruit jars, and keep them at a temperature of 70 degrees until they coagulate. When you find a sample that has coagulated solid, without any pin holes, and has a pleasant acid taste, you may know you have the right kind of fermentation present to give the desirable flavor. This can be used to inoculate the large quantity of milk to be used as a starter for the cream. After a starter of this kind has been carried forward a few times, it virtually becomes a pure culture.

In the near future, starters will undoubtedly be as commonly used for buttermaking as yeast is for bread making. The proper grading of butter and selling according to quality, will put the butter business on a much higher plane.

Buttermaking in a modern creamery is a very pleasant occupation. The separation of cream with a modern centrifugal separator, the use of pure cultures to control the flavor, the acid tests to determine the acidity of the cream, the combined churn and worker for working the butter, and the ammonia machine for refrigerating purposes, demand the highest kind of skill.

To the young man who has mastered all these, there is a bright future in dairying. To be a good creameryman, the first demand is cleanliness. Without this a maker might as well drop the dairy business.

I like to see a maker who has nerve enough to stand up for his rights and reject milk that will not make the best quality of butter. A patron who constantly sends poor milk needs arousing in a vigorous way. Smooth words fail to have any effect upon him.

Two of the highest salaried and most successful men we have in Iowa are termed "crauks" by many of their patrons; but their butter sells for one cent above, and we can stand a little crankiness in a man who produces first class goods and especially when his butter sells for one cent above.

All theories and rules laid down at dairy schools and conventions are just so much raw material furnished for makers to work with, and unless a maker can apply these, they are of no benefit to him.

SOME LESSONS FROM PAN-AMERICAN DAIRY TEST

DE WITT GOODRICH, FT. ATKINSON, WIS.

Mr. Chairman, Ladies and Gentlemen:—

The first act of this drama seems to be paper hanging. (Hangs chart.) It is possible that my paper will overlap the paper you heard yesterday. Not being present at that time, I cannot tell whether it will or not, but there may be some of the facts that were not touched upon.

The Pan-American dairy test extended over the whole six months of the Exposition. It included the testing of each one of the fifty cows, representing ten different breeds, both for butter fat and for total milk solids, as well as the weighing and charging of every item of feed consumed by each animal.

In addition to all of this, one day's milk from each herd of five cows was separated and churned by itself each week.

Every cow was weighed into the test May 1st and out of it October last, and the gain in weight of each herd credited at 3 cents per pound.

This work required the employment of about twenty experts and assistants, with the superintendent, at a total expenditure in salaries of \$7,320.00. The cost of the test to the exposition company for feeds,

ice, etc., amounted to \$4,700.00, making a total cost of over \$12,000.00, which was, however, to a great extent, offset by the sale of products.

An advisory committee composed of Major Henry E. Alvord, Hon. E. W. Hobson of Canada, Dr. W. H. Jordan and J. H. Grisdal (the two last named representing the Associations of America and Dominion Experiment Stations), together with a representative of each breed formulate the rules which governed the test.

They provided for the awarding of four prizes to the herds of five cows excelling in the following points of merit:

1st.—Greatest net profit on estimated butter at 25c per lb., 85 lbs. fat in milk, representing 100 lbs. of butter.

2nd.—Greatest net profit on churned butter at 25c per lb.

3rd.—Greatest net profit on total milk solids at 9c per lb.

4th.—Greatest net profit on total milk solids at 9c per lb., plus gain in live weight at 3c per lb.

This joint committee also established prices at which the various feeds should be charged to the cows, this being estimated from a review of the prices of the several feeds throughout the United States and Canada for the last five years. They were as follows: Corn silage \$2.00 per ton; green feed \$1.75; clover hay \$7.00; bran \$15.00; ground oats \$19.00; cornmeal and gluten feed each \$16.00; and oilmeal, cottonseed meal and pea meal each \$25.00.

The carrying out of a test of this kind, extending as it did through about two-thirds of a period of lactation, and embracing so many breeds of cattle, could not help but teach many valuable lessons, or to more firmly impress some previously learned.

The agricultural press during the last four months of this test kept the reading farmer pretty well posted as to its progress, and since its completion, has given out not only the general results freely, but has abounded in speculations and deductions from the results, variously colored according to the view point, previous conviction or prejudice of the writers.

Since five of the herds were from Canada and five from the United States, something of the spirit of international contest added to the interest of the work.

Considering that three of the four recognized dairy breeds were represented by Canada, namely: the Holsteins, Jerseys and Ayrshires, it would not have been strange if three, or even all four of the prizes had been carried off by our industrious neighbors on the north, but, thanks to the excellence of our Guernsey herd and ability of their herdsmen, the two prizes for butter production came our way.

In the brief time at my disposal, I shall try to call attention to a few of the lessons taught by this work as they appeal to me.

As the standing of the several herds has been so recently reported in all of the papers, I will not dwell on that, but will call attention simply to the chart showing net profit in each of the two principal phases in the test.

CHART 1.

Net profit six (6) months.

In butter fat.		° Total solids	
7 leading breeds.		7 leading breeds.	
Guernsey	234	Holsteins	262
Jerseys	225	Ayrshires	236
Ayrshires	218	Brown Swiss	208
Holsteins	211	Short Horns	206
Red Polled	198	Guernseys	203
Brown Swiss	183	Red Polled	202
French Canadian	176	Jerseys	202

One point which seems to me worthy of special mention is the method employed in the dairy barn at Buffalo to advise visitors and inquiring students of the performance and standing of each animal at any time during the test.

For the benefit of those present who were not privileged to see this exhibit at Buffalo, I have made a chart representing the bulletin board suspended above each cow, on which was kept her record.

CHART II.

Mary Marshall.

Born April, 1891. Last calf April 15, 1901.

RECORD.

Week ending Oct. 31.

Pounds milk	210
Test	6.2
Estimated butter	153
Value of butter	\$3.83
Feed—	
Hay .....	.16
Silage .....	.39
Grain .....	.73
	—
Total feed	\$1.28
Profit	\$2.55

RECORD.

May 1, to October 31.

Pounds milk	5611
Estimated butter	3542
Value of butter	\$88.56
Feed—	
Hay	\$ 6.63
Silage	4.34
Grain	18.19
	—
Total feed	\$29.16
Profit	\$59.40

(Shows photograph of Mary Marshall.)

In lieu of the cow herself, I have here the photograph of the cow whose record is given as it stood at the close of the test: Mary Marshall, the champion in net profit in butter production of all cows competing.

Thousands of people passed through the barn nearly every day, and these records, together with the animals making them, were studied by both city people and farmers.

Very frequently young ladies as well as young men, college students and business men were seen copying off these records with evident interest in having learned something of the possibilities of dairying, and having seen the cows which made the records.

A lesson which appeals to me as one of the most important to be derived from all this work, is that taught by a comparison of the extremes of profitable production found in the same herd. It is altogether likely

that in selecting individuals for any of the herds to take part in this great test, more care was exercised than would ordinarily be in making up a herd for private use by the farmer or dairyman who buys his cows, and yet, we had at Buffalo a very great range in profitable production in nearly all breeds.

Several of the Canadian cows were selected without much use of the Babcock test, and several of these were disappointing; some of our breeds had few available animals to select from, making it impossible to get a uniform herd, but a most striking instance of uniformity occurred in the Guernsey herd. Medora Fern was selected on account of her fine appearance. Little was known of her previous performance, and she did not promise great things when the scales and Babcock were applied just before the final selection, but her good looks let her in contrary to the better judgment of her herdsman.

CHART III.

Medora Fern.

Born January, 1894.

May 1 to October 31.

Week ending October 31.

Last calf April 9, 1901.

Pounds milk	84.5	Pounds milk	4225
Test	4.9	Estimated butter	215
Estimated butter	4.87	Value butter	\$53.75
Value butter	\$1.22	Cost of feed—	
Cost of feed—		Hay	\$6.92
Hay	\$.15	Silage	4.61
Silage .....	.39	Grain	12.83
Grain .....	.17		—————
	—	Total feed	\$24.36
Total feed	\$.71	Profit	29.39
Profit .....	.51		

Q.—You got 25c per pound for the butter?

A.—Yes sir 25c for butter.

Q.—Didn't you get 25 and 35c for some of it?

A.—Yes sir.

I have made a tabulation showing the difference in profit of cows of the same herds at Buffalo in several breeds, first showing extremes in in profit at Pan-American prices, and in the second column at present prices of feed and butter at 20c, which is about the net price received by creamery patrons at this time. To reduce feed to present prices I have added one-third to value of grain and doubled the price of hay and silage. This makes bran \$20.00; gluten over \$21.00; ground oats \$25.00; hay \$14.00 and silage \$4.00.

BREED	NAMES	Test	Pan-Amr. Prices	Present Prices
Guernsey	Mary Marshall	5.36	59.40	24.66
	Medora Fern	4.36	29.36	2.80
Jersey	Primrose	5.64	50.25	18.90
	Rexina	3.98	38.52	10.10
Ayrshire	Betsy	3.59	46.07	13.87
	Lady F.	3.40	38.70	8.87
Holstein	Beauty	3.42	49.35	13.75
	Meg	3.25	36.60	2.70
Red Polled	Mayflower	4.45	52.10	19.42
	Tryste	3.68	31.59	3.72
Swiss	Belle 3	4.09	41.23	11.80
	Nicola	3.25	30.35	.09
French Canadian	Denise	4.03	40.64	13.38
	LaBouch	3.67	22.94	1.85
Short Horn	Molly	3.71	43.01	9.02
	Daisy	3.43	28.80	2.40

In these days of high priced feeds, a small difference in economical producing power among cows which are generally called good dairy cows, makes the difference between the profit and loss.

Take the Ayreshire herd, which was considered by all who saw them, as the most uniform herd and finest representatives of their

breed; we find here that the best one made nearly 20 per cent greater profit than the poorest at the Pan-American prices with almost exactly the same ration, while 20c per lb. for butter and present prices for feed, the difference would have been over 50 per cent.

This marked difference in cows brought together from different localities would seem to teach that dairymen should not depend on buying cows to keep up the herd, but should build up and gradually improve by rearing from the best at hand and constantly weeding out the poorest. Even a careful test with Babcock and scales at just one time, will not tell what a cow will do for a year or for six months, and the best of judges are often deceived by appearances.

Medora Fern made a very good showing for three months, but then fell off rapidly, while apparently in perfect health; and at the end of the six months was making very little profit with butter at 25c.

One point about the best and poorest cow of each breed at the Pan-American, which seems a little strange, and yet would certainly seem significant, is the fact that in every breed the most profitable cow tested high, and the lesser profitable one low (for their breed.)

In several of the breeds the profit of the five cows is graded just in the order of the richness of their milk. Notice the test of the Jerseys in the order of their profit from highest to lowest: 5.64, 4.74, 4.40, 4.27, 3.98. The Brown Swiss, 4.09, 3.80, 3.61, 3.45, 3.25.

In nearly all breeds there is some uniformity of progression in richness corresponding with profit, but there are of course some irregularities in this.

COMPOSITION OF MILK.

Since my part of the work in this test was the weighing and testing of milk for butter fat and total solids, I shall confine the balance of my remarks to this phase of the work.

The average composition of milk of the several breeds at Buffalo for butter fat and for total solids is shown by the following table:

COMPOSITION OF MILK.

Breed.	Per cent total	
	fat	solids
Polled Jersey	4.66	13.93
Guernseys	4.60	13.92
Jerseys	4.58	13.96
French Canadian ...	3.99	13.32
Red Polled	3.98	13.14
Ayrshires	3.69	12.69
Brown Swiss	3.63	12.76
Short Horns	3.57	12.84
Dutch Belted	3.40	12.31
Holstein	3.25	12.08

INCREASE IN PER CENT FAT DURING PAN-AMERICAN.

During the six months every one of the fifty cows made a gain in richness incident to the advance of lactation period. By averaging the four weeks composite tests for each cow, for the last month separately, we have a basis for determining this gain without having to contend with the fluctuations from week to week caused by things seen and unseen. Comparing these averages for the months of May and October we find every cow gained, from the Guernsey, Cassiopia, with a gain of only 1 per cent, to the Polled Jersey, Queen, with a gain of over 2 per cent. The gain in richness of the mixed milk of the five cows of each breed was as follows: French Canadian, 1.1 per cent; Jerseys, .93; Guernseys, .9; Shorthorns, .9; Polled Jerseys, .8; Brown Swiss, .7; Red Polls, .6; Ayrshires, .6; Holsteins, .52; Dutch Belt, .5.

Of the 50 cows, twenty-eight averaged to test higher for each month of the six than for the preceding month. Eleven cows missed this uniform progression by testing lower for some one month than for the some preceding month. The other eleven did not increase in test with such uni-

formity. As most of the drops in the test occurred in the months which were excessively hot, and the cows known to be very uncomfortable from heat, it may be safe to attribute most of them to that cause.

Considering that, with a few exceptions, all the cows in the test had calved within two months of the opening, which would bring them from six to eight months in lactation at the close, a natural conclusion from the above data would be, that with cows calving in spring and stabled through summer, the percent of fat increases as the period of lactation advanced.

THE COMPOSITE TEST.

During a part of the time, the separate milkings of each of the five cows of some breed were tested independently of the composite test for the full week corresponding with the composite week. This was done partly as a check against possible tampering with the composite samples, and partly as a matter of interest in showing the accuracy of the composite method of testing.

As there is likely to be in this audience a number of patrons as well as proprietors of creameries, I thought it might not be out of place to show how nicely the two methods proved each other and how indisputably accurate the composite method is, if handled with a reasonable amount of care.

Each milking was weighed when brought to the dairy room, at once poured into a "shot-gun can," a sample taken with milk thief into the composite jar, one dipped out for the lactometer test and a third one taken with the pipette direct into the Babcock bottle. These last mentioned samples were tested every day and the composite sample at the end of the week.

The sum of all the different amounts of fat obtained by multiplying each milking by its test, should of course equal the product of the total yield of milk for the week and the composite test. Or, on the other hand, the sum of the daily fats divided by the total milk yield should equal the

composite test. Of the 35 cows tested in this way, not one differed more than one-tenth of one per cent between the composite test and the per cent of fat, as shown by the several milkings. And in no case was there a difference of more than one-fourth of a pound of fat for the week's work; several agreed exactly.

In further support of the reliability of the Babcock test and also of the composite method, I would say that of the 1300 official tests made in connection with this work (each one of which was run in duplicate) only seven of these pairs differed more than .1 per cent. Where a difference of more than this occurred, the test was repeated.

VARIATIONS OF TESTS.

Creamery patrons are apt to demand an explanation of any sudden change in the test of their milk at the creamery. Some of them seem to think that the man who operates the test should be able to tell why the difference occurs, and I believe some buttermakers, rather than plead ignorance, sometimes offer explanations which may seem to him to answer the purpose for the time being, but which fails to apply at some other time.

The man who feeds and milks the cow is really in better position to give intelligent reasons for variations in the test, but I see no reason why either one should be ashamed to own that they do not know, as it is pretty certain that there are a great many more things still to be learned on the subject than have been learned up to date.

A few things which affect the richness of milk of the individual cow from day to day or from week to week are pretty well established, but since some of these variations of individuals are equalized in the herd, we have fewer reasons for great variations in herd milk. The larger the herd the more uniform should be the test from week to week, other things being equal.

One of the Jersey cows at the Pan-American jumped around in test for successive milkings as follows: 5.6, 4.9, 3.7, 5.6, 5.2, 2.5, 4.7, 3.8, 2.9

and 3.5, but the same cow's weekly composite tests ran fairly even for successive weeks, thus: 3.95, 4.0, 4.1, 3.7, 4.1, 4.4, 4.2, 4.2 and 4.0.

In like manner the variations of individual cows from week to week are partially obliterated in the test of the mixed milk of the herd. Some of the greatest variations in herd tests for successive weeks at the Pan-American were as follows: Jerseys beginning with the week of August 6th, and for succeeding weeks was 4.32, 4.80, 4.40. The French Canadian July 16th and succeeding weeks, 3.59, 4.03, 3.87, 4.09. The Guernseys for weeks of July 30 and August 6 went 4.42 and 4.72.

I believe the Babcock test has been repudiated by creamery patrons sometimes for showing variations from week to week no greater than the above, just because they knew not reason why the milk should vary at all. But worse than this, and some times a direct result of kicking on the test, is the practice of evening up the tests by a dishonest butter-maker, who prefers to remove any seeming inconsistencies in the test before giving them out. I regret that such things as this have been known to occur, and am sure that such practices as this have in one way and another resulted in much lack of faith in the test even when honestly and intelligently handled.

When I find the test of a creamery running uniform from week to week with a range of only .4 to .6 per cent among a large number of patrons, I am suspicious that all may not be right.

It may be of interest to know that with every breed tested for consecutive milkings at the Pan-American, nearly every cow tested lowest in the morning. Five of the breeds tested in this way (25 cows) were milked three times a day, at 5:00 a. m., 12:30 p. m., and 8:00 p. m., making the night period 9 hours and the other two 7½ hours each. With these cows the morning's milk tested lowest, the noon milk highest, and the night milk between the two. Two breeds so tested were milked only twice a day at equal intervals and all of these averaged to test lower in the morning. This seems to indicate that the milking following the period of rest was least rich in fat, regardless of the comparative length of periods.

The difference in richness was not very great in most instances, but much greater with the Jerseys than any other breed. The average test of noon milk of the Jersey herd for one week was 5.34, for the night milk 4.61, and for the morning 3.97, a difference of 1.37 per cent between morning and noon milkings.

By the President: There are books at the end of the hall to which you are all welcome. They are last year's report. Read them and you will come back next year and join us.

CREAMERY BUTTERMAKING

A. E. THOMPSON, POPULAR GROVE, ILL.

By the President:—Mr. Thompson is the gentleman who took his little tub of butter over to Dubuque and brought back the grand sweepstakes of Illinois.

Mr. President, Members of the Illinois State Dairymen's Association,
Ladies and gentlemen:

In presenting a paper on the subject assigned me, Practical Creamery Buttermaking, I shall advocate no particular method as being superior to all others, but will only try to give a few details of my regular every day work.

One of the most important things in successful buttermaking is a good starter. With a good starter, rightly handled, the buttermaker has the ripening of the cream practically under his control, while with no starter, he must trust largely to chance.

To prepare a starter, I pasteurize skim milk at 180 degrees, and hold at this temperature not less than 30 minutes; then commence to cool and when cooled to 80 degrees, add about 2 per cent of previous day's starter and continue the cooling to 68 degrees, or 72 degrees, depending on the weather.

As soon as cream vat is emptied and washed, starter is put in, and when separating commences the brine coil is connected with line shaft and cream kept constantly stirred from beginning to end of separating.

In tempering milk for the separator, we use an ordinary tempering vat, the capacity of which is only equal to about one-third of our separating capacity. This lack of capacity is made up by the use of live steam directly into the milk. I know this is contrary to the teachings of the present time, but if rightly used I see no harm in it, at least, I have made some high scoring butter in this way.

The temperature at which milk is skimmed is from 78 degrees in winter to 88 degrees in winter.

We use the Alpha separators, running at a speed of 6,000 revolutions per minute; each one separating 2,000 lbs. of milk per hour; cream screws set to deliver a 45 to 50 per cent of cream.

At time of finishing separating, 10:30 o'clock, cream is at a temperature of 70 to 76 degrees. From this time on, cream receives no further attention until the required acidity is obtained, which usually takes from three to four hours.

When the required acidity is obtained, cream is cooled to from 46 degrees in summer to 54 degrees in winter. The point to which cream is cooled being gauged somewhat on the weather and time required for churning. When cooled, cream receives no further attention until churning time, 4 o'clock next morning.

Churning is done at a temperature of 56 degrees, or as low as possible and have the butter come in a reasonable time. This point is dependant somewhat on amount of cream to be churned and size of churn.

As soon as cream begins to break ten to fifteen gallons of water is added and churning continues until butter granules are about the size of wheat grain. The buttermilk is then run off and butter washed once in water at a temperature of 52 to 53 degrees.

Butter is worked once on a Mason worker and salted to suit the demands of the market.

Secretary Caven specified that I should give details as to care that was exercised to get good milk. In this connection I will say, if a can of milk comes to the factory either sour or bloody, I return it with a letter tied to the can, explaining what is wrong with it.

Another point which I think has a very great influence on the quality of milk delivered to the factory, is the pasteurization of the skim milk. Saying nothing about the other advantages of pasteurizing, the one fact of running the hot milk into the patrons cans is, in my estimation, a decided benefit, and since commencing to pasteurize, December 5th last, I am satisfied we are getting decidedly a better quality of milk.

DISCUSSION.

Mr. Hostetter:—I would like to hear a little more about this starter.

A:—In what respect?

Q:—Whether you get your own culture from skim milk?

Q:—I selected about two gallons of skim milk from a patron who brings fairly good milk and run that through the separator and pasteurized that at 180 degrees the same as the other and add the pure culture to that at about a temperature of 70 to 72 degrees and hold 48 hours. Then I use that in ripening up the larger quantity.

Q:—How do you hold your starter, what conveniences have you?

A:—For starting the culture, I use a half barrel set up on a shelf with steam and start to about 70 to 72 degrees, depending of course upon the wether and get the water around it. Leave it at night 76 degrees and in the morning it is about where I want it.

Q:—What kind of a starter can do you use?

A:—The starter can is of tin or copper 22 inches in diameter by about 40 inches high, probably 32. sufficiently high to make it last the 40 gallons. Some use galvanized iron about 6 inches in diameter. There has to be a little water space of 3 inches on the sides and 2 on the bottom. That has steam coil connections.

Q:—What percent starter do you use?

A:—Usually from 18 to 25 per cent.

Q:—Will it run through a hair sieve?

A:—Yes sir. We may have to shake the sieve the last time a little but not a great deal.

Q:—How often do you get milk.

A:—Every day Sundays included.

Q:—If that starter should become thick, would you advise warming it and getting whey and putting that in, would that be injurious?

A:—I am inclined to think that would be injurious. I don't know anything about putting whey in. I never heard of it until I heard your paper today. I have tried warming the starter, once to my sorrow. You can very easily make white specks in your butter by warming your starter. Of course using whey would not produce white specks. I don't know how that would affect it.

Q:—Suppose you was running a creamery three days in a week could you hold that starter from Friday to Monday?

A:—I never had any experience in that line. I think the way would be to pasteurize your skim milk and cool it down to a very low point and hold it until you wanted to ripen it up. I would try that.

Q:—Don't you think if it was cooled to 40 degrees it would hold all right?

A:—It is possible it might hold 24 hours. Not longer than that.

Q:—What per cent of acidity in your cream when you start?

A:—Well, of course, I use the Farrington tablets, but it is my impression that our tablets are weak. I run to .65 to .70 per cent.

Q:—Ever damp or soft?

A:—No sir. But you take 35 per cent cream and run in 70 per cent acidity, it is rather high.

Q:—How long have you had them?

A:—Over a year.

Q:—I would say here, I have had a talk with Farrington recently in regard to these tablets. They will not weaken in strength but the solu-

tion will. I have tablets which I have had a year and a half and I find for proper acidity I run up as high as 70 to 81 per cent, yet the tablets are all right and will not lose in strength.

Q:—Did you ever have any trouble in getting too much starter in that your cream gets too thick, will not string readily?

A:—No sir, never had any trouble.

Q:—In my work in Wisconsin I have found some of Farrington's tablets which were too weak. I carried with me what is called a normal solution for the purpose of testing tablets, and I have found in more than one case where the Farrington tablets had lost strength, but that is more than a year ago, they have probably changed them now. If damp or soft they will weaken. I found in one instance they were only about one-half strength. I think as a rule where the tablets are new and hard and firm and not allowed to get moist they are all right.

Prof. Erf:—I find once in a while that the water that you use has a great deal to do with the acidity, sometimes sterilizes the tablets with the acidity in the water. Some acids in water makes a lot of difference.

Q:—Ever tried the milk from fresh cows and used that for a starter instead of using pure culture?

A:—I have used skim milk starter; as to whether the cows were fresh or not I could not say. I selected milk from good clean flavored milk and I will say that as good a starter can be made with good skim milk as from pure culture, but it is not as uniform.

The President:—Whose culture do you use?

A:—Douglas.

Mr. Hostetter:—Do you know whether this starter is made from fresh cows or regular cows' milk?

Prof. Erf:—Not always. We prefer milk from cows that have been milked three months.

Q:—Will this milk from fresh cows make fancy butter.

Prof. Erf:—It seems to get a sort of a rancid or a sort of an older flavor from fresh cows.

DAIRY FIELD WORK IN ILLINOIS.

A. J. GLOVER, UNIVERSITY OF ILLINOIS.

Mr. President, Ladies and Gentlemen:

I am glad of the opportunity to get acquainted with the dairymen of the state of Illinois. I hope to meet some of you after this meeting and explain the work more in detail. While I cannot take a great deal more work, there is still a chance for some of you to have your cows tested.

Illinois is offering to her dairymen what no other state in the union is extending—a chance for them to find out what each cow is doing in their herds, without any expense to them.

Illinois is the first state that is offering to its dairymen an opportunity of this kind. It has been realized for a long time by close observing men, that there are many cows in the state that do not pay for the feed they consume.

The object of the work is to improve the dairy conditions, by getting dairymen to see better methods of breeding, feeding and caring for their cows; by getting them to take better care of their milk; but getting them to build better lighted and better ventilated barns; by getting them to select better sires for their herds, and by getting them to select better cows, and to sell their poor ones.

The work is not alone confined to the farmers, but whenever time allows, I visit creameries and milk men. If there is anything I can do to help them, I gladly do so. The aim of the work is to make dairying more profitable, to have the farmers keep better cows, get cleaner and better milk on the market, and to improve the conditions of the creameries, or, in a word, to raise the dairy standard in this great state of Illinois.

The method of doing this work does not involve any direct expense on the parties having the work done. Whenever we find a dairyman interested enough, in the improving of his cows, to weigh and sample the

milk from each of them, every seventh week, we furnish him the necessary apparatus for doing the work. The outfit consists of a pair of spring scales, milk sheet, sample bottles and tablets for preserving composite samples of milk. The party who undertakes this work is expected every seventh week to weigh and sample accurately each mess of milk from each cow in the herd for fourteen consecutive milkings. When the weighing and sampling of the milk are completed, I visit his place and test the composite samples. I am able, with the weights and tests, to determine the amount of milk and butter fat that each cow produces during the week her milk is weighed and sampled. I estimate from these weights and tests the amount of milk and butter fat she has produced three weeks before the period of weighing and testing, and three weeks following.

I have some farmers who are keeping approximate account of the amount and kind of feed fed to their cows. This makes the record much more complete, and my report will be of more value. The accounting for the kind and the amount of feed is not demanded of the person who accepts this work, but we are more than anxious to have them do it. The part of the work that we ask the farmer to perform, is to weigh and sample the milk from each cow every seventh week and to carry me to and from the station, for doing their testing. He has no expense, and only a little labor, to have a complete record of every cow in his herd.

This record tells him how much milk and butter fat each cow in his herd has produced during the year and when feed is weighed it will give him how much she has consumed to produce this milk and butter fat. Or, in other words, what she has charged him for her keeping. The time required for doing this work depends on the number of cows in the herd. With ten cows, it requires about ten minutes more time each day to do the milking, about seventy minutes every seventh week, or about eight hours per year to do all the extra work. These few hours of time spent give him a record of each cow in his herd.

It is my duty to keep all the records of the cows that I am testing, and to report to the owner at the end of the year what each cow has done.

I have, so far, only nine men who have seen fit to take hold of this work. These men own about 273 cows, and nearly all of them are now giving milk.

I have already hinted at the necessity of weeding out the poor cows, and keeping only the good ones. And right here I want to state my reasons:

In the spring of 1900, Hoard's Dairyman made arrangements with Mr. Kinsley to make a special investigation of 100 creamery patrons in the state of Iowa. The following I take from Hoard's Dairyman: "He was to visit each patron, make a special study of his farm methods, note the number and breeding of his cows, which he had milked the year previous, and to determine as nearly as possible just what his cows had cost him, in value, to feed. Also he was to take note of the owner himself, with a view of determining how much intelligence he was putting into his . . . After all these facts were ascertained, he was to visit the creamery and obtain the record of the yield of milk and butter per herd, for the year, and price received. This, when divided with the number of cows, gave the earning at the creamery per cow. Finally, he was to measure the cost of keep and determine the value in butter from each cow, for every dollar's worth of feed which had been given her. Nothing was to be said as to the cost of labor expended on the cows and milking and care."

"The total number of cows in these 100 herds was 982. There were four herds that ranged from \$2.11 to \$2.50 for every dollar's worth of feed expended. There were 61 besides, out of the 100, which averaged from one dollar upward for every dollar's worth of feed consumed. The highest being \$1.91, the lowest \$1.00. Of these 12 returned from \$1.50 to \$1.90. 23 herds returned from \$1.00 to \$1.20 for every dollar they expended in feed."

"Now we come to the dark side of the picture. Thirty-five of these patrons out of the 100, received less than one dollar from the creamery for every dollar they spent in feed, and the loss ran all the way from 2 cents to 36 cents. The extreme contrast is one man receiving \$2.30 and another 44 cents.

Now was it the creamery or the patron that was responsible for this difference?

At the Illinois Experiment Station, Mr. Fraser found that 2 cows could practically consume the same amount of feed and give different amounts of milk and butter fat. Rose and Nora were the names of the two cows that were in this experiment. Rose gave 11329 pounds of milk, 564 8-10 pounds of butter fat; and Nora gave 7759 4-10 of milk and 298 64-100 pounds of butter fat.

Prof. Haecker of the Minnesota Experiment Station found that he had cows in his herd that paid a net profit of \$50.00, others \$20.00, and others only \$8.00. The cows were all fed and cared for alike, but yet there were these great differences.

At the Wisconsin Experiment Station they found some cows in their herd that even charged something for their keeping. These different results show us that it is not altogether a question of feed, but the breeding of the animal must be considered. And this is not enough. She should also be put to test from time to time, in order to find out whether she is a profitable cow or not.

It seems to me fitting and wise for the farmers to dispose of their poor cows, and keep only the good ones. These facts that I have presented to you must appeal to you when the prices of feed are high as they are at the present time. What is the use of keeping cows upon your farm that do not pay you for their board? Why not sell them, and why not keep a cow that produces 350 pounds of butter, instead of a cow that produces only 150 pounds of butter in a year? The labor is the same, and she usually consumes the same amount of feed. I had rather have ten cows giving me a profit of \$50 per head, than to have 100 cows that were only giving me a net profit of \$8.00 a piece. But there are many dairymen who are keeping cows that do not pay for the feed they consume, as it has been shown with some of the patrons of the Iowa creameries.

Some of the dairymen, to whom I have offered this work, call it "Book Farming." These same people would not employ a doctor or a lawyer who were not learned in books. Let us put aside our prejudices,

and look squarely at the subject to see whether our cows are the best, our milk that we produce the cleanest and best, that our butter is of the highest quality possible for us to attain.

Hoard once said, when speaking in Massachusetts on the subject of breed, an old Yankee stood up and said it was not in the breeding, but all in the corn crib. Hoard reflected a moment and then said, "You are the man I have been looking for all these years. You say it is all in the corn crib. Uncle, how would you feed one of those razor-back hogs to make a Berkshire out of it? How would you feed a dairy cow to make a Short-horn of her? Let me tell you that there is a horse named J. I. C. that trots a mile in 2:10 on 12 quarts of oats a day; yet I'll bet you have horses on your farm that couldn't trot a mile in four minutes if you had run ten tons of oats through them. No, my friend, it is not all in the corn crib."

DISCUSSION.

Mr. Hostetter:—I would like to extend an invitation to have you come and test my cows, and have them on your list.

A:—Yes, sir; I think we can make arrangements, if you will see me afterwards. I would like to meet any one after the meeting who is interested in this testing.

By the President:—If you live in the right place, Mr. Glover will be pleased to meet and make arrangements to test your cows.

FEEDING THE DAIRY HERD.

BY M. S. CAMPBELL.

Mr. President, Ladies and Gentlemen:

I am not much of a speaker. I was asked to come here and tell you how I handled my dairy herd, and it will not take more than a few minutes of your time.

On account of the extreme high prices for feed, it occurred to me along in November, that I must do some thing to make a profit in handling my herd. My cows apparently were eating up all I got from them, and when oats were 45 cents a bushel and brand \$22.00 a ton. I could not stand those expenses. So I put my cows on the following feed in December:

Silage, \$8.62 worth; hay, \$5.50. and shelled corn, \$3.00. I gave them oat straw to pick at. That constituted all my cows' feed. I milked twelve. There were five of them 2 year old; three out of five had been milked 15 months, and the remainder three and five year old. Those twelve gave 7146 pounds of milk at \$1.15 makes about \$82.00, and with an expense of \$17.12 for feed, I received about \$65.06 clean profit from my entire herd.

I will say here that my hay was clover hay, and that substitutes for grain they did not get the month before.

Mr. Glover was at my place and we figured this thing over and I think that my cows were receiving on an average about 1.34 pounds protein per cow a day, where I had been feeding before 2.12 pounds protein per day. My test increased at the creamery on this feed to what it was when they were eating 10 pounds ration of bran and oats, less that clover hay.

My cows are handled probably the same as everybody else's cows are handled. House them in a fairly good barn; its nothing extra, only just medium. I give them pure water to drink twice a day and clover hay to eat once a day, and straw at noon. They have the chance twice a day to the water tank as I said and they get pure water. They are groomed only occasionally. Judging from what the gentleman said yesterday about using 25 per cent muscle, I don't think my cows are giving what they would according to his theory; I think my self they would be better if cleaned oftener. People in our neighborhood claim that it is costing them \$1.75 a hundred for milk and they are only receiving \$1.15 a hundred for their milk. I think if my cows were doing that I would put them on hardtack.

DISCUSSION.

Q:—Do you think your cows would have given just as much if you had not had silage?

A:—No sir.

Q:—What would you substitute in case you took your milk to the condensing factory, where you can't use silage?

A:—If I had to do that, I don't think I would take my milk there. No man is going to dictate to me what I shall give my cows to eat. There is too much dictation on what we produce. The factory may set up a howl to us about cleaner milk and cleaner barns and better goods, but it is a fact, nevertheless, that some of the creameries in my district are not clean. If my barn was as dirty as their creameries are I would not attempt to clean it. I would burn it. I will venture to say that you can go to my barn tonight and if it is not cleaner than some of these creameries, I will pay all your expenses and use you well, and will leave it to Mr. Glover who has been there.

Q:—Do you think a person would know you was using silage?

A:—I have my doubts.

Q:—Can you taste silage in your milk?

A:—I never have and we use it on the table. I take my milk to the creamery where there are 69 patrons and some of this milk goes to Chicago and is sold in there, and the creameryman says it is the nicest flavored milk he receives. I am the only one using silage. I used to think silage tasted in the milk, but it don't, it gives a fine flavor.

Q:—Did you say you are feeding no grain?

A:—Only excepting corn silage. In November I milked eleven cows. I fed \$6.65 worth of silage; \$3.00 shelled fodder; \$20.00 oats. Bran in my barn I paid \$14.75 a ton for. The expense of feeding the eleven cows was \$41.65. I took to two different creameries and those cows returned me \$52.98 worth of milk at an xpense of \$41.65, a net profit of \$11.33 for the same cows. We have one more now.

Q:—Are your cows losing flesh?

A:—Only one.

Q:—How much ensilage for each cow?

A:—On an average, about 40 pounds a day. In November 35 pounds.

Q:—Is your silage full corn in the ear?

A:—It is the native corn.

Q:—You have given the corn in the silage?

A:—Yes sir.

Q:—If fed by the basket, how much would you give?

A:—The cows vary so; will eat a scant basket.

Q:—Feed silage morning and evening?

Q:—Yes sir, and clover just before milking.

Q:—How much clover?

A:—I estimated they were eating five pounds a day, and night before last I took my fork and put it around in little piles and weighed it and I found my cows were receiving less than four pounds on an average a day, but I had charged them with five pounds.

Q:—What price did you charge the silage?

A:—\$1.15 in the silage.

Q:—Isn't silage worth what you can get for it?

A:—I could not get more for it.

Q:—Couldn't you get more than \$1.15 a ton?

A:—I don't think I could get 50 cents a ton in my neighborhood.

Q:—What condition is your corn in when you put it in the silo?

A:—Nicely dented.

Q:—What price the straw?

A:—\$35.00.

Q:—What part do you live?

A:—DeKalb county.

Q:—How many tons of silage from an acre?

A:—About nine tons.

Q:—What is the cost of labor to put it in the silo?

A:—I could not tell you here; I figured it all in.

Q:—The actual labor?

A:—I figured everything except my own labor. I hired some work, but most of the work that I had to have done in filling my silo I worked back in helping my neighbors thresh, and then I worked myself.

Q:—What do you figure the corn item?

A:—Ten dollars an acre. Corn sold in our neighborhaad under the hammer from \$8.00 to \$11.50 an acre, and I thought \$10.00 a fair estimate for the corn. I don't think my corn would have brought that. It was on a piece of land that was not right good for corn and I did not have right good corn.

Q:—How much to the acre husked out, how many bushels?

A:—Twenty-five, may be. It was very poor ground; ought to have had 40 bushels.

Q:—Were you feeding the same way last year?

A:—More grain ration last year.

Q:—Didn't you have a silo?

A:—Yes sir.

Q:—Did you feed silage?

A:—For about five or six months.

Q:—You think at the present time, if feeding a grain ration you would increase more?

A:—My cows lost 50 pounds of milk in a day, twelve cows, and I was feeding \$2.00 a day to those cows.

Q:—You think you can carry your cattle through on this system?

A:—I think so, have been at it over thirty days.

Q:—You say that they lost 50 pounds when feeding grain ration; do you think they will hold out in this?

A:—I think they will. It is an experiment at my own cost.

Q:—Do the cows seem to be satisfied?

A:—They are now. At first they were not. I did not quit their grain ration all at once. I took ten days to do it in. I took and fed them clover hay at grain feeding time when they were looking for something to eat; took their attention off the grain.

Q:—What was the test of that 1700 pounds of milk?

A:—3.6.

Q:—Your cows were diminishing in milk?

A:—They are holding on now.

Q:—Does this \$11.00 profit include the value of the skim milk also at these creameries?

