DOUBLE VALUE FROM FEEDING GRAIN

FOR EVERYBODY. ALL GRAINS AND FOR ALL STOCK

AMERICAN GRAIN GROWING CO.
CHICAGO, ILLINOIS, U. S. A.

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THE GRAIN GROWING APPARATUS

WHAT IT IS ❦ ❦ ❦ WHAT IT DOES

AND HOW IT WILL MAKE AND SAVE MONEY FOR EVERY FEEDER OF LIVE STOCK

BY

AMERICAN GRAIN GROWING CO.
HOME OFFICE AND FACTORY
CHICAGO, ILLINOIS, U. S. A.

Introduction

IT has been said that "he who causes two blades of grass to grow where but one grew before is a benefactor to humanity." If this be true, and we believe all will agree that it is, then he who devises a plan whereby double value may be secured from the grain ration as ordinarily fed to live stock, must be regarded as doubly a benefactor to mankind. Certain it is that the general methods employed at the present time are wasteful and unsatisfactory. Any improvement in such methods by which waste is avoided and better results obtained means a corresponding increase in profits.

It is the purpose of the pages which follow to introduce to the reader an apparatus for the sprouting and growing of grain for feeding purposes, new in principle, far reaching in results. Its general scope is the effecting of chemical changes in the flinty seed grains, dispersing certain of the constituent elements and adding others of vastly increased value, and rendering the whole a perfectly succulent, soluble food, in a form that the animal may digest and assimilate every nutrient in its make-up. The particular duty it sets for itself is, in brief, the accomplishment of these most salutary purposes:—

1. It increases the weight by the growth of the grain up to 100%.
2. Renders the grain wholly digestible and nutritive.
3. Brings to the grain by chemical changes most valuable food elements not otherwise obtainable.
4. It aids the digestion of other food with which the grown grain comes in contact.
5. The food supplies the best tonic that can be given to animals.
6. It converts corn, the great stock feeding material, into the ideal food for poultry, and all young growing stock.
7. It supplies at all seasons of the year a food to all animals which is the equivalent and counterpart of the nutritious pastures of summer.

These propositions may suggest themselves as extremely radical to one unfamiliar with the scope and bearings of our invention. We expect this to be true. The basis of the apparatus presumes a wide departure from well established feeding practices. It sets aside much misapplied knowledge of chemistry and food materials. But we make our statements fearlessly, and in the light of crucial, practical tests, having ourselves abundantly proven the truth of every claim.

We therefore submit this catalogue for your careful study and meditation, with full faith that the practice of its teachings will prove to be of vastly increased profit to you in your live stock feeding operations.

Most respectfully yours,

AMERICAN GRAIN GROWING CO.,

Chicago, U. S. A.

What Is Nature's Intent?

BEFORE entering upon the true object of this book, we have thought it wise to go into a discussion of a few facts which, while not of themselves necessary to the success of what follows, still have a more or less direct bearing on the matter and which will ultimately lead up to the main subject.

Seeds and grains not intended as food for man and animals,

Primarily, we wish to make the somewhat broad statement that seeds, and by seeds we mean grains of all classes, were not intended by nature as food for animals. We know of course that in taking this position we shall meet with the opposition of very many people and more particularly those who have not taken the time to investigate these matters, or even to closely observe natural conditions surrounding them. It is with a full knowledge of these facts that we make the above assertions, and have only to say in their support that they are not the result of mere hap-hazard conjecture but rather result from a deep study of the subject coupled with extended and well regulated experiment.

Let us in the first place then consider a seed in its natural construction, and as the best known and most common of the class of seeds let us select corn as the example.

Nature's care in protecting seeds.

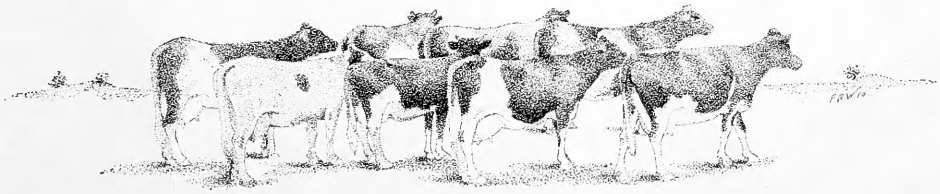
We find the single seed or grain of corn completely enveloped in a hard and horny shell which is of such a degree of toughness and leathery consistency as to be capable of withstanding many kinds and varieties of treatment without breaking down and meeting dissolution of its molecular construction. So great indeed is this protection that the seed may, and times without number does, pass through the entire alimentary canal of an animal and be again deposited upon mother earth without in the least impairing its vitality or growing ability.

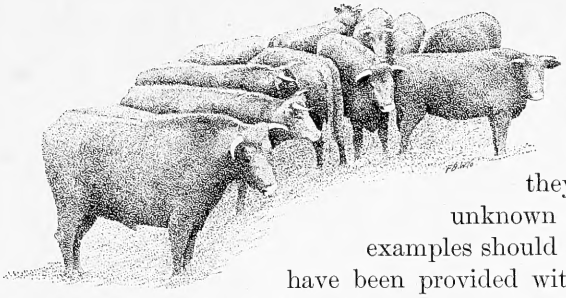
No proof need be brought in substantiation of this claim as it has been noted times without number, how in proper season, corn has been found growing in the fields and by the roadside from the decaying and disintegrated droppings of animals.

Vitality and indigestibility of seeds.

What has been said of corn in this particular is true to a much greater extent of the smaller grains, and the seeds of plants.

We know, for instance, of pieces of land, feed lots and milking yards particularly, becoming almost completely seeded with clover by the droppings of animals which were being pastured on second crop or aftermath clover. Many farmers have suffered from the ravages of weeds, which is one form of plant life, by buying and bringing to their own farms animals, as cattle, from another section of the country which had with them at the





time, within the stomach and intestines, such seeds. Most of us have observed how the excreta of birds are a most fruitful source of trouble to the agriculturist by the ease and rapidity with which they will pollute a country with new, often unknown and injurious plant life. These few examples should serve to show how the seeds of plants have been provided with protecting coats of mail as it were, enabling them to completely escape, first, the mastication of animals, and second, the action of the powerful acids and other effects of the gastric juices of the stomach and intestines, and still come again into outer life unharmed and with the life germ active and unimpaired.

Seeding of lands from excreta of animals, birds, etc.

Since these things are true we have come naturally to the conclusion that seeds were never intended as food for men and animals. This position is further borne out by the natural indigestibility of these various seeds and substances, and this holds true even after they have undergone the most careful preparation by man. It is assumed by most feeders that when corn is once ground and fed in combination with other substances that it is made wholly or entirely digestible. No greater mistake could possibly be made than to rely upon these conclusions as absolute. A careful washing of the excreta of animals which are being fed on ground grain, particularly corn, will show that large amounts of the grain have passed through the animal undigested.

Ordinary preparation of seeds and grain does not increase their digestibility.

FEEDING ONE ANIMAL ON THE WASTE OF ANOTHER

That this is the result of feeding whole grain is well understood, and that the practice is a most wasteful one, amounting in many cases to a loss of fully fifty per cent of the grain so fed, is accepted as fact by most feeders. It is this knowledge and the resulting desperate desire of the feeder to recover a part of this great loss which has brought about the loathsome, unsanitary, unnatural and disease breeding practice of feeding one animal upon the excretions of another. This refers in particular to the common and repulsive practice of following cattle with hogs.

The struggle to avoid waste.

It is a proper observance and due consideration of all these things which has led us to the conclusion first mentioned, i.e. that seeds—grains—were never intended by nature to be employed as food for man and animals.

SAVING THE WASTE

The inventor and originator of the process and machines hereinafter to be described, having suffered in common with all feeders from the natural waste and absolute loss resulting from the present methods of feeding, sought some means of their obviation with the results which follow.

Present methods worthless and obsolete.

It was found that such a considerable proportion of the grain ration remained undigested even after the most careful preparation by the best

known methods, such as grinding to various degrees of fineness, steaming, cooking, soaking, etc., that some other means had to be devised and adopted.

Natural methods.

It was found by careful and long drawn out experiment, coupled with a strict analysis of all substances brought into use, that nature had a way of so changing seeds and other grains as to make them entirely digestible.

Digestion of grain within the mouth.

It has long been known that the digestion of the mouth, which embraces the mastication of the food and a thorough mixing with the saliva, had a more direct and salutary action upon the breaking down of grain constituents and the changing of their chemical relations and forms than the after action of the stomach and intestines. This action and change are due to the presence of ptyalin, a diastatic ferment which exists in considerable quantities in the mucus substances, (saliva) of the mouth and not anywhere else in the animal economy. The office of this diastatic ferment is to produce such chemical changes within the food substances as to make them readily convertible into soluble form whereby they become digestible and ready for assimilation by the blood. This change which results entirely within the mouth progresses as follows:

Ptyalin and its properties.

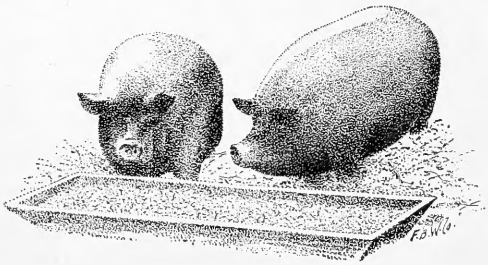
Chemical changes resulting from mouth digestion.

The starchy substances of the food are first converted into dextrin and sugar in combination, and then by further action of the diastatic and other ferments into sugar alone. The action of the diastatic ferment is so powerful that one part of it is capable of changing or transforming 2000 parts of starch. It must be remembered as stated above, however, that salutary and desirable as are these effects, they exist and take place only in the digestion of the mouth. To produce these very desirable results therefore, it would be necessary for the animal to hold the food within the mouth in the act of mastication until the whole mass was completely reduced to a liquid or soluble form. This we all know they will not do, the tendency to bolt the food being always present, notwithstanding our very best efforts to prevent it by means of mechanical appliances, ingeniously contrived feeding troughs, etc. It is not possible to train or even compel animals to eat their food so slowly and masticate it so thoroughly as to produce the best possible results in after digestion and assimilation.

