The University of Nebraska

DAIRY EDUCATION

An Address Delivered on the Occasion of the Dedication of Dairy Industry Hall, at the University Farm, on Wednesday, January Seventeenth, Nineteen Hundred Seventeen

BY

RAYMOND A. PEARSON, D. Agr.

President of Iowa State College
of Agriculture and Mechanic Arts

DAIRY EDUCATION

Twenty-one years ago, in 1896, your speaker was called upon to prepare a report upon dairy education in the United States. Every state was canvassed. The report published by the United States Department of Agriculture contained the following in reference to the dairy instruction equipment at the Industrial College of the University of Nebraska: "A dairy house has just been completed; it contains a large workroom and two classrooms. Apparatus consists of hand separators, deep-setting cans, and necessary utensils for making butter as in a home dairy." It was added that a twelve weeks winter farm dairy course was offered. A fee of one dollar was charged for this course, and it was announced that suitable board and room could be found in Lincoln at $2.75 per week. The statement was made in the report that when the need for education along dairy lines is more clearly recognized and the good resulting from such education is better appreciated, even better facilities for instruction would be offered. This prophecy now has come true in Nebraska, and in larger measure than anyone then would have dared to hope.

We have assembled to dedicate this splendid building to the further promotion of your dairy interests. I am highly honored by your invitation to speak on this occasion.

This building means different things to different people and groups of people. To the architect it means a building that compares well with other university buildings here and elsewhere,—its lines and proportions and visible materials of construction are pleasing to the eye. He has taken care to plan a building that will be substantial and fireproof and well adapted to the peculiar needs as these have been explained by the experts.

To the builder it has a different meaning. It represents a certain cash value in materials, labor, and supervision in the form of a building 141 feet long and 64 feet wide having three stories and a basement and with a wing 60 by 70 feet having one story and a basement. Undoubtedly it means good workmanship and undoubtedly it has meant to the builder many anxious hours caused by the exacting requirements of such a building and by the difficulties that have confronted all builders on account of changing values and prices.

To the owners, the people of Nebraska, this building represents the investment of nearly $200,000 for the promotion of one of the most important branches of agriculture. This is a large amount of money. A good many of us will work a lifetime and never get within touch, sight, or hearing of a quarter or an eighth as much. But it is not a one-man building nor a four-man building nor an eight-man building but a building belonging to and adapted to serve every person in the state. Its cost is equivalent to about sixteen cents for each person in the state and nothing better could happen to

this building than for each person in the state to realize that he or she has an investment here. Sixteen cents per capita in such a building as this is not very much when compared with the average amount of money spent by each person in this nation each year for candy and chewing gum,—about $2.00. The money so used in this country in a year would be enough to erect about three such buildings as this every day in the year; the tobacco expenditures would do as much, and the liquor expenditures about four times as much more. In other words, this nation expends for liquor and tobacco and candies in a year enough money to pay for about eighteen such buildings as this every day in the year. On a pleasant summer day the insects in the United States eat up values amounting to fifty such buildings as this.

But to those citizens of the state who are especially interested, and particularly to the governing board of this university, the chancellor, the dean, and the staff members who will use this building, it means very clearly a recognition of work done and an opportunity to increase a most useful service to the state.

I desire to refer to certain phases of development in the field of dairying and in the field of education which appeal to me with much force at this time.

First, this building is a recognition of the great importance of dairying, one of the leading industries of the country. Praise for the dairy cow has been heard in the halls of congress and of legislatures. We have been told how she emigrated to the west with the early settlers, and how she has furnished milk, butter, cheese, meat, leather, glue, hair, and fertilizer; how she has lifted mortgages and provided an income when all else failed. She even has been called our "foster mother." But she never can receive all the credit that is her due.