A:—I sell my milk right out so much a hundred. If I take skim milk away, I pay for it at the rate of 15 cents.

Mr. Sawyer:—I would like to know whether you think they will hold out through the winter? A number of years ago I went through this same siege and I would like to tell you you need not be anxious as long as your ensilage and clover hay hold out. Some one asked him about his cows holding out. My cows were in far better condition after feeding this feed all winter than when I took them off grass in the fall.

Mr. Campbell:—The day my cows were put on to this feed, Mr. Glover was there and when he came again I asked him to look them over and tell how the cows compared in looks. Mr. Glover, you said you could not see they had lost?

Mr. Glover:—I could not see it. It had been seven weeks since I saw them before, but I saw no change.

Q:—How much ensilage and clover hay was fed.

A:—They ate in the neighborhood of 40 to 45 pounds ensilage. Gave them all the ensilage they would eat, and gave them all the corn fodder they would eat.

Q:—How many ears of corn would each cow get?

A:—I could not say. The corn that I fed went about nine tons to the acre. It was a heavy yield of corn but a poor standard of corn on the ground. Probably averaged two stalks to the hill. It was planted for field corn. The stalks were large and the ears were large.

Q:—Naturally think ten stalks to make a basket full.

A:—I don't know.

Mr. Cobb:—We carried a herd of 40 cows on ensilage and clover hay without anything else whatever, and my recollection is that they shrunk

a small amount of milk on the start, but not nearly enough to justify a grain ration, and they milked right along and kept in good health with that feed. The only drawback to the transaction was that they were in a barn that was too cold for them. If the barn had been warm I think it would have been more profitable.

Mr. Glover:—I am going to keep track of Mr. Campbell's cows and will let you know about them.

President:—Convention will stand adjourned until this evening at 7:30. We have some good things on the program. Mr. Cobb will tell us how to build a silo and what to put in it. We commence the program tonight with a lady from Southern Illinois, and I would like all the gentlemen, if they have lady friends to bring them out so as to have a few more ladies with the gentlemen. I would like to have the house filled. We also hope to have the butter scores read tonight. The Board of Trade Medal is to be given to the man who is employed by a member of the Elgin Board of Trade, who makes the highest score.

Wednesday Evening, January 8th, 1902

Convention called to order by the President.

Music by orchestra.

Song, by Hon. Jules Lombard. Encored.

By the President: We will now take a little of the more serious side of life. Mrs. Copeland will talk to us on the Educational Side of Farm Life.

Allow me to introduce Mrs. Copeland.

THE EDUCATIONAL SIDE OF FARM LIFE.

BY MRS. M. L. COPELAND, MARION, ILL.

Mr. President and Friends of this Association:

It gives me great pleasure to be with you. I was thinking that today we had had the business side of life discussed very thoroughly, and in a

way that certainly was helpful to us all. Then I thought of the article I would have with you on the educational part of life discussed, or, we might say, useful too. We have been amused by the humorous side, by the recitation we have just listened to.

As I said, I was very much pleased to be with you, for the first time in the northern part of Illinois. I was born and reared in the extreme southern part of Illinois. I thought, as I came into your town today—this beautiful January winter day—as I looked across these lands, at the broad prairies, of history of long ago. I was thinking of two very great men who were giants in making history, who met in this town in the summer of 1858. Of those two men who met here to discuss those serious questions of their times, and who fell as martyrs to the cause of right—they met in this town of Freeport. And that great giant of his time in intelligence was also here again. We call to mind who they were—Lincoln and Douglas. I thought of how this country had made history, and the recollections of this town, and am pleased to be here and talk with you.

In these times of marvelous invention and rapid transit, where there is so much to be seen and heard, we are almost like what Walpole said of England in the beginning of the 18th century, so great were the changes and achievements. There each morning the question came, "What new victory for England today?"

While so much is written and read and so many things said, every true heart is longing for the very practical things of life. Marconi had no doubt his many theories which were his helpers, but when space was overcome and the Atlantic ocean ceased to be as it were, between America and Europe, then civilization congratulated the inventor for the practical work.

So with anything which we may say in this discussion. If it be practical, then we hope to have benefited some one.

Education is two-fold. It is acquiring and giving. It means to lead forth; to bring out. Hence, the native qualities of man at birth, we hope

to enlarge upon, and by his retentive faculties, the memory and reason, we gain through nature our best teacher. We also gain what is termed "learning" through books and by experiment.

It has been well said, "What sculpture is to the block of marble, education is to the human soul." So in a measure our education is with us at birth and in previous generations. For the records of our courts show whole generations of bad blood. Some may call to mind the New York woman whose several hundred criminals were a menace to society.

On the other hand we remember that the genealogy of Jonathan Edwards' family showed a number of preachers, sixty-five college professors, several missionaries and scores of worthy farm citizens, whose quiet, honest lives were as a leaven to the nation.

We know it pays to educate mind and heart as well, for not only ourselves in life's short day, but for those coming after us to perpetuate this great commonwealth, so hallowed by the blood and sacrifices of our patriots.

We, as a younger people, in retrospect, can but truly give our gratitude to those of our forefathers, who, by their struggles in pioneer days on unplowed prairies, or in heavy forests, prepared so well for our coming, and it becomes our duty to take up our responsibilities in good cheer and do our best.

President Roosevelt has said, in speaking of an American, that he should possess three things, without which he could never be a man, viz: Honesty, courage and common sense. He said: "The lesson of combining zeal, fervor, intense enthusiasm, with broad charity and sanity—that is the lesson that we all need to learn. The life worth living is the life of the man who works; of the man who strives; of the man who does; of the man who, at the end, can look back and say, "I know I have faltered, I know I have stumbled, I have left undone things that should have been done, and much that I have done had better been left undone, but as the strength was given me I strove to use it; I strove to leave the

world better and not worse, because I had lived in it." We feel proud to say there is no divine right of kings here; no royal road to greatness. No young man or woman can be great but through his own energy, or, in that homely but true phrase, "Get up and get." If any do inherit a fortune, it takes a good degree of common sense and work to keep it. We know "'Tis not in a wild chorus of praise nor chance, not yet fate; 'tis the greatness born in him and with him that makes man truly great."

It is wise to educate the infant, the youth, the man and even the old, for the older we grow the more accurate the thought should be. We love the thought of always being a student, and these meetings should serve us right here. No one is so ignorant as the one who in this age of science and development will say, "I know enough."

Some of us, upon inviting persons to take part in our institutions, have heard them say: "I have more good sense about farming than all the universities in Illinois." I don't know how you think, but the thought of the Pharisee of ancient days comes to me.

Friends, if the great Newton, who is the marvel of time, could discover the laws of gravitation and go to depths of science, and in his ripe years of knowledge and resource, exclaim, "I seem to have been only like a boy playing on the seashore and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me." How can we, whose discoveries have been less great, exclaim we know enough? Then let us grasp these agencies for education.

The Farmers' Institute seems to us the beginning of something better; a new era. The 20th century movement indeed. Free from politics, sectarianism, or unions of any sort, the only requisite is for us to wish more knowledge.

Why should not that occupation—farming—which is the very foundation of all earth as to sustenance, both physical and moral, as well receive every attention; receive highest honor, and why should not the farmer get fully equipped for the arduous and great responsibilities that ever have been, and ever will be, upon him?

In the Orient were originally but two occupations, farming and trading. That old rich empire, which we might call one vast farm, Egypt, grew wheat centuries before the Christian era, and the Nile watered as good grain as we have today.

There is another phase which we can not discuss at length, namely, there is a continual draw upon the farm for strong young men and women to fill important places in the nation. The offices to fill need physical strength as well.

It is interesting to note that out of 385 members of the House and 90 Senators at our Capitol, (while but three Senators and fifteen Representatives registered as farmers) that 159 of them were either born on the farm, or spent their boyhood there. The Christian Herald goes farther to say: "Notwithstanding this fact, but rather owing to it, they are a company of well educated men, many of them are self made, in a sense that they have made their own way in life, and 169 of them have been college bred."

I would say to the farm boy, "Stick to your job." We do not often have droughts in the middle west so severe as the past year. When it is so with us, the luscious fruits of the orchard come blushing to us, bending their boughs in sweet humility as if to apologize for the fields stint measure, and we of course accept the same with gratitude.

We should not be discouraged. If we do our duty, there will be a call for us according to our ability.

We call to mind circumstances of the Putnam, called from the plow to head armies. Jacob watched the flocks in Judea's hills preparatory to becoming Israel's king.

Gen. Grant was hauling wood in St. Louis, and Robert Burns best poems were written while he was the Ayshire plowman.

Neither be discouraged if we are poor, for Lincoln said: "No men are more to be trusted than those who toil up from poverty or know the worth of a dollar more."

The monotony of farm life is now being relieved by advantages of

rural mail, which has come to stay; by telephones and libraries; also better highways.

I say thoughtfully, every home should possess a library. A few well chosen books each year added will soon be a source of education; a mental reservation from which to draw. Children like to read and in the quiet of a country home will be found the best place to begin this habit. And right here, if there is any one thought that I wish to impress upon you, it is the plea for parents to see well, so far as lies in their power, that the girls be educated; not so much to make them independent in a business sense, for here in America, independence seems to be first nature, that will follow, but educate for the sake of better homes, better mothers, and a better society. We who have taught well know the drawback mentally and morally one illiterate mother is. In our rush to get gain, and everything else, we do not think of this and it is time to call a halt, and impress our daughters with a realization of God and responsibility of their lives.

Here in the State of Illinois, which leads in railroads, pork, in grain, and is the banner state of the middle west, numberless advantages are offered.

Prince Chun of China said: "The United States won its standing in the world by its system of free education, giving all men an equal chance to reap the benefits of the culture of the mind. The people are the best educators in the world. There is no question with which they can not grapple successfully."

The more we enlarge our minds the keener our sensibilities. With our great opportunities come our responsibilities.

The farm boy is educated in economy and industry. No slot machines or painted candy for every cent.

The boy who wins against an ugly and ill-kept back yard and broken gates and transforms the same into grass plots, with shade, has won for himself a victory which will show greater things in manhood.

I like the parable beginning "Behold a sower went forth to sow." We all know the joy and hope when we plant.

It is not easy to labor, but to labor and to wait is harder still. The idle are the troublesome element in school and state. The virtue of patience is also learned. For we know the "acorn does not become an oak in a day. The refined scholar is the raw recruit of yesterday; there is always months between the seed time and the harvest."

It is here we are educated to love to work. I could have said learn how, but to love work, and take real delight—not half-hearted. I have seen men plow as if it were a real punishment; also women cook as if it were a real burden. Such persons leave all undone that they can, and dislike the farm and almost everything else.

We also know the farm gives a strong body, good health, the foundation, open air and sun. No need of gymnasium, climbing of hills and over fences, riding of horses; every muscle has full play. This beats all the gymnasiums from Mexico to Canada. No foot ball needed with broken limbs or crushed heads. God gives us a good form, strong arms, he did not give them to us to beat it up in pugilistic manner unless necessary in war. We only have one soul. We are to take care of this physical body, keep it in good shape, not ruin it by vice or by things we could do without, but to keep it as a temple, and when the time comes to return it over in good condition.

I thank God, after I spent a while in that rushing Chicago, with its pent up flats (as well as fine houses), that I could go to the orchard and stand in the June sun amid the corn and drink its freedom from so-called society, here to commune with God in the quiet hour.

if we take the opportunities the farm offers we will be content.

I like Whitcomb Riley's, "Thoughts for the Discouraged Farmer."

Does the meadow lark complain, as he swims high and dry
Thro' the waves of the wind and the blue of the sky?

Does the quail set up and whistle in a disappointed way,

Or hang his head in silence and sorrow all the day?

Is the chipmunk's health a failure?

Does he walk or does he run?

Is there anything the matter with the rooster's lungs or voice?
 Ort a mortal be complainin' when dumb animals rejoice?
 Then let us one and all be contented with our lot;
 The June is here this morning and the sun is shining hot.
 Oh! let us fill our heads up with the glory of the day,
 And banish ev'ry thought and care and sorrow far away!
 Whatever be our station, with Providence for guide,
 Such fine circumstances ought to make us satisfied;
 For the world is full of roses, and the roses full of dew,
 And the day is full of heavenly love that drips for me and you."

Let us introspect and see if we have done all that we can to make the farm a success. Our children will be content with us. It is a good sign to see a boy love home—both for the boy and the home. The golden city will then lose its so-called attraction. We sometimes wonder how long the farm will continue to feed this modern minatur which requires its yearly tribute.

Then with this motto, that greatness in character not circumstances,

"Let us rise for the day is passing,
 And we are dreaming on,
 The others have buckled their armor and
 Forth to the fight have gone.
 A place in the ranks awaits us,
 Each man has some part to play.
 The play and the future are nothing
 In the face of stern today."

Opportunity is passing with broad charity reaching for the higher education of love and light. Right thoughts and action will follow, success in your day will come. Now is a mighty word.

Maybe we, like the great men and women who live and have lived, whose lives are a sweet incense brewing upon times' altar, and we will earnestly labor for our homes and those whom God has given us.

Tell me, gentle traveler, who has't wandered through the world and

seen the sweetest roses bloom and brightest gliding river, of thine eyes have seen, which is the fairest land?

Child, shall I tell thee where nature is most blest and fair? It is where love abides. Though that space be small, ample it is above kingdoms; though it be a desert, through it runs the river of paradise and there are the enchanted bowers.

Duet by Hon. Jules Lombard and Mr. Bagley. Encored.

By the President:—I understand the Committee on Resolutions are ready to report.

Resolutions read by Mr. Caven. Mr. Long Chairman of Committee.

Whereas, An effort is now being made by the dairy industry of the United States, through the National Dairy Union, to secure the enactment of a national oleomargarine law which will prevent the fraudulent sale of oleomargarine for butter and will compel oleomargarine manufacturers and dealers to sell their product for what it is; and,

Whereas, Experience has shown that state laws are inadequate to deal with this fraud; and

Whereas, An anti-color law is the only law that will be effective to prevent the fraudulent sale of oleo margarine for butter; therefore, be it

Resolved, That this association recommend the passage by Congress of the Tawney-Grout oleomargarine bill (H. R. No. 4) and respectfully request our representatives and senators from Illinois to use every honorable means to secure the passage of H. R. No. 4, which places a tax of ten cents per pound on oleomargarine colored in semblance of butter, and removes the present tax of two cents per pound on oleomargarine in its natural color.

Resolved, That we endorse the work of the State Food Commission in its efforts to better dairy conditions and the dairy industries, and we would urge upon the Commissioner the importance to the dairy industry of Illinois of securing from the Supreme Court of the State a decision as to the constitutionality of the anti-color law of Illinois. We wish to call the attention of the Food Department to the need of dairy statistics of the State, including number of cows and value of same, list of creameries and

amount of capital invested therein, amount of butter made, both dairy and creamery and value of same, amount of butter exported, amount consumed at home, etc.

Whereas, In the judgment of the breeders of dairy cattle in Illinois the State Dairyman's Association can be made of more importance and worth to the dairy interests of the state and

Whereas, There appears to be no organization of the different breeds in the state,

Resolved, The President of the Illinois Dairyman's Association be requested to appoint one man from each dairy breed whose duty it shall be to endeavor to have those several breeds organized during 1902 in the State of Illinois, each to send a representative to meet with this organization at its next annual meeting, to report the success of this movement, and to act with us in the future for the general good of the dairy interests of the state.

Whereas, Illinois is one of the leading dairy states in the union, and dairy conditions here as elsewhere are such that they demand the attention of both the producer and the consumer, and

Whereas, We believe that a large number of dairy cows in this state are not paying the owner in milk or butter what it costs to feed them, and that a great many dairymen do not realize the importance of weeding out poor cows, but keep them in their herds year after year at an actual loss, and,

Whereas, A part of the milk produced is not up to proper standard in purity and a large share of the public does not realize the importance of pure milk, and

Whereas, The manufacture of process butter has greatly increased in past years and this industry is stimulated by the production of poor grades of butter, and,

Whereas, The cheese industry is one of the most important features of the dairy vocation, and since the state of Illinois has sadly neglected this part of the dairy work, therefore, be it

Resolved, We, the members of the Illinois State Dairyman's Associa-

tion, ask the support of all interested in the dairy industry of the state to co-operate with the Illinois College of Agriculture and Experiment Station in advancing the cheese industry and rectifying existing evils and in promoting the dairy business of the state to the utmost possible limit.

Resolved, That we express our gratitude to both our state and national government who have been and are standing for the legislation needed for the dairy industry. We assure them that we appreciate their efforts.

Resolved, That we give to Mr. Sudendorf, who is a candidate for the position of Superintendent of the dairy department of the St. Louis World's Fair, our endorsement. We believe that he is the best man in the country for the place and will get together the best possible representation of dairy machinery and supplies and products.

Resolved, That we express our thanks to the Mayor and citizens of Freeport for the favors that we have enjoyed at their hands during the convention.

Resolved, That our thanks are extended to the railroads of the Western Passenger Association, and especially to the C. & N. W. Ry. Co., the I. C. Ry. Co., C. M. & St. P. Ry. Co., and the Great Western Railroads that enter Freeport, for the open one and one-third rate granted for the convention.

Resolved, That we thank the newspapers of Freeport for the liberal notices they have given us in advertising our convention. We thank also the other newspapers of the state that have kindly used the news matter relating to this meeting sent to them.

Resolved, That we thank W. D. Collyer, of Chicago, who judged the butter.

Resolved, That we thank those who have taken part on the program of this convention, making it one of the best in the Association's history. We are grateful to Hon. Jules Lumbari, of Omaha, and F. R. Bagley, of Chicago, who entertained us with music and Elmer Thayer, of Freeport, for readings and songs.

By the President:—What will you do with these resolutions?

Mr. Long:—I move their adoption.

Mr. Nowlan:—I second the motion.

By the President:—It is moved and seconded that these resolutions be adopted as read. All in favor of that say "I."

Contrary:—It is unanimously voted that the resolutions are passed.

Recitation:—By Elmer Thayer, accompanied by orchestra. Encored.

ADDRESS

BY MR. PATTERSON, REPRESENTATIVE OF HON. A. H. JONES,
FOOD COMMISSIONER OF ILLINOIS.

By the President: The next on our program was an address by the Hon. A. H. Jones, Food commissioner, and he has sent his able representative in our friend, Mr. Patterson.

Mr. Chairman, Ladies and Gentlemen:

The officers of this organization are to be highly congratulated for the excellent program thus far. In addressing this organization in behalf of the distinguished Food Commissioner, whom I represent, Mr. Jones, I have to extend his regrets for his absence, he having been called to Washington, and he sent me out here to do the best I can. Your Chairman said "able representative"; of course it is always nice to give a man a good send off.

This year is certainly a good year for the interests of the dairy and creamery industry. In looking over this field, one can't help but be impressed with the tremendous interests involved in the dairy industry.

I want to say, before I begin a little paper I have prepared, that the resolutions just passed, we, as members of the Illinois Commission, feel highly gratified, and feel that your work and our work is practically on the same line. The resolution that said it would be well to secure all of

the data of the animals and creameries of Illinois is something we are very anxious to do. Mr. Burke, who is chief inspector, is here tonight, and we have prepared a list or a blank for names and addresses of the dairies and creameries, and we would like to get them filled out as near as we can, and ask your help in securing the addresses. This year, of course, we are unable to secure all of them, but by this time next year we expect to have them and give them to you in our next annual report. It will be a great aid to you and those interested in pure food.

That part of the resolution that made mention of the oleo law interests us all, and we have given that a great deal of attention. In Elgin last summer they tried several cases against dealers selling oleomargarine without it being labeled and tried to get a decision, but the juries failed time and again to agree, but at last one jury agreed against us. We have two cases that we are going to take to the supreme court, to test this oleomargarine law, and feel confident that the supreme court will find that law good. It would be a great aid for the pure food producers in Illinois. If a man adulterates his food, let him label it as such, so that the buyer will know he is buying adulterated food. Let us label oleomargarine or anything else along that line. That is what we are making a special effort to do now.

In taking the counties and the farms in Illinois and from what information I could get since my appointment I have approximated that the number of cows in Illinois are 750,000. Of course that's a great many cattle, and if properly taken care of, will be a great benefit, and that number could be increased because Illinois is a great state with broad prairies, especially adapted for the dairy industry.

I want to say right here that you have dairies and creameries in Illinois as good as any in the world from what I know, and I am acquainted with creameries in Pennsylvania, Iowa and Kansas. You are to be congratulated upon the work you are doing, but extend it and broaden out and join together is all that we have to do in that line and we will be surprised at the results.

I understand the object and purpose of your Association is to improve and develop the dairy industry of this great State. When the magnitude of the industry is considered, it is apparent that the subject is one of the utmost importance to the people of Illinois. It can be truly said that the prosperity of the State rests largely with you gentlemen. There are now in Illinois, for dairy purposes, approximately 750,000 cows, yielding an annual supply of nearly 350,000,000 gallons of milk, from which 100,000,000 pounds of butter are made. This great supply of butter and milk, if equally divided among men, women and children of the State, would give to each one annually about 58 quarts of milk and 20 pounds of butter. These figures would indicate that the supply is not sufficient to meet the demand of its citizens without importation.

The farmer who follows dairy pursuits should have to begin with a dairy of good cows and he should acquire the cows with the least possible outlay of money. If there is any particular breed of cows more profitable than another, it should be known to him. At the lowest estimate \$900,000 is annually withdrawn from circulation and is expended in the purchase of cows from other States. About 70 per cent of this stock is bought on credit, and the farmers therefor pay annually a large amount of money in interest. The time was, in Illinois, when the farmers practically raised all of their own stock. If that was done today, we should not only have better dairies, but we would escape many dangerous diseases which find their way through our State through the importation of stock. Through our inspection, we seek to bring about clean stables, clean milk receptacles, the general condition made better. The introduction of modern scientific methods we believe will be the result of these inspections, in many instances in which they are not now in use. I know of no better means of bringing about improved conditions than through inspection, and it is my opinion that not only is the public health protected thereby, but that the competent, up-to-date dairyman will be greatly benefitted thereby. I know of no up-to-date dairies who receive as much as 12 cents per quart for their milk from the consumer. I am

personally interested in the dairy business. I began life on the dairy farm, and I am still in the business and I expect to remain in it and do my utmost to advance the industry, in and out of office.

The first work I did as a boy on a farm for my mother was to milk eight cows a day; take them to pasture in the morning and bring them home at night. I am interested in a farm in Cook county on which there are several cows, and my brother and I are owners of a dairy at Emporia, Kansas, where 60 cows are kept.

The Food Commission thus far has prosecuted no owner of dairy or creamery. All we desire is your co-operation in enforcing the laws. While we have not begun prosecution of any one connected with the dairy industry, the records show scores of arrests of dealers in imitation of butter, or oleomargarine in Chicago and elsewhere, and the expenditure of money and time in securing convictions. We believe it is of the utmost importance to protect the butter and dairy interests of this State. The fame of Illinois butter is known the world over, and the Elgin stamp is a guarantee of an A 1 butter in America, as well as in Europe.

Milk depots and dairies within the city limits of Chicago were inspected during the last two weeks of December, and many of them were found to be very badly in need of sanitary improvements. It was discovered also that the ordinance of the city, prohibiting the feeding to cows vinegar slops, was being violated by scores of dairies in the city.

In the city milk depots we found rusty cans, rusty on the inside as well as the outside of the can, and many cans used for garbage and such like; also mouldy and unclean walls and ceilings from which particles of dirt fell into the receptacles used for milk and cream. The most startling discovery was the unclean stables and yards, lack of proper drainage, cows huddled together in very close quarters, and improper feeding were observed. We found that there had been no inspection by the city of these places, although the income from the milk depots and dairies in Chicago is over \$60,000 per year. For this reason we have been very active in endeavoring to bring about a better condition in the city of Chicago.

I believe the future of the dairy industry of this State is exceedingly bright. There are great opportunities to advance this industry in Illinois. It is my opinion that much of the soil that is now occupied in raising crops could be used to a much better advantage in dairy farming. The seeding of the land for year after year for nearly a century has a tendency to make it poor, but this land could be easily transformed into excellent dairy pasture which would improve the soil. Dairymen should co-operate and stand together and demand better prices for their product. You should join with your neighbors and buy in carload lots and save from two to four dollars per ton on feed. I am free to say that the dairy farmers should have net, above freight, one-half of the retail price to the consumer. The middle man has generally the better part of the business on milk products. With my experience, if I had to take the low price prevailing for the past few years for milk in Chicago, I should be very much inclined to let the other fellow do the producing and I would do the selling and the money making. People are beginning to appreciate the value of the dairy products, and I believe there is a much better day ahead for the dairyman. Let your association forge ahead with the wave of prosperity. There is need of more practical education for our country boys, especially in the dairy farming industry; an education which will not only prepare them for farm life, but at the same time awaken within them great respect for their calling. The mechanic is taught manual training; the engineer surveying; the soldier military tactics; the doctor physics; the lawyer jurisprudence; the preacher theology; and the banker bookkeeping and banking—all these are educated and equipped for their special lines of endeavor, but the farmer boy is turned loose in the broad open field to work out his own salvation in the great workshop of nature, handicapped by the lack of knowledge of the soil and its capabilities. It is my opinion that the farming chemistry should be taught in the country school districts. The farm boy should know more about plant life and its relation to the soil, and the future dairymen should understand thoroughly all the questions bearing upon

the treatment of a cow, such as pasturage and the character of food necessary to enable her to produce, as well as the most improved methods of handling the milk and preparing it for the market.

A new interest should be revived in dairy industries; go where you will among the farming community and you will hear nothing but words of condemnation.

That most honorable of all industries, the one upon which our ancestors built the foundations of our government, and which for more than a hundred years has been its mainstay and support, is today without scarcely a friend in this whole land to speak a good word in its defense. Abuse after abuse has been heaped upon this greatest of all industries, by the very people who should defend it, so that today the sons and daughters of the farmers are fleeing from their country home to take their chances of gaining a less honorable livelihood in the workshops and crowded thoroughfares of our large cities. While farm values have shrunk and social structure of our country life are almost destroyed and the lands, which a generation ago, were the hope and pride of our ancestors, are now occupied by renters. Why should not the owner of the farm remain upon it and make the home a bright and happy one, and teach his children the dignity and advantage of farm life? The wealth of our great nation was acquired from the soil and from their products it has been maintained all the years of its existence. The country districts have furnished men to us like Lincoln, Logan, Yates, and Grant. These men came from the farm and had the brains to mould the nation's future and they placed this country in the front ranks of the nation of the world, and the country home has ever been the embodiment of comfort and happiness, its purity of character and love of virtue has always embellished the lives of its sons and daughters.

With the permission of the Chairman I would like to have Mr. Burke speak to you a little while on our idea of inspection. I thank you.

BY MR. BURKE, AURORA, ILLINOIS

Ladies and Gentlemen:

I have been requested to give you some idea of how the State Food Commissioners intend to inspect the creameries. In that request is embraced a wish to have me read some of the reports. I have a number here, but your Chairman has very kindly stated that I can't have all night, so will call your attention to some parts of them.

The State Food Commission is composed of the commissioner, two assistants, Mr. Patterson the dairy man, and a chemist and six inspectors. First of all I wish to call your attention to the fact that if they have ten inspectors to inspect milk depots in Chicago under the city administration, six inspectors is rather a small number for the great State of Illinois. We have found this to be so and are cramped to a great degree in the matter.

The State Food Law is one of the best laws upon the statute books, and the people of Illinois will take more interest in it and aid the commission before many years. Of course, it is not well for us to advocate more inspectors and we are not doing it, but are doing the best we can, and when you understand what the duties of the inspectors are you will be surprised we are doing as well as we are. It requires the inspection of all the creameries—and there are somewhere near 600 in the state; it requires the inspection of all the milk depots, not alone in Chicago but in every city in the state; all the dairies on farms and in the city; all the restaurants, hotels, and in fact everywhere where food is sold or given out to the public. This is a big affair, and to say that six inspectors are adequate to do all that work, is saying a great deal; but, as I said before, we are doing the best we can.

The State Food Law is specific in some of its provisions and some not specific. The law says what you shall do and what you shall not do, of course that is clear and defined. The section pertaining to the sanitary

conditions of creameries, requires the commissioner to present to the governor at least once a year, the sanitary conditions of all the creameries in the state. We found that was impossible. Of course in its nature, it is a police system, and some of the people feel as if one of Pinkerton's detectives were after them. But that is not the desire of the commission. We don't want the creamery men to think so for a minute. When we go to the creameries, what we want is to have a friendly chat concerning the condition of the creamery, and any suggestions we can recommend, or any suggestions they can recommend to us we would be glad to have them. After we have gone, accept our suggestions in a friendly way and fix up, as you will find it is to your interest to do so in the end.

We report the creamery as either good, fair, poor, very bad. I find that this is the method of inspection in other states, and we did that, but finally we have decided to make a more specific or more detailed report in regard to creameries. I might say right here that a great deal of complaint has been made by people that are interested in this work, asking me why we don't prosecute the unsanitary creameries and close them up. You know a good many of the creameries in this state, their buildings are old, farm buildings, that have been running along for a great many years, and while the creamery people on the whole have met in a friendly way after they have found out our idea, we desire to educate them to it. In this blessed day of prosperity they find it better to sell all the milk they get and not manufacture it. They say they are not getting much for their milk and can't fix up. We find the condition of the buildings on the inside so that they will have to have time to fix them up. It would not be fair to jump on them right away.

This law, as I said, compels the commissioner to present his report once a year. It does not say what is meant by "sanitary conditions," that is left to the judgment of the commissioner. It seems to me that they wisely left that question to be filled in by the inspectors. They have not adopted a standard; they could have adopted the opinion of one

man what should be considered the sanitary condition of a creamery, but they have judiciously left that open, but after a while there will be a standard established and then every creameryman will have to live up to it. We wish, therefore, to meet all the creamery people in a friendly way and friendly spirit, and not in the spirit of detective force or need of conviction. As Mr. Fatterson has told you, we have not made any prosecutions whatever, and we do not intend to do so at present. It is only fair to give the creameryman time to fix up his creamery, and to meet us in a friendly way, but after a while we will have to act in our official or police capacity, and in case the sanitary conditions are not up to standard, they will have to be prosecuted. Such a course is only fair to the creameryman who does keep his creamery clean.

It was given out some time ago that the creameries of the state were in a filthy condition. Now that was very unfortunate, but I have not time to go into this question. But I wish to say that the creameries of Illinois, particularly those in the northern part, are not in a filthy condition. Some of them are fair, some of them are poor, not up to what we call good sanitary condition, and a great many are in excellent condition. I will read this report I have here and you will get an idea from this of our method of inspection.

Report of Freeport Creamery: Ordinary square built brick dwelling house with a brick addition; outside in good condition; yard made of cinders, thoroughly packed and hard; yard scrupulously clean, evidence that it had been swept; building on the corner of the street in the center of the city; cement walks on two sides.

Receiving room lined with pine matched boards painted dark color; walk and ceiling clean and in good condition. Three full windows, clean and in good condition, give good light; wood floor, four feet below the surface of the ground, still damp but clean and in good condition, cement under wood and cinders under the cement.

Receiving vat five feet from the floor; wood work clean and in good

condition; tin old and partly worn off, but clean and in fairly good condition.

The receiving platform is a shelf made of pine matched boards in the corner of the room, wood floor quite old, but fairly clean; can old; tin worked off, but clean on the inside; valve clean; scales fair. Around the wall to a height of four feet is a wood wainscoting; wood work is in good condition, freshly painted red. On two sides of the room, directly over this wainscoting runs a narrow platform to walk on. This platform is thoroughly scrubbed and in excellent condition. Skim milk tank of galvanized iron; sets on floor near the separator. Milk is pumped from this tank to a washer in the side of the room and from there to the outside where it is received by the patrons. Everything about this skim milk tank is clean and in good condition. Churn room is in cellar of the dwelling house; the walls are plastered and freshly whitened, ceiling in excellent condition; wood floor on cinder foundation, clean and in good condition; square box churn in fairly good condition. Engine in good condition and in this room.

The cream room is a separator room built in the center of the churn room; the walls made of matched pine boards, ceiling matched pine boards all freshly painted and in excellent condition. Wood floor inclined enough to keep the water constantly running to the drain in the center of the floor. This room has one-half window which affords fair light; the wood floor is on cement foundation. The cream vat is 20 inches from the floor; wood work fair; tin fair; refrigerator in the end of this cream room, made of pine matched boards, wood floor; air space in wall; this in end of room is freshly painted, wood work dry and in excellent condition.

The boiler and engine are in a separate building in the rear of the dwelling house; the boiler is bricked up and in good condition; engine is in fairly good condition.

Water obtained from drilled well 76 feet deep; temperature 52 degrees.

Condition of milk fair, average test 4 per cent. Everything about

this creamery, notwithstanding the fact that it is partly located in the cellar, indicates care on the part of the man in charge to keep everything clean and in good condition. There is no evidence of any dampness or mouldiness on the wood work because it is kept painted; and it is evident that while there is no direct ventilation that the windows are kept open at the proper time and every care taken to keep the place ventilated and clean; and there is no smell.

We find that this inspection goes into detail more than any other state. This year we are not giving the name of the owner, but the name of the creamery. In this we report we head it Freeport creamery, and tell who owns it farther down. I have a great many other reports here some not as good as that.

Mr. Hostetter to the President:—Ask him to read the poorest report.

The President:—I think it best not to at present. I want to say that the creamery men in the Elgin district are perfectly willing to go heart and soul into this work of weeding out the poor, dirty, filthy creameries. I for one want to see them weeded out, and they should be, and we will stand back of the Food Commissioners if they go on in the way they have commenced. If the creameries are in bad condition, the creamerymen ought to know it. We want our buttermakers and creamerymen who are back of us to look out for this work. They are liable to fines as well as we are. I don't think it is a good thing to go to work at this present time and publish all the poor ones. If by next season they continue bad, we may want to take other steps. But the bulk of our creameries are in good condition, and we should let it go out to the world that the Illinois creameries are in good condition.

Mr. Burke:—Your President has the same opinion as the commissioners. We are going along in this work and doing it cautiously, giving the dairymen and creamerymen a chance to fix up. The reason I read this report to you tonight was to give you an idea of how we report the conditions of the creameries. We are not prepared at present to go into details on the construction and technical part of creameries. We have

found in some creameries the cream room is dark so that you can hardly see the vat, and he will have the windows closed and so dirty you can't see through them. It isn't built right, but while our jurisdiction may not go to the construction of the building, only the sanitary conditions, it does go into the construction of the building and the arrangement of the place where it prevents good sanitary conditions. Where we find vats only two inches from the floor and not thoroughly cleaned, we want it raised and cleaned. Where we find the floor so water congregates in the center, we don't want the cream vat put on the floor where the sewerage runs under them. Where the shaft and pulley and hangers are set directly over a creamery receiving vat, we would like to have that removed.

When construction and all these things have been gone over and everything said about it, I have come to this conclusion in my short inspection of creameries: The most prominent factor in the creamery is the man who does the cleaning. I find a difference in men. One man can go over his creamery and explain it all to me and the other man don't seem to have the knack of studying it at all. Some men have a natural knack of details, and a man that has none never can make a clean creameryman in my opinion. He has got to study details, and be methodical, and when things are once cleaned, keep them clean.

I have also found men of this sort: They will walk around and splash around and keep the water running all the time. I found in these places that that was the way they cleaned, let the water run all the time. I went and took up the cover to the drain and would find it dirty all around the sides, not corroded, but the dirt had not been removed in some time. He had an idea in thoroughly washing with water that was sufficient. He had not studied the idea of scrubbing the drain. He said it did not smell. In other creameries I have found such drains scrupulously clean.

In regard to wood floors, we don't commend wood floors, and if they have them they must keep them clean. Some men don't let the water run all the time, and yet their floors are clean. They use a mop and a brush, and when he gets through that floor is dry. Another man's place

was visited at five in the afternoon, when the work is done. His floor was on the pine order, built below the surface of the ground, windows were down, but floor was still wet. He was the kind that flushed water so hard; it is the peculiarity of the man. What the commission wants is to have them pay more attention to the sanitary part of the creamery. In going through some of these places we have said it seemed that any old thing in the line of sanitation would do. We want the co-operation of the creamerymen in this matter. Do not suppose to drive you to the wall, nothing of the kind. It is not a hard matter to make a standard in regard to cleanliness. That standard will be raised and we shall expect every creamery to come up to that standard.

Now in regard to the owner. I find this kind of an owner: I ask to see the vat and he will tell me he is going to have a new one in the spring. Tell him his wooden floor is old, worn out, and he tells me he is going to have a nice cement floor. He will go on and detail all these things to me, if I notice the deficiencies.

Another man meets me. "How's Burke?" "How did you find my place out there?" I will tell him what was needed to be done there and he will say, "Why, is that so?" I tell him his floor is pretty well rotted out and his answer will be, "Why, you don't say so. I must see Jim about that." I just tell you these little things to show you how we are met by some of the owners. I think when a man has studied details, he has learned a very good moral lesson of taking his faults and blame upon his own shoulders, and it has been my experience, when you find a man willing to take the blame upon himself, he is going to improve mighty fast. The one man is a good, happy-go-lucky kind of a fellow, who depends on Jim, and if he hasn't a good Jim, he will be in trouble all the time. What we want to bring to the attention of the owner is that he must study these conditions as well. Some of them never stop to think of the sanitary part of their creamery; but will wear a pencil out figuring on the money end of the business.

Now, gentlemen, I have talked longer than I intended to. This is a very great question, and I want to state again to you Mr. President, that

the commissioner wants your assistance. Here's another thing; in your resolution you say you want to get statistics. We have sent out to get statistics. We sent blanks by mail, asking for kind of creamery, amount of milk, butter, and where shipped to, number of patrons, and out of probably one hundred sent out we would get but 20 returned. I want to ask all who have received these blanks to fill them out and return them to us. One man said: "I can fill this blank out all but two things, the amount of milk and the butter I got last year, that would take me a week to figure that up." That is the condition of affairs that we find. There seems to be no complete books. If I wanted an accurate account of butter and milk I would have to leave it with him and he promised to send it by next mail; but they never do. We are willing and anxious to get all those statistics and will do so, but we must have the help of the dairymen. Some of the men don't want it known how much milk and butter they get, and I wish to tell them that it will never be known. It is not going to be published as individuals, and the amount from any one creamery, but the totals of butter and milk and where shipped is what we are after, the same as your resolution asked for tonight. I thank you.