Impossibilities of mouth digestion.

William Gladstone's recipe for longevity.

The very desirable action of the diastatic ferment was well known to, and most highly appreciated by, the great William Gladstone, though we have no knowledge of his having been in any sense a feeder of animals or a student in that direction. Touching on the subject, however, he mentioned it as being in his opinion the precise reason for his great longevity, stating on one occasion that he lived long because he made it a rule to masticate every morsel of food which went into his mouth thirty-two times before swallowing it.



GERMINATION--NATURE'S PROCESS

In casting about for the means of bringing large masses of food into the same soluble and digestible condition in which we find them within the mouth of the animal, after

having been thoroughly masticated and well mixed with the mucus substances, (saliva), we were led to the analysis of the sprouted and growing grain.

How nature changes the seed and comparison with mouth digestion.

We found by analysis that the masticated bolus of food taken from the mouth of the animal and the sprouted corn taken from the ground showed practically the same chemical constituents, the same food substances, and that they had both undergone the same changes. Here then was the basis of our first active operation. If we could but find some means of bringing the grain forward in a natural state of growth and development in requisite quantity, and in succession from day to day, we had solved the problem, and felt that by so doing we should prove the humble means of one of the greatest benefactions to humanity. How successful we have been we shall leave to the judgment of the reader after he has finished a perusal of this book.

Seeds not intended entirely as food for the young plant.

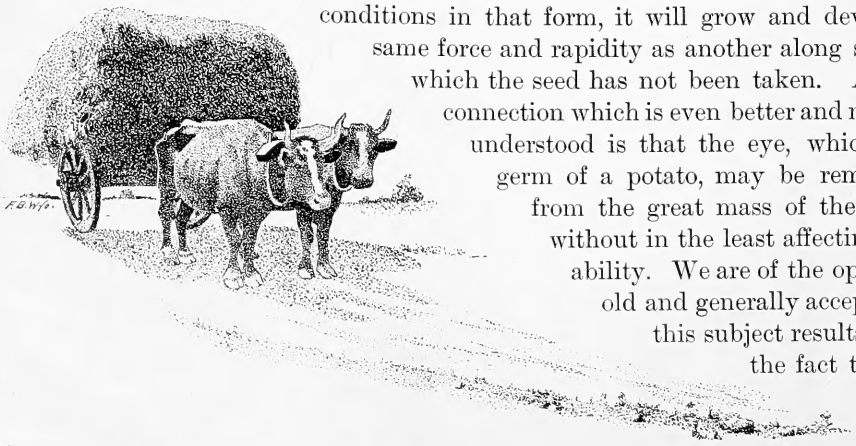
Having to some extent looked into the digestion of foods within the mouth of an animal, and observed the changes brought about there, let us for a short time consider the changes which take place in the great chemical laboratory of nature in preparing the seed as food for the young plant, that is, so much of it as may be required for that purpose.

Just at this juncture we are compelled to depart to some slight extent from the ordinarily accepted theory relative to this matter. It has been laid down in the past as an inflexible rule in nature that the seed is intended to supply the young plant with food until it has grown sufficiently and has developed the necessary organs for extracting its nourishment from the soil and air. We have not found this to be the case to any considerable extent, and are not, therefore, prepared to subscribe entirely to the old theory concerning these things.

Seeds sprout and grow without the presence of all the seed substances.

Our own extended experiments have demonstrated in the most satisfactory way that these things are true only in part, and that for the simple development of the plant only a small part of the components of the seed will be absorbed.

If, therefore, the acrospire and radicle be carefully removed from a kernel of sprouted corn and planted in the ground under normal and natural conditions in that form, it will grow and develop with the same force and rapidity as another along side of it from which the seed has not been taken. A fact in this connection which is even better and more generally understood is that the eye, which is the live germ of a potato, may be removed entirely from the great mass of the parent tuber without in the least affecting its growing ability. We are of the opinion that the old and generally accepted theory on this subject results largely from the fact that if a plant be pulled up some time



after growth has started the parent seed will be found as a shell from which all substance has been absorbed or otherwise dispelled. This fact is one quite well known to us, but the two examples of the corn and potato stated above prove that the absorption of the endosperm, (entire inner substance of a seed), is for a different purpose and result entirely. We hold that the absorption by the plant of the endosperm, is not, therefore, for the nutriment of the plant, but that there exists within the seed substance certain live materials, organisms or cells which in accord with the laws of propagation and the reproduction of their species, live within the sap or blood of the plant, and again reproduce themselves into a new seed. It is of greatest importance that these materials or cells are taken up by the young plant in the greatest quantity for the production of a large crop, and as they are of a very composite nature and easily decomposed, it follows that under unfavorable atmospheric conditions which retard the growth of the plant, the destruction of these cells occurs before they can be absorbed.

Other offices of the endosperm or seed substance.

Endosperm in relation to abundant crops.

The first action of the seed in beginning new life is the absorbing of water. Farmers and gardeners in order to facilitate the growth of the seed have often found soaking before planting very beneficial.

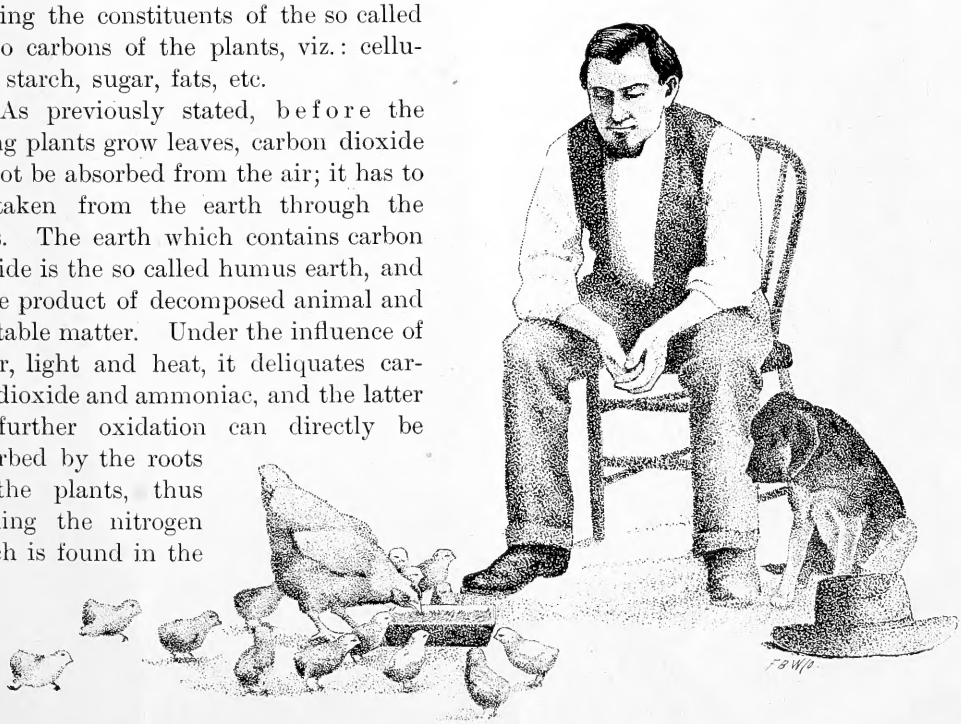
Plant elements and methods of distribution.

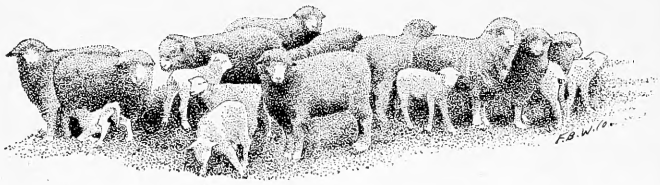
Water furnishes the seed and afterwards the plants with hydrogen and oxygen. The next action of the plant is the absorbing of carbon dioxide by the roots and leaves. Carbon dioxide consists of carbon and oxygen.

Changes into other substances.

When the elements of water, viz.: hydrogen and oxygen, combine chemically with the elements of carbon dioxide they produce a combination of carbon, hydrogen and oxygen; one part of oxygen is liberated, forming the constituents of the so called hydro carbons of the plants, viz.: cellulose, starch, sugar, fats, etc.

As previously stated, before the young plants grow leaves, carbon dioxide cannot be absorbed from the air; it has to be taken from the earth through the roots. The earth which contains carbon dioxide is the so called humus earth, and is the product of decomposed animal and vegetable matter. Under the influence of water, light and heat, it deliquates carbon dioxide and ammoniac, and the latter by further oxidation can directly be absorbed by the roots of the plants, thus forming the nitrogen which is found in the





Humus earth —what it is and what it does.

albumen, gluten, legumin and other protein substances of the plants.

The compounds of carbon dioxide and ammoniac are volatile, and are precipitated by rain, snow, dew, etc., furnishing thereby to the plants these nutriments in liquid forms; nevertheless, a direct assimilation by the plants of such matters from the air also takes place.

If the plants can abundantly absorb all these substances the development and growth is greatly accelerated; nevertheless, the atmospheric air and accompanying conditions often act unfavorably and may hinder and retard the growth by too much or too little moisture, warmth and light.

Following nature's methods.

The apparatus controls in the most natural manner all necessary conditions and furnishes abundantly the above mentioned elements and nutriments to the cereals within, and the seed is quickly started to life, and a further uniform growth continuously sustained.

The present sprouting process of the brewers in making malt is not a natural growing process; it provides no nutriment to the grain and therefore is slow in development of the sprout, the main object being to secure the greatest amount of sugar from the starch. Prolongation of this process quickly destroys valuable substances in the grain by oxidation, prevents an increase in weight, and has, therefore, no value as a process for growing grain for feeding purposes.

Unnatural means of preparing malt.

It transpires, therefore, that the action of germination in grains through the presence of ptyalin or diastatic ferment, brings them to exactly the same condition as we found them within the mouth of the animal after only the most thorough mastication and exposition to the action of the saliva and other ferments of the mouth.

This then brings us to the point we sought, i. e., the means of bringing grains to this entirely soluble and wholly digestible condition in an easy, abundant and economical way. We have attained all we sought and even more by the invention and perfecting of our grain growing apparatus as it appears on these pages.

