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## **Thirty-fifth annual report of the Wisconsin Dairymen's Association : held at Tomah, Wis., February 20, 21, and 22 1907. Report of the proceedings, annual address of the president, and interesting essa...**

Wisconsin Dairymen's Association

Madison, Wisconsin: Democrat Printing Company, State Printer,  
1907

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# THIRTY-FIFTH ANNUAL REPORT

OF THE

## WISCONSIN

# Dairymen's Association

HELD AT

Tomah, Wis., February 20, 21 and 22, 1907.

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REPORT OF THE PROCEEDINGS, ANNUAL ADDRESS OF THE  
PRESIDENT, AND INTERESTING ESSAYS AND DISCUS-  
SION RELATING TO THE DAIRY INTERESTS.

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COMPILED BY

**GEO. W. BURCHARD, Secretary.**

MRS. A. L. KELLY, Stenographic Reporter.



MADISON

DEMOCRAT PRINTING COMPANY, STATE PRINTER,

1907

CONFIDENTIAL / SYSTEM REPORT

WIRE CENTER

Darwin & Association

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REPORT ON THE PROGRESS OF THE WORK OF THE  
COMMISSION FOR THE YEAR 1910  
IN THE FIELD OF THE WORK OF THE

THE COMMISSION FOR THE YEAR 1910

THE COMMISSION FOR THE YEAR 1910



THE COMMISSION FOR THE YEAR 1910

JUL 27 1911

## LETTER OF TRANSMITTAL.

WISCONSIN DAIRYMEN'S ASSOCIATION,

*Secretary's Office,*

FORT ATKINSON, May 20, 1907.

To His Excellency, JAMES O. DAVIDSON,

*Governor of the State of Wisconsin.*

I have the honor to submit for publication, as provided by law, the thirty-fifth Annual Report of the Wisconsin Dairymen's Association showing the Receipts and Disbursements the past year, also papers relating to the dairy interests read and discussions had at the annual convention held at Tomah.

Very respectfully,

GEO. W. BURCHARD,

*Secretary.*

# OFFICERS, 1907.

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## PRESIDENT,

W. J. GILLETT,

ROSENDALE, FOND DU LAC COUNTY.

## VICE PRESIDENTS,

HON. A. D. DeLAND, SHEBOYGAN, SHEBOYGAN COUNTY,  
President 1877.

PROF. W. A. HENRY, MADISON, DANE COUNTY,  
President 1890.

HON. W. D. HOARD, FORT ATKINSON, JEFFERSON COUNTY,  
President 1891-3.

HON. C. H. EVERETT, RACINE, RACINE COUNTY,  
President 1894-5.

HON. H. C. TAYLOR, ORFORDVILLE, ROCK COUNTY,  
President 1898-9.

HON. C. P. GOODRICH, FORT ATKINSON, WIS.,  
President 1900-1.

HON. J. Q. EMERY, ALBION, WIS.,  
President 1901-3.

CHARLES L. HILL, ROSENDALE, FOND DU LAC COUNTY.

## SECRETARY,

G. W. BURCHARD,

FORT ATKINSON, JEFFERSON COUNTY.

## TREASURER,

H. K. LOOMIS,

SHEBOYGAN FALLS, SHEBOYGAN COUNTY.

HON. CHESTER HAZEN, RIPON, FOND DU LAC COUNTY,  
President 1872-74. Died 1900.

HON. HIRAM SMITH, SHEBOYGAN COUNTY,  
President 1875-76. Died May 15, 1890.

HON. H. F. DOUSMAN, WAUKESHA COUNTY,  
President 1878.

HON. Z. G. SIMMONS, KENOSHA COUNTY,  
President 1879.

HON. C. R. BEACH, WALWORTH COUNTY,  
President 1881-82. Died September 15, 1896.

HON. W. H. MORRISON, WALWORTH COUNTY,  
President 1883-86. Died December 15, 1893.

HON. H. C. ADAMS, DANE COUNTY,  
President 1887-83. Died July 7, 1903.

HON. STEPHEN FAVILL, DANE COUNTY,  
President 1886. Died —, 1906.



## ARTICLES OF ASSOCIATION.

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(Adopted February 15, 1872.)

ARTICLE I. The name of this organization shall be, the Wisconsin Dairymen's Association.

ARTICLE II. The officers of this association shall consist of a president, secretary and treasurer.

ARTICLE III. The vice presidents of the association shall consist of all past presidents.

ARTICLE IV. The president, vice presidents, secretary and treasurer shall constitute the executive board of the association.

ARTICLE V. The officers of the association shall be elected at the annual meeting and shall retain their offices until their successors are chosen.

ARTICLE VI. The regular annual meeting of the association shall be

held each year, at such place as the executive board shall designate.

ARTICLE VII. Any person may become a member of this association and be entitled to all its benefits, by the annual payment of one dollar.

ARTICLE VIII. The executive board shall have power to call special meetings whenever and at such places as in their judgment its interests so demand.

ARTICLE IX. The officers of the association shall perform such other duties as usually devolve upon the officers of like associations.

ARTICLE X. The treasurer shall have the custody of all moneys belonging to the association, and authority to pay out the same whenever an order is presented, signed by the president and secretary.



# ARTICLES OF ASSOCIATION

## ARTICLES OF ASSOCIATION

Article I. The name of this Association shall be the Association of the People of the State of New York.

Article II. The object of this Association shall be to promote the interests of the people of the State of New York, and to secure to them the enjoyment of the rights and liberties guaranteed by the Constitution of the United States.

Article III. The Association shall be organized into a body politic, and shall have the power to acquire and hold real and personal property, and to convey the same.

Article IV. The Association shall have the power to make and alter its by-laws, and to amend or repeal the same.

Article V. The Association shall have the power to sue and be sued, and to defend itself in law or equity.

Article VI. The Association shall have the power to make and alter its constitution, and to amend or repeal the same.

Article VII. The Association shall have the power to make and alter its rules of procedure, and to amend or repeal the same.

TRANSACTIONS  
WITH  
ACCOMPANYING PAPERS AND DISCUSSIONS  
OF THE  
**Wisconsin Dairymen's Association**  
AT THEIR  
THIRTY-FIFTH ANNUAL CONVENTION

Held in Tomah, February 20, 21, 22, 1907.

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The Convention was called to order by Secretary George W. Burchard.

Sec'y Burchard: We never expect a very full attendance at the opening session of our conventions; this session is devoted largely to preparing the way for the business which follows.

I, in a way, very much regret that the President of our Association is unable to attend. He is that sort of a man that we are glad to show you, to advertise, but matters at his home in connection with dairying, which I will not now explain, are in such shape that it is not prudent for him to leave. I will call on one of his neighbors, and a Vice-President of the Association, to occupy the chair in his absence.

Vice-President Charles L. Hill called to the chair.

The Chairman: Ladies and Gentlemen, I assure you that my neighbor Gillett very much regrets that he is unable to be with you at this annual meeting of the Wisconsin Dairymen's Association. Mr. Burchard did not feel free to tell you what

kept him at home, because the matter in a way is a secret, but Mr. Gillett said he was willing you should know how important it is for him to be home. He is a breeder of Holstein-Friesian cattle, and he has under test at this time a Holstein-Friesian cow who has already passed the two weeks record, the month's record and before this week is up will pass the sixty days' record for butter fat. He felt that it was important to the dairy interests of Wisconsin and of the country at large that he should be at home taking care of that cow. We are glad to know that we have a man who is well enough known throughout the dairy circles of this State to be President of our Association here and who has been for two terms President of the American Holstein-Friesian Breeders' Association and is still milking the cow and, indeed, is so closely tied up to that cow's tail that he feels that it would not be wise for him to come here to preside at this meeting. Mr. Gillett is milking the cow four times a day and has not missed a single milking in sixty days with the exception of one morning, when he was at the bedside of his mother, who was dying.

Mr. Gillett sent by me the very kindest regards and best wishes for this Association and for this meeting at this time and I presume he will be thinking of us at this hour.

We have with us the Mayor of the City of Tomah, who will at this time give us his address of welcome.

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Mr. Chairman: I am beginning to think that Tomah is quite a Convention City, although, having served as Mayor but a short time, I have already been called upon to welcome the delegates to three different conventions.

Now, while I am averse to public speaking, I am always ready and willing to extend the official hand of welcome.

I believe it was Walton who said—"That doubtless God might have made a better berry than a strawberry, but doubtless he never did"—and I suppose I speak the sentiment of those present, when I say—God might have made a more useful animal than the cow, but doubtless he never did.

If I understand aright, the purpose of this Convention is to increase the usefulness of the cow, and as that self same animal turned last year through the channels of the local cream-

ery over one hundred thousand dollars into the pockets of the Tomah traders, I am sure we all appreciate her worth.

Gentlemen, it is with genuine pleasure we welcome you to our city. May your stay be both pleasant and profitable, and may you carry away pleasant recollections of Tomah and of the 35th annual meeting of the Wisconsin Dairymen's Association.

If at some future convention the question should arise as to where your next meeting place should be, I shall expect to hear the words, "Tomah, Tomah, Tomah."

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## RESPONSES TO ADDRESS OF WELCOME.

C. P. Goodrich, Ft. Atkinson.

Mr. President' Ladies and Gentlemen: This looks to me as though they had got me into a little bit of a box, being called on suddenly to respond to such a fine address of welcome in Taylor's absence.

I want to say to you that this is not my first visit to Tomah; my first visit in this part of the country was fifty-one years ago and I don't think there was any Tomah here then, at least I didn't discover any. There was not a railroad in Wisconsin. I made my way on foot, looking for a location, a place where I could buy government land to make a farm out of, and I found some land, I can't tell you exactly where, but only a few miles from here that suited me very well. I started to go to the land office at La Crosse, and I ran across the stage somewhere along through here that ran from Mauston to La Crosse. The stage was pretty well loaded down, the roads were muddy and I was in a hurry to get the land, so I went on foot, and I beat the stage into La Crosse, but the next morning when I went to the land office as soon as I could get there, I was informed that the land had been entered the day before, and that must be the reason why I am not now a citizen of this part of the country. Even then I was welcome to the few settlers that were here. We considered it then a vast, unbroken,

almost trackless wilderness; the few tracks that were here, some of them I made.

So I knew we would be welcome here now. At that time I doubt if the average would have been more than a cow to five hundred acres. Now there are a great many.

You see I am talking along in a rambling sort of a way. I have known of gentlemen who could talk without thinking, their thinking machines stop entirely and their tongues run on, but mine won't work that way.

The Dairymen's Association was formed some thirty-five years ago and it has done wonders in pushing the cow industry in the State of Wisconsin. It has built up the southern part of this State, made the lands very valuable because it has made them rich and the cow has filled the pockets of the farmers with money and is beginning to do that somewhat in the further north. We can see that it is already doing it in this part of the country, and in the course of time, with the encouragement of the Dairymen's Association, the dairy industry is going to redeem the whole State of Wisconsin and make it the greatest dairy state in the Union, if not in the whole civilized world.

I know that we are welcome here and I thank the Mayor for his kind words.

My thinking machine is stopped and I will not let my tongue run on any longer.

C. H. Everett of Racine being called for, spoke as follows:

Mr. President, Ladies and Gentlemen: I am glad to be at Tomah this morning and to meet the dairy farmers of this vicinity, and I am glad to say a few words and hope to offer a little encouragement to them.

I have been an exponent of the dairy cow for a good many years, and have been engaged in the work of milking cows myself; most of my life I have spent as a dairyman. I have always been anxious and am still so to do something to help the dairy farmers of Wisconsin; to help them secure better results, to help them to see more clearly, to enlarge their vision and to raise them up so they may see how to help themselves.

Dairying is a matter of education very largely; it is a matter of good heart, common sense and thought. Our state is burdened with poor cows, and that more than anything else is what holds back the Wisconsin dairyman to-day,—the poor cows that he has on his farm. Our dairy farmers are too easy,

too careless, too slow in regard to the individual ability of their cows. They are broad in other ways, broader than other farmers in this state or any other state, and they are broader than the dairy farmers of other states, but not nearly as broad as they should be and as they can be.

Every farmer knows better than to sell a fat steer worth seven cents a pound for four cents, or a good fat hog worth six cents a pound for three cents. He knows a cord of hickory wood is worth more than a cord of poplar wood, but still a large majority of them seem to be content to put expensive feed into different cows and do not seem to think that it is important to know what kind of cows they have upon the farm; in other words, to test the cows and get their value, their ability to turn feed into money.

Now, a dollar's worth of feed put into a cow may render two dollars worth to the owner of that cow, and a cow in the same herd may not pay him back but one dollar. That has been demonstrated time and time again by Mr. Goodrich and many others in taking a cow census.

It seems to me it is a matter of common sense, a matter of pride, for a man to know which one of those two kinds of cows he has upon his farm.

Life is short at the longest, and many of you farmers, as I see you in front of me, are past middle age, you are going down hill; like myself, you are on a decline and a few more years will put us out of usefulness, and it seems to me it is too bad to spend the little valuable time we have, fooling it away on these indifferent cows,—at least, not to know something about our business, not to test these cows, to apply the Babcock test to them and find out what they are worth, and whether they pay for the feed that we give them; in other words, whether they pay for their board. I bought a Babcock milk test fifteen years ago or more, and it didn't take me long to find out that I had a lot of poor cows, cows that ate more feed than they paid for, and I got rid of them, kept the better ones, purchased a pure bred Guernsey sire and began to breed up, to improve my cows, until I got a herd that began to pay a profit.

It is simply a matter of business and a little energy, that is all there is about it.

I want to urge upon your farmers attendance at this con-



vention and to seriously consider what is going to be said to you here. It will come from men of experience, like Mr. Goodrich, men who have owned good cows and have become independent, some of them, and they have done it by having good cows and doing a little clear thinking, that is all, applying good business methods to their business.

This convention is for the milk producers of the state, the county and this vicinity, and you cannot afford to miss a single session of it, and we want you to take part, too. Tell us what you are doing, give us your experiences and if any of us can help you, we will be glad to do so.

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## PRESIDENT'S ANNUAL ADDRESS.

President W. J. Gillett, Rosendale.

(Read by the Secretary.)

Members of the Wisconsin Dairymen's Association, Ladies and Gentlemen: It is with pleasure that I extend to you greetings at the opening of this meeting.

One year ago you took advantage of my absence from your convention, and in electing me as your president, conferred an honor, the highest within the gift of the members of this Association. This is the first opportunity, gentlemen, offered me for publicly extending to you an expression of the grateful appreciation which I deeply and sincerely feel for the honor thus conferred.

With this meeting the Wisconsin Dairymen's Association reaches the thirty-fifth mile-stone in the history of its existence, and the good work accomplished by this organization during these years can not be easily estimated. Indeed, it has woven a mighty fabric which has spread over every dairy precinct of the state of Wisconsin and its far reaching influence has directly or indirectly benefitted every dairyman in the state, and so thirty-five years ago, when a small body of energetic, enthusiastic dairymen met at Watertown and affected

the permanent organizaion of the Wisconsin Dairymen's Association they "bulted better than they knew."

We meet here at this time for the purpose of an exchange of ideas and to discuss questions which are of interest and importance to the dairy husbandman, and the program which is to follow is such that I believe no one can go home from this convention without taking with him some ideas—some knowledge that will be new and valuable to him.

We have every reason for taking a just pride in Wisconsin. A pride because of her high standing among the leading agricultural states of this nation; pride because of her rapid advancement in agricultural pursuits; pride because of the excellent character and wide reputation of her herds and flocks, and pride because of her public institutions for mental training and learning.

Wisconsin is looked upon as authority on dairy topics. The attention of the world is attracted to Madison; her young men and women have gone out into the world and hold many positions of responsibility and honor; representatives from her dairy herds will be found in every state from the Atlantic to the Pacific; at the World's Columbian Exposition and at St. Louis, in open competition with the world's fittest, no contestants were found "worthy of her steel," while later developments in the dairy performance of some of her animals, have challenged the most phenomenal yields of the world. Thus the high character of our purebred herds makes the avenues for improvement in the dairy cattle of the state more easy of access, and a practice of grading up can not be too strongly urged or too highly recommended.

Surely the pure bred sire is the salvation for all live stock improvement, and the fact that dairymen from the Pacific Coast, the Atlantic and Gulf states, Canada, and Mexico can afford to come to Wisconsin and pay high transportation rates upon sires selected to improve their herds, should serve as an eye opener to some of our own dairymen, who have heretofore failed to appreciate the influence and value of the improved sire. Surely a sum of money thus invested is a most paying investment, and quality will endure and live on long after the purchase price is forgotten.

During the past few years the prevailing prices of dairy products have been very encouraging for profitable dairying



and there is positive proof of a general awakening of interest in the dairy industry.

The dairy cattle markets of the United States are continually clamoring for a higher grade of dairy products and cattle and more of them. On every hand dairy ability commands a price commensurate with the quality, and there is certainly little danger of over-loading the market for some years to come. These facts, aside from the advantages to be derived in his own dairy should encourage every dairy farmer in the matter of breeding and reaching out for animals of a higher standard of excellence.

During the past year this Association has entered into work which has for sometime been carried on in other states and in Canada.

Contemplating the good that might be derived from a practice of weighing and testing the milk of the dairy herds through-out the state, for the *entire period of lactation*, and to encourage the adoption of such a plan by every dairyman of the state, as well as to encourage the formation of Test Associations in different dairy precincts, this Association has two men in the field but since one of these representatives is on our program, I will say nothing as to what the results of this work have been further than to mention, that within my knowledge, there have been two herds sent to the shambles because of unfavorable disclosures this system of weighing and testing has revealed to the owners who by it found their cows were a bill of expense rather than a source of profit. Such conditions, which certainly prevail in many instances, leads to the thought, that a man to be a successful cow keeper, should learn his business, and for this purpose and as an educator the value of the scales and fat test cannot be ignored or their constant use neglected.

Know your herd, investigate the best methods of breeding, feeding, and care taking, and study the prevailing conditions that surround you, for our equipment will grow better with the application of a higher intelligence and a clearer understanding of our subject.

When the roar of cannon and the shriek of shell proclaimed the victory of Dewey at Manila Bay; when Admiral Schley vanquished Cervera's squadron off Santiago harbor; and when Admiral Togo met and destroyed the magnificent Russian fleet

in the sea of Japan, the laurels of victory came not alone through the equipment but through "the men behind the guns."

Although we take great pride in Wisconsin as one of the leading states in dairy husbandry, we have fallen far below the limit of our possibilities and our progress and advancement during the past two decades bespeak something of what the future holds in waiting for us.

It is sad, but nevertheless true, that the incentive that prompts the average man to action is the love of gain, his interest increasing or decreasing according to the size of the arc described in the swing of the pendulum of prosperity, but it is a pleasant thought that life holds out to us things dearer than wealth—a public benefactor—and help to our fellow men—an honor and a pillar of strength to the business in which we are engaged.

During the past year it hath pleased Almighty God to remove from our midst three of our most distinguished and honored members.

Stephen Favill, one of the ex-presidents of this Association, Congressman H. C. Adams, ex-dairy and food commissioner of the state of Wisconsin and a former president of this Association and Mr. Fred Rietbrock.

Mr. Favill's life ripened into a good old age. He was always a lover of agricultural pursuits, a thorough dairyman, enthusiastic, energetic, aggressive and ever ready to espouse the cause of dairying and assist in the advancement of the dairy interests in Wisconsin.

Mr. Adams' life was much given up to the cause of agriculture. He was a born leader of men, easy of approach, kind of heart, genial and beloved by all who knew him. His work in the different capacities in which he served reflect the high character and marked ability of the man. His services in the capacity of president of this Association, in the State Dairy and Food Commission and in Congress speak of that leadership and untiring energy characteristic of his life, and leaves behind a record that will be ever cherished by an appreciative constituency.

Mr. Rietbrock was an enthusiastic admirer of the dairy animal, a devout lover of agriculture, a noted breeder and a man whose influence we could little afford to lose.

In the passing of these three gentlemen, the voices that were

so often heard in the councils of this Association and for the advancement of the dairy interests, are forever hushed and it is with a mingled feeling of joy and sadness that we recall them in memory—joy because of the great good the efforts of their lives accomplished—and sadness because of their departure. It can well be said that the world has been made better by them; we cherish their memory and revere their names.

The Chairman: I feel sure that there are in that paper many things that we will wish brought to our attention, and I will appoint a committee for that purpose, consisting of Mr. A. D. DeLand, Mr. E. F. Wyatt, Mr. M. L. Wells. I want to speak of one or two things I noticed in Mr. Gillett's paper. He speaks of the "man behind the gun," and he ought to be competent to do so, because he is at present the "man behind the cow," and to secure such records as his cow is making at the present time, very much depends upon a man's personal attention. The other records made by Wisconsin dairy cows that he speaks of are now the talk of the whole world. Three years ago "Loretta D" brought to Wisconsin the laurels that she gained at the so-called "St. Louis Dairy Cow Demonstration." Two years ago "Yeksa Sunbeam" established a world's standard of fat record; making 857 pounds fat, equivalent to a thousand pounds of butter, and now my neighbor Gillett's cow has reached the magnificent yield of milk, last Sunday, of 106 pounds. She has given 28.4 pounds fat in a week, which with the one sixth added to the butter fat, would make close to thirty-three pounds of butter, and in thirty days she has given 110.13 pounds, being just slightly ahead of the previous Holstein-Friesian record. But she will probably yet add something to that record, for she is now doing better than she was thirty days ago, and the sixty days' record will be closed Saturday night.

It is these records that bring the attention of the whole world and the whole dairy universe to the State of Wisconsin.

A Member: Do you know how she is being fed?

The Chairman: Yes, I do know a little about it. Mr. Gillett says she is having twenty-three pounds of grain a day. Mr. Wells was there yesterday and may be able to correct me. I think she is eating in addition to that, thirty pounds of silage and thirty-five pounds of sugar beets, and hay without regard to weight, practically. As we have a little time this

morning, I think it will be valuable for us to know a little bit about how that cow is handled. She is kept carefully in the barn, watered and fed there; she is kept in a box stall and blanketed all the time. Mr. Wells said he was there yesterday afternoon when Mr. Gillett milked the cow and it was marvelous to see the pains he took to get the last drop of milk that she had. You may say, that has not any bearing upon your life as dairymen, but I say it has. We think a cow is doing pretty well that makes a pound of butter fat a day, and yet that is only one quarter of what a cow has been known to do. But let me tell you, this cow is not an accident, she is a result of a long line of breeding that Mr. Gillett and his father have been paying attention to ever since I can remember. In 1881 they bought the great-grandmother of this cow, and in 1887 they bought the grandmother on the other side and have been mingling those two strains since that time. Not only does she show her breeding, but the calf that was dropped by her this year is said to be a marvel of excellence by those who have seen it. These records are turning the eyes of the dairy universe all toward Wisconsin, and Wisconsin is destined to become, not only the leading state in dairying, but it is also going to be the leader in the production of the best dairy bred cows and I think that this Wisconsin Dairymen's Association can take to its credit the work of bringing the most advanced dairy ideas into practice in Wisconsin down through all these thirty-five years that now result in the great and general dairy prosperity of the state.

Mr. Wyatt: How is this contest conducted?

The Chairman: It is an official test. There has been a representative from the Experiment Station at Mr. Gillett's place, who has watched every detail and been in control for sixty days. There is no opportunity for graft or deception. Take this case, Mr. Gillett will probably sell that cow for \$10,000 when he gets ready to sell her, and you may be sure the Experiment Station does not want to vouch for that work unless it is all right, so every care has been taken. They have changed the man in charge, Prof. Woll, or his assistant, has come up from Madison and stayed there for a while, and then the man has been changed, so that there can be no possible question about this test. The man takes a sample of the milk



as soon as it is milked and puts it under lock and key until he tests it. The man who is in charge is compelled to report every day to Madison just what she is doing, so that they may more closely keep track of the work.

More than all that, the Holstein-Friesian Association are watching it as closely, although of course we might say they are an interested party, but the Station cannot be called in any way an interested party, and there is no reason in the world to question any fact contained in this record in the least.

I might go on and talk a good while of the benefit that accrues to the dairy industry through these official tests, but you will hear more of them.

I want to speak of one more thing. It was my privilege, last week and the week before to be in attendance upon the Farmers' Course at Madison—not all the time the first week nor the last week—six hundred farmers were there in attendance upon that ten days' course of study, and a more enthusiastic, earnest lot of men I never have seen.

What impressed me more than any other one thing was that there was not what I call a "critic" in the bunch. There wasn't a man that came down there endeavoring to tell a university professor what he knew, there wasn't one single criticism at any session that I was able to attend of the work of any man. They were all there to learn, and four-fifths of these men, if not more, were men who are particularly interested in the dairy industry and a large portion of them were using pure bred dairy sires on their farms and had silos and farm separators and many other evidences that they were of the advanced class of dairymen. They were going back from that ten days' course of study inspired for better work upon their farms, not only to make more dollars, but to be better farmers in the larger sense of the word.

I asked one of the pioneer members of this Association this morning what constituted a successful farmer, and the answer was, that he should not only make money, be successful in a financial way, but also keep his farm in such condition as to soil and the stock kept and the buildings, fences, etc., that his example would make his fellow farmers better farmers for his influence in the community.

I want to call your attention to our program, and partic-

ularly to the milk and cream exhibit. I believe we will have a good exhibit of milk and cream that will be scored by gentlemen from the Dairy and Food Commissioner's office at Madison, and prizes will be awarded upon its cleanliness and purity, etc.

We have a fine program as you see, and we want you to help us to make it a success that we may be inspired to be better dairymen and in a larger sense more successful farmers.

Secy. Burchard: I want to call your attention particularly to the second paper this afternoon, "Why the Silo?" This paper will be read by Mr. Hill, who has had a silo now some twelve years, is it?

The Chairman: Nineteen.

Secy. Burchard: I doubt not there are a good many people in this vicinity who have some question as to whether it really pays to have a silo, and they will bring up all manner of objections to the silo; it costs too much to build one; it costs too much to get the corn into it, and all that sort of thing; it makes sour feed anyway. But Mr. Hill has tried it, he says for nineteen years—he doesn't look it, does he? Well he had a father before him who brought him up in the way he should go, and we will go back to cover the nineteen years. Mr. Hill will give you figures which will be of considerable importance. Upon this program we will find many other interesting papers.

Adjourned to 1:30 P. M.

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Convention met at 1:30 P. M.

Vice President Hill in the chair.

The Chairman: I do not need to tell you that Mr. Wyatt's farm produced the milk that took the gold medal at the National Dairy Show, at Chicago. It was this show that particularly gave us the idea of having a milk show at this meeting of the Association, and very likely it helped to interest Mr. Wyatt and his neighbors to ask the Wisconsin State Dairymen's Association to meet here this year.

For several years past, at the meetings of this Association, we have had some one, prior to the convention, take a so-called "cow census," going among the farmers, the factorymen and

patrons of one particularly creamery or cheese factory or two or three factories, and finding out, first, perhaps the man's own estimate of his cows, and his idea of the cost of keeping them, etc., and then going over the figures with him and determining, as nearly as possible, what it did cost him to keep those cows and how much they have produced for him, and these have always brought out some of the most valuable discussions and knowledge that we have obtained in these meetings.

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### A LOCAL COW CENSUS.

E. E. Wyatt, Tomah.

I wish to present here today a few facts I have been studying, concerning the cows that were being kept to bring a revenue of some \$112,000 during the year Dec. 1, 1905 to Nov. 30, 1906. I have visited 52 farmers during the past two months, to find what it has cost them to feed their cows during the year named.

None of these farmers had an exact account of what they had fed their cows, but by using judgment and studying their methods and ideas of amount fed, I would find the number of tons of coarse feed and its kind, together with grain and kinds used, amount of soiling and roots.

I realized that some fed much more than others, especially coarse feeds, as these feeds were very cheap that year, while others fed still more closely, even not allowing enough to carry the cows through in good condition. But in all, while I do not expect my estimates are exact, I think they are very close and all concurred in the opinion that they were very fair estimates and as close as possible to secure.

Now having found the amount of the several feeds used, I charged the cows in every herd the same price for the same articles and as follows: Timothy hay per ton, \$7.00; mixed hay, \$6.00; clover hay, \$5.00; corn stover, \$2.00, shredded, \$3.00; corn fodder, \$3.00; straw, \$1. soiling crops, \$2.00;

roots, \$4.00; oats, 29 cents per bushel; barley 40 cents; corn 40 cents; rye, 45 cents; bran, \$17.00 per ton; standard middlings, \$18.00; oilmeal, \$1.50 per cwt.; pasture, \$5.00 per cow.

Next, I went to the books of the creamery at Tomah, as all these were patrons of the same creamery, and the entire product, except for calf feed and family use, had been sent there. I found the number of pounds of fat and cash returns for the same for each half month; computing these, I found the exact amount of fat and cash for each herd, and then reduced all to the basis of one cow or an average cow for the herd.

This, with the cost of feed per cow, I have arranged in tabular form, and will place it so it may be examined by all during the convention. It has each herd designated by number, then the number of cows in herd, and kind of cows, the cost of feed in dollars and cents per cow, cash creamery returns per cow, and number of pounds butterfat per cow. You will notice this is butterfat not butter, as this creamery does not compute butter at all, the unit being butterfat. Next, the owner's estimate of butter per cow of his herd. Take notice of the variation, but consider one is butter and the other butterfat. The average price per pound of butterfat follows, and next the cost of the same pound of butterfat. The value \$1.00 worth of feed brought, and the profit or loss per cow per year. Those in red show a loss between feed and creamery returns.

Now, to a casual observer, this table might not show any more than so much wall paper. But let us study it and make some comparisons.

Take No. 1. His feed per cow was hay, a little stover and straw to amount to \$12.94; grain, barley and oats, \$10.16; this with pasture makes a total of \$28.10. Out of this his cows produced 166.5 lbs. butterfat at 16 cents per pound which sold for 23.9 cents per pound amounting to \$39.44, a return of \$1.42 for every \$1.00 worth of feed. This man estimated that his cows were producing 250 lbs. butter against a creamery yield of about 200 lbs.



COST OF FEED AND INCOME IN 52 HERDS BELONGING TO PATRONS OF THE CREAMERY AT TOMAH IN  
MONROE COUNTY FOR THE 12 MONTHS ENDING NOVEMBER 30, 1907.

Herd No.	No. of cow.	Kind of cow.	Cost of feed per cow.	Cash from creamery per cow.	Pounds of butter fat per cow.	Owner's estimate of butter per cow.	Average price of butter fat.	Average cost of butter fat.	Value of butter fat for feed.	Profit (+ or loss) per cow.	Butter made for home.
1	15	Common Durham stock	\$28 10	\$89 94	106 5	250	23 9	16 7	\$1 42	\$11 84	No.
2	22	Grade Jersey 7, grade Durham 5	26 31	43 99	101 5	275	25 4	16 3	1 55	11 64	No.
3	10	Grade Durham 2, grade Holstein 1, grade Jersey 3, grade Red Poll 4									No.
4	9	Grade Jersey	41 15	47 72	188 1	210	25 3	21 8	1 16	6 37	No.
5	16	Common stock	50 47	53 69	200 8	225	26 7	21 0	1 06	8 22	No.
6	4	Red Poll 1, grade Jersey 1, grade Durham, common 1	22 65	29 21	116 8	175	25 0	19 3	1 29	6 58	Yes.
7	15	Common Durham stock	38 18	52 84	210 2	250	25 2	16 2	1 55	14 66	Yes.
8	9	Grade Durham	28 50	36 81	148 0	...	24 9	19 2	1 29	8 35	Yes.
9	7	Grade Jersey	35 04	33 91	119 8	225	25 9	24 0	1 10	3 87	Yes.
10	6	Grade Jersey 5, grade Durham 1	34 10	43 01	170 5	225	25 2	20 0	1 21	8 99	No.
11	11	Red Poll 3, grade Jersey 2, grade Guernsey 1, common 5	29 54	40 55	162 2	225	24 9	18 2	1 37	12 81	Yes.
12	11	Common stock	20 07	28 19	114 8	175	24 5	17 6	1 39	8 11	Yes.
13	16	Grade Jersey 5, grade Durham 11	33 22	24 79	130 1	...	26 7	25 5	1 01	1 57	No.
14	10	Grade Shorthorn	11 79	21 03	98 4	150	24 4	32 3	0 75	7 74	Yes.
15	14	Grade Jersey 8, grade Durham 6	25 97	43 42	166 7	...	25 4	17 9	1 49	14 45	Yes.
16	10	Grade Jersey 5, grade Durham 5	26 89	28 72	118 3	150	24 8	22 7	1 07	1 83	No.
17	4	Grade Durham	23 53	35 62	147 4	150	24 2	16 2	1 49	11 69	Yes.
18	7	Common stock	30 63	42 78	163 8	...	26 0	18 7	1 40	12 15	Yes.
19	7	Common stock	23 49	38 00	152 5	...	24 9	15 7	1 16	14 01	Yes.
20	10	Common stock	27 35	40 19	157 1	...	25 5	17 1	1 47	12 74	Yes.
21	32	Grade Jersey	22 31	41 77	161 3	250	25 8	13 8	1 87	19 46	No.
22	20	Common stock	24 96	60 84	210 7	510	25 3	10 7	2 43	35 88	No.
23	16	Grade Durham	25 76	40 23	163 3	175	25 1	16 7	1 50	13 47	No.
24	18	Red Poll 3, grade Red Polls 6	25 87	36 51	144 5	225	25 2	17 1	1 45	10 67	Yes.
25	14	Common Durham stock	29 91	44 25	178 9	225	24 7	15 7	1 41	11 31	Yes.
26	30	Grade Shorthorn 25, grade Jerseys 5	25 31	29 47	122 1	150	24 3	23 2	0 83	5 89	No.
27	27	Grade Holstein 14, common stock 6	20 96	28 95	107 8	275	24 9	19 4	1 26	16 48	Yes.
28	9	Grade Durham	23 15	39 79	157 1	...	25 3	14 7	1 76	18 64	No.
29	18	Shorthorn 3, grade shorthorn 15	33 67	51 33	208 9	250	24 6	15 8	1 21	16 48	No.
30	10	Grade Durham	26 94	32 73	135 0	200	24 2	19 9	1 05	3 79	Yes.
31	12	Common stock	29 71	41 51	168 0	120	21 7	23 5	1 30	9 91	No.
32	15	Grade Durham 14, Angus 1	22 71	35 91	148 9	150	24 1	15 2	1 40	7 51	No.
			15 57	26 11	109 6	...	21 8	16 9			

No.	Yes.	2 14	30 32	No.	Yes.	2 14	30 32
53	10	226.7	25.5	11.9	30	7.74	93
34	30 06	63.4	24.9	16.4	13	93	93
35	30 06	20.82	24.9	16.4	6	98	98
36	27 76	41.69	24.9	16.4	0	10	11
37	26 82	33.30	24.9	14.9	7	10	11
38	26 82	33.30	24.9	14.9	0	10	11
39	16 81	112.6	25.4	19.8	34	9	41
40	16 81	36.95	25.4	14.8	73	16	97
41	27 54	136.2	25.0	14.8	71	17	35
42	22 22	39.19	25.5	14.8	0.84	4	32
43	22 22	102.8	24.5	29.7	1.18	19	28
44	24 22	41.57	24.3	21.1	2.01	19	28
14	28 88	26.50	25.0	12.4	1.79	19	31
43	24 95	118.1	24.8	14.0	1.73	22	56
44	19 06	39.47	24.2	15.2	1.95	22	55
14	19 06	38.34	25.4	12.4	1.67	19	36
45	24 01	43.32	24.8	13.9	1.71	19	31
16	30 00	52.56	24.8	12.3	1.90	16	28
46	33 29	45.54	24.2	20.6	1.17	5	33
47	28 85	48.22	23.7	20.9	1.47	6	93
11	28 85	44.36	23.7	16.8	1.23	6	93
48	27 77	34.05	23.7	16.8	1.23	6	93
10	26 53	31.88	23.7	16.8	1.23	6	93
49	30 15	37.08	23.7	16.8	1.23	6	93
50	14 87	21.79	23.7	16.8	1.23	6	93
15	28 88	108.2	23.7	16.8	1.23	6	93
51	24 95	118.1	23.7	16.8	1.23	6	93
52	19 06	39.47	23.7	16.8	1.23	6	93
15	19 06	38.34	23.7	16.8	1.23	6	93
15	24 01	43.32	23.7	16.8	1.23	6	93
15	30 00	52.56	23.7	16.8	1.23	6	93
15	33 29	45.54	23.7	16.8	1.23	6	93
15	28 85	48.22	23.7	16.8	1.23	6	93
15	28 85	44.36	23.7	16.8	1.23	6	93
15	27 77	34.05	23.7	16.8	1.23	6	93
15	26 53	31.88	23.7	16.8	1.23	6	93
15	30 15	37.08	23.7	16.8	1.23	6	93
15	14 87	21.79	23.7	16.8	1.23	6	93
15	28 88	108.2	23.7	16.8	1.23	6	93
15	24 95	118.1	23.7	16.8	1.23	6	93
15	19 06	39.47	23.7	16.8	1.23	6	93
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15	24 95	118.1	23.7	16.8	1.23	6	93
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15	24 01	43.32	23.7	16.8	1.23	6	93
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15	33 29	45.54	23.7	16.8	1.23	6	93
15	28 85	48.22	23.7	16.8	1.23	6	93
15	28 85	44.36	23.7	16.8	1.23	6	93
15	27 77	34.05	23.7	16.8	1.23	6	93
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15	24 95	118.1	23.7	16.8	1.23	6	93
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15	27 77	34.05	23.7	16.8	1.23	6	93
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15	19 06	38.34	23.7	16.8	1.23	6	93
15	24 01	43.32	23.7	16.8	1.23	6	93
15	30 00	52.56	23.7	16.8	1.23	6	93
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15	28 85	48.22	23.7	16.8	1.23	6	93
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15	24 95	118.1	23.7	16.8	1.23	6	93
15	19 06	39.47	23.7	16.8	1.23	6	93
15	19 06	38.34	23.7	16.8	1.23	6	93
15	24 01	43.32	23.7	16.8	1.23	6	93
15	30 00	52.56	23.7	16.8	1.23	6	93
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15	14 87	21.79	23.7	16.8	1.23	6	93
15	28 88	108.2	23.7	16.8	1.23	6	93
15	24 95	118.1	23.7	16.8	1.23	6	93
15	19 06	39.47	23.7	16.8	1.23	6	93
15	19 06	38.34	23.7	16.8	1.23	6	93
15	24 01	43.32	23.7	16.8	1.23	6	93
15	30 00	52.56	23.7	16.8	1.23	6	93
15	33 29	45.54	23.7	16.8	1.23	6	93
15	28 85	48.22	23.7	16.8	1.23	6	93
15	28 85	44.36	23.7	16.8	1.23	6	93
15	27 77	34.05	23.7	16.8	1.23	6	93
15	26 53	31.88	23.7	16.8	1.23	6	93
15	30 15	37.08	23.7	16.8	1.23	6	93
15	14 87	21.79	23.7	16.8	1.23	6	93
15	28 88	108.2	23.7	16.8	1.23	6	93
15	24 95	118.1	23.7	16.8	1.23	6	93
15	19 06	39.47	23.7	16.8	1.23	6	93
15	19 06	38.34	23.7	16.8	1.23	6	93
15	24 01	43.32	23.7	16.8	1.23	6	93
15	30 00	52.56	23.7	16.8	1.23	6	93
15	33 29	45.54	23.7	16.8	1.23	6	93
15	28 85	48.22	23.7	16.8	1.23	6	93
15	28 85	44.36	23.7	16.8	1.23	6	93
15	27 77	34.05	23.7	16.8	1.23	6	93
15	26 53	31.88	23.7	16.8	1.23	6	93
15	30 15	37.08	23.7	16.8	1.23	6	93
15	14 87	21.79	23.7	16.8	1.23	6	93
15	28 88	108.2	23.7	16.8	1.23	6	93
15	24 95	118.1	23.7	16.8	1.23	6	93
15	19 06	39.47	23.7	16.8	1.23	6	93
15	19 06	38.34	23.7	16.8	1.23	6	93
15	24 01	43.32	23.7	16.8	1.23	6	93
15	30 00	52.56	23.7	16.			