By the President:—We had hoped to have ex-Governor Hoard with us this evening, but on account of being called to Washington to help Mr. Knight, it is impossible for him to be here. He was one of the shining lights on the program, and I am sorry to pass it by. We will finish our program tonight with a song by Mr. Bagley.

Song by Mr. Bagley.

By the President:—Don't forget to go to Machinery Hall tomorrow. We have an invitation from the Stover Manufacturing Company, between 10 and 11 tomorrow. We also have two boxes of last year's report. Take one home with you and study it and it will help you.

We will now listen to the butter scores.

BUTTER SCORES READ BY MR. CAVEN, SECRETARY.

These scores show the extreme, some are high and some are low. Some are low on account of very poor flavor. This is particularly true

on the dairy entries. The scores are low on them. The reason is that nearly all the persons making dairy butter send only one or two pounds, or just a small amount. After it has been transported some distance and it stands in the express office for a little while, and then stands around a day or two, there is such a small amount of butter and so much surface exposed that it does not hold its flavor very long. If the packages were larger that would keep their flavor better.

I will read the creamery scores first.

BUTTER AND CHEESE SCORES.

Name.	Address.	Score.
A. M. Anderson.....	Polo, Ills.	92
S. M. Jensen	Orangeville, Ills.	92
T. H. Straw	Shannon, Ills.	93½
J. W. Reynolds	Nicolett, Minn.	85½
N. N. Engebretsen	Mansfield, Minn.	92
Chas. H. Thornton	Argyle, Ills.	92
L. E. Camp	Blanchardville, Wis.	91
Wm. Frayer	Winslow, Ills.	86
Forest City Co.	Rockford, Ills.	94
F. R. Wolf	Dakota, Ills.	98
Geo. Bloyer	Harper, Ills.	91½
A. E. Thompson	Poplar Grove, Ills.	93
C. L. Bartholomew	Cedarville, Ills.	88½
Wm. Ohl	Stevens, Ills.	91
H. W. DeLano	Sugar Grove, Ills.	90
W. H. Maurer	Rock Grove, Ills.	88½
Gustave Kruempel	Frankfort Station, Ills.	92½
H. Eastman	Shabbona, Ills.	93
S. W. Peak	Winchester, Ills.	87
H. P. Olsen	Ashby, Minn.	95
Anton Bueler	Bewes, Ills.	90
O. C. Benton	Kaneville, Ills.	95½
W. J. Nagel	Searville, Ia.	91
John E. Linn	Gaylord, Minn.	93
Orho Bloyer	Elkhorn Grove, Ill.	89

Frank Beunner	Nouhrop, Minn.	93
Geo. Kendall	Mt. Carroll, Ills.	93½
Chas. V. Speed	Baileyville, Ills.	91½
C. D. Coffin	Neoga, Ills.	84½
F. J. Muller	Miledgeville, Ills.	92½
Geo. A. Cutler	Herbert, Ill.	95½
Grant Mallory	Freeport, Ills.	93
W. S. Hollister	Pana, Ills.	89½
C. C. Likens	Walworth, Wis.	91
W. J. Hyne	Evansville, Wis.	93
L. H. Knigge	McHenry, Ills.	92
Oscar W. Reed	Lebanon, O.	91½
John Bogd	Morrison, Ills.	92
Berger Peterson	Round Grove, Ills.	92
Peter Nelson	Creston, Ills.	95½
P. J. Herkenheim	Malta, Ills.	95½
Frank Johnson	Rockford, Ills.	91
J. S. Waspi	Spring Grove, Ills.	91½
R. A. Laird	Yorkville, Ills.	93
F. E. Rawson	Alden, Ills.	94
Frank M. Farland	Big Rock, Ills.	96
H. R. Duell	Franko, Ills.	90½
Mat Ludwig	Lockport, Ills.	95
C. N. Woodard	Big Rock, Ills.	89
Robert Baxter	Palatine, Ills.	92
P. H. Kieffer	Strawberry Point, Ia.	97½
G. Herman	Manhattan, Ills.	91½
David Van Patten	Plainfield, Ills.	91
I. E. Schock	Damascus, Ills.	91½
F. H. Brinzer	Winneshiek, Ills.	91½
C. H. Seidel	Orangeville, Ills.	88½
G. L. Phittaplace	Hinckley, Ills.	92
Harry Nolan	Hinckley, Ills.	93½
Chas. M. Dyer	Little Rock, Ills.	97
Lewis E. Johnson	Byron, Ills.	94
A. B. Campbell	Oregon, Ills.	96
W. L. McNewton	Steward, Ills.	92
K. B. Carpenter	Thomson	92½

John Carlson	Aurora, Ills.	89
Geo. W. Hoppenstadt	Eagle Lake, Ills.	96
Peter Damelson	McCennell	92
M. J. Mansager	Ellsworth, Ia.	86½
Walter Kerns	Warren, Ills.	93
W. E. Mann	Pecatonica	93½
Chris. Becker	Elgin	91½

DAIRY CLASS.

F. S. DuBois	Rockford, Ills.	93
Samuel Gray	Hartins, Ills.	85
D. J. DeHoogh	Boyden, Ia.	90
Thos. Stoneborg	Savanna, Ills.	91
Irvin Nowlan	Toulon, Ills.	86
Mrs. Chas. A. Beebe	Cladwick, Ills.	90½
Eli I. Crosior	Attica, Ills.	89
Davis Bros.	Fairfield, Ills.	83
Mrs. R. E. Cotherman	Rock City, Ill.	90
Nellie Gray	Hastings, Ill.	85
Mrs. Eva H. Springer	Springfield, Ill.	90
Mrs. E. Wolf	Rock City, Ills.	89
Miss Ada M. Blakeway	Ridott, Ills.	87
Miss Lizzie Sullivan	Providence, Ills.	93

CHEESE.

C. A. Poplett	Dunlap, Ills.	78
A. M. Anderson	Polo, Ills.	86
J. R. Biddulph	Providence, Ills.	92

It is always customary to announce what salt and color is used in the first and second scores, and in both Worcester salt was used and Wells, Richardson & Co.'s color

We cannot tell exactly who takes the Elgin Board of Trade medal. I don't know whether Mr. Wolf is employed by a member of the Board of Trade or not? His score is 98.

A.—No, he is not a member.

Then the second highest is Mr Keiffer, 97; but he is out of the state and therefore barred, being from Iowa.

The next highest is Charles W. Dyre of Hinckley, whose score is 97. He is employed by a member of the Elgin Board of Trade and is the third in the list of scores.

By the President:—Then the Elgin Board of Trade medal goes to Mr. Dyre of Hinckley, being the third highest score on the list.

Presents medal.

By the President:—Don't forget the program tomorrow. Would like to see you all here tomorrow. The silo matter will be taken up.

Thursday, January 9th, 1902, 1:30 p. m.

Convention called to order by the President.

The first paper this afternoon will be "The Private Dairy," by Irvin Nowlan.

PRIVATE DAIRYING

IRVIN NOWLAN, OF TOULON, ILLINOIS.

Gentlemen:—This is a side of the dairy industry that has received but little attention heretofore in a general manner.

While, perhaps, there is not so much capital invested in the business at any one central point, the private dairyman is practically a whole world in himself.

He must be breeder, raiser, feeder, milker, buttermaker and oftentimes his own salesman, and to a certain extent a consumer of his own product.

The writer's experience as a private dairyman dates back about 25 years; ever since that time I came into this world I have been interested in the cow. Of course the first few years of my existence it mattered but little what sort of a cow it was, what her breeding, what her shape, nor any of these important points considered by the up-to-date dairyman. I was at that time a great deal like so many of would-be dairy farmers today—anything just so it gave milk.

The man running a private dairy must breed his own stock and raise the heifer calves from his best cows. I have never found it advisable to buy cows.

Perhaps practical experience will bear me out in the assertion that many failures of the dairy business is due to negligence on the part of the dairyman in not testing his cows.

It has been my practice to weigh each cow's milk night and morning every day in the year, and one week in each month I make a composite test of each cow's milk. I find it best to divide the cows into squads, and test four or five, as the case may be, at a time and it lessens the work greatly. If one made a test of all his cows at a time, it would be more than one man could attend to.

At the end of a cow's milking period—say ten or eleven months—I sum up the total amount of milk given and make an average of the tests of her milk. I can get a very accurate record of the amount of butter fat in this manner.

I do not weigh my feed only at such times that there is a change made in the ration. One can get the approximate amount of food after weighing it once.

There are several ways in which a man can increase his profits, but the principal one I consider is that the dairyman become acquainted with his cows individually. I mean by this that he must know not only his cows by their color, or contour, but he should know the kind of work she is doing, the amount of milk, what it tests; he must know whether she is paying a profit over and above the cost and labor or not. He must also know each cow's likes and dislikes. No two men like the

same food, and I believe cows have just as many peculiarities in this respect as do men.

The quality of a cow is determined by inheritance and the dairyman must apply his skill in developing the quantity and preserving the quality. By this I mean that a cow is born with the power to produce four or five per cent milk, and no food or system of feeding can materially increase that per cent of fat; so there is a necessity of the dairyman learning at the outset that nothing but a well-balanced food ration and pains-taking handling under favorable conditions will enable any dairy cow to do her best. I believe every cow will do her best at all times, no matter what her surroundings, care or feed may be; but I also believe the better bred, better cared for, the better fed the cow will do better. The moral to this might be—use brains in feeding.

To breed the best cow for the average dairyman has been a study with me for several years. I have tried nearly all the breeds as well as crosses, but I find the best grade cow to be produced by crossing a Short-horn cow with a full-blooded Holstein sire.

The offspring has a good quality of milk, averaging about four per cent fat, also a large quantity of milk. They keep in good flesh and are easily disposed of should an accident occur, or the cow fail to make a profit as a dairy animal.

I believe that a young man just starting out in life with a very limited amount of capital, can buy a few cows from the general farmers, either securing a full-blooded sire or borrow the use of one, and in a few years build up a valuable herd by careful selection of the heifer calves from the best cows.

The first few months of a calf's life determines largely the future value of the cow. At this critical stage by judicious feeding we can prevent the tendency to the laying on of fat and ruining the milking qualities, although I have seen beefy calves that turned out excellent milkers, but this was the exception and not the rule.

It is our rule to remove the calf from its mother at about two days after birth. This will depend somewhat upon the mother, of course.

When it is taken away, feed for three or four days with whole milk, then drop out some and add skim milk. In a few days drop out some more whole milk and add more skim milk, and by the time the calf is twelve to fifteen days old, you are feeding about eight or nine pounds skim milk and one pound whole milk.

At the present price of oil meal I figure that one pound of four per cent milk is cheaper than the meal, makes a good growing feed and is handier than meal. I put before the calf plenty of clover or millet hay and some whole oats. The calf will grow rapidly fed in this manner and will not lay on fat.

I much prefer to have my heifer calf at two years and two months rather than before, and rather they would come fresh in the spring with first calf.

I keep my heifers on blue grass pasture before calving and usually feed some little grain, like whole oats and gluten meal. After the first calf if we want winter cows it isn't much trouble to breed them that way, but by having the heifer come fresh in the spring, I get a better udder development.

You will find men feeding their cows corn meal and hay, and for a time they are wonderfully taken with the dairy business, but some day they find that their cows have fallen off in their milk, some have caked udder, some ropey milk and others seem to have no appetite. Then the owner begins to curse the business when it is all due to his ignorance in feeding such a highly concentrated ration. He is feeding practically no protein at all. It is the certain result of an unbalanced ration. The animal's system is full of fever. The Babcock test will show that the butter fat is almost burnt out of the milk.

It is a common saying that a cow is a machine and returns a profit only after she has appropriated enough food for her own support. I can not say that is my opinion of a dairy cow. A good dairy cow will return to you a certain proportion of milk if you feed a milk ration. We must combine the foods in a proper manner to contain the standard amount of

protein, carbohydrates and fat. Then feed all the cow will consume, but be sure she eats it up clean and is greedy for the next meal.

At present we are using the following ration for our cows with excellent results:

Corn meal, gluten meal, cut oat straw—equal parts by weight—about 5 pounds clover hay and 5 pounds cut straw mixed. And for roughage we use corn straw and oat straw.

We have cut the dry corn fodder up same as for silage and run it into a tank. When the tank is full throw several pails of water in the cut fodder and let it stand for twelve hours. This makes a good feed and none is wasted.

Another thing that should receive the attention of the private dairyman is his water supply. Much has been said concerning this subject and I have no time to enlarge upon it only to say the water supply both for washing the utensils and for the cows cannot be too good.

We must have the cows lined up along the gutter and provided with plenty of bedding so they can be kept perfectly clean. Then no man ought to be allowed in the barns of whom the cows are afraid. A man who causes the cows to squirm and twist should be kicked off the farm and in a hurry too.

Often milk is left standing in the stables, and as milk absorbs odors readily, butter made from the cream of such milk will be off flavor, and oftentimes for no apparent reason to the farmer. But the cause of this is this, and must be eradicated if a pure, long-keeping article is to be made.

In several countries we find the practice of milking cows out in the pasture, and from those countries we find butter scoring the highest in flavor. I have often been tempted to try that plan along with stabling, but have never had the opportunity yet to compare the results. I believe even with the best of sanitary conditions, a better product can be made in open air, for it has more purity, less chance for contamination, but owing to climatic conditions here field work is out of the question either in summer or winter.

In the operation of a private dairy, several means of disposing of the product may present themselves. I can not say anything from the standpoint of one who sells milk, nor as a cheesemaker, although we have made some little cheese. Our product is mostly butter and cream. The cream that goes to market is pastuerized, sealed in pint or half pint jars. The cream for buttermaking is cooled down immediately after separation to about 45 degrees or 50 degrees. It is kept at this point until a few hours before churning, when the temperature is raised to churning. At all times I use the thermometer and have the cream under absolute control. I have had a little experience with commercial starters which I do not care to relate.

I make my own starter in this manner: A cow that shows appearance of great constitution is placed in a box stall that has previously been thoroughly cleaned and whitewashed. After the udder has been well cleansed, the first few streams of milk are rejected from each teat. The milk flows into a sterilized vessel and is carried at once to the separator where the cream is extracted. The skim milk is allowed to run into another sterilized vessel and this is set away and allowed to sour. After the skim milk has soured, it is used as a starter. I much prefer this to buttermilk as a starter.

In churning, the buttermilk is drawn off when the butter is about the size of wheat grains, and is then washed until the water runs off clear. We add salt to our butter in quantities to suit the customers. If they want it very salty, they shall have it, if they do not like salt, it is our business not to put any in their butter. Some also like butter quite yellow, while some do not care for so much color.

In regard to salt and color, I believe in catering to the tastes of my customers. I will make whatever color my customers like best. If some want it black they shall have it. Pleasing your customers with the product you have for sale will make larger sales and increase patronage, and this is what we are all after.

Whether you are all engaged in dairy business or not you must all admit that all lines of business must have a firm foundation. You must not

expect to make a success of any business by jumping into it head-over-heels. Careful study day and night, since competition is so fierce, is the only chance for success. It is the little things you must attend to and you can make dairying pay as well as any other line of business if you will.

DISCUSSION.

Q:—I would like to ask the gentleman what per cent milk he found the cheapest to produce?

A:—We have one cow at No. 5 barn that lacks \$2.20 of paying for her keep in skim milk, and she has to her credit besides that 267 pounds of butter and the average this cow has had was 3.2 per cent. But it cost a little more to keep that cow than it did one that produced 284 pounds of butter and whose milk test was 4 per cent. When the profit of the cow is taken into consideration the 3 per cent and 3.2 per cent give the biggest profit for feed consumed. The profit of that one cow over and above the feed was something like \$56 or \$57. Take milk anywhere between 3.5 and 3.6 would be a cheaper producer than when a little higher. When you get it higher you sacrifice the quantity of milk. I may have the price of my skim milk a little too high, and I would not like to come out and say what value to put on skim milk; I don't believe I could get along without it at all. In feeding hogs I don't know as I would be very far off if I would say it was worth nearly 50 cents a hundred, the way I feed in connection with ground grain. Where we give the cows credit for skim milk, we allow 33 1-3 per cent. That is high I will admit, but it is worth more than that to us.

Q:—Of course you take our country creameries and in the summer the farmers' net returns for the cream and all runs down as low as 45 cents along in July and August. I have watched and find that about 20 cents a hundred, from 15 to 20 cents was the average price of skim milk. I think you have your cows figured too high. Do you find your profita-

ble producers in your large carcass cows, or in your medium sized carcass cows.

A:—I would say that the cheapest producers we have ever had since we got any figures at all have been cows that would weigh between 1000 and 1200. The highest cost we ever had was one that run us in debt some \$8 or \$10 and weighed 1400 pounds. I think about 1200 pounds, somewhere in there.

Prof. Fraser:—How much does it costs to keep your cows on an average and the value of the productions?

A:—The average cost for 1901 was about \$36 to \$37, along in there. Not counting cream along sold, if the whole amount was made in butter we would have gotten 25 cents a pound for butter.

Q:—How much did you get per cow?

A:—About \$36.00 cost. They vary of course. They gave us a profit, the lowest was \$38 on a cow last year, and we had this one cow I spoke of a little bit ago, she was an exception, not yet 3 years old, and she gave a clear profit of a little over \$50.00.

A member:—Do you include the calves in your figures?

A:—No sir, I don't. I can't do that.

Q:—You raise most of your calves?

A:—Yes sir. Keep some of the male calves for crosses. We haven't got room for them all.

President:—What breed are your cattle?

A:—Several breeds. Some thorough bred Jerseys. We have about fourteen thoroughbred Holsteins. Some half-bleed Holsteins and half Jerseys, and some part blooded Durhams and part blooded Holsteins.

Q:—Any second cross Holsteins and Jerseys:

A:—I was in hopes I wasn't going to be asked that question. We got one cross and the first cross was an excellent one. We will give you all the second crosses you want. We got badly left on that. The first cross, we never had anything better. When we get any farther than that we didn't get anything.

Q:—Then the first cross is a very desirable one either one way or the other?

A:—Well, I don't know whether I could say it would be or not. You take a Holstein cow and cross it with a Jersey and I am a little afraid of the result. The largeness of the animal is a little on the wrong side.

Mr. Cobb:—It is as good one way as the other.

Q:—With regard to that profitable cow of yours that gave that 3.2 per cent milk, I don't know, I can't quite agree with you. There is one thing, she was giving a large flow of milk, low per cent of cream, and you figured your skim milk way out of sight, and that is where that cow's profit comes in. You figure that profit at 33 1-3 per cent. That is the place where we will get a wrong impression if we are not careful. We can't dispose of skim milk and get that per cent.

A:—As far as that figuring is concerned I said when I started in I was going to talk egotistically and talk only of myself. I will admit from creameries it will not be worth more than 15 to 20 cents, but I do believe a man can get more than that out of it if he will.

Mr. Cobb:—I will have to take Nowlan's part on this skim milk question. They say to me, "How do you get your silage so cheap." They ask him here this same question. It is almost indispensable at any price where you raise your calves. We can't do without it. It is one of the best things I have ever found in connection with developing the dairy cow for the future, and consequently I would not put a price on my skim milk unless it was equal to what I could make out of it. When a certain company wanted to buy my skim milk, I told them I had a price and if they wanted to pay it I would sell it, and they asked what it was and I told them 50 cents a hundred, and consequently the deal was stopped right there. I would not take a cent less than that. If a man is raising pigs and calves he needs all he can get. There is too much of this western cow combine for the good of the average farmer. If they would raise their own stock they would do much better. There is too much western cow coming into the Elgin district. A man buys them and takes them home and they haven't been milked for three days, and the first thing

he knows he is banged to one side of the barn and then you are willing to sell her at any price. When they come that on me, I took to raising my own cows.

Mr. Nowlan:—Did you ever feed any skim milk to your cows, and what was the result?

A:—No, only once. I thought I would see what one cow would do by giving her a little extra. I got a larger flow of milk by decreasing the per cent of fat. The cow was fed in the barn; made a milk slop out of oil meal and bran and thin gruel. After a few days she took to drinking this readily in place of water, but she went down on her quality of milk and part on the flow. I thought I was only robbing the calves and pigs, so I stopped.

By the President:—The price he puts on skim milk is what he can afford to pay for it when feeding it to full blooded stock. He does not intend to convey the idea that you should feed it to pigs and ordinary cattle. Try to raise them on 35 and 50 cent skim milk.

Mr. Nowlan:—With one exception here. I did not mention full blooded cows. When it comes to raising your own heifer calves for your own use, you can't do without this skim milk at any price. Am not speaking of full blooded cows at all; am speaking of reasonable grade that you carry. You can't feed them anything that will do them more good and make a cheaper feed than skim milk. You can raise them without skim milk, of course, but you haven't got the calves at the end of it. We feed it to hogs and get as much profit for them as the calves. You can get them on the market quicker, and make nicer looking animals and sell them at a high price.

Q:—How many cows do you have?

A:—Thirty-eight cows and heifers.

Q:—Consequently the hogs receive milk from that number of cows?

A:—Partly more or partly less.

Q:—What average do you get a day?

A:—Average 640 pounds of milk a day.

Q:—You say you feed this skim milk to your hogs. Ain't you way out on hogs. If they pay in anything like this gentleman talks? If you had twenty \$50 ones that is \$1000; you didn't sell any \$1000 worth of hogs?

A:—The hogs and calves will amount to more than that.

Q:—Returning back to ordinary farmers' feeding this skim milk to the average grade calf. From what the creamery is paying for skim milk it more than cuts the price in two of what my estimate was and the price of my cows and the price of the average cow is more than cut in two. What I wanted to get at was what they are actually worth on the market. You can figure feeding a calf some 15 to 18 pounds of skim milk a day and feed nine months and you are getting her pretty near to where she is a cow, and when that cow comes up to three she has improved and when four is a \$55.00 cow in the Elgin district.

By the President:—My mind travels back to when Hoard made his experiment on hogs to see what skim milk was actually worth. He made his experiment and did it intelligently. If I remember rightly 17 cents a hundred he recognized feeding skim milk to pigs. It ranged from 15 to 17 cents. This 50 cents is so large that it staggers me.

Mr. Nowlan: You don't understand me. I place a 50 cent value not on skim milk for hogs alone, but on calves as well.

Q:—During weaning season is it worth more than 15 cents?

A:—Yes sir worth more than 15 cents when hogs are on the farm. It is worth at least 20 cents then.

Mr. Crozier:—It seems to me the skim milk question would depend on the feed too. At the time of high prices for feed it would make considerable difference than when corn was worth 30 cents. It might be 17 cents with Hoard's experiment if corn was on a 30 cent basis or 35 cent basis, than when now with corn at 60 cents, and other stuff in proportion.

Mr. Nowlan:—When feeding skim milk to hogs just for the sake of selling hogs to the market; that isn't the only object. We have some that we have had on the farm for three or four years and keep them to raise pigs, and they are better. Another thing, take the sows you are going to

keep and put them on this ration, it is just the same, and also with the best heifer calves, it is the value they will bring in the future.

Mr. Cobb:—One thing more on this feeding skim milk to pigs. One spring the pig's drop was almost entirely a failure. I had eight and raised 72. But my neighbors had been feeding feed that fevered the hogs up and consequently when they fell they had no milk for their young and they starved. If they had had skim milk they would have raised as good pigs as I did. You can make nicer pigs by feeding your hogs on slop, feed skim milk, shorts, dried brewer's grain, corn and oats ground together. At the present price it is expensive, but the price of hogs have gone from \$3.00 to \$6.00. We can feed just as well now as we did in 1893, 1894 or 1895.

A member:—This skim milk question and the value of it is a good deal like the mercury in the thermometer. The weather conditions and so many conditions have to be taken into consideration. One man may make a profit on 50 cent skim milk and another can only do it on 5, 8 and 10 cent. One man can make more profit on feeding 75 cent corn than another can feeding 25 cent corn. It depends on the individual. For myself, I would rather have 20 quarts of skim milk than ten quarts of oats.

A Member:—Does it occur to you that you are feeding too much protein to your animals. It is the protein question that these gentlemen have discussed and I don't hardly think more than one or two have thought of the protein. In raising young, we need the protein, the elements that will form bone, muscle and blood. The carbohydrates, we can supplement them at a very small cost, and who will deny that milk from the cow is the most nutritious feed they can get. In the mature animal, it is just as essential for them to have protein feed to supply their young within them through the blood whereby they can get their growth just as the other animals get it that are not carrying young. The carbohydrates, as I said the other day, are very easily raised, but it is the protein feeds that are the most expensive.

Q:—I have been waiting to hear some one tell about the condition of the skim milk when it comes back from the creameries, and under some of the conditions I would not feed that milk to a thoroughbred calf if you would give me ten dollars; it all depends on the quality of the milk when it comes back.

A:—If you take your milk in the morning you feed your calves fresh skim milk.

Q.—What do you do with the balance?

A:—We feed just twice a day. If any balance over and above what we feed the calves, the rest of it goes to the pigs right away.

Q:—Why shouldn't the condition of skim milk kept twelve hours and warmed up again and fed to the calves be just as good as when it comes from the cow?

A:—I would insist on its being pastuerized. You won't get as good a production after getting it strained, after being separated; better pastuerize it.

Q:—When pastuerized; isn't it equally good then?

A:—I should judge it would be.

Q:—Most milk is taken in the morning and brought back. That milk is kept 36 hours in order to feed to calves. In hot weather you have got to keep milk cooler than most men do to feed it to calves?

A:—We are speaking of pastuerized skim milk.

Q:—I understand it comes from the creamery pastuerized.

A:—If you trace the matter back you will find it will come back to the dairyman. The large trouble probably is that it don't arrive at the creamery in proper condition.

Q:—What is the point in making it keep? What's the reason? What does it do?

A:—It would still leave germs that produce other bacteria. They would not be killed at 155.

Q:—That there are some bacteria of a different sort that is left in after it is pastuerized?

A:—Yes sir, certainly.

Q:—If that worked it would deteriorate the milk in time?

A:—Yes sir.

By the President:—That is a very simple matter to remedy. I would rather have your milk come to my factory that was simply areated. Get the pure air into your milk. It is a good deal better to have it cooled at the same time. Set it in a tub and stir it up. As you milk one can and bring it in and then milk another can and bring that in, why stir the first one again. It will give you your skim milk in proper shape. You can trace it back to the farm every time.

Q:—It seems to me that when that milk is taken in the summer time to the factory and the sun shines on those cans and glazes the milk over that the skim milk from that would not be worth very much for calf feeding.

By the President:—The heat in the summer and the long distance, that seems to me a simple matter to get over. I think if the farmers on a route where the hauling is done would get together and talk this over rationally, I think you could remedy conditions.

Q:—When you speak of areating milk, you touch a vital part?

A:—I am satisfied of that.

Q:—The way I made my cooler was to take an ordinary pail with little holes around the edges inside of the pail. The bottom of the pail is suspended above the milk can 8 or 10 inches. The milk is strained and poured in above and it runs down into the can in very small streams, all the time the air is going around these little holes and it took out the animal heat. When you take out the animal heat that milk will keep without cooling from 12 to 24 hours longer than if you simply take and strain your milk right into the can. By areating it in this simple way, which any one can do and it won't cost over 35 or 40 cents, and your milk will be brought to the creamery in much better condition and it will keep from 12 to 24 hours longer than milk not areated.

By the President:—I will name the Committee for which you gave me proper authority in your resolution, naming a man for each breed of cattle to organize themselves into an association and meet with us next year.

Holstein—M. S. Campbell, Genoa.

Jersey—W. R. Kimzey, Tamaroa.

Guernsey—W. C. Taft, Rockford.

Ayrshire—John Stewart, Elburn.

Brown Swiss—E. M. Barton, Hinsdale.

Durhams—Although that is a class of cattle in which grades are mostly used, I have not been able to locate a full-blood Durham breeder. Will name that later.

Is the Committee on Nominations ready to report?

Mr. H. H. Hopkins:—Your Committee on Nominations respectfully submit the following report:

Whereas, The present officers of this Association have proved themselves to be the right men in the right place, we think it will be for the best interest of the members of the Association that they be retained in their present offices and we submit the names of

Joseph Newman, George H. Gurler, Fred A. Carr, R. R. Murphy, John Stewart, J. R. Biddulph, Irwin Nowlan for Directors.

Joseph Newman for President.

J. R. Biddulph for Vice President.

Respectfully submitted,

H. H. HOPKINS,

Chairman of Committee.

By the President:—This is an office I think should be passed around, but it rests in your hands, gentlemen.

Mr. M. S. Campbell:—I move the adoption of the resolution of the nominating committee.

Mr. W. S. Moore:—I second the motion.

By the President:—It is moved and seconded we accept the report of the committee on nominations. All in favor say "I." Contrary.

Carried unanimously.

Q:—How will you proceed with the election.

Mr. Nowlan:—It has been customary for the Secretary to cast the vote.

It is moved and seconded that the Secretary cast the vote of the convention for the names mentioned in the report. All in favor say "I."

Contrary, none. Carried unanimously.

By the President:—There is due to you a vote of thanks for continuing the old officers.

SILOS AND ENSILAGE

E. N. COBB, MONMOUTH, ILLINOIS.

Mr. President and Members of the Association:—I am very glad to have learned since I have been here and observed as well, that this has been a splendid meeting. I have been told it is one of the best meetings held in several years. I am especially glad, because I have not been present the past two years. I probably have missed a great deal.

While I am enjoying myself at this meeting, seeing old friends and making new ones, I, perhaps, am as care-free of what is going on at home concerning business affairs as any person that has attended this meeting. I am positive to a certainty that there are no gates left open, no door left open where they should not be; that the 80 head of Jerseys we have, that every one of them has been cared for properly; I know the hired men have not forgotten to note the temperature of the barn in the morning and at noon and at night; I know they have not forgotten to look to the ventilation, and that the water supply in our 100 barrel system that is fed from a deep well and windmill, that that temperature has been regulated by a steam pipe to fit the climatic conditions; I am positive that every cow has been fed according to her capacity to yield

profit; I know that every ounce of milk has been recorded on a milk sheet. When I get home I don't have to ask questions; each individual cow's record is there and I can at a glance see what they have done. The first thing I do when I go in the barn will be to go to the milk record of the Lady of Athens and see what she has been doing. Another thing I am sure of, is that the hired man has not been making love to the hired girl while I have been gone, because I have no hired man and no hired girl and have no use for them. With our large herd we have just our own family. The Cedar Hill Dairy and Agricultural College is self-supporting. The faculty and superintendent are as follows: Nathan H. Cobb, farm machinery. Virgil C. Cobb, swine and poultry. Curtis A. Cobb, herd and buildings. Ina A. and Emma A. Cobb, creameries. Euclid M., Jr., and Grace L. Cobb, pet stock, and Euclid N. Cobb, Sr., (better known as Buff Jersey), general superintendent. I will tell you how many children we have, in order that you can catch the number. We have six girls and four boys. I have a standard I am working to. My standard is a cow to the acre and a child to ten acres. I am pretty well up to standard on cows. We got 80 Jerseys and only lack nine children of being up to standard on land, and we hope to get them.

I am to talk to you a little on ensilage. I brought the matter of the family up, for without ensilage I could not hold my family at home. Ensilage makes intensive farming and extensive employment. I have been using ensilage for fifteen years, and if I had to go without ensilage I would stop dairying at once. The two are inseparable, as far as I am concerned. Last year Mr. Gurler told me he was about talked out on ensilage. I never was so far gone but what I could always say a little more about ensilage. I have seen ensilage grown, put up and fed in Dakota, Nebraska, Colorado, Kansas, Iowa, Missouri, Texas, Tennessee, Illinois and Wisconsin. I have not merely passed by where this work was being done, but been actually employed in directing the work; built silos, filled them and fed the ensilage.

To illustrate the value of ensilage on the dairy farm in Illinois, down in Warren county, I will give you the figures and facts of our ensilage

crop put up in 1900 and fed in 1900-1901. We planted 55 acres of ensilage age crop in spring of 1900. On the 28th day of July of the same year we were obliged, on account of the drought, to begin feeding this ensilage crop. We fed 40 cows and about 35 mixed young things from the 20th day of July until the last day of September, when we cut our crop and put what was left in the silos. We filled two silos, one of 150 tons and one of 250 tons, and continued feeding. The first day the ensilage was dropped in the silos, we took it out and fed it. We fed during the winter an average of 85 head of cattle, and fed more or less to our hogs and chickens. We fed all that every animal would clean up readily and cleanly. We fed up to the last of April and then took out the young things and put in the pasture with the hogs. The cows we continued on the ensilage feed up to the 18th day of June; then the grass got so good in the pasture we turned them out ten hours for a few days, to get them weaned from the ensilage. We were receiving in the creamery something like 725 pounds of milk and after having them out for about ten days it shrunk to 645 pounds of milk and the pasture at its flush. We at once commenced feeding ensilage again and continued during the summer months, with the result I will give you.

I have a record from the creamery from July 1st to September 18th. If you dairymen will go back to July, August and September, you will remember it was a most severe time for milk, severer than we have had for some years; the dairy papers show shrinkage from 50 to 75 per cent of the milk yield throughout the country. This record shows that on July 1st we got 614 pounds of milk and 675, 641, 636 and on toward last of July 675, 655. On September 1st, 610, 630, 619, 612, 635, 606 and so on up to the last day of September, 675 that day. That's from an average of 30 cows and heifers. That illustrates the value of ensilage. Our pasture was as bare as the road. The 55 acres I mentioned fed our cows to the first Monday in September. We fed them all through the season up to the first Monday in September; I should have said that first.

I got a circular from a silo manufacturer in Michigan a little while ago, stating what a man had accomplished in ensilage and wanting to get

a letter from him; I wrote and asked him if the statement in the circular of the company was correct. He wrote me quite a detailed statement. His statement was that he put 178 steers on ensilage the first day of September, weighing them at the time and weighing every feed of ensilage they received up to October 1st. The cattle had no feed to speak of beside ensilage, and they weighed 52 pounds more on October first than they did when they began, and used 1,300 pounds of ensilage. That is a pretty good illustration of what ensilage will do for cattle feeders.

I met a man awhile ago who was telling he built a silo 13 years ago and had filled it every since and fed it exclusively to steers. He said he could not get along without the ensilage. Another point he made was that a silo was not necessarily an expensive building. A mere framework of 2x10 studding and lined with just 1 inch flooring. He said that floor had been filled 13 times and has not decayed, but was in perfectly good condition, with the exception of the two bottom boards, and they had been touched with dry rot.

Briefly, I will give you the style of silo to build and the manner of building. I advocate the round silo. To build a round silo of 2x4 stuff, get your lumber and have it dry and free from loose knots; see that edges are straight, so that when walls are up edges will touch evenly the entire height of silo. In a circle of 14 feet or more it is not necessary to bevel the lumber to fit the circle; it is better not to do so, because the lumber will dry out more quickly when ensilage is removed, which tends to prolong the life of the silo by checking decay. In case beveling is done, don't bevel the entire stick's width; only take off bevel from center of timber; this will leave other half slightly separated from its mate, giving air a chance to dry the wood. To the novice an empty stave silo, with its staves showing daylight shining through cracks from top to bottom is far from air-tight building, but one has only to tighten up hoops snug and go ahead and fill. A stave silo is like a leaky barrel; it only wants hoops driven tight to make it as tight as ever. While the silo has not hot water, it has something just as effective—

ensilage, which is 80 per cent water or sap, and heats up to 180 degrees; every crack is shut tight. To build a stave silo, first decide on the size of the silo you want to build, then get the material easiest to get. Any lumber that will not warp is suitable; have it as dry as possible. If your silo is to be above 20 feet in height, buy lumber of two lengths; for a 40 foot building get 14 and 10 ft. stuff; or in 26 ft. silo, 12 and 14 foot lengths. Get your stuff on the ground some hot dry days, laying it closely like a floor. Then take an old broom or a whitewash brush and a bucket of coal tar and paint the lumber, not scrimping the amount; let it lay a day or so and then turn up another face of the lumber, again give it the gas tar paint. Continue till all sides and edges are painted. Gas tar has been found to be the best preservative of silo walls yet found, and I may add that for rough work, such as farm gates, corn cribs and board roofs it is not equaled by any of our many paints. If the tar is too thick, thin it with gasoline. While our lumber is drying, we will put in silo foundation. We must decide where to build, and the best rule is to build just as near the animals' mouths as possible, to save the work of feeding; at gable end of barn or shed is the best place. To lay foundation, drive a peg in center of ground selected for foundation; take a fence board, bore a hole in end, slip over peg, then at half of distance of diameter of silo slip a pin or bolt that will mark ground as board is moved around. After this mark is made, set pin as far as width of foundation trench is to be, which is about 16 or 18 inches. Now dig trench 18 or 20 inches deep, then fill up within 6 inches of top with small rocks, brickbats or very coarse gravel; over this pour thin cement. After this is completed, start wall 6 inches from outside of trench, leaving a 6-inch jog; that jog is to fool any rat that may wish to explore contents of silo. It is better to finish the narrower wall with flat rock or brick; build up 8 or 10 inches above ground level. The dirt should then be thrown up against wall on the outside, even with top of wall to turn water from building. The inside circle or silo bottom should be of dirt only. Many people put down costly cement floors, only to find a large amount of ensilage spoiled each year. A sill is not necessary, but I always use one.