While the apparatus will handle equally well all varieties of grains, we have confined our experiments more largely to corn than the other grains for the following reasons:

Advantages of corn as a main feeding ration in its changed form.

In the first place we are situated within that great imaginary zone reaching from the Ohio Valley west to the Rocky Mountains, known as the Corn Belt. Within this section corn grows almost spontaneously within the proper season. It transpires that under these conditions corn is more largely fed than any of the other grains because of its ease and cheapness of production and its very universality.

Furthermore, none of the other grains are so widely grown, that is, over so wide an area and under so many and such varying conditions of altitude and latitude.

Excess feeding of carbon and its results.

In the feeding of corn under the conditions of ease mentioned above, there has been produced the most baneful results by reason of the excess carbon crowded into the animal economy. Corn is exceedingly rich in carbon, and for that reason becomes an exceedingly one sided or unbalanced food for animals. This fact is well known to intelligent feeders, and in their desperation to escape the direful results they are either compelled to buy large quantities of other food stuffs, rich in constituents other than carbon, with which to tone down the carbon content of the corn, thereby producing a ration which is practically balanced in the relation of its various food constituents to each other, or continue to suffer the enormous loss resulting from the feeding of excess amounts of corn in order to secure the requisite amounts of other substances.

Balancing of the ration to reduce the effects of carbon.

Just here it may be added that the facts just stated above have been largely responsible also for the practice throughout the great feeding sections of allowing hogs to follow cattle in the feed lots.

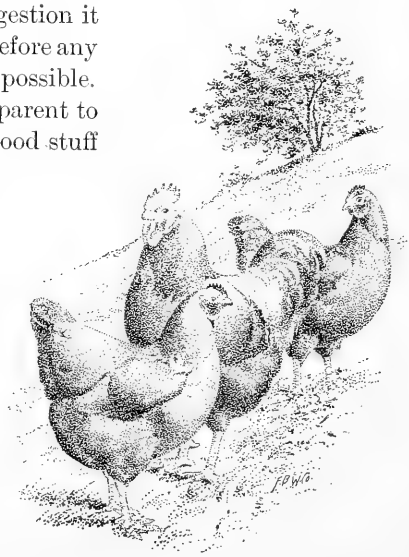
Advantages of solubility and succulence in stock foods.

SOLUBILITY OF FOODS

Earlier in a discussion of these subjects we made some short reference to the solubility of foods in general and of the grains treated by our apparatus in particular. This is a matter of such very great importance in its relation to feeding results that we wish to take the matter up somewhat at length in this place. We may base our claims upon that well known law existing everywhere in nature, which is, that every living thing in either animal or plant life can take nourishment only in the liquid form. This does not necessarily mean that the food must be liquid when taken into the alimentary canal, although the more nearly it approaches that condition the better, but that by processes of digestion it must reach a liquid, or at least semi-liquid condition before any assimilation to the blood, and hence to life, can be possible.

Nutrition extracted by the blood only in liquid form.

Since these are well known truths, it will be apparent to all that any process which will make the ordinary food stuff —and more particularly the grains, which we have found in our discussion of the subject to be the most indigestible of all substances—more readily digestible and more easily assimilated, is to be hailed with joy and immediately embraced as an economic measure.



It is not necessary to bring any further proof to the aid of these claims than merely to point out that all herbivorous animals, including the hog, thrive amazingly on the soft and succulent grasses. This is not due so entirely to the fact that grasses constitute perfectly balanced food

rations, capable of producing the best obtainable results, as to the further fact of their being in a soft, soluble and easily digestible and assimilable condition. The very cellular structures of green and growing plants in combination with rich juices — sap or blood of plants, and not water as so many chemists erroneously claim — make them yield readily to all the processes of digestion from mastication, rumination and deglutition, through to the peristalsis of the alimentary canal.

Entire solubility and digestibility of growing plants.

Since we find then that the greatest amount of growth and development in young animals, the greatest amount of fat in more mature animals and the greatest amount of milk in cows, are all resultant from the consuming of these naturally succulent and almost wholly digestible foods under normal or natural conditions, should we not all the more attempt their adoption with the less digestible grain foods and at all seasons of the year?

Growth and profit of soluble foods.

Let us turn for a moment to the consideration of this subject in comparison with feeding dry grain either whole or ground.

We have already seen that an extremely large amount of grains so fed passes through the animal undigested and is in a great measure lost. This is especially true in those cases where cattle, horses or dairy cows are not followed by hogs.

Continued loss from feeding whole grains.

We have found that in the growth (sprouting) of the plant the same changes take place as in the mouth digestion of grains. We find that by the very best means ever known for bringing about these changes, which is by the use of our own apparatus, it takes four full days to bring the grain to a condition of complete digestibility and assimilability.

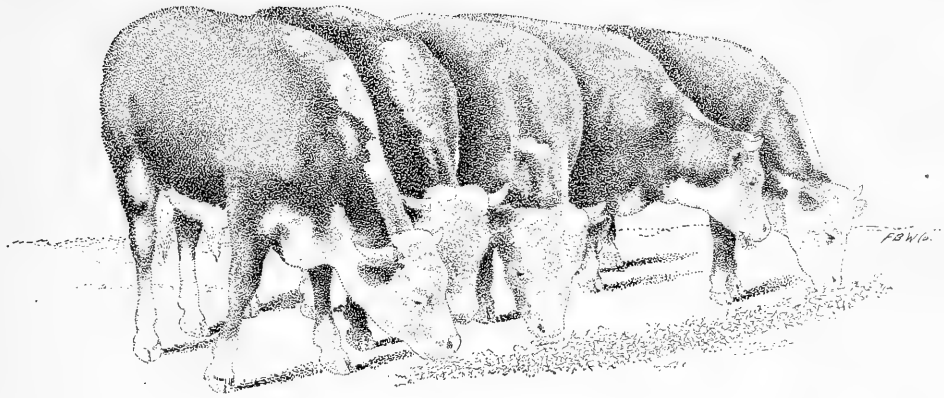
Changes in growth and time required.

How absolutely impossible then is it for hard and dry grains to undergo this necessary change during the few instants that they are contained within the mouth of the animal, which we have found to be the only place where this change can take place in a natural way. Even if we allow the added time necessary to carry the substance through the entire alimentary canal, subjected to all the action of the numerous acids and ferments of the stomach and intestines, we find that it reaches the outer world again in about twenty-four hours, forty per cent or more of it being unchanged.

Inability of gastric and other juices to deal with hard substances.

This is but one more of the many reasons why solubility and succulence of food stuffs should be held to be an absolute essential in the feeding of live stock for whatever purpose.

Before passing this phase of the subject there is another matter of more than ordinary importance that should be mentioned here. It is the



natural result to the animal from the feeding of grains in their raw and unchanged conditions as at present.

By this we mean the result so far as it concerns the ease and comfort of the animal. Having found that such a very large proportion of the grain food consumed by an animal passes through the alimentary canal in a whole, partially whole, or at least undigested condition, we must conclude, taking ourselves and our own experience as examples, that during the season of feeding dry foods, animals must of necessity suffer much from indigestion. Of course the animal has no means of making its suffering known, but that they do suffer in this manner and from the reasons before mentioned, hardly admits of any doubt. The writer, being what might be termed a heavy feeder, and believing that every animal should be pushed to the limit of its production, be that for growth, fat or the production of milk, has lost many animals which were sleek and fat and apparently in the pink of condition. This too when strict attention was paid to the feeding of a balanced ration composed of a variety of foods, brought together in the proper nutritive ratio. In a majority of cases the post mortem examination disclosed a completely impacted condition of the manifolds or maniplies of the stomach. In other cases death resulted from a devitalized condition of the entire alimentary canal, which prevented peristalsis and a consequent retention of the aliment, excess fermentation, hoven and death.

Indigestion and the troubles arising therefrom.

Heavy feeding.

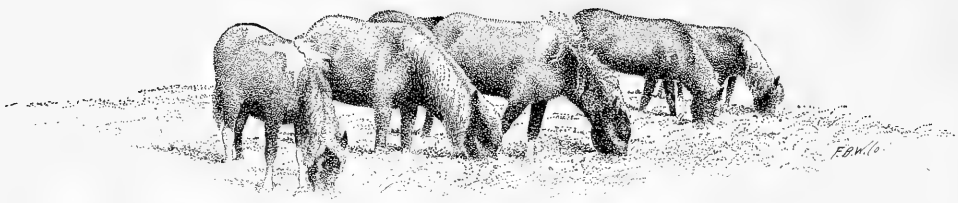
Impaction and clogging of the digestive tract.

Another fruitful source of trouble to him in the feeding of dairy cows where the grain ration was necessarily heavy, was from garget and milk fever, showing a feverish condition of the blood well nigh impossible to overcome if cows were to be kept up to the limit of profitable production.

Garget, milk fever, etc.

All these troubles, however, arose from the feeding of dry foods, and never occurred where animals were at pasture, and were almost entirely dissipated when he began the feeding of ensilage.

There can be little doubt that other feeders have had similar experiences, and that the occasional loss of an animal quite materially cut down the profits sought to be gained. Neither is there any doubt but that liability to disease is greatly heightened by the almost continuous indigestion of animals under high feeding pressure.



Loss of vitality.

Another matter that deserves consideration is that the nervous force of animals fed largely on indigestible substances yield continuously during the process until they reach a point beyond which it is not possible to feed them further with any observable good results. In case of cows or other animals kept from year to year, their vitality constantly wanes and they become prematurely old, failing in their functions long before their allotted time.

NITROGENOUS FOODS

Feeding Animals.

The true principle of feeding animals of any kind consists in providing the animal with a combination of food substances in such quantities and in such relation to each other as regards their chemical constituents as to supply all the wants of the animal.

Balanced ration.

The food constituents so combined constitute nutriment which in a general way consists of starch, sugar, fat, gluten, casein, albumen, etc. Every fodder or food stuff contains these elements, but they will be found in widely varying proportions in different food substances.

When brought together in one mass in the right proportions they constitute what is termed a balanced ration.

The animal body and its constituents.