No. 23 fed hay, stover and a little straw to the amount of \$11.87; bran, oats, rye, \$9.00 worth, with pasture making \$25.87 which was made into 144.5 lbs. butterfat at 17.4 cents per pound. This sold for 25.2 cents per pound making \$36.54, a gain of \$10.67 over cost. One dollar's worth of feed brought \$1.45.

Here are another two herds fed heavier. No. 8 has 9 cows, large Durhams; he fed hay, stover, roots and soiling \$22.33; bran, middlings, corn and oats, \$8.71, this with pasture amounts to \$36.04. This, you will see, is a very heavy feed of roughage, but it seemed all around to be a very conservative estimate. This feed made 149.8 lbs. fat at 24 cents per pound sold for 25.9 cent per pound, total \$39.91. One dollar's worth of feed brought \$1.10 in butter, a profit of \$3.87 per cow per year.

Then No. 20 has 10 cows, part Durham; fed hay, stover, roots \$22.20; bran, oats, corn, barley and a little odd feed \$12.40, making a total of \$39.60, including the pasture. This produced 168 lbs. butterfat at a cost of 23.5 cents per pound sold at 24.7 cents, or \$1.05 for \$1.00 in feed. Each cow produced \$1.91 worth of butter in excess of cost of feed.

Now compare those with these two who fed a better allowance of grain and less roughage. No. 44, fed 14 cows of dairy form. at a rate of hay, stover, soiling \$9.85 per cow; bran, corn, oilmeal and oats \$9.15, with pasturage amounts to \$24.01. This produced 174 lbs. butter fat at a cost of 13.8 cents per pound which sold at 24.8 cents per pound, or \$43.32 per cow, or \$1 worth of feed sold for \$1.79, a profit above cost of \$19.31.

No. 45 has a herd of 16 dairy built cows. Hay, stover and soiling, \$9.28; bran, oats, corn oilmeal, \$14.46, with pasture, \$30.00 was fed to each cow and they produced 213.8 lbs. butterfat at a cost of 14 cents per pound which sold for 24.8 cents per pound, or \$30 worth of feed produced \$52.56, a profit of \$22.56 per cow. One dollar's worth of feed sold for \$1.75.

We might go a little farther. Take No. 11 who fed very cheaply. Hay, stover and straw, \$13.18; oats, \$1.89, together with pasture a total of \$20.07. But see, this only produced 114.8 lbs. fat costing 17.6 cents per pound, when delivered sold for 24.5 cents, or \$28.19, a profit of \$8.12.

Another who fed similarly is No. 52, only cost \$14.87, get-

ting the cost of feed pretty near rock bottom. This consisted of hay, straw and stover, \$4 worth, oats, barley, \$5.87, plus pasture make \$14.87. After being manufactured into butterfat it made the paltry sum of 88.2 lbs. per cow per year, but it only cost 16.8 cents and sold for 24.7 cents per pound, making a profit of \$6.92 per cow.

Through doing as well as some others who fed at greater expense, still it is below the average of the 52 herds. Satisfied to be compared with a neighbor instead of looking to the top and raising a standard of business and getting upon a paying foundation.

How does this compare with a fat yield of 226.7 pounds butterfat per cow? But this must cost more. Yes, grossly, but per pound this cost 11.9 cents while No. 52 paid 16.8 cents per pound and the same amount of labor both ways.

Let us investigate this both ways a little farther. No. 33 kept 10 cows; fed hay, stover, \$11.50 per cow; bran, corn, barley \$10.52, which with pasture made \$27.02 per cow; producing 226.7. pounds fat for 11.9 cents per pound and sold for 25.5 cents; a clear profit of \$30.92 per cow and \$1 worth of feed brought \$2.14. Don't you think this man has a corner on the feed market? Sells \$1 worth for \$2.14.

Let me compare No. 21, after which I will tell you a little how he cornered this market when perhaps you may be able to spy the ladder and climb up but you cannot crowd him off, as there is lots of room up there.

No. 21 had 12 cows; fed hay, stover, \$11.83; supplemented with bran, middlings, corn and oilmeal to \$7.79; with soiling and pasture, it cost him \$24.96 to feed his cow one year and was credited with 240.7 pounds fat at a cost of 10.4 cents per pound sold at 25.3 cents leaving a profit of \$35.88 per cow. How is his corner on the feed market? Well, one dollar's worth of feed at the ordinary market prices sold for \$2.43 on his corner. A good comfortable margin to do business upon.

Now, shall we run these men into court for creating such enormous profits, incite the public against them, summon them before a grand jury and have them indicted for manipulation of prices and suppression of competition? Or shall we make a quite investigation, lift the lid, and spy their business methods. They will need no summons or subpoenas. When I

made my inquiries they were very free and willing to talk and among other things gave me the key to their success, and this unlocks several compartments before reaching the goal.

First, they were dairymen, well caring for their cows, and studying their business and cows, and then applied their knowledge.

Second, their cows were built according to that dairy form and temperament and had been reared for dairy cows and were dairy cows and could not be any other form.

Third, they may made a business of their dairy work and were not mixing it up with everything else and then not attend to the cows.

Now, think for a moment! These men were not planning on what these cows would be worth, when old or worn out, to sell for butcher stock; neither were they raising any steers for the market to sell at 2c after costing 3c or more to produce. It was not in their business, but left that for the man who keeps a different cow, operates a different business and sells a different class of beef.

What would a \$35 per year profit amount to beside No. 8 who keeps those large, beefy cows and has a \$3.87 profit? Let each keep his cows for eight years, then let us figure up and see. No. 8 would have a total profit of \$30.96 and a cow to sell for say, \$26.00, or \$56.96 as a grand total of 8 years of the cow's life.

No. 21, \$287.04 profit, and we say this cow must sell for only \$10.00, a smaller price than probtble, then this makes \$297.04. Can you see a difference?

Now, where is the man who dares to jeer at the necessity of selling that cow so cheap and spoiling our beef markets with their calves. Let us have dairy cows for dairy work and beef cows for beef.

In making my inquiries I questioned each one as to what agricultural papers they read, with the following results: Those who studied and endeavored to follow the teachings of papers and investigations along the line of dairy work, specially, were making a profit of \$20.66 per cow. The average herd produced a profit of \$11.16 while the ones who did not read dairy literature received but \$9.88 or a difference of \$10.78 per herd for every cow, or \$134.75 per average herd was made by doing a little reading.



As a summary, we have 52 herds, the smallest was 4 and largest 30 cows, in all, 655 cows, the average herd from 12 to 13 cows. The largest yield 240.07 lbs. fat; smallest, 88.2 average per cow, 153.5 lbs. Highest cost of keep per cow, \$50.47; lowest, \$14.87; an average of \$26.49. Highest cost of a pound of fat was 36c; lowest, 10.4c.

A few averages: It would take 3 of the average cows to make an equal profit of the highest, or 4 of the non-readers to equal one like No. 21. Our creamery received 427,128 lbs. butterfat, or the product of 2,782 cows like the average would be required to produce this amount of butter, while 1780 cows of the capacity of No. 21 would do the same work, while it would require 4,842 like No. 52. Or, in other words,  $2\frac{1}{2}$  times as many barns,  $2\frac{1}{2}$  times as many milkers and  $2\frac{1}{2}$  times as many separators would be required to care for the latter kind of cows to produce the same amount of butter. Or, were the 2,782 cows producing an amount of butter equal to No. 21, the revenues of our creamery would be \$174,000 instead of \$112,000, a difference of only \$62,000. Let us make a grab for it.

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#### DISCUSSION.

Secy. Burchard: I wish you could explain how it comes that one patron received 23.1 cents and another 25.1 cents per pound of fat, when they were both patrons of the same creamery?

Mr. Wyatt: They are patrons of the same factory, but we all know that the price of butter was something like 20 cents through the summer, while it is something like 33 at present. To get that, I took the number of pounds of butter fat that each man brought to the creamery, and the number of dollars, and divided that finding the number of cents per pound that he got. This is caused to vary by one man bringing more in the summer time when butter was cheap and the other bringing more in the winter when butter was high.

The Chairman: I feel quite sure that the audience is interested and pleased with this paper. Now, it is yours for discussion. He has told you a whole lot of things, but there are

a whole lot more things you want to know about the way these cows were cared for. You are at liberty to fire as many questions as you like at him.

Mr. Freeman: How many of these herds of cows were kept in a barn that has a system of ventilation?

Mr. Wyatt: I think I found four with a fairly good system of ventilation. One or two systems that pretended to be systems, but there were only four that you could call systems of ventilation.

Mr. Goodrich: I would like to ask Mr. Wyatt what proportion of the farmers that you interviewed knew what the cost of keeping was, or whether they were making any money or losing money. Did you find many that did know?

Mr. Wyatt: No, sir, as I said, none of them had exact accounts.

The Chairman: How many of them had an idea that turned out to be pretty accurate when you asked them for their estimation?

Mr. Wyatt: I have not figured that over, but I know from casual observation that most of them were a great way off. One of them made 88.2 pounds of butter fat, and his estimate was about 275 pounds of butter. How much did he know about that?

Mr. Goodrich: So it was the men that knew the least about their business that succeeded the poorest?

Mr. Wyatt: I must go back to No. 21, who had the largest profit, his cows at the creamery returned 240.7 pounds of fat. Now, if that was reduced to butter, at the usual rate, it would make practically 300 pounds of butter. He estimated that his herd was giving 310 pounds. There was another that had a very close record of his cows; he could tell me just how many pounds of butter his cows made per year. He had his cows tested and the milk weighed each day of the month and totals made. His average, according to his statement, was 286 pounds of butter per year. While the creamery returns were not so much, that would be accounted for from the fact that the milk and cream that the family used and for feeding a few calves was taken out of his estimate, so that his estimate was within ten or fifteen pounds of the correct estimate.

Mr. Newsome: What time were these estimates made for, between what periods?

Mr. Wyatt: They were made for the year beginning December 1, 1905, and ending November 20, 1906.

Mr. Newsome: What I wanted to know is this; in making my estimates I estimate from January 1, 1906, to January 1, 1907, including just an exact year. Did they all make that same estimate on just exactly a year?

Mr. Wyatt: It is made for exactly a year. Whether we began on the first day of January, or November, it wouldn't make any difference in the term.

Mr. Newsome: Now then, I want to know how those men that figure that it only cost them from \$6 to \$9 a cow for rough feed, I want to know how they figured. I don't believe it can be done.

I don't believe a cow can be fed a year for a cent less than \$30 if he does justice to his cow, and it ought to be \$40.

Mr. Wyatt: The one that was fed for \$14.87, I haven't the notes here of the different kinds of feed, but each kind was figured at so much. Here's about eight tons of hay, two tons of stover and twelve tons of straw. There would be about a hundred bushels of barley and about a hundred and eighty bushels of oats, and that would be the total grain. The pasture was allowed at five dollars a cow. You can get straw at one dollar a ton, the hay you can't figure less than ten dollars a ton.

Mr. Newsome: When a man comes down and visits a farmer at his barn, the farmer doesn't have time to come at an accurate statement. For instance, the State Dairy Inspector came to my place and asked if I knew what I had fed. I told him by looking over my books, I could tell him to a penny, but we hadn't time to do that, so he went without ascertaining just what I had done. I presume that is the way with every farmer, they wouldn't have time to make a thorough statement.

The Chairman: How many of these farmers fed silage?

Mr. Wyatt: None of them. None of them were in a position to have silos.

Mr. Goodrich: There is something suggested to me by what Mr. Newsome has said about the difficulties of getting accurate information of the farmers. Now, I, in quite a number of instances, have taken a cow census and I was bound to get as accurate information as possible. If I went to a man and he said he was busy, as Mr. Newsome says, I went to see



his wife, and perhaps she could tell me something. If she couldn't I went to see his daughter, and she could tell me something, and I went to see the boys and I looked at the measures that they fed the grain in and stuck to the business until I did find out.

The Chairman: Did you ever have to interview the hired girl?

Mr. Goodrich: I suppose that is what you were thinking about all the time. But I could get the informaton some way. I don't suppose it was accurate every time, but I am going to tell some of the difficulties that came up.

I tell you, you just go along and say, "How many cows did you keep last year?" and half of the men won't tell you right. They will try to, but it is guesswork, and it is simply foolishness to ask the average dairyman what it costs to keep his cows. They will answer, "I don't know, I give them all they want to eat." "But I want to find out, I want to know whether you are making anything." "Why, you can't make any more out of them by figuring." Well, I simply followed it up. Once I was taknig a cow census around Fort Atkinson. I would ask a man, "How many cows did you keep last year, the average number?" "O, we calculate to keep about twenty." "Did you keep twenty?" "Yes, I guess about twenty." "Was it just twenty that you kept? Were they the same cows you kept right through?" "Why, no." "Well, now how many cows did you have a year ago the first of December? I want to know just how many you had then." "Oh, I had twenty-five then. Some of them were dry, you know." "Well, they were eating all the time, I suppose." "Yes." "I want to know just the number of cows." "Well, I had twenty-five then, but I sold off some." "When did you sell them off, figure to see how many months?" He would have twenty-five cows, whether he was milking them or not, it is all the same. "Didn't you have some heifers that came in fresh?" "Yes." And you would finally figure it out of him that he had twenty-five, when in fact, he guessed he only had twenty, and he did it honestly enough.

Then, about feed. It is wonderful how they do miscalculate the feed and the cost of it. But you know if you stick to them you will find out. For instance, I met a man near Fort Atkinson, a man I knew well, a man that meant to be straight

and square, and was a pretty good farmer. He was going to Fort Atkinson with a load of corn and oats, to be ground. I said to him, "I was just going out to your place, Mr. Sherman. How many cows do you keep?" He told me how many cows, and I found he was a little bit off when I got out to his place, but I said, "How do you feed them, what grain?" He says, "Corn and oats." "How many pounds a day do you feed to a cow?" and he says, "Twenty." I says, "Are you sure of that, that you feed twenty pounds a day to each cow?" "Yes," he says, "I feed heavy." Well, I said to him, "How much have you got on this load?" He says, "I pay for it by the hundred and it is about so much," and he told me how much each load was. "How often do you take a load to mill?" "Oh, once in about two weeks." I says, "Is it just once in two weeks," And he says, "Come to think of it it is every other Monday right through." Then I figured it up, calculating the the number of cows he had and he had only fed ten pounds a day and he fed high then. As Mr. Newsome says, you can't just go and ask a farmer what he s feeding, or how many cows he has, because if you do you won't find it out. It is an actual fact that the average farmer knows less about his business than a man engaged in any other occupation on earth. He don't know what a pound of butter has cost him; he don't know what a bushel of barley or a bushel of wheat has cost him. Very few farmers do. How could anybody carry on any other business and not know what it costs? Don't you suppose your merchants know what their goods cost? If they didn't, they wouldn't be doing business a great while. Don't you suppose a manufacturer knows what the goods he manufactures cost? Of course he does; he has got to know, and it seems to me that farming is the best business on earth, or men could not survive and do such slack work as they do. Dairying is the best branch of farming and the farmers know the least about it. That is, the least about their cows and the expense and the profits of it. Now, this is pretty hard to say about farmers, but I have been right to the farms of a great many of them in this state and I know it is so.

The object of this cow census is to set men to thinking so that they will know something about their business.

Mr. Newsome: Don't you think, Mr. Goodrich, that it is a paying business to feed your cows liberally?

Mr. Goodrich: Of course I do.

Mr. Newsome: Don't you think it would pay to feed them in the summer as well as in the winter?

Mr. Goodrich: I don't know. Did any of these men feed grain in the summer time, Mr. Wyatt?

Mr. Wyatt: Not many.

Mr. Goodrich: I found that it paid me to feed my cows a small grain ration during the summer. I think they did better, not only kept up their flow as we went along, but the cows came into winter quarters in better condition and did not dry up so quick, and went out the next spring able to do more work; that was the idea that I had. Of course that would depend something on the cows and the feed.

The Chairman: Another question enters into that still farther. What about the benefit to the pastures?

Mr. Goodrich: Yes, of course, it doesn't take quite as much pasture and it makes the manure richer for the pasture.

Mr. Newsome: It makes better milk and more of it.

Se'cy Burchard: Have you practiced feeding your cows dry hay in the summer?

Mr. Goodrich: I have. For as much as twenty years before I went off my farm, my cows had dry hay before them every time they were put in to be milked, which was twice a day, and the pasture never was so good but what those cows would eat some of the dry hay.

The Chairman: What was the benefit of giving them dry hay?

Mr. Goodrich: Why, they wanted it and I wanted to please them. They like a variety and I think they did better for having it. Of course I couldn't figure that out, just how much better they did.

The Chairman: Wouldn't it have been better to feed them straw if you could have gotten straw for a dollar a ton? You could have kept them cheaper that way.

Mr. Goodrich: I don't know whether it would be cheaper or not. They have got to be pretty hungry to eat straw in the summer time.

Se'cy. Burchard: Did you ever drive a load of straw through your pasture in the summer time?

Mr. Goodrich: I don't go around with straw in my pastures. I have seen them take a mouthful of straw in the sum-

mer time, but they don't eat much of it. But anyway I know hay is better than straw and the old cow knows it, too.

Mr. Newsome: They like to be in the stable in fly time, too.

Secy. Burchard: I think this question of feeding grain or hay in the summer time is a very important question and one that is too often—I may say, almost universally—overlooked. Just what is the effect of feeding grain or feeding hay or whether there is any distinction between them is an open question. Prof. Sanborn, of New Hampshire, some years ago, tried the experiment and he found that one pound of hay was equivalent to one pound of grain for feeding his cows in the summer on fresh pasture. The Rev. Mr. Dietrich, the man most famous of all men in the world for making a profit per acre on a little farm not a great ways from Philadelphia, carries his cows through the summer time with soiling and silage; he has no pasture whatever. I don't know that there is anybody here, unless it be Mr. Goodrich and myself, who noticed it, but Hiram Smith, whom we all looked up to as a man of men to be patterned after in Wisconsin, used to say that the most slovenly way of feeding a cow was to let her go to pasture; that she destroyed more than she would eat, and if a man is using very much fine pasture, especially on high priced land, he is using it to great disadvantage. He could better afford to grow a crop and feed it to the cow so there should be no waste. Mr. Dietrich found it important with silage and soiling crops to feed some dry hay as well as grain through the summer for the effect that it had on the digestive tract. We all know that in fresh pastures the bowels of the cow are made very loose, and if you feed silage also, there must be something to correct that effect, and dry hay or dry grain will have that effect. I question whether it is so much a question of nourishment to the cow as a question of the dietetic effect. It certainly pays to feed something in dry forage, dry grain, dry feed of some kind when the cows are on pasture.

Mr. Goodrich: If you remember, down at the meeting of the Dairymen's Association at Watertown I had a chart showing what my cows produced each year, and one year they jumped up 50 pounds. Now, that was the year that I commenced feeding grain in the summer time and dry hay every

time they were going to be milked. The way I came to do it, I had a lot of feed, ground up corn and oats mixed with bran, that I was feeding the cows, and after I had turned them out to grass—the grass came a little sooner than I expected, and the feed was good and I had some left, and I thought I would feed it to the cows, and I noticed that the cows liked it and I noticed another thing, that the more corn meal there was in it, the better they liked it in the summer time. They didn't like the bran, I suppose because they had protein enough. They did not increase very much at the time, but I thought they would do better in the next winter and the next year, and I fed that hay and corn meal and oats, and they produced that next year 50 pounds of butter more. Now, I don't think it was all owing to that difference in the feed. I was improving my cows all the time.

I used to keep account of what each cow was doing, I weighed the milk every day and every milking for more than fifteen years, so that I knew just how much milk each cow produced and every two weeks I tested it with the Babcock test. I made a composite test of four consecutive milkings so I knew how much butterfat each cow was producing during the year and of course when I had any cows to sell, I sold those that produced the least, and the joke was, I didn't know until I did test them which were the best cows and which were the poorest cows.

Mr. Woodward: Were these fall or spring cows?

Mr. Goodrich: The cows that I fed in the summer time? I commenced with those that were fresh in the spring, or in the winter or giving a good flow of milk. When they were dry, I fed them very little grain, just a little, and those that were giving a good flow of milk I fed about half what I would in the winter time, say, four or five pounds a day.

Mr. Woodward: Would you advise feeding cows that were fresh in the fall and going out dry in the summer time?

Mr. Goodrich: They should have good pasture and if dry in the summer time I would not think it would pay to feed grain.

Mr. Woodward: I mean those that are fresh again in the fall.

Mr. Goodrich: The last part of the summer I didn't think that it paid to feed grain.



Mr. Zimmerman: Were you ever bothered with your cows bloating when they had hay?

Mr. Goodrich: No, I found dry hay was a preventive of clover bloat every time, and when they are turned out into the field of fresh clover, which is liable to make them bloat, they will rush with all their might to get some dry hay to eat to counteract the effect of the green feed.

Mr. Burdick: How did you find ensilage compared with hay or grass?

Mr. Goodrich: I haven't had much experience myself in feeding silage on grass, because they generally got it pretty nearly eaten up before spring, but I know of a good many that do feed in the summer time. One of my sons feeds silage every day in the year. They will prefer silage to fresh cut corn, I know that, it is the experience of those that have fed silage in the summer time, that when cows come up to the barn after they have been out on pasture, they will eat the silage and eat about half as much as they will in the winter time. That is about all I know about feeding silage in the summer.

Secy. Burchard: Talking about that son, what sort of pasture do his cows have early in the summer?

Mr. Goodrich: His cows have very little pasture. He is keeping as many cows as he has acres of land, and he raises alfalfa and corn and feeds them silage.

Secy. Burchard: Perhaps it is hardly a fair question, but if he had fine pasture early, May and June, do you think he would feed silage?

Mr. Goodrich: Yes, he did last summer. Last summer, when I was there there was a little while that he pastured them; he had a small pasture where he kept his young cattle and the grass grew up so big that he turned his cows in and they ate silage there.

Mr. Kelley: Did he have more than one silo?

Mr. Goodrich: He only has one silo.

Mr. Burdick: My ensilage ran out before the grass came, so I wanted to know what the results were.

Mr. Goodrich: There is a Mr. Clinton out in Waukesha county; I was out there one time and he was feeding his cows silage that he said was four years old and the pasture was very good, and they ate the silage with good relish.

Secy. Burchard: Do I understand you to say, Mr. Wyatt,

that the average yield of butter fat for all these cows in these fifty-two herds was 153.5 pounds?

Mr. Wyatt: Yes.

Secy. Burchard: I would like to have Mr. Goodrich state how that average compares with the averages of censuses that he has taken, and with the average in Jefferson county, for instance. That reduced to butter would be about 180 pounds of butter.

Mr. Goodrich: Now, I may not be able to remember just right, but I think that Gen. Burchard can help me a little. You remember, General, one time, when you wrote letters to every creamery man to give their reports, and if they gave their reports correctly, it would appear that they had averaged 240 pounds of butter per cow in Jefferson county. Gen. Burchard and myself both thought that that must be entirely wrong. So I took a census of one hundred herds right around in the vicinity of Fort Atkinson, and my recollection is that they averaged 244 pounds. That confirmed us in the belief that 240 pounds for all the dairy cows in Jefferson county could not be a great way out of the way. It was all figured in butter instead of butter fat.

Now, the census that I took in Dunn county up in the vicinity of Monomonie, I think was 220 pounds. Now, what was it in Waukesha last year?

Secy. Burchard: The average pounds of butter per cow was 202.1.

Mr. Goodrich: I thought it was about 200.

Mr. Wyatt: What do you consider the essential feature in that variation?

Mr. Goodrich: In the first place there is a great difference in the cow, and in the next place there is a great difference in the care of the cow and the feed of the cow. Cows have to be fed right and handled right before you can count on a good return. You will have to divide it into those three parts, the cow, the feed and the care.

Mr. Griggs: I would like to ask what percent of the herds included in these censuses taken in Jefferson and Dunn counties and other places had been bred up to the dairy standard and what per cent Mr. Wyatt found were just common farm grades.

Mr. Goodrich: In Jefferson county, almost all the cows

have some dairy blood in them. I didn't know of but one or two herds that were anything else; that is, they had some dairy blood in them, some whole Jersey and Holstein, a good many of them Guernseys and other breeds. In all of Jefferson county there is only one herd of thoroughbred Shorthorns and that herd the man has been breeding for dairy purposes for a great many years, but he hasn't a herd that are very big producers yet.

The Chairman: Did you notice that feature in your census?

Mr. Wyatt: Yes. I have not the figures or the general average.

The Chairman: I noticed on the chart quite a small proportion of them were dairy breeds.

Mr. Wyatt: I found a great many of them had been crossed backwards and forwards and were worse out of the way than when they started.

The Chairman: What did they have?

Mr. Wyatt: I don't know—nothing, or worse than nothing.

The Chairman: Perhaps some of you are wondering why the average was lower at this creamery than at some other creamery when you have 180 pounds of butter per cow average. The man who kept down that average certainly was not the man whose cows produced nearly 300 pounds of butter, but it is more likely to be the man who produced 88 pounds of butter fat and thought all the time that his cow was making 275 pounds.

Mr. Everett: I wonder if he is here at this convention.

The Chairman: I don't think you can get him out.

Mr. Wyatt: I have another line of thought I want to bring out. There is a very common question we find where we ask about why they don't keep dairy cows. They say, "I can get a little bit out of the steers and out of the calf, and with dairy cows I can't get anything. Is there any way we can do it so we can get something out of dairy calves?" I think there are some who would like to hear that question discussed.

The Chairman: Mr. Goodrich, what answer would Mr. Wyatt or any one else give to a neighbor who says that he wants to increase the profit of his farm a little by raising steers and that you cannot get anything out of a grade Guernsey or Jersey heifer calf?



Mr. Goodrich: His paper showed what profit there was in a good dairy cow, how much more she made than one that just perhaps paid for her feed.

Mr. Wyatt: What are they doing down in Jefferson county about this?

Mr. Goodrich: They are selling their dairy heifers, that is the stock they have sold—the male calves, unless they are thoroughbreds, are sold when they are—I don't know—from a week up. We have seen loads of them every day loaded on the cars and shipped away, because they can't afford to give good milk nor good feed to be made into meat with such stock as that. They would rather give the feed to the animal that will pay a great deal bigger price, and that is the cow that turns the feed into milk. That is what they do down there and that is what I did for a good many years. I never, for a great many years, tried to sell any meat. I would sell young calves for \$2.00 or \$2.50, or whatever they were a mind to give for them. The calf buyer would come along every week and took what I had. The heifer calves, from the best cows, of course, I raised. I sold all of the others, I couldn't afford to feed steers, I couldn't afford to feed worn out dairy cows. I always sold them for just what they were a mind to give, just what they would bring. I sold some for \$15 apiece. I remember once that I had a cow and I figured that she had averaged me \$25 a year for twelve years and that would make \$300 profit that I got, and I was willing to sell her for \$15 when I got through milking her. I had another cow that never paid me one cent above the feed that she cost, and I sold her after several years for \$75. Which did I make the most out of? The one that I made a clear profit of \$300 on, or the one that I kept on several years and she just paid for her feed and I got \$75 for her in the end? Give me the little cow that made the profit, the highest priced cow. I want to get all I can for the products of my farm. I want to sell my hay and my grain and my corn and my pasture at the highest price. Everybody is crazy to get a higher price. Men all over the state are almost crazy to get a higher price and yet they are feeding cows for years when it doesn't pay as well as if they killed them. Why not study and learn to feed a cow that will pay you \$2.40 for \$1.00 worth of feed? That is a pretty good price to sell that feed for.

Sec'y Burchard: That was the average of your whole herd, was it?

Mr. Goodrich: Yes, \$2.40 for each dollar's worth of feed, and I tell you that is a big interest. If you can double your money you will get rich pretty fast—if you don't spend it faster than you get it.

Sec'y Burchard: You have struck now the keynote, only you haven't said just the one word, and that is you should look at the cow as a market, a market to which you are going to sell your produce. A man brings in a load of oats, or a load of corn, or a load of calves, in the autumn to sell, and one man offers him twenty cents for his oats and another offers him thirty, which will he patronize? If he sold those oats for twenty cents when he can get thirty, what would you think of him? The question is, what will the cow give him for his oats this cow, that cow, this kind of a cow, that kind of a cow? Think of the cow as a market, a purchaser of your produce.

Mr. Freeman: It has been up to me several times to know, to decide, what I should do in these cases of disposing of these male calves, and I have figured this way; I figured from the standpoint of what the cow had been producing and what she would produce and whether or no it would pay me to keep that calf until it was three or four weeks old, and let it have what the cow will give and take what I could get for the calf at the end of that time. I would come out a little bit ahead as I find, if I killed the calf and fed it to the pigs, and I get as much out of the butter fat that I save during that time as I would have gotten for the calf at the full time and then I have the skim milk left for my pigs and besides that have not been bothering with that calf three or four weeks. I think, as a rule, I come out ahead by disposing of my calves early. Although this year I was advised by a friend to try another plan. He said he fattened his calves on skim milk. I was afraid I would kill them, but he said, "No, don't worry." I told my hired man, I says, "It is an experiment. We might as well have our knowledge cheap and the cows are not worth very much." So we tried that. When the calves were about three or four days old, we put them on skim milk. We found it rather a slow process, and I think it is preferable to feed the calf all new milk and then take all you can get for the little fellow.

Mr. Goodrich: On this idea of finding out what a thing costs, I wanted to find out what it costs to make veal out of a calf. At that time I had grade Shorthorns,—that is a good while ago—I could get five cents a pound for veal calves, I could sell a calf when it was a day old for a dollar. Now, the question arose, shall I make it into veal, and I wanted to know how much milk it took to make a pound of gain. There is the foundation, you want to know that, and I found it out. Of course the calf does best to help himself to the milk, suck the cow, and it was just fine fun for the boys to just step on the scales with a calf and see how much the boy and the calf weighed before the calf had its dinner, and then let him get his meal and weigh again. We did that, and I found the first week it took seven pounds of milk to make a pound of gain. Now, the milk was worth a cent a pound to me, so it cost seven cents to put on a pound that I could get five cents for. That was the first week. The second week it took eight pounds of milk to make a pound of gain, and the third week, it took nine pounds. That is the law of nature in the growth of animals, the older they are the more it takes to put on a given weight. Now, you see, if I could in two weeks get that calf up so it would sell instead of a cent a pound, for five cents a pound I would make something. If it took three weeks, I made very little. If I kept it four weeks, I was running behind. So that unless it was a very thrifty calf, one that would make a good growth, I had better let it go right off when it was young. That is the way the situation was with me at that time, and I think I would be out at the end. Why, a calf took 21 pounds of milk a day and gained three pounds. You see that was a good calf that would do that; and then, I could not keep any such calf until it was four weeks old without losing money. I had one that I knocked in the head to start with.

The Chairman: The question Mr. Wyatt asked is not quite answered yet. I know he was down to Madison last week where there as a good deal of talk about this very proposition, and I think he would like to have that question answered. The question was what you might say to your neighbors who said that they wanted to get something more than just what they would get out of the milk of the cow. They perhaps wanted to raise some young stock on the farm and what could they raise in place of the dairy steer that they had to sell for two

or three cents a pound? The fact is, the cow buyers are coming in from Mexico and Central America and Cuba and other places, and they are after grade cows, and they don't care what they cost. Now, a farmer that will continue breeding with a pure bred sire may feel confident that after a while, at least, he can dispose of his heifer calves at a very fine price. Up to the time a heifer calf is two years old, he could raise her cheaper than he could a steer that will bring less money. A heifer in Southern Wisconsin at two years old today is worth at least \$40 and you would have to put into a steer that you expected to get that much money from, a good deal more than you would the heifer.

Mr. Newsome: Is there anybody here that knows a genuine good remedy for bloat in cattle?

The Chairman: Mr. Goodrich gave a good remedy and that is feeding hay on grass or silage. Or if they have access to a straw stack, it would help them. If it becomes necessary, use the trocar and save the cow's life. We haven't any more time for this subject, and I am going to ask Mr. Everett to sum up the truth that we ought to get from this census.

Mr. Everett: I was not here to hear about the census, but I want to say that \$2.40 return per cow for one dollar's worth of feed is pretty profitable farming, and the farmers should not lose sight of the fact that the cow has paid the market price. She returns the dollar spent for the feed and she returns \$1.40 besides, so that, for instance, if oats are worth thirty cents in the market fed to that kind of cow, she will bring back about seventy cents a bushel for the oats.

The Chairman: And that is not all; she has left the fertility on the farm which you would have sold off at so much a bushel if you had sold your oats. Mr. Everett says he did not hear the census paper. General Burchard did. We will let him sum up.

Sec'y Burchard: I don't think it is necessary to say anything in addition to what has been said here, except to suggest that if there is this difference between herds, there is very likely to be a similar difference among the several cows in the same herd, and that, Providence permitting, the closing subject on this program alludes to that very thing, namely, "Robber Cows, a Detective's Report." This Association has had two inspectors in the field, one devoting all his time since about the mid-

dle of May, the other only a portion of the time since July or August, in trying to find out and show to dairymen just which of their cows belong in this class that yields \$2.40 for this dollar's worth of feed and which ones pay less and which ones do not pay for their feed at all. Now, the important thing is not to know what the average of the herd is, but to know what each individual cow can do, and I feel like saying that I think Mr. Wyatt has done himself proud in taking this census and in reporting it. If he wasn't here, I would say that I felt just a little bit nervous about trusting this important work to such young hands, but I am satisfied that I made no mistake in asking him to take this census.

Mr. Wyatt: I would like to say just another word.

Remember, this was taken on a very cheap feed. Running over them again, taking this one herd, No. 21, making a rough estimate on the figures as to the feed and the prices, for instance mixed hay is put in at six dollars. Put it in at \$12 which it should be this year, and then find out how his profit stands. I find that the difference in the price of feed would reduce that about \$8 and still leave him a profit of over \$27 a cow and so on down through.

Mr. Everett called to the chair.

The Chairman: I want to comment on what friend Bur-nard said in just these words, the individuality of the cows of the herd. Now, I know that as dairymen we are very likely to consider the herd as a herd and not as individuals, and there is where we make a serious mistake, not doing business with each cow in the herd, but with the herd as a whole.

As editor of an agricultural paper, The Wisconsin Agriculturist, I receive a great many letters, they come faster and faster every week, asking for information in regard to building and filing the silo. I really am astonished at the awakening of the people on the question of this silo business in this state. Our farmers have come to understand that it is really a necessity in profitable dairying. The other day I received a letter from a farmer over in Crawford county, who wanted to know how to build a silo and he wound up by asking me if he would need to wear rubber boots when he took his silage out of the silo, but let the farmers know a little more about silage and they will know better than that. Mr. Hill is a veteran on this subject and he will now tell you practically all that there is in it.



## WHY THE SILO.

Charles L. Hill, Rosendale.

This ought to be one of the most important subjects to be discussed at this convention. I have been much interested in the way Mr. Wyatt's report has been discussed, and all I ask of you is to listen to my paper and discuss the question, not from a critical standpoint, but as learners.

The aim of every manufacturer is to produce each year a little better grade of goods than he did the year before, and at the same time produce them at a lower cost.

As dairymen we are manufacturers, striving each year to increase our production of milk, and its products, and also to cheapen their cost.

For this reason first of all we need the silo, for in no other way can we so economically produce the rough feed for our cows.

I find that on my own farm I can cut an acre of corn yielding 13 to 14 tons and put it in the silo for \$7.00, or about 50c per ton.

The same acre of corn would have 150 bushels of ears that would cost me \$6.00 for husking alone, which with the cost of cutting, shocking, shredding and grinding, costs me double what it does to put the same crop into the silo.

It is usually estimated that it costs 70c to \$1.00 per ton to put corn in the silo, but I know that myself and neighbors put it in for \$.50 to \$.60 per ton.

My silos this year were filled very full holding 22 acres, and close to, or quite, 300 tons, and the total expense, figuring men at \$1.75 per day would be \$150, exclusive of the board for the men.

In what other way can you handle a crop of corn so cheaply and have it ready to feed, not only prepared for feeding, but right where you want it.

Not only is silage the most economical of rough feeds, which I think is the greatest claim that can be made in its favor, but it is also greatly relished by almost all kinds of stock, and is absolutely necessary for the production of maximum yields of milk in the winter time.



It is an easy matter to tell by the condition of a cow's coat in the winter time whether she is getting silage, for its succulence has the same effect on a cow's system that pasture grass has, and it keeps her thrifty and in the best of condition for her everyday work.

How would you like it if your good wife compelled you to live on only dried foods in the winter time?

You could not have the potatoes, apples, cabbage, celery, and hosts of other things that you relish, but would have to live on bread or other flour products, dried vegetables and fruits, and even these latter the housewife would soak up endeavoring to make them seem more like the fresh.

If any of you have been denied the privilege of standing before a long string of cows when the semi-daily feed of silage appears, and watch the eagerness with which they await it, you have indeed been denied one of the delights of dairyman's life.

They will leave everything else except the best of alfalfa hay to eat silage.

Silage is also more digestible and nutritious than the same amount of food value the chemist would say was in dry feed.

Another point in its favor is its convenience.

With silage ready for feeding every day in the year, much less help is required to care for the herd, than will be needed where it is necessary to cut or shred fodder in the winter time when it is cold, and possibly snowing.

Ten to twenty minutes per day will be all the time required to get out the silage and feed the herd.

Nearly all the talk about silage for feeding is concerning its use for winter feeding, but I insist it is almost as necessary in the summer as in the winter.

If we could be sure we would have plenty of rain, and resulting good pasture all summer, silage would not be so necessary, but almost every summer brings us a dry period when the pasture gets poor, and the cows shrink so in their milk unless we feed them that it is impossible even if later we do have good pastures, to get the cows back to their normal milk flow.

If you have no silo this want can be supplied by the use of soiling crops, but it takes considerable time in the busy season, each day, to hitch onto a wagon drive to the field, hitch onto the mower, rake, and wagon again and draw in the green feed.

Feed handled as silage is handled much more cheaply.

Nearly all of the best dairymen like to feed some feed to their cows even when on the best of pasture, not only for its food value to the cows, but also for its manurial value to the pastures, and nothing is more convenient for this purpose than silage.

Probably I have said enough about the need of a silo and will add a few suggestions for those who contemplate building one.

The smaller the farm in proportion to the number of cows kept the more necessary the silo becomes, and any farmer with ten cows who wishes to reach the maximum production from his cows should have a silo.

I have in mind a farmer in Sheboygan Co., who kept ten cows and had a small silo in the corner of his barn, filled by himself and daughter with whole corn, that furnished perfect silage and made his cows pay for his farm.

I know of another farmer near me with 40 acres of land who with a silo made his ten or twelve cows earn him \$72.50 each the past year at the creamery, and he does all his own work except at silo filling time.

In planning to build remember the best is really the cheapest, and if you build a silo that will last you a lifetime, you need to figure its cost to you as only 6% on the amount invested as it will be worth as much at the end as when you built it.

If you built a silo for \$500 its real cost to you would be but \$30.00 per year and if you will think of it this way, can you afford to be without one?

If you cannot possibly build the best, build the best you can but build anyway.

Build it deep and of small diameter, as this will insure you better silage especially in warm weather.

No matter how large the herd up to 100 cows I would not build over 18 feet in diameter, and 14 or 16 is better for smaller herds.

The best silos are certainly the round ones built of brick or cement with dead air spaces. This provision would not be so necessary in a winter like this but sometimes in severe weather solid wall silos will allow the silage to freeze, which while it injures it but little it bothers about feeding, and frozen silage is not good feed.

Stone or wood silos, brick lined will also make splendid silos, and the only ones really expensive are the wooden ones.

However I used two rectangular wood silos for 18 years, and in the days when those were built and good common lumber only \$12 per M even these were cheap silos. Many built of wood at the same time have been gone for years.

When silos were first built of wood some of them did not cost over \$1.00 per ton capacity, but the best ones as built to-day will cost \$2.00 to \$3.50 per ton capacity but will be good when the cheaper ones are gone.

In building your silo locate it as conveniently as possible to your stable, as the difference of a few feet in distance will in the year's feeding make a difference of many miles of travel.

The popularity of the silo is ever on the increase, and its users are its warmest friends.

The men who condemn the silo, are the men who have not used it.

Of the 600 farmers who attended the Farmers' Course at Madison last week 113 reported they were feeding silage, and about half of the remainder said they would build silos this year.

Wisconsin is destined to be the leading dairy state of the Union and one of the things that will contribute largely to this end will be the increasing use of the silo.