To make sill, take 10-inch width lumber 1 inch thick and cut in segments of circle of wall; cut enough of these to make 3 or 4 inches thick; put first in layer of mortar, then give a coat of gas tar, then lay on another course, breaking joints; nail down to lower layer. Continue laying, tarring and nailing till desired thickness is reached. We are now ready for the tarred staves or 2x4's. But you will wonder how to make a start, what to use for fastening hoops and silo with, and what to fasten staging to. To do all of this requires 4 timbers of hardwood 4x6 inches in size and as high as the silo is to be. Before we put these timbers, we bore enough holes in these sticks to receive the hoops. These holes are in pairs, and are 2½ inches from what will be the inside edge of silo. Holes are to be 3 inches apart long way of timber. Now we will lay off our circle, finding ¼ distance, where we stand one of these sticks and secure it by toe-nailing to sill; again measure another ¼, set up timber, and continue till we have four up; we at the same time brace these pieces well with fence boards or 2x4's, always keeping out of inside of silo. After we have braced well, we set 2x4 pieces on outside of silo, opposite the 4x6 timbers, about 3 feet from them, or as wide as you wish to build scaffolding; nail lumber from these 2x4's at intervals of about 8 feet, on which scaffold lumber is laid. A silo 25 feet high will require 3 of these stagings. Now we are ready to set up these staves. Three men or boys are needed for this work. The tools necessary are 3 hammers and plenty of 60-penny wire spikes; 40's will do in case 2x4's are scant 4 inches, as they often are. Now set up one of the 2x4's against a 4x6 piece about every 4 feet; the men on different stages will attend to nailing up to top of silo; toe-nail the 2x4 stave to sill with 10-penny wire nails. Continue setting up and nailing; if the upper half of staves do not want to follow circle, strike on inside wall with heavy hammer, maul or back of axe, and the right curve will come. After setting all staves to lay 3 or 4 feet (and this space should be where doors are to be), make arrangements for the doors. The doors are only the wall of the silo cut out on bevel and the pieces thus cut out nailed together with some barrel staves, the staves giving the short pieces the necessary curve to circle;



A. J. GLOVER, ELGIN, ILL.

Instructor in Dairy School. University
of Illinois. Dairy field work among
Dairymen of the State.



PROF. E. H. FARRINGTON,
MADISON, WIS.

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the bevel must be on inside of silo, so that when doors are set in place the ensilage will place them in place. No frames for doors are necessary and no fastenings or hinges. In cutting out these places for doors they should be numbered so they will be put in same places each time. A door 18 inches by 2 feet is large enough. To cut out these places it is best to cut side bevel piece, while the 2x4's are on the ground. To do this, bore a hole in center of the 2x4 on right bevel and cut with a tenon saw far enough to allow larger saw to enter cut: when piece is cut out, tack in place with some small nails. Now finish up silo walls and then the man in silo will have to cut out lower door in order to get out; if on outside, can cut his way in. Doors must be about 3 feet apart to be handy in taking out ensilage. The hoops for this silo should be of 5-8 round iron; each section of hoop should be long enough to pass through 2 of the 4x6 timbers and threads should be cut 6 or 8 inches on each end of hoops, so as to take up any shrinkage of silo. Cast iron washers are necessary to bear against the 4x6; light washers will sink into the wood when the silo is full and pressure bears on hoops. Hoops should be placed as follows: first one near bottom of silo about six inches from sill; the next two feet higher, and each alternate hoop 6 inches higher than the last one put on. This is for 18, 20 and 25 foot in diameter silos; smaller ones may use less hoops and even one-half inch hoops will answer. We built our silo and put on the hoops when we had time and felt like work. Our silo is now ready for the roof. I neglected to say that the 4x6 pieces are flush with inside wall of silo and are a part of the wall. The roof of the silo can be built of boards put on hip roof style, or a cone-shaped roof can be put on and shingled. Metal roofing is used by many, while others have no roof at all. I have used silos without a roof and saw no bad results.

The crops we put in the silo and the method of cultivation and the handling has a great deal to do with the cost of producing and filling and the cost of labor, etc.

We find that the corn that will produce 50 or 60 bushels to the acre on an average is a first-rate corn for ensilage. We are using a corn

from Indian, with from one to five ears on the stalks; some weighed eight pounds apiece. The boys like this corn because it gives a big yield and the ears are distributed equally and they run through the cutter better than the two-ear corn.

We found Sorghum another good crop to put in the silo. At the time that we are ready to put the corn in the silo, probably the weather is dry and a lot of the corn will only stay in good condition five or six days; sometimes not as long as that; it dries up too quickly, but we can correct that with Sorghum, that will stand thirty days. We plant 10 or 15 acres every year for that purpose. If the corn has matured too rapidly, we haul a load of corn and one of Sorghum, and if the corn is too dry for one load we take two loads of Sorghum and one of corn alternately. We drill our corn and Sorghum with a corn drill. We drill the Sorghum with a small corn drill. This is necessary, for if you don't the Sorghum goes in too coarse. The corn if planted 8 or 10 inches apart gives better results. We have discarded the shovel plow and use the plow weeder. We then put on the surface cultivator and work the corn three times.

In harvesting some 12 or 14 years ago, it cost \$1.25 a ton for labor. We have reduced that down to 60 cents and then to 50 cents and 40 cents and once to 33 cents a ton for labor. If you take the average corn crop through the country, you will find the average labor is in cutting your corn and shocking it and running through the shredder. The cost is just the same to put in a silo or run through the shredder.

I think, perhaps, discussion would do more good than anything more I can say.

DISCUSSION.

Q:—How did you reduce your cost to 33 cents?

A:—Well, we reduced the cost by having a corn that produced more tons to the acre and it put our land in better condition, and used self-feeding ensilage cutter and so on.

Q:—Do you think Mr. Gurler is tired of ensilage?

A:—No, no, no, no. He talked ensilage so much that he could not think of anything new to say. I have some ensilage here, corn and Sorghum mixed, if you care to look at it.

Q:—Do you shred your corn or cut it?

A:—Cut it with a Ross cutter.

Q:—What length?

A:—Half inch.

Q:—How do you find the capacity of the silo?

A:—The rule is about 40 pounds to the cubic foot.

Q:—In giving facts about that silo, is that the cheapest silo that can be built?

A:—Taking into consideration the silo is for 250 tons. The larger the silo the less cost per ton in capacity.

Q:—Did you say flat hoops?

A:—Round hoops.

Q:—Isn't a 250-ton silo too large for a small herd of cattle?

A:—Yes, sir. I gave the directions from building one in Iowa, one ten feet in diameter, and he filled that one and has kept the ensilage in perfect condition. This man had 8 to 10 cows.

Q:—Your hoops were in sections?

A:—Yes, sir, four pieces.

Q:—What thickness?

A:—58 inch.

Q:—How far apart did you put your hoops?

A:—On the large silo, 6 inches from the bottom, then jump another 16 inches, and then two feet and so on to the top. The last three hoops are five feet apart.

Q:—Are they tight silos?

A:—Yes, sir.

Q:—The lumber will shrink?

A:—It does. Last summer you could see through those 2x4's. But the beauty of it is, those 2x4's will last indefinitely. They spring apart and the air gets through them.

Q:—How about the moisture?

A:—It goes up to 180 degrees heat. If you are not careful when full your hoops will be too tight. You must watch your hoops.

Q:—Ever planed the 2x4's?

A:—No, sir. Buy your 2x4's and have them of even width.

Q:—Any objection to building a more expensive silo?

A:—No, sir, not at all.

Q:—In view of the life of the silo, would it not be better to build a stone foundation and then use brick?

A:—I told you some used concrete; that is the best foundation.

Q:—Supposed we built 8 or 10 feet of hard brick, how then?

A:—Cost too much. Of course he is welcome to it, but I could build my silo on the interest of the money he spends.

Q:—How about the kind of silos Mr. Gurler builds?

A:—He has a number of silos, some of the best made no doubt, but I am talking to the small farmer and the renter, the man who don't want to put much money or more than necessary into a silo to get the same results.

Q:—Mr. Gurler's won't cost so much.

A Member:—I built one this summer after Mr. Gurler's plan and it didn't cost over \$50.00, 150 ton; prefer it to any other kind.

Mr. Cobb:—I would not think you could buy the cement for much less than you stated.

Q:—Four barrels cement, \$2.25 a barrel; 1,600 feet lumber. You heard Mr. Gurler tell it; that's all there is to it. I made a concrete foundation and it is very easily made. A man used to making cement sidewalks will make a foundation. And then we just simply studded up 2x4's, 7 feet apart. Took lumber to the planing mill, got 8 inch boards, 14 feet long and had them split; they were not over 3-8 inch thick. Lathed that from the same lumber; had them cut 3 strips and with beveled edge, so when nailed on there would be a piece to dovetail in behind. They were put on the same as the other boards and cemented.

Mr. Cobb:—No hoops necessary?

A:—No, sir.

Q:—Nailed on through those boards?

A:—Yes, sir; break joints all the time, so in going round and round the silo no two boards stay in the same place.

Q:—Gurler any hoops on his?

A:—Not necessary for every board is the same as a hoop, and get the cement in there it would not burst.

Q:—How long seen that used?

A:—Never saw any but my own. Mr. Gurler told us how to build it and I built one.

Q:—Cement on the outside or inside?

A:—Inside.

Q:—What diameter?

A:—My silo I think was only 15.8 inches in diameter and 22 or 23 feet high.

Q:—Does that hold 150 tons?

A:—I think about that, on the ensilage. I estimated from the number of loads I put in.

Q:—Wasn't Mr. Gurler's 20x40 and held 180 tons each?

A:—I don't know. I just went according to the loads that went in mine. That is a very cheap silo.

Mr. Johnson:—You say 2x4 on the outside and 23 feet high; how did you make it lap in the middle?

A:—Let one run by the other 6 inches or so and nail them together.

Q:—Possibly that was inside?

A:—He sent me a plan this summer and it did not look that way in the picture.

A Member:—I was called out of the room when Mr. Cobb was telling about taking his cows off ensilage and put them on that grain; what was the depreciation in your per cent of fat?

A:—The fat depreciated about one-half, but the cows were not content with the food.

Q:—They acted as those something was lacking?

A:—Yes; they were not content.

Q:—I think I have some ensilage left over from summer and shall go home and feed it.

A:—You are in luck. If we didn't have a rough piece of land I would not have pasture; it is the dearest kind of land.

Q:—How do you protect your ensilage when you don't use it?

A:—Just let it alone.

Q:—Never carried any over?

A:—Never that fortunate yet.

Q:—I asked because some claim it ought to be covered; although I never covered it?

A:—We may have to skim off some that is partially spoiled ensilage; maybe five or six inches.

Q:—I there any objection to putting it six or eight feet under the ground?

A:—Nothing but lifting it out.

Q:—It is hanuer to some barns?

A:—If not able to build above the ground, I would go below.

Q:—Did you notice any odor or taste in the milk in any way or in the butter or cream from the ensilage?

A:—I probably have had good experience to answer that; I furnished milk to the hospitals at Chattanooga during the war and that milk was inspected three times a day and those cows were fed ensilage all that time, and they sent an inspector to find out how we got such excellent milk. At Springfield my butter from three farms scored 94½ or 95 I think. Over in Missouri 94, and it was all made from ensilage fed cows.

Q:—Ever put any clover into a silo?

A:—I never have; have seen it done. Clover is too valuable outside.

Q:—As to regarding putting silos under the ground, isn't it cheaper to carry the ensilage into the silo with a carrier than shovel it out of a

sunken silo? Can't you fill with a carrier cheaper than shovel it out of a basement; it is better above ground?

A:—Yes, sir, rather have it above. With our silos, if we wanted to increase our capacity and hadn't a place to put the silo, it would be better to go into the ground than to put a silo where it would be unhandy to feed the cows. It is a big job, though, to get it out.

President:—Four or five feet wouldn't be bad?

A:—No, sir, not that much.

Mr. Wentworth:—Q:—I think it is the hardest job on the farm. You can't do any work that will work up more of a sweat.

SOME CAUSES FOR DECLINE OF DAIRYING

BY E. M. WENTWORTH, DAVENPORT, IA.

Mr. President and Gentlemen:

I think it would be a good deal more profitable for this discussion to go on on the part of Mr. Cobb with the value of silos and the ensilage than it would to listen to the few ideas on the decline of dairying in Iowa. I have been to various conventions and listened to Mr. Cobb and every time I get some new ideas from him on the ensilage question. I thought I knew all about it. Our first silo was about ten feet below the barn floor, and I know what it is to get it out from that depth and would not have one built two feet below the surface of the ground, provided I could get the money to put it up where it belongs. I think everything should go up in the air.

I was amused to hear Mr. Cobb tell about his children on his farm, and it reminded me of a story from Des Moines. We have a custom of having our school teachers meet during the holiday season, and a couple of these young ladies who are graduates and who had not met for twelve

months until they got into the state capitol. They stood there talking and a good farmer's wife stood behind them. They were comparing notes on their schools, and at this point in the conversation, the good old woman was surprised to hear one say she had 56 children this year; the other one said "I have 28." The old lady asked, "Where do you live?" Well anyway on the basis of that 56 and 28 and ten acres to the cow we will stampede to Iowa.

I have a little stuff here that struck me would explain the situation in Iowa as well or better than I could state it in my own language.

In May of 1823 Henry Clay wrote:

"Since my return from Washington I have been principally engaged with the operations of my farm, which have more and more interest for me. There is a great difference, I think, between a farm employed in raising produce to market and one as mine is applied to all kinds of live stock."

Mentioning the "English Hereford" and "Durham" cattle, he continues:

"The progress of these animals from their infancy to their maturity presents a constantly varying subject of interest; then our fine green-sward, our natural parks, our beautiful undulating country, everywhere exhibiting combinations of grass and trees and growing crops."

He paints a word picture worthy the genius of "The Gentleman Farmer," the eloquence of the distinguished Senator, worthy "The Kentucky Home," but equally applicable to thousands of acres today—

"From yonder Mississippi's stream,
To where Missouri's water gleam,
Iowa in Iowa."

Then the haunt of buffalo, deer and Indian.

In less than a generation Iowa prairies re-echoed the defiant bellow of the buffalo, as he sullenly retreated, yielding the rich range to the advancing herds of the sturdy settler; in less than a generation, Iowa passed through the period of poverty that has ever marked the picket line

of the pioneer. Agricultural evolution restricted the range, soil and climate—encouraged effort—bountiful harvests rewarded labor—the energy of a Stewart and the opportunity of the Centennial pointed out the possibilities of dairying—the stimulus of hard times established the industry—economic conditions enthroned the cow! In less than a generation Iowa exported a thousand millions pounds of butter!

Here and there may be found the graceful Jersey or the generous Holstein; here or there the glossy Angus or the sleek Hereford—special purpose breeds, the pride of their special purpose owners.

“Here, there and everywhere,” the Shorthorn calmly and contentedly combining the corn, clover and blue grass into beef and butter.

Nine out of ten of our farmers believe it to be self-evident that there is greater profit, year in and year out, in the dual purpose, beef and butter combination breeds than in the exclusive development of either.

The natural conditions in Iowa are more favorable to the grower of beef than the maker of milk—our great staple crops are ideal flesh formers; they must be “balanced up,” “supplemented” with “mill feeds” to make a profitable dairy ration; we grow the one; we must buy the other.

The following figures, representing the farm values of certain products in 1901, are to me both interesting and suggestive:

Corn	\$130,000,000
Cattle	150,000,000
Wheat	11,000,000
Butter.	12,500,000

The ratio between corn values and cattle, wheat and butter, wheat and corn, or butter and cattle are approximately the same, and not without interest in our efforts to learn “the reasons for the decline in dairying” in Iowa.

For economy in farm labor, the steer affords maximum results for minimum effort and expense in care and feed. The present industrial expansion created an active labor market—a demand for the clear-eyed,

clean-brained farm boy, whose energy and intelligence, application and adaptability in other occupations have won personal success, while contributing most to the power of the nation in its industrial conquest of the world. The immigrant who formerly sought work as farm laborer, as the preliminary to farm ownership, is now absorbed by that wonderful army of workers in the manufacturing district, adding another healthy appetite for beef and butter (should I say oleo?) in the hungry workman's ratio of at least sixteen to one.

The steer and the hog are having "their inning" and, so far as the cow is concerned, a condition not unlike that noted saying by the poet, Virgil, nearly two thousand years ago, now exists in Iowa—

"Nor shall your heifers, as was the custom of your fathers, fill the snowy milking pails, but spend all their udders on their sweet offspring."

Another potent factor is found in the universal good times. The Iowa farmer is financially "on easy street," the farmer's wife shares his prosperity and one of its greatest blessings has been the emancipation of the "women folks" from the milk stool, which, after years of honorable service, has been relegated with grandma's spinning wheel to the dusty garret of memory.

From the preliminary reports to the State Dairy Commissioner, I find there are—

784 creameries.

90,000 patrons.

1,382,000 cows.

in Iowa; each patron milked an average of seven cows; each cow producing one hundred and thirty pounds of butter. In short, less than half the cows contributing to the creamery and that half at less than half their capacity, produce the eighty odd millions of pounds that make Iowa the Queen of the Dairy States.

The dairyman declares dairy bankruptcy to be the only resultant of such a policy; the Hawkeye farmer retorts—"If it don't pay, it helps

to pay"—and points to that "twelve and one-half millions of dollars net," credited to the cow through the creamery.

The one hundred and thirty pound average is criticized and the one hundred and thirty pound cow ridiculed by the advocates of the special purpose dairy breeds. The criticism is met by the query of "What's the use to drive the limit when you don't have to"; the ridicule is met with a laugh by the cow owners, who point to the actual results accomplished by Director Curtiss with "beef breeds on dairy feeds," and suggest comparison.

They love to tell the story of the eleven year old Angus giving 6,855 pounds of milk, making 308 pounds of butter; and the seven year old that gave 8,139 pounds of milk and made 387 pounds of butter, each in the first and only tested period of lactation.

They point with pride to the record of the Shorthorn—only one that has failed to return a profit as a dairy animal in all the college tests; they quote figures running from that indebtedness of \$1.20 to the dairy profit of \$77.65 net, made by the five year old Reward or Nora's Duke—9,326.8 pounds of milk; 449.3 pounds of butter; average cost per pound of five and two-tenths cents, from the first of April, 1900, to the first of April, 1901; carrying a calf during the latter part of the period that sold, to head a Massachusetts herd, for \$500.00. Or College Moore, that in the last three periods of lactation, produced 403, 409, and 474 pounds of butter—1,286 pounds in three consecutive years

The tendency of the average farmer is better illustrated by an acquaintance, who in 1899 drew \$941.26 from the creamery and in 1901, \$435.26. In 1899 he sold a car of fat cattle on the Chicago market for ten cents less than the top; in 1901, he sold three cars within a "nickel of the top" and his check accompanying the account sales was for \$4,735.00; he had thirty cows in 1899 and thirty-five in 1901.

Few Iowa farmers have a right to the title "Dairyman," although creamery patrons, for the milk product is a subordinate, or rather auxiliary, branch of a business, aggregating last year six hundred millions of dollars.

I have briefly sought to indicate some of the reasons for the decline of dairying.

Natural conditions promise no relative increase, although economic conditions may produce an artificial stimulus, which the Iowa farmer will be quick to see and ready to accept.

Experience and economy taught the lines of least resistance; education and environment begat wealth and prosperity; industrial intelligence will welcome opportunity in every branch of agriculture.

Under the inspiration of Bear'shear, Curtiss and Wilson, the boys have learned the soil elements and crop necessities, the science of breeding and the value of feeding. The girls have been to Ames also and learned philosophy—the philosophy of domestic economy—better living lighter labor, brighter homes.

Father and mother went to Ames, possibly, to visit the children, perchance on college excursion days. They roamed at will through orchard, field and pasture; they investigated the creamery; the hall of domestic economy; they visited the barns, admiring the cattle, the horses, the sheep and the swine; compared types; quizzed the president and professors; asked a thousand and one questions on breed and feed and profit; then, true to the Hawkeye habit, started home at "sundown."

They thirsted after knowledge and invited "Charley" Curtiss and "Tama Jim" to their homes; "talked shop"; "told their troubles"; sought advice; got in touch with teacher in their study of causes and conditions.

Education directs mind and muscle in the contest for the mastery of the secrets of the science of agriculture, "robs it of the mystery it would have for all, if it were the reward of the few, instead of the privilege of the many."

By the President:—Any further business to bring before the convention?

Personally I wish to give my thanks, as well as the Association's, to you people of Freeport for your courtesy to us and for turning out to the meetings as well as you have. It has been an enjoyable convention to us, and I hope profitable to you.

The convention stands adjourned.

**Seventh Annual Meeting
Illinois Farmers' Institute**

Rockford, Ill., Feb. 18-21, 1902

Wednesday, 9:30 a. m., February 19, '02

DAIRY SESSION

Joseph Newman, President Illinois Dairymen's Association, Chairman. Mr. W. R. Kimzey, President Illinois Farmers' Institute, called convention to order.

Exercises opened with a violin solo, Mazurka, by Miss Woodward.

PRAYER

REV. B. E. S. ELY, PASTOR FIRST PRESBYTERIAN CHURCH.

Almighty God, our Heavenly Father, unto Thee we lift our hearts and our voices in prayer.

We ask Thy blessing to rest upon us this day. Grant us Thy presence in the deliberations of this day. Be pleased so to favor us by Thy Divine grace, so we shall be led to those results which shall be for the highest and the best.

Be pleased, O Lord God, to remember us while we are here tarrying. Keep us in health and in life. We pray for a blessing on those whom we have left in our homes; watch over them during our absence, and in Thine own time do Thou return us unto them in safety and in peace.

We pray Thee that Thou wilt bless us in all pursuits in which we are here engaged, so that we may follow them in accordance with Thy

righteous will, and each of us in his place, work out that high purpose of God that put us in the place.

Be pleased, O Lord God, to help us all to remember that there is a great vineyard, and that the call comes to every one, some good work in the vineyard to do. Let each one of us be found faithfully responding to that call, so that by and by, when we come to the harvest home, we shall come bringing our sheaves with us to joy and re-joyce in the harvest feast, and to receive the commendation of Him who is our Great Master and our righteous Lord.

We ask it all in the name of Christ, the Redeemer. Amen.

By the President:—We shall now be favored by a song by Miss Garlick, who comes all the way from Wisconsin.

Song, "Swallows," by Miss Ruby Garlick.

By the President:—When a change is necessary to be made in a program, it is disappointing. In the dairy program we counted very largely on having Mr. Adams, the Pure Food Commissioner of Wisconsin, with us. He is sick in bed and unable to be here. Mr. Knight, who is on the program this morning, was called to Washington and is pushing the bill which is of such vital importance to all dairymen. Mr. Newman, the president of the Illinois Dairymen's Association, to whom these men reported, made an earnest effort to furnish other talent for the day. He received a note from Mr. Gurler as follows: "My brother tells me you wish me to go to Rockford. This will be impossible, on account of the death of my niece today and the funeral is on Wednesday. If this had not prevented, I would have been with you." We thought we could get Mr. Hoard of Wisconsin, who we always like to hear, but he wired: "Can't be with you at Rockford," so you see the Committee has tried to supply the work, but death and sickness is something to which we all must bow. We have others with us who have been asked to substitute for the forenoon.

The work is along the dairy lines especially this morning and also being a Jersey crank a thome, I thought presiding over a meeting specially

devoted to dairy interests, no one would be able to do it more genially than the President of the Illinois Dairymen's Association, and I hand the gavel over to him. Allow me to introduce Mr. Joseph Newman.

Ladies and Gentlemen:

Of course we had a little disagreement about this gavel business, but I had to bow to higher authority. The dairymen are inclined to be intelligent people, and we believe they are among the best of the agricultural producers of this State and the Northwest.

We like to stand shoulder to shoulder with all the different matters pertaining to the garm, and always willing to do our part. We believe in deliberations of this kind. We want what is right and what is best and good for all.

To fill out the program this morning I have arranged with Mr. A. J. Glover, who is doing field work, and goes once in every seven weeks to the different farms and tests the cows and keeps records for a whole year and knows the practical results, whether they are keeping paying dairy cows or not.

Allow me to introduce Mr. A. J. Glover.

ADDRESS

BY MR. A. J. GLOVER, UNIVERSITY OF ILLINOIS.

Mr. President, Ladies and Gentlemen:

After you have heard what you have in regard to being disappointed in prominent men, it makes me feel something like the darkey who went fishing. He went a fishing, so the story goes, down South and caught a nice bass. He puts this bass on a stringer and it went swimming about in the water and couldn't get away, so the darkey drifted down farther and tried again, but caught no more. During his absence another young

fellow came along and took the large black bass, and put a little bit of a sucker on the string. When he came back, the darkey pulled the string up and looked at it in astonishment. Then he looked at the sky, it was the same sky, the same woods and the same spot. Then he looked at the fish and said, "You little cuss, you've shrunk up so."

I was to fill in here for a short time this morning, telling what we are doing in dairy field work in Illinois; to tell you the character of the work and how it is carried on.

The State, during the meeting of the last legislature, made an appropriation for a small amount of field work to be done. It provided for a man to go into the field and find out the actual dairy conditions as they existed in Illinois. We have taken the Northern part of the State, as the dairying is largely confined to this section.

The work consists of a man going about and getting individual herds, and takes the individual cows of that herd and see what they are doing. It has long been realized by men who have made it a study, that the farmers are carrying a great many cows on their farms that do not pay for their board.

The work we are asking the farmers to do is very little, to find out what their cows are doing. We go to a farmer, who is interested in improving his herd and interested in getting a greater profit for the feed they consume, and furnish him with the apparatus for doing this work—a pair of spring balance scales, the tablets for preserving the composite sample and the bottles for holding the same. I go to his place and make this test once in every seven weeks and enter the weights and the tests of his milk in my record book, and all concerning his dairy work. In this way we are able to tell what each cow has done.

The work as we have it outlined at the present time is this: We have the farmer weigh and sample each mess of milk every seventh week. You may not think this often enough, but after taking a certain number of cows whose milk has weighed and tested every day for a year, and by doing this we know how much milk and butter each produced

during the year, then we computed her milk and butter records from the weights and tests of every seventh week during her period of lactation. We found the variation was not over 7 per cent. If we can come within 7 per cent or even 10 per cent of what the cow is doing in your herd, we are getting pretty close. As I was saying, every seventh week the farmer is supposed to weigh a sample of each mess of milk from each cow in his herd. He placed the little sample of milk in a composite bottle which is provided with a tablet for preserving it for a week or two. He mixes it thoroughly every day, and at the end of fourteen consecutive milkings I come with my traveling outfit and test that milk. We have the weights and tests of each cow in the herd for a whole week and from this I can figure exactly how much each cow has produced in that week of weighing and sampling. From this we estimate what she has done for the three weeks past and what she will do the three weeks following. Then for the next six weeks the farmer goes on with his regular work in the same way, until I notify him it is time to begin weighing and sampling again.

That is all there is to do, unless the man is interested in keeping track of the amount of feed and he kinds that he is giving his animals. I have some farmers who weigh the grain when mixing it. For example, he mixes together one-half bran and one-half corn meal. One hundred pounds of each is weighed and mixed together. He then takes a measure and weighs it full of this mixture of grain and by keeping track of the number of measures that he feeds each cow, he knows approximately how much grain each cow is getting. The roughage is also estimated in a similar manner.

At present, I have all the work I can attend to. When I first commenced, it was hard to get any one to take any interest in it at all. They took me for a creamery shark. They wouldn't let me test their cows; thought I was working for some creamery, or a crank of some kind. When I had been to their places three or four times, they found out I was no creamery shark or connected with any creamery, and the work goes

splendidly. I was told of twelve men last night who wanted this work done, but as I have four already in that neighborhood and all I can possibly do, I had to refuse them the privilege.

We want to find out as near as possible what the cows are actually doing, and when I come next year with a full year's record I will be able to say these records are correct. I have about 350 cows under the test, and from them we are going to get a great amount of information, and we will be able to show up the great difference in individual cows.

What is the object of this work? Simply to improve the dairy herds of Illinois; to improve the general dairy conditions; and get the farmers to build better ventilated and lighted barns; to get them to see better methods of breeding; to get them to select better cows and to sell their poor ones; to get them to care for and feed their cows more judiciously. I find, if there is any attempt at ventilation, that it is all wrong. A hole is cut through the ceiling which lets out the warmest and purest air in the barn. What we want is to get some means to take it out at the bottom. Light and ventilation are what is most needed in the barns, and I might say cleanliness in a great many cases. I go to some of these farm houses and have a chat with the farmer and tell about these things, and try to show them how they can be improved. This is the object of the work.

What suggested a man for the field, to get the farmers to sample and weigh from time to time each mess of milk from every cow in his herd? I will give you some reasons taken from another State. I have not been in Illinois long enough to answer for this State. Gov. Hoard, in the spring of 1900, sent a man into Iowa to examine and find out what 100 herds of dairy cattle were doing in that State. This man was to go to the farmers and find out just how much dairy knowledge they had; just how he handled their dairy cows; whether they had good ventilated barns; whether they saved the manure; whether or not special dairy breeds or dual purpose cows were used; whether they read the dairy papers or agricultural papers. In short, to find out how much dairy intelligence was put into their business. In that 100 herds there were 982 cows. The results are something like this:

All the farmers were selling their milk to creameries. Out of that 100 herds there were four (4) that gave a profit of \$2.11 to \$2.30 for every \$1.00 worth they consumed. There were 12 out of that number that gave a profit of \$1.50 to \$1.91 for every \$1.00 worth of feed that they ate; 23 out of them gave a profit of \$1.20 to \$1.50 for every \$1.00 worth of feed given them; 26 herds out of that 100 gave a profit of \$1.00 to \$1.20.

And now we come to the dark side of the picture. Thirty-five out of those 100 herds of cows charged the owners from 2 cents to 66 cents for their keep. Thirty-five herds out of that 100 did not pay for their board; some of them only gave 44 cents for every \$1.00 they consumed, while others only 2 cents difference. The extreme contrast is one man receiving \$2.30 and another only 44 cents. That is one of the reasons that suggested Illinois taking up this work. I was talking to a man the other day, and he said that he believes only one cow in three was paying for her keep, and he asked, "How do you find it?" I quite agreed with him on those I had tested.

Ex-Gov. Hoard was once upon a time talking in a meeting in Maine on the subject of breeding, when an old fellow arose and shook his head and said, "I believe it is all in the corn crib, in the feeding." The Governor reflected and said, "Uncle, you are the man I have long been looking for. I want to find a short cut in the breeding of cows. You have seen this razor-back hog with long legs built for running?" "Yes." "How would you feed that hog to make a Berkshire or a Poland China out of it? How would you feed a Jersey cow to make a Shorthorn out of her of the beef type? How would you feed a trotting horse to make a draft horse?" Then the Governor went on to state that there was once a little horse in Wisconsin by the name of J. I. C. that could trot a mile in 2:10 when fed 12 quarts of oats. I dare say you have horses on your farm that couldn't trot a mile in four minutes if you put four tons of oats through them." Is it all a question of feeding?"

What were the results in making this investigation in Iowa. It was like this: Out of all those herds they returned about \$27.00 per cow to

their owners. Butter fat sold at 19 cents a pound, but the cow only returned \$27.00 and the average cost of feeding her was \$26.00, so you see there was about \$1.00 profit from those 1000 cows kept in Iowa. And haven't we got some here in Illinois? That is what I am trying to find out.

In Minnesota, where I come from, the Experiment Station had cows that gave us a large profit, and others that gave very little, but were handled in the same manner. Each mess of milk is weighed and tested every day in the year, and this has been done for eleven years. I don't suppose the cow has received a ration but that it has been weighed. The records are there for eleven years of each cow in the herd. The cows were divided into groups. Some of the groups were classified as special dairy cows, and others as the dual purpose cow and the beef type, etc. Prof. Haecker found that the cows gave a great difference in profit. One class of cows gave a profit of \$8.00 and paying for their board and the feed they consumed was figured at market prices. Another group of \$20.00; another group of \$23.00, and the special dairy cow gave a profit of \$45.00. There is this difference in cows eating the same amount and kind of feed, kept in the same barn and milked by the same man. One cow gave a profit of \$8.00, consuming the same amount, occupying the same room, taking the same amount of labor, and then on the other hand, was a cow that gave a profit of \$45.00. These things are not impossible on the dairy farm. This \$45.00 cow may be a little bit higher than we can expect of the average cow for some time to come, but she is by no means impossible. Here was one cow producing 500 pounds of butter, and another less than 200 pounds of butter in a year.

At the Illinois Experiment Station Mr. Fraser fed two cows. One cow gave over 560 pounds of butter, and the other about 300 pounds in a year, and they consumed the same amount of feed, and you will notice the great difference. The only way we can find out about this is by taking the Babcock test and the scales and weighing the milk from time to time and also testing it. The Babcock test and the scale are not always an absolute settlement for a dairy cow.

We must also take into consideration the dairy form. We must study that and learn the dairy type. We want a cow with a large body because she must have a good digestive tract to digest and assimilate her feed. The dual purpose cow—and she has a place—I have not gotten so far that I have no use for the dual purpose cow. We often find people calling cows dual purpose, when they are only scrubs. I was saying, we must not take the Babcock test and the scale as conclusive evidence of the profit of the cow, for cows will have their off year. We must care for them and learn to like them. I was pleased to hear Mr. Carter last night speak on the necessity of being kind to the cows. In Mr. Gurler's herd I have 65 under this test every seventh week. He has one cow, a Jersey, a very fine type of dairy cow. The least thing disturbs her, she is very nervous. They were somewhat crowded for room and wanted to put her in another row. They moved her, but that cow was uneasy and everything seemed to go wrong with her; she would not give her milk down. They changed her back to the other side in another stall, and she tried to turn around and get out. They finally put her back in her old stall; and the same man milked her as had milked her before, and she gave nearly twice as much milk as when handled by a stranger. Some cows would not have minded the change at all, but she was extremely nervous and sensitive. We have to take all these things into consideration.

I have something here which I wish to give you; some of the records I have got. They are not complete, but I wish to give you some of the figures. It is like the German said of his wife: "My frau is not so very good liiking, but Mine Godt; she is the best I have by me." There will be a chance here for criticism for some of these cows were fresh and some were not. The herd here that is doing the poorest has the largest per cent of new milk cows in it. I have selected three herds, because I wish to brink out several facts that is in them this morning.

Here is one herd I have been testing. It contains 12 cows. In one week they sold 1305 pounds of milk from that herd; 40 pounds of butter fat. How much feed did they take and how much did it cost to produce

this milk? The cost of feeding those cows was \$12.18. That is the figure at what you could place the feed upon the market for. It does not figure hay at \$13.00 a ton; I figured it at \$10.00. He had fed \$12.18 grain and roughage; received \$10.80 for milk, which is a loss of \$2.11, a direct loss upon the milk. He received his skim milk back, valued at \$2.77, figuring it at 25 cents a hundred. Figuring corn at 56 cents a bushel, your skim milk is worth 30 cents for feeding young stock. He received \$2.77 worth of this skim milk to feed to his young animals. That gives him, including skim milk and amount received for butter fat over and above the cost of feed 66 cents profit on 12 cows for one week. That does not include the labor, and that is that herd's best week of profit. Twenty-five cents a pound for butter fat, milk 75 cents per hundred; average test was 3 per cent. The ration? I figured the same prices on all herds, so comparison will be on the same basis. The ration he was feeding here was 10 pounds crushed corn; 40 pounds silage and 10 pounds stover.

Q:—That price is too low for milk.

A:—Will you pay \$1.02 for 3 per cent milk?

Q:—They pay \$1.02 on average test. The average test is 3.80.

A:—You have almost a 4 per cent test. This is 3 per cent milk and selling by the test.

Q:—Are you figuring on that one herd?

A:—Yes.

He was feeding 23 pounds of dry matter to that herd. There was about 1.32 pounds of protein and 15 pounds of carbohydrates; that ration was extremely rich in carbohydrates and extremely low on protein matter. It is a poor ration. His herd was in bad condition. Their udders have become caked and he has disposed of six of them already because he has found out through this work that they are not paying cows. His silage is sour. He is giving them all a corn ration and the combination seems to be bad at the present time.

Q:—Were they dual purpose cows?

A:—I should call them common natives; you might call them dual purpose cows.

Q:—What do you call a dual purpose cow?

A:—Is one that is medium size to large, weighing about 1200 pounds. She has not as broad a back as our beef animal, but she is broader than the dairy cow. She has a deep body and a well developed udder, good milk wells and veins. She has good depth of body and not too heavy thighs. A cow that is medium, between the typical dairy and beef animal.

Here is another herd in the same community. The man sold 1870 pounds of milk and 69 pounds of butter fat. The cost of feeding was \$14.06. The net returns he received from butter fat at 25 cents a pound was \$17.40.

Q:—How many cows in that herd?

A:—I think 16 or 17.

He received \$17.40 and the cost of feed was \$14.06, leaving a profit of \$3.34 for the week. Figuring his skim milk as I have before would give a profit of \$7.32. The ration contains 14 pounds of grain, 9 pounds of bran, 5 of corn, oat straw and corn stover, all they will eat. That is a ration which is exceptionally rich in grain. It is a heavy ration, 14 pounds a day to a cow, so he is feeding less to the cows that are getting well along in the period of lactation; this ration is only fed to the fresh milk cows. He was feeding 2.23 pounds protein to his cows; enough protein for a cow that is making 400 or 500 pounds of butter a year. I believe in feeding according to the amount of milk and butter the cow is able to produce. There is no use in trying to crowd a 150 pound cow to make 500 pounds of butter. A cow that is only making 200 or 300 pounds of butter does not need as much as the cow that is making 400 or 500 pounds. Some of the scientific rations are all wrong for some cows; $2\frac{1}{4}$ or $2\frac{1}{2}$ protein for cows that are making 400 or 500 pounds of butter is alright. If you feed these 200 pound cows as much protein as the 500 pound cows she will use that feed to make flesh or waste it and not make milk. Feed according to the amount of milk and butter that the cow is giving. This man was feeding extremely high in protein; he was feeding too

much I think for the class of cows he has. If he had 400 or 500 pound cows, this ration would be excellent, and an excellent one for the fresh cows. Feed a fresh cow all she will use to the best advantage, but during the latter part of her period of lactation she does not require the same amount of feed as a cow on the full flow, and a great many men are making the mistake of feeding the same amount of feed through the cows whole milking period.

Here is another herd that was in the same community. This man has 18 cows. He got 2563 pounds of milk from these 18 cows; he sold 92.63 pounds of butter fat. It cost \$16.81 for feed for them. As you will remember, it cost one man \$12.00 for feed, another \$14.00, and this one \$16.81. This man spent \$4.00 more and received about twice as much milk as the first man who only sold 1305 of 3.08 per cent milk, which gave 40 pounds of butter fat. The net profit on the total amount of butter fat at 25c a pound would be \$23.00; the cost of feed \$16.81, gives a profit of \$6.34, and here we have one man lost \$2.10, another man makes a profit of \$3.35 and here \$6.34 profit from about the same number of cows, and feeding about the same amount of grain and roughage and selling milk to the same creamery. If we add the value of this man's skim milk he has a net profit of \$11.78. Here is the ration: Four pounds of corn, 4 pounds bran and 1 pound gluten meal and Timothy hay about 5 pounds, and all the Stover they will eat. This ration comes out nicely for a cow giving the amount of butter fat they did. It is I think the best ration I have here in my list for cows that are giving about the same amount of butter fat that these cows are producing.