In the United States there were in 1850, $6\frac{1}{2}$ million milch cows, 275 to each 1000 persons, and their average production was $166\frac{1}{2}$ gallons of milk per year. In 1870 there were 9 million cows, 232 to each 1000 persons, with an average production of 206 gallons. In 1890 there were $16\frac{1}{2}$ million cows, 264 per 1000 people, and their average production was reported as 315 gallons per year. In 1910 there were about 22 million cows, 220 per 1000 persons, and their average production was reported as 362 gallons per year. It will be noticed that the number of cows per thousand people has decreased, but this is practically offset by the increase of milk production.

In Nebraska, the development of dairying has been rapid. The United States census first reported the number of cows in this state for 1860 when there were 5 less than 7000, which was **241** per 1000 people, and the average yield was 149 gallons. In 1870, the number had increased to almost 29,000 or over 400 per cent in 10 years. There were then **235** cows per 1000 people, and the average rate of production was 165 gallons per year. In 1890 the cows had increased to 505,000 in number or almost 1700 per cent in 20 years. There were then **477** milch cows per 1000 persons, and the average rate of production was 287 gallons per year. In 1910 there were reported **640,000** milch cows or **537** milch cows per 1000 persons, and their average production was reported as about 323 gallons.

In 1890 Nebraska ranked as the 26th state in population and 12th in the number of milch cows. Since then the cow population has made relatively the larger progress.

In 1880 nearly 10 million pounds of butter were made in Nebraska, and in 1910 the quantity had increased to practic lly 50 million pounds. In 1880 almost all the butter was made on farms while in the last census year about one-half was made in factories. In 1896 a dairy investigator traveling through this state called attention to the advanced development of dairy farming in the eastern portion of the state, and especially the southeastern portion, and he mentioned that exceptional dairy districts were found in some of the northwestern counties. At that time much farm-made butter was finding its way to the ladlers or dealers in low grade butter. The development of creameries and shipment of cream long distances have produced profound changes in the character of dairying in this entire section of the country. The number of creameries made a rapid increase when this system of butter-making was finding favor in this country. From 1880 to 1890 the creameries in Nebraska increased from 21 to 58.

It is worthy of note that the surplus of dairy products available for export has been steadily decreasing in recent years. In 1880 over 39 million pounds of butter were exported. In 1890 the quantity had fallen to 29 millions of pounds. In 1892 it was reduced to 15 millions, and in 1913 just before the European war it was only $3\frac{1}{2}$ millions of pounds. Cheese exports also have fallen off rapidly. In 1881, 147 million pounds were exported; in 1891, 82 millions; in 1901, 40 millions; and in 1911, 19 millions. In 1910 the exports were only 3 million pounds.

These export figures tend to prove the statements that dairy products are more and more favored as a food by the people of this country. Particularly they are learning the food value of milk and consuming increased quantities. Government experts say that about 16 per cent of the ordinary American diet consists of dairy products. And these are among the cheapest of our foods from animal sources. For example, one quart of milk costing 9 cents contains as much food value as 8 eggs worth 32 cents, at 48 cents per dozen; or as much as $\frac{3}{5}$ lb. of ham worth 21 cents, at the rate of 35 cents per pound; or $\frac{3}{4}$ lb. of beefsteak worth 18 cents, at 24 cents per pound; or 2 lbs. of chicken worth 50 cents, at the rate of 25 cents per pound. And one pound of butter at 45 cents contains as much nourishment as 14 lbs. of potatoes worth 48 cents if potatoes are worth $2.00 per bushel. One pound of cheddar cheese, worth 30 cents, is represented as having food value equivalent to 1.4 lbs. of ham worth 49 cents, at the rate of 35 cents per pound, or 1.7 lbs. of beefsteak worth 41 cents, at the rate of 24 cents per pound. More and more a variety of dairy products is being developed to cater to all tastes. Ice cream has become a popular year-round article of food. It is estimated that in the United States about 200 million gallons of ice cream are consumed in a year.