I often think that after feeding silage 19 years I would want to quit dairying if I could not have the silo.

I hope and believe that many of you have silos who live in this vicinity, but I also hope that the discussion of this paper will cause many of you to determine to have a silo before another corn crop is ripe.

Again, build just as good a silo as you can, but build one anyway.

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#### DISCUSSION.

Mr. Freeman: What size silo would you recommend for ten or twelve cows?

Mr. Hill: We all swear by Hoard's Dairyman; if you will look on page 60, you will find figures of the cost of building a

cement silo. I was at this man's place when he was getting ready to build; he lives some five or six miles from where I do and he keeps a small herd of cows, I don't think over eight or ten. He has built a silo 31 feet deep and 10 feet in diameter and I think for that sized herd, it would be an ideal size.

They can be built much smaller of cement than of stone or wood.

Mr. Newsome: How deep below the ground would you go?

Mr. Hill: Just as far as possible and not get over six or seven feet below the feeding floor of the stable. I know one place where a man has a silo where he can practically pour the silage into it. If you are not situated so you can put the silo on the upper side of the barn, then go six feet into the ground. Of course there are some places where you can not go six feet into the ground on account of the water, but where the water doesn't bother you, the only objection to going deep into the ground is the trouble of getting it out, and it is easier to get it out of five feet below the ground than up higher.

Sec'y Burchard: That is not the only objection to going further into the ground. I wouldn't like to have the death of a child or a grown person charged up against this Dairymen's Association. It is not very probable, but it is quite possible, if the lower opening of the silo is much below a man's chin, that sometimes he may be overcome by carbonic acid gas in the same way that the same gas gathers in deep wells, so that it is not safe, in my judgment, to make them too deep. Many silos are built that way and no accidents have happened, but it is not safe really to have a silo more than six feet below the lowest opening out of the silo.

Mr. Hill: There is one silo in this state, at the Marathon County Asylum, where four deaths resulted from carbonic acid gas. That did not come from going deep below the ground but from the fact that they put the doors all in and climbed in from the top. When the silo is empty, the gas would not be there. It is not worth discussing, because you wouldn't care to go more than six feet below on account of the trouble in getting the silage out.

Mr. Freeman: If you could get good stone within half a mile from where you were building, would you build with stone, or would you get cement?

Mr. Hill: I would certainly build it of stone. An ideal

silo would be to face it inside with brick and have a three or four-inch dead air space, building a foundation on which to set this brick. But the fact remains, that very many all stone silos, without any dead air space, are used in Wisconsin and those who have them like them. If you build a solid stone silo, ten or twelve feet in diameter, it is pretty sure to freeze.

A Member: It is necessary to have a dead air space below the ground?

Mr. Hill: No, it won't bother you, freezing down there.

A Member: How about ventilation on top?

Mr. Hill: There ought to be some ventilation at the top. If you have a circular silo and you put on a cupola in the middle, that is all right, but there should be arrangement for ventilation on top for the preservation of the roof.

The Chairman: How about stave silos?

Mr. Hill: I think that in the East the silos put up are largely stave silos. They don't have there the objection as to freezing that we have in Wisconsin. Of course a stave silo will allow the silage to freeze, though not as badly as in a stone silo. In case of a small silo, it would freeze more than you can afford to have it. They cost two or three times as much, (that is, the best of them,) as the best silo built of cement or stone, and they are not as durable as a silo of brick or cement or stone. A farmer must be very careful in taking care of them. I have seen them where they have gone to ruin. I was at a farm last year in New York State where they had put up a silo, a new one. The contractor had put it up and gone away and fastened it temporarily to the corner of a building and another contractor supposed it was fastened and somehow it was cut loose and over it went and it was nothing but a mass of kindling wood. I think we can build better silos than stave silos in Wisconsin, although they are very much better than a wooden silo built any other way, and ever so much better than no silo at all.

Mr. Lee: In that stave silo, were there any tongues and grooves?

Mr. Hill: Yes, not very deep. It was one of the best silos built in the east.

Mr. Goodrich: If you tighten up the lugs in the spring and the next year they will swell and shrink again, what will



happen to your silo in the course of years? I know what happened to one, two or three or four miles from Fort Atkinson. They had to build another wall under it to keep it from dropping down.

Mr. Hill: I have not had experience with stave silos. I have visited a number of farms in the East where they used from one to eight or ten stave silos and they speak very highly of them. They are, most of them, set on a cement foundation.

The Chairman: General Burchard has a stave silo that I think is in good shape yet.

Secy. Burchard: Yes. Pine makes good silos and hemlock makes good silos. The stave silo is a good silo.

The Chairman: They are making a number of stave silos that are good; some are made of cypress and some of pine. Every farmer who wants to build a silo cannot afford to put up a stone or cement silo.

Mr. Wyatt: Would you recommend the King system silo?

Mr. Hill: That was a wooden round silo. I don't believe that at present prices of lumber, except in the case of the stave silo, that it would pay to build a wooden silo. Lumber is getting higher and poorer every year. The King silo is all right, but it is not durable enough with the present prices of lumber.

A Member: How thick should the wall of the stone silo be?

Mr. Hill: They should be build 18 inches thick. Some are thicker at the bottom, two feet. Some are using cement blocks, but I think the better way is to build your frames and build of cement.

Secy. Burchard: Tell us something about roofs on silo.

Mr. Hill: I know less about roofs on silos than anything about them. I have a number of silos and I roofed them with long V-shaped roofing, because it happened to be the most convenient.

Mr. Goodrich: All the silo needs a roof for is to keep the snow out; the rain won't hurt the contents.

The Secretary: Four or five years ago I built a silo, the mechanics were all busy and I had trouble to get it finished in time enough. I was in a hurry to put the corn in and I finally got men who promised to go out and help me put on the



roof, a certain man promised to come and do it in a short time, finish it up. So I put the corn in. He didn't come, and that was a very wet fall, it rained and rained, and it wasn't very long before some of my neighbors began to talk to me about it. They said that silo didn't speak very well for its owner and the silage would all be spoiled, of course. I said I knew it, but I did the best I could under the circumstances. Then finally, a long time after Thanksgiving, the man came and we put the roof on and very soon after that we commenced to feed the silage to our dairy cows, and I was surprised to find there was but very little waste, three or four inches of mouldy silage on top, which was thrown off of course. The water did it good. Mr. Gurler, down at DeKalb, Ills., has some silos out in his field and no roofs on them at all, and as Mr. Goodrich has said, so far as experience has gone, you don't need any roof on a silo, except for the purpose of excluding the snow in the winter so you can get at the silage to feed it. You may put on some loose boards and keep the snow out, or cover it with straw to keep the snow out, and you will have first class silage. It won't be so nice looking as if you have a fine looking building and a cupola on top, but it will keep the silage all right.

Mr. Goodrich: I went down into the State of Indiana to take a cow census, and of course I traveled around amongst the dairymen. A good many of them had stave silos from 14 to 16 feet in diameter that had absolutely no roofs on them, only they had a cover that was just flat and a place where you could roll it off out the way and when it came winter and the snow began to fall, they could slide that cover on to keep out the snow, and they all claimed that the silage kept all the better for the rain coming onto it.

Secy. Burchard: If a man doesn't feel able to go to the expense of putting a roof on, he needn't do it this year or next year, or until he gets ready to do it.

Mr. Sweden: In constructing a silo with a brick lining, do you advise building it with stone or some lighter material?

Mr. Hill: I would recommend some light material. My neighbor, Mr. Scribner, has one lined with brick and wood on the outside with a dead air space. I think if I was going to do this that I would go to the further expense of covering it with galvanized iron. Wood sprung around a silo, especially

if it is a round silo, has an inclination to split off a piece around the side. I have not seen a silo fixed that way, but I have heard two or three who say they are going to cover the outside of their silos to preserve the wood. If you are going to cover with iron, you can put on much cheaper lumber. All the lumber is for is to act as a hoop to support the brick. You set up the perpendicular studding and sheath it around outside. If you have a stave, you can use a good deal poorer stave if you are going to cover it on the outside with something else.

Mr. Freeman: Is there any one who can give us an approximate estimate of what the cost of this brick lining would be?

The Chairman: What is the price of brick with you?

Mr. Freeman: Eleven dollars.

The Chairman: You ought to be able to buy brick cheaper than that, around \$8.50, and in Southern Wisconsin for \$7, or even less than that.

Secy. Burchard: If you want to be economical, you can set the brick up on edge and they are just exactly as good. You don't have to lay your brick down flat, they are just as good set on edge. Of course you will have to have a heading course every little way. If you are going to have a two-inch dead air space, your brick will go to the side against your lining. If you want a four-inch dead air space, the brick may go on in this style, or you put it this way, and that will make a six-inch dead air space. A two-inch air space is just as good as anything.

A Member: How thick will the inside cement wall need to be to stand?

Mr. Hill: They re-enforce that inside wall with wire which is laid in the cement. When you contemplate building a silo, by all means send to the Wisconsin Experiment Station and get the Bulletin on Silos. It is a book in itself that will tell you practically all you wish to know about building silos. It does not deal quite so fully with cement silos as the others, because in the last two or three years cement silos are being built more and more.

Mr. Sweden: If a solid cement wall is built, is it not more apt to freeze?

Mr. Hill: If I were building at all with cement, I would build with a dead air space and with frames.

Secy. Burchard: In this brick lining, it is a little better to set the brick on end than sideways, it turns the circle a little better, although if a silo is going to be as big as 14 to 16 feet, it won't make any difference. The inside of the brick work is cemented anyway, so it is made perfectly smooth.

A Member: Are bricks cheaper than cement at \$8.50 a thousand?

The Chairman: I don't think so; I think the cement would be the cheaper. Cement does not vary much over the State, but the nearness to gravel or broken stone, all those things can be figured out when you get at it.

A Member: If you have good, coarse sand, do you have to have gravel?

Mr. Hill: It will be cheaper to get some coarse material rather than to use the extra cement necessary. It will be necessary to have one to three of sand to make it strong enough, and you can add three or four or even more parts crushed stone to that and make it really better than it is without.

A Member: Do you know how much your brick silos cost you?

Mr. Hill: Yes, I do know what they cost, but I hate to say for fear I might discourage someone, though I feel that they were cheap silos for me to build. In the first place, they were a patented silo and something was asked for the patent. They are 15-10 inside and 35 feet deep, and they cost between \$550 and \$600 apiece, exclusive of the excavation. They are the very best I could build, and I believe they are cheaper than anything else I could build in my neighborhood. The first silo we built was 14 by 21 feet and 22 feet deep and the material cost about \$74 on the cars, so that the whole cost of the silo was only a little over \$100, and that silo was used eighteen years, but the same lumber would cost three times that now and be poorer in quality than that was.

I wanted to say something when the question of summer feeding with silage was up. I feel that it is almost as important to have silage for summer feeding as it is for winter feeding. I know I sleep a whole lot better nights now from knowing that I can't possibly feed out the silage in my silos if I feed 360 days, and I tell you it is a pleasant feeling when we have a dry year. I have a number of years fed silage every day in the year and have had silage to spread out on the

bottom to start to fill in again, but I am sorry to say a number of years I have been left without any.

A Member: How many acres did you cut last year to fill your silos?

Mr. Hill: Twenty-two acres and it was a little better than an average yield. We talk about getting twenty tons to the acre, but when some expert comes around and wants your corn, your yield isn't as big as you thought it was. It is like the man's cows that yielded 88 pounds when he thought they were yielding 275.

A Member: How much stock will that amount feed?

Mr. Hill: The roughage ration is thirty pounds a day. If you feed a cow 300 days, it will take five tons for her, and three hundred tons will feed sixty cows the major part of their roughage ration.

Mr. Newsome: Do you feed any ground feed with it?

Mr. Hill: Yes, I feed the cows according to the amount of milk they are giving at the time, varying from four to eight pounds a day. I think some cows have had some years eleven or eleven and a half, but that is the maximum. There is considerable corn in the silage.

Mr. Newsome: What is your ration?

Mr. Hill: The usual ration is bran and gluten feed in about the proportion of 4 to 1 or 3 to 1. I think if you have clover hay or alfalfa hay, you can substitute something for the bran. Bran at \$20 a ton is pretty expensive feed; if you had clover hay you could substitute ground barley or corn.

The Chairman: What would a cow do on ensilage and alfalfa without any grain?

Mr. Hill: If you had good silage and alfalfa hay, it would cost less than what it cost that man to feed his cows that got the 88 pounds and you would have a good deal more than 88 pounds of butter.

Mr. Newsome: Have you ever experienced taking the grain away from your cows and feeding more ensilage?

Mr. Hill: No, I have not.

Mr. Searles: What does that silage cost you per ton to raise and put in?

Mr. Hill: I have kept accurate account of what it cost me some years. Of course the yield of the corn and the price of

labor would enter into that, but I am sure that year after year I can grow corn and put it in the silo for a dollar a ton.

Mr. Newsome: That is the labor?

Mr. Hill: No, that will cover everything, the rent of the land and everything. Perhaps I would have to revise that by saying I could not do it with the present prices of labor, but the years I did keep track of it it would run a little less than a dollar a ton. It may cost now \$1.10 or \$1.15 a ton, but certainly not over that, when I could put it in for fifty cents, as I know I can.

Mr. Goodrich: When I took my census in your neighborhood, I figured silage \$2.50 a ton, and the way I got at it was by figuring what an acre of corn was worth and the number of tons it would make, and I think that is the proper way to figure the value of silage, and of the material that is put into it.

Mr. Hill: I disagree with you for this reason—partially disagree—because I have put in a crop of corn that was 150 baskets, say 75 bushels of shelled corn per acre for 40 cents a bushel and 30 cents. But the fact is it costs me eight, yes, ten cents for husking, in an average year it cost me ten cents out of that forty cents a bushel to husk it alone.

Mr. Goodrich: It is all right to figure it that way. The way I figured it was that an acre of corn was worth, that is, by selling it, husked and all, you would get 25 cents, then sell the fodder, and it would make ten cents difference. That made the silage worth \$2.50 a pound.

Secy. Burchard: You are talking from two different standpoints. What did it cost to raise that acre of corn that you talk about? Mr. Hill is showing not what he could sell an acre of corn for, but what it cost to raise it.

Mr. Hill: If I have a couple of friends who are looking for feed and I am going to sell it to them, then I call it worth \$2.00 or \$2.50 a ton.

Mr. Goodrich: When I was up there, there was a question I propounded to several intelligent men, including Mr. Hill and his father, what should I charge for silage fed to cows and some put it down to a dollar and some up to four or five dollars. They said: "Timothy is worth \$12 a ton and silage is worth one third as much, it has one third as much dry matter in it and that makes the silage worth four dollars a ton. I don't



figure it that way, I figured to take an acre of corn as it was grown and stood there. Now, then what is it worth to harvest it and to sell the forage?

Mr. Hill: I charge my cows with it at \$2.00 a ton and when anybody asks me what it costs to keep a cow—I am just hog enough to make two hundred per cent on it. If I am going to get 80 cents a bushel for wheat I wouldn't like to raise it for a dollar. I charge my cows with silage at \$2.00 a ton.

Mr. Goodrich: We have been talking about selling things in the market. Now, then, you could sell that corn and sell that fodder and get 25 cents out of it. Now, will you sell it to your cows and only charge them a dollar a ton?

Mr. Hill: I beg your pardon, I could not sell it for 25 cents. I couldn't afford to, because it would cost me so much more to get it ready to sell.

Secy. Burchard: What do you estimate the relative feeding value between silage and good timothy hay? Two and a half tons of silage has the same amount of nutriment in it that a ton of timothy hay has.

Mr. Hill: I should have said 1 to 3.

Secy. Burchard: That is what Mr. Goodrich says, but I think it is only two and a half.

Mr. Hill: I would rather have two and a half tons of silage to feed my cows.

Secy. Burchard: But then silage at \$2.00 a ton is cheaper than timothy at the usual prices.

Mr. Hill: Yes, it certainly is. If you could buy silage for \$2.50 a ton, you couldn't afford to pay over \$6.00 a ton for timothy hay to feed cows.

Mr. Newsome: How do you harvest your corn?

Mr. Hill: We harvest it with a binder, and I might say that I am fixed so as to know pretty near what is costs, because I hire all the work done. I say, when I can hire somebody to come with a horse and cut my corn I can't afford to do the work myself, I have too much other work. I grow just as much corn as I can possibly grow to the acre and have it mature. If I can have the cured corn I want the heaviest yield I can get per acre. I use Dent corn and it is heavily eared. We want to grow for silage the biggest corn that will mature with us.

A Member: How do you plant it?



Mr. Hill: In checks, three feet each way or three feet three inches each way. We don't drill it.

Mr. Newsome: Don't you think it would be preferable to drill it?

Mr. Hill: For some reasons I do, but I confess I am unable to keep corn as clean as I am bound to have it and raise drilled corn. I can be sure of keeping it clean in the hills. I know it doesn't cut quite so nice for the binder and theoretically, you say you ought to grow more corn to the acre growing it in drills, but, experimentally, there isn't as much difference as you would think there is.

A Member: Do you let your corn get ripe?

Mr. Hill: Yes, it is practically in condition to cut for the grain, perhaps not quite ripe. When the lower leaves first begin to turn yellow or the husks are turning yellow then it is rushed into the silo. Three of us have a large self-feeding cutter and run it with an engine and we fill the 150-ton silo in about two days, rush it in as fast as we can.

The Chairman: The sooner the better.

Mr. Hill: There is no danger of filling it too fast, only if you fill it more slowly you can get in more. You can fix that all right if you wait a few days between. I don't care whether it is wet or not, except when it is so wet that you cannot ask the men to handle it. I would like to know how many men there are in this audience who have silos. Twelve, including myself.

A Member: Do you use a blower?

Mr. Hill: No, we use a carrier. I bought a big carrier before the days of blowers and it is all right yet.

A Member: Do you use steam or gasoline?

Mr. Hill: Steam. I hire a steam engine for \$4.00 or \$4.25 a day and a man to run it. They will run a gasoline engine for \$6 a day and furnish their own fuel.

A Member: What did your carrier cost?

Mr. Hill: I don't know that I can answer that. I think it cost \$250. Three of us own it in company and we have it mounted on a low platform wagon on trucks. I think you can buy them cheaper than that now.

A Member: Did you ever see any ensilage put in with a corn cutter?

Mr. Hill: No, I haven't seen any, though I know some do put it in that way and like it very much.

A Member: I saw some this winter that Warren & Company put in with a cutter and it was fine. Have you seen any put in whole?

Mr. Hill: Yes, I have seen it put in whole. it will be sweeter a good deal. There is a sample of silage here. I should say it was nice, but a little bit too much acid. Whole silage will be a good deal darker color and very much sweeter. It is more trouble to get it in and to take it out. People who have not tried it will contradict that, but those who have tried it will want to cut it.

Mr. Freeman: There is 40 per cent waste when you take it out and feed it.

Mr. Hill: You mean the cattle would not eat it up clean?

Mr. Freeman. I saw one silo in Waukesha county, the man was a strong advocate of whole silage, and I was in his barnyard in the spring of the year and saw stalks piled up there, and I asked him if he had fed any dry stalks. He said no, that was what came from the silo. They had wasted as much as they would have wasted if the corn had been husked and they had fed the husks dry.

Mr. Hill: I think that criticism would be true if it was large corn.

Adjourned to 7:30.

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Convention met at 7:30 same day.

Music by the Indian School Orchestra.

Exercises in charge of Rev. Mr. Atkinson.

Prayer by Rev. Smith.

Mr. Atkinson: I am sure I voice the sentiments of the citizens of this city when I say that you are welcome in our midst and we rejoice exceedingly that there is the interest that is exhibited in this convention. During the twenty years I have been in Wisconsin, I have observed those who are interested in such assemblies, and I know that they mean education and helpfulness and the largest good of the dairy interests and the farming interests of this community and this state; that these conventions constitute some of the most helpful things

that have been in operation in our state, and I trust that the result of this convention will be more intelligence, a higher appreciation and realization of the possibilities within our reach.

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Music by the High School Glee Club.

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## THE RELATION OF SCHOOLS TO AGRICULTURE.

W. McNeel, Principal High School, Tomah, Wis.

Outside of religion there is no theme of more universal interest than education. It has a bearing more or less direct upon every activity of life. But the purpose underlying educative effort has gradually undergone a change. Up to the present time the thought was to train the mind and that alone. But the influences of this industrial age have crept in to alter, not only the purpose, but more particularly the methods. Very seldom do we now hear the expression of that antique idea,—“My boy needs no education, he is going to be a farmer or carpenter as I am, and education is not necessary for that.” Perhaps many of you have seen the day when conditions gave to that expression a great deal of truth, but these conditions have undergone a radical change. The farm is no longer fenced in by a couple of dogs; everything is no longer left to the blessed trinity of chance, accident and mistake; the boy acquainted with the three “R’s” reading, ’riting and ’rithmetic, no longer thinks he has more education than ought to be wasted in raising potatoes, corn and cattle; the world no longer asks the single question, “What does he know”, but the double question, “What does he know and how can he apply that knowledge?” In other words, time has so altered conditions that education is essential to every holder of most any occupation. Not the education that makes of your brain a junk house, but the reservoir of thoughts which may be applied to the molding or construction of something that stands for something.

The principal producer to-day is the farmer. We can safely say that he is directly responsible for this great and complex industrial fabric that exists today, for without the hogs to ship, the corn to grind and the cattle to slaughter, where would lie the incentive to better the facilities along the lines of transportation and distribution? Manifestly this great development would not be possible without a corresponding development of that upon which it depends, namely, agriculture; and agriculture has enjoyed this corresponding development, through improvements resulting in more intense cultivation and by the opening up of new land resulting in an extension of agriculture.

But statistics show that the individual farmer does not receive and never has received as large a return on his investment as does the manufacturer and transporter. To a very large extent his profits are kept low by monopolies among the interests that handle his product, but the trouble lies more with the farmer than with the distributor of his product. He is not so well trained in the principles of his art as is his dependent, the transporter and manufacturer, and, consequently, is not living up to his possibilities. The typical farmer of today is not as good a business man and manager as is his neighbor who conducts a store or shop with an equal capital. He has not awakened to the needs of an education for himself and children as fully as has his city neighbor. Realization of this fact has brought about a great movement on the part of the government, both State and National, through rural school education, through research work and experimentation and by the circulation of literature which treats of the problems with which the farmer must contend.

Wisconsin was the first state in the Union to encourage the establishment of schools for the teaching of agriculture to the rural classes. The Legislature of seven years ago realized the need of the country boy and girl and appropriated \$5,000 annually to provide one half the support of two public schools whose purpose should be to train young men and women for life on the farm.

The work carried on at these schools is intensely practical and the students "learn to do by doing." The first to be established is at Menomonie, Wis., and that city has become widely known for its industrial work done in its public schools

The other is situated at Wausau, but is not as largely attended and not so widely known.

But the state government did not stop here, however; but passed an act which has had a greater effect toward the uplift of agriculture in our state. The Legislature of 1905 provided that the curriculum of all common schools throughout the state should be so extended as to include the elements of agriculture as a required study.

In the graded school below the High school the study must be pursued for at least one half year, and graduates from District schools receive their diplomas only after they have completed a satisfactory course in agriculture. The purpose of requiring this course is not that farming be taught from the book, but it is hoped that a study of the reasons and principles underlying agriculture will serve to create an interest in farm life and prevent a dislike for agricultural pursuits. Its aim is threefold:

1. To instruct the pupil in some of the fundamental principles of agriculture;
2. To create an interest in farm life and farm work.
3. To enable the pupil to read agricultural literature with greater intelligence.

Instruction in what is commonly designated nature study is taught in the grades. This is a course of agriculture in its simplest form. In the high school we have no course in agriculture in the truest sense of the word. You know if there is a man who must be a Jack-of-all-trades and yet a master of one it is the farmer. He must have plant knowledge or botany; animal knowledge or zoology; soil knowledge or geology; knowledge of mechanics or the application of the laws of physics; arithmetic or computation by means of numbers; economics or his relation to society and a knowledge of the laws of supply and demand. All these we give to our students in the high school not under the name of agriculture, but under the name designated and they cannot help but make of the boy a better farmer; if not in the application of the knowledge derived from the study, it will by adding more interest and zest to his life.

And after all, the purpose of an elementary education is not to educate a person into a profession or occupation, but it is to prepare him for good citizenship by instructing him in



the general principles of the things that immediately surround him, and teaching him how to apply those principles. This will make of him a more useful citizen. It is to endow him with the principles of right living by impressing him that gold and silver are not the most precious things that exist, but that the sweat of the brow, good deeds and good thoughts are far more precious and are not subject to depreciation.

You have undoubtedly heard the story of the two frogs. I use it so often to illustrate various points that my pupils can tell it as well as I can. It is an old and worm-eaten chestnut, but very appropriate for a dairymen's convention.

A dairyman was going to town to distribute his milk among his patrons and on his way he stopped at a spring to water his horses and, incidentally, to water his milk cans. While he was dipping the water from the spring into the cans two frogs by chance got into the bucket and shared the same fate as the water, and the dairyman closed the can and started toward town. Now, the two frogs immediately started investigations as to how they were going to make their escape. One frog more anxious than the other made many excursions around the inside of the can and made many trips up the slippery sides only to fall back discouraged. It went to the other frog and said, "There is no use in trying to get out of here. I have investigated every square inch of the surface and can find no means of escape. We may as well give up first as last, for we are doomed to die in this place of confinement anyway." That frog sank to the bottom and became a dead frog. But the other frog took a brighter view of the situation and it kicked and jerked and worked; and it worked and jerked and kicked, until finally it had churned a lump of butter. When the man opened the can he found this frog sitting upon this lump of butter and floating around the inside of the can, singing,

"A life on the ocean wave,

A home on the boundless sea."

Now, that frog was endowed with the principles we try to instill into our pupils, namely, the principle of optimism or the taking a bright view of any situation, no matter how gloomy it may look. This will give him a cheerful and merry disposition and his task can be completed with one half the effort and in one half the time, and the other principle is that

of persistency or sticking to a task until it has been completed. If endowed with these principles our graduates will make better citizens. They will make of him a better farmer if he is to be a farmer; a better lawyer if he is to be a lawyer, or a better doctor if he is to be a doctor.

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Music by the orchestra.

Recitation, Mrs. Joseph Grossman.

Music by the Glee Club.

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### ADDRESS.

W. D. Hoard, Ft. Atkinson.

Mr. President, Ladies and Gentlemen: Before entering upon the subject matter of my talk before you this evening, I wish to dwell for a moment upon the question presented to you so clearly by the principal of your high school, the question of Agricultural Education. The question touching the elements of agriculture in the common school is interesting, not only to educators and to communities, but is beginning to interest farmers.

In Hoard's Dairyman, when we established the Department of Inquiries and Answers, we were obliged to use certain terms that are found in the agricultural industry; for instance, we were obliged, when we meant protein to say protein, when we meant carbohydrates to say carbohydrates, because there were no other words in the language that were equivalent, by which to convey the meaning, and we got hundreds of letters from farmers, good men, but men whose state and whose government and whose fathers had neglected in their youth to put them in their school, the farm school,—the only school the farmer has, the only school that ninety-five out of every hundred farmers in Wisconsin ever have any schooling in,—had neglected to put before those children, now full grown men—any informa-

tion concerning these questions that related to their life, and so they wrote us and asked, "What do you mean by protein? What do you mean by carbohydrates? What do you mean by nutritive ratio? What do you mean by ether extract?"

Now then, there isn't a farmer in Wisconsin that don't know the meaning of "telegraph." Yet it is a Greek word. There is not one that does not know the meaning of the word "telephone," another Greek word, and so today, if the farmers of Wisconsin had a clear understanding of the meaning of terms then their reading would have a very much wider and stronger meaning to them. And I plead with the farmers of this portion of the state that they make their influence felt in their own farm schools and with their County Superintendents, and everywhere, that they make that influence felt for the promotion of teaching of the elements of agriculture in the common schools, so that the boy of today, the farmer that is to be, shall have some clear equipment of knowledge, that when he strikes these words and terms in the literature of his business that he shall know what they mean. I say to you that the farmers have not half realized the importance of such knowledge.

Now, knowledge goes from one man to another by virtue of language, and if man is deficient in his knowledge of language he cannot receive from another man that which he should receive. And so I say that the common school of today, the high school, which is included in the common school, ought to be made a splendid engine for the promotion of agricultural knowledge.

I am to say something to you tonight upon a question not so closely and practically connected with dairying as it is with the construction of the man who is milking the cow.

The title of this talk is *The Making of a Man*, and when I am through with that I want to speak to you a few moments on another topic, for I may not have a chance to give my thought on this matter.

It is on the Evolution of the Dairy Farm. It is very fairly well known to the people of this state that for nearly thirty-seven years I have been working steadily for the promotion of dairy intelligence, in Wisconsin, and other states so far as I could, and slowly, good friends, as this convention testifies, do we see this sentiment springing up where, only a few years

ago, there was scarcely a thought or a deed that was in consonance with it.

(That portion of Mr. Hoard's address which was "not so closely and practically connected with dairying" is omitted at his request.)

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## THE EVOLUTION OF A DAIRY FARM.

W. D. Hoard, Fort Atkinson.

The progression of events towards a completed purpose is called Evolution. There may be evolution up, or evolution down; towards construction and perfection of purpose, or towards destruction and final collapse. Which way evolution takes will depend on the mind, the brain, the thought of the man at the helm.

There is no finer sight than a complete dairy farm, worked out to as perfect adaptation of means to ends as it is possible to make, and no finer ambition can take possession of any man than to construct such a farm. We instantly know it when we see it. We know that it is the result of a splendid ambition, a fine constructive mind, the logical sequence of a thinker, a student, a worker, a master among men. What a marvellous change would be wrought in agriculture if such an ambition could take possession quite generally of the minds of farmers. Suppose a young man should set out in life with this thought and purpose:

"I propose to be the owner of as perfect a dairy farm as I can make, whether it be of 40 acres or 500. Just as soon as I have paid for my land, and maybe sooner, I will start the work of building up a first class dairy herd.

Every dollar above the payment of indebtedness and current expenses is going into the construction of the right kind of barns, stables, outbuildings, yards, paddocks, etc., for the life of a dairy cow, and the proper handling of her product.

I will carry as large a herd as it is possible to keep in perfect health and the land will support, for this will give me more

manure and this give me constantly increasing fertility in my land.

As my revenue increases I will devote it to the building up of this farm factory plant, whereby still larger and better results may come.

I will try and make money, but it will not be for the purpose of investing it in notes, mortgages, stocks or bonds, until I have this Dairy Farm in as perfect shape as I can possibly make it.

I will spend no money for foolish display or vanity, but I will fearlessly spend it as fast as I can get it, to the purpose of doing first class money making work on this farm.

To this end I will try and take good care of my mind, knowing that it is the extent of my knowledge *as a farmer*, and my energy in carrying it out, that will tell the final story for me."

Think what splendid results would be now seen in every state, if the majority of dairy farms were guided and managed with an ambition like that? Many farmers think that such a course would be wasteful of money and not a profit making venture in the end. Right there is where they make their greatest mistake. The trouble with dairy farming to-day, all over the United States, is that the farmers engaged in it are doing their work without clear, definite, ideas of what dairy-ing means and without an uplifting ambition to excel as dairy farmers. A large number would spend more money to be elected to some county office than they would for a pure bred sire or the building of a first class dairy barn and stable. Their ideas of making money are on too low a plane.

We well remember once when a kind hearted German farmer, a neighbor, took us to task for paying several hundred dollars for a Guernsey bull calf. "You might as well throw your money in the river" said he. He thought a scrub grade sire was good enough for him. He sees things differently now since we showed him where we had sold nearly \$3,000 worth of stock from that sire, with more coming on and the sire still in his prime. His last remark to us was: "If I had commenced where you did I would be worth ten dollars where now I am worth one."

It is this idea of gathering good forces together, making a complete whole of a dairy farm, with a definite ambition and



purpose that in the end blossoms out in the perfect flower; the Evolution of a Dairy Farm, the education and making of one of the noblest products of his age, a first class dairy farmer. There is money in it; there is splendid citizenship and patriotism in it; there is a grand upbuilding of your state in and of it.

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Music by the orchestra.

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Adjourned to Thursday, February 21, 1907, 9:30 A. M.

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Convention met at at 9:30 A. M., Thursday morning, February 21st 1907. Charles L. Hill presiding.

Report of the Secretary.

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### SECRETARY'S REPORT.

To the President and Members of the Wisconsin Dairymen's Association: I have the honor to submit the following report, covering the period from the adjournment of our convention in Waukesha last winter to the present time.

I have drawn orders on the treasurer to the amount of \$3,445.58 for the current expenses of the association. The treasurer's report will show in detail in whose favor the several orders were issued, but as has been my custom in previous years, I give a brief summary of the purposes for which the expenditures were made as follows:

Convention expenses of 1906. ....	\$420 79
Convention premiums paid.....	125 24
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	\$546 03

Dairy Inspector H. C. Searles .....	\$1,336 51
Dairy Inspector H. K. Loomis .....	420 10
Cornish, Curtis & Green M'fg. Co., Outfits and supplies .....	52 29
Blanks for reports .....	18 50
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	\$1,872 40

Expenses of members attending meeting of the Ex- ecutive Board .....	\$15 86
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SWISS CHEESE PURPOSES.

Instructor Peter Zumkehr .....	\$924 00
John Luchsinger, legal services .....	50 00
Printing report .....	63 75
Milk for experimental purposes .....	18 54
	<hr/>
	\$1,056 29
	<hr/>
	\$3,445 58

There still remains to be paid as part of the legitimate expenses of the year, the salary of the secretary, \$250, the expenses of his office. \$94.10, a printing bill, for stationery, programs, etc., \$25.40, and several outstanding accounts for traveling expenses of several officers while serving the association. When these several accounts are presented and paid, the expenditures for the year will fall but little, if any, short of \$4,000, which is the amount of our annual appropriation.

As noted in the program prepared for this convention, the Executive Board, after mature consideration, considered it inexpedient to continue premiums on butter and cheese and adopted the following resolution March 22, 1906:

*Resolved*, That premiums on factory butter and cheese be discontinued and that premiums be offered for milk and cream for market, cheese factory, and creamery purposes, including all essential points except the per cent of fat and solids-not-fat.

Mr. Charles L. Hill with the president and secretary was constituted a committee to formulate satisfactory rules for the milk and cream exhibit. It has been found difficult, not to

say impossible, to formulate satisfactory rules for this purpose, for the reason that there were neither precedents nor experience for guidance but with the co-operation of the State Dairy and Food Commissioner and some of his expert assistants, we have arranged for such an exhibit and for judging and awarding premiums. It is confidentially expected that our experience this year will enable us to overcome in the future many of the difficulties and discouragements that have been met with in the past.

The Executive Board at its meeting last March also adopted the following:

*Resolved*, That the association discontinue the present system of instruction to creameries and cheese factories and in lieu thereof establish a system which shall deal more directly with the milk producer.

Pursuant to this instruction it was determined to make some initial experiments in establishing test associations. Several applications were received but none of them seemed to offer sufficient dairies or cows to occupy the full time of an inspector in one locality, but after some effort and delay by combining the applications from territory northeast of Fond du Lac with others from the neighborhood of Rosendale, west of Fond du Lac, a circuit was established and Mr. H. C. Searles was started in the work about the middle of May. It is expected that he will be present and report concerning the progress made. The monthly reports he has sent in show only too plainly the imperative need of such work and letters from dairymen whose herds he has visited from month to month speak very encouragingly of the benefits already accomplished.

Later in the season, Mr. H. K. Loomis was persuaded to take up a similar line of work, but on a much more restricted scale in Sheboygan county.

These inspections, to be of full value, should cover a full year. Doubtless from experience gained, these inspectors will have valuable suggestions to offer concerning methods for the future.

Respectfully submitted,

GEO. W. BURCHARD,

Secretary.

Secy. Burchard: Gov. Hoard suggests that I very briefly

explain this method of inspection to which I have referred in my report.

The inspector goes once a month to each herd; he there sees to the milking morning and night or night and morning, gets one day's milk. He takes samples of that milk and tests them and he assumes that for practical purposes this may be a sample of the entire product, of each cow for the month. If anything really abnormal occurs, he can check it up with his test for the month preceding and the month following. He makes a record of this and reports to me as secretary of the Association once a month.

I have looked over those reports with some care and it is astonishing as well as instructive to note how much different cows vary, cows in the same herd. Some hold out well and others drop off almost at once. Some start in magnificently, but they soon fall out of the race.

These inspectors also report briefly about conditions on the farm, how the man feeds and what care he gives his cows, etc., and it is instructive to note that there is oftentimes quite a relation between the falling off of the milk in the herd and the lack of proper care given to them.

I don't want to trespass too much upon this line of thought as will be developed by Mr. Searles, who has been in the work and has a paper which he will present tomorrow morning, going more into details I expect, but I am glad to call your special attention to this matter.

The Chairman: At this time I am going to appoint the following committees:

Resolutions—C. H. Everett, A. D. DeLand, M. B. Lee.

Nominations—J. Q. Emery, Prof. W. A. Henry, Mrs. A. L. Kelly.

Auditing—H. C. Taylor, C. P. Goodrich, H. D. Griswold.

Milk Exhibits—W. D. Hoard, U. S. Baer, Secy. Burchard.

At this morning session, Gov. Hoard is to occupy the chair.

Ex-Gov. Hoard: The hall seems to be pretty cold. Way back in my boyhood days, when we took sleighrides and it was chilly, we used to say, "Lay the brands close if you want a good fire," and I have always noticed that it is a good deal so with an audience. If you have a warm room and a good audience, well packed in together, somehow or other the action and reaction of the moment is more prolific. You know how

it is, you don't enjoy your meals if you sit down in a cold room and eat alone.

For a number of years it has been my fortune to know of the character of work which has been performed by one of the younger members of the faculty of the College of Agriculture in Wisconsin. I have happened in the course of my life to meet a good many men who did good work.

Now, we have before us this morning a very important topic, wonderfully important to the comprehension of the practical farmer if he can be brought to see it, and I think as a rule that almost every farmer is willing to see if he possibly can have an opportunity to see.

The relationship of alfalfa and corn to dairy farming in Wisconsin is remarkably close. One little word may help us by way of illustration. Here is a circle, it is complete, we will say, almost closed at the top. I find in my practical work on my farm that corn ensilage and alfalfa hay close the circle pretty nearly and all it lacks is the keystone of a little more grain.

Now, the relationship of corn and alfalfa is remarkably intimate. Wisconsin is a good corn state, raises corn when a study is made of it and raises it successfully, and it is very fortunate for us this morning that we have one of the most devoted students and teachers in the College of agriculture with us to discuss this question, and it gives me exceeding good pleasure to introduce to you Prof. R. A. Moore, who will discuss this question as I know in a very enlightened manner.

Prof. R. A. Moore: Mr. Chairman, worthy Secretary, Ladies and Gentlemen: It is certainly a great pleasure for me to be with you. It is my first opportunity of meeting with the dairymen of the State of Wisconsin, with this particular Association which has done so much good to our state. It carries me back to my younger days in old Kewaunee county, when, through the efforts of this organization such men as ex-Gov. Hoard, Dean Henry and Hiram Smith came to our county and told us we had been soil robbers. We were growing wheat in Kewaunee county in the same way that it was being grown all over the fair state of Wisconsin, but we didn't know that we were robbers until we were told it by these men who warned us we should turn before it was too late.

There was not a single creamery or cheese factory in the



county of Kewaunee at that time, but we did turn; in a few years we stopped growing wheat upon our farms, we turned our attention to dairying and when I left the county eleven years ago to take up my work in the College of Agriculture, we had at that time 68 cheese factories and creameries in the county, and we are pulling the mortgages off our farms that has been placed there by continuous wheat growing.

That same thing took place throughout our entire state, and today the state of Wisconsin is largely indebted to what this Association has done, with the co-operation of the collage of Agriculture, for her present condition.

The state of Wisconsin had a population who were willing to learn and when they saw that it was for their interests to take up the dairy business in preference to growing wheat upon their farms, they did so, and today we have in the neighborhood of 2,995 cheese factories and creameries in the state of Wisconsin and its dairy products bring to our farmers some \$40,000,000 or \$50,000,000 annually, and it is right upon that subject in particular that I wish to speak.