Q:—What is their test?

A:—3.60.

He has a cow that is doing exceptionally well. They call her "Crazy," but she don't act like it. Gives 9 pounds of butter every week since she calved. If she keeps on she will be a 350 pound cow.

We must not put too much dependence on a cow from what she does the first three or four months. The cow that is a persistent milker is the one

most likely to make a good record. It is not the one that commences big that always lasts. He has a Jersey near the end of her period of lactation. She comes in the first of April. Her milk tests 4.4 and has been milking since last May, I think, so you see she has been milked nearly a year and gives nearly 5 pounds of butter fat from Jan. 16 to Jan 23, or for seven consecutive days she shows a persistent producer.

While these records are not complete, they indicate the great variation in cows in Illinois. I hope next year to have the records more complete, and more interesting and convincing, so that when I appear before you that I can give facts that we have found in our own State, and not have to go to Iowa or Minnesota to obtain them.

I am glad I have had the opportunity to meet you.

Q:—Can you feed butter fat into milk?

A.—No sir.

Q:—If I feed a cow all straw, tests 3 per cent, and enrich her feed in corn meal, can I increase that butter fat?

A:—I think you decrease it. If she has been fed straw she is only giving a small amount of milk. You are not feeding a cow in a normal way when you feed only straw. When corn is added you will probably increase the flow of milk and the test will undoubtedly become lower; it will go down rather than up.

Q:—You say you can't feed butter fat into milk?

A:—That is what I said.

When I worked in Northern Minnesota, where the grass was wild and cured quickly, and the cows were not giving much milk, they tested more than cows in the southern part of the State where they fed plenty of grain and more succulent feed.

Q:—Does fresh milk test as high as old milk?

A.—The nearer the end of the period of lactation the higher the test. As she advances in her period of lactation the solids and butter fat increase.

Q:—How much would be the churn test, or oil test?

A:—A test of 4.2 for example, she will make about 4.9 of butter because the butter fat or oil is simply fat pure and simple, while butter has about 15 per cent of water and salt in it. We usually add 1-6 to the butter fat.

Mr. Sprague:—Why is it if you can't feed butter fat into milk the same herd will test a great deal different than others when a change of feed is made?

A:—I can't explain that. I have seen a cow that was fed the same kind of feed test 3 per cent in the morning and 5 per cent at noon, and she seemed to be perfectly normal. I cannot explain that. Hoard says the darkest place on earth is the inside of a cow.

Q:—Then in decreasing or increasing the butter fat in milk, if any change is made at all, you say you decrease the fat in cows rather than increase it?

A:—I think decrease. But I cannot answer that question. A cow sometimes becomes agitated and nervous, and that will make a shrinkage in the milk and increase the fat. I have seen cows that were sick and tested 16 per cent, but gave very little milk. Strangers coming around nervous cows will make a difference in the amount of milk given. All kinds of feed have been given them to increase the fat, but it makes no difference, we cannot feed fat into milk.

Mr. Campbell:—How do you account for the longer a cow is milked the more the fat will increase, or rather how do you account for a fresh cow that out-tested any time during the year?

A:—I cannot explain that. I think she must be a freak. There are some things we cannot explain. The general rule, Mr. Campbell, is that she increases in test as she advances in her period of lactation. The total amount of butter fat will be less, but the test higher.

Q:—Outside conditions affect them?

A:—Yes sir, a lot of things. Flies and all such things affect them.

Q:—Then if I want more butter, I must get different cows or increase the flow of milk?

A:—The selection should be based on the quality and on quantity. I know a man who wanted me to test his milk. He wanted a high test and bred for this and got a herd with udders as big as goats; got 7.8 per cent test, but didn't give milk. Let us bear quality in mind when selecting cows, also quantity; don't select for quantity regardless of quality.

Q:—Why is the test higher in my cow during the first period of lactation?

A:—I don't know unless the cow is feverish. Were you feeding her anything to make her feverish?

Q:—She was a little feverish, maybe I was.

A:—I guess you were.

Q:—Isn't it a fact that a heifer that tests low at two years old may the succeeding season be a much better tester and at the same time give more milk?

A:—A heifer does not test as much as an old cow. The cow that made the record in Minnesota never tested over 3.2 when purchased, or thereabouts. They shipped her up there and she made an average test of 4.2, 84 pounds of milk per day.

Q:—Was she a Jersey?

A:—No, a Holstein. If you take Hoard's Dairyman, it is in there some time about the first of January issue. You write to them and they will send you a picture of that cow.

By the Chairman:—Better yet; take Hoard's Dairyman, subscribe for it.

Mr. Russell:—Can you give us any rule that we can pick out heifer calves that are going to make good heifers?

A:—Go farther back yet and see that a good sire is selected. Get good sires and breed from your best cows and from them I should select my heifers for making my milch cows. These heifers will have some indications of a dairy cow from the time they are a few months' old. They will have deep bodies for one thing. You don't want to get a beef type on those heifers. Her hips will begin to show when young; good milk

wells, feel under her belly for them; some are large and some are small. They should be large. She should have a clean cut neck and head; her general type is spare. She has no tendency to lay on fat.

Q:—I would like to know what is a balanced ration for milk?

A:—A ration made up of the feeds that are on the market?

Q:—What is a balanced ration for milk, say in Chicago?

A:—I should think the same as sending to a creamery. I should feed according to the amount of milk my cows were giving. In giving a large flow of milk, 30 to 40 pounds, $2\frac{1}{2}$ to 2 pounds of protein and for succulent feed there is nothing better than a silo. Feed green corn in summer and she will make all kinds of milk. Why not feed her that corn in winter in the silo and she will do the same and thus avoid so much of this expensive feed.

Q:—I feed my cows cob corn just as it is?

A:—What do you feed with it?

Q:—Nothing.

By the Chairman:—This discussion is very interesting, but we have others on the program and shall have to draw this to a close.

HOW TO MANAGE A DAIRY HERD

MR. JUDSON T. MASON, ELGIN, ILLS.

Mr. President, Ladies and Gentlemen:

In managing a dairy herd, be it the special purpose cow, or the dual purpose cow, we have the same object in view. The farm and buildings are the fixed capital; the dairy and tools are the working capital. The object is to make the working capital pay the largest per cent possible on the fixed capital. As in any line of business, its value is measured by the per cent it will pay on the capital invested.

Tributary to Elgin, the farms are largely managed by tenant farmers, probably 75 per cent of them. The landlord furnishes the farm with good buildings, suitable for dairy purposes, and the dairy. The tenant furnishes the teams and farming tools, and performs all the labor necessary to run the business. Each receives one-half of the proceeds of the farm and dairy, and in changing cows, which vary on different farms, from ten to thirty-three per cent each year. Those changing the most realize the greater per cent. What feed is purchased, each pays half.

Comparatively few farms are rented for cash. There is a vast difference in the per cent these farms pay. Some of them pay a greater per cent on a valuation of one hundred dollars per acre than others do on forty, with local conditions the same. The difference is largely due to management—an item well worth looking into.

By having a farm stocked with a dairy, which brings the soil up to a high state of fertility and increases its productiveness and value; and with thorough cultivation and preparing a perfect seed-bed, there can be an abundance of feed raised which is essential to the production of milk and keeping of stock.

As the land increases in value, that value can be met by careful and better farming; by producing more feed to the acre; keeping more stock to the acre, and producing more milk to the acre.

We formerly planted our corn in checks three feet eight inches, and as the land became richer and stronger, we reduced that check to three feet four. The last few years we have planted three feet each way.

In planting 3 ft. 8 in. there are 3,240 hills to the acre; with the 3 ft check there are 4,840 hills, an increase in number of hills on an acre of fifty per cent. There should not be over two or three stalks in a hill, two is better. If you can grow an average of one pound per hill, you will produce eighty-six bushels of corn per acre.

In planting, we make the first row three feet from the fence. We aim to get the use of all the land in the field. Do not lose sight of the fact, that this high state of fertility of the soil must not produce anything but corn. Therefore, keep it clean and thoroughly cultivated.

We put in as many acres as we can conveniently handle. It has often been said, and well said, that "Corn is King" and "Clover is Queen" of the dairy. These crops, with the addition of bran, are our main reliance; therefore it is necessary to have an abundance.

I have taken a little latitude in my subject. While I admit a man might be an excellent dairyman and a poor farmer, or vice versa, yet owing to the small margin between the market price of dairy products and cost of production, to be a successful one he must be thorough in both.

For years we have run what you might call a winter dairy. We aim to have the cows fresh in September or October, as that is the time when we stock up for our winter run. We select well bred cows of fair size and not too old. The quality and type should regulate the price.

As we sell our milk by the quantity, we prefer the Holstein, but our market objects to an all Holstein dairy, so there are a good many Short-Horns of the milking strain used.

As they become fresh, feed light at first and gradually work them up as the feed is increased, the milk flow increases; as the milk flow increases the appetite increases, and so you work her up to her full capacity. They can be held to a full flow of milk only by the most judicious care and feeding.

Do not overfeed. Do not feed more than they will eat up clean and have a sharp appetite for the next feed. Feeding and milking should be done with the greatest regularity possible. The feed cannot be made any too good for the cow. The hay should be early cut and nicely cured, so it will have that greenish cast and fresh sweet smell. She enjoys the meal freshly ground and the fodder freshly cut. She will not relish stale food of any kind. Salt them every day and provide water boxes so that they can have access to water at all times.

Some winters we have made milk exclusively from the corn crop, with the addition of bran, and feed as high as twenty pounds of grain per cow a day, one-half meal and bran by weight, and the fodder from which this corn was taken furnished the roughage. By having good

clover hay as part of the feed, the grain ration can be reduced one-third and give as good results, but even the above way of feeding corn after the bran has been deducted, will pay a handsome price per acre.

The cows should have the best of care, kind and gentle treatment, so that you can approach them in the stable yard or pasture without any fear on their part. The stable should be warm, well-lighted, well-ventilated and have a cement floor.

Stable them in early fall as soon as the nights become uncomfortably cool. A milk cow should not be exposed to any frost. As the weather grows colder, we keep them in all the time, except an hour or so in the morning while the stables are being cleaned.

Each cow has her individual stall and soon learns her place, and the feeder knows where to find each cow. They are not all fed the same. I believe a cow feels at home in the stall she has become accustomed to. And then each milker must commence with the same cow, also milking the same cows in regular rotation. The milking should be done quickly, and in as cleanly a manner as possible.

The cows should be heavily bedded, and it should be shook out and kept level and not allowed to bunch up. It not only makes it easy and comfortable for the cow, but keeps her clean and nearly doubles your loads of fertilizer, which is no small item in keeping up the fertility of the farm.

It has been my experience that winter dairying is more profitable than summer. It takes less land to produce the feed than it does in summer, where pasture is used.

A cow will give more milk for a longer period; she is better looked after and cared for. She has turned the raw material from the farm into the finished product.

This daily round of feeding and milking is continued until about the middle of May, varying a little with the seasons. As we always reduce the dairy, it can now be done to good advantage, and we usually reduce it a third, sometimes nearly one-half. The cows being in good flesh at

this time are sold for beef, often bringing as much as they cost and sometimes more.

There should always be a provision made for summer feeding, as the pastures of late years are of very short duration. Oats and peas should be sown as early as the season will permit, at the rate of one and a half bushel each per acre, and to be fed when the pastures begin to fail. Clover makes excellent feed cut and fed in the stable, before the oats and peas are ready.

We seldom turn the cows out to grass before the 15th or 20th of May, so as to give the pastures a good start. It is a good plan to give them some hay while the grass is fresh and rank; it prevents them from getting too relaxed.

The cows should be well fed in summer as well as winter, and not allowed to run down in flesh, getting thin and out of condition. The cows giving milk are given a feed of grain night and morning, and are always on hand at milking time, consequently have no use for a dog. There are some months it may not pay to feed grain, but by doing so you will keep the dairy up so they will be ready to do business when it does pay. What you feed in the barn they do not have to hunt for in the pasture, and then probably not find it. I believe with a dairy or any kind of stock if it is worth keeping at all it is worth keeping well.

In farming and dairying, as in any business, there should be a strict book account kept of all transactions—capital invested, labor expended, taxes, insurance, and all running expenses, for the use of which all have to be deducted from the gross receipts of the farm before any profit is rendered. This will stimulate the ideas of the farmer to better his conditions more than anything one thing, as he compares one year with another and see where he can improve on the past.

By getting better acquainted with his business and in being a better judge of values in buying and selling stock, by doing better farming and trying to raise larger crops, in good care and liberal feeding of stock, and close attention to his business, all of which will tend to raise the per cent of profit on the capital invested.

DISCUSSION.

Q:—Do you stable your stock in summer?

A:—Yes, sir, while feeding and milking.

Q:—Feed them some?

A:—Yes, sir; you feed her and she will always be ready for milking. You keep the cow up in good condition and she will be in shape to do business; that is a great point in dairying.

Q:—Any experience in feeding ensilage?

A:—Our factory don't allow us to feed ensilage.

A:—Can't feed ensilage or gluten meal. Our feed is largely corn meal and bran.

Q:—Any oats?

A:—We usually sell the oats and buy bran.

Q:—Do you think ensilage taints the milk?

A:—Had no experience.

Q:—Do you grind your corn fine or coarse?

A:—Fine.

Q:—Ever mix cob with the corn meal?

A:—Trying it this winter. Everyone fed shelled corn, but this winter trying the cob meal.

Q:—I have had experience and have fed it for years.

A:—That's what we are doing this winter, owing to the high price of bran.

Q:—How much do you feed your cows each day?

A:—When the dairy is on full feed, about 20 pounds per cow.

Q:—How much milk from your best cows on 20 pounds of grain a day?

A:—Take the dairy, they should average a can to three cows during the milking season, say for ten months.

Q:—About 22 pounds to a cow?

A:—Considerable more than that, as through the first half of the milking season we often get a can from two and one-half cows, sometimes a little better.

Q:—Do you get enough more milk to pay for the extra feed?

Will a cow give you 18 pounds of milk on 10 pounds of grain?

A:—There may be a way of getting something for nothing, but I have never found how in the dairy business.

Q:—If you get 18 pounds of milk from 10 pounds of grain, would you be losing?

A:—I have always fed that way; it has been my observation and experience, that the liberal feeders were the most successful. If you could make 18 pounds of milk from 10 pounds of grain, you certainly would not be a loser.

Q:—How do you keep up the fertility of your soil if you sell your milk?

A:—Careful farming, good crops, keeping the farm heavily stocked will increase the fertility of the soil.

Q:—How long do you keep the same cows on your farms?

A:—Some of them we do not keep a great while; change perhaps 25 per cent of them a year.

Q:—How long do you keep your good cows?

A:—As long as there is a good profit. A cow will wear out the same as a machine.

Q:—The harder you work her the quicker she gives out?

A:—I say when the profit gives out she gives out for me.

Q:—Do you buy your cows?

A:—Yes, sir; I let the other fellow raise them and I can buy them for less value than I can raise them.

Q:—You get beat sometimes?

A:—One will get beat sometimes at almost anything.

Q:—How do you like shock corn?

A:—One feed a day will make the cows do better; it makes a change and is relished by them.

Q:—How many pounds of milk in a can?

A:—68.

Q:—How many stalks to a hill did you get on that corn?

A:—Two or three.

Q:—Make it for the purpose of fodder, not corn?

A:—Two will make more corn.

Q:—Do you shred your corn fodder?

A:—Cut it, cutter and thresher combined.

Q:—Do you raise the corn for the corn and fodder both?

A:—We raise it for the corn and fodder both.

Q:—Don't you raise it for the milk ration to?

A:—Yes, sir. Have to be careful in getting it up, and then we stack it generally, thrash and feed it. A cow will like it fresh. We don't cut up a lot of it at once, but keep it fresh, and we thrash that and then grind the grain as fine as possible. Then we have mixed it with bran, same weight; light bran, the lighter the better.

Q:—Do you get any better results from shredded corn fodder than corn stalks?

A:—No.

Q:—What time do you cut your corn?

A:—When it is ready to cut; when it is glazed like, about the first of September.

Q:—What do you say should be the state of the corn?

A:—When it is glazed over and commenced to harden up or dent.

Q:—Do you let it stand as late as you can before frost?

A:—Yes, sir, or it should be in the shock before frost or before it dries up.

Q:—Ever use much oats?

A:—Never used many oats.

Q:—They are selling bran \$20.00 a ton?

A:—Yes, I know it.

Q:—How many kernals, did you say to the hill on your corn?

A:—Two or three.

Q:—How many cows to the acre around Elgin?

A:—Vary a good deal. I keep on one of my farms 50 head of cattle on 110 acres; that is a rented farm.

Q:—Do you cut up your corn and put it in the barn?

A:—We put it in large shocks. We get it in the stacks all we can't feed before the first of January.

Q:—How do you stack it?

A:—Round stacks 4 or 5 loads, or in ricks. Some folks think fodder is not good if kept over a year. I have threshed them the next year and gone up a can of milk.

Q:—What do you thresh it with?

A:—A regular corn thresher, separates all corn husks and cleans the grain.

Q:—Use corn husker?

A:—No, corn thresher.

Q:—Ever kept it two years?

A:—Yes, I suppose the older the corn the stronger it is. Would not think the fodder would be as nice and green as it is.

Q:—Ever try sweet corn?

A:—Never had much experience with sweet corn.

Q:—Do you use the Canada peas?

A:—Yes.

Q:—How many bushels to the acre?

A:—A bushel to the acre, with a bushel and a half of oats.

Q:—How many bushels?

A:—One bushel or one and one-half bushels. It will make a good soiling crop to feed; something to carry the cattle over the dry weather.

Q:—About stacking corn fodder; is it stacked like wheat and slants?

A:—Just like stacking oats.

Q:—Isn't great care needed in making it very slanting?

A:—No, sir.

Q:—How dry must it be?

A:—Pretty dry, or it is liable to heat and damage.

Q:—Cut in the field and cut when glazed with a corn harvester?

A:—With a corn binder.

Mr. Dalling:—Had considerable experience with stacking corn and cutting it; always husk it. I always stack my fodder; tried shredding it, but I shan't shred again. I started in the middle and stacked two bundies up to each other. So we started in that way and run off and by keeping up the middle and not getting them flat you always keep the fodder where the rain will run off.

Mr. Mason:—That's the way a stack has got to be made. If you want to keep it so, stack the middle, that gives it a way for the rain to run off and not spoil the fodder. If you keep the middle full and the sides lean from it, you will have no trouble.

A Member:—I have tried the shredded fodder; I find I can get as much good in providing fodder not shredded as that that is shredded.

Mr. Mason:—We like the round stacks the best. You have got to keep the middle filled; fill in the middle like stacking oats; it will come out easier than from a rick.

Q:—Isn't your stack exposed more to the surface?

A:—Put a good top on it.

Mr. King:—It seems to me that with all this talk about stacking corn on the slant, that a farmer ought to know that water won't run up hill. I have built many and many a stack of grain to the present date, and invariably when building a stack had that in view, that water won't run up hill. My stacks are slanted so they will shed water. We get our bundles slanted and then the water will run off. The question is how to preserve it. I never found it so well as when left in the field and taken to the yard as we wanted it. If we get our profit out of it, it must be done with the smallest amount of labor.

Q:—Then comes a bog snow and thaw and freeze and what then?

Mr. Mason:—Then every stalk will be frozen down; you will have to chop it lose; a great deal will be wasted. Some winters during the past 20 years it would be literally impossible for weeks at a time to get it out of the field.

Mr. Coolidge:—The Agricultural Stations tell us that corn fodder

left in the field very long loses 50 per cent of its protein for feeding. As a matter of convenience I have found in my experience that you want to stack your corn fodder when the corn is in it and stack it outdoors. You don't want to stack it in the barn; if it is dirty, let it stand dirty. The rats and mice and manure and these other odors that pass through the corn fodder, make it so the cattle will not eat it so well; so stack it out doors. Fodder that is fed early in the year does good. You should stack fodder outdoors that will carry you through the bad days of the spring. There is no difficulty on earth in stacking corn fodder outdoors; no trouble whatever. The first of March and April have enough corn fodder that I can feed during this season of the year. There is a whole lot of waste in corn fodder, but the waste is worth more per ton than the whole fodder cost you. Good for bedding, and when scattered in your barns it tones up the bedding, easily absorbs liquid manure and your barns will be as dry in March and April as if you had a cement floor, and the cattle will not go covered with the manure.

Mr. Mason:—Do you like shredded fodder as well as cut fodder?

A:—The early part of the year, about two months in the spring, like shredded fodder, never tried cutting. I think corn fodder is the coming feed of the State of Illinois, and bound to take the place of hay.

A Member:—Corn probably cut for early feeding can be fed cheaper from the shock than anywhere else in the world, but many days you all know it is stormy in the morning and frozen down. Never have tried cutting, threshing and shredding. The ordinary threshing machine will do it faster and cheaper than anything else. I would rather have it than the cut corn. We have threshed 70 acres of heavy fodder in three days time easily, while a shredder that cuts in our neighborhood takes a third longer.

Mr. Mason:—We stack corn so we can get it out in January.

Mr. Allen:—In speaking of stacking fodder, you give the idea that it is husked?

A:—Corn all in it.

By the President:—The Grout bill is now before the Senate committee

Washington, and while it interests the dairymen, it also interests everyone concerned in the productions of agriculture. It is the reconstructed Grout bill before the Senate committee, and I will ask Mr. Grout of Winchester to speak to us on this subject.

Mr. Grout—I am very sorry that I have been called to champion the Grout bill, and I don't want you to make the mistake that I am the author of it. I have been asked that several times if that was my bill, but that was down in Egypt where they didn't know any better.

While I have nothing to do with this Grout bill, and while I care very little for the dairying especially, still I am in full sympathy with that bill. Not because I sympathize especially with the dairymen, but because I am opposed to fraud and deceit of every kind. I believe that every cup should stand on its own bottom. Everything should be considered at exactly what it is worth.

I know of no reason why there should be any contest over a bill of this kind. I represent the people, perhaps, in raising beef cattle, and it is claimed that the beef interests of this country will be greatly injured if this bill—that is known as the Grout bill—passes and becomes the law of this country. I do not know why, or even if it passes that it will be injured, and see no reason why it should not be passed. The beef interests should stand upon their own merits; then let them pass it. I do not see why fraud should be perpetrated in order to build up any industry in this country.

While I have not taken any special interest in this bill, I decided at once that I was in favor of anything that would prevent a fraud. The people of this country are entitled to know what they consume. If they are buying butter, it is their right to know that they are buying butter, and not something else. If the people of this country want to consume oleomargarine or things of that kind, they have a perfect right to do so, but they should know what they are doing. When they do know what they are doing, there is no reason on God's earth why they should not do it.

As I stated in the first place I have no special interest in this bill, and in fact I don't like the dairy business. I took a great dislike to it in

my early youth, back in Vermont. I remember I was brought up on a dairy farm, and that is why I don't like the business, I guess. I also remember when I was about eight or nine years old and living on the dairy farm, my father and the hired man were away from home one night. So I determined I would bring up the cows to the house as usual, and then conceived it would be an excellent idea if I milked the cows, and helped get some of the work out of the way. I pitched in with a great deal of enthusiasm to show my father what I could do. I succeeded in milking all of those cows before he returned, and was proud of it. But I very soon had cause for regret. It was not very long before I was placed in service and made a regular hand at it, and ever since that time I have not taken any interest in dairying. But there are those who do take great interest in it, and it is their right that the productions that they make should not be interfered with. That fraud should not be perpetrated upon them by having an article introduced as butter that is not butter.

On the same principle, we may go back and produce wooden nutmegs. If the people want wooden nutmegs and consume them, that's their business. It is all right so long as they are not deceived.

I look for the corn growers of Illinois to get up in arms and denounce our pure food law. That is, I would, if the pure food laws were to be enforced; but since listening to the speech of Kerrick that that is not the case; those laws are made for the purpose of forming commissioners whose object it is not to enforce the laws of the state but to get away with the appropriations and furnish followers for the administration. What a pity it is 'tis true, and a great pity that the administration must have followers in that way.

Now only a few days ago I found an institution in a town and in talking with the elevator man, he informed me that he received over three hundred dollars for the cobs that he handled through his elevator the year before. I asked him what became of them. He told me he shipped them to a certain factory in a neighboring town and I followed it up. He says they go to make up hominy. That is what the corn men will find if the pure feed law should by any chance be enforced, because it would not per-

mit a thing of that kind, and would be doing away with some values to the corn crop. Here this one elevator had sold \$300 worth of corn cobs to go to make up a production to deceive the dairymen of Illinois or some other state—a fraud was perpetrated. It was not claimed there was any special value in corn cobs, it simply goes in there to make up the bulk and deceive some one. It ought to be stopped. Corn cobs are all right in their place. If I go and buy corn cobs and fed them I know what I am doing. I do that very thing, I grind my corn cobs, but I am not deceived by it, I know what I am doing. And it is all right if I want to buy corn cobs, but buy hominy with bran to feed to stock, I want to know which is good and which is not. That is not the only instance.

Not long ago in talking with a gentleman about feed grinders he informed me that he had sold eight to one mill down in Egypt, and was surprised that one mill should need so many. They are grinding corn cobs with them, for the purpose of adulterating bran. Another man in Southern Illinois was shipping in corn cobs from Nebraska by the train load for the same purpose. And here we have a commission in Illinois for the purpose of stopping those things.

And this is why this Grout bill as it is called is now the absorbing topic among dairymen. It is for just such examples and the principle is the same. I am in favor of that bill because it will tend to stop deceit and fraud. And I am in favor of the pure food bill, if they will do what it is intended to do, and expected to do by those who make them.

By the President:—Now we will listen for five minutes to our friend Cobb.

BY MR. COBB.

Ladies and Gentlemen:—What Mr. Grout has said regarding this bill, I hardly agree with him on all he said. While I am in favor of stopping fraud in feeding us poor milk when we come to these conventions,

I am fighting out my salvation individually by increasing our production and lessening the cost while we are waiting for this bill.

What the gentleman told you about this morning in regard to testing different herds, we are carrying on our individual farm. I think that the greatest obstacle to success to dairying in Illinois, is the cow jobber; a man who brings a car load of springers or fresh cows for the farmers. They drive their dry cows to the butcher and sell them for so much a pound, and then go to the stock yards and pick out the cows they need to replenish their herds from these cattle shipped in from Iowa, Nebraska and perhaps Minnesota. These cows are perfect strangers to these dairymen, and by the time they get conversant with their character, they are dry cows and ready to go to the butcher, and the same process is repeated.

In my country, I was called a crank, a cow crank, but they don't call me that any more. We have the special purpose cow. Our aim is to raise every animal, that is, for our herd. We keep accurate accounts of every pound of milk that each cow gives and records are kept on milk sheets, and these milk sheets are filed away so we can refer back and ascertain what each cow has done for us in the years passed. They are tested regularly with the Babcock test and their milk yield is recorded on milk sheets and their disposition and their ability to assimilate food and make a profit is carefully looked after. In this way we are improving our herd. If our milk cost \$1.25 or \$1.00 or .75 to produce, we try the next year to produce that for 25c, 30c or 50c less. While we are keeping these records of our cows, we are learning the best feeds to feed these cattle. This year I will start even with dry weather and high priced feed, and thus far we have made more money with our herds than we ever have before with the exception of one year, and that was the year we had the war with Spain and got large prices for our crops.

The food question is of more importance or as much importance as the breeding question. This winter and last fall in my institute work and attending dairy conventions, it seemed that they were the leading ques-

tions. What shall we feed and what shall we buy? We buy nearly all the ground feeds we use. Our rule is to ascertain the protein, and by feeding the number of pounds and thice per hundred we know the protein and that is what we are after. We are long on carbohydrates in the State of Illinois but short on protein. The protein in oats runs from 18 to 25c per lb. the protein in cotton seed meal is about 5c a lb., and all along the line you will find that a ration can be compounded by the by-products of the milk through the country and make a profit on the feed we are giving to our cows.

The Grout bill that is before the Senate, I don't wish it to make our dairy products any more expensive, that is not my idea of the benefits to be derived from the Grout Bill, but it will be largely in favor of the consumer. There is no doubt but what prices the manufacturers are receiving from the oleo product is larger a good deal than the dairymen are receiving. While I don't wish the dairy product to be any higher, I do wish to have the consumer to get good butter and all he wants, even when butter is a reasonable price. There is not enough good butter to go around and I hope if a resolution is presented there it will be accepted.

By the President:—I want to say a word myself about this Grout Bill in which we are so deeply interested.

I know you people who are largely from the agricultural districts have no idea that it is sold for what it is, because your store keepers are honest and tell the truth about it. But it is not so in the larger cities. We sent out in Chicago and bought 84 pounds of butter from 84 different stores. They asked for butter and paid for butter. It was all sent to the chemists to be analyzed and 65 out of the 84 pounds was butterine, unmarked and unlabeled, and that is where the fraud comes in and what we are asking to be protected against.

The gentleman who spoke to you last night, from Champaign, telephoned his grocer to send some butter. He knew the difference between them, and when it was sent he found out it was not butter. He tele-

phoned asked the grocer what he bought last night. He mentioned the articles and included butter. He asked him if he had sent butter, and he thought he had. He told him he wanted him to come up and get it because he hadn't sent butter but oleomargarine. So you see they do go to the people even in country towns, and we ask and demand this legislature that they put a stop to it, it is just and fair that we have it.

If the working man wants to eat it, we have reduced the price, or if the farmer wants it, he should have it without the tax on it. If the bill passes, they will get it two cents a pound cheaper. We simply want it sold for what it is. Those who want to eat it and ruin their stomachs, can do so, but they ought to know what they are buying, but I don't think any intelligent man ought to want to have it.

Less than three weeks ago a man in our own county was sent to the hospital, and the doctor could not get anything to stay on his stomach, and he was no young doctor. He asked this man about himself, and told him, "I know what is the matter with you, you have been feeding around at these restaurants, and got your stomach lined with this oleomargarine, almost like a plating of glass." and it took him three weeks to make him well. Men who are in offices and in workshops do this same thing, and I want to tell you it is a serious thing to consider. If you will give a unanimous vote on this question, you will be asking for nothing but what is right and what is fair.

Directors' Meeting and Report of Officers

SESSION HELD IN SPRINGFIELD.

Directors of the Association held two meetings since the appearance of the 1901 report

The first was during the State Fair at Springfield in 1902, and the second at Rockford, Ill., during the meeting there of the State Farmers' Institute. One day, Feb. 19, of the Institute's convention was dairy day, and was conducted by the State Dairy Association's officers, the program being furnished by the Association.

At the Springfield meeting the chief object was to confer with other agricultural organizations of the state with a view of having the agricultural interests of our state properly represented at the Louisiana Purchase Exposition to be held in St. Louis, Mo. As a result of the meeting a committee, made up of members from the different associations, was appointed to take the matter in charge. Joseph Newman of Elgin, president of the Illinois State Dairymen's Association, is the member from this Association on that committee.

At a meeting held in the St. Nicholas Hotel of directors of our Association, E. Sudendorf of Elgin, was indorsed as the best man to have charge of the dairy department of the St. Louis Exposition.

It was also decided to let the officers of the Association try the effect of subordinate dairy meetings to be held before the next state dairy convention.

The discussion at this meeting was largely on dairy display at St.

Louis. This discussion, however, was general in character, no definite plans being agreed upon.

—
DIRECTORS MEET AT ROCKFORD.
—

At the Rockford meeting Directors Newman, Murphy, Biddulph, Carr and Nowlan were present. The reports of Treasurer H. H. Hopkins and Secretary Geo. Caven were received and referred to a committee, which later reported them to be correct, and they are here given:

Hinckley, Ill., Feb. 18, 1902.

To the President and Board of Directors of the Illinois State Dairymen's Association:

Your Treasurer respectfully reports the following:

On hand May 18, 1901, as per last report..	\$ 43.20
July 19, 1901, received from Secretary..	1500.00
Jan. 28, 1902, received from Secretary..	105.00
	\$1648.20
Total	\$1648.20
Paid out on orders.....	1466.86
	\$181.34
Balance.....	\$181.34

A supplemental report by the Treasurer and approved by the Auditing Committee, brings the Treasurer's report down to June 10, 1902, as follows:

Hinckley, Ill., June 10, 1902.

Balance on hand..	\$181.34
Feb. 22, check.. . . . .	..10.00
Feb. 22, check..	25.00
	\$216.34
Total.....	\$216.34
Paid out on orders.....	211.60
	4.74
Balance....	4.74

Several bills still outstanding and the fact that only half the Secretary's salary for the year had been paid, left a deficit of about \$150.00.

SECRETARY'S REPORT.

Receipts.

Balance from 1901.....	\$ 29.68
Check.....	50.00
Memberships.....	160.00
Fremont Butter Tub Co.....	5.00
Winnebago Butter Manufacturing Co....	5.00
J. P. Younger (contributions).....	60.00
Hotel Brewster	25.00
De Laval Separator Co.....	30.00
Elgin Butter Tub Co.....	10.00
Diamond Crystal Salt Co.....	10.00
F. D. Moulton & Co (Asnton & Cadillac Salts)	10.00
Dairy Mutual Insurance Co	10.00
Worcester Salt Co	10.00
The Sharples Co.....	10.00
Gnesee Salt Co.....	10.00
Vermont Farm Machine Co	10.00
A. H. Barber & Co.....	10.00
Wells, Richardson & Co.....	25.00
John Newman Co.....	25.00
Heler & Merz Co.....	25.00
Creamery Package Manufacturing Company	50.00
Total	\$579.68
Deficit.....	31.50
	<hr/>
	\$611.18

Expenses.

Stamps.....	\$ 42.50
Express, drayage, freight.....	8.35
Telephones and telegrams.....	2.50
Secretary, railroad and total expenses.....	42.77
Printing, binding, folding, addressing, etc.....	65.31
Mailing reports.....	37.50
Paid Treasurer.....	140.00
Convention expenses.....	272.25
	<hr/>
Total.....	\$611.18

Had the contribution from Freeport been as large as expected, the deficit would have been about \$100 less.

After approving the reports, the directors appointed F. A. Carr and G. H. Gurler a committee to arrange a plan whereby, in the future, all the money received by the secretary would go to the treasurer before being paid out, instead of being paid out as needed to meet the expenses of an annual convention. The idea was to, in the future, have all the receipts from every source show the treasurer's report.

The printing of the annual report was left with the president and secretary.

President Newman made a verbal report on a sub-meeting of dairymen held at Elgin. Extreme weather conditions prevented this meeting from being a success.

A committee of three was ordered to be appointed by the said meeting to revise the rules under which the association is working and report at the next meeting of the board.

Tuesday, Wednesday and Thursday, Jan. 6-7-8, 1903, were the days decided upon for the next annual convention of the association.

The place of meeting was left in the hands of a committee consisting of F. A. Carr, Irvin Nowlan and the secretary. This committee has since decided to hold the convention at the new agricultural college, University of Illinois, Champaign. It is hoped that this will prove an attractive place of meeting and draw a large attendance of dairymen of the state. Judging of cows and practical demonstration in the College Creamery will be unusual and valuable features of the program.

H. H. Hopkins, Hinckley, was re-elected treasurer, and George Caven, Chicago, was re-elected secretary.

REPORT ON UNIVERSITY WORK.

A valuable report at the Rockford meeting was made by Irvin Nowlan, of Toulon, on work along dairy lines, being done by the State Dairy

School, University of Illinois. It will be remembered that the advisory committee appointed by President Newman, when this work was taken up, consisted of H. B. Gurler, DeKaib, John Stewart, Elburn, M. Long, Woodstock, Irwin Nowlan, Toulon, and A. N. Abbott, Morrison. This was an advisory committee to confer with the Dean of the Agricultural College on work to be carried on in the dairy school. Mr. Nowlan's report is on the work of the committee and is as follows:

Toulon, Ill., April 2d, 1902.

Mr. Geo. Caven, 154 Lake St., Chicago, Ill.

My Dear Sir—I am now prepared to submit the following report as to the inducements offered by the State Agricultural College, Urbana, to hold the next meeting of the Illinois State Dairymen's Association at that place

- 1st. The hall for general meetings heated and lighted, free.
- 2d. Butter room, cold storage for the butter.
- 3d. Room for exhibiting dairy machinery and power for operating same.
- 4th. Use of stock judging room along with the dairy animals of the herd.

As to a contribution from the two towns, I am sorry to say that such a thing is about impossible. Yours,

Irvin Nowlan.

Also find enclosed report of work done in the dairy section of the Agricultural College under Sec. 5, House Bill 315.

REPORT OF WORK DONE IN THE DAIRY SECTION OF HOUSE BILL
No. 315 BY IRVIN NOWLAN, TOULON, ILL.

In carrying out the provision of House Bill 315, providing for a committee of five (5) to be appointed by the Illinois State Dairyman's Association to confer with the directors of the Agriculture Experiment Sta-

tion, the following committee was appointed: Messrs. H. B. Gurler, De Kalb, M. Long, Greenwood, A.W. Abbott, Union Grove, Irwin Nowlan*, Toulon, John Stewart, Elburn.

At the meeting held at the Agricultural College June 18, 1901, all members were present except Mr. Stewart. The committee invited Professors Frazer and Erf to meet with them to discuss the dairy conditions of the state and to jointly devise some ways and means to improve these conditions.

Upon invitation Prof. Fraser presented some suggestions as to what ought to be done in the way of developing the animal side of the dairy industry, and what investigations ought to be carried out in this line.

The work agreed upon in connection with this department of the college was as follows, given in order of importance:

(1.) That a man under the control of the Directors of the Experimental Station be sent over the state to do field work, with a view of studying the dairy conditions and assist in every possible manner to improve those conditions. It was suggested by Mr. Abbott and agreed upon by all members of the committee that the greater portion of this work be carried on in the dairy districts of the state.