The enormous business developed on account of the sale of dairy products may be imagined from the fact that the United States census reports the

estimated value of the dairy products of farms (excluding home consumption) as $656,000,000. This item may be made much larger by the addition of the dairy products not produced on farms and by attaching retail prices such as are paid by the ultimate consumer instead of wholesale prices or farm prices as reported by the census. Among the many reasons why the dairy industry deserves to be encouraged are the facts that it furnishes employment throughout the year and it builds up rather than depletes the soil. The fertilizing constituents removed from the soil in one ton of timothy hay are worth $5.78; in one ton of clover hay, $11.38; in one ton of wheat, $9.59; in one ton of oats, $9.97; in one ton of corn fodder and ears, $8.76; and in one ton of butter, 64 cents.

Second, this building stands as a recognition of the development of dairy cows and of the improvements of methods of dairying. In these respects the dairy industry has been transformed in recent years. Records of production have been made and broken repeatedly until now the largest record is held by the Holstein cow Duchess Skylark Ormsby with a credit of 1205.09 pounds of fat; the record for Guernseys is held by Murne Cowan with 1098.18 pounds of fat; for Jerseys it is held by Sophie 19th of Hood Farm with 999 pounds 2 oz. of fat; and for Ayrshires the honor is held by Lily of Willowmoor with 955.56 pounds of fat. These figures furnish eloquent testimony as to the work of the dairy breed associations which through their systems of registry and advanced registry or other recognition for superior animals are doing much to bring up the average yield in almost every dairy district.

The great majority of cows are not pure bred and the work that is being done in connection with these animals by the dairy test associations is worthy of special mention. Mr. Helmer Rabild of the Federal Dairy Division reports 346 cooperative cow-testing associations in active operation on June 30, 1916. These associations are located in 38 different states. Their number has increased 64 per cent in the last year. Their membership reported nearly 9000 herds having slightly over 150,000 cows under monthly test. In an Iowa cow-testing association that has been in operation four years, the average production of the cows increased from 6483 pounds of milk with 246 pounds of butter fat to 8648 pounds of milk with 312 pounds of butter fat.

A Michigan association reports for 6 herds which have been under observation continuously for nine years an average gain of 685 pounds of milk or 51.8 pounds of fat, the average percentage of fat having increased from 3.91 to 4.29. The average profit, which is the more interesting because of large increases in cost of grain and roughage, increases from $21.71 to $36.13.

The advances in dairy methods include such notable changes as the introduction of the centrifugal separator, the general use of the Babcock milk test, the use of starters in butter making, the development of combined churns and workers, the perfection of methods of pasteurization, the introduction of the dairy score card, the development of the certified milk movement, the production of condensed and powdered milk, the use of milking machines, and still other improvements more or less familiar to dairymen in this state.

When discussing improvement of dairy methods, it is necessary to mention the results that have come from cooperation in manufacturing products and in making sales. The greatest progress through such organizations has been made in the little countries of Denmark and Holland. They have learned that it pays to produce good quality, and dairymen have found it to their financial advantage to combine and employ expert assistance to make tests of their products and to advise as to methods.

In all the developments that have taken place, the dairy departments of our colleges have been prominent because of their wise leadership. They have all worked together and the dairy department of this university has taken a prominent place in the progress that has been made. I am glad to give credit to Professor Frandsen for the excellent work he has rendered not only here but in a much larger field.

In the *third* place, this building is another evidence that the American people recognize the importance of making good provision for giving instruction in the fundamental and vital industries of our country. The state of mind of the public on this question has undergone great change in the last few years. People are coming to recognize that agricultural education is a public question,—that it is a question which concerns the general public even more than the farming classes. Our population is increasing faster than our food production. James J. Hill saw this a few years ago and prophesied that the nation would go to bed hungry within twenty years if the development of agriculture did not receive proper attention. Only three days ago an item of news was flashed over the country from Washington to the effect that our food supply has not kept pace with our growth in population. Records for the last 16 years, the news item states, show that the population has grown about 33 per cent while there has been a decline in per capita production in foods constituting about 75 per cent of the country's diet. It is pointed out that the output of meats fell from 248.2 pounds for each person in 1899 to 219.6 in 1915; and milk fell from 95.6 gallons for each person in 1899 to 75.5 in 1915. Meat and dairy products furnish 37 per cent of the food used on the American table. Cereals, which supply 31 per cent, declined from 43.9 to 40.2 bushels.