The compounds named above will be found in practically every part of the animal body, and all that is necessary to keep up the animal economy or increase its weight or product is to feed the elements of which it is itself made. Analysis shows the animal body to be made up of nitrogenous and non-nitrogenous elements with an admixture of certain mineral substances.

Fodder contents.

Some few fodders possess all these elements in such perfect combinations as to be denominated a perfect or balanced ration. This can hardly be true, however, of any fodder growing in a natural state except mixed grasses. Corn, straw, turnips and a few other substances contain an excess of carbon, while oil meal, malt sprouts, etc., abound in an excess of nitrogenous or albuminous substances.

Relation of animal and vegetable albumen.

Being very desirous of showing the great importance of nitrogenous foods, we shall give here a short analysis showing how nearly the albumen of animal structure and that of plant structure approach each other. Just here let us say that the terms *nitrogenous*, *albuminous* and *proteids* are practically synonymous terms and have the same meaning.

	Animal Albumen.	Vegetable Albumen.
Carbon	53.5	53.5
Hydrogen	7.0	7.2
Nitrogen	15.5	16.5
Oxygen	22.4	21.6
Sulphur	1.6	1.2
	100	100

Since we find by the preceding table that the albumen of animals and plants so nearly equal each other in the proportions of the elements of their constituency, we must at once conclude that it is of the greatest importance that proteids, albuminoids or nitrogenous foods are fed to animals in large quantities.

Of all the food elements the albuminous are by far the most easily digested and assimilated. Indeed, they present to the animal economy a mixture in which the substance of muscle or lean meat exists already formed, and for this reason the albuminoids have for a long time been known as flesh forming foods. As a further evidence of the importance of this class of foods, it may be pointed out that no food or class of foods destitute of albuminous compounds can sustain animal life for more than a few days. For instance :—A sheep weighing fifty-two pounds, being fed on sugar dissolved in water, died at the end of twenty days, having lost twenty-one pounds in weight. A goose weighing six pounds, fed on sugar, died in twenty-two days, and another, fed on starch, lived but twenty-seven days.

Solubility and digestibility of albuminoids.

It is not maintained on the other hand that animals can live upon albuminoids alone, but it is well known that foods rich in albuminoids are greatly superior in feeding value.

This brings us to another phase of the subject, and one which, while amply borne out by our own experince and experiment, is somewhat at variance with the generally accepted theories regarding such matters. Without fear of successful contradiction we make the declaration that nature intended that for all the ruminants, solipeds and certain of the pachyderms, notably the hog, the live sap of plants and grasses, should constitute the most nourishing and vitalizing of all foods. It is well understood that plants take their nourishment in liquid and gaseous forms. We have found that all the mineral substances after being brought to the liquid form are taken up by the principle of osmosis or membrane diffusion. The gaseous substances are taken in, in part by the leaves or lungs of the plants from the light, air, rains, dews, etc. All these substances diffuse and are deliquated as sap or life blood of plants, from which the solid substances and forms of the plant are made up. These things being true, and certainly nobody will presume to dispute the facts, the live sap of the plant must necessarily contain all of the elements of which the plant itself is made up, in gaseous, liquid, semi-liquid and semi-solid form. The sap of plants contains the same substances, therefore, as were previously shown in our analysis to be the constituents of the animal body, i. e. carbon, hydrogen, nitrogen, oxygen, sulphur, and as before stated, these elements of all others are most readily digested and assimilated by the animal, more especially cattle, and are so vastly superior to the same forms of food when found in a hardened or solid state as in the grains, that it is hardly worth while to draw any comparison.

The growing, not the grown plant, the most natural and best food for animals.

Diffusion of substances necessary to plant life and development.

Sap, the life-blood of plants.

We have frequently referred to sap as being the blood of plants, and this is a comparison which pleases us very much, as the function of the sap in plant life is certainly analogous to the blood of animals, for like the blood of animals, we find it constantly sur-charged with assimilable nutriments or food material.

Errors of the chemist.

Just at this juncture is where one of the most egregious errors in connection with the whole problem of plant and animal life creeps in and, so far as we know, no single book, report or other matter devoted to the subject is free from it. It is the persistency with which the inorganic chemist insists blindly upon calling the sap, or life giving substance of all plant life, water. He conveys that impression in everything he says or writes, and in every analysis he makes. This misstatement of actual fact has for so long a time been held up to the public, and particularly to the farmer and feeder, that many of them have come to believe that the sap of plants is nothing more or less than so much water of the same character that composes springs, brooks and rivers. If these claims of the chemist were true it would seem possible to draw off the sap of plants and replace it with a like amount of pure water, and the plant yet live, grow and perform its normal functions. This we all very well know would be quite impossible.

Sap of plants is not water.

The chemist follows the ordinary practices.

If the inorganic chemist should happen to be possessed of a dairy farm he would quickly discard his water theory relative to the sap of plants or else starve to death through ignorance or stubbornness. For instance, the chemist tells us that the food of cattle obtained in the pastures consists of a large percentage of water and a little vegetable fibre. Notwithstanding all this and his very learned way of dealing in these matters, he will pasture his cows just as does every farmer who has for his guide only that knowledge gained from experience in his occupation. While we are regarding him as a dairyman and a shipper of milk, he might find a still more practical illustration of how quickly his water theory in practice will reduce to absurdity. Since milk is seventy-eight per cent water, which he claims is valueless, if he will concentrate it on the farm, thus saving freight, and send only the solids to his customers, notifying them to dilute to suit their respective tastes, he will at least be impressed by the striking rapidity with which a well established business can be destroyed. He could lay claim to the advantages of this plan with just as much reason, since he so openly declares the sap and juices of plants to be water pure and simple. The actual facts are that in the theories

relating to the matter under discussion and the various analyses thereon, the conclusions of the chemist are at fault and not in any single instance in accord with experience and results.

In consideration of all of the foregoing and in accord with our own experience we must conclude, therefore, that there is no single substance or combination of substances which will produce the same salutary and beneficial results when fed to cattle as these tender and juicy grasses. We must also declare that it is not at all in keeping with the results to declare that the soluble juices of these grasses consist simply and solely of water as the chemist would have us believe.

In this connection we should like to propound a question and state a well known fact. Will anybody name for us one single soluble nitrogenous substance which stall fed cattle get during the long winter months when they are obliged to subsist entirely on dry, woody and fibrous foods, and when the entire system is in an overwrought and feverish condition? We wish to state it as being a well known fact that constipation, indigestion, impaction, loss of appetite, restricted growth and product are the sure results of the present unnatural methods of crowding animals during the long winter months with hard, dry, insoluble and fibrous foods, and that all these conditions may be improved and relieved entirely by feeding even small daily rations of grain sprouted by our grain growing apparatus.

Undesirable expensive and worthless so-called "stock foods."

Just above we have stated that stall fed cattle did not have within their reach at any time during the long feeding period any succulent, albuminous or nitrogenous substances. In this statement we referred directly to the foods produced upon the farm and not to those which were bought in the open market and which require cash outlay.

Within comparatively recent years an enormous business has been built up in this country based entirely upon supplying these substances in one form or another. In every instance the pretended object has been to supply the natural deficiencies as to nutritive ratio and digestibility of home grown foods. This has led to crowding upon the market almost numberless worthless substances hiding under the name "stock food," their pretended object being to aid the animals in the digestion and assimilation of the coarse home grown foods. In most cases the required cash outlay to the farmer is so large as to be almost fraudulent, and in all cases where used to any extent, such so-called "stock foods" reduce the farmer's profit in his feeding operations by just the amount he pays for such substances.

The natural law the best.

Since none of these materials are used by the feeder while his animals are at pasture, for the very good reason that neither these nor anything else can be an improvement upon the natural grasses, we must conclude

that in order to secure such results as are satisfactory and desirable we must follow closely nature's laws in the preparation of animal foods. This we have done in the invention of our grain growing apparatus and the food which it produces.

A simple proposition.

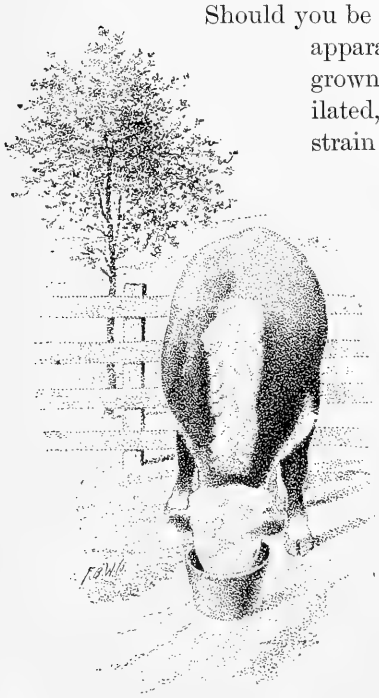
This brings us to a practical conclusion of the discussion of the main subject, but before closing finally there are a few matters upon which we should like to lay particular stress.

Grown grains for the dairyman.

We refer most particularly to the great simplicity of the entire proposition. While much of the discussion has necessarily had to do with matters which are more or less scientific in their nature, in reality they are very simple after all. The adoption and use of the apparatus requires no scientific training or profound knowledge, and it may be used with absolute surety of good results by anybody.

Increased period of usefulness in cows.

Should you be a dairyman you will find that with no other grain ration than the grown corn which can be produced so easily, you will have a perfectly balanced food which will produce the maximum flow of the richest of milk at but a fraction of the cost as compared with dry feed. Furthermore, the cows will keep in better condition, their general health will be materially improved; the naturally fevered condition of the blood—and necessarily therefore the milk—produced by the feeding of excess amounts of dry and fibrous foods will all be obviated, the cows will last much longer, that is, their period of usefulness will be extended as they will not be "burned out," so to speak, by being always heavily charged with carbonaceous and heating foods, and their calves will be stronger and develop more rapidly because of the better health and more even condition of the dam.