(2.) That the dairy experiments at present carried on by the Experiment Station in regard to determining the difference in efficiency of individual cows be continued on U. S. Government Fund.

(3.) That a cheap and effective method be devised for keeping flies from cows.

(4.) To determine how small a quantity of milk on which calves can be successfully reared and what food will make the best substitute for milk.

(5.) The immediate and continued effect of different quantities of the same kind of feed on the production of milk of cows.

(6.) Wide vs. narrow rations for dairy cows and to determine the widest ration most economical for conditions that exist in Illinois.

The investigation and experiment work on the manufacturing side

under Prof. Erf was given due consideration and the following suggestions in order of importance were agreed upon.

(7.) Experiments on whipping cream explaining why some cream whips, while other cream of the same per cent. does not.

(8.) Testing different insulations for creamery refrigerators.

(9.) Experiments on mold in refrigerators.

(10.) Experiments to determine the species of bacteria that causes butter to deteriorate at low temperature.

(11.) Experiments in making butter from cream that has been frozen.

Such was the work mapped out by the advisory board and it is with feeling of pride I make report of the progress that has been made in this department. One of the most neglected things about dairy farms is the sanitary conditions of the barns, and it was thought best that the University of Illinois set an example in this respect for the dairymen of the State by putting the dairy barns at the experiment station in the best possible condition.

The floor, joists and sills of the University dairy barn were badly rotted and unsafe for longer use, then it was thought best to tear out the whole inside of the dairy barn, new sills were put in where needed, the loft supporters on iron collums, new windows put in giving four times the light originally. The barn was ceiled on the inside, a large feed room partitioned off at one end for the preparation of feed for experimental purposes, at the other end a milk room, an office and a herdsman's room were put in. A cement floor and mangers were put in three feet lower than the old floor and resting on the ground. Considerable time was spent investigating the stall question and it was finally decided by putting in the Drown iron stall.

These stalls were the second lot manufactured and they are giving excellent satisfaction.

This makes a good barn for experimental work and with the small dairy building standing near it which has also been remodeled makes

one of the best of the dairy plants in the state from a sanitary standpoint.

The work in the field is being done by Mr. Glover in the dairy section. He is testing herds as follows, visiting each every seventh week:

H. B. Gurler, DeKalb	65 cows tested
F. M. Barber, Greenwood	25 cows tested
J. M. G., Greenwood	30 cows tested
Ray Wilson, Greenwood	30 cows tested
M. S. Campbell, Genoa	18 cows tested
W. C. Taft, Rockford	18 cows tested
Chas. Gilkerson, Marengo	10 cows tested
S. Seward, Marengo.....	6 cows tested
W. R. Hostetter, Mt. Carroll.....	20 cows tested
H. M. Phillips, Lena.....	20 cows tested
S. M. Malinx, Damascus.....	15 cows tested
E. G. Heim, Freeport.....	6 cows tested
Smith, Aurora.....	7 cows tested
J. F. DeGarmond, Genoa	6 cows tested
G. E. Burland, Woodstock.....	30 cows tested
J. F. Hordel, Lena.....	10 cows tested
J. A. Phillips, Lena	9 cows tested
H. J. Younger, Stillman Valley.....	30 cows tested

Making a total of 355 cows being tested without any expense to the owners excepting what little time required to weigh the milk, etc.

This method of testing cows every seventh week by a representative of the experiment station cannot help but add untold benefit to the dairy industry of the state. Applications have been coming in from dairymen to Mr. Glover to test their herds that many have had to be refused on account of lack of time.

Thus the light is breaking upon the dairymen, that to be successful in his business he must know his individual cows so that the poor cows may be weeded out, this is perhaps one of the most important matters to be considered by the up-to-date dairyman.

Experiment No. 2 is being continued on United States funds.

Experiments Nos. 3 to 11 with no definite results as yet.

The matter of whipping cream at different per cents of butter fat, and at different degrees of temperature and different per cents of acidity has been taken up, a number of data have been obtained but on account of the intricate factor of viscosity which enters into the work there will be some problems that cannot be solved except by very expensive and elaborate experiments.

Refrigeration has been duly considered and approximate estimates were made as to the probable cost of such an experiment in order to secure such results that may be helpful to the average dairyman and still stay within reasonable bounds of our appropriations.

Unforeseen circumstances do occasionally arise in experimental work and it often becomes very expensive to avoid the obstacle but trusting that nothing of the kind will arise and with well laid plans to make a thorough test of all factors that enter into this work, but it will require considerable time if the experiment is to be conducted on a thorough and economical manner, this will be especially true of the deterioration test of different insulating materials.

Such has been the progress of the work done by the dairy department of the Agricultural College upon the plans laid out by the Advisory Board

Respectfully submitted.

IRVIN NOWLAN.

Corn Silage vs, Shock Corn for Beef Production.

The experiment detailed in the report below, while it relates to beef production, is valuable knowledge for the dairymen of the state. The

work was done under the direction of the College of Agriculture, University of Illinois. The details were:

I.—WINTERING CALVES.

OBJECT.

The object of this experiment is to determine the relative merits of silage and shock corn as factors in beef production. The comparison is made both by weight of feeds and area used in their production. Everything considered it seemed best to begin with eight-months-old calves; to feed them liberally through the winter months without attempting to fatten them or to secure the greatest possible gains; to turn them to grass with or without grain, according to the season, and the abundance and kind of pasturage available, and, finally, to finish them during the second fall and winter on rations similar to those used in wintering them as calves. These calves were purchased in Kansas during the early fall of 1901 by Mr. E. D. Funk, an extensive cattle feeder of Bloomington, McLean county, Illinois, upon whose farm this experiment was conducted and to whom the Experiment Station is indebted for his active interest and co-operation.

The feeding extended over a period of 88 days. Equal areas of the same kind of corn were harvested as silage and shock corn for use in this experiment, a careful record being kept of the cost of harvesting and feeding of each. After the termination of the winter feeding the calves were turned to grass on May 17, 1902. Their gains will be noted at frequent intervals during the grazing season. Next fall and winter they will again be placed in the feed lot where they will receive rations similar to those of the first winter for a time sufficient to finish them for the market. The experiment will be terminated by a slaughter test.

PLAN OF EXPERIMENT.

ANIMALS USED.

Fifty eight-months-old grade Hereford and grade Shorthorn calves were selected for this experiment. Upon their arrival at Mr. Funk's farm the calves were given the run of blue grass pasture and stalk fields

until within a few weeks of the date of beginning the experiment, when they all received shock corn and mixed hay. The calves as they arrived from Kansas were quite thin, showing the effects of short pastures; but by the time they were put in the experiment, February 5, 1902, they were in good thrifty condition and of about 500 pounds average weight. It was a decided advantage to be able to get calves that were so nearly uniform and that had been so similarly treated. They were divided into two lots of twenty-five each, care being taken to make lots equal as to age, thrift and quality.

Ten sows averaging 65 pounds each were placed with each lot of calves, the object being to reduce the waste of shock corn feeding to the minimum by converting the corn in the droppings into pork and to determine what benefit, if any, pigs would get in following silage-feed steers.

SHELTER FOR CALVES AND PIGS.

The calves and pigs were given the run of feed lots in which they had access to the shelter of a large shed adjoining the barn in which were the mixed hay and the stave silo containing the silage used in this experiment. The shelter provided for these calves was warmer and more protected than the average feed-lot shed, owing to its location and to the fact that it was not all open on one side. The calves and pigs gained access to it by large doorways opening to the south. The kind of shelter afforded is specified because it is generally believed, and rightly so, that cattle fed largely on silage or other succulent food should have warmer quarters than those fed on a dry ration. Then again it should be remembered that the animals used in this experiment were calves which no effort was being made to fatten, but simply to keep growing nicely. It is economy to give such calves reasonably warm winter quarters even in localities where there might be a question as to the economy of furnishing to fleshy cattle on full feed anything more than shelter from wet storms and cold, driving winds.

Every effort was made to surround both silage and the shock corn lots with conditions equally favorable for securing the best results from each feed.

RATIONS FED

The amount of corn put into the silo represented an area of 5.33 acres. An equal acreage of corn was also cut and shocked in the field where it remains until needed for feeding to the calves during the winter and spring months. All of the corn was cut with a corn binder.

There was a total of 101,200 pounds or 50.60 tons of corn put into the silo. As taken out there were 86178.81 pounds, or 43.09 tons. There was, therefore, a total loss of 7.51 tons, or 14.88 per cent. in the siloing of 5.33 acres of corn. Of this loss two tons were taken from the top of the silo in a condition unfit for use. This would leave 5.51 tons, or 10.88 per cent. as shrinkage in gross weight. This is not an unusually high percentage. When it is remembered that a total of only 50.60 tons of corn were put into the silo from 5.33 acres it will be seen that the yield of silage per acre was about ten tons or below what an average crop should be for Illinois. It is well known that there was a short corn crop last season. Add to this the fact that in this case the corn was of a small early maturing variety and it is easy to account for the low tonnage secured. This shortage in yield per acre was not as apparent in the case of the silage as with the shock corn. Had the plot which was fed as shock corn been husked and the stover field cured there would have been a yield of only thirty-two bushels of shelled corn to the acre, while the yield of cured stover per acre would have been 1.68 tons. Of the yield of shock corn 38.4 per cent was ear corn (70 pounds to the bushel) and 61.6 per cent. was stover. It will be seen that the proportion of corn to stover in this instance was altogether too small and the total yield of corn and stover much below a normal crop. The stover usually represents from 50 to 55 per cent. of the total tonnage of the corn crop, the average generally being something above 50 per cent.

While these small yields interfere with our making a good showing as to the total number of pounds of beef it is possible to produce from an acre of corn either as silage or as shock corn, they do not interfere with our comparing the results of feeding the corn crop by these two methods.

The shock corn from the 5.33 acres was weighed as fed out. The total amount fed was 29095 pounds, or 14.55 tons, very close to one-third of the gross weight of the silage as fed out.

The rations were made up as follows:

Lot 1. Silage, whole oats and mixed hay.

Lot 2. Shock corn, whole oats and mixed hay.

That we might be able to make as direct a comparison of the corn part of these rations as possible, the same amounts of whole oats and mixed hay were fed to each lot except as noted below, while the amount of silage and shock corn fed varied with the appetites of the calves. It was thought advisable too, to keep the amounts of food stuffs other than shock corn and silage as small as possible, since corn and its products are bound to remain the greatest factors in beef production.

As all the calves had been getting shock corn and mixed hay up to the beginning of the experiment the calves in Lot 2 naturally took to their ration more readily than did the calves in Lot 1 which were started on silage, a food stuff with which they were entirely unfamiliar. It should be said, however, that the steers in lot 1 never failed to relish their silage after the first few days.

The average daily ration for each steer at the beginning of the experiment, February 5, 1902, was as follows:

Lot 1.—Silage.....	15 lbs.
Oats	2 lbs.
Mixed hay.....	4 lbs.
Lot 2.—Shock corn.....	11.5 lbs.
Oats	2 lbs.
Mixed hay	4 lbs.

The amount of mixed hay fed to Lot 1 was increased on the second day of the experiment to 6 pounds per head per day as the ration given above did not seem to satisfy the calves. On the third day the amount of silage was increased to 20 pounds per head per day. It took about three weeks to get the proportions of food stuffs used satisfactorily adjusted, especially was this true with the lot receiving silage. Each steer in Lot 1 would have consumed 25 pounds of silage after the first ten days. The average daily ration for each steer on March 3, 1902 was as follows:

Lot 1—

Silage.....	25 lbs
Oats.....	2 lbs
Mixed hay (clover and timothy)....	4 lbs

Lot 2—

Shock corn.....	13.8 lbs
Oats	2 lbs
Mixed hay (clover and timothy)	4 lbs

In a week's time it was found that the shotes following the calves getting silage were not only failing to make satisfactory gains, but were actually losing in weight quite rapidly, a condition which was anticipated. The feeding of one pound of ear corn to each of the shotes in Lot 1 began February 13th. Under this treatment the pigs maintained a constant weight until March 3rd, when the ear corn was increased from one to two pounds per pig per day. During the week following this increase in feed the pigs made an average daily gain of nearly a pound per head. During the next week, however, they lost about a tenth of a pound and it was thought best to still further increase the amount of corn to three pounds per pig per day. This ration, in addition to what was secured from the droppings of the steers getting silage, produced satisfactory gains. By this system, however, we were not able to arrive at any very definite conclusion as to just how much of the gain of the pigs could be credited to the droppings of the silage fed steers. It will be remembered that ten shotes

were following twenty-five steers. It was thought best to decrease the number to five and not give them any additional corn. For the first week following this change each of the five pigs made a daily gain of .4 pound. There appeared to be sufficient food in the droppings of the twenty-five steers to keep five 100 pound shotes growing nicely; however, the next week the pigs lost 1.14 pounds per head, showing the necessity of still further reducing the number of pigs if they were expected to thrive on the droppings alone. Subsequently the number of pigs with Lot 1 was decreased to one. By this system of reducing the number of pigs following silage-fed calves which received a daily ration of 25 to 30 pounds of silage, two pounds of whole oats and four pounds of mixed hay to each steer, it was observed that the droppings from twenty-five such calves would keep one and possibly two pigs growing nicely. Figured out more accurately we might say that it would be fair to credit Lot 1, the silage-fed steers, in addition to the beef made, with the production of 87 pounds of pork in 88 days. The matter of pigs following silage-fed steers will bear further study.

The ten shotes following the twenty-five steers getting shock corn, oats and mixed hay received no corn or other food stuff in addition to what they secured from the droppings of the steers. The total amount of pork made by the pigs following the shock corn lot was 587 pounds in 88 days. During the first 70 days of the experiment, only ten pigs were run with the steers getting shock corn. During this period they made a total gain of 476 pounds. In other words, the steers in Lot 2 receiving shock corn should be credited, in addition to the beef made during the first ten weeks, with the production of 6.8 pounds of pork per day. During the last 18 days of the experiment, fifteen shotes were run with the shock corn lot and these pigs made a total gain of 89 pounds, or an average total daily gain for the fifteen of 4.9 pounds. This clearly indicates that when the pigs are expected to get their feed from the droppings of the steers better results in pork production were secured when ten and not fifteen shotes were run with the twenty-five steers getting shock corn, oats and mixed hay in the quantities above mentioned, than when fifteen

pigs were made to follow the same lot of steers. It should be remembered that these steers were calves and that they were not on full feed. More pigs could be run with older cattle on full feed to advantage.

WEIGHT OF STEERS AT THE BEGINNING AND END OF THE EXPERIMENT AND TOTAL NUMBER OF POUNDS OF BEEF PRODUCED.

Lot 1—Silage fed—

Total weight of 25 steers February 5, 1902.....	12606.66 lbs
Total weight of 25 steers May 5, 1902.....	16300.00 lbs
Total gain of 25 steers in 88 days.....	3693.34 lbs
Average weight of the steers at beginning of experiment	504.24 lbs
Average weight of the steers at end of experiment	652.00 lbs
Average total gain per steer in 88 days.....	147.76 lbs
Average daily gain per steer.....	1.68 lbs

Lot 2—Shock corn fed—

Total weight of 25 steers February 5, 1902.....	12296.66 lbs
Total weight of 25 steers May 5, 1902.....	15430.00 lbs
Total gain of 25 steers in 88 days.....	3133.34 lbs
Average weight of the steers at beginning of experiment..	491.86 lbs
Average weight of the steers at end of experiment.....	617.2 lbs
Average total gain per steer in 88 days.....	125.34 lbs
Average daily gain per steer.....	1.42 lbs

The steers in Lot 1 (with silage as a part of their ration) made uniformly satisfactory gains from the start. Except during two weeks each steer in this lot made an average daily gain of one pound or more. The average daily gain per steer for the whole period of 88 days was 1.68 pounds. The highest average daily gain for a period of a week was made during the week ending April 14th, when the steers gained 2.74 pounds per day per animal. The lowest average daily gain per steer was made during the week ending March 17th, when the gain was .85 of a pound. The total number of pounds of beef produced during the 88 days of the experiment was 3593.34.

The steers in the shock corn lot, or Lot 2, were much more variable in their gains and the average daily gain was not so great. To indicate the wide range in the average daily gain of the steers in this lot may be

stated that, during the week ending March 3d, there was an average daily gain of only .28 of a pound per steer while during the week ending April 7th, the average daily gains of each steer was 3.2 pounds. The shock corn from 5.33 acres, the acreage used in this experiment, was exhausted on May 5th. The shock corn lot, therefore, should be credited only with the beef made by the steers in Lot 2 between the dates February 5th and May 5th, a period of 88 days. During this time the shock corn steers made a total gain of 3133.34 pounds, or an average daily gain of 1.42 pounds per steer.

These figures show that 14.55 tons or 5.33 acres of shock corn together with 137½ bushels of oats, and 4.4 tons of clover and mixed hay made 3133.34 pounds of beef and 587 pounds of pork, or a total of 3720.34 pounds of beef and pork. All of the shock corn produced on the 5.33 acres was consumed. In case of the silage only 69.95 per cent of the total amount of silage was used. This 69.95 per cent of 5.33 acres of corn (3.73 acres) or 28¾ tons silage fed together with 137½ bushels of oats and five tons clover and mixed hay made 3693.34 pounds beef and 87 pounds pork or a total of 3780.34 pounds of meat. The acreage required for crops other than corn was computed on a basis of an average crop of fifty bushels of oats per acre and one and one-half tons of hay per acre.

The silage remaining, 24,673.81 pounds (1.6 acres) fed together with 2.15 tons (1.43 acres) of hay and 59 bushels (1.18 acres) of oats would produce 1622.53 pounds of beef and 33 pounds of pork at the same rate of gain per pound of food consumed as that which prevailed during the progress of the experiment. Had the silage all been fed the amount of land used in the production of the corn, oats, and hay consumed would have been 14.02 acres, of which 5.23 acres would have been devoted to corn, 4.93 acres to oats and 4.76 acres to hay, or 8.69 acres of crops other than corn. In the case of shock corn, the amount of land used in the production of corn, oats, and hay consumed was 11.01 acres of which 5.33 were devoted to corn, 2.75 acres to oats, 2.93 acres to hay or 5.68 acres to crops other than corn. From these figures we see that in feeding shock corn and corn silage from equal areas of land, the additional acreage re-

quiring to be devoted to crops other than corn is 53 per cent more in the feeding of the silage than in the feeding of the shock corn. On the basis of the total area involved 62 per cent in case of silage, and 51.6 per cent in case of shock corn were devoted to growing crops other than corn. It should be borne in mind that this refers to the acreage involved and not the meat made. From these data we can compute the number of pounds of meat (beef and pork) produced per acre. Where silage, oats and hay were fed, 385.35 pounds of meat were produced per acre. Where shock corn, oats and hay were fed, 337.91 pounds of meat were produced per acre. As the amounts of hay and oats fed to the two lots were practically the same, it is reasonable to suppose that this difference of 47.45 pounds of meat produced per acre was due to the different form in which the corn plant was fed. As the better results were secured with the lot of steers receiving their corn in the form of silage, we may conclude that this experiment indicates that it is possible to get 47.45 pounds more meat from an acre of corn put in the silo than when fed as shock corn to calves which are being wintered rather than fattened.

This experiment indicates that there are at least nine advantages of a system of silage feeding over that of shock corn in the wintering of calves intended for beef production.

First, the corn can be hauled from the field and stored in the silo at a time when little damage is done to the soil by getting onto the land when it is too wet.

Second, the manure and litter incident to the feeding of steers where silage is used are in much more convenient form to handle, and probably they are more readily available as plant food than where shock corn is fed.

Third, the quality of silage and the cost and convenience of feeding it is but little, if any, affected by bad weather which in Illinois so frequently makes it next to impossible to feed shock corn to advantage.

Fourth, the calves in the spring are in better thrift and flesh.

Fifth, more rapid gains can be secured.

Sixth, in case of an epidemic of cholera or other contagious swine disorder, the pigs as a factor in economical production of beef may be eliminated without any considerable loss, which would be impossible in case of steers feeding on shock or whole corn.

Seventh, more pounds of meat can be produced per acre where silage is fed to steers than where shock corn is used; even though the greater amount of pork produced in case of a system of shock corn feeding is taken into account.

Eighth, a much larger proportion of the meat produced is beef.

Ninth, the corn may be harvested earlier in the season, generally before danger of frosts, and at a season, in Illinois at least, when other farm work is not pressing. In speaking of the advantages of the silo it should not be overlooked that silage may be stored for late summer feeding when pastures are often short and the new corn crop is too immature to feed to good advantage.

The disadvantages appear to be:

First, that in feeding equal areas of corn as silage and as shock corn a greater acreage of crops other than corn is required to supplement silage than shock corn. This is an item which can not consistently be overlooked, as economical beef production in the corn belt involves the utilization of as large a proportionate amount of corn as possible; nevertheless, when we consider the ultimate effect upon the fertility of the soil, the clover acreage, at least, may very profitably be increased.

Second, it is believed that winter quarters must be provided for silage fed steers than for those receiving shock corn.

Third, a system of feeding steers on silage involves more capital and labor.

Before attempting to draw final conclusions from the result of this experiment as to the value of silage in beef production the reader should bear in mind that wintering calves is but one factor in beef production and that this experiment will not be complete until we have an opportu-

ity to study the subsequent development of these two lots and the quality of the finished product. Conclusions are withheld, therefore, until the experiment is completed.

This experiment is but one of a series which is intended to thoroughly investigate this subject of silage as a factor in beef production.

SUMMARY.

1. The results secured in this experiment were from a yield of ten tons of corn silage to the acre and 32 bushels of shelled corn and 1.68 tons of corn stover per acre.

2. Of the 50.60 tons of corn put into the silo, but 42.09 tons were available for feeding, there being a loss of 7.51 tons. Two tons or about four per cent were spoiled silage taken from the top of the silo and 5.51 tons or 10.88 per cent were shrinkage in gross weight.

3. The gross weight of silage available for feeding was about three times as great as that of shock corn.

4. In the feeding of 5.33 acres of silage to calves 8.69 acres of crops other than corn were used. In the feeding of 5.33 acres of shock corn to calves 5.68 acres of crops other than corn were used. This difference may or may not be found unavoidable.

5. It requires a third longer time to feed an acre of corn silage than an acre of shock corn.

6. The average number of pounds of meat made per acre from a system of silage feeding where oats and hay were used as supplementary feeds was 385.35, where shock corn with oats and hay were fed 337.91 pounds—a difference of 47.45 pounds per acre in favor of a system of silage feeding.

7. So far as the cost of harvesting and feeding crops for the production of beefs is concerned, in the net profits of the enterprise, it should be borne in mind that it will probably require nearly twice as great an expenditure of labor and capital in a system of silage feeding as in a system of shock corn feeding.

8. The silage-fed steers were in much better thrift and flesh at the end of the experiment than were the shock corn fed steers.

9. In case of the silage-fed steers 97.69 per cent of the meat produced was beef and 2.31 per cent pork. In case of the shock-corn-fed steers 84.22 per cent of the meat produced was beef and 15.78 per cent was pork. This clearly shows that pork production is an important factor in a system of feeding shock corn for beef production, while it may be entirely eliminated from a system of silage feeding for beef production practically without loss.

10. It should be noted that the silage-fed lot consumed less feed than the shock corn lot and less feed per pound of gain whether beef alone is considered or beef and pork combined. The amount of dry matter required to produce a pound of gain of meat where the corn was fed in the form of silage was 6.52; where fed in the form of shock corn it was 8.57 pounds.

11. With an average daily ration to each steer in Lot 1 of 26 pounds silage, two pounds oat and 4.55 pounds of mixed hay, an average daily gain of 1.68 pounds was secured for a period of 88 days. With an average daily ration to each steer in Lot 2 of 13.22 pounds shock corn, two pounds oats and four pounds mixed hay an average daily gain of 1.42 pounds was secured for a period of 88 days.

12. Under conditions comparable with those prevailing in this experiment one steer would be able to make an average daily gain of 1.68 pounds for a period of six months on .82 of an acre of silage, oats, and hay of which .31 of an acre would be devoted to corn for silage, .23 of an acre to oats and .28 of an acre to hay. One steer receiving shock corn, oats and hay would be able to make an average daily gain of 1.42 pounds for a period of six months on .92 of an acre, of which .45 of an acre would be devoted to growing the corn, .23 of an acre to oats, and .24 of an acre to hay, making a difference of .26 of a pound of meat per day per steer and one-tenth of an acre of land for the season, both being in favor of the steers receiving their corn in the form of silage for the period designated.

Dairy Laws of Illinois

Laws of 1879, page 111. (Hurd's Revised Statutes, chapter 38, sections 9-9e.)

AN ACT to regulate the sale of milk, and to provide penalties for the adulteration thereof. (Approved May 29, 1879.)

Section 1. That whoever shall, for the purpose of sale for human food, adulterate milk with water or any foreign substance, or whoever shall knowingly sell for human food, milk from which cream has been taken, without the purchaser being informed or knowing the fact, or whoever shall knowingly sell for human food, milk from which what is commonly called "strippings" has been withheld, without the purchaser thereof being informed or knowing the fact, or whoever shall knowingly sell for human food milk drawn from a diseased cow, knowing her to be so diseased as to render her milk unwholesome, or whoever shall knowingly sell for human food, milk so tainted or corrupted as to be unwholesome, or whoever shall knowingly supply, or bring to be manufactured into any substance for human food, to any cheese or butter factory or creamery, without all interested therein knowing or being informed of the fact, milk which is adulterated with water or any foreign substance, or milk from which cream has been taken, or milk from which what is commonly called "strippings" has been withheld, or milk drawn from a diseased cow, knowing her to be so diseased as to injure her milk, or milk so tainted or corrupted as to be unwholesome, or whoever shall knowingly, with intent to defraud, take from milk after it has been delivered to a cheese factory, or butter factory or creamry, to be manufactured into any substance for human food, for or on account of the person supplying the milk or cream, or shall, with like intent, knowingly add any foreign substance to the milk or cream, whereby it, or the pro-

ducts thereof, shall become unwholesome for human food, shall be guilty of a misdemeanor, and for each and every such misdemeanor shall be fined not less than twenty-five nor more than one hundred dollars or confined in the county jail not exceeding six months or both, in the discretion of the court.

Sec. 2. Any person who shall adulterate milk, with the view of offering the same for sale or exchange, or shall keep cows for the production of milk for market, or for sale or exchange, in an unhealthy condition, or knowingly feed the same on food that produces impure, diseased, or unwholesome milk, shall be deemed guilty of a misdemeanor, and, on conviction, shall be punished by a fine of not less than fifty dollars nor more than two hundred dollars, for each and every offense.

Sec. 3. Any person or persons who shall in any of the cities of this State, engage in or carry on a retail business in the sale, exchange of, or any retail traffic in milk, shall have each and every case in which the milk is carried or exposed for sale or exchange, and the carriage or vehicle from which the same is vended, conspicuously marked with his, her, or their name or names, also indicating, by said mark the locality from which said milk is obtained or produced, and for every neglect for such markings, the person or persons so neglecting shall be subject to the penalties expressed in section 2 of this act; but for every violation of this act, by so marking said case, carriage, or vehicle, as to convey the idea that said milk is produced or procured from a different locality than it really is, the person or persons so offending shall be subject to a fine of one hundred dollars.

Sec. 4. Any person who shall, in any of the cities in this State, offer for sale any milk from which the cream or any part thereof shall have been taken, shall offer for sale and sell the same as skimmed milk, and not otherwise, and shall have each can or vessel in which such milk is carried, or exposed for sale, plainly and conspicuously marked with the words "Skimmed Milk." Any person violating this section shall be subject to a fine not exceeding fifty dollars for each and every violation.

Sec. 5. Upon the rendition of judgment imposing a fine as provided in the foregoing sections, it shall be the duty of the justice of the peace or other court rendering said judgment, also to render a judgment for the costs, and forthwith to issue a capias or warrant of commitment against the body of the defendant commanding that, unless the said fine and costs be forthwith paid, the defendant shall be committed to the jail of the county, and the constable or other officer to whose hand said capias or warrant shall come shall, in default of such payment, arrest the defendant and commit him to the jail of the county, there to remain, as provided by section 308 of "An act to revise the law in relation to criminal jurisprudence," in force July 1, 1874, unless such fine and costs shall sooner be paid.

Sec. 6. The addition of water or any foreign substance to milk or cream intended for sale or exchange, is hereby declared an adulteration. Any milk that is obtained from cows fed on distillery waste, usually called "swills," or upon any substance in a state of putrefaction, is hereby declared to be impure and unwholesome. Nothing in this act shall be construed to prevent the addition of sugar in the manufacture of condensed or preserved milk.

Sec. 7. Section nine of division one of an act entitled "An act to revise the law in relation to criminal jurisprudence (approved March 27, 1874); and all other acts and parts of acts inconsistent herewith are hereby repealed.

Laws of 1883, page 54 (Revised Statutes, chapter 5, sections 29-32.)

AN ACT to require operators of butter and cheese factories on the co-operative plan to give bonds, and to prescribe penalties for the violation thereof. (Approved June 18, 1883.)

Section 1. That it shall be unlawful for any person or persons, company or corporation, within this State to operate, carry on, or conduct the business of manufacturing butter or cheese on the co-operative or dividend plan until such person or persons, company or corporation, shall have filed with the circuit clerk or recorder of deeds of the county in

which it is proposed to carry on such business a good and sufficient bond, to be approved by such circuit clerk or recorder of deeds, in the penal sum of six thousand dollars, with one or more good sureties, conditioned that such person or persons, company or corporation, proposing to carry on such business will, on or before the first day of each month, make, acknowledge, subscribe, and swear to a report in writing, showing the amount of product manufactured, the amount sold, the prices received thereof, and the dividends earned and declared for the third month preceding the month in which such report is made, and will file a copy of such report with the clerk of the town or precinct in which such factory is located, and will also keep publicly posted, in a conspicuous place in such factory, a copy of such report for the inspection of the patrons thereof, and that such dividends shall be promptly paid to the persons entitled thereto.

Sec. 2. Such bond shall run to the people of the State of Illinois, and shall be for the benefit and protection of all patrons of such factory, and suit may be had thereon by any person or persons injured by a breach of the conditions thereof by an action of debt for the use of the person or persons interested for all damages sustained by them.

Sec. 3. Such bond shall be recorded by the circuit clerk or recorded with whom the same is filed, and all such reports so filed with any town or precinct clerk shall be preserved by him and held subject to the inspection of any person or persons interested.

Sec. 4. Any person who shall willfully violate any provision of this act shall be liable to a fine of not less than two hundred dollars, or more than five hundred dollars, or imprisonment in the county jail for not less than thirty days nor more than six months, or both, in the discretion of the court.

Laws of 1879, page 11 (Revised Statutes, chapter 38, sections 39a-39c.)

AN ACT to prevent frauds in the manufacture and sale of butter and cheese. (Approved May 31, 1879.)

Section 1. That whoever manufactures, sells, or offers for sale, or causes the same to be done, any substance purporting to be butter or

cheese, or having the semblance of butter or cheese, which substance is not made wholly from pure cream or pure milk, unless the same be manufactured under its true and appropriate name, and unless each package, roll, or parcel of such substance, and each vessel containing one or more packages of such substance, have distinctly and durably painted, stamped, or marked thereon the true and appropriate name of such substance, in ordinary boldfaced capital letters not less than five lines pica, shall be punished as provided in section 3 of this act.

Sec. 2. Whoever shall sell any such substance as is mentioned in section 1 of this act to consumers, or cause the same to be done, without delivering with each package, roll, or parcel so sold, a label on which is plainly and legibly printed, in Roman letters, the true and appropriate name of such substance, shall be punished as is provided in section 3 of this act.

Sec. 3. Whoever knowingly violates section 1 or section 2 of this act shall be fined in any sum not less than ten nor more than three hundred dollars, or imprisoned in the county jail not less than ten nor more than ninety days, or both in the discretion of the court; Provided, That nothing contained in this act shall be construed to prevent the use of skimmed milk, salt, rennet, or harmless coloring matter, in the manufacture of butter and cheese.

Laws of 1881, page 74, (Revised Statutes, chapter 28, sections 9f-9g.

AN ACT to prevent the adulteration of butter and cheese, or the sale or disposal of the same, or the manufacture or sale of any article as a substitute for butter or cheese, or any article to be used as butter and cheese. (Approved June 1, 1881.)

Section 1. That whoever manufactures, out of any oleaginous substances, or any compound of the same other than that produced from unadulterated milk, or cream from the same, any article designed to take the place of butter or cheese produced from pure, unadulterated milk, or cream of the same, and shall sell, or offer for sale, the same as butter or cheese, or give to any person the same as an article of food, as butter or cheese, shall, on conviction thereof, be fined not less than twenty-five dollars nor more than two hundred dollars.

Sec. 2. All acts or parts of acts inconsistent with this act are hereby repealed.

Laws of 1881 page 75 (Revised Statutes, chapter 33, sections 9h-9o.)

AN ACT to prevent and punish the adulteration of articles of food, drink and medicine, and the sale thereof when adulterated. (Approved June 1, 1881.)

Section 1. That no person shall mix, color, stain, or powder, or order or permit any other person his or her employ to mix, color, stain, or powder any article of food with any ingredient or material, so as to render the article injurious to health, or depreciate the value thereof, with intent that the same may be sold; and no person shall sell or offer for sale any such article so mixed, colored, stained or powdered.

* * * * *

Sec. 3. No person shall mix, color, stain, or powder any article of food, drink, or medicine, or any article which enters into the composition of food, drink or medicine, with any other ingredient or material, whether injurious to health or not, for the purpose of gain or profit, or sell, or offer the same for sale, or permit any other person to sell or offer for sale any article so mixed, colored, stained, or powdered, unless the same be so manufactured, used, or sold, or offered for sale under its true and appropriate name, and notice that the same is mixed or impure is marked, printed, or stamped upon each package, roll, parcel or vessel, containing the same, so as to be and remain at all times readily visible, or unless the person purchasing the same is fully informed by the seller of the true name and ingredients (if other than such as are known by the common name thereof) of such article of food, drink or medicine, at the time of making sale thereof, or offering to sell the same.

Sec. 4. No person shall mix oleomargarine, suine, butterine, beef fat, lard, or any other foreign substance, with any butter or cheese intended for human food, without distinctly marking, stamping, or labeling the article, or the package containing the same, with the true and appropriate name of such article, and the percentage in which such oleo-

margarine or suine enters into its composition; nor shall any person sell or offer for sale, or order or permit to be sold or offered for sale, any such article of food into the composition of which oleomargarine or suine has entered, without at the same time informing the buyer of the fact, and the proportions in which such oleomargarine, suine, or butterine, beef fat, lard, or any other foreign substance has entered into its composition. Provided, That nothing in this act shall be so construed as to prevent the use of harmless coloring matter in butter and cheese, or other articles of food.

Sec. 5. Any person convicted of violating any provisions of any of the foregoing sections of this act shall, for the first offense, be fined not less than twenty-five dollars nor more than two hundred; for the second offense he shall be fined not less than one hundred nor more than two hundred dollars, or confined in the county jail not less than one month nor more than six months, or both, at the discretion of the court; and for the third and all subsequent offenses he shall be fined not less than five hundred dollars nor more than two thousand dollars, and imprisoned in the penitentiary not less than one year nor more than five years.

(Section 6, which makes ignorance of the provisions of the law a defense against prosecution, is repealed in the food commission bill.)

Ses. 7. The State's attorneys of this state are charged with the enforcement of this act, and it is hereby made their duty to appear for the people, and to attend to the prosecution of all complaints under this act, in their respective counties, in all courts.

Sec. 8. All acts and parts of acts inconsistent with the provisions of this act are hereby repealed.

Laws of 1897, page 3 (Revised statutes, chapter 38, sections 39d-39n.)

AN ACT to regulate the manufacture and sale of substitutes for butter.

Approved June 14, 1897.)

Section 1. That for the purpose of this act every article, substitute, or compound other than that which is produced from pure milk or cream therefrom, made in the semblance of butter and designed to be used as a

substitute for butter made from pure milk or its cream. is hereby declared to be imitation butter. Provided, That the use of salt and harmless coloring matter for coloring the product of pure milk or cream shall not be construed to render such product an imitation.

Sec. 2. No person shall coat, powder, or color with annatto or any coloring matter whatever any substance designed as a substitute for butter, whereby such substitute or product so colored or compounded shall be made to resemble butter, the product of the dairy. No person shall combine any animal fat or vegetable oil or other substance with butter or combined therewith or with animal fat or vegetable oil or combination of the two, or with either one, any other substance or substances, for the purpose or with the effect of imparting thereto a yellow color or any shade of yellow so that such substance shall resemble yellow or any shade of genuine yellow butter, nor introduce any such coloring matter or such substance or substances into any of the articles of which the same is composed: Provided, Nothing in this act shall be construed to prohibit the use of salt, rennet, and harmless coloring matter for coloring the products of pure milk or cream from the same.

No person shall, by himself, his agents, or employes, produce or manufacture any substance in imitation or semblance of natural butter, nor sell, nor keep for sale, nor offer for sale any imitation butter, made or manufactured, compounded or produced in violation of this section, whether such imitation butter shall be made or produced in this State or elsewhere. This section shall not be construed to prohibit the manufacture and sale, under the regulations hereinafter provided, of substances designed to be used as a substitute for butter and not manufactured or colored as herein prohibited

Sec. 3. Every person who lawfully manufacture any substance designed to be used as a substitute for butter shall mark by branding, stamping, or stenciling upon the top and side of each tub, firkin, box, or other package in which said article shall be kept and in which it shall be removed from the place where it is produced, in a clean and durable

manner, in the English language, the word "Oleomargarine," or the word "Butterine," or the words "Substitute for Butter," or the words "Imitation Butter," in printed letters in plain, Roman type, each of which shall not be less than three-quarters of an inch in length.

Sec. 4. It shall be unlawful to sell or offer for sale any imitation butter without informing the purchaser thereof, or the persons or persons to whom the same is offered for sale, that substance sold or offered for sale is imitation butter.

Sec. 5. No person, by himself or another, shall ship, consign, or forward by any common carrier, whether public or private, any substance designed to be used as a substitute for butter, unless it shall be marked or branded on each tub, box, firkin, jar, or other package containing the same, as provided in this act, and unless it be consigned by the carrier and receipted for by its true name: Provided, That this act shall not apply to any goods in transit between foreign States across the State of Illinois.