Principal food products of export have been declining steadily. Formerly, large numbers of live cattle were exported. The average at the beginning of this century was about 500,000 per year. In 1915, less than 6000 were exported. Similar reports are made on live sheep and swine. Fresh beef, exported annually at the beginning of this century at the rate of about 300 million pounds per year, fell to less than 7 millions in 1914. As would be expected, there was a considerable increase in 1915. Fresh pork was being exported at the rate of about 26 million pounds 17 years ago. In 1914 the quantity was less than 3 millions. There was very little increase in 1915. Wheat was being exported at the rate of about 90 million bushels per year at the beginning of this century. In 1912 the exports had fallen to 30 millions, but they have considerably increased during the years of the war. Corn has fallen from 85 millions to 40 millions with a slight increase during the last three years. And exports of oats have fallen from about 12 million to 2 million

bushels per year with considerable increase since the European war began. Furthermore, our imports show beef and corn from Argentina, potatoes from Europe, butter from the South Sea islands, and even eggs from China.

These are some of the reasons why bankers and lawyers and other thoughtful people who do not live on farms are coming to appreciate the importance of agricultural education. I fear the problem is much larger than most of these gentlemen apprecia e. It involves profits from one's industry. The recent surveys made by government and state officials in various states have shown that a considerable number of farmers are not receiving even ordinary day wages for their labor after allowance is made for reasonable return on their capital invested. This question, together with the question of providing some of the advantages of the town to the people in th country, has a most important bearing upon the future of our agriculture. Our friends not living on farms, who have become alarmed about their future food supply, should give careful consideration to these deeper phases of the question, for without proper attention to them the difficulties that are now becoming known cannot be remedied.

This whole matter is closely related to the attitude of the public towards the natural resources of the country. These have been exploited without regard o posterity and even without regard to our own old age.

The construction of this building is a hopeful sign. When the busy and successful people of a great co monwealth resolve to put their good money into a building where instruction will be given in dairying, it shows a conception of the whole subject of our future prosperity that is encouraging and that should be made known to the people in all states.

In New York state, with its great population, the subject of food supply has become so serious that state and city committees have been investigating, and these committees have united in a recommendation that the system of agricultural education should be strengthened and expanded. The joint recommendations contain these words: "State agencies for agricultural education and research are a prime requisite in this connection. The state should lose no time in extending the work already under way at its various agricultural institutions. We recommend that these institutions be instructed to submit plans and estimates as to what will be required to extend their facilities in the way of additional buildings and equipment and the securing of a larger staff." The report then proceeds to show that in the United States we are far behind European countries in respect to these developments. It points out that during the last five years Norway, with a cattle population of 1,100,000, expended $650,000 for a new veterinary college and equipment. The joint recommendation further states: "We believe the time is ripe for this state to render all the aid it possibly can and offer all the inducement it possibly can to people who will engage in farming in this state. We believe that no better investment could be made on behalf of the people than appropriations by the legislature along these lines."

In the *fourth* place, this building is another proof that the dignity of education in the industries is coming to be recognized by the American people. Here in the middle west we would naturally expect the public to regard education in agriculture as highly as equivalent education along any other line, but both east and west we still find objectors. They are a remnant of a considerable group who looked down upon education in agriculture fifty years ago and some of whom never could become reconciled to this kind of education. It is necessary that the dignity of agricultural education be recognized for three reasons:

A. Because agricultural education is in itself worthy.

B. Because unless agricultural education is so recognized it will be avoided by the ambitious, talented, American boy, who is unwilling to cast his lot in a field where he might be estopped in his progress.

C. And recognition must be given because of the splendid work in investigation and education that has commanded our attention during these recent years.

I say that education in agriculture is as dignified as equivalent education in any other subject—for example, the law. To understand the sciences that relate to agriculture is to understand God's laws. Can anyone say that this is less dignified or less worthy than to be an expert in the knowledge of man's laws? Is there any reason for saying that one who understands the laws that govern the struggles of myriads of bacteria in the soil is less worthy than one who understands the laws that govern the location of line fences or trespass on top of the soil?