It has been suggested that in order to get the discussion properly before the members of this Association and their friends, that I give a couple of short papers upon the topics assigned me. Then these can be discussed and before taking up the discussion, it will be well to present both these papers.

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## THE WISCONSIN CORN CROP.

### Breeding, Growing and Dissemination.

R. A. Moore.

For many years Wisconsin has been handicapped in corn growing. Our southern neighbors have told us that we were out of the "Corn Belt," and unless we could come over into the corn belt there was little use of growing anything except flint corn in Wisconsin.

A careful survey of the climatic and other conditions seemed to show that Wisconsin was not out of the corn belt, but

was very much inside and underneath the belt proper. All that seemed necessary was to stop purchasing seed corn in accordance with the scoop shovel method and stop trying to adapt southern grown corn for our conditions. The corn needed was Wisconsin corn belt corn, bred and acclimated especially for different localities of the state. The Wisconsin Experiment Station undertook the task of developing the varieties of corn and with the aid of the Experiment Association within five years have established Wisconsin corn, "true Badger corn" in every county of the state.

Five years ago Wisconsin produced 28.2 bushels of shelled corn per acre. Secretary Wilson sends forth in the U. S. Crop Reporter the remarkable yield for Wisconsin of 41.2 bushels per acre for the year 1906. Wisconsin's yield per acre is only surpassed by the state of Ohio, which has a yield of 42.6 bushels per acre.

Parties who have not understood what has been going on in the state of Wisconsin in regard to corn breeding, can hardly realize what is meant by the figures I have given you. What that means is this, that Wisconsin this year has grown twenty million bushels more corn on approximately the same acreage than she did in 1902.

The breeding, acclimating and dissemination of corn for various sections of the state has been an important factor in bringing about this increased yield. Like the Dairymen's Association now in session, which sprung into existence at a time to prevent the farmers from depleting their soils through constant wheat cropping, the Wisconsin Experiment Association has come to the rescue for better corn production. By the establishment of several thousand corn centers, the improved varieties have been grown and acclimated in all sections of the state and farmers now have within easy reach good seed corn, which they can purchase fire dried in the ear that has been grown under their own local conditions.

It is surprising what an association of 1200 young farmers can accomplish when all proceed in a systematic way along one line of effort.

During the five years work with corn at the Experiment Station a few things have been learned that are of vital interest to the Wisconsin corn breeder and will be herewith given with the hope that some farmer will be benefited thereby.

For improvement of yield we should observe careful selection of seed ears when stalk study is permissible. The ears should not be taken from the stalks until well matured. Seed corn should not be dumped on a floor, but hung in a well ventilated room or top of corn crib to dry. A well ventilated furnace room is an admirable place to cure corn. Small outside building, well ventilated, with corn racks arranged and shielded, stove in center of room is preferable for drying large amounts of seed corn. After seed corn is well dried, it will stand cold weather without serious results.

The ear we desire should be cylindrical and true to type, tapering ears are objectionable as they do not carry uniform kernels. Kernels should be of medium depth and of practically the same width from butt to tip of ear with edges fitting closely from crown to cob. Ears having sixteen to twenty rows are preferable for our latitude, as by carrying that number of rows, they dry out more readily than if carrying more. A slightly roughened seed coat is desirable and the corn should come well down around the shank, which should be of medium size. The tips of the ears should be fairly well filled, but do not discard the ear if a few tip kernels are missing when other good characteristics are present.

Ears should be of uniform size, 8 to 10 inches in length, and 6 to 7 inches in circumference. Uniformity in size of ear usually carries with it uniformity in size of kernels.

The secret of good crops is largely in the seed. Only the best should be planted. No uniformity of stand can be secured unless seed has good germinating power. All corn of doubtful character should be tested. General test should first be made by taking at least two kernels from each of fifty ears and making test in simple plate tester. If test is from 98 to 100 strong and vigorous, and corn was cured under similar conditions, the farmer can be reasonably certain the corn is all right. Resort to the ear test if general test is low, or if any doubt exists, as it will amply repay for time and trouble.

Before testing make general selection of ears that have kernels of about the same size. Use planter plate that will plant by check row system three or four kernels to a hill. Stay by planter until it will drop four kernels eighty out of a possible one hundred times.

Shelled corn should not be purchased for seed. Every corn grower should insist on having seed corn shipped in the ear so that he can test the same before planting and discard it if of no value. There is no good reason why any honest corn dealer should refuse to sell corn in the ear.

Bear in mind that in order to lock the vitality of seed corn in the kernel until time of planting, the corn should be fire dried and then stored in a safe place.

Chairman: Please speak further in regard to curing corn in basements of buildings.

Prof. Moore: Farmers having furnaces in the basement of dwellings for heating purposes can use the furnace room for kiln drying corn. The corn can be strung on wires or slats or the ears tied so as to be suspended from the ceiling. The windows should be opened so as to have free circulation of air and the furnace run as to have the heat retained as far as possible in the basement. Where a corn grower hasn't this convenience and where the desire is to cure a very large quantity we advise a regular corn curing building.

Chairman: Do you furnish plans for these curing rooms?

Prof. Moore: We give general directions, we have not any elaborate system. We have told a great many of our members of the Experiment Association to go ahead and take any of their old outstanding buildings and put little corn racks in them and put in a shielded stove in the center of the room, and before going to work in the morning, run in and start a fire and keep the corn in there for a couple of weeks. Do not fire too heavily at first, but have a slow heat the first day or two, and windows well open, be very careful that there is good circulation of air in the room, otherwise the corn will be bathed in moisture that is driven off the corn.

Chairman: What do you mean by "ear" test?

Prof. Moore: I mean to go to your corn racks, wherever they are, and select your ears of corn and lay them on a table in rooms having them all numbered. Take out from four to six kernels, usually four are sufficient. One hundred ears would be sufficient to plant at least eight acres of corn. It doesn't take very long to select out one hundred ears that are uniform. Number them and take out four kernels from dif-

ferent parts of the ear. We have a little board box and we put sawdust in the bottom and nail a cloth, which has squares drawn upon it that are numbered. This cloth is drawn over the sawdust and tacked to the sides of the box. Then the kernels from ear No. 1 go into square No. 1 and so on down. Then we have a little sack that we fill with sawdust and moisten that goes on top of the corn in the tester. After the corn has been in the tester three days we look at it and most of the kernels will have germinated at that time, but we cannot tell the character of the germination so well until about five days have elapsed. Then we go to the box and here we will say is square No. 10 with four kernels in it, and two of them have failed to germinate and the other two weak. We cast ear No. 10 out as we know that something has occurred to injure the vitality. We figure that a thousand plants would be produced from this ear if the kernels were all good, but something has happened to this ear that has made it a poor ear, and the only way of telling whether it is good or poor is to put it to the ear test. No man will make money so fast as he will while testing corn. Now, then, we will go to square No. 25, and find something is the matter with the germination. We will see that the vitality has been injured to a certain extent and we throw out the ear to be put into the feed box. You may find there will be five or ten ears out of a hundred that something is the matter with the germinating power, and they should be discarded. Only keep those ears of corn to plant that give a vigorous germinating test.

For Wisconsin conditions the only true method of curing corn is to fire dry it. When we harvest corn, even though it looks to be well matured, it has from 25 to 30 per cent of moisture in it, nearly one third moisture. Even though we have considerable good weather after harvesting the corn, the moisture content will not be reduced more than five or ten per cent, so when freezing weather comes the corn having eighteen or twenty per cent or moisture in it, is injured or rendered entirely unfit for seed. The water freezes within the corn and the germ is destroyed and even though some of the kernels germinate, the vitality is knocked out of the corn. We wish to have the vitality and the energy, locked into the seed corn so that it will come forth after planting and produce a good stalk and at the same time produce a good ear.



By going through a field of corn you will find a great many barren stalks, the seed producing these stalks had just sufficient vitality to produce the stalk and perhaps put out a little nubbin. If your seed corn is fire dried and you secure the vigorous ears by testing, you will find in your field annually a less number of these barren stalks, and a less number of stalks that will produce nubbins.

We have bred, at the Station, a variety of corn that will produce merely one ear to the stalk. You will find it characteristic of this Wisconsin No. 7 to produce one good ear to the stalk. You might say, "Wouldn't it be better to produce two or three ears of that same corn?" You would thereby have a lower grade of corn. The high grade seed corn you can sell at \$3.00 a bushel. So we wish to breed a corn that will give as many bushels as possible of this \$3.00 corn. If we have more ears to the stalk, we are going to have a great deal of the other kind of corn, the twenty and fifty cent corn. When we started working with corn, we thought five ears out of a hundred that we would not be ashamed to send out for seed was pretty good. We have gradually been working up, so that this year we got about twenty per cent of ears that would go into the seed corn lot. We made three divisions of the corn, namely, the seed ears, the feeding ears and the nubbins. We are striving to reduce the lower grade of corn and raise the higher grade, and this we are accomplishing through our single row tests.

Mr. Taylor: Is it delivered to the purchaser in the ear?

Prof. Moore: Yes, we do not believe in the scoop-shovel method of selling corn.

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## ALFALFA IN WISCONSIN.

R. A. Moore.

Wisconsin is a great dairy state and her dairy products brings to her farmers some fifty million dollars annually, but a considerable sum of this money is spent by the farmer for

high protein feeds. Oil meal, oil cake, cotton seed meal and bran are purchased by our dairymen for the protein these feeds contain. These feeds are high priced and often farmers living at a distance are obliged to spend much valuable time on the road bringing home these feeds after they have been purchased at a good round sum. It seems to me that the Wisconsin farmer has reached that stage in development, when we can solve this trying problem, and grow his protein feeds on his own farm. We know he can, as many of our best dairymen are already doing it, and keeping their protein money at home, instead of sending it out of the state annually.

The alfalfa plant has come to help us out and as soon as we learn to grow and care for this great plant, the problem of protein mixtures for our carbonaceous feeds is solved. The man who may have tried the growing of alfalfa without success, should not feel discouraged, and should remember we are working with a wonderfully mysterious plant. A plant that can build in its tissue 18 per cent of protein matter and secure the larger portion of it from the air, and much of the other feeding elements from many feet below the surface, of the ground, is worthy of our best judgment in the establishment of the same upon our farms. No better inheritance can we leave to our offspring on the farm, than good established fields of alfalfa and a knowledge of how to grow the same.

An organization that has come to the dairymen in times of need is now in session, and may we not spread broadcast throughout our state some information that will enable the farmer to solve forever the question of high protein feeds. During the past eight years at the Experiment Station, we have successfully grown alfalfa, and no less than eight hundred members of the Experiment Association are growing alfalfa as object lessons in all the older sections of the state. We hope to be able to present to you a few facts bearing upon the growing and handling of this coming forage plant.

*Test the Seed.* Seed should be tested before purchasing. Use the simple plate tester. Farmers should write seedmen for sample or seed and test the same; if the seed does not test 90 per cent or above, do not purchase, but try another firm. The character of the germination should be considered, as well as the fact that the seeds germinate.

*Reasons for Failure to Procure Good Stand.* Seed of low

vitality has been the principle reason for numerous failures in the past. Sow the seed on well-drained land, south slope preferable. Do not sow on low, moist, or heavy red clay soils. Use twenty pounds of seed per acre, and if the land is weedy, use one bushel of barley or oats as a nurse crop. If the nurse crop does not lodge, let it mature and harvest in the usual way. Under very favorable conditions, a cutting of alfalfa can be secured the same season of sowing. Do not cut alfalfa after September 10th.

*Soil Inoculation.* In many portions of Wisconsin, alfalfa plants readily develop the proper nodules on the roots without artificial inoculation of the soil. To insure a good stand it is safest to scatter bacteria laden soil on the surface of the ground, just previous to sowing the alfalfa seed. Soil taken from an old alfalfa field or where sweet clover (*Melilotus alba*) grows, contains the germs that act in a beneficial way on the alfalfa plant.

A good plan to get the proper bacteria into the soil is to put some alfalfa seed with our clover mixture we desire to sow. a few scattering alfalfa plants will become established in our clover field, and act as bacteria distributors, until whole fields will become properly infected with the essential germs for the proper development of the alfalfa plant.

*When to Cut.* Alfalfa should be cut when coming into blossom, and not too close to the ground. Hay caps to cover alfalfa and protect it from dew, rain and sunshine, are desirable. One-half the value of alfalfa hay may be lost if it is not properly protected.

*Feeding Value.* Alfalfa hay has nearly the same feeding constituents as bran and should be regarded on a par with grain feed by weight for dairy cattle.

Do not pasture your alfalfa fields which you desire to cut for hay, as alfalfa is readily killed by close pasturage. A top dressing of well rotted manure aids materially in producing a good crop.

Fields which you desire to sow to alfalfa should be fertile, well drained and well manured in order to get a good stand from the start. In old hog pastures or cattle yards, there seems to be very little difficulty in getting alfalfa established at first seeding.

I have here a sample of alfalfa seed grown in Wisconsin,

true Badger seed, which gave a yield of four bushels per acre. We have already made germinating tests of this seed at the Station and found it to be 95 per cent. The price of alfalfa seed at the present time is 15½ cents a pound, about \$9.50 per bushel. So you see at four bushels to the acre, a man can get \$38.00 for the seed from an acre of land after getting one good cutting of alfalfa hay. It will be a blessing to our state when more members of our Association grow this seed; they will find a ready market for all the Wisconsin grown seed they can raise.

The young man who grew this seed, took first prize at the Annual Meeting of the Association.

Four years ago when the Experiment Association received its first annual appropriation of one thousand dollars from the state, we used the larger portion of the money to buy alfalfa seed. We were very careful to get good seed, consequently made many germinating tests of seed from different seed firms before placing our order. We were surprised to find some of the germinating tests run as low as twenty percent. Any farmer who sows 20 per cent seed is doomed to failure from the beginning. We got other seed that tested 98 to 100 and that is the kind we purchased, you may be sure. Fields today that were put in from this seed are giving annually three crops a year, and have established the fact in many counties where they were not growing alfalfa at that time, that we could grow and develop this great forage plant.

Be careful before purchasing alfalfa seed that you make the test. Send it down to the Station, if you have any doubt, and we will make the test for you, and report on the purity as well as the germinating quality of the seed.

Chairman: Do you as a rule get a cutting of alfalfa the same year of seeding?

Prof. Moore: It is only occasionally we get a cutting of alfalfa the same season of seeding. We have done it at the Station farm. We got two and a half tons to the acre the first year, and the next year we took four crops from the same field, but it is safer not to cut the first season and never cut after September 10th.

We have a plant commonly known as sweet clover growing along our roadsides, that is performing very important mission in spreading the germs necessary for the growth of alfalfa.

fa. We passed laws putting sweet clover among noxious weeds, we started out with the determination to cut it down and exterminate it, but the plant is quietly performing its great mission in life by paving the way for alfalfa. When we realize the great mission this plant is accomplishing, we will be willing to let it grow alongside of the road unmolested.

The reason in many parts of Wisconsin that we can get a good stand of alfalfa today is because this same sweet clover is growing by the roadsides. The sweet clover germs which are beneficial to growing alfalfa are washed onto the adjoining fields and the ground filled with the bacteria which are necessary for the growth and development of alfalfa.

Chairman: You spoke of getting the land inoculated by sowing a mixture of alfalfa and clover seed, please explain further.

Prof. Moore: In sowing alfalfa with clover, the few plants that become established among the clover plants, if but one plant in fifty the germs seem to act on it and that plant will look vigorous. Nodules develop on the roots of these plants which release sufficient bacteria so that whenever the clover sod is turned up and we sow alfalfa upon the field, we are pretty sure to get a good catch of alfalfa and practically all plants will develop the nodules when we follow the above practice on high well drained soils.

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#### DISCUSSION.

A Member: How would it be for the farmer who was not selling seed to shell it and put it in a bag after having fire-dried it, and put it away?

Prof. Moore: In some respects that might be all right. Of course there may something have happened to the corn that he is not aware of and he would not be able to test it to advantage if it has shelled from the ear. Now, if this corn was going into a breed test I would not advise that at all. If it was just going into a general field, it probably would be all right and be safe for him to make a general test, but if it was going to a breed test, I would fix it so I could test these ears before putting them into the test.



I did not speak of our system of breeding. It is practiced by the members of the Association, nothing hard about it. We go to work and select 50 ears and finally we select the smallest ear, the one which has the least number of kernels, and we reject the tip and butt kernels so as to get uniform kernels and we will plant this ear in a row, putting in three or four kernels to the hill, whichever we decided on, three feet eight inches and four feet apart. Plant it as far as it will go.

Then take this next ear and so on down through until we get the 50; we usually run 50 ear tests. Now, when it comes to looking over this corn and the selection, we begin at a time before the corn has fully ripened; for instance, if we wish to fix early characteristics and wish them to be prominent in some of this corn, we will go through when some of the early ears begin to ripen up and we will mark these stalks on which these early ears grow. At the same time, we wish to have this corn selected with reference to the stalk, we want to consider the characteristics of the stalk, there is a great variance, for instance, in the leaf development of the stalk. Wisconsin farmers use a great deal of corn for forage purposes or for the silo. Consequently, we save ears of the leafy corn. This No. 7 corn is the most beautiful corn in that respect that I have ever seen grown. You select a very leafy stalk.

Corn is one of the most beautiful plants to deal with you ever saw, because you can breed any of the characteristics you desire into the corn plant, and we have developed a variety of corn which has an excellent stalk, nice and leafy. Of course this corn that you are selecting must be left, it must not be picked. A great many farmers make the mistake and go in when the first husks of the corn begin to turn yellow and they pick those ears off and put them in a bag and take them home thinking they are going to get early corn. Well, they are going to develop that characteristic in the corn to a certain extent, but at the same time, they have lost a most essential thing in corn; that is, they have lost the vitality, the energy, which goes into the corn just during the last few days of the ripening period, and that is what we want in corn, if it is going to have sufficient energy and vitality locked up in it to put forth a stalk and good ear it must be left to get the

benefit of those last few days, because that is what they lose by selecting in the way it is so often done. But, mark the stalk, and after it is well ripened up, go in and gather your selected ears and you have got those qualities you are after.

The Chairman: Do you make any study of the character of the stalk, as well as the character of the ear, I mean the vigor of the growth of the stalk?

Prof. Moore: Yes, we study that. We size the corn stalk up just as you would if you wished to select an important man to put in an important position. Make a general selection.

The Chairman: Your idea is that the vigor and appearance of the stalk itself is of importance as well as the appearance of the ear?

Prof. Moore: Yes, very important indeed. Now, for instance, each ear has its identity just as closely as the identity of a man. For instance, we find in the human race we have a class of men that is always behind, never get up, it seems as if they are born two or three hours late in the world and never catch up. Then we have another class of people who are able to hold their own and keep up with the world's progress and not only to hold their own, but to go beyond the general average, and so it is with corn. We have some corn that is going to drop back just as some dairy cows are a detriment to the herd, they will never catch up. So it is with corn; while, on the other hand, we have come to where we can produce three times as much good corn under the same conditions, the land plowed in the same way, cultivated in the same way and seemingly the same kind of corn at the beginning. But to come to our seed corn again. The next year we plant from our high yielding row and our whole yield is going to be high and that is how the yield rises, and that is the reason that we are getting from 75 to 100 bushels of corn to the acre, because we have thrown brains into the work; we have a thousand young men doing that, throwing brains into their work of breeding corn and that is one reason why we are able to give you the results that we have.

A Member: Would you advise shelling another year?

Prof. Moore: No, for two reasons. We reject the tips and butts for two reasons, one is because they are tardy in the germination, about three or four behind in the germination, so if they are planted with the other kernels these tip and

butt kernels come on about four days late and are shaded during the whole growth and they never have sufficient vitality to produce a good year. Another reason is that they are not the same size and will not plant in the same way, the planter will drop six or seven kernels down into the hill where you only want four.

The Chairman: Do you go through a field of corn and cut out the barren stalks?

Prof. Moore: No, sir, we haven't done that to a very great extent. There is a great doubt upon that particular subject as to whether or not this is a breed characteristic. A great many of the best corn breeders think that it is and while I may be convinced otherwise, I think that it is not a breed characteristic. I think that barren stalks are largely the result of corn that is planted that has not had vitality and energy locked up in it.

Mr. Goodrich: They are sometimes large stalks, are they not?

Prof. Moore: Yes, occasionally the corn has sufficient vitality to put thrift into the stalk, but, as a rule, it is not so.

A Member: In your selection of seed corn, when you go through the field and mark certain stalks, how would you mark it?

Prof. Moore: I would either use a little string or one of these clasp clothes pins.

The Member: How would you know that it is the proper kind of an ear? Would you rip off the husks?

Prof. Moore: No, I would just select about three times as many ears as I thought I would need. You can go through and mark enough stalks to make two or three hundred ears in a very short time. I mark about three times as many as I need and about from fourteen to sixteen ears of corn like this that I have here would plant an acre.

The Member: And the corn that is marked should be cut at the proper time for fodder, should it?

Prof. Moore: Oh, no. After the corn is all ripened up and it is all right, the leaves have stopped performing their functions of putting energy and vitality into the corn. We like to leave the seed corn until it is all ripened.

Mr. Everett: What the gentleman wants to know is, if

you cut that ear of corn at the time when you are cutting corn for the best feeding value for fodder.

Prof. Moore: You ought to leave it there in order to get more vigor.

Secy. Burchard: How do you harvest this seed corn?

Prof. Moore: We wish to cut our fodder corn a little earlier than the seed corn. Our desire is to leave the seed to receive as much vitality in the ear as possible, while in the fodder corn we want the vitality scattered through the whole stalk, consequently where we are growing for seed, we let the corn ripen up at the expense of the fodder.

A Member: You might select your seed in one strip.

Prof. Moore: Yes.

The Chairman: It is a good thing to plant the corn you intend for seed by itself.

Prof. Moore: I wish to state here that we have here three or four of the varieties of corn that we have developed in Wisconsin. Here in Wisconsin No. 8; this was developed for the lake shore counties. We grow it up to within twelve miles of Lake Superior and forty-seven bushels of shelled corn have been harvested. The people up there were very much surprised. They thought they could not use flint corn up there. So we are looking forward to the time when we can push this corn belt way up to Lake Superior.

Here is another very nice yellow corn that was rather late. It is a nice corn, known as the "North Star," but it is later than the other. In order to get a medium variety, we crossed these two and we produced a cross-bred corn which is called "Golden Glow" and we have been carrying on special tests to know whether the characteristics in that corn are sufficiently settled so that we will be able in a couple of years to establish that corn.

Here is another, "Clark's Yellow Dent" that was grown by a farmer by the name of Clark and we got a nice yellow corn. However, that No. 7 is the highest yielder we have in the state.

The Chairman: This is a very important discussion, and I wish we had time to continue it, but we must go on with our program. Our next topic is "The Relation of Feeds to Profitable Dairy Farming." For a number of years it has been my fortune to do lecture work in the state of New Jersey and

in many other state, and I have come to regard with very great respect and confidence the work of one man in that state, which is in many particulars like that of Prof. Henry's in Wisconsin and is revolutionizing the farm judgment of New Jersey. He bears the same relation to New Jersey that Prof. Henry bears to Wisconsin—God bless him, we are to lose him; Prof. Henry for ill health must retire, and sadness fills the hearts of all the true good farmers of this state.

I know that Prof. Voorhees has held the same relation, very nearly, to his state. Last May I visited him on the state farm at Princeton, and I was powerfully impressed with the quality of his thought and his work as it was seen there by demonstration, and I take exceeding pleasure in introducing to you for a discussion of this, a very important, subject, a man who has made his mark all over the United States and largely so in Canada and elsewhere, Prof. Edward Voorhees, Dean of the Agricultural Experiment Station of New Jersey.

Prof. Voorhees: Mr. Chairman, Ladies and Gentlemen: It is certainly a very great pleasure to me to come into Wisconsin. We have been looking toward Wisconsin from the East for a great many years and we have received a great deal of the inspiration that we have in dairy farming, from Wisconsin men.

I like to look a body of farmers in the face. I like to speak face to face on these and other matters that are so practical, so important to every one of us. In my experience in New Jersey I have always felt that it is not so much the new thing that we take to the farmer, as it is to impress upon him the value of the old things; the value of the underlying principles; so that in coming to you here today I do not propose to bring to you something very new or very remarkable, but to present in a simple way some of those very important underlying principles which have to do with the development, not only of the man, but the development of the man's farm and ultimately increase his financial profit.

We of the East are farming on soils that are poor, many of them poor originally, many of them poor because they have been exhausted of their fertility; so that our work for a long time has been to get the farmers to understand this whole question of fertility, how to maintain it, how to build it up.

We have been working along the line of fertilizers a great



deal, but recently we have been working more particularly along the line which shows the farmer how he may prevent, or how he may escape, the necessity of the purchasing of so much fertility.

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## FEEDS IN RELATION TO FERTILITY AND PROFITABLE DAIRYING.

Professor E. B. Voorhees, New Jersey.

It is very much like "carrying coals to Newcastle," to have an Eastern man attempt to assist Western dairymen in the development of their business. The farmer of the East, who from his exhausted acres is trying to maintain his dairy, looks toward the West, with its boundless wealth of fertility, for information concerning this great industry. Moreover, a state like Wisconsin, whose dairy products have increased at the rate of \$1,400,000 per year for the last 35 years, should, it seems to me, be able to give the Eastern farmer much valuable information concerning the proper management of the dairy business, and I am glad to say that the progress that we have made is largely due to the inspiration given us by a Wisconsin man. The Eastern dairymen are largely engaged in studying how to build up their exhausted soils in such a way as to enable them to raise food for their cattle. That they have succeeded, in a degree, does not make them any more capable of giving assistance except in so far as the dairy business has a relation to that important, and I may say vital, question of fertility. The subject of my address, therefore, is a fortunate one, because it permits me to digress when there is any approach to deep water in the matter of technical dairy problems as you have them in the West.

From the earliest times, the methods of farmers have been such as to make it seem to be a far cry from feed to fertility. In all countries until quite recently, and our own country is no exception to the rule, people have been so intent upon the accomplishment of some one thing, and so absorbed in but one

phase of a question, that they have not taken the time to study the relation of the work which they are doing to that which other people are doing, and thus pursue irrational and wasteful methods; this is quite as true of the farmer as of any other class of citizens. We are unable to appreciate the relation of one part or branch of farming to all the other parts. For example, farmers when they are making up rations for dairy cattle, think principally of the effect of the ration upon the milk flow, and not of the relation of the preparation and use of that ration to soil fertility in its various phases, and its influence upon the present and future dairying of the country, though these, as a matter of fact, may be quite as, or even more, important in the long run, than the effect upon milk flow. In this country, we have been particularly delinquent in our study of fertility, and it has not been confined to the farmer, but is true of all classes of citizens—of our statesmen, even, who are presumed to have a patriotic interest in the future prosperity of the country. At present, there is a feeling upon the part of businessmen, in lines which have no direct connection with farming, that questions concerning the soil have been neglected too long; they are beginning to inquire what of the future? They now realize that all true progress is based upon soil fertility, and the relative rapidity with which soils become so far exhausted as to prevent the growing of profitable crops under old methods, raises the question with them as to how much further this can go without such a reaction as to cause serious changes in our commercial relations.

### SOIL FERTILITY.

In order, therefore, that we may have a basis for our discussion, we will look at this question of fertility briefly. What is it? What are the essential principles of it? How can it be conserved, rather than wasted? In the strict sense, the potential fertility of our soils, that is, the possible crop-producing power, is finally measured by the content in them of certain constituent elements that exist in soils in very small amounts relative to the others, namely, nitrogen, phosphoric acid and potash. That is, the power of the soil to produce plants would end were any of these three constituents absolutely removed, even though all of the other required elements

were present in abundance. This is, of course, only theoretically true, as the chances are that even when soils are regarded as exhausted, they still contain a very considerable quantity of one or more of these constituents. Furthermore, active fertility, or that which is possible for the plants to obtain, is influenced by other conditions, as, for example, climate, season, location, presence of vegetable matter and a number of other factors, which enter in to make it possible for us to grow plants, but were all of these factors present, and the others absent, plant production would be impossible. The soils in our country were originally so rich in these fertility elements and the climatic conditions have been so favorable that the apparent necessity, not the actual, for the study of this question has not appealed to us as it should. Farmers have gone on their way year after year, planting their seed, cultivating their crops, and selling their grain, until the crops now raised show that something has been removed that was there formerly, they find that they cannot now secure crops large enough to make the business pay. This has been the experience from the earliest times; other countries than ours have been subject to the same methods, and when the conditions have become so bad that profitable crops could not be secured, they have not attempted to improve, but have moved elsewhere, and to this country, and when the soils in the East have become partially exhausted, they have gradually moved westward until even the rich soils here do not possess their former power of crop production, and they are now seeking the virgin fields of Canada and other countries. The system practiced has resulted not only in the removal of the essential fertility constituents, but has changed the character and composition of the soil in such a way as to make it impossible for the plant to readily obtain the plant-food still present. Take the question of the sale of crops alone:

	Nitrogen, lbs.	Phosphoric, lbs.	Acid. Potash, lbs.
Every ton of corn that is sold from the farm removes from it .....	36	14	8
Wheat .....	47	16	10
Rye .....	35	16	11
Barley .....	30	16	10
Oats .....	41	16	12
Buckwheat .....	29	9	4
Flaxseed .....	72	28	20
Cottonseed .....	62	25	24

That is, by this continuous sale of crops there has been a rapid removal of the basic elements of fertility which sooner or later will reduce the amounts below the point where profitable yields may be obtained. One other point of very great importance is also clearly shown by this tabulation, namely, that of the three constituent elements, nitrogen exists in the greatest proportion. Experiments conducted in this country and elsewhere show, furthermore, that it is not a question of the simple removal of these constituents, but that the character of the farming determines whether the soil shall lose nitrogen in addition to that carried away in the crop. Prof. Snyder, of the Experiment Station in your neighboring state of Minnesota, has shown the effect of continuous cropping upon the fertility of soils, having reference both to the loss of the constituent elements mentioned, and to the changes which take place and unfavorably affect the physical character of the soil.

He shows that a virgin soil, which contained 47.64 per cent of insoluble matter at the beginning of a ten years' period of exclusive wheat farming, contained 55.12 per cent insoluble matter at the end of the period; an increase of 7.48 per cent. At the beginning of the experiment, it contained 15.55 per cent of volatile, or organic, matter, and but 5.58 per cent at the end; a loss of 9.97 per cent. It contained 5.34 per cent of humus at the beginning, and 3.12 per cent at the end; a loss of nearly one-half. Because of this loss, its capacity to absorb water, which at the beginning was 75 per cent, was at the end but 58 per cent. In other words, the continuous cultivation of wheat for but ten years increased in a marked degree the percentage of insoluble matter, and decreased the water-absorbing power. In reference to the constituent elements, it was shown that in the beginning it contained .38 per cent of nitrogen, and at the end .24 per cent; it contained .38 per cent of phosphoric acid, at the beginning, and .31 per cent at the end. It contained potash at the beginning amounting to .54 per cent and at the end .50 per cent, or a very considerable decrease in the nitrogen and mineral content of the soil. The relation of method of cropping and management to fertility, is more clearly shown in another experiment, in which a comparison was made of continuous wheat growing, and of crop rotation. The soil contained in the beginning of the experiment .221 per cent nitrogen, and at the close of the ex-

periment, with continuous cropping, .0193 per cent; an annual loss of nitrogen of 24.5 lbs., due to crop removed, and of 146.5 pounds, in addition to that removed in the crop. In a rotation of wheat, clover, wheat corn and the manure used, the nitrogen in the beginning of the experiment was 0.221 per cent, and at the close of the experiment 0.231 per cent, or with the removal of 44 pounds of nitrogen in crop, there was an annual gain of nitrogen of 61 pounds. The wheat yield, with the continuous wheat raising was 12 bushels per acre, and with the rotation of crops 17 bushels per acre. I cite these experiments to show that the method of cropping has a very important influence upon the question of loss or gain of nitrogen, and upon the decrease or increase of the crop-producing power of the soil. This matter of nitrogen is of the greatest importance, because it is not only required by plants in relatively large amounts, but because the system of farming determines whether it shall be gained or lost. He also discusses another very important phase of the question which is apropos in this connection, namely, the influence of stock growing, which includes dairying, upon the question of fertility. Taking as a unit a quarter section, and raising flax, oats, wheat and barley, he shows that in average crops grown there would be sold from the farm, in one year, under the old system of practice of grain selling:

6950 pounds nitrogen,

3080 pounds phosphoric acid.

5670 pounds potash.

Where butter, young cattle, steers, flax, rye and other crops were sold and where clover, timothy, corn, mangels, potatoes, barley and oats are raised and consumed on the farm, there was removed from the farm, under this system, but:

781 pounds nitrogen,

259 pounds phosphoric acid,

149 pounds potash.

Or, in other words, the sale of grain results in increasing the sale of fertility by nearly ten times over the system of mixed farming, including dairying. While, as pointed out in the other statement, the soil had not lost in its physical properties but had rather gained, because of the added manure, and the rotation of crops.

This question of nitrogen is, also, important from another



standpoint, because it is the one element which, under certain conditions, is not so readily available as the other constituents. For example, it has been found in older settled countries, and even in our eastern states that have been growing crops for a long time, that the nitrogen that is contained in these soils is less available than in the virgin soils. This fact is so apparent that it has been said by an eminent German experimenter, that water and nitrogen govern the yield, and the net profit, in farming. Another eminent experimenter, Dr. Paul Wagner, asks: "Is this view correct? May it be accepted, as a rule, that where there has been a poor crop, deficiency of moisture, or hunger for nitrogen, or both, are the principal causes? May it be accepted as a rule that when a field needs manuring, it requires, in the first place, nitrogen, and only in the second place phosphoric acid and potash, in order to secure maximum yields?" With these questions before him to answer, he has conducted a large series of experiments on the soils of Germany, which had been wastefully farmed for a long time; a system, however, less wasteful than that practiced in this country, and he finds it to be a fact that nitrogen is required before everything, and that only in the second place is phosphoric acid and potash required. These results being obtained by pot culture, the experiments were then duplicated in the field, for a series of years, to obtain average results, and on a wide variety of soils, ranging from light and sandy to heavy clays, and confirmed the pot experiments—all soils were found to be essentially poor in available nitrogen. That is, if either phosphoric acid or potash were omitted from a complete dressing, the yield fell regularly, but if nitrogen was omitted, the yield fell in a very striking manner.

In order to avoid any possibility of accident, further experiments were made upon the soils showing a composition of .13 per cent phosphoric acid, .12 per cent of potash and .14 per cent of nitrogen, and on the mean of three years' experiments, he found that only 2.6 per cent of the nitrogen in the soil was available to the plants. The nitrogen in these soils, though contained in average amounts, was shown to be of difficult solubility. The soil bacteria that have to do the business work slowly. It is clear, therefore, that even when a chemical analysis of a soil shows much nitrogen, the soil may remain poor in nitrogen, so far as the plants are concerned.

These experiments, as already pointed out, were carried out upon soils that have been farmed for a long time, under wasteful methods, and my object in bringing the matter before you now, is to show that if we are to avoid this condition in this country, we must have a definite knowledge of the relation of feeds to the fertility of our soils and the important role enacted by nitrogen, not only in the preparation of rations, but in improving our soils. We must more clearly realize the fact that a judicious rotation, coupled with a rational live stock industry, is the only method by which we may prevent losses in our soils, and thus ultimately require purchased fertility, and this fact applies quite as well to Wisconsin as to the states further east. Years ago, when the soils of the New England and Middle States began to show the effect of the continuous sale of grain, by a reduction in the crop-producing power, many of our farmers migrated to Ohio and Illinois, where it was claimed that the fertility was so great that no attention need be given to the question of soil exhaustion, but a continuation of the original method of practice for sixty to seventy-five years in Ohio, has revealed the fact that now the soils are showing the results of improvident methods. The sale of wheat, oats, corn and hay has so reduced the quantity of the available fertility elements, and has so changed the physical character of the soils as to make it necessary now to apply commercial fertilizers, or to increase the production of manures, if they are to realize from them a profitable return in crops.

Dr. Thorne, of the Ohio Experiment Station, has wisely taken up this question, and his experiments, planned to include a wide series of crops and cover a long series of years, are liable to become quite as classic in their way as those of Rothamsted, England. His study of the use of fertilizers, and particularly of the value of caring for and utilizing to the fullest extent the yard manures, is of the greatest importance in the East and will be to those in other states, which have carried on farming in a similar manner, and which I am quite sure includes some parts of Wisconsin and of other of the northwestern states. These northwestern states have been engaged very largely in the growing and selling of wheat, barley and flax, without direct return to the soil of the constituents removed thereby. Wheat goes either as a whole grain to foreign countries, or is manufactured into flour, and the refuse

products, bran and middlings, are shipped in large part to foreign countries, a little being dribbled out here and in the New England and middle states. The "beer that makes Milwaukee famous" is derived partly from the barley grown in Wisconsin, and the refuse products, brewers' grains and malt sprouts, which remain are not retained to improve your rations, and to save your soils from exhaustion. The oil in the flax-seed, which contains only the carbon, hydrogen and oxygen derived from the air, is extracted and retained in part, but the linseed meal, that most excellent feed, and rich in fertility, is shipped to Europe, and in such great quantities that the European markets fix the prices that the farmers here have to pay for it. The gluten feeds derived from our corn, so excellent as a source of protein, are also largely exported; they contain the fertility elements, while the starch or sugar remaining contains only the sunshine, which is free to all.

This kind of farming can be continued possibly for some time to come, but those following you, will find, as has been found in Europe and in the Eastern and Middle States, that the point will soon be reached when, unless this relation of feed to fertility is understood and practiced, the farming industry here will have been materially changed, and the question of importing fertility be brought home to you in a very practical manner. There is no real objection to the selling of grain; the objection comes in not utilizing the refuse upon the farm, and thus limiting the rapidity with which the soil is exhausted, particularly of its most important constituent, nitrogen. The question, however, is not only a question of manure, but one of quality as well. The various products used for feeds vary in their digestibility. This also, has a direct relation to immediate or available fertility. If we feed only the roughage of the farm, mainly mixed grasses, corn fodder, or silage, we have less of valuable manure than if with these are added the clovers, and the fine feeds, containing high percentages of protein, because these show a higher rate of digestibility. The point here is, that the digestibility of the ration measures to some extent the quality of the nitrogen that will be contained in the manure.

## THE IMPORTANCE OF NITROGEN IN RATION MAKING.

I am sure that by this time you are wondering when I am going to touch the question of the relation of feeds to fertility, and profitable dairying, as I seem to have been discussing fertility in an abstract and impractical way, particularly in reference to nitrogen, a matter which you may readily admit is of the greatest importance in the East, but is probably of no particular interest to you; what you are looking for is something practical, which will help you improve your everyday business. Let us, therefore, look at the ration side of the question. The investigations that have been made in reference to the preparation of rations for farm stock show one thing to be paramount above all others, namely, that cattle foods must be so proportioned as to give to the animals that amount and proportion of the various classes of substances as shall best meet the demand of the animal for the particular kind of work that it is to do, and further, if the farmer is to get the best results from his feed, either in milk, or flesh, or work, he must see to it that there is at least two pounds of digestible protein in the daily ration for a 1,000 pounds of live-weight of animal. This percentage will, of course, vary slightly according to the object of feeding, location, the season, climate, prices of feeds, conditions under which the animal is fed, etc., but it is a fair assumption that two pounds should be present, if we are to give the animal a sufficient amount of this substance, and thus most economically obtain these various objects.

Protein is, however, only another name for nitrogenous substance. In other words, nitrogen is the base of protein, and if we are to secure at least two pounds of digestible protein in a ration, we will find that it requires at least  $2\frac{1}{2}$  pounds of total protein. This is based upon the average digestibility of the various products used in making up rations. For example, on the average, in corn fodder and silage 55 per cent of the protein is digestible; corn stover, 45 per cent; hay and grass, including clover hay, 60 per cent; alfalfa hay, 70 per cent; of the fine feeds, the average will be much higher. The gluten, brewery and distillery products will average 85 per cent of digestible; wheat refuse products, 77 per cent; and linseed and cottonseed meal, 87 per cent. Inasmuch



as the finer feeds constitute a smaller proportion of the ration the average would not be found to be above 80 per cent. Hence, we have then to provide this  $2\frac{1}{2}$  pounds of total protein in our rations, which is equivalent to .4 of a pound of nitrogen in the daily feed of a full grown dairy cow. In reference to the other elements of fertility, the question of amount is not so important, as we shall see later, because if we are able to secure the necessary protein the feeds are quite sufficiently supplied with the others to furnish the needed elements under average conditions.