Should you be a feeder of beef cattle for market you will find in this apparatus the first real assistant you have ever known. The grown grains being so easily masticated, digested and assimilated, the animal is relieved from practically all taxation or strain upon the digestive organs, and everything moves forward with that ease and evenness characteristic of pasturing upon the natural grasses. Owing to these facts and to the succulence of the food, beef made in this way is much more tender and richer in natural juices than when fed on dry feed. Then too the animals may be fed for a much longer period and made to convert much more cheap corn into high priced beef. This is so for the reason that as we have seen before there can be no sour stomach, indigestion, impaction, etc., nor will there be any stiffness or bursal enlargement in the joints as so frequently results from long feeding of dry feed. Then too there are the advantages of cheap production which may be referred to here.

As a concrete illustration of the value of grown corn, let us suppose that it requires fifty bushels in its unprepared state to fatten one steer; ten steers will

require five hundred bushels. The grown or prepared corn gives you double the weight with as many and as essential food constituents, pound for pound, as you have in the ungrown. Therefore, you will require but one half or two hundred and fifty bushels to do the duty of the five hundred. If corn be worth fifty cents the net saving is $125.00; a most important item on so small a matter as the fattening of ten head of steers. If, in addition to the above, we take into consideration the matter of waste, the figures become still more significant. It is the experience of feeders that a large percentage of the corn as ordinarily fed, anywhere from thirty to fifty per cent, and varying in different animals, passes through the animal system unassimilated and undigested, frequently unmasticated. The grown grain is all digested, the animal appropriating every food element it contains. We have only to note this stoppage of absolute waste to see that the figures above given are easily within bounds.

Complete digestion.

Should you desire to grow calves in large numbers for marketing as veal, to replenish your dairy herd, for breeding purposes or for the general increase of your live stock, you will find in this grain growing apparatus your most efficient assistant. When the grown grains are ground and mixed with the requisite quantity of water the substance almost instantly dissolves into a rich creamy liquid that is second only to warm milk from the cow in the ability to promote growth and rapid development in calves. We have tried all of the substances recommended as substitutes for milk in feeding calves, but have never found anything that was a near approach to this liquefied corn. Calves will be absolutely free from indigestion, scours or bloody flux, and will need no other liquid food to bring them to the highest state of profitable development.

Advantages of grown grains for feeding calves.

Best substitute known for milk.

For the feeding of horses for either speed, heavy work or ordinary service, there is nothing in the form of single or mixed grains which will produce the same uniformly good results as corn when grown by our apparatus.

Feeding horses on grown grains.

While it is true that the horse of all domestic animals, is best provided with the means of mastication, first because of the large and powerful teeth, and second, because of the enormous amount of the secretions from the glands within and near the mouth, the principal constituent of which is diastatic ferment, we know also that none of our animals suffer so keenly from the effects of indigestion. In case of the horse the almost direct result of this, coupled with the great amount of dry foods consumed, is to largely dry up the secretions of the body and produce that condition commonly known as "hide bound." No horse has ever been known to suffer from this ailment when at pasture. No horse can possibly suffer from this cause when fed upon the succulent and easily digested corn from our grain growing apparatus.

Freedom of troubles arising from indigestion.

Freedom from indigestion, etc.

In feeding of hogs the grown grains will prove quite as salutary and beneficial in effect as in those cases already referred to. Hogs for market as in case of cattle can be fattened in the shortest possible time and at the minimum of cost when fed with this food alone. Young pigs should be fed upon the liquefied corn as previously described, for the feeding of calves. By using this prepared corn the farmer will no longer be limited in the number of pigs he can grow by the amount of milk he shall be able to provide them. The growth will be simply surprising to one trying the food for the first time, nor will the development be one-sided as the grown grain possesses all the elements necessary for muscular and bone development. Stock boars may be carried from one season to another on this food at a most trivial cost and have the added advantage of remaining active and serviceable for a much longer period than if fed upon dry feed. It excels as a food for brood sows because of its great milk making qualities. Sows fed with this food will remain in fine condition and at the same time supply their pigs with an abundance of rich and fever-free milk. Other advantages of feeding sows on this food will be found in the appended list of questions and answers.

Feeding hogs for market.

Best for growing pigs.

The stock boar.

The brood sow.

The poultryman without respect to his object, will find the grown grain the cheapest, safest and most profitable food it is possible to obtain. The corn as changed in the apparatus is rich in albuminous substances as we have seen in the previous discussion of these subjects. Since eggs are so largely composed of the same substances it must necessarily, and does, follow that this is a most excellent food for producing eggs. Since the production of winter eggs is merely a question of the proper food, we have solved the problem in the invention of our grain growing apparatus. These conclusions are amply borne out by our own experiments, when under normal conditions and with no other food than the grown grain we made the most profitable winter layers of practically all of the breeds.

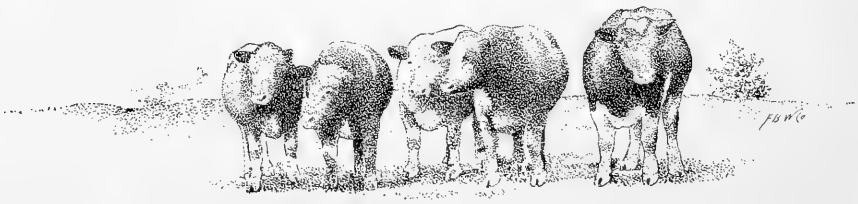
For feeding poultry.

Winter eggs.

Experiments with chicks fed exclusively upon this food after being ground, prove it to be a perfect food for rapidly developing the small birds. Chicks so fed escape entirely that great bane of the poultry grower—diarrhœa—and continue in perfect health from start to finish of growth. In an experiment where a brood of chicks fresh from the incubator was divided equally, one half being fed on the ground grown grain and the other fed in the best way known to the poultryman's art, lot 1, at the end of three weeks were not only the most active and vigorous, but were found by the scales to weigh 40 per cent more than lot 2.

For growing young chicks, broilers, etc.

This experiment may serve to show the advantages of this food to the man who is producing broilers and ducklings for market.



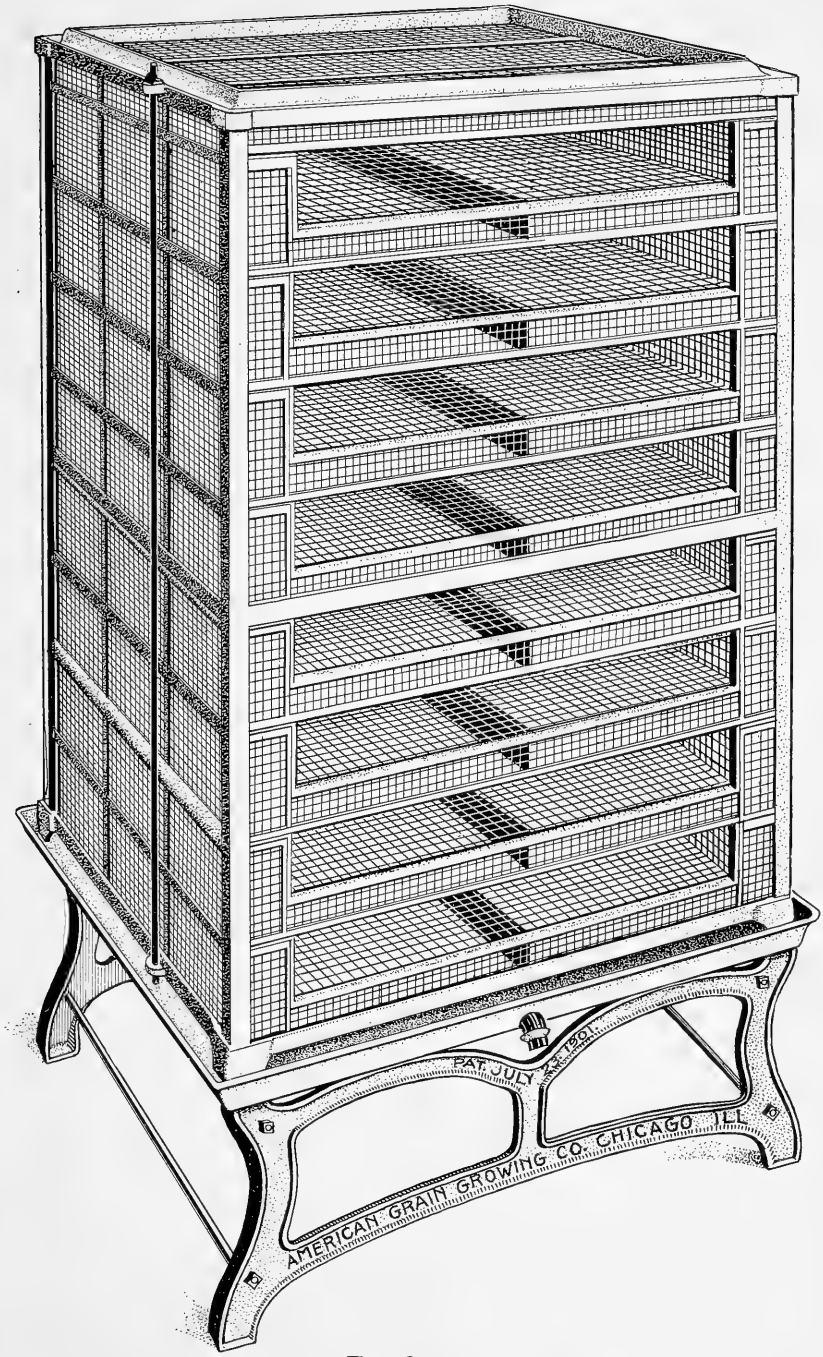


Fig. 0

This cut shows the apparatus set up in a completed form ready to receive the moss and drawers, and is given here for the purpose of showing how thoroughly well and durable it is made.

Note the supporting rods under each of the chambers which sustain the weight of the filled drawer and prevent all sagging or springing when the apparatus is filled.