As to the attitude of the American boy, this was clearly described in a remarkable letter written by the Honorable Charles B. Calvert, of Maryland, in 1852. He was interested in a plan to establish an agricultural college and experimental farm. He wrote as follows:

"The agricultural community has long felt the want of such institutions, and it is to be hoped that the present generation will do something to elevate the standing of the profession by establishing colleges and schools which will enable the sons of agriculturists to obtain, not only a liberal, but a professional education. The learned professions, as they are commonly termed, have engrossed most of the talent of all nations. Is it because those professions are more honorable in themselves than agriculture? Certainly not. Is it because they require more talent, learning and energy? It will not be pretended that they do. Then why is it that you find the most talented and promising sons of agriculturists deserting the profession of their fathers for some one of these?

"It is because they are endowed by nature with a certain ambitious thirst for distinction, which they feel can only be gratified by uniting themselves with some one of these professional combinations. What is the remedy necessary to remove this incubus which is consuming our vitals? Simply, education—for so soon as you give a professional and at the same time a liberal education to the farmer, you at once arouse a professional pride to make his own the most honorable of all pursuits; and it is only necessary to

arouse this pride to enable the agricultural community to take the position which their intelligence and numbers entitle them to. It cannot be denied that the agricultural community composes the great conservative power of this country—and it is impossible to disguise the fact that we are daily departing from the great principles laid down by the wise men who formed the happy government under which we have become a great and powerful nation. We see daily combinations formed in large cities to manufacture public opinion in favor of some scheme originated solely for the benefit of some selfish individual or political party, without any regard to the great interests of the country. If, on the other hand, the agriculturists were, as a body, liberally and professionally educated, they would take that stand in the political community which their numbers and interests entitle them to, and thereby control such matters; and I therefore trust that you will see the importance of such an establishment in our state, and will give it your active support, by obtaining as many and as large subscriptions as possible."

This letter is a classic, true in its day and just as true at this time.

My argument is that agricultural education needs to be more generally recognized as dignified. I know and you know that it is dignified, and it makes a favorable comparison with any other kind of education; in fact some of our best scholars have frankly acknowledged that the whole subject of research in this country has received an impetus from the research work done recently in the field of agriculture. One historian records the fact that the work of research in a few state universities began in their departments of agriculture. From these departments the endeavor for scholarly research extended into the departments of liberal arts and science.

Today it is amusing and sometimes sad to read of the struggle for recognition made by a few who were first to see the need and the worth of education along industrial lines. About 1840, according to Dr. Dabney in his "Education in the United States," President Francis Wayland of Brown University became interested in scientific and technical education. He wrote a book on the collegiate system of the United States and argued earnestly in favor of placing scientific subjects in the college curriculum. He succeeded in securing a science hall and a museum of geology at Brown University, but Francis Wayland was ahead of his time. Support was withheld from his scientific courses and he was forced to resign in 1855 and the old classical course was reestablished. President Wayland had studied the enrollment at New England colleges and found the number of students to be decreasing in spite of increases of endowments and reduction of tuition. He wrote, "It would seem from such facts as these that our present system of collegiate education is not accomplishing the purposes intended. * * * Our colleges are not filled because we do not furnish the education desired by the people. * * * We have in this country 120 colleges, 42 theological seminaries, and 47 law schools, and we have not a single institution designed to furnish the agriculturist, the manufacturer, the mechanic, or the merchant with the education that will prepare him for the profession to which his life is to be devoted."

A monument in memory of President Francis Wayland should be erected by us who believe in a magnificent dairy building upon the campus of a great university.