Sec. 6. No person shall have in his possession, or under his control, any substance designed to be used as a substitute for butter, unless the tub, firkin, jar, box, or other package containing the same be clearly and durably marked, as provided in this act: Provided, That this section shall not be deemed to apply to persons who have the same in their possession for the actual consumption for themselves or their families. Every person who shall have in his possession or control any imitation butter for the purpose of selling the same, which is not marked as required by the provisions of this act, shall be presumed to have known during the time of such possession or control the true character and name as fixed by this act of such product.

Sec. 7. Whoever shall have possession or control of any imitation butter or any substance designed to be used as a substitute for butter, contrary to the provisions of this act, for the purpose of selling the same, or offering the same for sale, shall be held to have possession of such property with intent to use it in violation of this act,

Sec. 8. No action shall be maintained on account of any sale or contract made in violation of or with the intent to violate this act by or through any person who was knowingly a party to such wrongful sale or contract.

Sec. 9. Whoever shall deface, erase, or remove any mark provided by this act, with intent to mislead, deceive, or to violate any of the provisions of this act, shall be guilty of a misdemeanor.

Sec. 10. Whoever shall violate any of the provisions of this act shall be punished by a fine of not less than fifty nor more than two hundred dollars, or by imprisonment in the county jail not to exceed sixty days, for each offense, or by both fine and imprisonment, in the discretion of the court, or the fine alone may be sued for and recovered before any justice of the peace in the county where the offense shall be committed, at the instance of any person, in the name of the people of the State of Illinois as plaintiff.

Sec. 11. It is hereby made the duty of the State's attorney of each county in this State to prosecute all violations of this act upon complaint of any person, and there shall be taxed as his fees in the case the sum of ten dollars, which shall be taxed as costs in the case.

AN ACT to protect the public from imposition in relation to canned or preserved food. (Approved June 27, 1885.)

Section 1. That it shall hereafter be unlawful in this State for any packer or dealer in preserved or canned fruits and vegetables or other articles of food to offer such canned articles for sale after January 1, 1886, with the exception of goods brought from foreign countries, or packed prior to the passage of this act, unless such articles bear a mark to indicate the grade or quality, together with the name and address of such firm, person, or corporation that pack the same or dealer who sells the same. The firm, person, or corporation labeling such goods shall be considered the packer or packers.

Sec. 3. Any person, firm, or corporation, who shall falsely stamp or label such cans or jars containing preserved fruit or food of any kind, or

knowingly permit such false stamping or labeling, and any person, firm, or corporation who shall violate any of the provisions of this act shall be deemed guilty of a misdemeanor, and punished with a fine or not less than fifty dollars; in the case of vendors, and in the case of manufacturers and those falsely or fraudulently stamping or labeling such cans or jars, a fine of not less than five hundred dollars nor more than one thousand dollars, and it shall be the duty of any board of health in this State cognizant of any violation of this act to prosecute any person, firm, or corporation which it has reason to believe has violated any of the provisions of this act, and after deducting the costs of the trial and conviction, to retain for the use of such board the balance of the fine or fines recovered.

PURE FOOD COMMISSIONER'S BILL.

For an act to provide for the appointment of a State Food Commissioner and to define his powers and duties and fix his compensation, and to prohibit and prevent adulteration, fraud, and deception in the manufacture and sale of articles of food, and to repeal certain acts or parts of acts therein named.

Section 1. Be it enacted by the People of the State of Illinois represented in the General Assembly: That the office of State food commissioner for the State of Illinois is hereby created. Within thirty days after this act shall take effect such commissioner shall be appointed by the Governor, by and with the advice and consent of the Senate, and his term of office shall be for two (2) years from the date of his appointment and until his successor is appointed and qualified. Thereafter the term of office of the commissioner shall be for four years and until his successor is qualified. The salary of the commissioner shall be twenty-five hundred dollars (\$2,500) per annum and his necessary and actual expenses incurred in the discharge of his official duties.

2. Such commissioner may, with the advice and consent of the Governor, appoint two assistant commissioners, each of acknowledged

standing, ability, and integrity, one of whom shall be an expert in the matter of dairy products, and the other of whom shall be a practical and analytical chemist, who shall be known as State analyst. The salaries of such assistants shall not exceed eighteen hundred dollars (\$1,800) each per annum and their necessary and actual expenses incurred in the discharge of their official duties. In case of the absence or inability of the State analyst to perform all the duties of his office, the commissioner may appoint some competent person to assist in the same temporarily.

3. The food commissioner shall have authority to appoint necessary inspectors not exceeding six in number to assist in the work of the food commissioner at such times and for such periods of time as may be required in the enforcement of the dairy food laws of the State. Such inspectors shall have the same right of access to places to be inspected as the commissioner. The compensation of such inspectors shall be three dollars (\$3.00) per day for each day of actual service, and their necessary and actual expenses when so employed.

4. It shall be the duty of the commissioner to enforce all laws that now exist or that may hereafter be enacted in this State regarding the production, manufacture, or sale of dairy products, or the adulteration of any article of food, and personally or by his assistants to inspect any article of food made or offered for sale within this State, which he may, through himself or his assistants, suspect or have reason to believe to be impure, unhealthy, adulterated or counterfeit, and to prosecute, or cause to be prosecuted, and person or persons, firm or firms, corporation or corporations, engaged in the manufacture or sale of any adulterated or counterfeit article or articles of food contrary to the laws of this State.

5. It shall be the duty of the food commissioner to carefully inquire into the quality of the dairy and food products, and the several articles which are foods or the necessary constituents of food, which are manufactured for sale or sold or exposed or offered for sale in this State, and he may in a lawful manner procure samples of the same, and direct the State analyst to make due and careful examination of the same, and report to the commissioner the result of the analysis of all or any such food or dairy products as are adulterated, impure or unwholesome, in contravention of the laws of this State, and it shall be the duty of the commissioner to make complaint against the manufacturer or vender thereof in the proper county, and furnish the prosecuting attorney with the evidence thereon and thereof to obtain a conviction for the offense

charged. The food commissioner, or his assistants, or any person by him duly appointed for that purpose, shall have power in the performance of their duties to enter any dairy, creamery, cheese factory, store, sales-room, warehouse (excepted bonded warehouses for the storage of distilled spirits), where goods are stored or exposed for sale or place where they have reason to believe food is stored or offered for sale, and to open any cask, tub, jar, bottle or package containing or supposed to contain any article of food, and examine or cause to be examined the contents thereof, and take therefrom samples for analysis. The person making such inspection shall take such samples of such articles of product, in the presence of at least one witness, and he shall, in the presence of such witness, mark or seal such sample and shall tender, at the time of taking, to the manufacturer or vender of such produce, or to the person having the custody of the same, the value thereof, but if the person from whom such sample is taken shall request him to do so, he shall, at the same time and in the presence of the person from whom such property is taken, securely seal up two samples of the article seized or taken, the one of which shall be for examination or analysis under the direction of the commissioner, and the other of which shall be delivered to the person from whom the article was taken. Any person who shall obstruct the commissioner or any of his assistants by refusing to allow him entrance to any place which he desires to enter in the discharge of his official duty, or refuse to deliver to him a sample of any article of food made sold or exposed for sale by such person, when the same is requested, and when the value thereof is tendered, shall be guilty of a misdemeanor, punishable by a fine of not exceeding fifty dollars (\$50.00) for the first offense, and not exceeding five hundred dollars (\$500) or less than fifty dollars (\$50.00) for each subsequent offense.

6. It shall be the duty of the state's attorney in any county of the State, when called upon by the commissioner or any of his assistants, to render any legal assistance in his power to execute the laws and to prosecute cases arising under the provisions of this act.

7. The State board of health may submit to the commissioner, or to any of his assistants, samples of food or drink for examination or analysis, and shall receive special reports, showing the result of such examination or analysis.

8. It shall be unlawful for the State analyst, while he holds his office, to furnish to any individual, firm or corporation any certificate as

to the purity or excellence of any article manufactured or sold by them to be used as food or in the preparation of food.

9. The salary of the commissioner shall be paid from the fund appropriated for the payment of the salaries of State officers, and his assistants shall be paid out of the State treasury from the same fund and in the same manner as the salaries of other employes of the State are paid, and their official expenses shall be paid at the end of each calendar month upon bills duly itemized and approved by the Governor, and the amount necessary to pay such salaries and expenses is hereby appropriated.

10. The commissioner may, under the direction of the Governor, fit up a laboratory, with sufficient apparatus for making analysis contemplated in this act, and for such purpose the sum of fifteen hundred dollars (\$1,500), or so much thereof as may be necessary, is hereby appropriated; and for the purpose of providing materials, and for necessary expenses connected with the making of such analysis, there is also hereby appropriated so much as may be necessary, not exceeding six hundred dollars (\$600) annually. The appropriation provided for in this section shall be drawn from the State treasury upon certified bills approved by the Governor.

11. The commissioner shall make an annual report to the Governor on or before the first day of January in each year, which shall be printed and published. Such report shall cover the doings of his office for the preceding year and shall show, among other things, the number of factories, creameries, and other places inspected, and by whom; the number of specimens of food articles analyzed, and the State analyst's report upon each one when the analysis indicates the same to be contrary to law; the number of complaints entered against persons for violation of the laws relative to the adulteration of food; the number of convictions had and the amount of fines imposed therefor, together with such recommendations relative to the statutes in force as his experience may justify. The commissioner may also prepare, print and distribute to the newspapers of the State, and to such persons as may be interested or may apply therefor, a monthly bulletin containing results of inspections, the results of analysis made by the State analyst of articles offered for sale contrary to law, with popular explanation of the same, and such other information as may come to him in his official capacity relating to the adulteration of food and drink products and of dairy products, so far

as he may deem the same of benefit and advantage to the public; also a brief summary of all the work done during the month by the commissioner and his assistants in the enforcement of the laws of the State, but not more than ten thousand copies of each of such monthly bulletins shall be printed: Provided the necessary printing shall be done by the State printer, and all expense for stationery and printing shall be audited and paid from the same fund and in the same manner as other State printing and stationery.

All fines, penalties and costs recovered for violations of this act and other acts now enacted or hereafter to be enacted prohibiting or regulating the adulteration of foods shall be paid into the State treasury to the credit of the general fund of the State.

12. No person shall, within this State, manufacture for sale, have in his possession with intent to sell, offer for sale, or sell any article of food which is adulterated within the meaning of this act.

13. The term "food," as used herein, shall include all articles, whether simple, mixed or compound, used for food, candy, drink or condiment by man or domestic animals.

14. An article shall be deemed to be adulterated within the meaning of this act:

First—If any substance or substances has or have been mixed with it so as to depreciate, lower or injuriously affect its quality, strength or purity.

Second—If any inferior or cheaper substance or substances has or have been substituted wholly or in part for the article.

Third—If any valuable necessary constituent or ingredient has been wholly or in part abstracted from it.

Fourth—If it be an imitation of and sold under the name of another article.

Fifth—If it is mixed, colored, coated, polished or powdered, whereby damage or inferiority is concealed, or if by any means it is made to appear better or of greater value than it really is.

Sixth—If it contains any added substance or ingredients which is poisonous or injurious to health.

Seventh—If it consists wholly or in part of a decomposed, putrid, infected, tainted or rotten animal or vegetable substance or article, whether manufactured or not, or, if it is the product of a diseased animal, or if of an animal that has died otherwise than by slaughter: Provided, that

an article of food that does not contain any ingredient injurious to health, and in the case of mixtures or compounds, which may be now, or from time to time hereafter, known as articles of food under their own distinctive names, or which shall be labeled so as to plainly indicate that they are mixtures, combinations, compounds or blends, and not included in definition fourth of this section, shall not be deemed to have been adulterated. Provided, further, that all manufactured articles of food offered for sale shall be distinctly labelled, marked or branded with the name of the manufacturer and place of manufacture, or the name and address of the packer or dealer who sells the same.

15. No person shall manufacture for sale, offer or expose for sale, sell or deliver, or have in his possession with intent to sell or deliver, any vinegar not in compliance with the provisions of this act. No vinegar shall be sold as apple, orchard or cedar vinegar which is not the product of pure apple juice, known as apple cider and apple, orchard or cedar vinegar upon test shall contain not less than one and three-fourths per cent, by weight, of cider vinegar solids upon full evaporation at the temperature of boiling water.

16. All Vinegar made by fermentation and oxidation without the intervention of distillation shall be branded with the name of the fruit or substance from which the same is made. All vinegar made wholly or in part from distilled liquor shall be branded "distilled vinegar." All fermented vinegar, not distilled shall contain not less than one and one-fourth per cent, by weight, upon full evaporation (at the temperature of boiling water), of solids contained in the fruit from which said vinegar is fermented, and said vinegar shall contain not less than two and a half tenths of one per cent ash or mineral matter, the same being the product of the material from which said vinegar is manufactured. All vinegar shall be made wholly from the fruit or grain from which it purports to be or is represented to be made, shall contain no foreign substance, and shall contain not less than four per cent, by weight, of absolute acetic acid.

17. No person shall manufacture for sale, offer for sale or have in his possession with intent to sell, any vinegar found upon test to contain any preparation of lead, copper, sulphuric acid or other mineral acid, or other ingredients injurious to health. All packages containing vinegar shall be marked, stenciled or branded on the head of the cask, barrel or keg containing such vinegar, with the name and residence of the manufac-

turer or dealer, together with the brand required in section 16 of this act.

18. No person shall offer for sale, sell or deliver for food or drink purposes, ice, natural or manufactured, containing any decomposed, putrid, infected, tainted or rotten animal or vegetable substance or any ingredient which is poisonous or injurious to health. If intended for food or drinking purposes shall not be composed of water of lower standard of purity than that required for domestic purposes by the state board of health.

19. Any person or persons manufacturing for sale or selling or offering to sell any candies or confectioneries adulterated by the admixture of terra alba, barytes, talc or other earthy or material substances, or any poisonous colors, flavors or extracts or other deleterious ingredients detrimental to health, shall, upon proper conviction thereof, be punished by a fine of not less than ten nor more than one hundred dollars or imprisonment in the county jail not less than ten nor more than thirty days, or both such fine and imprisonment, in the discretion of the court.

20. No packer or dealer in preserved or canned fruits and vegetables or other articles of food, shall sell or offer for sale such canned or preserved fruits and vegetables or other articles of food, unless they shall be entirely free from substances or ingredients deleterious to health, and unless such articles bear a mark, stamp, brand or label bearing the name and address of the firm, person or corporation that packs same, or dealer that sells same. All soaked or bleached goods or goods put up from products dried before canning, shall be plainly marked, branded, stamped or labeled as such, with the words "soaked" or "bleached goods" in letters not less than two-line pica in size, showing the name of the article and name and address of the packer or dealer who sells same.

21. No person shall manufacture for sale, have in his possession with intent to sell, offer or expose for sale, or sell as fruit, jelly, jam, or fruit butter, any jelly, jam or imitation fruit butter or other similar compound made or composed, in whole or in part, of glucose, dextrine, starch or other substance, and colored in imitation of fruit jelly, jam or fruit butter; nor shall any such jelly, jam or fruit butter or compound be manufactured or sold, or offered for sale, under any name or designation whatever, unless the same shall be composed entirely of ingredients not injurious to health; and every can, pail or package of such jelly, jam or butter sold in this State shall be distinctly and durably labeled "imi-

tation fruit, jelly, jam, or butter," with the name and address of manufacturer or dealer who sells same.

22. Extracts made of more than one principle must be labeled with the name of each principle or else simply with the name of the inferior or adulterant.

In all cases when an extract is labeled with two or more names, the type used is to be similar in size and the name of any one of the articles used is not to be given greater prominence than another. The word compound cannot be used. Extracts which cannot be made from the fruit, berry or bean, and must necessarily be made artificially, as raspberry, strawberry, etc., shall be labeled "artificial." Chocolates and cocoas must not contain substances other than cocoa mass, sugar and flavoring and will not be required to be labeled "compound" or "mixture." Prepared cocoanut, if so labeled, shall contain nothing but cocoanut, sugar and glycerine, and shall not be classed as compound or mixture.

23. Whoever shall falsebrand, mark, stencil or label any article or product required by this act to be branded, marked, stenciled or labeled or shall remove, alter, deface, mutilate, obliterate, imitate or counterfeit any band, mark, stencil or label so required, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than twenty-five nor more than two hundred dollars, and costs of prosecution, or by imprisonment in the county jail for not less than thirty days nor more than ninety days, or by both such fine and imprisonment in the discretion of the court, for each and every offense.

24. The taking of orders, or the making of agreements or contracts by any person, firm or corporation, or by any agent or representative thereof, for the future delivery of any of the articles, products, goods, wares or merchandise embraced within the provisions of this act, shall be deemed a sale within the meaning of this act.

25. Every person manufacturing, offering or exposing for sale or delivery to a purchaser any article intended for food, shall furnish to any person, or analyst or other officer or agent appointed hereunder who shall apply to him for the purpose and shall tender him the value of the same, a sample sufficient for the analysis of any such article which is in his possession. Whoever hinders, obstructs or in any way interferes with any inspector, analyst or other officer appointed hereunder, in the performance of his duty, and whoever wilfully neglects or refuses to do any of the provisions of this act, shall be guilty of a misdemeanor, and

upon conviction shall, where no specific penalty is prescribed by this act, be punished by a fine not exceeding two hundred nor less than twenty-five dollars, or by imprisonment in the county jail for a period not exceeding ninety days, or by both such fine and imprisonment, in the discretion of the court.

26. All acts and parts of acts inconsistent with this act, and Section 6 of an act entitled "An act to prevent the adulteration of butter and cheese, or the sale and disposal of the same, or the manufacture or sale of any article as a substitute for butter or cheese, or any article to be used as butter and cheese," approved June 1, 1881, be and they are hereby repealed.

27. For the purpose of enabling dealers in products affected by this act to dispose of same without loss, it is hereby expressly provided that the penalties of this act, and prosecution under the same, are suspended until the first day of July, 1900.

New National Oleomargarine Law.

The law as amended by the Congress presented with an introduction by Charles Y. Knight, Secretary of the National Dairy Union. This law became effective July 1, 1902.

Illinois dairymen were in the fight from the first for a tax of 10 cents per pound on oleomargarine when colored in imitation of butter. so the victory in Congress last April, when the law was passed by both branches of the National legislative body, was a victory for Illinois dairymen as it was a victory for dairymen of the whole country. This fight had in Illinois the indorsement of the Farmers' Institute, that body in its State convention having passed a resolution asking Congress to give the dairymen of the country the legislation asked for the protection of their business against the fraudulent selling of oleomargarine as butter. The dairymen of the State acknowledge and appreciate this help from the Farmers' Institute. They also acknowledge the help given by men in this State who are conspicuous representatives of the beef industry, but who supported in public speeches the dairymen in this struggle.

The new national oleomargarine law, or rather the old law as amended by Congress, went into effect July 1, 1902. The amended law is given

here in full together with an introductory explanation by Charles Y. Knight, secretary of the National Dairy Union. Mr. Knight was the leader in the fight for this legislation. He arranged the campaign and headed the dairy forces and to him a large share of the credit is due. He succeeded where others had failed, and did it with constant, conscientious and thorough work.

The amended law, together with Mr. Knight's letter transmitting to dairymen of the country a complete copy of the law are in full as follows:

THE NEW OLEOMARGARINE LAW.

Chicago, June 6, 1902.

To the Dairy Interests of the United States:

I take pleasure in transmitting to you herewith a complete copy of the new Oleomargarine law, which was finally passed by Congress April 28, and approved by President Roosevelt May 9.

THE VITAL FEATURE OF THE LAW.

The important feature of the law is contained in the following paragraphs:

"Sec. 8. That upon oleomargarine which shall be manufactured and sold, or removed for consumption or use, there shall be assessed and collected a tax of ten cents per pound, to be paid by the manufacturer thereof; and any fractional part of a pound in a package shall be taxed as a pound: Provided, When Oleomargarine is free from artificial coloration that causes it to look like butter of any shade of yellow said tax shall be one-fourth of one cent per pound.

"And any person that sells, vendes, or furnishes oleomargarine for the use and consumption of others, except to his own family table without compensation, who shall add to or mix with such oleomargarine any artificial coloration that causes it to look like butter of any shade of yellow shall also be held to be a manufacturer of oleomargarine within the meaning of said act, and subject to the provisions thereof."

THE NEW GROUT BILL ONLY AN AMENDMENT TO THE LAW OF 1886.

What has been known as "The New Grout Bill," it will be understood, is only an amendment to the original oleomargarine law of 1886.

That law, which taxed all oleomargarine 5c per lb. contained complete provisions for the marking and branding of packages, the taxing of manufacturers (\$600 per year), wholesalers (\$450) and retailers (\$48), the object of the new measure being to increase the tax to 10c per lb. upon that oleomargarine which is artificially colored to resemble butter and to give states the right to control the traffic without interference upon the part of the Supreme Court of the United States.

ORIGIN OF THE TEN CENT TAX IDEA.

The writer has the honor of having originated the idea and developed the plan for increasing this tax, having set forth fully the scheme in the issue of his paper, Chicago Dairy Produce, of Dec. 10, 1898, three and one-half years ago. The proposition was submitted to the National Dairy Union, of which he had then been secretary for two years, and was endorsed. In January, 1899, Chicago Dairy Produce, of which the writer is editor and manager, started the ball rolling by subscribing \$1,000 to a fund of \$10,000 to be raised to defray the expenses of bringing this matter to the attention of the dairymen of this country and Congress. This \$1000 contribution was promptly duplicated by a similar amount from the De Laval Separator company of New York, and a \$500 subscription from the Worcester Salt company of the same city. Buttermakers and creamerymen throughout the country took up the work and inside of seven months the \$10,000 fund was fully subscribed.

WORK OF SECURING LEGISLATION GREATER THAN ANTICIPATED.

It must be confessed, however, that, despite our intimate knowledge of conditions to be met in securing legislation for the protection of the dairymen, we underestimated the strength and resources of the opposition. First, we found the chairman of the committee to which the original bill was sent in the House was bitterly opposed to the legislation, although coming from an agricultural district of New York, where we counted upon support. In order to carry out his promise to the oleomargarine makers to smother our bill, he referred it to a sub-committee, the chairman of which represented the oleomargarine making district of Chicago, and four out of five members of which were against us. After four months fighting we finally succeeded in getting a report from this sub-committee, and although it was adverse, by a narrow vote of nine to eight, we secured a favorable report in the full committee.

Then followed what is conceded to be one of the most active and bitterly contested fights ever known in Congress. The oleomargarine makers summoned to their support, through misrepresentations, the growers of cotton, live stock and leaders of organized labor, all of whom sent delegation after delegation to appear before the House and Senate committees to protest against our bill. The cotton growers through cottonseed oil makers, claimed the cottonseed oil industry would be wiped out if oleomargarine could not masquerade as butter; the National Livestock Association maintained a lobbyist at Washington, whom they paid \$10,000 per year, to antagonize the bill, on the plea that if oleomargarine could not be colored to look like butter, the value of livestock in this country would depreciate \$65,000,000 per year as a result of a loss of a market for beef fat and lard. The representatives of labor unions claimed that laboring men wanted oleomargarine and wanted it colored to look like yellow butter.

Our victory of December 7, 1900, in the House, was overwhelming, the bill passing by a majority of 104 votes. But we had been too long delayed in the House committee to enable us to get through the Senate at the short session of the Fifty-sixth Congress.

However we took the matter up again at the Fifty-seventh session, and this pamphlet contains the result.

NATIONAL DAIRY UNION WORKED CONTINUALLY FOR OVER THREE YEARS.

For three years and five months the National Dairy Union has maintained an office and force to carry on this work. The original \$10,000 asked for to defray the expenses proved to be only a good starter. We have expended in a single month in postage, printing and labor, as much as \$5,000, one lot of letters sent to dairymen of the country costing \$2,500 alone for postage printing of contents and labor of preparation. In this manner, and for traveling and other expenses of those who have been compelled to go to Washington in the interest of this legislation, over \$35,000 has been expended in three and one-half years from this office alone.

Practically every dollar of this money has been raised through solicitations by the writer in addition to the work necessary in connection with the tremendous correspondence and over a year's time spent in Washington. The treasury of Chicago Dairy Produce has been open at all times to the National Dairy Union, and when funds have not been otherwise available, this paper has supplied the necessary means to carry on the



CHAS. Y. KNIGHT, CHICAGO, ILL.
Secretary National Dairy Union.



work, so the cause has never suffered from lack of ready money for all necessary expenses.

OFFICERS OF DAIRY UNION GAVE THEIR TIME AND SERVICES FREE.

The officers of the National Dairy Union received no salary. Not only have they given freely of their time for three and a half years, but President (ex-Governor) Hoard has paid over \$1,500 personal expenses from his own pocket, for which he asks no return.

WILL MAKE SIX THOUSAND CARS OF OLEOMARGARINE THIS YEAR.

The make of oleomargarine for the fiscal year ending June 30, 1902, will reach close to 115,000,000 lbs., or 2,300,000 fifty pound tubs, against 104,000,000 lbs. last year. This would fill 6,000 cars and is equal to the output of 2,000 of our 8,000 creameries, which in the year 1900 made 470,000,000 lbs. of butter. It displaces the product of 500,000 cows, and never has gone on the table in shape so that it can be distinguished from butter. Henceforth it must either throw off its yellow guise and be served for what it is, or pay the 10c tax, which will bring its cost up to the price at which the farmer can produce butter in competition.

NEW LAW LITTLE UNDERSTOOD.

So many conflicting impressions of the new oleomargarine law have gained circulation throughout the country that the writer believes some corrections and information upon the subject of its character, strength and scope are called for.

The idea of the framers of the bill, and the basis upon which they appealed to Congress, were the principles of what is known as the "anti-color law," pronounced constitutional by the well-known decision of the Supreme Court of the United States in *Plumley vs. Massachusetts*, handed down December 14, 1894, by Justice Harlan. At the time of this decision statutes of this character were in force in New York, Massachusetts, Iowa, Maryland, New Jersey and Ohio. Such strength was given the Massachusetts statute by the *Plumley* decision that inside of six years from the time it was rendered twenty-six more states had copied the principle, if not the letter, of the Massachusetts law, making the total number thirty-two states where colored oleomargarine was forbidden. It was the existence of these laws that laid the foundation for the 10c tax on colored oleomargarine, and the publication of these statutes by the Agricultural

Department at Washington that suggested to the writer the possibility of convincing Congress that a principle so generally endorsed should as nearly as possible be made into national law.

REASONS FOR CHANGES FROM ORIGINAL GROUT BILL.

The original Grout bill, which passed the House in December, 1900, taxed 10c per pound all oleomargarine "colored in imitation or in the semblance of butter." This wording was objected to in the construction of the measure to be presented to the 57th congress because it threw upon the government the burden of proving the compound to have been "colored," and the color of butter was not established.

After numerous conferences, endless discussions and changes in committee and out, the "New Grout Bill" as finally agreed upon provided that:

"When oleomargarine is free from coloration or ingredient that causes it to look like butter of any shade of yellow, said tax shall be one-fourth of one cent per pound."

All other oleomargarine was taxed 10c per pound. The bill passed the House in this form and was favorably reported by the Senate committee on agriculture, despite the protests of the oleomargarine makers that oleomargarine could not be produced that did not carry some shade of yellow.

After the measure was reported to the Senate the friends of the bill began a more thorough investigation of the subject. They knew the oleomargarine forces were reserving their best arguments for the Senate discussion, and endeavored to prepare the champions of the measure to meet every point of attack. It came to our knowledge that they would endeavor to demonstrate to the Senate that the bill as drawn would annihilate the entire industry, uncolored oleomargarine and all, and experiments were undertaken to ascertain if it were as claimed that a shade of yellow is produced by the oleo oil and cottonseed oil used. Mixtures of the ingredients, oleo oil, neutral lard, cottonseed oil, milk and salt, after being granulated, as is done in the manufacture of oleomargarine were produced and exhibited to our supporters in the Senate.

While the mixture was apparently white in comparison with any butter ever seen in the markets, it showed a shade of yellow when placed against a dead-white object. Each of our friends was compelled to admit that a shade of yellow was present, which under strict interpretation would invoke the 10c tax, although it had no semblance of butter as

commercially known. And in such matters the internal revenue department has no discretion.

The best ability in the Senate and advice of dairy experts and food commissioners communicated with was invoked to frame a provision so as to escape the charge of an attempt to tax all oleomargarine 10c per pound, and at the same time reach any attempted imitation of yellow butter. Senator Foraker's amendment striking out the words "or ingredient" and inserting ahead of "coloration" the word "artificial" appeared the only feasible solution. As amended by Senator Foraker the vital section reads:

"When oleomargarine is free from "artificial" coloration that causes it to look like butter of any shade of yellow, said tax shall be one-fourth of one cent per pound."

NO STATE LAW STRONGER THAN THE NATIONAL LAW AS AMENDED.

Some of the friends of the measure at the time feared some loophole had been left whereby oleomargarine might be given a deep yellow butter color by the use of some yellow ingredient that would not be held to be "artificial" coloration.

An investigation of the history of anti-color legislation, however, revealed the fact that the Supreme Court of the United States has never gone further in support of an anti-color statute than to uphold the prohibition of the use of "artificial" coloration.

The admitted facts offered as evidence in the Plumley case, as quoted in 155 U. S. Reports, page 465, reads:

"The article sold by the petitioner was the article the sale of which is forbidden by chapter 58 of the acts of 1891. Oleomargarine has naturally a light-yellowish color, but the article sold by the petitioner was artificially colored in imitation of yellow butter."

Justice Harlan, in his opinion, took judicial cognizance of these facts, as shown in the following extract from the decision of the court:

"It appears in this case that oleomargarine is of a 'light yellowish color,' and that the article sold by the accused was 'artificially colored' in imitation of yellow butter."

The following additional extract from his opinion shows that the only thing the court aimed at in the Plumley case was 'artificial' coloration, from which all oleomargarine not taxed 10c per pound must be free under the new federal law. Justice Harlan continues:

"If anyone thinks that oleomargarine not artificially colored so as to make it look like butter is as palatable or as wholesome for purposes of food as pure butter, he is, as already observed, at liberty under the statute of Massachusetts to manufacture it in that state, or to sell it there in such manner as to inform the customer of its real character."

In his brief, now on file with the clerk of the Supreme Court of the United States Attorney-General Pillsbury of Massachusetts, says in his argument in the Plumley case:

"Oleomargarine was formerly made in Massachusetts, and it is well understood that one reason why it is not made there still is because it cannot be successfully made or sold without artificial coloring matter to enable it to pass for butter. * * * * And the fact that it cannot be successfully or profitably manufactured under this law (that is without artificial coloring), affords a clear inference how far oleomargarine in its natural unadorned state, always resembled yellow butter, etc."

In other words the Plumley decision, upon which rests the validity of all the anti-color laws, including New York, goes no further than prohibiting the use of artificial coloring matter, and recognizes oleomargarine to be in its natural state a "light-yellowish color."

In fact, every time the color in question is referred to in this noted decision the word "artificial" is used. In concluding his opinion Justice Harlan said (p. 478):

"We are of the opinion that it is within the power of a state to exclude from its markets any compound manufactured in another state, which has been artificially colored or adulterated so as to cause it to look like an article of food in general use, and the sale of which may, by reason of such coloration or adulteration, cheat the public into purchasing that which they may not intend to buy."

New York has the best enforced and most effective state law in the United States today upon oleomargarine. In 1900, with 83,000,000 pounds of oleomargarine sold in this country, 19,000,000 of which was sold in Illinois, 8,000,000 in Ohio, 11,000,000 in Pennsylvania and 6,000,000 in New Jersey, but 200,000 pounds were sold in the state of New York, with the largest city population in the United States, yet the laws of all these states are practically the same, the only difference being in their enforcement. The validity of the New York law rests upon a decision of the Supreme Court of that state in *People vs. Arenburg*, 105 N. Y., 128, 129 and 130. In establishing the foundation for the enforcement of this law the New York Supreme Court said in this case:

"If it (oleomargarine) possesses the merit claimed for it, and is innocuous, those making and dealing in it should be protected in the enjoyment of liberty in those respects, but they may, legally be required to sell it for what it actually is, and upon its own merits, and are not entitled to the benefit of any additional market value which may be imparted to it by resorting to 'artificial' means to make it resemble dairy butter in appearance."

The Supreme Court of New Jersey, in *Waterbury vs. Newton*, based its support of the anti-color law of that state upon the ground that "annato" was used, and said:

"It is not pretended that 'annato' has any other function in the manufacture of oleomargarine than to make it a counterfeit of butter."

Thus it will be seen that up to this time the entire support of our state anti-color laws were decisions striking at "artificial" coloring, which in the new law is taxed 10c per pound. Anything that can go out at $\frac{1}{4}$ c tax as uncolored oleomargarine can be sold in New York or any other state legally, so far as their laws have ever been upheld. And the oleomargarine makers have never yet been able to produce anything yellow enough to resemble yellow butter without the use of "artificial" coloring matter.

Even annato was not strong enough for their purposes; the necessities of oleomargarine brought into use the stronger mineral of aniline color now generally employed in butter as well as oleomargarine.

USE OF BUTTER OF YELLOW COLOR NEITHER PRACTICAL NOR PERMISSIBLE.

Grass butter is the only fat that possesses the "butter yellow" color, without the addition of artificial coloration. The use of this natural colored butter in oleomargarine might not be held to be "artificial coloration;" but even if it were practical to secure natural colored yellow butter in winter, when three-fourths of the oleomargarine made is consumed, such a mixture is just as expensive under the new law as that "artificially colored."

The new oleomargarine law makes mixtures of butter in which are used substances other than salt, color and preservatives, "adulterated butter," upon which there is a tax of 10c per pound. The definition of adulterated butter in Section 4 contains the following:

"Adulterated butter is hereby defined to mean * * * any butter or butterfat with which there is mixed any substance foreign to butter as herein defined, with intent or effect of cheapening in cost the product."

Prior to the enactment of this law such a mixture would have been

classed as oleomargarine; but, in order to prevent the possibility of natural colored butter being used to make a yellow product, this clause was inserted.

Originally a great deal of butter was used in the manufacture of oleomargarine. During the year 1900, however, the records of the Treasury department show the use in 83,000,000 lbs. of oleo but 1,568,319 lbs. of butter, or 1.72 per cent. Not more than three of the 27 manufacturers used any butter of consequence. So they cannot claim any great damage to their legitimate business as a result of this provision, which might be very important should they conclude to try the use of naturally colored butter for the purpose of making their product yellow.

CHAS. Y. KNIGHT,
Secretary National Dairy Union.

THE OLEOMARGARINE LAW AS AMENDED IN FULL.

The national oleomargarine law, as amended by the act of May 9, 1902, is as follows:

THE LAW AS AMENDED

BUTTER DEFINED BY ACT OF 1886.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That for the purpose of this act the word "butter" shall be understood to mean the food product usually known as butter, and which is made exclusively from milk or cream, or both, with or without common salt, and with or without additional coloring matter.

LEGAL DEFINITION OF OLEOMARGARINE—ACT OF 1886.

Sec. 2. That for the purposes of this act certain manufactured substances, certain extracts, and certain mixtures and compounds, including such mixtures and compounds with butter, shall be known and designated as "oleomargarine," namely: All substances heretofore known as oleomargarine, oleo, oleomargarine oil, butterine, lardine, suine and neutral; all mixtures and compounds of oleomargarine, oleo, oleomargarine oil, butterine, lardine, suine, and neutral; all lard extracts and tallow extracts;

and all mixtures and compounds of tallow, beef fat, suet, lard, lard-oil, vegetable-oil, annatto, and other coloring matter, intestinal fat, and offal fat made in imitation or semblance of butter, or when so made, calculated or intended to be sold as butter or for butter.

Sec. 3. That special taxes are imposed as follows:

MANUFACTURERS OF OLEOMARGARINE DESCRIBED.

Manufacturers of oleomargarine shall pay six hundred dollars. Every person who manufactures oleomargarine for sale shall be deemed a manufacturer of oleomargarine.

And any person that sells, vendors or furnishes oleomargarine for the use and consumption of others, except to his own family table without compensation, who shall add to or mix with such oleomargarine any artificial coloration that causes it to look like butter of any shade of yellow shall also be held to be a manufacturer of oleomargarine within the meaning of said Act, and subject to the provisions thereof.

WHOLESALE AND RETAIL DEALERS DESCRIBED AND TAXED.

Wholesale dealers in oleomargarine shall pay four hundred and eighty dollars. Every person who sells or offers for sale oleomargarine in the original manufacturer's packages shall be deemed a wholesale dealer in oleomargarine. But any manufacturer of oleomargarine who has given the required bond and paid the required special tax, and who sells only oleomargarine of his own production, at the place of manufacture, in the original packages to which the tax-paid stamps are affixed, shall not be required to pay the special tax of a wholesale dealer in oleomargarine on account of such sales.

Retail dealers in oleomargarine shall pay forty-eight dollars. Every person who sells oleomargarine in less quantities than ten pounds at one time shall be regarded as a retail dealer in oleomargarine. And sections thirty-two hundred and thirty-two, thirty-two hundred and thirty-three, thirty-two hundred and thirty-four, thirty-two hundred and thirty-five, thirty-two hundred and thirty-six, thirty-two hundred and thirty-seven, thirty-two hundred and thirty-eight, thirty-two hundred and thirty-nine, thirty-two hundred and forty, thirty-two hundred and forty-one, and thirty-two hundred and forty-three of the revised statutes of the United States are so far as applicable, made to extend to and include and apply to the special taxes imposed by this section, and to the persons upon whom they are imposed: *Provided, That in case any manufacturer of oleomargar-

garine commences business subsequent to the thirtieth day of June in any year, the special tax shall be reckoned from the first day of July in that year, and shall be five hundred dollars.

Provided, further, That wholesale dealers who vend no other oleomargarine or butterine except that upon which a tax of one-fourth of one cent per pound is imposed by this Act, as amended, shall pay two hundred dollars; and such retail dealers as vend no other oleomargarine or butterine except that upon which is imposed by this Act, as amended, a tax of one-fourth of one cent per pound shall pay six dollars."