Further experiments have shown that in the making of milk, from 17 to 25 per cent of the total amount of protein in the ration fed, is found in the milk produced or in the flesh of your animals. Hence, we have as a refuse product in the manufacture of milk and of meat at least 75 per cent of the nitrogen originally contained in the ration, .3 of a pound per day, or 110 pounds per year, and since it has been shown that solubility of the nitrogen is in proportion to the digestibility of the protein, that is, all digested nitrogen is found in the manure in the liquid or soluble form, it makes it imperative if we are to obtain the largest return from the total nitrogen in the manure made, that they be so cared for as to prevent losses of the soluble constituents.

It has been shown by investigations at a number of Experiment Stations, that when manures are exposed during warm weather that at least one-half of the nitrogen and potash contained in them will be carried away in the water that passes through, and furthermore that the nitrogen which has passed through is much more valuable than that which remains behind. In experiments to test this point, that have been conducted at the New Jersey Station for the past ten years, and including grain and hay crops, it was shown that the availability of the nitrogen contained in the total excrement, the solid and liquid combined, was 62 per cent; using nitrate as the basis of comparison, whereas the availability of the nitrogen in the manure, which has been allowed to lie in the open air, and exposed to the rains that fell for half the year or less, the availability of the nitrogen was but 41 per cent. In other words, in addition to the losses that may occur by the direct removal of the nitrogen from the manure, there is a further loss of 50 per cent in the availability of the nitrogen remain-



ing. Using as a basis for the calculation the figures already obtained, as the amount of nitrogen in the manure of a cow, we find the total for a year to be 110 pounds, which, if 62 per cent available, would be sufficient to provide nitrogen for nearly two tons of wheat, barley, oats or corn, and three tons of timothy hay. If allowed to leach, we have but 55 pounds, which, with an availability of 41 per cent, leaves but 22.5 pounds, or but enough to provide for one ton of timothy hay, and less than two-thirds of a ton each of the grains. These principles, applied to the vast amount of manure made in the country, show how possible it is for us to unwittingly permit a very great loss of very available materials, not only, but to reduce the effectiveness of the manures that are saved.

The practical questions then, are how shall the farmer manage, in order that he may, in the first place, increase the usefulness of his ration, and, in the second place, increase rather than diminish the fertility of his soil, particularly in reference to the question of nitrogen. It is possible to increase the value of the ration by two methods, first, the purchase of fine feeds, or the exchange of home-grown products for them, which will result in adding to the supply of protein; and second, by growing those crops which enable him to build up his ration in these elements, without recourse to purchased feeds. In the first instance, it would seem a most desirable practice to exchange, as far as may be practicable,—which must be determined by the prices of both classes of products,—those feeds which are not rich in protein for those by-products, like wheat bran and middlings, dried brewers' grains, malt sprouts, gluten feed, linseed meal, etc., which add to the content of protein, and increase the rate of digestibility. One very important point in this connection, is, too, that as a rule, these concentrated fine feeds are sold on the basis of food values alone, and without regard to their fertility value, whereas in most of them the fertility value is a very important consideration, and in a few nearly equal to their food value. In the case of wheat bran, for example, if the Eastern farmer paid ruling prices for the fertility constituents contained in it, the cost without regard to food value would be \$12, and, on the same basis, linseed meal would cost \$21. That is, the farmer who buys these products on the basis of their food value, and brings them to the farm, brings valuable fertility elements, also, and

for which no charge is made, but which would cost the sums mentioned, if he bought them as fertilizers, and which, as has already been pointed out, has so important a bearing upon the subject of soil improvements.

The Chairman: You mean to state that the farmer could afford to pay \$12 a ton for wheat bran and \$21 a ton for oil meal as a fertilizer, measured by the cost of fertilizers in the market?

Prof. Voorhees: Yes, in the East he can afford to pay those prices without regard to the feed value.

The Chairman: You mean that he would have to pay that price, \$12 a ton, for the same amount of fertilizer if he bought it in the fertilizer market?

Prof. Voorhees: Yes, and the chances are that he would get better fertility in the bran.

The Chairman: Men won't see it that way; that when they buy these products they are buying something to go back on the land, which, if they bought it in the fertilizer market, would cost them so many dollars a ton.

Prof. Voorhees: Yes, that is, farmers who buy these products on the basis of their feeding value and bring those products to their farms, bring elements of fertility also for which no charge is made, but which would cost them the sum mentioned if they brought them as fertilizers.

In many instances, farmers have an excess of corn, or of barley, or of oats: that is, if he uses them exclusively, he will waste a portion of his carbohydrates. If he sells these, and purchases the others, which will reduce this waste not only, but increase his milk flow, the exchange always results in giving him an advantage in the way of fertility. For example, a ton of corn meal would contain fertility that would cost, if purchased, \$5.50, oats, \$8.00, and barley \$6.00. By exchanging these feeds for bran or linseed meal, therefore, there would be, on the money basis, and which we must regard it in the East, a very considerable addition to the fertility of the soil, and, in my judgment, it would be a wise method for the Western farmers to practice, at least in part.

Stated concisely, the principles involved are as follows:

1. Home-grown products are, as a rule, rich in carbohydrates and poor in protein and fat.

2. By-product feeds are, as a rule, rich in protein and fat, and poor in carbohydrates.

3. Feeds rich in protein contain more nitrogen, and, as a rule, more phosphoric acid and potash than whole grains or hays.

4. The results of the exchange of home-grown foods for by-product feeds are:

a. A more rational feeding of animals, because of a more economical use of nutrients.

b. A gain on the farm of fertility.

For example, the sale of 4 tons of timothy hay, at \$16 per ton, 3 tons of oats, at \$30, and 3 tons of corn, at \$20, would bring \$214.

The purchase of 4 tons of wheat bran at \$20 per ton, 4 tons of dried brewers' grains, at \$19, and 2 tons of cotton-seed meal, at \$29, would cost \$214.

The exchange of home grown products for the purchased products would result in a gain to the farm of:—

<i>Food Nutrients:</i> Digestible protein .....	2,470.0 lbs.
Digestible fat .....	456.0 lbs.
Digestible carbohydrates .....	3,496.0 lbs.

<i>Plnt Nutrients:</i> -Nitrogen .....	441.2 lbs.
Phosphoric acid .....	295.2 lbs.
Potash .....	37.6 lbs.

The protein gained is equivalent to nearly twice that sold in the 10 tons of home-grown products, or enough to provide the entire amount of protein needed for a herd of 40 cows for one month, and fertility constituents equivalent to those contained in 2,757 pounds of nitrate of soda, 2,108 pounds of 14 per cent superphosphate, and to 75 pounds of muriate of potash, fertilizer supplies that are expensive, but which farmers on exhausted soils have to buy.

This gain of digestible food would enable a larger production of milk, and at a reduced cost, or profitably increase the dairy products and provide a material increase in the fertility elements, which would cost, if bought in the open market in the East, \$85, and I believe that, in the long run, these fertility elements, if properly cared for, would be quite as useful in maintaining and increasing fertility as if bought in the

more concentrated forms. Many of you, I know, are following this practice, or it would not have been possible for you to develop your dairy industry as rapidly as you have. There are others, as everywhere, who may regard these figures as theoretical, and only of service in enabling a public speaker to provide himself with something to say. I wish to state, however, that this is an entirely practicable matter; that is, it is purely a business proposition, and means dollars and cents to a man who takes advantage of the situation, for not only have such results in reference to the influence of proper preparation of rations upon nutritive values and fertility been demonstrated in experiments, but in actual practice. Many Experiment Stations have been studying this problem, and they are a unit in recommending the improvement of the ration by the addition of more highly concentrated nitrogenous feeds than it is possible to secure under average farm practice.

In an experiment conducted at our own Station, with a wide series of rations, ranging in their nutritive ratio from one part of protein to four parts of carbohydrates and fat to 1:14, it was clearly shown that whenever the protein increased to the point which I have already pointed out as practically the best, 1:6 or 1:6.5, there was invariably an increase in the flow of milk, and a decrease in its cost per quart. For example, when the animals were changed from a ration containing a nutritive ratio of 1:6.5, to one showing a nutritive ratio of 1:14, made up wholly of home-grown products, there was a decrease in the milk flow of 33 per cent. or one-third. Now, while it is possible to secure an increase in milk flow without decreasing the cost per pound of milk, this was always accompanied by such a decrease. It has been possible by the use of this method in the East, when accompanied by a judicious seeding of other forage crops to provide all the roughage and part of the feed necessary to maintain at least one cow per acre per year, while at the same time to materially add to the fertility of the soil; that is, the soil's crop-producing power, instead of being reduced, has been increased in the course of ten years, by 40 per cent. This result, already hinted at as possible, has not been altogether accomplished by the purchase and use of the concentrated feeds alone, but rather by their use in connection with a larger cropping with leguminous plants, and this is the second method referred to, by which we

may constantly increase the fertility of our soil, while at the same time increasing the possibilities of keeping cattle on well balanced rations.

#### THE RELATION OF LEGUMES TO FERTILITY.

Farmers from time immemorial have known that crops differed in respect to the effect of their growth and removal from the soil upon fertility. They know that when they plant corn or wheat after clover, they get a better crop than if they plant the same chop on raw ground, or after a crop of grass. For a long time scientific men attempted to explain this phenomenon, by saying that the reason was that the clover crops were able, because of their root system, to gather large quantities of nitrogen and of the mineral elements from the lower layers of soil, and store them in their bulbous roots near the surface, and that this additional fertility was the cause of the increase in the following crop. This explanation, however, did not account for the fact that notwithstanding the larger crops that were grown because of the introduction of clover in the rotation, that soils, instead of becoming poorer in nitrogen, maintain their content, or even became richer in it, hence it was not until it was shown that the increased fertility was not the gathering of food from lower layers, and in storing it near the surface, but rather to the fact that the plants themselves were able to gather food not accessible to other plants. This point is of wonderful importance, and has a direct bearing upon the question of ration making and soil improvement. In the first place, because of the growing and use of these plants, rations may be made from home-grown products that will contain the proper proportions and amounts of protein; and in the second place, the soils became richer rather than poorer by the introduction of these crops, because of the power which they possess of gathering nitrogen from the air. Hence, the practical question arises: How far may farmers use these crops in their rations, or whether it is possible to make up rations, without the use of a large quantity of purchased feeds, which are richer in the protein substance than ordinary home grown product?

Experiments have been conducted along this line, which show very clearly that all the various leguminous plants,



alfalfa, as hay, possesses such characteristics as to enable it to very largely substitute such fine feeds as bran, middlings and linseed meal, that is, alfalfa, because of its palatability, because of its content of protein, and because of its proportion of digestible nutrients may be used to substitute in large part those feeds which possess the same general characteristics. Bran, middlings, linseed meal, cottonseed meal, gluten, alfalfa, and all of the other feeds that are recommended, are not recommended because they are bran, middlings, etc, but because they do contain these nutritive substances in such form as to satisfy the needs of the animal in respect to protein, and which are not always economically satisfied when only the ordinary farm feeds are used. Ground alfalfa has been shown to be more completely adapted to substitute bran than the hay, because a part of the work that the animals would have to do has been done by a machine; whether it will pay to grind the alfalfa depends upon the cost of grinding. Where the cost is such as to make the cost of the alfalfa meal no greater than the cost of bran, then it is a good form in which to purchase the material. The experiments referred to showed that it was possible to make up rations from alfalfa hay and silage alone, which would satisfy all the needs of the animals, and secure a flow of milk practically equal to that which was obtained when finer feeds were used, but because of the disproportionate amount of bulk it is not possible to make a ration of this sort quite as effective per unit of digestible matter as in the case of the feed rations. The experiments conducted at our Station with fine quality alfalfa hay, showed that 30 pounds of silage and 13 pounds of alfalfa hay produced within 4 per cent as much milk and butter as a ration made up of the same amount of silage and the following feeds:

Mixed hay .....	5 pounds.
Wheat bran .....	6 pounds
Dried brewers' grains .....	5 pounds

Besides, the alfalfa hay ration reduced the cost of 100 pounds of milk from 83.9 cents to 55.9 cents, and the cost of a pound of butter from 16.7 cents to 11.1 cents, when the alfalfa hay was valued at \$14 per ton, and regular prices paid for bran and dried brewers' grains, namely, \$23. and \$20. per ton, respectively. In other words, the feed ration increas-

ed the cost of milk and butter over the alfalfa ration by 50 per cent.

In another experiment, where the rations were made up of:

- 35 pounds silage,
- 11 alfalfa hay,
- 6 pounds mixed hay,
- 2 pounds cottonseed meal,

on the one hand, and:

- 35 pounds silage,
- 6 pounds mixed hay,
- 4 pounds wheat bran,
- 2 pounds dried brewers' grains,
- 2 pounds cottonseed meal.

the alfalfa hay ration produced within 4.5 per cent as much milk as the purchased feed ration, with a corresponding reduction in the cost of milk. These experiments are sufficient to show the practical usefulness of alfalfa as a substitute for fine feeds, in part at least.

In still another experiment, where the hay was not of so good a quality, it was shown that the amount of milk produced was much less than where the feeds were added, though the cost of milk and butter was very materially reduced. Experiments recently reported by the Pennsylvania Experiment Station, show that when it is assumed that alfalfa meal costs no more than bran, namely, \$20. per ton, the former seems to produce milk at the lower grain cost per hundred pounds, namely, 44 cents against 45.3 cents for bran; in comparison, if wheat bran is worth \$20 per ton, alfalfa meal is worth \$21.28 per ton, striking evidence of the practicability of the substitution of home-grown protein crops for the more expensive mill feeds. It has, also, been shown that hay from red clover, crimson clover, cow peas, soy beans and vetch, also possess the same characteristics, though not in the same degree, because they do not contain so high a content of digestible protein as the alfalfa, and their relative advantages are less, because these are annual or biennial crops, and not perennial, as is alfalfa.

With this point established, the next question is: Is it practicable to raise these crops, and thus make the farm in a way self-supporting, so far as the making of balanced rations

and maintaining fertility are concerned? I may say that in the East it has been abundantly demonstrated that all of these crops can be successfully grown, and many of them, as summer and fall catch crops which do not interfere with the regular rotations of corn, potatoes, wheat and grass, thus adding to the possibilities of an acre of land for crop production, though alfalfa, because of the valuable characteristics which it possesses in being a permanent crop, is one of the most important on the whole. At our own Station, for example, it has been shown that a seeding of alfalfa made in 1898, is still cutting profitable crops, and that the average cost per ton of hay has been about \$6.50, including the cost for labor, fertilizers, manures and all other expenses connected therewith. In my judgment, there is no one phase of the question under discussion which is so important, both in reference to the matter of feed and fertility, as the introduction and use of these various plants, because it enables the farmer to supply nearly all the needed demands in the way of protein, without extra cost, while at the same time helping to build up his soils in this most useful constituent, nitrogen. In one year on the New Jersey College Farm, there was harvested 7.5 tons of alfalfa hay per acre; each ton of hay contained, on the average, 330 pounds of protein, or a total for one year of 2476 pounds, sufficient to supply the total protein needed by 2.71 cows for one year, or each ton of this hay contained, on the average 52.8 pounds of nitrogen, or a total in the hay removed of 396 pounds of nitrogen. This nitrogen would cost, if purchased in organic forms, \$67.32. If used in the dairy, and only 75 per cent. of the total retained in the manure, there would be 277 pounds, or sufficient to supply the needed nitrogen for nearly 10 tons of corn. It is assumed, of course, in this statement, that all of the nitrogen contained in the crop was derived from the air, and that this is a well based assumption in this case is proven by the fact that the soil upon which other crops of alfalfa had been grown, and which were afterward used for cereal crops, showed that the soil was certainly no poorer in fertility, and was better for some reason or other, and naturally to the added nitrogen and organic matter accumulated in the roots and stubble, than before the alfalfa was grown. This method, therefore, enables the farmer to provide the needed protein in his ration, by inexpressive methods, while

at the same time obtaining, without cost, a very large amount of nitrogen, not needed in order to grow this crop, but quite as suitable for the growth of corn, or other crops useful in making rations, as that which can be purchased in commercial forms.

I have emphasized more particularly the alfalfa crop than red clover, alsike clover, the vetches, etc., because it is the one above all others which will, if successfully grown, permit the carrying out of the principles pointed out, though I do not wish to be understood as saying that the alfalfa should be grown to the exclusion of the others. Red clover in its way, and because it can be generally grown, should be as largely cultivated as is possible, and will, though not in the same degree, assist both in increasing the possibilities of making home grown rations and in soil building. Neither do I desire to be understood as saying that alfalfa can be grown on all soils without other effort than proper seeding. The nitrogen derived from the air is not the only element of plant-food required; there must be in the soil, either originally or supplied, the other element of plant food, phosphoric acid, potash and lime.

The Chairman: You think, do you, Professor, that lime and potash are very important constituents in growing alfalfa?

Prof. Voorhees: Yes, particularly lime.

The Chairman: I would like to know how many men in this audience have ever applied lime to their soil?

Mr. Taylor: I have a limestone soil.

The Chairman: But have you ever applied lime? There are three men in this audience only that have ever considered the question of applying lime to their soil.

Prof. Emery: Did not the report of our Agricultural Station speak adversely of that some years ago?

The Chairman: I don't know about that. I know it assists of the growth of alfalfa wonderfully.

Prof. Voorhees: We find that to be so in our state, that lime is almost universally required if we expect to get a big crop of alfalfa.

Prof. Emery: Suppose we have limestone six to eight feet under our surface, is it necessary then?

Prof. Voorhees: Very often, because the center soil may be acid, and it is deficient in the form of lime you require.

Prof. Emery: Is clay soil apt to be deficient in lime?

Prof. Voorhees: Yes. Sandy soils,—clay soils are perhaps not deficient in the amount of lime required by the plant itself, but deficient in that it does not give the plant the proper physical character of soil. The lime opens it up and makes it less hard.

The absorption of nitrogen from the air is possible only in proportion as these are available, and in many instances failure to grow alfalfa is due to neglect in supplying these mineral forms of plant-food. The same is true of the other leguminous crops that may be grown here; the availability of the minerals measures the power of the plant to acquire nitrogen, other conditions being favorable. We should take advantage of all of these opportunities, if we are to reduce the cost of our dairy products, and at the same time prevent the loss of our fertility, for it must be remembered that, after all is said and done, the soil is the source of the Nation's wealth, and that we, as individuals, will get our share just in proportion as we understand the laws of Nature, and direct them in our practice. These laws are immutable, and apply to all, the rich as well as the poor; the learned as well as the unlearned; the farmer as well as the manufacturer—all are subject to the law.

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#### DISCUSSION.

The Chairman: Now, I want you to show that a Wisconsin audience has brains enough to ask a New Jersey Professor some questions.

A Member: Have you ever tried cow peas as a fertilizer?

Prof. Voorhees: Yes, we are using them very largely in our state and with very excellent results. If you are sure that you have phosphoric acid and potash you can sow cow peas on very light soils; on practically barren soils you can put 200 pounds of phosphoric acid and 200 pounds of potash and sow a crop of peas about the first of June and ordinarily get a very good crop.

Prof. Emery: What about the soil for your alfalfa?



Prof. Voorhees: Our recommendation is to try to raise alfalfa only on ground that will grow potatoes and corn. If we can we put in a crop of cow peas or soy beans the year before in order to procure the humus, or if we have an abundance of manure that we are quite sure is free from weed seed, we plow that in the year before or in the spring, then cultivate it during the spring and precede with a crop of oats and peas. That is an excellent crop to precede alfalfa. We remove them about the first of July, we do not plow it again, simply cultivate and seed with alfalfa in the latter part of August. That has given us the best results of any method we have tried.

The Chairman: Now, you are in a different climate, Professor, so that you can get your alfalfa to grow large enough so it will go through the winter. We find it dangerous in this climate to seed as late as that. It is hard to get alfalfa to make sufficient growth to go through the winter after that.

Prof. Voorhees: We can get sometimes a foot—knee high. by sowing in August. We don't like the spring seeding so well, because we frequently have an early drought. After the alfalfa is seeded in April, we get a drought in June and it will continue long enough to practically destroy the plants—although many of our best alfalfa patches were seeded in the spring.

Prof. Moore: In Wisconsin we have carried on experiments during nine years and invariably we have found the early spring seeding to be the best. We have seeded all through the summer, practically every month, and I have not as yet been able to carry a crop through that was seeded later than the fourth of July, although it looked exceptionally fine in the fall.

Prof. Emery: How early is the best seeding time?

Prof. Moore: When you sow barley, from April 15th to April 30th, according to the season. In the Southern part of the state you sow barley as early as the ground will work well, when it is in good tilth.

Prof. Emery: That is, barley is sown with the alfalfa, you mean. What is the object of sowing barley with it?

Prof. Moore: Most of the lands of Wisconsin are inclined to be weedy, on account of the high fertility, and the Experi-

ment Association that is carrying on several hundred tests, found it was profitable to sow with a light nurse crop, not thinking that the nurse crop would help, except to keep down weeds. If they had land that was free from weeds, it would be an advantage to seed the alfalfa alone, but most of our land is quite weedy and consequently we put in that nurse crop. Three pecks of barley are sufficient and the barley can be left to ripen. If you sow oats, I think it would be well to cut the oats for hay, we cut the oats usually when they are headed.

Mr. Hill: I want to ask the Professor a question that perhaps will appear to be too technical for this audience, but sometime it is going to be important, I am sure. You remember that in his figures he said that the fertility in a ton of bran was worth \$12 and in a ton of feeds with higher protein contents, such as oil meal, it was worth \$21. Now, isn't it true, Professor, that we are going to be able to supply our lands with protein through clover and alfalfa and that bran, in proportion to the other, is worth more on account of being particularly high in phosphoric acid and potash in proportion to alfalfa?

Prof. Voorhees: Yes. Bran is rich in phosphoric acid and potash. While we place a value on those constituents and we need these, we have to buy them in our very light soils, in the East, but in your state where you have such an abundance of minerals as you have here, it seems to me that you can draw on those for a very long time, without danger of coming to the end of them. Now, your added nitrogen is not the only advantage you get in your alfalfa. You get a mechanical advantage, it improves your soil and enables the plants to get at the phosphoric acid and potash. It seems to me that so long as we can get such large crops of alfalfa and other leguminous plants which take out this potash and phosphate, that it is wise farming and I would not buy bran to do the same thing.

Mr. Goodrich: Doesn't alfalfa improve the mechanical condition of the soil?

Prof. Voorhees: Certainly, all these crops do. We had a crop of alfalfa growing and it was a new thing in the neighborhood and farmers came to see it, intelligent, educated men, all sorts of men came to look at this alfalfa, and I was look-

ing at it every fifteen minutes when I was home and was delighted to see it was making such grand growth. It was green, it looked so rich, you couldn't help but smile when you looked at it. A man came out there one day and he says, "That is a big crop, but I would be scared for that kind of a crop, it must be hard on the land." I said, "What in Sam Hill are we growing crops for? We are just trying to get them to take up the phosphoric acid and potash that goes back in the manure.

Prof. Emery: Then we have got to learn to feed, not only our animals, but our soils.

Prof. Voorhees: That is right. We have got to learn to feed our soils, not only in enabling the plant to get the thing in the soil that it wants, but to produce things that the plants want and you haven't got. You can buy those things very much cheaper than you can nitrogen. In the East we pay \$4.50 for phosphoric acid, \$4.50 for potash and the farmer pays from \$15 to \$30 a ton for nitrogen. The phosphoric acid and potash remain in his soil until the plant takes them out, and the nitrogen, you don't know whether you are going to get it out or not, so that the nitrogen question is far away above all other questions, so far as fertility is concerned.

Secy. Burchard: Some are beginning to think in Wisconsin, especially in the dairy sections of our state, that we do not need to buy any nitrogen; that by growing these leguminous crops for our cows, we can get our nitrogen in the cheapest way possible from Dame Nature, from the atmosphere.

Prof. Voorhees: I think you are dead right.

Mr. Fargo: How many times do you cut alfalfa during the season? And what is the best way of curing it?

Prof. Voorhees: Well, we cut, I suppose, on an average about three times, although we have cut four and five. Let me finish answering this other question. In making alfalfa hay we cut it in the morning, if it is a dry, clear day, and rake it up in the afternoon, or if the weather isn't as clear as we like, we cut it in the morning, let it remain there, and put it up in windrows, stack it up.

Mr. Fargo: Do you use hay caps?

Prof. Voorhees: We do to some extent and find them very desirable.

Mr. Fargo: And how long do you leave it lie?

Prof. Voorhees: That depends entirely on the weather. We can put it up in small cocks the same day. In bright, dry weather it is possible to do it, and then open it up the next day.

Mr. Howe: When should the lime be applied to the alfalfa field?

Prof. Voorhees: The lime should be spread broadcast previous to seeding. You plow your land in the spring, as soon as it is plowed I would apply the lime. Then when you cultivate and harrow it, get it in shape, you get that thoroughly mixed with the soil.

The Chairman: Did you ever use air slaked lime?

Prof. Voorhees: We have both kinds, but we prefer to buy the burned lime and slake it ourselves.

The Chairman: With water?

Prof. Voorhees: Yes.

The Chairman: That is what you call hydrated lime?

Prof. Voorhees: Yes. You take ground burned lime and it is better, but it is more costly. The cheapest lime with us is the ordinary unburned lime, because you get more lime to the bushel.

A Member: Why do you take the trouble to slake it?

Prof. Voorhees: Because it is in lumps and it can't be applied evenly.

A Member: How much do you use to the acre?

Prof. Voorhees: About twenty bushels on heavy clay, and from that up to fifty.

Mr. Glover: What objection would there be to adding your slaked lime to the manure?

Prof. Voorhees: The slaked lime would set free your ammonia. If your lime has been burned, it has a caustic effect upon organic matter and you will lose that nitrogen. Carbonate of lime, ground limestone, will not hurt your manure pile; in fact, it will help it. Your burned lime, unslaked and slaked, are both caustic if you apply them to your manure, and there is great loss of nitrogen.

Prof. Moore: At the Experiment Station we put on from twenty to thirty bushels of lime. We slake it everywhere else, except where we put on our oats. The soil has been analyzed and it has been found that there is abundance of lime in the soil, and consequently we did not receive any beneficial ef-

fects, we did not see where it was helpful at all. We applied it in connection with alfalfa and also with sugar beets.

Sec'y Burchard: Would you apply the lime on the surface of the alfalfa field where the alfalfa is now growing?

Prof. Voorhees: Yes, I would if I had not applied it before; no harm would come to the alfalfa, and in fact, if you get your alfalfa seeded well, so that it will continue I would advocate the application, say, of twenty bushels of lime, every four years on the surface.

Prof. Moore: Isn't there some way by which the average farmer could determine readily whether or not his land needed lime?

Prof. Voorhees: I think so. It seems to me if you had abundance of lime present, you could get a reaction with acid.

The Chairman: Could you use litmus paper?

Prof. Voorhees: It would hardly be sufficient, I think. It would not determine whether you had it within that soil or not.

Sec'y Burchard: But it would determine whether the land was sour?

Prof. Voorhees: It might be done if you had a small particle of lime in your soil, and would get an effervescence.

The Chairman: I have known men who have been bothered raising clover who have taken a small piece of ground and put on lime and they succeeded better. Alfalfa seems to be governed by the same law.

A member: How do you sow alfalfa?

Prof. Voorhees: Shallow, as a rule. I prefer to have Prof. Moore answer that question for Wisconsin.

Prof. Moore: We sow alfalfa with a seed attachment to the grain drill or with the seeder we are using for the corn crop, or sow by hand, then we cover quite shallow, running a slant tooth harrow over once. Alfalfa seed and the corn crop can be sown by the one operation.

The Chairman: I buy every year all the wood ashes that Fort Atkinson can let me have and pay ten cents a bushel for them to put on my alfalfa sod. I buy about five or six hundred bushels a year. That simply gives a combination of potash and lime and it is the finest thing I can get hold of. We have not yet in Wisconsin confronted squarely these questions of fertility, you know we have been with our back turned to that



question. Now, these Eastern farmers, after having gone through this experience of seeing all their farms go down, they have had to face it and face it squarely, and think of it, gentlemen, we are paying the United States over fifty millions a year for commercial fertilizers.

Speaking of phosphates, I got a carload from Tennessee last fall of ground phosphate rock. It cost me about \$10.50 a ton in 100-pound bags. I stacked it up in my shed. I had more than I needed myself, and bought it with the hope that some of my neighbors would want to take it with me. But, no, they don't want it, and I don't know as they would pay 50 cents for a dollar bill, I doubt it very much. But I keep pounding at them and I hope for better things all the time.

Recess to 1:30.

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The Convention met at 1:30 P. M., February 21, 1907.  
Mr. H C. Taylor in the chair.

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## INTENSIVE DAIRY FARMING.

H. D. Griswold, West Salem, Wis.

Mr. Chairman, Ladies and Gentlemen: What does "Intensive Farming" mean? It means more profitable farming, as I understand it. It means business methods applied to farming and to dairying.

Now, you have heard these dairy questions discussed, and I don't know that I can tell you anything new, but I can simply tell you that I have applied some of these methods that have been advocated for years and I have been fairly successful.

In the first place, to start a profitable dairy, you must have a good dairy sire. I have had a full blood dairy sire at the head of my herd for sixteen or seventeen years. I have weighed the milk and tested it from each cow for nearly that whole time. I know today what every cow in my barn has done last year and the year before and every year of her life.

When I got the full blood sire, I had a mixed bunch of cows probably like too many of yours. Some were good cows and some were poor cows and I didn't know which was which without I weighed the milk and tested it, then I could pick out the poor ones.

If you get a full blood sire into your herd, you want to keep the heifer calves, of course, and if you have a cow that does not pay, and you are going to keep the heifer calves, you are not likely to keep the heifer calves from the cows that don't pay; it is more likely that you will sell those heifer calves, because you don't want them, you want to get rid of them the first thing, the longer you keep them the worse you are off.

Now, I saved all of my heifer calves for a good many years; I didn't sell any of them. I kept picking out the best from time to time and every year I picked out the best and kept them for myself, and got rid of the poorer ones, and every year I could see a little improvement. You mustn't expect too much on the start, because if you have a poor lot of cows, you must not expect to get a first class lot of cows with the first cross. You may get some good ones, but you can't get rid of all of the poor blood by one cross.

Another thing I did was to pick up from time to time anything that I could buy that I thought was better than what I had, usually a heifer calf. Sometimes a man in town has a very nice family cow, and perhaps he doesn't want the calf and you can get it at a reasonable price; if you think it is better than what you have, buy it, and you have something good to cross up on.

Now, as to the full blood sire, I know a good many hesitate and say, "I can't buy one, they cost too much." Now, the cost of keeping isn't any more, the care isn't any more, all that costs more is that first cost, and after you have bought one you can usually make an exchange with somebody for another one when you want to change, or you can sell it and get your money back and buy another, and in the long run you are not much out. Or if he has a small herd, perhaps a man can buy one in company with his neighbor,—if they can agree, and the same one will answer for the two; that is done many times.

There are a great many things in the dairy business, little things that come up from day to day that you can't tell a man about. A man has got to have some judgment and some sense

of his own. He ought to know when a cow needs taking care of and he ought to have sense to know somewhere near what she wants done for her. He ought to have sense enough to keep her in when it is cold, and to keep her where it is warm, and he ought to have sense enough to feed her the right kind of feed.

Now, as to feed for a dairy cow—take a calf from the time that it is born, I like to feed it good all the time. A calf raised at the strawstack doesn't amount to much, it wants good feed all the way through, and my experience has been that I never have been able to feed a cow very well, or do much with her, that was brought up without good feed for the first two years.

I feed a little calf some food just as soon as it is old enough to take it, and I keep them growing, not fattening food, not corn meal, but I feed them such feeds as bran and oats, a little bit of oil meal, a little ensilage, a little clover hay, and you will be surprised how soon they will eat it. We feed them new milk at first, the first two or three weeks and then gradually work off into skim milk, putting a little skim milk with the new milk, and then some more until finally we feed all skim milk and keep that up until they are six or eight months old, about six pounds at a feed, and if they are hungry, they get to eating something else so much the quicker.

Then we feed our yearlings each of them a little ground feed every day, and we always tie them so that each one gets its own feed, never bunch them up in the stall so the big one get all they want and the little ones what they can. We always feed them so that each one gets his share of the feed.

Then we keep account of every cow's milk by having a scale and weighing the milk and setting it down every milking. We keep account of everything. We know when the cow is due to come in, and so we allow time enough for her to go dry, say, about five weeks. We think that is long enough, we don't want to go without the milk any longer than we have to, but we want to have her have a little rest and we think about five weeks is long enough and we take that time to dry her up and do it gradually, and at the same time we take away all the heavy feed and give her a little light feed. We don't want her to lay on any flesh while she is dry, that is, any fat.

Then when she comes in, she is in good shape. When she

has her calf, we see that she has a good warm place, well bedded and dry, and soon after the calf is born we give her a pail of warm water, milk her out partly and then leave the calf with her and let her alone as much as we can. We don't stay around there and keep her disturbed, but we leave her alone, she will take care of herself. We don't give her a big mess of feed right away, but we come up very gradually on that feed, and in three or four days, if she is well and healthy and has a good appetite, we will have her up to about full feed.

We haven't had a case of milk fever in six or eight years. I know you can cure milk fever in these days, but I think it is better for you not to have milk fever in your herd. We have our stable warm and it is light and we keep the cows in in cold weather. There are windows on each side, the stable is white-washed and it is ventilated by the King system so that there is no smell in the stable. The floors are cement and the mangers are cement. We water the cows in the manger and we don't have to turn them out. We sweep the manger out every day; let in water at one end, it runs along the whole length and each cow drinks as it reaches her and there is an outlet at the other end to let the water out, what is left. The tanks are in the stable, the water is forced in with a windmill and with a hose we can run the water into the manger and water them right there. My cattle have not been out of the stable since last September. I have a cow in there thirteen years old that has never been out a winter in her life. If you turn a cow out in cold weather, what does she do? She simply goes out and she finds the warmest place in the yard and she waits there until she can get back in the stable. She doesn't go off and walk a mile for exercise, and if the water is cold, she drinks a little and then she begins to go this way (shivering) and she doesn't drink nearly the amount she would if she was warm and the water was warm. In the stable, she drinks her fill and lies down; she is contented, because it is warm. Another thing, if you turn her out in cold weather, the stable grows cold pretty fast; you take a day like today, for instance, the stable grows cold, the cow comes in after having drunk some cold water, and that makes her colder yet, and when she comes back in the stable, it takes a long time before she is as warm as she was before, while if she stays there she is warm all the time.

I haven't got any expensive stable. I built it with my own hands, I made the cement floor with my own hands. It is simply double boarded with paper between, and anybody can do it.

Now, we feed our cows what we think they need; we do not feed any two cows just alike, hardly, but we study every individual cow and give her what she likes best and what we think she needs and all that she will take to advantage. The owner studies every cow in the barn, he knows when she came in, and he knows when she is due to come in again. He feeds her according to his judgment; he watches her milk sheet and there is the weight of the milk set down, and if there is a falling off there he sees it immediately and wants to know what the trouble is. If you are not keeping any account of your cow she may fall off half a pound a day and you won't notice it, but you will wake up some day to the fact that your cow is half dry; but with that milk sheet, if you are attending to your business you will notice it right away and will see that "Mary" is off today or "Pet" is off today. What is the matter? Maybe you will change your feed a little and watch the result, give her something different, or perhaps there is something the matter with her, maybe she needs a little physic or something to start her up. So you see that milk sheet gives you a chance to watch every cow and see what she is doing. Now, you say, "That is lots of bother to stop your work for that, I could not do that." I say, "You couldn't do anything else that would pay you any better."

I got one of my neighbors to take Hoard's Dairyman one year, and I asked him the next year if he was going to take it again, and he says, "No, the fact is I have so much to do I don't have time to read it." Now, what did he do that paid him better than to have read that? This neighbor lost three cows with milk fever and the fourth one came down with milk fever, and he said, "I have got another cow down with milk fever." I said, "Well, haven't you tried the air treatment?" "No, I don't know anything about the air treatment." "Well, if you had spent that dollar for Hoard's Dairyman you might have known that and saved all those cows." He did use it for that last one and saved her and he might as well have saved the others.

Now, I have been working on these lines, keeping a full



blood sire, keeping the record of every cow, watching for her comfort, seeing that she has what she wants to eat and all she wants to eat all the year through.

You know in the summer time that a pasture often gets short and you don't like to feed very well. You have lots to do and you let them run along, although you can see they are falling off a little on the milk, but they are getting their living out of that pasture, and that is easier for you than it is to feed them, and it won't make very much difference—maybe it will rain and the pasture will start up again, and the first thing you know your cows are half dried up. When a cow drops off you never can bring her back till she comes in again; the tendency of that cow is to drop off all the time, and you have got to do your best to keep her up. So when the pasture begins to drop off and your milk sheet shows that the milk is dropping off, then you should supplement with something. I have been feeding ensilage the last few years in the summer time and I find that ensilage, with grass, is very satisfactory. Before that I fed ground feed that I had to buy. Now I can feed ensilage and that I can raise, so I get along lots cheaper that way.

Now, you see those figures on the board over there. I got my first full blood sire in 1889, but you see it takes two years before you get some heifers and you can't expect a great deal of those heifers the first year or so, so it takes quite a little while to get a good start.

In 1891, I had eight cows and they brought me \$388. In 1893, I had ten cows, and they brought me \$609. In 1897, I had fifteen, and they brought me \$798. You must bear in mind that all this time I was carrying quite a number of heifers and those were always counted the same as full cows, though, as I say, a large majority were heifers with their first calves. In 1900, eighteen cows brought me \$1,147. In 1901, I built a silo; before that I had not had any, and you will see that after using that silo two years I was keeping twenty-three cows and had practically doubled the amount of money received in three years, \$2,243 it comes to.

Mr. Hill told you yesterday about the value of the silo; that speaks for itself.

In 1906, last year, I received \$2,091. Now, you will say, "You haven't made any gain, you have rather fallen off in

the last three years." Well, we have had some trouble in the last three years. You know that things never run along just so smoothly for any great length of time and there has been trouble in herds all over the country with abortion. When that first appeared in my herd, I must confess I was discouraged because my neighbors told me I would lose one-half my herd, but we did the best we could and you see we didn't lose one-half, we held our own pretty well and we think now that we are about through with it, we hope so, anyway. So that if these things come, don't think that you must throw up the business and quit. Stick to it, because others have to stick to it and make a success in spite of it, and they do it, too.

So that, in the last five years, with an average of about twenty-five cows, I have averaged over \$2,000 a year for my cream money; that is, I have taken in over \$10,000 in five years for my cream.

Yesterday I heard quite a little talk about dairy calves. It was said that they weren't good for anything. When I commenced I gave away some calves; then as they graded up and got better I didn't have to give them away, I got something for them and I kept getting more for them. When you have something that is good, there is always somebody that is willing to buy them, and today my calves are spoken for a year in advance. I can't supply the demand.

In 1891, for the increase of my herd I got about \$50 in the year. Last year, I had over \$1,000 for the increase of my herd besides the cream money. There is now a strong demand for good grades and just before I left home I sold two grade cows to go out to South Dakota at \$125 apiece.

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#### DISCUSSION.

The Chairman: Fellow dairymen, this subject comes closer to you and me than any other subject we have had. This gentleman has not a large farm, he chose to pursue dairying in a very close and intensive way.

I want you to note, first, that he told you he selected a sire to place at the head of his herd from one of the dairy breeds; that is the first step. Second, he continued to keep the cows

he had already, and so far he has done nothing more than any dairyman in this state can do. Third, he went and moused about for good cows and splendid heifer calves and put them on his farm and took good care of them from the time he got them until they became cows.

Now, you will see all the way through here that he rendered unto these cows, not only what he knew ought to be rendered, but he tried to perform all his duty by them just when it was needed to be performed; he did not wait for the next day—he did it at that one time; he kept his heifer calves, increased his herd from year to year, both in numbers and in productiveness. Besides that, he kept his cows in a good barn with a cement floor, mangers cleaned every day, just the same as you have your own kitchens cleaned up every day. He watered them there, bedded them, they made their whole toilet in the barn; he did not turn them out from fall to spring.