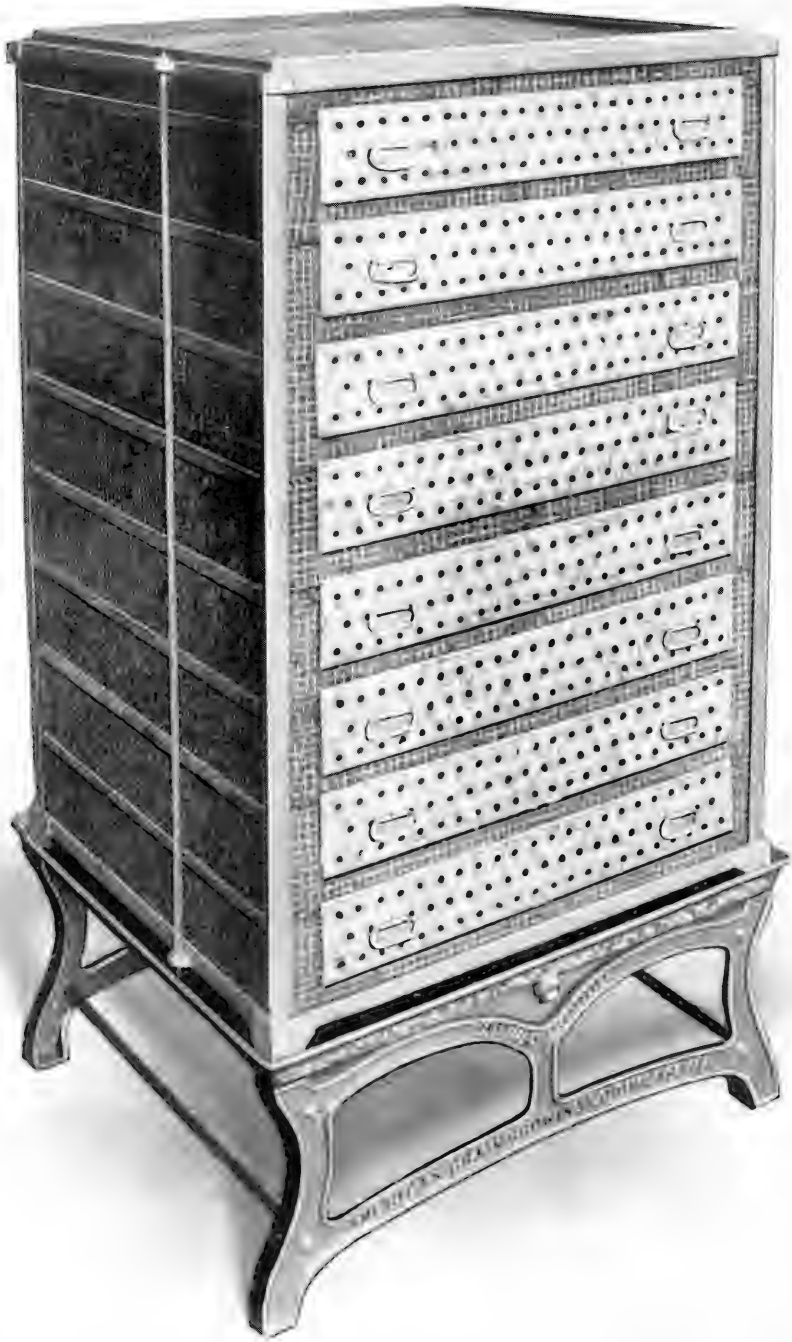


Fig. 1 This cut represents the growing apparatus set up complete and ready for use. It consists of a series of eight growing chambers, eight drawers, each of which has a capacity of one half bushel of dry corn, and a top cover. Three iron rods securely bolting together the above chambers in connection with the cast iron frames on top and bottom, four strong wrought iron corner posts which stand in sockets cast in the corners of top and bottom frames, which prevent a displacement of the growing chambers from their positions and add to the great stability of the apparatus.

The stand on which the above set of chambers rests is made of two strong heavy castings bolted together with four rods which are slipped through wrought iron pipes, forming as a whole a very substantial foundation for the whole machine. A large iron drip pan is placed between the stand and set of chambers which collects the water and drains it off through a nozzle in front into any kind of vessel.

The measurements of the apparatus are: Height, 5 feet 7 inches; width, 3 feet 6 inches; depth, 2 feet 8 inches; weight, 400 pounds; crated, 450 pounds.

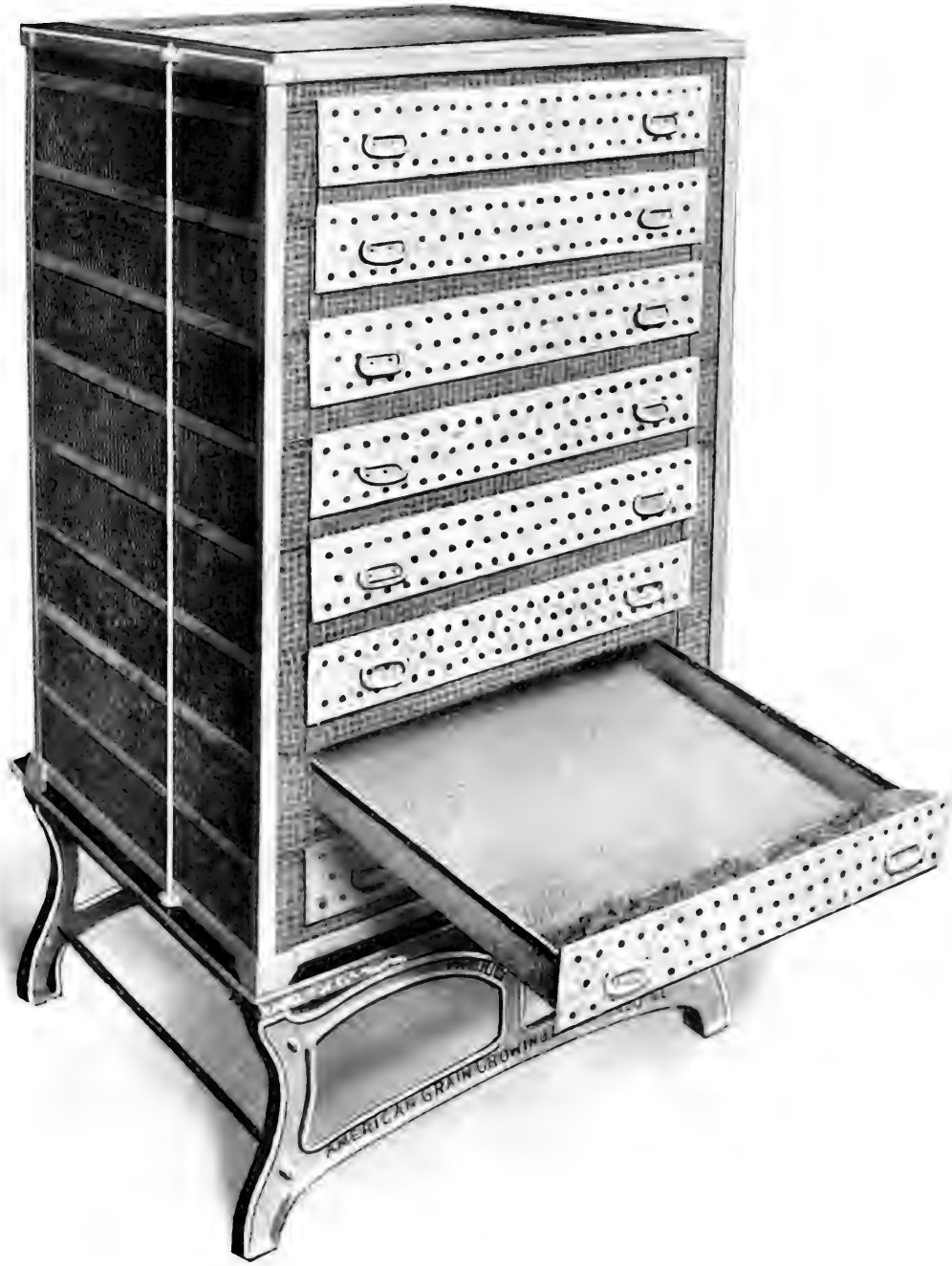


Fig. 2

This cut represents the growing apparatus with one drawer withdrawn ready to receive the grain, showing the construction of the drawer. It is made of best galvanized wire netting and edged and braced with galvanized iron, forming a very compact, durable drawer.

Fig. 3

This cut represents the growing apparatus filled with corn for growing.