The early educators simply could not understand. One who was interested in Greek made an attack upon "the butter makers across the campus" for holding their subject on a par with Greek as a part of the university education. But in 1896 President Walker of the Massachusetts Institute of Technology referred to the oldest university of America conferring its degree upon those who had never had an hour of either Latin or Greek within its walls and even dropping Greek from its list of entrance requirements. He says, "We get a measure of the enormous advance in educational philosophy which has taken place since President Wayland dared to challenge the opinion then universally held by the teachers and governors of American colleges and universities, that the classics were absolutely essential to liberal culture and that no one could be called well educated without them."

Members of Congress also failed to understand the situation. In 1859 Mr. Davis argued in Congress against the Morrill land grant and he said, "I have seen the growth of the proposition to do something for the agricultural interests of the country and I believe it was always delusive not to say fraudulent. It needs no aid. The agricultural interest takes care of itself and is drained to take care of every other pursuit in the country. * * * Agriculture needs no teaching by Congress. The wide extent of the country, the great variety of its soil and climate and products render it impossible that there should be anything else than local teaching in relation to agriculture."

Times have changed. The man who teaches cow test association work and how to conduct egg-laying contests is coming to be looked upon throughout the length and breadth of the land with as much respect as the one who teaches arithmetic, physics, or grammar. All these subjects are important, all are vital. The American boy now will make no mistake in selecting the one which appeals strongest to his individual interests.

Fifth. I have said that this building stands as evidence of the great growth of the dairy industry and the great development of dairy methods; also that it emphasizes the enlightened attitude of the people of this state toward education which is directly applicable to our chief vocations and that it is a proof that the dignity and worth of such education are appreciated. But all this represents a look backward. If the building stood for nothing more than what has been mentioned it would be a monument to the past. It is that and it is a starting place for the future. We dedicate it not to the past but to the future, for a service begun now; and no one would venture to say how great this service will be nor how far it will extend. We are able to foresee only certain further developments along the lines already started. Much needs to be done along these lines. The problems of feeding need further study, the economy of milk production, the further development and extension of sanitary methods, and the instruction of all people as to the wholesomeness and relative cheapness of dairy products as food, with the creation of new varieties of dairy products—

all these problems will receive attention in due time; and doubtless investigations in this building along these lines will attract not only statewide but nationwide and worldwide attention. The job of the discoverer of new lands to subdue has been transferred to the scientist. There was a time when our nation could increase its production in any line by finding new lands that could be adapted to the purpose desired. We now have reached the time when if we would increase our production we must appeal to the scientist to show us how it can be done; to show how one acre may take the place of two, or one cow may serve as well as two.

But the scientists engaged here are likely to find themselves working upon problems that today are utterly unthinkable. We must not assume that we have reached the limit of the field of knowledge. Surprises are in store for us now the same as they were in store for us thirty or forty years ago. Who then could have had imagination enough to foretell the developments which we have witnessed, and these are no more remarkable in the field of engineering than in the field of agriculture. Forty years ago a thoughtful business man remarked to some friends that the time would come when street cars would be driven by electricity. His prophecy was received with laughter. Can you imagine the surprise of the young Dutchman who first made a lens and through it saw forms of life which no one knew existed? Steadily our scientists are opening up new worlds. We cannot think that the last word has been said in the development of dairy science. Experiments being conducted at the Wisconsin experiment station suggest a wonderful development in dairying. Two scientists have been studying the differences between milk fat and other kinds of fat. They have carried a little farther some studies that to a layman seem quite mysterious. It may be that their work will mark another epoch in dairying, but it is useless to attempt to foretell the future.

The greatest need of our world today is big men with big ideas. This need is felt in every field. Here you have laid a broad and firm foundation for the development of such men in the field of dairying. Such men and others similarily trained in other fields will control the future of our country. They will stand a little higher and see a little farther than their fellowmen. Like the pilot who stands on the highest point of the ship with his head just above the fog which blinds the people on the decks below and who is able to see clearly the course that should be followed, so these trained men located in this building and their students located in all parts of the state will be leaders in attacking new problems and overcoming new difficulties and thus will help the people of Nebraska to maintain and further advance their high standing at home and the high standing of their state among her sister states.

To such high purposes this building is solemnly and reverently dedicated.

(1-29-'17—2½M)—6