He fed the cow that was about to freshen lightly after she was dry until she became fresh again, then he gave her a light ration which was gradually increased until she came to her full flow of milk. Is there anything in that that we cannot any of us do? Is there a man here that does by his cow as well as he knows how to do?

Now, the subject is yours and I venture to say the gentleman will answer any question you put to him, because he knows what he is talking about.

A Member: What breed did you have?

Mr. Griswold: Guernseys.

Mr. Goodrich: How many acres of land have you?

Mr. Griswold: Sixty acres.

Mr. Goodrich: You spoke of feeding silage to calves. Did they get that while they were on milk?

Mr. Griswold: Yes, I give them a little handful when they are not more than two weeks old.

Mr. Goodrich: Do you feed ground feed while the cow is dry?

Mr. Griswold: Yes, I feed bran or oats or something like that, but never corn meal.

Ex-Gov. Hoard: That is for sustaining the coming calf.

Mr. Griswold: Yes, some protein feed, but not a fattening feed.

A Member: How much grain do you feed after she is thoroughly dry?

Mr. Griswold: Not more than two or three pounds a day. Of course, if it is a strictly dairy type of cow she won't lay on flesh any way, and you can give her a little more, but if she is inclined to freshen up I keep her pretty short.

Mr. Aderhold: I hear dairymen frequently make the remark that they save their heifer cows from their best cows, and I happen to know that they never weigh or test the milk from any cow in their herd. Do you think that they know which are their best cows?

Mr. Griswold: No, sir; they think they know, but many a man gets fooled in this way, because a certain cow will come in and give a big mess of milk and you think she is the best cow you have and maybe after six months she is practically dry while another cow gives a small mess, but she will give nearly the same amount for eleven months and she will figure up in the long run a good deal more than the other one did.

A Member: Do you raise all you feed on sixty acres for twenty-four cows?

Mr. Griswold: No, sir; I buy some of the feeds that I use. I sell some of my corn and oats and then I buy something else to go with what I have left. We are using dried brewers' grains and a little screenings.

Mr. Goodrich: Do you pasture in the summer time?

Mr. Griswold: Yes. I have hardly pasture enough and I rent a small pasture in the summer time.

Mr. Goodrich: What do you pay for this brewers grain by the ton?

Mr. Griswold: It is a little less than bran usually, and it has a larger per cent of protein than bran.

A Member: At about what age do you have your heifers drop their first calf?

Mr. Griswold: Two years old.

A Member: What do you do for abortion?

Mr. Griswold: We think one of the best things to do is to secure cleanliness. We have fed carbolic acid to the cows.

The Chairman: Absolutely thorough cleaning up after it is in the herd is very important, with the use of disinfectants.

Ex-Gov. Hoard: Do you whitewash your stables?

Mr. Griswold: Yes, I try to do it every year.

Ex-Gov. Hoard: And do you isolate those cows that go wrong?

Mr. Griswold: We can't very well, we have only one stable so we disinfect thoroughly. If I had another stable, I would certainly put them away.

A Member: Do you disinfect the whole herd or simple the cow that is infected?

Mr. Griswold: We disinfect the one cow and the two cows each way from her and the stall, and wood work or anything that is bare.

Ex-Gov. Hoard: Do you think that a man can produce first class grade cows from a grade sire with any degree of certainty?

Mr. Griswold: No, I don't think so. I would not recommend a grade sire.

Ex-Gov. Hoard: But a very large proportion of the farmers of Wisconsin do not believe that it is important to use a registered sire. You have been through this, had considerable experience, and I want to know how you feel; if it would be profitable to you?

Mr. Griswold: I would not use a grade sire under any considerations. But I have sold my grades for breeding purposes, because there are men who are bound to have a grade. They will not buy a full blood anyway, and sometimes after they have used a grade two or three years they will come and buy a full blood when they would not have bought one to start with.

Ex-Gov. Hoard: They have to take it gently.

Mr. Griswold: There are some men, you know, that you have to handle that way.

Ex-Gov. Hoard: What do you do with the male calves?

Mr. Griswold: The first part of the time I gave them away to anybody to get rid of them, but for the past few years they are spoken for a year in advance. I usually get ten or twelve dollars apiece for them.

Ex-Gov. Hoard: Do you inbreed any?

Mr. Griswold: No, I don't. I have tried it, but I never have got anything good.

Prof. Emery: Would you use a sire on his granddaughters?

Mr. Griswold: I don't know that I have tried that.



A Member: Do you have your cows fresh in the fall or in the spring?

Mr. Griswold: Part in the fall and part in the spring.

The Member: What is the advantage of dividing it up?

Mr. Griswold: I would rather have nearer an even flow through the year, or perhaps more in the winter, but I find that it is a harder thing to get cows to come in in the fall than in the spring.

Ex-Gov. Hoard: Is it so when you start with the heifer first?

Mr. Griswold: It seems to be a more natural thing for them to come in in the spring.

A Member: What does your milk test?

Mr. Griswold: About five per cent butter fat.

Secy. Burchard: What is your market?

Mr. Griswold: I ship cream to La Crosse mostly, but this year I wouldn't hardly get any margin above the creamery.

A Member: How many pounds of butter ought a cow to make each year?

Mr. Griswold: This last year five cows made over 500 pounds of butter each, and eighteen cows made over 200 pounds of butter each, and if a cow won't make 300 pounds under ordinary conditions, then I don't want her at all.

The Chairman: "Go thou and do likewise." We will have to cut this off.

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## THE PATRON'S RESPONSIBILITY FOR THE QUALITY OF FACTORY PRODUCTS.

J. Q. Emery, Dairy and Food Commissioner, Madison.

By factory products, I understand butter and cheese to be meant.

The score card for cheese recognizes the following qualities: Flavor, texture, color, finish. In a total of 100 for a perfect product, flavor is given 45; texture, 30; color, 15; finish, 10.

The score card for butter recognizes the following qualities: flavor, grain, color, salt, packing. In a total of 100 for a

perfect product, flavor is given 45; grain, 25; color, 15; salt, 10; packing, 5.

It is to be observed that in both butter and cheese, flavor is by far the most conspicuous quality and when perfect receives 45 out of a total of 100 points. The flavor, therefore, of the factory product more than any other one quality and almost equaling all other qualities combined, determines the market price. In cheese, those conditions of milk that impart to it flavor, affect also its texture. For the flavor of butter or cheese, the patron is chiefly responsible. I do not say wholly responsible, but chiefly. If the patron delivers milk or cream of poor or bad flavor, it is absolutely fatal to a perfect or high class product.

The standard dictionary defines flavor as follows: The quality, especially a specific or delicate quality, of a thing as affecting the sense of taste or the senses of taste and smell; rarely, a quality affecting smell alone; the peculiar taste of a thing, especially if it be pleasant."

The presence or absence of this delicate quality in butter and cheese, determines more than anything else the market price of those products. Unless this quality is present in the milk or cream furnished by the patron, the maker can no more produce a product of high quality than could the Isrealites produce bricks without straw for their Egyptian task makers. If the patron destroys that delicate quality in his milk or cream, like the passing moment, it is gone, never to return.

This leads to a brief consideration of the source of those odors in milk or cream that destroy the much coveted flavor which is characteristic of butter and cheese of the best quality. The clearest, most exhaustive and authoritative presentation of how odors and flavors find their way into milk that I have ever seen, is given by Prof. King in his *Physics of Agriculture*. He says: "The substances producing these qualities in milk make their entrance there in three different ways: (1) from the blood at the time the milk is secreted; (2) from the outside after the milk is drawn; and (3) they are produced within the milk after it has been secreted before and after it is drawn."

The better to understand this subject, let us briefly recur to some of the fundamental principles as to the composition of matter. The molecule is the smallest part of a substance that

can exist separately and still retain its composition and specific properties. The molecular theory of the composition of matter teaches that ordinarily these molecules do not touch each other, that however compact a body may be there is in it space not occupied by the matter composing it; and that the molecules are constantly in motion. "As the worlds in space are clustered in mighty systems, the members of each revolving about one another in inconceivably *vast* orbits, so each body is a miniature system, its molecules moving in inconceivably *minute* paths."

As molecular motion increases, the molecules are forced farther apart, with rise of temperature. When the motion decreases, the molecules come closer together with decrease of temperature. In other words, at a higher temperature of a body, its molecules are in more rapid motion than when at a lower temperature.

To feel fully his responsibility for the quality of factory products, the patron needs to bear in mind the infinitesimal size of the particles to which a body is capable of being divided. Let me briefly illustrate: Strychnine is bitter. Place a grain of strychnine in 1,750,000 grains of water. In each grain of the water, there will be 1-1,750,000 of a grain of strychnine and can be distinctly tasted. These bottles contain the results of this experiment.

Dissolve 1 gram of 5. B. Methyl Violet in alcohol and distribute it through 1,000 cubic inches of water in a large flask. Pour out one-half of the colored water and fill to 1,000 cubic inches again. Repeat this operation until the eye can with certainty detect the color in this water. As many as ten divisions may be made. In the last 1,000 cubic inches of water there will be only a trifle less than 1-1000 of a gram of 5.B.-Methyl Violet, yet the color is apparent to the eye. That is, in each cubic inch of the water there is only 1-1,000,000 of a gram of 5. B. Methyl Violet. The results of this experiment are here exhibited.

Our knowledge or recognition of odors and flavors is due to the sensation caused by the infinitesimally small molecules moving through the air and striking our nerves of smell and taste. Instance the fragrance of the rose, the flavor of the apple, strawberry or other fruit. King mentions a blind lady who took the glove of a stranger and, walking up and down

the aisles of a large audience room filled with people, handed the glove to the owner, made known to her only by the likeness of the odor from the glove to that escaping from the stranger, produced by an inconceivably small particle of the volatile principle striking the nerve of smell.

It is by the extremely minute molecules of the volatile substances escaping from the foot of the master, through his shoe, remaining in his path for hours, and finally striking the nerve of smell in the dog that he tracks his master.

I have dwelt at this length on the subject of the nature and divisibility of matter and the way we acquire a knowledge of flavors and odors to produce the conviction that small particles of dust, dung, urine or of any other filth, entering milk may separate into infinitesimal particles, disseminate themselves through the whole volume of milk and work havoc to the entire mass, by imparting to it their odors and flavors. Thus, one careless, slovenly patron may irreparably undo the neat, careful and painstaking work of his neighbor and thus foist upon the consuming public an inferior and unsatisfactory product.

It is the butter fat in the milk that chiefly absorbs and retains the odors, agreeable or otherwise. The method of gathering the fragrance of various flowers for the manufacture of perfumery has a wonderfully suggestive lesson to dairymen. Plates containing fats are placed in chambers with the flowers. These fats absorb the fragrance from the flowers and retain that fragrance a long time. They are sold as pomades and are used in the manufacture of the finer perfumes. Think for a moment of the perfumery the butter fat of milk must gather and retain from an unclean and unventilated barn or from an agitated barnyard heap. Certainly it requires no small amount of skill and art to so feed and handle a herd of cows as to impart to the product the finest flavor.

"Any volatile principle," says King, "which may chance to be present in the blood of the animal at the time the milk is being drawn will find its way into the milk and will impart a quality to it, the intensity of the flavor or odor depending upon the amount of the volatile principle present and the readiness with which it evaporates."

It is easy to understand how these volatile substances may be present in the blood from the feed furnished the cow, such

as onions, cabbage, rape, turnips; or by forcing the cow to remain in and breathe an atmosphere that is filled with foul odors, due to lack of ventilation and cleanliness. Such odors being taken into the lungs in the air breathed by the cow must enter the blood through the membranes of the lungs and impregnate it, which in turn imparts the flavor to the milk. It is to be recognized that just the reverse of this follows when the cows are kept in clean, well-ventilated barns and furnished with feeds of befitting fragrance.

Damaging odors and flavors may be imparted to the milk from the outside after it is drawn. "If," says King, "the odors of manure, of urine, of ammonia, or any of those associated with the decay of organic matter are in the air above the milk, the rapid motion of these molecules will cause some of them to plunge into the milk and accumulate there until they become so numerous that just as many tend to escape per minute as tend to enter. The milk is then saturated with the odor in question. The warmer the air surrounding the milk and the warmer the milk, the more quickly will the condition of saturation be reached, simply because the rapidity of molecular motion increases with temperature, for when the molecules of foul odor are once inside the warm milk, they travel or diffuse downward more rapidly because it is warm."

If the milking is done in a stable that is unclean and unventilated, filthy, and filled with foul odors, it is readily understood how the streams of milk passing from the udder to the pail will force the contaminated air into the pail and impart to the milk its foul odors. The use of the separator under similar conditions must produce similar results.

Odors and flavors are also produced in the milk after it has been drawn, by the introduction into it of undesirable germs in the dust from the stable and the cow and from lack of cleanliness of vessels used in handling it.

If the milk is allowed to remain at body temperature and cool slowly, the gas-forming bacteria, whose habitat is filth, rapidly develop, producing undesirable odors, but if quickly after being drawn the milk is cooled to a temperature as near 40 degrees F. as possible, the growth of these undesirable bacteria in the milk will thereby be checked and reduced to a minimum.

From the preceding statements, it plainly follows that the



patron who keeps healthy cows, in clean, well-ventilated and well-lighted stables, feeds them sound, wholesome food, causes them to be milked in a cleanly manner, and the milk handled at all stages in clean vessels and quickly cooled as soon as possible to a temperature ranging from 60 degrees to 40 degrees F., and delivers it to the factory free from chemical preservatives and with such frequency, that when delivered, it is in prime condition, meets his responsibility for the quality of factory products.

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#### DISCUSSION.

Sec'y Burchard: In pursuing this subject, which I conceive to be one of the most important that can be presented in a dairymen's convention this year, and in its relation to the dairy industry in Wisconsin, it had been deemed fairly good policy to have an examination made by the Dairy and Food Commissioner's staff of some of the cream as delivered to your local creamery here with a view of ascertaining to what extent the farmers who were patronizing that creamery were following the practices that have been set forth in this paper or following the evil practices. Mr. Corneliuson, who was once employed by the Dairymen's Association, is now transferred to the Dairy and Food Commission, and he has prepared a very brief paper on the conditions as he found them here, which he will now read.

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Mr. President, Ladies and Gentlemen: During the last few days it has been my privilege to acquaint myself with the practices and conditions under which dairy products are produced in the vicinity of Tomah and with that end in view I have visited the creamery here and 72 dairy farms.

In judging anything it is necessary to have some "standard of perfection" in mind by which the conditions can be compared or measured. In criticising the barns of this community I have taken as a standard, a barn that is clean and provided with a sound and impervious floor, well ventilated and

well lighted. By the term "well ventilated" is meant proper provisions for keeping the air pure, without causing draft or undue cold in the stable. By the term "well lighted" is meant enough windows to admit an abundant flow of light to every corner, and every foot of floor space of the stable.

After consultation with those most interested in this matter it has been deemed best for the purposes of this report, to refer in general terms to conditions observed, rather than to particularize.

Contrasting the conditions of the barns visited, some were found with ceilings, walls, windows and floors relatively clean. The floors were free from litter by refuse, or the droppings of the herd. Others were observed with ceilings and walls covered with cobwebs, dust and chaff from the fodder. In some of the worst, even the walls were befouled with dung. Some were without floors, other than those nature provided. In other instances floors were defective in that the planks were more or less loose, allowing liquids to pass through forming filth below as a source for the emanation of foul odors. Some were observed to be unswept and were littered with feed, refuse and dung.

For ventilation, reliances were placed in most instances, on the hay chute; in some instances an effort had been made for better methods, but with misdirected effort, as to the application of the principles of ventilation, and gave imperfect results. A ventilating flue about 6 inches by 8 inches was observed in one barn with a herd of 13 cows several head of young stock and 3 or 4 horses, and thus fell far short of the four square feet of ventilating flue required according to King for that number of animals.

The lighting of the barns visited was in general better than the ventilation, some barns, however, had no windows. A goodly number of the barns met, approximately, the requirements of the standard, as given in this paper. The entrance of light through some windows was obstructed by the accumulation of dust and cobwebs.

In some of the herds, the conditions of the cows, as to cleanliness, was above reasonable criticism, in others a reasonable standard of cleanliness was fairly met, while others were befouled by their own droppings.

The separators were located either in the barns or in the

house. Of those located in the barns, some were just behind the trench, come in the feed alley, while others were in a room partitioned off for this purpose. Of those located in the house, some were in the kitchen, others in the cellar and a few in the woodshed.

Some were thoroughly washed each time after using—a practice that should be followed by all. Others were washed only once a day, and a few were not washed even that often.

By some, the cream was cooled by turning from can to can, or by setting it outside for a while to cool, with frequent stirrings. By others the cream was placed in a cool room and left there until delivered. By others, it was kept in the kitchen until delivered. A few kept it in the cellar. A very few considered a cool parlor none too good for keeping the cream.

Last Tuesday Messrs. McAdam, VanDuser and myself inspected the cream as received at the creamery. Some lots of a poor quality were particularly noted, and some samples were saved and afterwards tested by a fermentation test, the results of which bore out the defects as observed at the weigh can. This investigation was also followed up in some instances by an inspection of the premises, where such cream had been produced. For instance, one sample had a strong potato flavor at the weigh can; the fermentation test showed musty cellar flavor; the inspection of the premises brought out the fact that the barn had no ventilation, was insufficiently lighted, the separator employed was a so-called water separator kept in the cellar having a large amount of potatoes stored there and permeated with a musty odor. Another one showed a very bad flavor, at the weigh can the fermentation test gave "rank unclean flavor," the inspection of the premises proved that both ventilation and light in the barn were very poor, general conditions very bad, the cows were very unclean, a water separator was used which was washed once a day, the cream was not cooled and was kept in the pantry. Another sample showed unclean and tainted flavor at the weigh can, and also by fermentation test. On the premises the barn had neither light nor ventilation, the cows were not clean, the separator placed in the kitchen and washed once daily.

At the creamery the utensils and the surroundings were found in good conditions and everything indicating that the

work done, as well as the management, is above criticism. An improvement, however, could be made by installing a pasteurizer and a starter can, and pure or commercial starters employed in the ripening of the cream.

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#### DISCUSSION.

Secy. Burchard: I don't know that any more can be said about this matter than to quote from my report. It has been observed that in our previous conventions, by reason of the fact that the butter makers and the cheese makers have formed themselves into conventions by themselves, that our exhibits of butter and cheese were extremely limited, and but very little interest was taken in them from the fact that the great majority of the farmers who attended the convention were only concerned in producing milk or cream which was sent to the factory or creamery. In view of these conditions the executive committee of the Association, at its meeting last March, passed a resolution which is, in substance, that premiums on butter and cheese should be discontinued, and in lieu thereof premiums should be offered for milk and cream.

It became a matter of some importance to know just how milk and cream could be judged and there was a good deal of reluctance on the part of those whom I thought were quite competent to pass judgment on this matter—to undertake it. But I persisted and told them that it was useless in my judgment for us to harangue about delivering good milk and cream unless there was some way devised by which the butter maker or the cheesemaker could form some sort of an approximately correct judgment as to the quality of the milk or cream when it came to his intake, and that I thought it was the province of this Dairymen's Association, in some way, as best it could, to block out a plan. They received these suggestions of mine very kindly and made some experiments and came to the conclusion that by the use of the Wisconsin Curd Test and the Fermentation Test and the trained nose, they could tell very accurately the condition of milk, and so we have invited the people to send in samples of milk and cream here to contest for premiums to be judged, as I understand it, by Mr. Baer, who has had very

considerable experience in this line and who will now explain what has been done.

You will observe that in order to make this a fair contest the per cent of fat must be ignored—for instance, if one kind of separator gives a 40 per cent cream and another kind of separator gives only 30 per cent cream, it would be unfair to the 30 per cent man for it to be held that the 40 per cent cream was better.

The real questions to be considered are the flavor, cleanliness and—I don't know what else. You see this has to be done with great judgment, because it would be unfair, for instance, for a man who milked a herd of what we might call common cows whose test would run perhaps 4 per cent or less, to have his milk compare with milk from a Jersey or Guernsey herd, which gives 5 or 6 per cent milk and to say that the milk of those cows contained more fat than the milk of his cows and that therefore it is better milk. You cannot entirely depend on the test for fat in judging a cow. If a cow gives enough milk at a low per cent test to bring up the total amount of fat in her milk, that is all right, regardless of whether it is a low test or a high test. In other words, you must consider the quality of the cow and we know we cannot determine anything about the real quality of milk by simply putting it through the Babcock test and saying it contains 5 or 6 or 4 per cent of fat.

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Mr. Baer: Mr. Chairman, Gentlemen of the Association, Ladies and Gentlemen: I will state right here that butter fat tests were made of all these cream and milk samples. We, as inspectors, would naturally do that: we want to know whether they complied with the state law and I am glad to report that they did, they ran far beyond the state law.

I wish to state that you gentlemen put up a very hard proposition in fixing this duty upon your judges. These milks and creams are exceptionally fine, far above the average and we worked very earnestly and very hard in order to determine who was to get these awards. We had Mr. Kundert, one of the state chemists, with us, and he subjected all these samples of cream and milk to his tests for formaldehyde and for borax, finding no traces of either, as he anticipated.



Now, Mr. Moore and Mr. Cannon and myself did the judging. After considerable experimental work and discussion and trying of samples backward and forward, we decided on a sort of a score card and we divided this score card for milk into two general subdivisions. Under the first, which we named "Flavor," we placed taste and smell at 25 points out of a possible 100 each. Under the head "Condition," we placed the curd, the fermentation test applied to milk, at 25; cleanliness 15, and acidity, 10, and we determined the acidity by means of the well known acid tests that creameries use in their creameries and cheese factory work.

Now, on that basis we did our work and I will read you scores of those who submitted milk samples to us after which I will read you the prize winners in the milk class.

We prepared a similar score card for judging cream, putting "Flavor" as the first department, subdividing that into two divisions, "Taste" and "Smell," giving each 30 points out of a 100.

### Milk and Cream Exhibits.

There were twelve entries in each class. These were all tested for fat and the presence of preservatives and were found to comply with the laws of Wisconsin. That is, every sample was free from preservatives; all the milk tested above three per cent fat, and cream above eighteen per cent.

The scale for judging both milk and cream embraced the two essential items of Flavor and Condition. Flavor was subdivided into Taste and Smell, and for milk 25 points and for cream 30 points were assigned to each. In the class for milk, Condition was subdivided into results of Curd test, 25 points; cleanliness, 15 points; Acidity, 10 points. It being impracticable to apply the curd test to cream, Condition was determined from Cleanliness, 20 points; Acidity, 20 points.

The prize winning exhibits received the following scores;

*Milk.*

No. of entry.	Name of exhibitor.	Flavor.		Condition.			Total.
		Taste.	Smell.	Curd.	Cleanli-ness.	Acidity.	
		25	25	25	15	10	
10	Edgewood Farm, Pewaukee, Wis.....	25	25	25	15	9	99
5	F. W. North, Norwalk, Wis.....	24½	24	24	15	9	96½
2	R. B. Robertson, Tomah, Wis.....	24	24	24	15	8	95
3	Henry W. Schneider, Tomah, Wis.....	24	24	24	13	8	93
9	J. G. Hickcox, Whitefish Bay, Wis.....	24	24	2½	14½	6½	92½

*Cream.*

No. of entry.	Name of exhibitor.	Flavor.		Condition.		Total.
		Taste.	Smell.	Cleanli-ness.	Acidity.	
		30	30	20	20	
2	R. B. Robertson, Tomah.....	30	29	20	20	99
6	Wm. Brennan, Tomah.....	30	29½	20	18	97½
5	F. W. North, Norwalk.....	29	28	20	20	97
1	C. C. Hill, Tomah.....	30	28½	20	18	96½
12	Elmer Hill, Tomah.....	29½	29½	20	17	96

## DISCUSSION.

Ex-Gov. Hoard: I want to ask Mr. Corneliusson whether in this inspection around here (Tomah) you found any of the barns using the King system of ventilation?

Mr. Corneliusson: No, sir.

Ex-Gov. Hoard: Did you find any of the farmers knowing anything about it?

Mr. Corneliusson: No, that I was aware of. There was one man who had a small flue. I presume that that man

knows something about the King system, but he did not understand the proper principles, he has got too small a flue in.

Ex-Gov. Hoard: Had he his intakes right, letting in the air from below outside and up even with the sill on the inside?

Mr. Corneliuson: I don't recollect whether he had that or not.

Ex-Gov. Hoard: This is one of the most important propositions connected with the health of our herds.

Mr. Corneliuson: This man made the mistake, not alone in making the flue too small, but it was not air tight. The air flue should be air tight or practically so, in order to draw well, and his was open in the joints.

Mr Aderhold: Now, we are on this stable question, I would like to introduce a resolution that bears on this question.

The Chairman: There is no objection.

WHEREAS a large portion of our milk producers are using stable fixtures that fail to keep cows clean, and are housing their cows in poorly ventilated stables; and

WHEREAS, on account of our dairy laws and the inspection of stables, a big movement is on foot for the improvement of stable conditions; and

WHEREAS, the majority of our dairymen lack knowledge in stable matters, and complete instructions along that line are not readily available, therefore

*Resolved*, That we request Ex-Governor Hoard as chairman of a committee on Agriculture of the Board of Regents of the University of Wisconsin to use his influence with the management of the Agricultural College in persuading it to issue a bulletin illustrating and describing in detail a few of the better class of cow stalls, the King System of Ventilation, and such things as make for sanitation in dairy stables.

Mr. Aderhold moved the adoption of the resolution as read. Said motion being duly seconded, it was put to the house and unanimously carried.

Mr. J. G. Moore: Mr. Corneliuson spoke in his paper about some improvements that might be put in the local creamery here. He spoke of the pasteurizing and starter can. I would like to ask Mr. Corneliuson whether the cream comes in

rich enough in fat to allow the use of the starter can and the starter.

Mr. Corneliuson: The cream received at the creamery here tests about 24 per cent on the average. It is rather low for the employment of the pasteurizer or a commercial starter and that is an important question for every creamery patron to consider, the richness of the cream. A great many people think that when they have a large number of pounds of cream that they get more money, but that is a mistake; they lose the skim milk and the loss in the buttermilk is greater. The thinner the cream is the higher the churning temperature which must be employed, and that increases the loss of fat.

The Chairman: It is to the patron's interest then to produce heavy cream rather than light cream?

Mr. Corneliuson: Yes, every farmer should make it a practice to produce cream not less than 30 per cent, and up to 35.

A Member: I would like to have Mr. Corneliuson give some of the losses in such factories when they have gathered cream.

Mr. Corneliuson: I remember one instance of a creamery that I visited some time ago. They labored under great difficulties along this line, their cream was unusually thin; the average fat throughout the year was, if I remember correctly, 22 per cent and they lost a large amount of money through that one cause. The total loss sustained by that factory on account of this practice was estimated to be over \$2,000 a year. This amount of money could have been saved and been distributed through that locality to the various patrons if they had understood the matter. That was their yearly loss and they could have saved that money without the expenditure of a single cent, simply by a little attention to details. That is a very important question to be considered in every gathered cream factory, that of the richness of the cream, as well as the quality of it; in fact, the quality of it largely depends upon the richness of it, because the thinner the cream the easier it goes off flavor.

## REPORT OF AUDITING COMMITTEE

The Auditing Committee have examined books and vouchers of the Secretary and Treasurer and find the same correct as reported by the Secretary.

H. C. TAYLOR,  
C. P. GOODRICH,  
H. D. GRISWOLD,  
*Auditing Committee.*

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The Chairman: We have with us this afternoon Prof. Haecker of the Minnesota Experiment Station, formerly of Wisconsin. He has for many years carried on many original and close experiments along dairy lines. It appears that he has experienced some changes in his sentiments as well as in his experimenting in regard to dairy cows.

It gives me great pleasure to introduce Prof. Haecker of Minnesota.

Prof. Haecker: It always affords me special pleasure to meet a Wisconsin audience, for I always find in it quite a number of old personal friends, and I always like to come to Wisconsin because I feel under many obligations to the State that has probably done more to develop dairying during the last quarter of a century through its influence than all other states in the Union combined. We owe the State a debt that we will never be able to repay.



## THE CHANGE IN SENTIMENT IN MINNESOTA TOWARD THE DAIRY COW.

Prof. T. L. Haecker.

The subject assigned me is an unpleasant and difficult one to discuss because it brings to mind many incidents which if brought out in detail would lead to personalities which I have always aimed to avoid, and difficult because of a lack of authentic data in regard to the performance of the so-called dual purpose cattle.

When young and inexperienced in handling cattle, and when a cow was a cow, I settled on a farm in the town of Cottage Grove, east of Madison. Two cows were purchased, one a fine two year old Short horn heifer, fresh in milk, and the other some five years old. The heifer I considered a nice animal. She was deep red, compact and smooth, and being fresh made a good appearance. The cow was a roan, raw-boned, pot-bellied, and her general appearance indicated to me that she must be what was then termed a hard keeper. In a couple of years the perversity of the heifer brought her to the shambles, for she would persist in converting her feed into meat—when it was milk that I wanted. After this time I had an opportunity to take on shares two twin Jersey heifers; one was noted for her beauty—symmetrical and nicely rounded out, while the other was considered homely, for she was always poor, angular and pot-bellied. But being twins from a famous cow, and by a registered sire of approved lineage, the assumption was that both would prove to become good cows. Certainly the smooth and handsome one would for she won the first premium both as a yearling and a two-year old. During several succeeding years, during which they received good care, the beauty failed to make good either as a breeder or milker, while the other was prolific and far exceeded our expectations at the pail.

During the summer of 1882 I was commissioned by the regents of the University of Wisconsin to visit some noted dairy herds in New England, and brought back a carload, with the understanding that I should have the privilege of selecting one first, and they were then to select what they wanted and

I was to take the rest. There were some so-called beauties among them. I selected one, and then theirs were selected, and I took the remainder—among which there were no beauties. Notwithstanding the experience that I had had, I felt at first that I had the worst of the bargain. Records were kept in both places and time showed that my first choice proved the best in the lot, and those that had been left for me made records that I was proud of. Later I bought two more carloads from New England upon my own responsibility. One was composed of Jerseys and the other of Guernseys, and among them was Sunbeam, the dam of the famous Yeksa Sunbeam. With every individual in these two carloads time showed that there was a clearly defined relation between form and ability to perform at the pail, though the details of the dairy form were not clear to my mind and the same was true in regard to the relation of form and the nervous or what might be called the dairy temperament, first observed by Governor Hoard. But enough had been learned by close observation to fix in my mind the importance of dairy heredity combined with a certain type. So, when unexpected circumstances resulted in a call for me to go to Minnesota; and to bring a load of cows, the lessons learned were not ignored, and such cows as Houston, Sweet Brier, Tricksey and others of equal dairy capacity were added to the station herd.

The first winter I had little to do with dairy stock, giving all my time to the manufacture of dairy products, for it was the general conception then that instruction in dairying had strictly, if not solely, to do with making butter and cheese.

Soon after the close of the school of agriculture it was suggested that my services be dispensed with during the summer, but the regents did not give their consent and I was directed to spend the summer in visiting all the creameries and cheese factories and all the breeders of dairy stock, and generally familiarize myself with the status of the dairy industry and its future prospects. In the southern part of the state I found many breeding herds of dairy cattle. Along the southern tier of counties some half dozen herds were found in some counties, and many farmers who made no pretensions of breeding stock for sale kept at the head of their herds full blood dairy sires, and there was almost a universal trend towards breeding to sires bred especially for milk production. In all my travels

I found only two instances where men were interested in breeding stock that is now called dual-purpose; one a business man living on a small farm adjoining a town, and another a farmer who had a small herd of Swiss cattle. Even in the Red River Valley in the vicinity of Crookston and Moorhead, I found a number of fine herds of full-blood Jerseys. There appeared a universal sentiment among patrons of creameries and cheese factories that it was desirable to breed to dairy sires, since milk production was proving so remunerative and butter making was so rapidly restoring the fertility of the soil which had been impoverished by constant wheat raising. During some half dozen years there was a constant demand for dairy sires, and breeders within the state found ready sale for all their surplus breeding stock and many were brought from other states to make good the shortage in the state.

After bulletin No. 35 was issued the breeding and buying of dairy stock was greatly stimulated. This infusion of dairy blood into Minnesota herds had a marked effect in increasing our dairy products and cancelling the mortgages on our farms. But unfortunately the marks of dairy breeding were as evident among the steers that were shipped to market as it was among the heifers that were kept on our farms for milk cows. The meat combine took note of the change and resolved that something must be done to check the farmers in breeding to dairy sires. The edict came from the packers that all steers showing dairy markings must be cut in price. This order became effective at once, as practically all steers under the meat combine arrangement had to be shipped to the packers for slaughter. Through some mysterious influence some of our teachers in the departments of animal husbandry in our agricultural educational institutions suddenly discovered that steers from dairy bred stock were no good, that the meat was of poor quality and there was greater percentage of fat on the internal organs; that they carried a lower percentage of valuable cuts, and that so much more feed was required to a given weight that they were unprofitable. Some even went so far as to advise farmers to kill all dairy grade male calves. For several years there was a systematic campaign urged against breeding to dairy sires. At the stock yards, steers carrying any color markings betraying an infusion of dairy blood, were marked for a sharp cut in price, no matter how smooth, well rounded

and finished they may have been. Farmers were advised by the teachers to breed their milch cows to dual purpose sires, preferably to Shorthorns of a milking strain, well knowing that this strain had practically become extinct because Scotch Shorthorns had been the fad for a decade. Considerable headway was also made in the introduction of Red Polled blood into the state, and some ten or twelve breeding herds were started in the state. The vigor with which this war on the dairy sire was carried on by some of the teachers made it appear that there was some pecuniary interest at stake, though this is not herein affirmed. At all events the attack on the dairy sire was effective. I am in a position where I can measure from my correspondence the trend of public sentiment very closely. During the agitation there was a gradual decrease in the number of inquiries for dairy sires, and inquiries began to come for sires from milking Shorthorns and Red Polls. Finally there was rarely any inquiries for dairy sires and every one seemed to want something that was good for both meat and milk. This state of affairs continued for several years. Then an occasional letter was received asking for dairy bred sires. These could readily be secured at very reasonable prices. But as time passed, the demand for dairy stock rapidly increased, and as many of our dairy breeding herds had become so depleted, only a few sires and scarcely no females could be secured. During the years when the demands for dual purpose stock were so great, our dairy herds, especially the Guernseys, were nearly all taken by Wisconsin breeders. In Freeborn county there were two herds of Guernsey cattle deep in the blood of the noted Yeksa family that were picked up by two Wisconsin breeders, at prices that good grades should bring. Two years ago there was not a locality where a carload of grade or full blood dairy cows could be secured. While four years ago our dairy stock was carried into Wisconsin by the carloads, at merely nominal prices, during the past two years they have been coming into the state in carload lots at double the prices. During the past year I have received more letters asking where dairy stock could be secured than I have received in any one year since I have been in Minnesota, and among them all there has been only one that called for a dual purpose sire. In many of them it was stated that they had been led to breed beef or dual purpose sires and that it resulted in disappoint-



ment and great pecuniary loss. The dual purpose fad has cost our people many millions of dollars, and this is clearly shown by statistics.

The number of milch cows in Wisconsin is given in the last Year Book of the Department of Agriculture as 1,183,521, and the value of the dairy products is given in bulletin No. 140 of the Wisconsin Experiment Station in round numbers as \$46,000,000, being approximately a gross receipt per cow of \$39. The Year Book gives the number of milch cows in Minnesota as 903,796. The best data we have on the gross receipts from dairy products is \$26,100,000, being \$29 per cow. From this it appears that the receipts per cow are \$10 more in Wisconsin than in Minnesota; that if the cows in Minnesota earned as much as they do in Wisconsin, our receipts would be \$35,137,960, and that for some reasons we are annually losing \$9,037,960. I believe the chief cause of this enormous loss is the fact, that in Wisconsin there are large districts that are employing dairy bred cows, while in Minnesota the almost universal practice is the use of the so-called dual purpose cow. While there is now a great demand for dairy bred sires, but few are available, and it will take a decade to get back to the position which we formerly occupied, and in the meantime our losses will aggregate not less than \$75,000,000. This costly experience teaches that it doesn't pay to make a retrograde movement in an industry of such vast magnitude.

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#### DISCUSSION.

Prof. Emery: I want to make a statement or two with reference to this Bulletin 140. In that estimate of \$46,000,000 gross income of Wisconsin, no account was taken of the by-products of the factories. When next year, the report of the Dairy and Food Commission is published, it will show that an estimate of \$10 a cow is made for the by-products of creameries and cheese factories and by adding that the total annual income of Wisconsin dairy cows is upwards of \$47,000,000 annually.

But I want to say further that the statistics given in the forthcoming report and also in Bulletin 140 were taken from



the recent census taken by the state; that I have given particular attention to it in connection with the secretary of state and know that a great effort has been made to secure as great a degree of accuracy as possible, facts that are as reliable as can be, and while we know that there are errors I believe they are approximately correct, and it seems to me from knowledge I have gained that they have been taken with as much care as were the statistics of the United States officers.

Prof. Haecker: I was going to say that I am quite sure that the estimate appearing in Bulletin 140 is correct, because a little over a year ago, figuring on our yield of cheese and butter in finding what I did, that the annual receipts were \$26,100,000, I applied the figures to what data I could get from Wisconsin and found that their receipts were \$46,000,000.

Ex-Gov. Hoard: Prof. Haecker has given you in a sort of a rapid glance some idea of the very serious character of the results of a mistake, upon the fortunes of that state.

Hoard's Dairyman has been battling this heresy and humbug policy of the dual purpose cow for a dairyman for years, and has never turned its back to the proposition for one moment. It believed years ago—thirty years ago—that the way for the dairyman was straight and narrow and that there was no double purpose proposition in that way.

There is a little point I want to make right here. The other day I went out to Iowa. Iowa is getting in the same way; Iowa farmers are coming to the men who have been teaching them and saying to them, "You have been telling us to breed to dual-purpose, and we have got no milk. What good is it for us to breed in this way and get no milk?" And then these people have been saying, "Well, now, we, you know in Iowa, have a large surplus of very desirable feed and we need to use a dual-purpose animal to eat up this feed." And then the farmer turns around practically and says, "Why can't we use up the feed on a good cow as well as on a poor cow? Why should we breed for a cow in order to use up a lot of feed?" "Oh, that is for the fun of it," Prof. Haecker says. Well, you know this practice of getting down to the sharp edge of a proposition is good. The Professor has not given you all; he spoke of the by-products and I want to illustrate one point more.

The eyes of the whole country are turning upon Wisconsin as a source of good blood to go out and enrich the lines of cattle in other states. Not only \$47,000,000 has come from the cows of Wisconsin, but he has not said anything to you at all as to the amount of money that has come into Wisconsin for this very character of good blood.

Some of our Wisconsin dairymen have been fooled into believing in this dual purpose. They were like the boy who went out hunting and the old man told him to be careful and not shoot any cattle down in the woods. "Well," he says, "Dad, I have loaded the gun so that I can't do that. I have loaded it so as to hit it if it is a deer and miss it if it is a calf." That is dual purpose. Another fellow, a dual purpose man, went to be examined in the old fashioned way by the school committee to teach school, and they asked him if he believed the earth was round or flat. "Well," he says when asked that question, "I teaches 'em both ways, just as they want it."

Now, this idea of "hitting it if it is a deer and missing it if it is a calf," or "teaching them both ways, just as they want it," has been a delusion and thousands and thousands of farmers have wanted that same delusion and wanted it bad. Not unreasonably so, but because they hoped that there was some way by which they could get just as much milk and besides that, sell a good beef product.

You ask that same farmer if it is consistent that a man should expect to breed for the race track and at the same time get a draft horse? Why, no. Ask him if it is consistent for a man to breed for a bull dog and get a fox hound. Why, no, of course not. But it is consistent for a man to breed for beef and get butter. The days of humbug and Barnum are still with us.