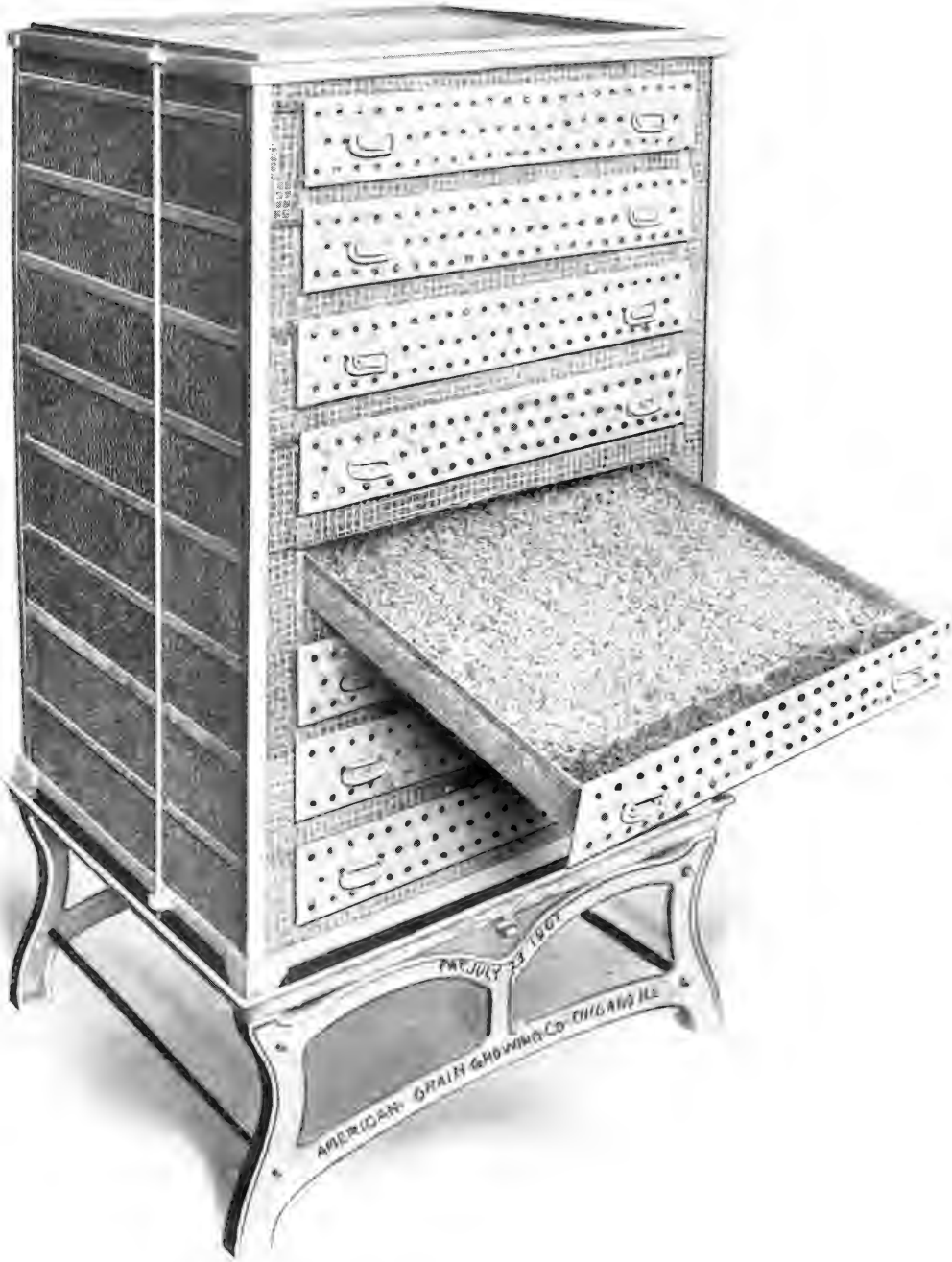


Fig. 4

This cut represents the growing apparatus with a drawer of corn showing the development of the corn between the first and second days.

Fig. 5

This cut represents the growing apparatus with a drawer of corn withdrawn showing the development of corn when finished and ready for feeding.

Fig. 6.

This cut represents the relative bulk of the same quantity of corn grown and ungrown.

The small portion shown in the left of the cut represents so much corn ready to be introduced within the apparatus.

The larger portion shown in the right of the cut represents the same grain four days later when it has been acted upon and removed from the apparatus.

This will serve in a much better way than by any argument we may adduce to show the increase in bulk of grains which are subjected to the action of our apparatus.

The changed and improved condition of the food as to its chemical construction, digestibility, etc., are fully treated elsewhere in this book.

Fig. 7

This cut shows how the grown grain may be prepared for the use of poultry or other small animals which from one reason or another might have difficulty in handling the long sprouts with kernel attached. A common meat grinder, such as is found in practically every household, will be found entirely satisfactory for preparing the food. The grown grain when treated in this way is especially well adapted to the feeding of small chicks, broilers, ducklings and all kinds of poultry. It will take but a few moments by this means to prepare the food for a flock of forty or fifty grown fowls.

Fig. 8

There has never been put in the hands of farmers such a satisfactory substitute for milk. This grown corn ground to a pulp and then dissolved by pouring water over it, fed to calves, will fatten them equally as well as when fed with fresh milk. It is very much relished by them and is preferable to all other substitutes for fresh milk. It will be found of equal value in feeding young pigs and hot-house lambs. The above cut shows the ready solubility of the food. The photograph of the cut was taken twenty seconds after the water had been poured on the pulp in the pitcher.

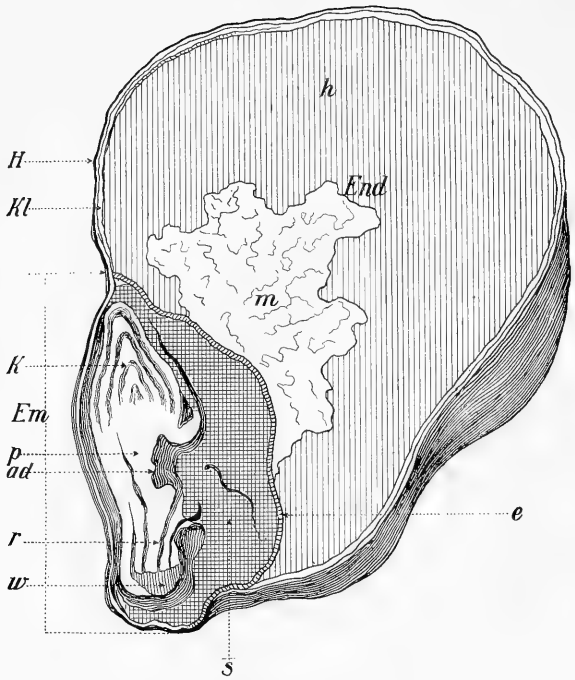


Fig. 9

As having a direct bearing upon the main discussion of this book we are presenting herewith a cut which gives a very excellent idea of a grain of corn when cut in two, showing the various parts in their relation to each other, together with detailed explanation and a complete analysis of the whole.

This cut explains in a much bettter way than could be done by any other means the percentages of the several parts composing the whole.

A careful study of this cut and the descriptive matter connected with it will help the reader to a much better understanding of the main subject.

H.—The outside shell, which is analogous with that of wheat, consists of the fruit and seed scale grown together, and form a solid leathery, indigestible substance of a rich yellow color in case of yellow corn, or nearly transparent in case of white corn.

Kl.—This portion of the grain consists of Gluten-Casein and Gluten-Fibrin, and these two elements are again analogous with certain of the principal substances found in wheat. These elements exist in very small proportions in corn however.

End.—Endosperm. This portion consists of—*h*, a horny part, and *m* a floury part; *h* being filled with close joined polyhedral starch grains which with the plasmatic substance are cemented into a solid horny mass; while *m*, the floury part, has a white color and consists of round free laying starch grains.

Em.—Embryo. The embryo is for the greatest part enclosed by the scutellum; and its epithelium, *e*, forms the immediate connection with the endosperm.

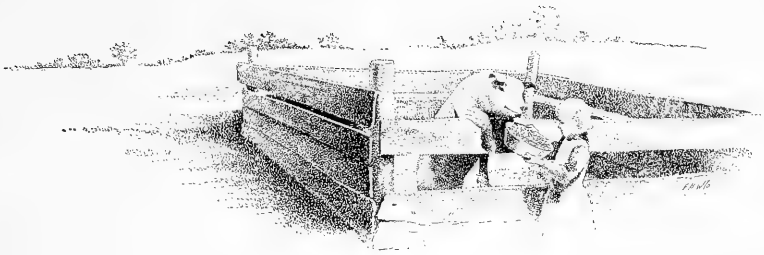
K.—Represents the point or head of the sprout or germ (acrospire) the part which first makes its appearance above the ground.

ad.—Represents the adventive rootlet of the sprout or germ (acrospire) stem.

r.—The radicle or root with its root cap *w*.

ANALYSIS.

Water	13.53	Non-Nit. Sub.—Sugar	1.06
Nit. Substances—		Dex	4.03
Soluble	.90	Starch	67.37
Insoluble	5.35	Wood Fibre	1.84
Fat	4.87	Ash	1 05



The following report of a conversation between a large feeder and the representative of the Company may interest the reader:

Q.—I notice that your machine seems to be very compact. What is the life of the machine, or how long will it last?

A.—As you will observe, all parts of the apparatus are made of the best galvanized wire and sheet iron. It is designed to last for ordinary use, from fifteen to twenty years without repairs. The total absence of any corrosive action in the use of the apparatus or process warrants such long life, and you will further notice here on this machine in use all metal surfaces are perfectly bright and without any coating whatever.

Q.—Supposing an accident happened to our apparatus, must the whole apparatus be sent to the factory to be repaired in such an instance?

A.—No. It could hardly happen that the whole apparatus would be damaged, making a return of it to the factory necessary. In most cases where an accident occurs it will be sufficient to send only that section which is damaged, as you see the apparatus can be taken apart in a very few seconds, and readily reassembled by any one.

Q.—How often does the moss or filling have to be replaced?

A.—The moss is designed slowly to decompose under the action of moisture and air, thereby furnishing to the grain within the necessary nutrition for its growth; after six months of use it becomes somewhat exhausted and should be replaced.

Q.—What is the cost of refilling the apparatus?

A.—It takes about one hundred and eighty pounds of moss to refill the entire apparatus, which costs in the open market, one cent per pound. Any inexperienced person can accomplish the task in a few hours.

Q.—Where can the material be had?

A.—The Company and its agents always keep on hand large quantities of the material which is specially selected for the purpose, and is sold to our customers at the very lowest possible price. Furthermore, it may be obtained from the regular farmers' supply houses and seed stores.

Q.—What previous preparation must the grain undergo before being put into the apparatus?

A.—It is not really necessary to do anything with the grain, although we prefer and advise to soak the grain for a day or so in water, as it saves time and thereby increases the output of the apparatus.

Q.—How can this best be done?

A.—Simply by putting the right quantity of corn into a tub or barrel and pouring sufficient water over it.

Q.—What material is added to the grain to make it grow?

A.—Only water must be applied in sufficient quantity on top of the machine to keep the grain always in wet condition.

Q.—What will be the result if for some reason the grain should grow too long?

A.—It would make it very difficult then to open the drawer, on account of the grain having grown into the sections above and below. In such a case the sections above such drawer will have to be lifted off; otherwise there would be no change and the same good results in feeding would obtain.

Q.—Does the apparatus require any specially prepared place for keeping it?

A.—It does not. It can be kept anywhere, in the barn, shed, etc., at the convenience of the user.

Q.—Can it be used in winter as well as in summer.

A.—Certainly. The seasons will not interfere at all, and indeed its greatest advantage will be derived from winter use.

Q.—But I see the apparatus is wet. How can you keep it from freezing?

A.—Most every farmer has a cellar warm enough to prevent freezing, which is in every way a suitable and desirable place for keeping the apparatus. Large dairymen and feeders have barns so constructed as to avoid freezing even in the most severe winter weather. Space in such buildings can be found for working the apparatus and will be found to be very convenient and desirable.

Q.—Will all farm animals eat the grain when prepared by this apparatus?