PENALTIES FOR MANUFACTURING WITHOUT FIRST PAYING TAX.

Sec. 4. That every person who carries on the business of a manufacturer of oleomargarine without having paid the special tax therefor, as required by law, shall, besides being liable to the payment of the tax, be fined not less than one thousand and not more than five thousand dollars; and every person who carries on the business of a wholesale dealer in oleomargarine without having paid the special tax therefor, as required by law, shall, besides being liable to the payment of the tax, be fined not less than five hundred nor more than two thousand dollars; and every person who carries on the business of a retail dealer in oleomargarine without having paid the special tax therefor, as required by law, shall, besides being liable to the payment of the tax, be fined not less than fifty nor more than five hundred dollars for each and every offense.

MUST GIVE BOND AND MAKE REPORTS.

Sec. 5. That every manufacturer of oleomargarine shall file with the collector of internal revenue of the district in which his manufactory is located such notices, inventories, and bonds, shall keep such books and render such returns of material and products, shall put up such signs and affix such number to his factory, and conduct his business under such surveillance of officers and agents as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, may, by regulation, require. But the bond required of such manufacturer shall be with sureties satisfactory to the collector of internal revenue, and in a penal sum of not less than five thousand dollars; and the sum of said bond may be increased from time to time and additional sureties required at the discretion of the collector or under instructions of the Commissioner of Internal Revenue.

HOW OLEOMARGARINE MUST BE PACKED AND SOLD.

Sec. 6. That all oleomargarine shall be packed by the manufacturer thereof in firkins, tubs, or other wooden packages not before used for that purpose, each containing not less than ten pounds, and marked, stamped, and branded as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, shall prescribe; and all sales made by manufacturers of oleomargarine and wholesale dealers in oleomargarine shall be in original stamped packages. Retail dealers in oleomargarine must sell only from original stamped packages in quantities not exceeding ten pounds, and shall pack the oleomargarine sold by them in suitable wooden or paper packages which shall be marked and branded as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, shall prescribe. Every person who knowingly sells or offers for sale, or delivers or offers to deliver, any oleomargarine in any other form than in new wooden or paper packages as above described, or who packs in any package or affixes a stamp on any package denoting a less amount of tax than that required by law, shall be fined for each offense not more than one thousand dollars and be imprisoned not more than two years.

LABEL TO BE PASTED ON EACH PACKAGE.

Sec. 7. That every manufacturer of oleomargarine shall securely affix, by pasting, on each package containing oleomargarine manufactured by him, a label on which shall be printed, besides the number of the manufactory and the district and state in which it is situated, these words: "Notice—The manufacturer of the oleomargarine herein contained has complied with all the requirements of law. Every person is cautioned not to use either this package again or the stamp thereon again, nor to remove the contents of this package without destroying said stamp, under the penalty provided by law in such cases." Every manufacturer of oleomargarine who neglects to affix such label to any package containing oleomargarine made by him, or sold or offered for sale by or for him, and every person who removes any such label so affixed from any such package, shall be fined fifty dollars for each package in respect to which such offense is committed.

TEN CENT TAX IMPOSED ON THE MANUFACTURED ARTICLE.

Sec. 8. That upon oleomargarine which shall be manufactured and sold, or removed for consumption or use, there shall be assessed and col-

lected a tax of ten cents per pound, to be paid by the manufacturer thereof; and any fractional part of a pound in a package shall be taxed as a pound: "Provided, When oleomargarine is free from artificial coloration that causes it to look like butter of any shade of yellow said tax shall be one-fourth of one cent per pound. The tax levied by this section shall be represented by coupon stamps; and the provisions of existing laws governing the engraving, issue, sale, accountability, effacement and destruction of stamps relating to tobacco and snuff, as far as applicable, are hereby made to apply to stamps provided for by this section.

PENALTY FOR NON-PAYMENT OF TAX.

Sec. 9. That whenever any manufacturer of oleomargarine sells, or removes for sale or consumption, any oleomargarine upon which the tax is required to be paid by stamps, without the use of the proper stamps, it shall be the duty of the Commissioner of Internal Revenue, within a period of not more than two years after such sale or removal, upon satisfactory proof, to estimate the amount of tax which has been omitted to be paid, and to make an assessment therefor and certify the same to the collector. The tax so assessed shall be in addition to the penalties imposed by law for such sale or removal.

ADDITIONAL TAX ON IMPORTS.

Sec. 10. That all oleomargarine imported from foreign countries shall, in addition to any import duty imposed on the same, pay an internal revenue tax of fifteen cents per pound, such tax to be represented by coupon stamps, as in the case of oleomargarine manufactured in the United States. The stamps shall be affixed and canceled by the owner or importer of the oleomargarine while it is in the custody of the proper custom house officers; and the oleomargarine shall not pass out of the custody of said officers until the stamps have been so affixed and canceled, but shall be put up in wooden packages, each containing not less than ten pounds, as prescribed in this act for oleomargarine manufactured in the United States, before the stamps are affixed; and the owner or importer of such oleomargarine shall be liable to all the penal provisions of this act prescribed for manufacturers of oleomargarine manufactured in the United States. Whenever it is necessary to take any oleomargarine so imported to any place other than the public stores of the United States for the purpose of affixing and canceling such stamps, the collector of customs of the port where such oleomargarine is entered shall design-

nate a bonded warehouse to which it shall be taken, under the control of such customs officer as such collector may direct; and every officer of customs who permits any such oleomargarine to pass out of his custody or control without compliance by the owner or importer thereof with the provisions of this section relating thereto shall be guilty of a misdemeanor, and shall be fined not less than one thousand dollars nor more than five thousand dollars, and imprisoned not less than six months nor more than three years. Every person who sells or offers for sale any imported oleomargarine, or oleomargarine purporting or claimed to have been imported, not put up in packages and stamped as provided by this act, shall be fined not less than five hundred dollars nor more than five thousand dollars, and be imprisoned not less than six months nor more than two years.

PENALTY FOR PURCHASING OLEOMARGARINE IMPROPERLY STAMPED.

Sec. 11. That every person who knowingly purchases or receives for sale any oleomargarine which has not been branded or stamped according to law, shall be liable to a penalty of fifty dollars for each such offense.

Sec. 12 That every person who knowingly purchases or receives for sale any oleomargarine from any manufacturer who has not paid the special tax shall be liable for each offense to a penalty of one hundred dollars and to a forfeiture of all articles so purchased or received, or of the full value thereof.

STAMPS ON PACKAGES MUST BE DESTROYED.

Sec. 13. That whenever any stamped package containing oleomargarine is emptied, it shall be the duty of the person in whose hands the same is, to destroy utterly the stamps thereon; and any person who wilfully neglects or refuses so to do shall for each such offense be fined not exceeding fifty dollars, and imprisoned not less than ten days nor more than six months. And any person who fraudulently gives away or accepts from another, or who sells, buys, or uses for packing oleomargarine, any such stamped package, shall for each such offense be fined not exceeding one hundred dollars, and be imprisoned not more than one year. Any revenue officer may destroy any emptied oleomargarine package upon which the tax-paid stamp is found.

COMMISSIONER OF INTERNAL REVENUE TO DECIDE WHAT SHALL PAY TAX.

Sec. 14. That there shall be in the office of the Commissioner of Internal Revenue an analytical chemist and a microscopist who shall each be appointed by the Secretary of the Treasury, and shall each receive a salary of two thousand five hundred dollars per annum; and the Commissioner of Internal Revenue may, whenever in his judgment the necessities of the service so require, employ chemists and microscopists, to be paid such compensation as he may deem proper, not exceeding in the aggregate any appropriation made for that purpose. And such Commissioner is authorized to decide what substances, extracts, mixtures, or compounds which may be submitted for his inspection in contested cases are to be taxed under this act; and his decision in matters of taxation under this act shall be final. The Commissioner may also decide whether any substance made in imitation or semblance of butter, and intended for human consumption, contains ingredients deleterious to the public health; but in case of doubt or contest his decision in this class of cases may be appealed from to a board hereby constituted for the purpose, and composed of the Surgeon-General of the Army, the Surgeon-General of the Navy, and the Commissioners of Agriculture; and the decisions of this board shall be final in the premises.

FORFEITURE AND FINE FOR UNSTAMPED GOODS.

Sec. 15. That all packages of oleomargarine subject to tax under this act that shall be found without stamps or marks as herein provided, and all oleomargarine intended for human consumption which contains ingredients adjudged, as hereinbefore provided, to be deleterious to the public health, shall be forfeited to the United States. Any person who shall wilfully remove or deface the stamps, marks or brands on package containing oleomargarine taxed as provided herein shall be guilty of a misdemeanor, and shall be punished by a fine of not less than one hundred dollars nor more than two thousand dollars, and by imprisonment for not less than thirty days nor more than six months.

NO TAX ON EXPORTS.

Sec. 16. That oleomargarine may be removed from the place of manufacture for export to a foreign country without payment of tax or affixing stamps thereto, under such regulations and the filing of such bonds and other security as the commissioner of internal revenue, with

the approval of the secretary of the treasury may prescribe. Every person who shall export oleomargarine shall brand upon every tub, firkin, or other package containing such article the word "oleomargarine," in plain Roman letters not less than one-half-inch square.

PENALTIES FOR FRAUD IN TAX.

Sec. 17. That whenever any person engaged in carrying on the business of manufacturing oleomargarine defrauds, or attempts to defraud, the United States of the tax on the oleomargarine produced by him, or any part thereof, he shall forfeit the factory and manufacturing apparatus used by him, and all oleomargarine and all raw material for the production of oleomargarine found in the factory and on the factory premises, and shall be fined not less than five hundred dollars nor more than five thousand dollars, and be imprisoned not less than six months nor more than three years.

GENERAL PENALTIES PROVIDED.

Sec. 18. That if any manufacturer of oleomargarine, any dealer therein or any importer or exporter thereof shall knowingly or wilfully omit, neglect, or refuse to do, or cause to be done, any of the things required by law in the carrying on or conducting of his business, or shall do anything by this act prohibited, if there be no specific penalty or punishment imposed by any other section of this act for the neglecting, omitting, or refusing to do, or for the doing or causing to be done, the thing required or prohibited, he shall pay a penalty of one thousand dollars; and if the person so offending be the manufacturer of or a wholesale dealer in oleomargarine, all the oleomargarine owned by him, or in which he has any interest as owner, shall be forfeited to the United States.

Sec. 19. That all fines, penalties, and forfeitures imposed by this act may be recovered in any court of competent jurisdiction.

Sec. 20. That the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, may make all needful regulations of the carrying into effect of this act.

DATE OF EFFECT OF ORIGINAL LAW.

Sec. 21. That this act shall go into effect on the ninetieth day after its passage; and all wooden packages containing ten or more pounds of oleomargarine found on the premises of any dealer on or after the nine-

tieth day succeeding the date of the passage of this act shall be deemed to be taxable under section eight of this act, and shall be taxed, and shall have affixed thereto the stamps, marks, and brands required by this act or by regulations made pursuant to this act; and for the purposes of securing the affixing of the stamps, marks, and brands required by this act, the oleomargarine shall be regarded as having been manufactured and sold, or removed from the manufactory for consumption or use, on or after the day this act takes effect; and such stock on hand at the time of the taking effect of this act may be stamped, marked, and branded under special regulations of the Commissioner of Internal Revenue, approved by the Secretary of the Treasury; and the Commissioner of Internal Revenue may authorize the holder of such packages to mark and brand the same and to affix thereto the proper tax-paid stamps.

WHEN TAXES MAY BE PAID.

Sec. 53. That all special taxes shall become due on the first day of July, eighteen hundred and ninety-one, and on the first day of July in each year thereafter, or on commencing any trade or business on which such tax is imposed. In the former case the tax shall be reckoned for one year; and in the latter case it shall be reckoned proportionately, from the first day of the month in which the liability to a special tax commenced to the first day of July following. Special tax stamps may be issued for the months of May and June, eighteen hundred and ninety-one, upon payment of the amount of tax reckoned proportionately under the laws now in force, and such stamps which have been or may be issued for the period ending April thirtieth, eighteen hundred and ninety-one, may, upon payment of one-sixth of the amount required to be paid for such stamps for one year, be extended until July 1st, eighteen hundred and ninety-one, under such regulations as may be prescribed by the Commissioner of Internal Revenue. And it shall be the duty of special tax-payers to render their returns to the deputy collector at such times within the calendar month in which the special tax liability commenced as shall enable him to receive such returns, duly signed and verified, not later than the last day of the month, except in cases of sickness or absence, as provided for in section three thousand one hundred and seventy-six of the Revised Statutes.

OLEOMARGARINE SUBJECT TO LAWS OF STATES.

That all articles known as oleomargarine, butterine, imitation pro-

cess, renovated or adulterated butter, or imitation cheese, or any substance in the semblance of butter or cheese not the usual product of the dairy and not made exclusively of pure and unadulterated milk or cream, transported into any state or territory or the District of Columbia, and remaining therein for use, consumption, sale, or storage therein, shall, upon the arrival within the limits of such state or territory or the District of Columbia, be subject to the operation and effect of the laws of such state or territory or the District of Columbia, enacted in the exercise of its police powers, to the same extent and in the same manner as though such articles or substances had been produced in such State or Territory or the District of Columbia, and shall not be exempt therefrom by reason of being introduced therein in original packages or otherwise.

RENOVATED AND ADULTERATED BUTTER AMENDMENT.

RENOVATED AND ADULTERATED BUTTER DEFINED.

Sec. 4. That for the purpose of this Act "butter" is hereby defined to mean an article of food as defined in "An Act defining butter, also imposing a tax upon and regulating the manufacture, sale, importation and exportation of oleomargarine," approved August second, eighteen hundred and eighty-six; that "adulterated butter" is hereby defined to mean a grade of butter produced by mixing, re-working, re-churning in milk or cream, refining or in any way producing a uniform, purified, or improved product from different lots or parcels of melted or unmelted butter or butterfat, in which any acid, alkali, chemical or any substance whatever is introduced or used for the purpose or with the effect of deodorizing or removing therefrom rancidity, or any butter or butterfat with which there is mixed any substance foreign to butter as herein defined, with intent or effect of cheapening in cost the product or any butter in the manufacture or manipulation of which any process or material is used with intent or effect of causing the absorption of abnormal quantities of water, milk or cream; that "process butter" or "renovated butter" is hereby defined to mean butter which has been subjected to any process by which it is melted, clarified or refined and made to resemble genuine butter, always excepting "adulterated butter" as defined by this act.

TAX UPON MANUFACTURERS AND DEALERS.

That special taxes are imposed as follows:

Manufacturers of process or renovated butter shall pay fifty dollars

per year and manufacturers of adulterated butter shall pay six hundred dollars per year. Every person who engages in the production of process or renovated butter or adulterated butter as a business shall be considered to be a manufacturer thereof.

Wholesale dealers in adulterated butter shall pay a tax of four hundred and eighty dollars per annum, and retail dealers in adulterated butter shall pay a tax of forty-eight dollars per annum. Every person who sells adulterated butter in less quantities than ten pounds at one time shall be regarded as a retail dealer in adulterated butter.

Every person who sells adulterated butter shall be regarded as a dealer in adulterated butter. And sections thirty-two hundred and thirty-two, thirty-two hundred and thirty-three, thirty-two hundred and thirty-four, thirty-two hundred and thirty-five, thirty-two hundred and thirty-six, thirty-two hundred and thirty-seven, thirty-two hundred and thirty-eight, thirty-two hundred and thirty-nine, thirty-two hundred and forty, thirty-two hundred and forty-one, and thirty-two hundred and forty-three of the Revised Statutes of the United States are, so far as applicable, made to extend to and include and apply to the special taxes imposed by this section and to persons upon whom they are imposed.

PENALTIES FOR MANUFACTURING WITHOUT A LICENSE.

That every person who carries on the business of a manufacturer of process or renovated butter or adulterated butter without having paid the special tax therefor, as required by law, shall, besides being liable to the payment of the tax, be fined not less than one thousand and not more than five thousand dollars; and every person who carries on the business of a dealer in adulterated butter without having paid the special tax therefor, as required by law, shall, besides being liable to the payment of the tax, be fined not less than fifty, nor more than five hundred dollars for each offense.

MUST FILE BONDS WITH COLLECTOR OF INTERNAL REVENUE.

That every manufacturer of process or renovated butter or adulterated butter shall file with the collector of internal revenue of the district in which his manufactory is located such notices, inventories, and bonds, shall keep such books and render such returns of material and products, shall put up such signs and affix such number of his factory, and conduct his business under such surveillance of officers and agents as the Commissioner of Internal Revenue, with the approval of the Secretary of the

Treasury, may by regulation require. But the bond required of such manufacturer shall be with sureties satisfactory to the collector of internal revenue, and in a penal sum of not less than five hundred dollars; and the sum of said bond may be increased from time to time and additional sureties required at the discretion of the collector or under instructions of the Commissioner of Internal Revenue.

PACKING ADULTERATED BUTTER.

That all adulterated butter shall be packed by the manufacturer thereof in firkins, tubs, or other wooden packages not before used for that purpose, each containing not less than 10 pounds, and marked, stamped, and branded as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasurer, shall prescribe; and all sales made by manufacturers of adulterated butter shall be in original stamped packages.

REGULATIONS FOR RETAIL DEALERS IN ADULTERATED BUTTER.

Dealers in adulterated butter must sell only original or from original stamped packages, and when such original stamped packages are broken the adulterated butter sold from same shall be placed in suitable wooden or paper packages, which shall be marked and branded as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, shall prescribe. Every person who knowingly sells or offers for sale, or delivers or offers to deliver, any adulterated butter in any other form than in new wooden or paper packages as above described, or who packs in any package any adulterated butter in any manner contrary to law, or who falsely brands any package or affixes a stamp on any package denoting a less amount of tax than that required by law, shall be fined for each offense not more than \$1,000 and be imprisoned not more than two years.

MANUFACTURERS MUST PASTE ON LABEL.

That every manufacturer of adulterated butter shall securely affix, by pasting, on each package containing adulterated butter manufactured by him a label on which shall be printed, besides the number of the manufac-

tory and the district and State in which it is situated, these words: "Notice.—That the manufacturer of the adulterated butter herein contained has complied with all the requirements of law. Every person is cautioned not to use either this package again or the stamp thereon, nor to remove the contents of this package without destroying said stamp, under the penalty provided by law in such cases." Every manufacturer of adulterated butter who neglects to affix such label to any package containing adulterated butter made by him, or sold or offered for sale for or by him, and every person who removes any such label so affixed from any such package shall be fined fifty dollars for each package in respect to which such offense is committed.

TEN CENT TAX ON ADULTERATED BUTTER.

That upon adulterated butter, when manufactured or sold or removed for consumption or use, there shall be assessed and collected a tax of 10 cents per pound to be paid by the manufacturer thereof, and any fractional part of a pound shall be taxed as a pound, and that upon process or renovated butter, when manufactured or sold or removed for consumption or use, there shall be assessed and collected a tax of one-fourth of one cent per pound, to be paid by the manufacturer thereof, and any fractional part of a pound shall be taxed as a pound. The tax to be levied by this section shall be represented by coupon stamps, and the provisions of existing laws governing engraving, issuing, sale, accountability, effacement, and destruction of stamps relating to tobacco and snuff, as far as applicable are hereby made to apply to the stamps provided by this section.

That the provisions of sections nine, ten, eleven, twelve, thirteen, fourteen, fifteen, sixteen, seventeen, eighteen, nineteen, twenty, and twenty-one of "An act defining butter, also imposing a tax upon and regulating the manufacture, sale, importation, and exportation of oleomargarine," approved August second, eighteen hundred and eighty-six, shall apply to manufacturers of "adulterated butter" to an extent necessary to enforce the marking, branding, identification, and regulation of the exportation and the importation of adulterated butter.

PROVISIONS FOR INSPECTION OF "RENOVATED OR PROCESS BUTTER.

Sec. 5. All parts of Act providing for an inspection of meats for exportation, approved August thirtieth, eighteen hundred and ninety, and of an Act to provide for the inspection of live cattle, hogs, and the carcasses and products thereof which are the subject of interstate commerce approved March third, eighteen hundred and ninety-one, and of amendment thereto approved March second, eighteen hundred and ninety-five, which are applicable to the subjects and purposes described in this section shall apply to process or renovated butter. And the Secretary of Agriculture is hereby authorized and required to cause a rigid sanitary inspection to be made, at such times as he may deem proper or necessary, of all factories and storehouses where process or renovated butter is manufactured, packed or prepared for market, and of the product thereof and materials going into the manufacture of the same. All process or renovated butter and the packages containing the same shall be marked with the words "Renovated Butter" or "Process Butter" and by such other marks, labels or brands and in such manner as may be prescribed by the Secretary of Agriculture, and no process or renovated butter shall be shipped or transported from its place of manufacture into any State or Territory or the District of Columbia, or to any foreign country, until it has been marked as provided in this section. The Secretary of Agriculture shall make all needful regulations for carrying this section into effect, and shall cause to be ascertained and reported from time to time the quantity and quality of process or renovated butter manufactured, and the character and the condition of the material from which it is made. And he shall also have power to ascertain whether or not materials used in the manufacture of said process or renovated butter are deleterious to health or unwholesome in the finished product, and in case such deleterious or unwholesome materials are found to be used in product intended for exportation or shipment, into other states, or in course of exportation or shipment, he shall have power to confiscate the same. Any person, firm or corporation violating any of the provisions of this section shall be deemed guilty of a misdemeanor and on conviction thereof shall be punished by a fine of not less than fifty dollars nor more than five hundred dollars or by imprisonment not less than one month nor more than six months, or by both said punishments, in the discretion of the court.

WHOLESALE DEALERS MUST KEEP BOOKS.

Sec. 6. That wholesale dealers in oleomargarine, process, renovated or adulterated butter shall keep such books and render such returns in relation thereto as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, may, by regulation, require; and such books shall be open at all times to the inspection of any internal-revenue officer or agent. Any person who willfully violates any of the provisions of this section shall for each such offense be fined not less than fifty dollars, and not exceeding five hundred dollars, and imprisoned not less than thirty days nor more than six months.

Sec. 7. This Act shall take effect on the first day of July, nineteen hundred and two.

MEMBERSHIP LIST FOR 1902

A

- Atchison, M. C., Woodbine.
 Alexander, C. B., Chicago (Star Union
 Line.)
 Allen, Fred J., (C. M. & St. P. R. R.)
 Anderson, A. M., Polo, Ill.
 Anderson, C. A., Altuna.
 Ardrey, R. G., Oakdale.

B

- Beede, Mrs. Chas. A., Chadwick.
 Biddulph, J. R., Providence.
 Barwell, J. W., Waukegan.
 Barrett, F. E., Union.
 Boethke, Wm., Elmhurst.
 Boyer, Otto, Elkhorn Grove.
 Boyer, George, Harper.
 Burton, D. C., Kaneville.
 Brundige, Mrs. Emma, LaFox.
 Blood, F. J., Chicago (Wells, Richard-
 son & Co.)
 Browning, H. A., Elgin.
 Becker, Chris, Elgin.
 Buelter, Henry, Batavia.
 Barclay, A. C., Elgin.
 Bueler, Anton, Bemes.
 Betts, H. S., Rockford.
 Boehmer, H., Barrington.
 Bagley, F. R., Chicago (Francis D.
 Moulton & Co.)
 Breed, G., Galesburg.
 Bloomfield, R. A., Mt. Sterling.
 Burton, G. F., Mt. Carroll.
 Baldwin, Geo. H., Mendon.
 Beatty, Frank, Fairhaven.
 Blakeway, Miss Ada M., Ridott, Ill.
 Brunner, Frank, Northrop, Minn.
 Benton, D. C., Kaneville, Ill.
 Bartholomew, C. L., Cedarville, Ill.
 Benton, D. C., Kaneville, Ill.
 Brinker, F. H., Winneshiek, Ill.
 Boyd, John, Morrison, Ill.

C

- Clapp, C. E., Quincy.
 Carpenter, K. B., Thomson.
 Charles, A. D., St. Charles.
 Cheesman, James, 2112 Michigan ave.,
 Chicago.
 Carr, George S., Aurora.
 Coolidge, J. H., Galesburg.
 Camp, L. E., Blanchardville, Wis.
 Crissey, N. O., Avon.
 Christ, John, Washington.
 Cook, F. L., Lyle.
 Cooper, Miss Mae, Steward.
 Carr, J. W., Aurora.
 Carr, F. A., Aurora.
 Cooley, J. H., Hillsdale.
 Collyer, W. D., Chicago.
 Catherman, Mrs. R. E., Rock City, Ill.
 Cutler, Geo. A., Herbert, Ill.

Cooley, Fred A., Yorktown.
 Crosier, Eli I., Utica.
 Carlson, John, Aurora.
 Caven, George, Chicago.

Currier, J. B., Freeport, Ill.
 Campbell, M. C., Genoa, Ill.
 Cobb, E. N., Mounmouth, Ill.
 Coolidge, C. P., Winnebago, Ill.

D

Dubois, F. S., Rockford.
 Davis, S. E., Elgin.
 Davis Bros., Fairchild.
 Danielson, Peter, McConnell.
 Davis, C. W., Woodstock.
 Deitz, E. J. W., Downers Grove.
 Davenport, Prof. E., Urbana.

Duel, H. R., Franks, Ill.
 Dunlap, Mrs. Theodore, Abingdon.
 Dorsey, L. S., Moro.
 De Lano, H. W., Sugar Grove, Ill
 de Hough, D. J., Boyden, Ia.
 Dyer, Chas. M., Little Rock, Ill.

E

Eastman, H., Shabbona.
 Engebretson, N. N., Mansfield, Minn.

Erf, Prof. Oscar, Urbana, Ill.

F

Finch, N. W., Victor.
 Frein, H. P., Smithton.
 Freund, S. H., Johnsburgh.
 Francisco, M., Wauconda.
 Fulrath, P. G., Bristol.
 Fraser, Prof. W. J., Urbana.

Fredericks, Andrew, Chicago.
 Fourbain, B. C., Belvidere.
 Fryer, Wm., Winslow, Ill.
 Fremont Butter Tub Co., Rock Island,
 Ill.
 Fairchild, A. E., Chicago.

G

Gurler, H. B., DeKalb.
 Gurler, G. H., DeKalb.
 Gullickson, Martin, Frankfort Station
 Grover, W. J., Belvidere.
 Gray, Samuel, Hastings.

Goodrich, DeWitt, Belvidere, Ill.
 Grout, A. P., Winchester.
 Gibbons, P. H., Elgin.
 Glover, A. J., Elgin.
 Gray, Miss Nellie, Hastings, Ill.

H

Herman, G., Manhattan.
 Hougland, A. C., Little Turkey, Iowa.
 (Heller & Merz.)
 Hopkins, H. H., Hinckley.
 Hollister, W. S., Pana.

Haecker, Prof. T. L., St. Anthony
 Park, Minn.
 Hicks, J. E., Thomson.
 Henry, R. J., Millersburg.
 Hawthorne, G. E., Elgin.

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| Hoppensteadt, Geo. W., Eagle Lake. | Hansen, A., Stewart, Minn. |
| Hostetter, W. R., Mt. Carroll. | Hyne, W. J., Evansville, Wis. |
| Hostetter, A. B., Springfield. | Herkenheim, P. J., Malta, Ill. |
| Hardiker, F. H., Chicago (Merchants'
Despatch Transportation Co.) | Henry, E. J., Chicago. |
| Hoisington, S. S., Stillman Valley. | Howe, T. J., Owatonna, Minn. |
| Harvey, W. R., Clare. | Horsing S. S., Stillman Valley, Ill. |

J

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| Jennings, A. A., Chicago (Star Union
Lines.) | Jensen, S. M., Orangeville, Ill. |
| Johnson, Lovejoy, Stillman Valley. | Johnson, Frank, Rockford, Ill. |
| Johnson, L. E., Byron, Ill. | Jacobs, F. I., 185 South Water Street,
Chicago. |

K

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|------------------------------------|---|
| Kerns, Walter, Warren, Ill. | Kruempel, Gustave, Frankfort Station,
Ill. |
| Kniggs, L. H., McHenry | Kieffer, P. H., Strawberry Point, Iowa. |
| Kendall, George, Mt. Carroll, Ill. | Kimzey, W. S., Tamaroa, Ill. |
| Kirkpatrick, J. R., Oakdale. | |
| Kilbourne, C. S., Aurora. | |

L

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|---|---|
| Ludwig, Mat, Goodings Grove | Lichthardt, Herman, Schaumberg, Ill. |
| Lally, W. A., Chicago (Erie Despatch
Transportation Co.) | Likens, Curtis C., Walworth, Wis. |
| Long, M., Woodstock. | Lorengen, C., Rockford, Ill. |
| Lucas, O. F., Belvidere. | Linn, John E., Gaylord, Minn. |
| Lloyd, W. B., Glen Ellyn. | Laird, W. R., Yorkville, Ill. |
| Loud, E. P., (Francis D. Moulton & Co.)
Chicago, Ill. | Leighton, F. A., (Genesee Salt Co.)
New Hampton, Iowa. |
| | La Bundy, B. A., Elkhorn, Wis. |

M

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|---|----------------------------------|
| Mann, W. E., Pecatonica. | Mason, J. L., Elgin. |
| Metzger, F. L., Millstadt. | Mason, J. P., Elgin. |
| McNish, F. J., Chicago (Creamery
Package Mfg. Co.) | Murphy, R. R., Garden Prairie. |
| Moore, W. S., Chicago. | Monrad, J. H., New York. |
| Muller, F. J., Milledgeville. | Musselman, S. L., Brookville. |
| McCredie, Wm., Elgin. | Maurer, W. H., Rock Grove, Ill. |
| Mallary, Grant, Freeport. | McFarland, Frank, Big Rock, Ill. |
| | McConnell, Carrie, Ridott, Ill. |

McFarland, Frank, Big Rock.
 Myers, O., Little Rock.
 McNurlin, Wm. L., Stewart.

McNurlin, W. L., Stewart, Ill.
 Mansager, M. J., Ellsworth, Iowa.
 McEdward, G. A., New Haven, Conn.

N

Nowlan, Irvin, Toulon.
 Nelson, Peter, Creston.
 Nolan, H., Hinckley.
 Newman, Joseph, Elgin.

Newman, John, Elgin.
 Nolting, E. L., Elgin.
 Nolting, August, Elgin.
 Nagel, W. J., Scarville, Iowa.

O

Olson, Chas., Kirkland.
 Ohi, Wm., Stevens, Ill.

Olsen, H. P., Ashby, Minn.

P

Poplett, C. A., Dunlap.
 Powell, J. W., Peoria, (Merchants'
 Despatch Transportation Co.)
 Petit, Peter, North Aurora.
 Patterson, J. P., Plainfield.
 Peak, S. W., Winchester.
 Powell, L. A., Bowen.
 Phillips, Louis, Germantown.
 Patton, R. A., Hanna City.

Peterson, Berger, Round Grove, Ill.
 Pitteplace, G. L., Hinckley, Ill.
 Phillips, J. A., Damascus, Ill.
 Patterson, R. M., Chicago.
 Pffingston, H. W. F., Schaumberg, Ill.
 Purvis, Miller, 224 Dearborn Street,
 Chicago.
 Pierce, Harry, Savanna, Ill.

R

Redpath, R. C., Baldwin.
 Rutter, Geo. F., Sr., Libory.
 Reed, Geo., Belvidere.
 Reed, Oscar W., Lebanon, O.

Rawson, Frank E., Alden, Ill.
 Rice, H. B., Lewiston.
 Reynolds, J. W., Nicolet, Minn.
 Russell, Theodore, Shelbyville, Ill.

S

Shearer, A. J., Aurora.
 Sykes, Josiah, Kaneville.
 Sudendorf, E., Elgin (Wells Richard-
 son & Co.)
 Spicer, C. W., Edelstein.
 Spicer, J. G., Edelstein.

Sears, Howard O., Garden Prairie.
 Spanger, E. E., Big Rock.
 Sloggett, John, Hinckley.
 Stewart, John, Elburn.
 Sturgis, Cornish & Burr Co., Chicago.
 Sullivan, Miss Lizzie, Providence, Ill.

Steidley, A. B., Carlinville.
 Spencer, C. V., Chicago.
 Sawyer, J. Y., Chicago.
 Swanzey, L. M., Ridott.
 Shamel, Clarence A., Chicago.
 Schlattmann, Fred, St. Libory.
 Springer, Mrs. Eva H., Springfield.
 Slouborg, Thomas, Savanna.
 Soverhill, S. G., Tiskilwa.

Straw, T. H., Shannon, Ill.
 Springsteen, P. J., Egan, Ill.
 Schoch, Irwin E., Damascus, Ill.
 Seidel, C. H., Orangeville, Ill.
 Speed, Chas. V., Baileyville, Ill.
 Seidel, C. H., Orangeville, Ill.
 Schlappi, J. Fred, New York.
 Segar, J. W., Pecatonica.

T

Thompson, A. E., Poplar Grove.
 Thompson, Frank B., Greenwood.
 Thompson, M. H., Elgin.
 Thurston, Henry F., Chicago.

Taylor, W. H., Stillman Valley.
 Thompson, A. E., Poplar Grove, Ill.
 Thornton, Charles H., Argyle, Ill.

V

VanPatten, David, Plainfield.

W

Wright, F. W., Joslin.
 Wood, R. L., Woodhull.
 Wilson, Geo. R., Monmouth.
 Welford, R. G., Red Bud.
 Williams, C. H., New York (Genesee
 Salt Co.)
 Wilson, E. L., Manhattan.
 Wilder, C. R., Manhattan.
 Waspi, J. S., Spring Grove.
 Woodard, C. H., Big Rock, Ill.
 Woodring, F. W., Chicago (Creamery
 Package Mfg. Co.)
 Winton, W. W., Madison, Wis. (C. St.
 P. & M. R. R.)

Waterman, Geo. E., Garden Prairie.
 Wentworth, E. M., Davenport, Ia.,
 (Star Union Lines.)
 Willson, D. W., Elgin.
 Wright, S. N., Elgin.
 Woolverton, D. C., Chicago.
 Walline, C. W., Cambridge, Ill.
 Wolf, F. R., Dakota, Ill.
 Wolf, Mrs. E., Rock City, Ill.
 Wood, D. E., Elgin, Ill.
 Willson, W. C., Elgin, Ill.
 Winnebago Butter Mfg. Co., Winne-
 bago, Ill.

Y

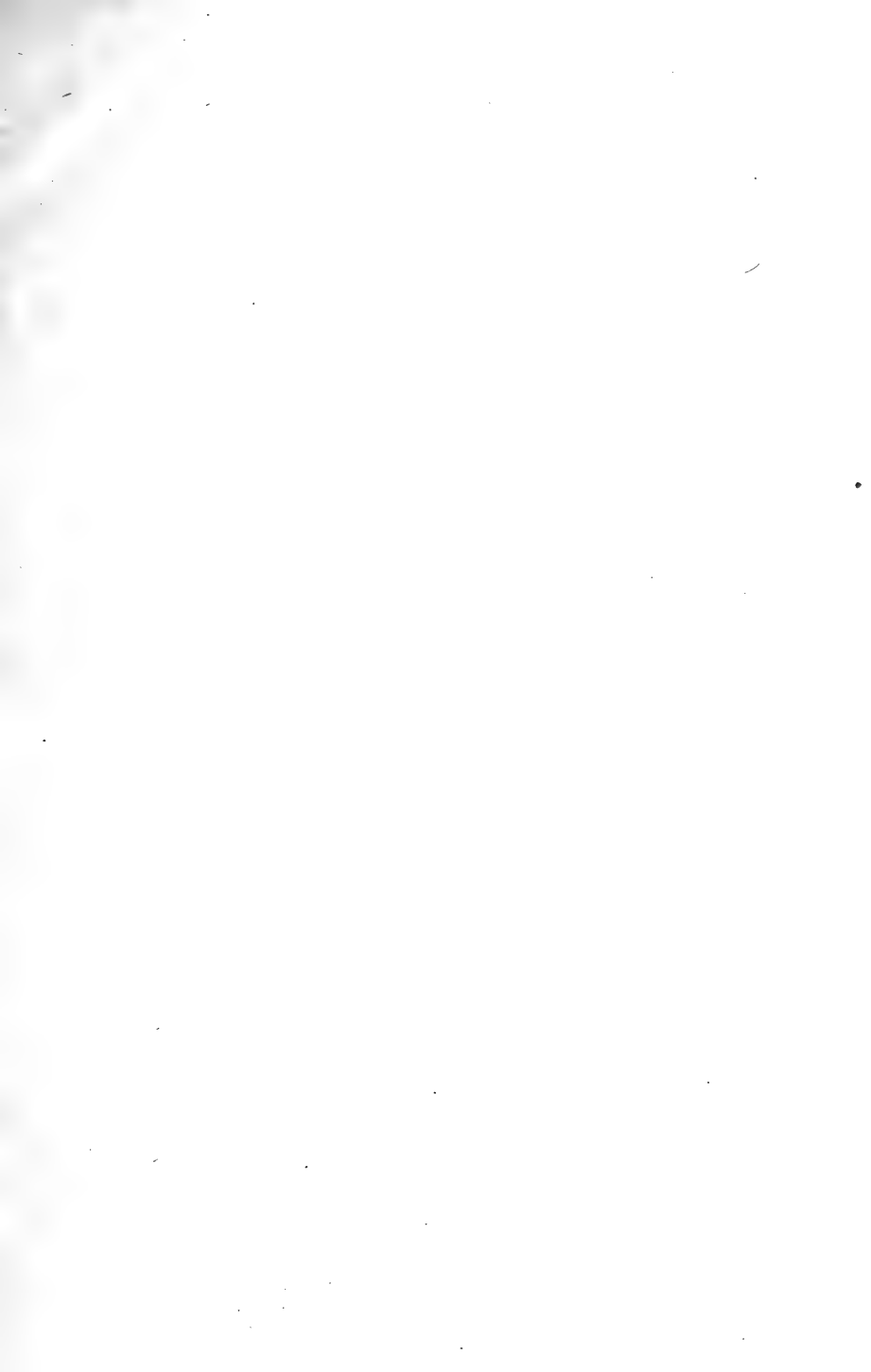
Young, H. J., Stillman Valley, Ill.
 Young, W. H., Aurora.

Young, F. L., Kaneville.

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