The Chairman: If you have been engaged in breeding pure bred dairy cows for twenty-five or thirty years and have come up against these fellows who are endeavoring in every part of the country to lead the dairyman to believe that the dual purpose cow is the only salvation in dairying, you have been obliged to sit still and listen to a false gospel and keep your mouth shut a long, long time. As we talk today it seems to me from this standpoint that we are kicking a fellow when

he is down, that we are hitting the enemy when he is already prostrate before you.

The time was never so ripe for teaching these things as it is today, the eyes of the brightest of the dairymen in this state, in Minnesota and in Iowa are raised and they say, "What good thing have you to tell us? Come over into Macedonia and teach us the things that we want to know." Down at Madison, at the Experiment Station, we had some of these teachers that were trained in the schools of the dual purpose cow, and they were there holding an official position, and with the human equation producing preconceived notions which have been demonstrated to the dairy fraternity of Wisconsin, the same false doctrine that we are meeting with today and it is prostrate before us. I have visited hundreds of farms where there was a grade bull at the head of a herd and on the table in the house were pamphlets and bulletins from Minnesota and Iowa and Wisconsin, all teaching these things and my heart sank within me and my tongue become still, because I knew what these fellows were coming to. It is no time to stand on our feet and say, "I told you so."

Gov. Hoard and I have talked this matter over many times and we have stood up and will stand up to show these fellows the foolishness of their mistake. The great pendulum of the true gospel is swinging back to us. Let us not make fools of ourselves; let us not think we are going to get rid all at once of these things, but let us continue to work to place dairy sires at the head of our herds in Wisconsin and the call will be long continued and all the time for the surplus dairy bred stock at remunerative prices.

Secy. Burchard: You haven't said what you started to say I am sure.

The Chairman: I don't want to do too much talking. I want to say this, however: we have down there at Madison a conscientious, clear-thinking dairyman that is bringing this dual purpose cow out of the dairy barn on the Experiment Station. The Red Polled cow is gone from there, the Short-horn dual purpose cow has come out of the barn and the right kind of attention is being given to the dairy breeds, the Holstein, the Jersey, the Guernsey and the Ayrshire and other splendid cows, also some Brown Swiss and some that we are going to experiment with in Wisconsin. You will find that

it will be the simplest and easiest thing in the world for Wisconsin dairymen to take up with this kind of true gospel. They are ready to receive it now and we are going to lend them all the assistance we can to help our brothers in the dairy business in the state of Wisconsin through the Agricultural Station. Anything further on this subject?

Secy. Burchard: In the current annual report of the Wisconsin Experiment Station you will find in the concluding sentence words to this effect: "From our records, kept from 1898 to the present time, it has become apparent that the dual purpose cow has no place whatever on the dairy farm and that no dairy farmer can afford to breed to the dual purpose idea."

Now, quite closely related to this question is that matter of constitution, etc. I would like to have you hear a word on that question from Mr. Glover, whether it is true or false that the dairy cow has an inferior constitution to the beef cow; whether, in other words, what we hear so much about, breadth of chest, chest girth etc., have anything to do with the heart and lungs capacity or anything of that kind?

Mr. Glover: Mr. President, Ladies, and Gentlemen: Before I start to tell what General Burchard has in mind, I want to say just a word further on this subject of the dual purpose cow. It has been pretty hard for me to keep still as much as I have since I have been here, but in the presence of my two associates I have thought it best to keep still and let them do the talking, for if I made any mistake they would both get after me, and I would be between two millstones.

Looking over my mail the other day, I found a letter from a man writing from Minnesota or from Iowa, and saying that a few years ago he wanted one of the Professors in the Iowa Station to pick him out thirty cows, and they did so and sent them to him as ideal dual purpose animals. He writes me: "After five years I have got rid of nearly all of them, I am through with that kind of breeding. It has been very expensive to me."

That is one of the many letters that are coming to us at the Dairyman's office constantly.

The other day, in looking through a Bulletin from the Iowa Experiment Station, I found they had four dairy steers and weighed the hearts and lungs and also four beef steers and



weighed the hearts and lungs. It has always been claimed and taught by many of our teachers than an animal's constitution depended upon the depth and width of the chest, the measurement around it; that is, if an animal was broad between the legs and deep, it showed an animal with a great constitution. That has been the guiding thought, I think, lots of times in the human race as well as in the bovine, but to my surprise when I came to compare the weights of the hearts and lungs of the dairy bred steers and the beef bred, I found that the dairy bred animals were  $54\frac{1}{2}$  per cent larger per thousand pounds live weight. Now, it would seem that external measurements and observation were not true indices of the size of the lungs and it brought up this question to us, Does the heart girth bear any relation to the constitution?

Mr. Everett: What was the difference in the size of the hearts?

Mr. Glover: The hearts in the dairy steers were a trifle larger. There were four beef animals and four dairy animals, and I will say to you that Prof. Voss has done some very interesting work along this line.

Prof. Haeker: This is in harmony with the data that we have at the Minnesota Experiment Station and have had for several years, but there has not been a disposition to publish it. When Sweet Brier was dissected, it was found that they had never found as large a pair of lungs as Sweet Brier had; in fact, all of those dairy cows, where any post mortem has been held and their lungs and hearts examined, have shown that those organs were very large for the size of the animal.

Ex-Gov. Hoard: I think it is something like fifteen years ago that I followed certain cows to the butcher block in Fort Atkinson and examined the size of their lungs and hearts and also followed certain beef bred cows, and I found the same thing to be true, and I early saw that the popular idea on that subject was a fallacy.

But I want to give you a little pointer, and that is this. A race horse sometimes looks as though both his fore legs came out of the same hole, doesn't he? You have heard men say that. A thoroughbred race horse will run a mile, say in 1.40. That horse has to use more heart action and lung action in running a mile in 1.40, than a draft horse would use in a week of hard pulling and yet, they tell you that the shape



of the race horse indicates that he does not have large lungs, does not have large heart action.

A dairy cow has to use her heart and her lungs tremendously to evolve forty pounds of milk a day. The milk must come from the blood, the blood must come through this circulation, —look at the great milk veins on the belly of a fine cow. You don't find that on the belly of the beef cow. No, those veins are the veins that take the blood back from the udder to the heart, and that shows you that here is provision made for tremendous circulation of blood from the udder to the heart and going around the other way back, constantly pumping blood to make forty pounds of milk a day. Could a small, weak, poor heart do that? Nature never fails you nor herself and consequently the dairy cow has a large heart and big lungs, and yet people have fooled themselves with these false judgments of conformation for all these years. So it is for the horse; so it is with dogs. Notice the big bull dog with his legs spread way out, he looks as though he had lungs for everybody. Turn to the pointer or the setter, turn to the greyhound, the foxhound. Don't these things indicate to you and me that we ought to judge things from the standpoint of nature and judge things from the standpoint of true principle?

Now I throw out these ideas that every farmer ought to become an independent thinker, an independent reader, a student of dairy cattle.

Sec'y Burchard: This bulletin that Mr. Glover referred to, telling about the four dairy steers and four beef steers that were killed in Iowa, contains information along another line that may be of interest here. It is claimed that the dairy steer, when fattened, does not bring as much in the market as a beef steer, and that is true, but there are some other considerations to be taken in connection with that and I think Mr. Glover can give us some of the figures and we will be glad to hear them I am sure.

Mr. Glover: To make it short and get at the subject quickly, I will say this, that those four dairy steers were fed alongside of four beef steers. We will not enter into the particulars, but it was simply four special beef steers against four special dairy steers. The dairy steers made just as good use of their grain as the beef steers did, perhaps a trifle better in a live weight gain. That is, it took so many pounds of grain and

hay to produce a pound of beef and it took about the same amount to produce it in the dairy steers. These steers were killed and sold; the dairy steers averaged in market price \$42 apiece, the beef steers \$60 apiece, there is \$18 difference between the special beef animal and the special dairy animal in the price placed in the market.

Now, when these animals were cut up and sold, the dairy animals sold within \$13 of as much as did the special beef steers, within \$13 each, making a market discrimination of \$5 per head in favor of the beef animal.

Now, I will say this, this experiment was carried on entirely by beef men and one of Kansas City's best judges placed the price on the respective cuts of both breeds.

Now, those steers were in round numbers two years old and taking it upon a sale price of \$60 and \$42, which the steers average, it makes a difference, as I said before, of \$18 in favor of the beef, and you see that the beef steer was two years old, so you see that he returned \$9 more per year for the feed consumed than the dairy steer, for all the feed that he ate.

Now, to come back to the dual purpose argument for a moment, let us see what there is in it. Suppose you are a dairyman and you are breeding cows that average you 350 pounds of butter per year, and you ought to have that kind, because it is possible to get them without injury or without any great exertion on your part. With just good dairy intelligence you can produce animals that will average 350 pounds of butter per year. Suppose that the average price of butter was 20 cents a pound; there is \$70 for the butter from that special dairy cow that produces 350 pounds in the year.

Now, supposing that the dual purpose man produced a cow that would yield him 300 pounds of butter in a year, and that is very close, within 50 pounds of the other, and at 20 cents, that makes \$60. Now, your dairy cow has returned you \$10 a year more for the food consumed than the beef cow.

Now, granting the dual purpose cow will produce a calf and your dairy cow will produce a calf, she still will return you \$10 more for the butter than your dual purpose cow and the special beef cow only returns you \$9 more in beef and the difference between \$9 and \$10 is exactly one dollar. Do I make it clear?

The Chairman: There is only one thing wrong with that hypothesis that you have given us, and that is you have credit-

ed the dual purpose cow with about 100 pounds more butter than she will produce.

Mr. Glover: I have given the dual purpose animal the very best chance as to the production of butter, and I have given the dairy cow as good a calf as the special beef animal has, and still the special dairy cow will beat the other.

I presented that argument a while ago to a dual purpose breeder, and he tried to avoid it and he wanted to avoid it by saying that the dual purpose cow would produce 350 pounds of butter, but he had to admit that they can't prove any such thing as that.

There are plenty of dairy herds that will average 400 pounds and the dual purpose cows I feel sure will not average more than about 160 pounds of butter.

The Chairman: C. P. Goodrich is spoiling to say something.

Mr. Goodrich: Yes, I haven't said anything for a long time. Down in Jefferson county, in the country right down around Hoard's Dairyman, they have got pretty good dairy cows. I took a cow census of 100 herds down there and the average product was 244 pounds per cow for all the herds, good, bad and indifferent. There is just one herd of registered Shorthorns in Jefferson county, and the owner of that herd has been breeding for milk production till he has spoiled them for beef and they are not very good for butter yet; his herd produced 184 pounds per cow and that is all.

The Chairman: Do you want to continue this any longer? Mr. Emery has something he wants to present.

Mr. Emery: Mr. Chairman, Ladies and Gentlemen: You have heard of many subjects of great importance relating to the dairy interests of the state and I have one here that I am sure is as important as any, and it will take me but a short time to present it and I wish to present it because it concerns every dairyman, it concerns every patron of every creamery in the state of Wisconsin. In my judgment, never in the history of this state has the local creamery industry been so menaced as at the present time. If our local creamery interests in Wisconsin, this magnificent dairy state with a total annual income from her dairy products of more than \$57,000,000 is to continue and advance that industry, there are certain conditions that are absolutely indispensable.

First and foremost is cleanliness in dairy products, from cow to consumer. Second, in our creamery work the testing for butter fat of the patron's cream or milk must be done with intelligence, skill, painstaking care and absolute honesty.

I am not going to argue this question here, but that is an exceedingly important point for this reason, that any set of men or any man who deals with the public must so deal with that public as to establish and maintain confidence. The breaking down of confidence is the ruination of business and to maintain the confidence of patrons, the managers of creameries must see to it that the testing is done with absolute accuracy and absolute honesty. The patron who takes milk or cream to a creamery has a right to just what he takes there, every ounce of butter fat. What difference does it make to-day, when my cream is in the hands of the creamery and to-morrow when the cash for it is in the hands of the cashier of the bank? That cashier must handle every cent, account for every cent, and so, too, that creamery manager must account for every ounce of fat if the testing is done as it should be done.

Third, there must be no discrimination in railroad transportation by the railways between the various classes of producers of these dairy products. Now, we know that some of the greatest monopolies, some of the greatest outrages that have been practiced upon the American public have come about because of discrimination in railroad transportation. I want to give on this point a few statements. It is a serious proposition, and there is no body of men so called upon to deal with this proposition as the Wisconsin Dairymen's Association and the Wisconsin Creamery and Buttermaker's Associations.

A local creamery—I am not going to say just where it is and I am not saying that every local creamery does this—I give this as an instance of the condition that is beginning to creep into Wisconsin. It is firmly fixed in Kansas and Iowa and some other states, and this octopus is reaching out its tentacles to cover Wisconsin. A local creamery is charged one dollar per hundred weight to ship its butter to Chicago by express. Now, keep that in mind. At the same time, from the same place, the same railroad takes one hundred pounds of cream to Chicago for 25 cents as baggage. The cream is 40 per cent butter fat. It amounts to this, that the Chicago centralizers get their butter for 52 cents per 100 weight, for trans-



portation charges, while the Wisconsin local creamery must pay a dollar per 100 weight to get its butter to Chicago on the same train. I made this statement at the Buttermaker's meeting, and somebody said, "That Mr. Emery knows, or ought to know, that the creamery people do not get their butter to Chicago at that rate by express." Of course Mr. Emery knows that, but why shouldn't they? Why shouldn't the creamery man get his butter to Chicago going on the same train that the cream goes there, under the same rates? That is a fair proposition.

Now, gentlemen, this is not a square deal. In addition to this, the railway return cream cans free of charge; they do this by shipping as baggage. Thus it will be seen that by this action of the railways the Wisconsin local creamery is placed in a position of peculiar hardship. Neither the Chicago centralizers nor any other centralizers can get out of a farmer's cream any more, honestly, than the local co-operative creamery can get out of it; therefore, it is to the interest of every Wisconsin farmer to stand back of the Wisconsin local creamery. That is a thing we want to keep in mind. We want to remember how the beef trust of this country has driven out the local interests and then reached out its tentacles and got the American people under its control and destroyed the local butcher in the majority of cases, and destroyed, as Prof. Haecker has so well told us this afternoon, the dairy breeds. So I say again, it is to the interest of every Wisconsin farmer to stand back of the local Wisconsin creamery. I mean that. It is the business of the weakest local creamery to deal fairly with the Wisconsin farmers and of the farmers to deal fairly with those creameries. It is to the mutual benefit of all those parties, and they are standing in each other's light if they fail to do these things. The farmer gets all there is in his cream when he takes it to the local creamery—overrun and all.

The dairy sentiment of the state, the Railway Commission and all the forces of our state should stand like a solid wall in defense of our dairy industry as a part of Wisconsin; not only should they stand as a stone wall, but they should be as aggressive as a mighty army, seeking to gain what is right and just in these transportation matters. The Wisconsin Dairy-men's Association and the Wisconsin Creamery Buttermaker's Association can do much to bring this matter to a right turn.



Ex-Gov. Hoard: I want to say a word on this. The other day two farmers came to my office and said they were stockholders in the South Koshkonong Co-operative Creamery. they came in and chuckled to me, because they said they were shipping their cream as baggage to Chicago and they were getting the Elgin price for butter for their butter fat. They looked as jubilant as though they were facing a thaw in winter—I didn't say what thaw. I said to them, "Now, boys, it is so easy to fool one's self." My observation of smart men is this, keen men, shrewd men, they never fool other people, they don't need to, the other people will fool themselves. But I said to these boys, "You are badly fooled." "Well, how? We are getting Elgin for our butter fat." I said, "You not only ought to get Elgin, but you ought to get 16 per cent more." "Why, how is that?" "Why, at your local creamery you will get everything that there is in it less the cost of making and that is \$3 a hundred pounds of butter, three cents a pound. You have got everything in it and you will get 16 pounds of butter in every hundred pounds; you get not only your hundred pounds of butter, but you get 116 pounds, and here you only get your hundred pounds of butter fat and you think you have got the railroad by the tail, don't you?"

The Chairman: And that 16 pounds is worth 30 cents a pound, \$4.80.

A Member: They are getting it made for 2 cents a pound at that creamery.

Ex-Gov. Hoard: Well, those farmers stood and looked at me in amazement, their eyes began to get wide open when I talked about the overrun, and they said to me, "What is this overrun?" I said, "Boys, you live in my own town; my God, how long does it take a man to keep stupid? You don't know anything about the overrun?" Well, they had heard it talked about a little, but they didn't know whether it belonged to the butter or the buttermilk or what.

Now, that is an illustration of the way people do; there was a set of men sending their cream away and thinking they were doing God's service, stoning Stephen, and they were stoning nobody but themselves. There is where a great lot of farmers in Wisconsin are going to be humbugged about this shipping of cream to the city, Milwaukee, for instance, to men to make it

up into butter there. When it comes to the question of shipping cream for direct consumption as cream, I have nothing to say, provided they can get all the value that it will have locally in the butter market; but one thing I do want to say concerning the creamery, and that is this, there is no centralizer in Chicago that can get any more out of the butter fat than the local creamery can, none. Not only that, but they get less. Now, how do they make it up?

The Chairman: Do they sell it as cream down there or make it into butter?

Ex-Gov. Hoard: Why, these customers down there make it into butter and they would pick out some of the finest cream and get a cream price for it, but as a rule the centralizer in Chicago gets less for his butter, because he gets the worst kind of cream and then it makes several different grades of butter and between it all they don't begin to get as much as a good, clean, wholesome Wisconsin creamery for their butter.

Now, this is what is done in Kansas and Nebraska: The centralizers drove the local creamery to the wall, and the farmers turned traitors to their own interests and shipped in to the centralizers until they have almost killed out every creamery in Nebraska and Kansas, and then when they had the local creamery cleaned out by competition, they went to playing hob with the farmer himself and today the farmers there are selling their cows and quitting the dairy business, because they can't get justice, where they could have had justice if they had stayed by their own local creamery.

Oh, it is well for us to be wise as serpents about these things.

Mr. Moore: The Governor didn't say anything about the way the Chicago centralizers try to fix this thing, and the farmers don't know anything about it. They don't give the local farmer the entire weight that he is entitled to, or the entire amount of fat that he is entitled to in the test.

Ex-Gov. Hoard: My nephew, who was testing for one of these institutions in Chicago, wrote me a letter. He was competent, thoroughly educated, a fine creamery operator, and he went there and tested for that institution and he tested as he knew was fair to the farmers who shipped them the cream in there, and they said to him, "You must read that test lower." He says, "I can't do it and do it honestly." "Well, you will do it if you stay here." And they turned him out and he sent me

the full particulars of that matter. When you put your interests two or three hundred miles away you can't help yourself much. Can't any farmer be better served where he can step over and look after his own interests, watch the test himself? I want to see the local creamery maintained in Wisconsin; I want to see the farmers looking after their own business; to see them able to do it, to know enough to look after it. I want to see them educate themselves to read more, become more intelligent, and then I want to see them the peers of any set of men on God's green earth.

Mr. Corneliuson: I think there is one more point that would be well to consider in regard to this work. Men generally think they have a big price when they get Elgin for butter fat. Now, if that creamery was well managed they would get at least 16 per cent overrun. We will be conservative and say they are getting one-sixth; at the present price for butter, which is 33 cents Elgin, there would be about  $5\frac{1}{2}$  cents in the overrun, that is, what the overrun would amount to, one-sixth of the price of a pound of butter, which is just about  $5\frac{1}{2}$  cents.

Now, then, it will cost them three cents to make the butter they are still  $2\frac{1}{2}$  cents ahead and suppose you sold the butter on contract, you are just two cents to the good.

The Chairman: I will ask the Dairy and Food Commissioner, Mr. Emery, to formulate the ideas presented by him here, covering the transportation of creamery products, into a resolution to the Railroad Commission of the State and present it to this meeting tomorrow.

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Adjourned to 9:30 A. M., Friday, February 22, 1907.

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The Convention met at 9:30 Friday morning, February 22nd.

Mr. C. P. Goodrich in the chair.

The Chairman: The first business of the morning will be the report of the committee on nominations, which will be made by Prof. Emery.

Prof. Emery tendered the report of the committee on nominations, recommending as officers of the Association for the ensuing year the following named gentlemen: For President, W. J. Gillett, Rosendale; for Secretary, George W. Burchard, Fort Atkinson; for Treasurer, H. K. Loomis, Sheboygan Falls.

Prof. Emery: I move that Mr. Hill be instructed to cast the ballot of the Association for the officers named.

Motion seconded and the ballot so cast by Mr. Hill for said nominees, who were declared to be the duly elected officers to the respective offices for the ensuing year.

The report of the committee on exhibits being called for, Secretary Burchard reported as follows:

Secy. Burchard: I want, not as a member of that committee but as the secretary of the Association and charged by the Executive Board in the way of general looking after the details of the convention, to say that I made no effort this year to secure a large line of exhibits of machinery. We are very glad, however, to see the things that are here; they are the things that pertain more particularly to the dairy farmer, to the milk producer. The big things, the vats and the big churns and the pasteurizers and all that sort of thing belong now in the factories, but we have here and I am very glad to have noticed that they have attracted a very great deal of attention, these hand separators,—farm separators, as I like to have them called. They have come to stay. The three leading makes of farm separators are here and I do not think anybody who contemplates buying a separator, will make any mistake in buying any of these; in parting with his money he will get his money's worth back again, I am sure.

I notice Mr. Corneliuson mentions some of the farmers using the water separator, sometimes called the "dilution" separator and he said in a sort of an aside that perhaps the more proper way to pronounce it would be the "delusion" separator. I would advise those people, if they are here, to put a Babcock test over that "delusion" separator and see if they can longer afford to use it. You never can know for a certainty whether they do good work until you put the Babcock test over them and see what it says about the residue after the separator has taken off the cream.

There is here also an exhibit of a stall, which has attracted

a very great deal of attention. I am not here to say anything about the merits of that stall one way or the other, further than this, that you have heard here from time to time a great deal about the necessity of providing such arrangements in the stable as shall conduce to the comfort of the cow. If you are satisfied that this stall or any other arrangement for securing the cows in your stable will give your cows greater comfort than the manner you now have of fastening them, I beg to assure you that you cannot make a better investment than in providing something to add to the comfort of your cows in their stable. If this stall or any other arrangement that you may have for confining your cows contributes also to the cleanliness of the cow and of the stable, you make no mistake in investing in that direction.

Hence I say, these exhibits, while they are not numerous in number or elaborate in quality, yet they serve as samples and ought to be educative to this community.

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## WHAT THE PURE BRED SIRE HAS DONE FOR THE DAIRY INTERESTS OF JEFFERSON COUNTY.

Frank B. Fargo, Lake Mills.

Mr. President, and Gentlemen of the Convention, I appear here today in response to an invitation from your Secretary, to read a paper or speak on an important subject, certainly not because I am a public speaker or writer of papers, for he knows full well I cannot claim a reputation for either, but probably because I have something of a reputation as a breeder of full blood dairy cattle, and have decided views as to the best methods for the improvement of dairy stock.

What have full blood sires done for the dairy interests of Jefferson county is the subject assigned me, and if I repeat in this paper much of that which I read last week at Madison, I hope I may be excused, and, if I express my preference of breeds let it not be understood that I desire to belittle any of the choice breeds which have participated in making Jefferson county famous, or underrate the judgment of those whose preferences differ from my own.



The world's four great dairy breeds are well represented in Jefferson county, all have their admirers, and all have contributed to the reputation of our county. The Jerseys, the Guernseys, the Ayrshires, and the Holsteins, in the hands of those whose aim is, and has been, to reach high quality, by pure breeding, have brought about great results, and it is only needful to consult any of these breeders to learn that the use of full blood sires, chosen from ancestry of high quality in both of their families, have been the source of a large share of the success which has been reached, and is the only safe method of breeding.

Not having had personal experience with but one of these dairy breeds, I can better show my knowledge of what full blood sires have done for us, by taking that breed as a criterion by which to show the value of full blood sires, whether in pure or in grade breeding, and if by this course this paper sounds rather loudly of Holsteins, you will pardon me.

Without doubt it is the desire of every dairyman to have a herd of cows which will secure for him the largest net income and give him the greatest amount of satisfaction in their handling. To this end, enterprising men have given attention, devoted their labor and money, with varying results; in the section where I have had my experience, the conclusion has been reached not in haste, but after years of careful trial tests as to butter producing qualities, and the other features which go to make up a really profitable dairy breed, that the Holstein Friesian class of dairy animals are superior to all others. Some years ago a very few of this breed were brought to Lake Mills. Later, Mr. August Wegemann bought of importers in the east, a number of choice selected registered Holstein Friesians and stocked his farm at what was considered by his neighbors fabulous prices; but his venture proved a grand success and created a desire in others to follow him in his undertaking. Probably Mr. Faville and Mr. Leonard were pioneers, but it fell to the lot of Mr. Wegemann to exemplify his courage by venturing upon the secure ground of pure breeding regardless of cost, and to him is largely due the credit of setting the ball rolling which has made Lake Mills the greatest Holstein center in the west. Full blood sires have been secured by farmers who possessed herds of other breeds, and the raising of grade Holsteins has become a large business, covering a radius of

some seven miles, including probably two thirds of the farmers in that section; and so extensive has it become, and so wide the reputation of Lake Mills as a Holstein center, that buyers from Maine to California, from Canada to the Gulf and from the Republic of Mexico, Cuba, and the Isle of Pines, are purchasers in our markets, at high prices both for full bloods and grades, until the demand has exceeded the supply, in spite of the hundreds that are being raised every year. It is safe to say that a hundred thousand dollars worth of these cattle have been shipped from our station annually for the past three or four years, which money has been left with the farmers who have been wise enough to engage in the business.

Some eight years ago I commenced looking into the quality of this breed, studying its history back to its mother country, Holland, and found that the ancestry of these cattle may be traced unalloyed for more than two thousand years, and that they have been carefully bred there, treated with the utmost kindness, until their natures had become imbued with that same kindness, and gentleness of spirit, and they are famous for their docility. Their ability to give their owners a fabulous quantity of milk which has given Holland an almost world wide reputation as a butter and cheese-producing country, makes them eagerly sought after in the best European markets at the highest prices. And I also found that the breeders of pure stock in this country, and the Holstein dairymen east and west were constantly accumulating evidence of the high qualities of this breed, corroborating the reputation it had at home; and after tracing up the pedigrees of different herds, I stocked my farm with full blood Holstein Friesians, built a barn of a size to accommodate over two hundred head, with all conveniences for feed, light and ventilation, a silo capable of holding 1,200 tons of silage. Soon my barn room was full of such stock as would bear inspection both as producers, and in breeding, and I was able to make advantageous sales and at prices which corresponded with the care I had taken in building up my herd and the quality of my stock. With others I have helped supply the farmers with choice young full blood registered sires and from these united efforts have come the remarkable results before spoken of in the breeding of both pure blood and grade Holsteins which has made Lake Mills, Jefferson county, the great center of this breed in the state and in the west, lifting

the mortgages from many farms, and brought to the community thousands and thousands of dollars to make happy the earnest, honest sons of toil with which our community is favored. It has been brought about by the persistent work of a few, but with a tardy response from those who could be most benefited. Still the results have been good, not so good, however, as they would have been, had the farmers more readily accepted the fact that nothing but full blood sires should ever be used, to convince them of which has been a hard task and still is somewhat in the way of reaching highest success.

Here permit me to say to the farmers present if you wish to better your herd, whatever may be your choice of breeds, use nothing but a full blood registered sire from a family of butter producers with a reputation on both their sire's and dam's side as such; have no trifling in this matter, better far pay a high price for the right one, than to have the wrong one as a gift; of this I speak both from observation and experience. In raising grades you are much more apt to get a producing herd in this way; and as the demand is greater than you can supply, your income is a certainty. You cannot be too careful in this, and especially so in starting a full blood herd, as I find that most new breeders buy anything in shape of a full blood if registered, paying no attention to what their ancestors have done. It is the high prices and lack of understanding of their necessity that brings this about. When stock is selected with records only on one side, they have to peddle out their stock for some time at low prices which discourages many and drives them out of the business; when, if they had started right, they would be in a position to ask prices and get them. Instead, they practically give them away, receiving probably \$25 apiece for calves.

You will readily see from this that the demand for your cheaper bred stock is from your neighboring farmers for grade breeders to those who do not look ahead for results, and for your full blood advanced registered stock from breeders who have given it thought and are willing to pay the prices.

Giving calves away, reminds me of a story I heard the other day.

"A negro woman on a train in trying to get her baby to nurse used the following convincing argument. 'Take youah dinnah, Gawge Washinton Jackson; now Gawge Washinton

Jackson, you bettah take youah dinnah! If you don't take youah dinnah, Gawge Washinton Jackson, I'se a gwine to give it to the Conductoh!"

You know by this time my choice of dairy breeds is the Holstein Friesian, and of course you want me to tell you why.

To begin with, as I said before, this breed has been constantly bred in Holland for two thousand years and so handled that it has such prepotency that not only color, but other characteristics have been transferred to the progeny in nine cases out of ten, where full blood sires are used, regardless of what they are crossed with. They are the largest dairy breed in the world, have the greatest vitality of any, which they universally hand down to their progeny, together with their docile character, and the good disposition of the calves is shown that they will drink from the pail almost from the start; they are large at birth, almost always strong and healthy, growing fast and fattening easily, making their veal exceptional. The great size of the adults makes them superior as beef cattle if it becomes desirable to thus dispose of any, and they fatten rapidly. As milkers they surpass other breeds in the quantity they yield, and though the milk may not be quite as rich in fat as that of other dairy breeds, the greater quantity fully makes up for the difference, leaving a much larger amount of skim milk for the use of the owner. Further than this, their milk partakes of the great vitality of the breed, and by scientists it is declared to be the safest milk for food, both for adults and children of any product.

Allow me to quote from J. Allen Gilbert, an eminent scientist, as follows:—"All in all, if one were choosing a human wet nurse he would look for just the characteristics in her that tution, quiet, easy going temperament, uninfluenced by external we find presented in a Holstein cow, namely, vigorous constitution, good glandular development, abundance of good milk, freedom from disease or tendency to disease, a good healthy child of her own, and a good family history."

As to the skim milk, it has a larger percentage of food qualities than that of any other dairy breed, which taken together with the greater quantity, is a very important consideration to the owner. The fat globules in the Holstein milk are much smaller in size than in the milk of Jerseys, Guernseys or Ayrshires; hence will not float or rise so rapidly, which is an im-

portant consideration in shipping milk as it can be sent further without creaming and after cream has to some extent risen, the milk will bear mixing by stirring that other milk will not, and when thus stirred it resumes its normal condition without damage, which enables milkmen to serve their customers with milk nearly or quite uniform in richness, the bottom of the can being as good as the top. It must not be understood that the milk of the Holstein is deficient in butter fat, for such conclusions would be entirely erroneous; they stand at the head as being the greatest butter producers of the world, and placed side by side with other herds they will hold their own, herd for herd in butter yield and give a much larger and better by-product than any of their competitors. Among the great records in America today the Holsteins both in number and in quantity of product hold rank with the best.

The great vitality of this breed has proved a safeguard against disease, as their resisting qualities are so great as to make them largely immune from tuberculosis and other dangerous diseases, and more simple ailments. This also enables them to bear their young when properly cared for almost entirely without loss or failure or danger of milk fever or exhaustion.

I have thus briefly and crudely drawn a vivid picture of the Holsteins as it appears to my mental vision after breeding them for years, handling and testing them in every way and observing the results in the community where I live; and the work and the results of other breeders, and the further my research goes the more firmly am I convinced that the Holsteins are the greatest dairy cattle in the world, and so firm is that conviction that nothing could induce me to change to any other breed.

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#### DISCUSSION.

The Chairman: It is the mission of the Dairymen's Association to help the dairymen all that it can; to help them to improve their stock and to encourage them to keep the best dairy cows. But it is not the purpose of the Dairymen's Association to help build up any one particular breed of cows. We know that there are many—as Mr. Fargo has said—there



are several different good dairy breeds, and we want every one free to use the breed which suits him the best and then he will do better by them every day and they will do better by him, than if he took a breed that he didn't take a fancy to.

What has been said about the pure bred sire is just right, it is just what we all have to do, and what I have to say about Mr. Fargo's paper is, if he had, every time he spoke of a Holstein, said "a good dairy cow" instead, it would have just suited me.

Now, this question is open for discussion, but I want to say on the start that I think it is better to rule out a discussion of the merits of the special breeds. I have seen such a discussion take possession of a meeting and there was nothing but war from that on all the way through. I think it would be well to discuss the effect of using pure bred sires, just as the title of the paper suggests, but I do not think it best to champion any particular breed. The *dairy* cow, that is what we want.

Mr. Taylor: Mr. Chairman, in the discussion of dairying we want to make the dairy cow the center of our thought, that is, the dairyman and the dairy cow.

Now, the time has gone by for us to discuss anything but the dairy cow and the dairy man. I think that everything the gentleman has said in his advice regarding pure bred sires, is good. I am not in sympathy with any person breeding a pure bred dairy animal, standing before an audience and praising his own breed as standing above all others.

There are four main dairy breeds of cattle in the mind of a dairyman, who likes dairy cattle, and the breed that he likes best he will do better with than any other, the breed that receives his sympathy and his best effort. I think it is safe advice to advise the dairy men of Wisconsin to use a dairy bred sire of the breed he likes the best, the breed that receives his love, his his prejudices and his favor. I am in favor of that always. How do you suppose a Jersey cow would fare in the hands of a Holstein breeder, a man who likes Holstein cattle, or how do you think a Holstein cow would get along in a Jersey herd?

Sec'y Burchard: Down at your place, for instance.

Mr. Taylor: Down at my place. Don't you think she would be a little like a sinner in Heaven? Honestly, don't you think

she would be all out of place just as much as a sinner in Heaven?

Now, fellow dairymen, you are receiving the advice of men who want to do you good, that want to help you, and we think that we have got you switched off from the dual-purpose cow onto the line of the special dairy cow and we are perfectly willing that you should sail under your banner, under the flag that you have raised yourself. I wouldn't breed Holstein cattle if I liked Jersey cattle, simply because my neighbor does, and I wouldn't expect my neighbor to breed Jersey cattle because I do; no more than I would ask my Baptist friend to come over and join my church because there are more in my church than there are in his.

I am saying to you that you had better take a breed of cattle that you like best and then do the very best you can with them. There are seven thousand things that a good dairy cow is entitled to as a dairyman. You have a right to daily demand that the cows that you have put in your dairy shall be dairy bred cows. She has a right to demand that her offspring, the calf that is to take her place, shall be from a thoroughbred dairy sire.

But now, my fellow dairymen, I want you to understand that it is not all a matter of the breeding. There are a hundred thousand things that the cow has a right to demand of you as a cow owner, and best of all she has a right to demand a good home with a dairy man that likes that kind of a cow, and you have no right to put a cow in any other kind of a home. She has a right to demand of you that from start to finish of her living with you that you render unto her proper attention at the proper time that she may do her best work in the dairy.

This is a subject that is very close to my heart and life and I want to give to you what help I can in your dairy work. I don't want to becloud your vision, I want to encourage you to build up better herds, give them better attention, better barns, care for them at the proper time when they need attention, do as well as you can and I know that your financial interests will be advanced.

Mr. Glover: Mr. Chairman, I would like to supplement what Mr. Taylor has said by speaking a little further in regard to the selection of a sire.

It is not enough to choose a sire from the breed that you like

best, but it is also necessary to look into the ancestry of that animal that you are to buy. Because an animal is pure bred doesn't necessarily make him a good sire.

Mr. Taylor: It is better than a grade or scrub.

Mr. Glover: May be not. I have seen some grade sires that have been chosen for years and years for dairy purposes that I would rather have than some pure bred.

Mr. Everett: That is dangerous doctrine.

Sec'y Burchard: No, it is not.

Mr. Glover: I want to tell you, I have tested pure bred dairy cows for three years that didn't average 200 pounds of butter per cow.

Mr. Taylor: Did you test the dairy man?

Mr. Glover: Yes, I tested the dairy man. We not only want to like that particular breed, but we want to look back to their ancestry. It is time we raised ourselves above these notions and asked what kind of a mother did this sire have and her mother, his grandmother, as far back as you can reach.

I want every farmer to use a pure bred sire, but I want him, when he goes into a herd, to ask the man, "How much did his mother produce and her mother and her grandmother?" and so on back into the pedigree, through the record. When farmers begin to study a sire from that point they are not going to be very far wrong.

You take some of the animals that have been exhibited and won prizes at our shows. A few years ago a man sitting before me now was exhibiting a very fine cow from Wisconsin at the State Fair. There was a very practical judge passing upon it; the audience stood by the show ring and they saw that this beautiful cow did not receive any place at all, but that a rather inferior looking cow was put at the head. The same judge was passing through the barn that night and the owner of this cow was milking her, and the judge said to him, "Mr. Jones, is that the best cow you have on your place?" "No," he says, "that is my poorest cow, but she is a mighty good show cow." Those two men are here, the man who did the judging and the man that owned the cow. We want to do away with these things in our breeding up, we should be guided largely by the records,—just how much by the breed characteristics I am not able to say.

There is another thing of great importance, and that is the

power of producing young. In the work in Illinois these things came before me. Here are a hundred points we give to an animal on the score card. Well, we take into consideration her breed characteristics, her dairy conformation as it conforms to the standard outlined by some associations.

The question has been running over and over in my mind how much should we give to breed characteristics and how much to the power of the animal to produce butter and milk which is the ultimate end of all breeding, to get an animal of as high a power as possible to turn oats and bran into milk. Because she has a high, curved, pelvic arch you will not get milk for that. We do not keep cows to satisfy our fancy. A few rich people do but the rank and file of Wisconsin are keeping them for what butter fat they will produce.

Now, how much shall we give to the breed characteristics and how much to production and how much to the power of producing calves annually? We are placing too much emphasis upon breed characteristics, upon fancy points, but I am glad to see the breeders are facing right about, and they are making records; they are talking figures with records back of them, and the day is here when we are going to have, not only for a week, sixty days, but yearly records, and I offer these suggestions to the farmers that have not bought a pure bred sire and are going to do so. Go to the farmer who can show you the yearly record of his cows and pick your sires from his herd. I had rather have a sire out of a cow that I was sure would produce 300 pounds of fat in the year, than one out of a cow that would take first prize at our state fairs.

Prof. Emery: Mr. Glover, which gives the greater promise of certainly transmitting these dairy qualities, the pure bred sire or the grade sire?

Mr. Glover: Well, you of course are asking a very hard question.

Prof. Haecker: Other things being equal, the pure bred sire.

Mr. Glover: Yes, other things being equal, the pure bred sire. We should stick for the pure bred, don't go for the grade. When I said I would rather have a grade than some pure breeds, I meant just what I have seen by traveling about six years among breeders of all kinds of dairy animals and making records of what they are doing. I took a pure bred herd of



dairy cows and in three years' time, raised them from 225 pounds of butter up to 306, by culling them out, and there was one pure bred cow in that record that never raised herself above 158 pounds of butter. Do you want a sire out of that mother? Or would you take it out from a mother that would make you four or five hundred pounds of butter?

Mr. Everett: You don't advise farmers to use grade sires?

Mr. Glover: No, I don't.

Mr. Everett: Particularly at this time when pure bred sires are so abundant.

Mr. Glover: No, I don't at all.

Mr. Taylor: You mean to say that some pure bred sires are not fit to breed to?

Mr. Glover: I say there don't enough of them go to the block and there are a few grades that are good ones.

Mr. Phillips: How are we going to find out whether they should be sent to the block?

Mr. Glover: If you found out that he had an inferior mother, a cow that produced, say, 150 pounds of butter, she was not a fit cow to use a sire from.

Prof. Emery: Then you would send that calf to the block?

Mr. Glover: Yes, I would if I were a breeder, for the advancement of the breed.

Sec'y Burchard: There is nothing that has so militated against the breeders of pure bred dairy cattle as the fact that they have sent out from their herds just that kind of stock, and when the common dairy farmer has got a bull from a pure bred sire and the dam actually only makes 150 pounds of butter and the farmer is using that sire on his common stock and finds that the calves produced are inferior to their mothers, as they are almost sure to be, he then very naturally becomes disgusted. Breeders of pure bred dairy cattle can do themselves and their stock no better service than to condemn mercilessly to the calf buyer every bull calf that does not come from a good producing cow.

A Member: I want to stand up and serenade what this young man said.