A.—In all our experience we have not found an animal refusing to eat it greedily. If for any reason an animal should refuse to taste it, as has been experienced at times in the feeding of ensilage, then a little bran or middlings sprinkled over it will induce the animal to taste, which is all that is necessary to overcome further objection.

Q.—If it is a superior food for fattening stock as claimed, how can it also be a good food for milch cows?

A.—To properly answer this it would be necessary for me to enter into a very scientific explanation of the many chemical constituents of the prepared grain and its further modifications and final assimilation into the animal body, but let me explain, that nature's laws of self preservation enable an animal to use the same substance supplied as food for such organs which necessarily must first be supplied on account of being for one reason or another exhausted, in order to prevent breaking down. After these organs have been sufficiently supplied and a surplus of substances is still undisposed of, then nature will facilitate the building up of other organs or parts of the animal. A perfect balanced ratio of food will not only sustain a healthy animal body, but will also perform the work necessary and accompanying all the functions of propagation. Let me illustrate this to you by a fact which we can daily observe. There are to-day made from malt many different articles of food. The most concentrated form on the market is probably the malt extract. Another product, malt tonics, another one is the beer and whisky. All these products contain in principle the same chemical substances of nutriment. Now let us see the direct effect from their use. Malt extract given to very weak persons has been recognized as a universal remedy and tonic for the entire system. It makes nerves, muscles, blood, flesh, etc. It is also successfully used for the special purpose of increasing the flow and quality of the milk in nursing mothers. It is hardly necessary to point out to you the layers of fat the malt extract produces, in form of beer on heavy beer drinkers. It is therefore very plain that nature can develop from the same substances and different bodies, different results, for the purpose of propagation, self preservation, and for the development of the highest type of species.

Q.—But this may be true of food extracts whereas the prepared grain is only so much raw material?

A.—I am glad you mentioned this. This prepared grain is the most composite form of food possible, containing all the elements necessary in making the animal body, and because it is so composite, it is easily decomposed; and in order to make an extract from same, which in order to be a marketable article must keep for any length of time, a great many valuable substances must necessarily be destroyed in the process of manufacture and be entirely lost because the product cannot be consumed immediately after making.

Q.—Will the food or grain prepared prove a satisfactory ration for the production of winter eggs?

A.—No better food could be imagined for this purpose. It is so little work for the hen to modify this food into eggs. The chemical analysis of the grain and eggs show them to be closely related in form, and the first stated results have been substantiated in all trials of practical use.

Q.—Does the grown grain possess any desirable qualities for feeding young chickens, ducklings, and broilers for the early market?

A.—In the practical use of this grain as food for this class of animals, it has again been shown overwhelmingly, how, in the work shop of nature, the same substances can adopt different forms. It is true that the stomachs of these delicate, tiny birds will not bear trifling with. No class of domestic animals gives more trouble fn feeding or suffers more from consequences of indigestion, than a flock of newly hatched

chickens. The feeding of this prepared grain not only develops the young birds with astonishing rapidity, but it also causes a marvelous growth of feathers from the very beginning and prevents, during this period, many ailments of the young chickens, which may be compared with the ailments of the human baby while teething.

Q.—What would be the probable effect in feeding brood sows?

A.—I may answer this with a question. Namely, what would young clover do to them? You know that young clover as a food for animals of this class can hardly be surpassed. It is a very nitrogenous food and just exactly what is needed for them. The nitrogenous matter in the clover does not, however, reach the same percentage as in the grown grain and your own experience as a feeder will help you to conceive the true results, namely, a very rapid development. The feeding of these sprouted grains will have another and most salutary effect on the brood sows. It will prevent entirely that pernicious and unnatural habit of sows eating their new born pigs. Many breeders suffer large annual losses from this cause. Taking into account their short-sighted methods of feeding we must conclude that they have only themselves to blame. Brood sows, like most animals in the corn belt, are fed excess amounts of corn and other carbonaceous substances. During the period of gestation the temperature of the blood is very naturally raised by several degrees, and the carbonaceous food adds to this high temperature until it amounts to a positive fever. The entire animal nature under these conditions craves something which will be cooling and soothing in its effect to counteract the feverish influences. The result is that the brood sow eats first the placenta and then the pigs. Singularly enough analysis shows that the newly born pig is a complete lump of albumen or nitrogenous substance, which we have found to be so valuable in counteracting the evil influences arising from a use of excess amounts of carbon. Taking all these things and relative analyses into account, we find that the brood sow fed on our prepared grains will be entirely free from a desire to consume her own offspring.

Q.—Is there anything in this grown or sprouted grain that would be likely to affect the reproductive organs of the female animals or cause them to abort?

A.—None whatever. On the contrary, in feeding large herds with this grown grain we actually prevent organic disease, including abortion, by the more vigorous condition of the animals.

Q.—If for any reason the grain after sprouting should become dry, will it be lost or wasted, or may it be used just the same as dried or natural grain?

A.—Grown grain from our apparatus does not decompose when dried and therefore connot be lost or wasted. It is in such a state, a still better article of food than the dried natural corn, on account of a solubility and change of the anatomic construction of the grain.

Q.—Can the grain be grown and sold in a commercial way by use of this apparatus, i.e. could a man establish a plant in a community and hope to grow and sell the grain successfully and at a margin of profit?

A.—It will indeed be a profitable undertaking for a man to establish a central station for growing the grain to be sold or exchanged to farmers in the neighborhood. Such business could easily be carried on by the present grist mills. The value of a bushel of corn by the growing process is more than doubled, which certainly should leave a margin of profit for both the grower and the farmer.

Q.—How may the grown grains be prepared otherwise than to feed them in the form in which they come from the apparatus?

A.—For the purpose of increasing all the qualities of the grain, there is absolutely no better process of preparation possible; but for making the substance more suitable to be eaten by poultry, it can be ground up, sprouts, roots, grains, altogether into different sizes in machines like our modern meat choppers, and even to so fine a pulp that it can be easily and entirely dissolved by pouring hot water over it. In this form it can also be fed with the greatest success to calves, as a substitute for milk.

Q.—Will those grains which from any chance escape mastication, be in a condition to be acted upon by the digestive tract, i. e. will they digest if they reach the stomach without mastication?

A.—We can guarantee that the grain in this form will be totally digested, even if the animal had not a single tooth in its mouth, for we have found that the digestion of the mouth is not at all necessary.

Q.—How long does it take a standard sized apparatus to pay for itself in extra advantages over the ordinary methods of feeding, if operated to its full limit daily?

A.—You will certainly not find it very difficult to figure the profits the apparatus will make for you, after our explanation and what you have seen here. A standard sized apparatus prepares one bushel of corn daily. If a bushel of corn is fed unprepared, half of it is lost, which at present prices equals twenty eight cents per day, and which

we redeem under all circumstances. Considered alone on this account the apparatus will pay for itself in about two hundred and seventy days. The second feature of the process is that about fifty to sixty pounds of succulent and nitrogenous substances are added to the weight of the bushel of corn, and taking the price of oil meal as a standard for comparison, should be valued at a cent per pound, which equals fifty to sixty cents a day; it is by no means exaggerated, as claimed that the earning capacity of a standard machine at the present time is equal to two hundred and seventy-five dollars per year in coin.

Q.—How many mature animals should a farmer or feeder have to make it an object to own a grain growing apparatus?

A.—Whenever a farmer has sufficient stock to feed a half bushel of grain ration per day. Such stock to include horses, cattle, calves, swine and poultry.

Q.—On what kind of animal would a trial best show the beneficial results to be derived from a use of the apparatus?

A.—We recommend that it be tried on milch cows first, for the reason that a change of food of any kind is more quickly apparent in the dairy herd than elsewhere; or on any animal that from one cause or another is off its feed and generally out of condition.

Q.—As compared with the cooking, steaming or grinding of feed is this process more or less expensive?

A.—It is infinitely less expensive than any of the plans named above. The apparatus does not cost more in the first instance than a first-class, durable and long-lived boiler and does not cost anything like as much as a power feed grinder, power included. Then in the second place there is no comparison between the labor required in working out the several plans, as it only takes ten minutes time per day to successfully operate our apparatus. Then too it requires no power, no fuel, there is no danger of fire, none from explosion, no costly repairs, and above all, no danger of spoiling the feed from over-cooking or burning.

Q.—Now, I have asked about all the questions which I think have any direct bearing on the case. To sum up these from the answers you have given me I must conclude that corn as sprouted and grown in your Grain Growing Apparatus is in and of itself a balanced ration and a perfect food for all kinds of live stock; that the corn so grown contains all the elements necessary to develop the animal in bone and flesh and product, such as milk; that by the use of this apparatus I will in future be spared the enormous expense of buying wheat, bran, middlings, oil meal, cotton seed meal, etc., etc., containing nitrogenous substances with which to balance up my excessively carbonaceous corn feed.

A.—Yes, your conclusions are entirely correct and the results you name are borne out entirely by our experiments and long experience in the use of the apparatus and the food it produces. We know that you and all other feeders of live stock will secure equally beneficial and money-making results from its use.

AN INVITATION

In the foregoing we have given the reader all the information that seems possible without an actual observation of the machine itself, and the growing of the grain within the machine.

Our factory in Chicago is located at No. 163 South Canal Street, just a half block south of the Union Passenger Station and on the same street.

Grain growing machines will be constantly in operation there and courteous and intelligent attendants will always be present to show the machines and explain their workings.

We extend a most cordial invitation to all farmers, feeders, breeders, poultrymen, etc., who are visiting the city to pay us a visit. "Seeing is believing," you know, and we know that you will not dispute the evidence of your own eyes.

PRESS OF FRANK B. WHITE COMPANY CHICAGO AND NEW YORK

To Whom It May Concern

The American Grain Growing Company guarantees the fullest protection to all users of its grain growing apparatus through its broad and sweeping patents, and through the further guarantee of the responsible company whose seal appears below.

It will prosecute in a most vigorous way all infringements of whatever kind, the above company being ordered to proceed immediately and without further authority in all such cases. No person or persons other than the American Grain Growing Company or their regularly constituted agents shall be allowed to make or sell the grain growing apparatus or its products.