Mr. Hill: I want to serenade what Gen. Burchard said. This is a mutual admiration society, I guess; at any rate I want to emphasize a little further what Gen. Burchard said.

There is no question but what with many of the breeds,



their popularity for a time has been built up upon some fad of color or form or something else that has appealed to people rather than what ought to have appealed to them in dairy production.

Remember, we are talking about dairy cattle, that is, we have ruled out beef and the dual-purpose calf. There isn't anybody here to defend them, and I think we can congratulate ourselves on that more than anything else this afternoon.

Then, having ruled them out we ought to consider nothing else but how much butter fat a cow will produce in a year. A year ago, perhaps it would not have seemed wise for me to say that, but now all four dairy breeds are doing efficient work and you can go into any breed in Wisconsin and pick out a dairy sire from a breed that has been officially tested by the Wisconsin Experiment Station.

Another thing. Because some one breed may to-day be more popular than another breed—I can say this because the breed in which I am interested happens to be popular at this time and I think it works with other breeds, but as I was saying, because almost any—say, Guernsey bull—can be sold at this time at a good price, no doubt Guernsey bulls will be sold that ought to have their throats cut. Don't you go and buy a bull of a breed that is popular just because he is of that breed, when you can get a better bull of one of the other breeds for less money. Keep it in mind that it is a question of the production of butter fat, never let that get away from you when you go to buy a bull, no matter what the breed is.

Prof. Haecker: I have been greatly interested in this discussion and I want to heartily endorse what has been said here by those who have taken this advanced position in regard to the sires that are the offspring of cows only that do good work, sires from cows that have made records, and I think that we are today in a better position than we have ever been before; that the conscience of the breeder has been awakened as well as the conscience of the politician and that from now on there will be probably less unworthy male calves offered for sale, simply because they happen to have belonged to a certain breed and to be eligible to register.

It is rather a difficult matter for a breeder to kill a calf that he could turn off at a pretty good price, and sometimes I

think that there are some justifications in selling a calf that is really not up to the standard to a man who has very poor cows. Of course I wouldn't want to sell a bull calf—I wouldn't want to keep a thoroughbred cow that might not perform any better than the one Prof. Glover has referred to, but sometimes there are bulls that are not up to the standard, that we don't think are fit to sell for the use of a full blood herd, that yet would do a great deal of good in a scrub herd.

If I may diverge a little from the subject under discussion I want to say that I have a wholesome respect for a state that has held its own so remarkably well during a period when the trend seems to have been all in another direction in the surrounding states. You people who reside here in Wisconsin can have no idea of the strong current that was flowing from 1896-7 or along there, toward the use of the dual-purpose sire and the powerful forces that have been backing up that sort of doctrine. In fact, all the other states surrounding you have been swept over with this dual-purpose craze. I remember one of my colleagues writing an article in one of our agricultural papers and he boasted that the dual-purpose band wagon was sweeping over the great Mississippi from Winnipeg to the Gulf of Mexico, and I am sorry to say there was a good deal of truth in that, but when they came down here near Wisconsin, they found an established sentiment against this theory which had caused in Minnesota and Iowa and other places a great deal of destruction of dairy breeding and progress in dairy lines.

Now, that means a great deal to this state; it means millions of dollars per year that you have retained your dairy sires, that you have retained the idea of dairying with a dairy animal, and I want to locate the source of the powerfully potent forces that have been enabled to stem this tide in this state, and I say it finds its foundation in the influence of the Old Guard that first established this Association, and that influence has spoken through this Association and through Hoard's Dairyman and I might say through the dairy school, but I will have to omit that, but through other organizations that have been in public service in this state. The state of Wisconsin will never be able to give the due share of credit to those forces that have accomplished so much when the tide was running against the dairy cow.

The Chairman: We will have to close this discussion and go on with another subject.

Now, the summing up of this whole talk is this: Get a good, pure bred dairy sire, but be sure to get one that has good producing female ancestors. We will now hear the report of the committee on resolutions.

The following resolutions were read by Mr. Everett:

## RESOLUTIONS ADOPTED AT THE WISCONSIN DAIRYMEN'S CONVENTION.

Mr. C. H. Everett, chairman of the Committee on Resolutions, submitted the following report which was approved by a rising vote:

*Resolved*, That we have been well received and entertained by the people of Tomah and vicinity; that the local committees have been diligent and painstaking in preparing for this convention; that we have had a splendid meeting and a good time; that we duly appreciate the many courtesies and kindly acts extended to us and express sincere thanks for the same. The banquet was splendid; the hospitality of the citizens of Tomah unsurpassed; we appreciate everything.

*Resolved*, That it is the sense of this convention that the Wisconsin Dairymen's Association is warranted in using a large portion of its annual appropriation for the purpose of organizing self-supporting cow tests associations. The work of an extended test of the performance of individual cows wherever carried on has proved of immense value in weeding out inferior cows and educating cow owners.

WHEREAS, Under the present railroad rates in portions of this state, a local creamery paying a dollar a hundred to ship its butter to Chicago by express is competing at the same time with Chicago centralizers that secure rates on 40 per cent cream shipped as baggage at 26 cents per 100 lbs., cans returned free, thus enabling Chicago centralizer to obtain a transportation rate of 52 cents a hundred on their butter, while the local Wisconsin creamery must pay \$1 per hundred to get its butter to Chicago by express, therefore be it

*Resolved*, That such discrimination in transportation charges by the railroad is not a square deal to Wisconsin local creameries, railroad companies and their patrons.

*Resolved*, That this discrimination in charges is a serious menace to the local creamery and the dairy industry of the state, and the officers of this association are hereby requested to urge this matter upon the Wisconsin Railroad Commission and the National Inter-state Commerce Commission for the purpose of securing justice in transportation to the Wisconsin local creameries and their patrons and that they secure the co-operation of the dairy and daily press in arousing and reporting the dairy sentiment of this state in the securing of equitable rates.

*Resolved*, That we fully appreciate the splendid work being done by Dairy and Food Commissioner Emery and his able corps of assistants in enforcing the laws strictly to the letter.

*Resolved*, That we deeply regret the loss of health to Professor W. A. Henry, which compels him to tender his resignation as Dean of the Wisconsin College of Agriculture, and Director of the Experiment Station.

Professor Henry has done a grand work for the farmers and dairymen of this state. He has been a man of great endurance and of fine executive ability, but has done too much, worked too hard and must now retire for a time to regain his strength. He is an ex-president of this Association and a member of its Executive Board. He has always been found with his shoulder to the wheel, pushing with all his might to elevate the standard of dairying and to bring more prosperity more comfort, more knowledge and more independence to the individual dairyman. He has always been a wise and safe counselor and we are pleased to know that he is not to retire permanently from his chosen field of work, and that we may have his advice and counsel for many years to come. The members of this Association, who have worked with Professor Henry for these many years, appreciate his worth to the agriculture of Wisconsin and regret that duty compels him to place the reins in other hands.

*Resolved*, That we have met with severe loss in the death of two distinguished and greatly beloved members and ex-presidents of this association, who have gone on before us into the sunshine of the future, since our last meeting.

No man can say too many good things about H. C. ("Cully") Adams and Stephen Favill. Mr. Adams was a remarkable man in many ways. He was far above the average



man in intellect, in debate, in judgment, in frankness, in kindness, in sympathy and in loyalty to his fellowman and to right principles. He was never known to do a mean thing or to commit a dishonorable act. His soul was large. He had a great big heart, full of tenderness for everyone. He was a big, broad man with a mental vision of great power. We all know of the splendid work he has done for this state and for the agriculture of the United States. We also know what he accomplished for the good of mankind during his short stay in Congress and in what esteem he was held by both houses of our national legislature and by President Roosevelt. He was a leader, so recognized by the brightest minds of our country, and lacked only physical strength to have made him one of the foremost men of the nation. There is not another "Cully" Adams, and there never can be, to the old members of this association. We loved him because of his honesty, his wisdom, his loyalty, his manliness, and his sweet, simple personality. We miss him at this meeting and we shall miss him greatly in the Executive Board, of which he was an honored and ever useful member. The place made vacant in this association and in our hearts by his untimely demise can not be filled now, nor do we want it to be. It is "Cully's" place and we shall keep it vacant until we meet him again.

*Be it Resolved*, That a copy of this resolution be sent Mr. Adams' family.

What can we say of that sweet old soul, Uncle Stephen Favill, who, though past 80 years of age and nearly blind when he died, was patient with all, still hopefully cheerful, and anxious for the welfare of Wisconsin dairymen? No man ever lived with a sweeter, more kindly disposition than he possessed. We have often seen him opposed in debate, but never saw him ruffled nor out of patience. He was always most charitable toward others and while he entertained most decided opinions, was ever ready to give way when satisfied that he was wrong. Although Mr. Favill was almost double the age of many members of this body, he was one of the boys just the same. He was so close to us, so entwined in our affections that we often called him Steve. He was always more like a young man than an old one. He was the oldest member of this association and one of its first presidents. His splendid work in building up the dairy industry of Wisconsin



will live on long after him and will stand as a monument to his skill, integrity and perseverance. His long active career has come to an end and he has passed on from this world of tribulations into a calm peaceful future. All we can say is "Good-bye, Uncle Steve, we will join you later."

Prof. Emery: I move that the resolutions relating to Mr. Adams and Mr. Favill be adopted by a rising vote.

Motion seconded and carried.

Said resolutions adopted by unanimous rising vote.

The rest of the report of the committee also adopted.

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## STABLE CONSTRUCTION AND SANITATION.

By E. L. Aderhold,

Dairy and Food Commission.

It would be an easy matter to demonstrate that the question of stable construction and sanitation has been badly ignored and in some respects, entirely misunderstood by the masses of milk producers.

In case we were to inspect a promiscuous lot of several dozen stables we might find a few that have fair ventilation, plenty of light, whitewashed walls and ceilings, sanitary floors, an absence of objectionable odors, and where clean cows are kept.

In most stables, however, we would find the ventilation very faulty, not enough light, cobwebs and dust overhead. in some we would find leaky, rotten floors, putrid soil underneath, strong odors and cows plastered with dung.

Milk produced under such conditions does not belong in the same class with milk which comes from clean cows in a sanitary, healthful stable.

The man who works in a tannery becomes so accustomed to the odor connected therewith that he fails to mind it. In a

like manner, he who daily works in a filthy stable may not appreciate the odors that prevail there.

The law requires that the stable shall be well lighted, well ventilated, not filthy, and the cows shall not be filthy. A penalty of \$25.00 to \$100.00 for each offense is provided for a violation of this law. Stable inspection will be in progress hereafter, so it behooves every dairyman to post himself on this question.

In discussing the subject assigned me I have no wish to go into details but merely to touch upon those features which insure to the cows comfort and cleanliness and which are conducive to healthfulness and productiveness.

#### CONTAMINATION OF STABLE AIR.

According to a certain experiment the weight was kept of the food and water consumed by a steer weighing 1600 pounds, also the weight of the solid and liquid manure voided and the gain in weight of the animal.

The weight of said voidings, plus the gain in weight, proved to be 49 pounds less in 24 hours than the weight of food and water consumed.

It was given out that this 49 pounds of food and water was discharged mostly from the lungs in the form of moisture and carbonic acid gas, nearly half of it being converted into carbonic acid gas.

When one animal will discharge so large an amount of impurities we must conclude that with a stable full of live stock the constant discharge of impurities amounts to considerable. To this must be added the odor arising from the dung.

Upon reflection it becomes at once apparent that if the stable air is to be kept comparatively pure it must be kept rapidly changing.

Carbonic acid gas is poisonous, is heavier than air, and settles to the floor. The coldest air also settles. In the upper layer we find the heat and purer air than at the floor.

#### VENTILATION.

The system of ventilation in use in many stables is an opening in the ceiling, with everything else closed during cold

weather. That system does not remove the foulest, coldest air; it does not provide good circulation at the floor where the cows breathe and throw their breath; it does remove the best air and the heat, and it demonstrates the ignorance of the masses on stable ventilation.

We should aim to have the air changing as rapidly as possible consistent with a sufficiently high temperature. Cows will not yield milk profitably if they are obliged to suffer from cold.

This picture illustrates the King system of ventilation, the principal features of which are that it removes the lower layer of air but does not permit the warm air to escape. In a well constructed stable this insures a rapid change of air without unduly lowering the temperature.

Outlet flues are built, usually of lumber, beginning eight or ten inches from the floor and extending higher than the ridge of the roof to insure a good draft at all times. When made of metal, ice is liable to form on the inner walls. One such flue is sufficient for a small or medium-sized stable, while a very large one would probably be better served with two flues some distance apart.

The proper capacity of the outlet flues is determined by the total weight of live stock in the stable, figuring one square foot of cross section inside for each 5000 pounds of live stock.

For instance, if the stock weighs about 20,000 pounds four square feet would be required, which could be furnished by one flue two feet square, or by two flues 12 by 24 inches each. Each flue should be provided with a damper for regulating the flow of air when a strong wind prevails. The lower layer of air at every part of the stable should have an opportunity to flow along the floor to an outlet flue. These flues may be placed where least in the way. If one happens to be placed close beside a cow she should be protected from draft by a partition several feet high and as long as the cow is.

#### INLET FLUES.

Fresh air is admitted through the small flues at the walls, which compels the air to travel upward about four feet where it is discharged at the ceiling where it meets the heat and becomes warmed. This arrangement prevents the warm air

from flowing out, inasmuch as it will not travel downward against the colder, heavier air outside. These inlet flues are usually four to five inches in diameter and are distributed on two or more sides of the building, say one every 10 to 15 feet. Where cows are facing away from the walls I think some of these flues should be extended along the ceiling so that they will discharge the fresh air directly over their heads.

At present I don't know how important the inlet flues are as I have seen apparently satisfactory results where only the outlet flues were used and I would urge every dairyman to install the latter and follow directions closely.

#### HEAT.

Heat in a stable represents food, so during the winter we can't afford to waste it. It should be utilized to the fullest extent in warming fresh air. It should not be permitted to flow, leak or be conducted out. That implies a tight ceiling, tight walls, preferably with one or more dead air spaces or some other good insulation.

#### LIGHT AND DISINFECTION.

Sunlight doesn't cost anything so we should not deny it to cows. The amount of window space recommended by the United States Department of Agriculture is six square feet per cow. Windows should be long, placed vertically, most of them perfectly on the south and east sides where they are protected from the coldest winds.

Whitewash is a most effective, inexpensive agent of sanitation and should be used about twice a year on ceiling walls and fixtures. It can best be applied with a spray pump. A little common salt added to the whitewash renders it less liable to rub off.

#### FLOOR.

The plank floor is now quite expensive, not durable and, as commonly laid, permits liquids to leak through into the soil, which becomes foul and from which gases rise upward into the stable. As a rule it is a decidedly unsanitary floor. Whenever a new floor is to be laid cement concrete should be

used by all means. Then there will be no leaking and no decay.

The stall floors may be overlaid with boards or plank. The pitch of the stall floor should not exceed half an inch from manger to gutter. The size of the gutter, according to some of our most progressive dairymen, should be eight inches deep by twenty inches wide. Others maintain that it is not necessary to have it so big. The passage back of the gutter should slope but slightly toward the gutter. It should have a rough surface to prevent slipperiness. The inner surface of the manger should be very smooth to facilitate cleaning.

Common decency, as well as the law, requires that cows be kept clean. It is not expected or necessary that farmers spend much time in cleaning them. The sensible thing is to provide stalls wherein cows cannot become filthy, and on this point some farmers will be obliged to do some studying otherwise they may get into trouble.

It should be made next to impossible for a cow to soil her bed. This result can be obtained by using such stalls as the "Thorpe," "Howie," or the "Model" stall, and several others. The above named stalls, I understand, are not patented. The rigid stanchion should not be used because it is non-adjustable, and punishes the cow. An adjustable swing stanchion is now on the market and is considered worthy of attention and, by the way, I would suggest that almost any swing stanchion can be made adjustable by using an eight or ten inch plank flatwise at the bottom and one likewise at the top to fasten the ends of the stanchion on. With such an arrangement the stanchions need not be fastened in a line. They can be fastened long or short, according to the length of the respective cows.

It would seem advisable to have stalls of various lengths, rather than do all the adjusting at the front, especially where the manger is not movable. The mangers or gutter may be on the bias. Let the stall at one end of the row be four feet long and at the other end of the row, five feet long. The cows may thus be placed in stalls that nearly fit them. The fit can be made perfect by a little adjusting of the fasteners. Where stalls are separated by partitions the cow cannot step on and injure her neighbors udder. A box stall should be available at time of freshening.



The sprinkling of land plaster behind cows daily, as practiced by some of the most successful dairymen, tends to hold the ammonia in the manure, thereby preserving fertility and lessening contamination of the stable air.

When horses and calves are kept in the same building with cows it is an advantage to have them partitioned off.

Where manure is kept in the barnyard it should, if possible, be piled up some distance away from the stable, so that cows don't need to wade through it.

Having provided sanitary, healthful, comfortable quarters such as every cow owner ought to have, the cows should not be left long outside on winter days. The stable keeps the cows warm provided the cows keep the stable warm. They can't do it if left outside too long.

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#### DISCUSSION.

A Member: Would you make that outtake flue as large as 3 by 3 feet if the barn required it, rather than to make two flues?

Mr. Aderhold: Mr. Hoard has his outlet flue 3 by 3 feet and it certainly does good work. You will find some stables where they have high mangers or partitions which are high clear across and you can't expect that heavy, lower air to jump over that partition, and you have to have more than one in that case.

A Member: Would you take the air all from one place?

Mr. Aderhold: Run it clear down to the floor, just as you would a chimney.

Mr. Linse: Isn't it a fact that the outlet can be too large?

Mr. Aderhold: No; the trouble is that most of them are too small.

A Member: Would you advise having the cows face each other or otherwise?

Mr. Aderhold: I don't know that I want to give an opinion on that. The only criticism I have ever heard is that when they are facing the walls they face the light. Of course the question as to which is the most convenient for doing the work comes in. I am not particular about that.

A Member: I have those ventilating flues and I put them in the wall 6 inches by 10, I have four of them. They were intended to be 10 by 12, but they ran to the purlein and then had to be made smaller. Is that enough capacity, do you think?

Mr. Aderhold: I would rather run them full size, clear down.

A Member: How much stock would you calculate for that size? I have about thirty head.

Mr. Aderhold: Well, you have just about half enough ventilation.

A Member: They are twenty-eight feet apart on this side and I am calculating to put in an extra flue over the top there and carry it down in front of the mangers so there will be the same capacity below.

Mr. Aderhold: You are putting in a lot of lumber for the effect you are getting, I will tell you that. I think with less lumber and bigger flues you would have a great deal better effect.

The Member: The question with me is, how can I improve on it, having it the way I have, or had I better tear it out altogether?

Mr. Aderhold: Talk to me privately about that, and I will give you advice. I never would advise a man to follow the line of roof. If they come out at the purlein plate or the hip you can let them stick straight up sufficiently so that they clear the ridge of the roof rather than to follow the line. It is a good deal better and saves the expense of making those crooks.

A Member: Why is it necessary for the light to shine in the cows' faces?

Mr. Aderhold: It isn't for the light alone, but the fresh air comes in at the walls, and if some of those flues discharged right near, it might be some injury to the cows.

A Member: If you didn't care about having an alley wide enough to drive through, but simply to be able to clean out how wide would you make that alley?

Mr. Aderhold: I can't tell you that. My lecture has been along lines of sanitation, but of course you are supposed to have room enough to pass behind the cows easily.

Prof. Emery: This system, what we call the King system, for the ventilation of barns is very familiar to the teachers of

Wisconsin, particularly where they have had the old so-called Ruttan system of ventilation in the school houses, and I do hope that the encouraging of good ventilation in your barns will result finally in bringing about better ventilation in our school houses. By this system of ventilation, if you get that point you can adjust your means to the end, and the point I refer to is to ventilate by means of frequent change of air without creating cold currents upon the cows. I suppose the discussion will go on for a long time yet as to where the vilest air is in a barn. The vile air diffuses itself by what is called the principle of the diffusion of gases. The gas doesn't come and stay anywhere in one place, but when the gases come together they tend to diffuse, so that a heavy gas in the lower portion of a room does not remain there, but by a law that is well recognized diffuses itself throughout the room. You must consider gases somewhat different from liquids, but this, in one sense, is just like a pail of water reversed; this is the portion that is holding the gas down, and by the expansive force of the air due to heat is governed the pressure which causes this air to rise here; hence, you will see that you must have close walls and you must not have open windows, and in any system of ventilation we must recognize the necessity of having the walls thoroughly tight, except the opening where the air is admitted.

Now, if you keep in mind these few fundamental principles that animals, (to which class we belong,) God has made them with lungs for a certain purpose and the purpose of those lungs is to take in the oxygen in the air, and in these lungs the air comes in contact with the blood that is circulating through the body. The air passes through these membranes of the lungs into the blood, and the oxygen combining with the various impurities in the blood, purifies the blood. We can't help ourselves, we are made that way, and to husband life and health we need to do this and if we breathe an impure air, this carbonic acid gas that we exhale, if we breathe that for a short time we die; all animals must have good air. When you put your animals into a barn that is extremely close you put them into this vile air that is all the time tending to destroy the life.

This is a wonderfully interesting subject in so many of its phases, because the hope is that when we come to understand that it is worth dollars and cents to us in this way, we will

realize the necessity of ventilating our schoolhouses for our children.

There is one point that might help some people, and that is with reference to building crooked chutes. We know that the more elbows a stovepipe has, the harder it is to get the stove to draw; so it is with this ventilating flue, the more crooks and turns it has the less ventilation it provides and the straighter the flue is from top to bottom, the more ventilation you will get, because there is less friction.

## ROBBER COWS—A DETECTIVE'S REPORT.

Inspector H. C. Searles, Fond du Lac.

### *Do Away With Robber Cows.*

The establishing of Test Associations in Wisconsin will enable the dairymen to eliminate the unprofitable cows from their herds and help them to get better cows and make half the number do the same or even better work than the whole number of our average cows in Wisconsin are doing at the present time.

This fact may seem an absurd one to many, but this seems to be the case as it stands.

The milk scale and Babcock test must of necessity come in to use. Every farmer should have a milk scale hanging in his barn where it will be handy to weigh each cow's milk and by the side of this a milk sheet with names or numbers of cows, enabling him to keep a daily record of the performance of each cow in his herd. There is not more than one in twenty farmers that know the amount of milk and butter fat each cow in their herd is producing per year. However, now is a good time for every dairyman to begin a more economical production of milk. It costs but a very little more to keep a cow that will produce 400 pounds fat per year than one producing 100 or less.

The most extravagant thing a dairyman can do is to head his herd with a scrub sire; this is a step back and a continual

slide as long as he continues such methods. There surely will be no advancement or grading up unless you have secured the best bred, most prepotent sire at the head of the herd that is obtainable. Improvement comes only through the superior qualities of the male used. Great damage is done breeders of high class dairy cattle by poor dairymen buying stock expecting to get something that will return a very large profit without much feed or care, and bad results are sure to follow. The poor dairyman says thoroughbred stock is too tender. Experience in my work shows that cows kept at a good profit to their owner are not allowed out of barn in winter more than one half to one hour per day in fine weather and are kept in warm, well lighted and well ventilated stables. They are watered in stable cold days and fed food of a succulent nature, such as ensilage or mangles, with all the alfalfa or clover hay they will consume without waste, and a balanced grain ration of not less than one pound to every three pounds of milk given.

#### Herd No. 1.

The following tables will convince the average dairyman that it pays to breed up and feed up their herds of dairy cows.

Herd No. 1 consists of eight grade Dur. and native cows.

No. lbs. of fat produced by herd in 9 monthes. . . . 847.6 lbs.

Average amount of fat per cow . . . . . 106 lbs.

Average amount of fat per month per cow . . . . . 12.11 lbs.

Best cow in herd produced in 9 months 181 lbs. fat.

Four cows in herd range from 27.7 lbs. to 75.8 lbs.

Average test of herd 4.11.

Cows fresh from first of April to 1st. of May, test began in May. Cows showed lack of care in winter, having heavy coats of hair standing in all directions. They were milked at irregular periods, mornings from six to eight, and any time at night. They were turned in the yard after milked mornings and fed corn in the bundle, and the remainder of the day, ate at the straw stack, had free access to ice water and plenty of exercise, which the manager thought they needed in winter as well as in summer.



### Herd 2.

Herd No. 2 consists of 20 grade Durham and native cows. Fresh in March and April.

Total number lbs. fat produced by herd for the period	
of nine months .....	2264.9 lbs.
Average amount fat produced by each cow ....	113.24 lbs.
Average amount per month per cow .....	12.58 lbs.
Best cow in herd produced 171.1 lbs. in nine months. Six cows in herd range 23 to 70 lbs in the same period of time.	
Average test of herd .....	3.97 lbs.

Herd in fair condition but not a dairy type. The manager called my attention to one cow saying, "That is my best cow in the barn, but she does not give as much milk as usual. I think her milk must be very rich, and will make up in fat what she loses in milk." He was very anxious to know the results of the test, and found to his disappointment that she tested 2.4. This cow produced 33.5 lbs. fat in nine months, and I think is in Chicago now, as she was sold to the stock buyer. Cows in yard a large portion of the day; fed corn in bundle, timothy hay and a small allowance of ground feed.

### Herd No. 3.

Herd No. 3 consists of 15 natives said to be a little of every breed. This herd has a scrub sire at the head same as herds No. 1 and No. 2.

Total number lbs. fat produced by herd in 9 mos.	2246.9
Average amount of fat per cow .....	149.7 lbs.
Average amount of fat per month per cow ....	16.6 lbs.
Average of fat made by best cow in 9 mos. ....	217 lbs.
Amount of fat made by poorest cow .....	80.3 lbs.
Average test of herd .....	3.94 lbs.

Cows allowed one half day in yard or field for exercise. This dairyman has concluded he is on the wrong cow path, and will stick to one breed hereafter. He will secure for his use a thoroughbred sire and has made up his mind it does not pay to let his cows roam in the cold for exercise.

## Herd No. 4.

Herd No. 4 consists of nine grade Jersies, Guernsies and two natives. Fresh in March and April; herd well wintered. Total number lbs. fat produced in 9 mo. 2377.2 lbs.

Average amount of fat per cow .....	264.13 lbs.
Average amount of fat per mo. per cow .....	29.34 lbs.
Amount of fat made by best cow in 9 mos. ....	345.1 lbs.
Amount of fat made by poorest cow .....	169.2 lbs.

The poorest cow being a native. Average test of herd 4.98.

Cows not allowed to shrink in milk when pasture became short in the fall, but were fed a forage crop at this period which is very essential, carrying them into winter quarters with a good flow of milk.

Cows watered twice a day and not allowed to stand out more than one half hour each time, and cold days they were watered in the barn. There is a thoroughbred sire at the head of this herd. There is silage and clover hay fed winters for roughage, with a liberal feed of gluten and bran. This herd of nine cows made 112.3 lbs. more fat than herd No. 2 consisting of 20 cows.

## Herd No. 5.

Herd No. 5 consists of 19 grade Durham and native cows; fresh from March to May; cows in fair condition.

Total amt. of fat produced by herd in 9 mos. ..	1633.2 lbs.
Average amt of fat per cow in 9 mos. ....	102.07 lbs.
Average amount per month per cow .....	11.34 lbs.
Average fat produced by best cow in 9 mos. ....	169.1 lbs.
Amount of fat produced by poorest cow .....	91.6 lbs.
Eight cows in this herd range from 65.8 lbs. to 91.6 lbs.	
Average taset .....	3.48 lbs.

This herd of 19 cows produced 744 lbs. less fat than herd No. 4 containing 9 cows.

Care of this herd: Cows well cared for, watered twice a day, fed silage, clover hay, oats and wheat ground, and bran equal parts by weight, but feeds the same ration to each cow regardless of the amount of milk given by same. Not a dairy type of cow.

I wish to speak of one patron that quit the work of having a yearly record kept of his herd. When I went to his home in the month of August he said "I have made up my mind to quit the test." I said, "Are you dissatisfied with my work?" "No," he said, "You are conducting your work all right, but I find I will have to cull out part of my cows, and I made up my mind if I continued I would have to cull them all out."

#### Herd No. 6.

Herd No. 6 consists of 17 cows, grade Guernsies.

Total amount of milk produced in one year . . .	112,282 lbs.
Total amount of fat produced in one year . . .	5205.64 lbs.
Average amount milk per cow . . . . .	6722 lbs.
Average amount of fat per cow . . . . .	306.03 lbs.
Cash receipts per cow . . . . .	\$76.83
Average test . . . . .	4.62

A thoroughbred sire at the head of this herd. Herd well cared for. All winter milkers, not allowed out to drink over one half hour; fed silage and alfalfa hay; all they will eat up clean, also gluten and bran fed in proportion to amount of milk given.

#### Herd No. 7.

Consists of 12 cows—grade Jersies and Guernsies; freshening in Oct. and Nov. 1905 for year 1906 Produced.

Milk . . . . .	77,227 lbs.
Fat . . . . .	3352 lbs.
Cash . . . . .	\$869.45
Average milk per cow . . . . .	6460 lbs.
Average amount of fat . . . . .	279.38 lbs.
Receipts per cow . . . . .	\$72.45

A thoroughbred sire at the head of this herd.

## DISCUSSION.

The Chairman: This paper shows up the great difference between cows, and it shows up the robber cows pretty well. Was this work done in this vicinity, Mr. Searles?

Mr. Searles: It was in Fond du Lac county.

The Chairman: So that the farmers who own these robber cows are not, many of them in the audience, probably because they are not the kind that will go clear across the state to go to a Dairymen's Association meeting.

Mr. Glover: Before a discussion of this subject, I want to confirm what Mr. Searles has said. In my work with the Experiment Station of the University of Illinois I found many, many, just such examples as he has cited this morning. It is almost beyond comprehension, the lack of intelligence regarding such conditions that exist. I have gone into many herds and had a man try to pick out his best cow, he has done so and at the end of the year I have shown him that his estimate must be reversed. He could see for himself that his best cow or what he thought was his best cow, was the poorest. The chairman is right in saying that the owners of these cows do not come out to conventions. I have in mind one man who split the end of his cow's tail and put a chunk of pork in to cure her when something was the matter with her. He was the kind of man that cut his hay only after it was ripe. I said to him, "Don't you know that you are locking up the nutriment in that hay in such a way that the cows will never be able to get it out, although it may be there?" But I kept after him and after I had tested his herd for two years, he came to me and he says "When you started coming to my place I had no faith in you, but your work has been a great revelation to me, and I have received a lot of knowledge and I want to get some more," and he kept on asking me about this, that and the other thing. I found just such conditions as Mr. Searles has given.

A Member: It is the general impression among average farmers that it is too much work to keep account of the production of each cow. How did you find that, Mr. Searles? Does it take too much time and trouble, according to the people you meet?

Mr. Searles: Where the milk scale is handy and the milk sheet right there in place where they are passing with their

milk pails anyway, they can hang their pails on the scales and jot it down in a moment. At the end of the month they run up these figures, or I ran them up for them, and they have the satisfaction of knowing exactly what each cow is doing, and that satisfaction more than pays for the trouble.

Sec'y Burchard: And how many extra minutes to a cow does this extra labor require?

Mr. Searles: It wouldn't take over one-eighth of a minute.

Mr. Goodrich: I have kept time on my boys—I had a great deal rather hold the watch on some one else when they work than work myself, I was always that way,—and they didn't know that I was timing them, you know. It took one fifth of a minute to put down the record, it averaged 12 seconds. I have known men to send their boys to college and spend thousand of dollars to get them through, and when they got through they didn't know so much as a boy that would spend twelve seconds a day to weigh the milk of the old brindie cow. It has waked him up, giving him something to think about.

Mr. Searles: Out of the twenty-six herds that I visited, two thirds of the owners are weighing and keeping daily records of their herds today, and I have not urged them much either. Indeed, I have asked a number of them, "Would you go back to the old way?" and they said, "No, I want to know what my cows are doing."

Sec'y Burchard: I think perhaps a little corporation glorification ought to come in here. Mr. Searles has been in the employ of the Dairy Association doing this work under instruction from the Executive Board, and you can see that the Association is trying to do something besides coming up to Tomah and having a good time.

Mr. Aderhold: It is really remarkable how few dairymen are keeping records of individual cows and know what they are earning, to say nothing about the cost of feeding them. Several years ago, during one season I held something like forty to sixty cheese factory meetings. I was talking a little along this line and had a chart, and I always asked the audience how many there were there that knew what each cow in their herd earned for the year. I would ask them to raise their hands, and there was only one out of all those audiences that I got the raise of one hand from. I asked him "How many cows have you " and he said, "Only one."



Mr. Hill: I think there ought to be a still further comparison of those figures,—one hundred and two pounds of butter fat in nine months for a herd of twenty cows and on the other hand a herd that produced just six times that. Taking these figures with those that Mr. Wyatt has brought up for the production of the herds here, I am wondering if there are some of these farmers in this audience whose herds average 102 pounds of butter per year and if there are such I hope that somebody is going to get enough inspiration, after having come perhaps six or eight miles to our association and having heard what other cows are doing, that he will at least find out what kind of cows he is keeping by weighing and testing his milk, and before long that he will quit breeding such cows, and like some others that we have heard of here, he may find that after two years of hard work and dairy thinking he can receive something like seventy dollars per cow instead of boarding her for next to nothing. Mr. Searles found some cows that were making 33 pounds of butter in nine months. I had occasion to talk with a man in our vicinity the other day and he told me that he had come to the point where he had concluded to get rid of several of his cows and buy a few grade heifers and start anew.

Prof. Emery: There was one phase of the subject under discussion this morning that ought not to go completely by default. It was stated very emphatically that a breeder of pure bred cattle should not send out sires that are unworthy. I think that is a very wholesome doctrine, but this is a fact that I would like to have come out in connection with that; that the breeder of pure bred dairy cattle cannot live entirely upon the basis of being a philanthropist, and he cannot kill off in his herd that inferior stock and then sell his superior animals at the prices of scrub or grade. Every breeder knows that he is beset with customers asking for pure bred sires at a price that no good breeder can possibly make a living at, and if dairymen are to have good dairy sires they must expect to pay a reasonable price for such an animal.

A Member: I think it is the experience of all breeders that the average farmer will pick the cheaper animal every time.

Mr. Hill: On the other hand; the best dairymen will buy the best, regardless of the price.

Report of Treasurer H. K. Loomis received and filed.

# TREASURER'S REPORT FOR 1906.

Mr. President and Members of the Association: The following itemized report is made showing the source from which all moneys paid into the Treasurer's hands were received and the disbursements paid on orders from the Secretary which I hold as vouchers.

## Receipts.

Feb. 6.	Amount in hands of treasurer.....	\$345 44	
	Memberships.....	27 00	
	Memberships....	166 54	
	From sale Keilismeier cheese.....	3 82	
May 5.	From state treasurer.....	1,000 00	
Aug. 4.	From state treasurer .	2,000 00	
	1907.		
Feb. 20.	From membership.....	6 00	
			\$3,848 80

## Disbursements.

Feb. 6.	H. K. Loomis as per Sect. order.....	\$201 50
	C. P. Goodrich, taking cow census.....	75 00
	H. K. Loomis and assistant, expenses to convention .....	14 49
7.	Fred Kietbrock, premium on butter.....	15 00
	John E. Baltchner, premium on butter..	14 16
	W. F. Hyne, premium on butter.....	11 80
	Louis G. Heimerl, premium on butter...	15 00
	A. G. Puerner, premium on butter.....	9 44
	W. F. Krohn, premium on butter.....	9 44
	C. A. Paddock, premium on butter....	14 16
	Murphy Bros., premium on butter.....	4 72
	C. H. Wild, premium on butter.....	4 72
	Otto Keilismeier, premium on cheese ...	15 00
	Axel Bruhn, premium on cheese.....	11 80
March 9.	H. C. Searles, inspector.....	124 86
	Pro. H. L. Russell, expenses Waukesha convention .....	3 90
	C. P. Goodrich, expenses Waukesha convention.....	2 30
24.	H. K. Loomis, expenses attending executive committee meeting.....	7 98

Mar. 27.	John Widmann, expenses Waukesha convention.....	\$1 96	
Apr. 7.	H. C. Searles, inspector.....	136 60	
May 2.	H. C. Searles, inspector.....	127 80	
	C. H. Everett, expenses attending ex. com. meeting, March 22nd.....	7 88	
16.	Peter Zumkehr, inspector.....	125 00	
26.	W. A. Henry, expenses attending Waukesha convention.....	4 50	
	Mrs. A. L. Kelly, reporter.....	106 00	
June 7.	H. C. Searles, inspector.....	123 00	
	Peter Zumkehr, inspector.....	140 00	
	Cornish, Curtis & Green, milk tester....	41 19	1,369 20
July 5.	John Luchsinger, legal services and expenses .....	50 00	
	Peter Zumkehr, inspector .....	137 00	
	Fond du Lac Blank Book Co., printing blanks .....	9 00	
	H. C. Searles, inspector .....	103 15	
Aug. 10.	Cornish, Curtis & Green, supplies .....	11 10	
	H. C. Searles, inspector .....	101 90	
	H. C. Loomis, inspector .....	72 96	
	Peter Zumkehr, inspector.....	130 00	
Sept. 10.	Peter Zumkehr, inspector .....	135 00	
	H. C. Searles, inspector.....	102 90	
	H. K. Loomis, inspector.....	60 94	
Oct. 12.	H. K. Loomis, inspector.....	69 69	
	H. C. Searles, inspector .....	101 00	
	Peter Zumkehr, inspector.....	120 06	
Nov. 18.	Peter Zumkehr, inspector .....	137 00	
	H. K. Loomis, inspector....	55 00	
	H. C. Searles, inspector.....	104 35	
Dec. 12.	H. C. Searles, inspector.....	102 35	
	Fond du Lac Blank Book Co .....	9 50	
20.	H. K. Loomis, inspector.....	55 00	
31.	Henry Elmer, printing report, premiums, etc .....	82 29	
1907.			
Jan. 14.	H. C. Searles, inspector .....	104 25	
	H. K. Loomis, inspector.....	56 51	
	Chas. Linse, expenses Waukesha cons ..	11 14	
8.	H. K. Loomis, inspector.....	50 00	
	H. C. Searles, inspector.....	104 35	

Mar. 26.	W. D. Hoard Co., printing .....	\$25 40
	Geo. W. Burchard, salary and expenses.	344 10
Mar. 6.	H. K. Loomis, postage for three years ..	4 63
	Chas. L. Hill, expenses, 1906 .....	20 97
	Balalance in hands treasurer .....	8 12
		<hr/> \$3,848 80

Chairman Goodrich: The time has come for us to close this convention. We have had a good time, but all good times have to come to an end. I have been several times to Tomah, and each time I come here I like it better than I did the previous time. When I came here fifty-one years ago, there were not more than one or two farmers in this part of the country, but I was greeted heartily and urged to stay. The next time I came, I attended a Farmers' Institute and I was used still better, and this time is the best of all.

Now, I will call on General Burchard to give the benediction.

Sec'y Burchard: My opinion is we don't need any benediction here. The truth of the matter is, of course, that the Secretary, being a sort of executive officer of the board, has a good deal to do in arranging the program and getting ready, and I wish to express my very great satisfaction with the work of my hands on this occasion. It has turned out quite as well as I had any reason to expect that it would. I want to say further, however, that that is not due to me, nor is it due altogether to the men who have been on the program, but a very great proportion of the merit is due to the audience that we have had. Those of us who sometimes try to speak in public know very well that there are two kinds of audiences, one is a cold audience and the other is a warm audience; one is a responsive audience, the other a non-responsive audience,—you speak your words and they seems to come back to you and that doesn't give a man very much energy, it doesn't prompt him to say his best things. The other kind of audience seems to draw your thoughts and your words out of you, and it is a pleasure to speak to them, and that is what makes a good convention, and I beg to say that I think the success of this convention, if it has been a success, is due quite as much, if not

more, to the audience than to the Secretary who arranged the program, or to the gentlemen who have read papers, and answered your questions.

I do not think it remains with me to say anything more. I believe you know that we are greatly obliged to you and if we leave with you, those of us who are strangers, as good a flavor of ourselves as we carry away with us of you—flavor is a distinctive thing in dairying, you know—I think we will all be satisfied.

The Chairman: This convention is adjourned until the next time.



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