

THIRD ANNUAL REPORT

OF THE

State Dairy Commissioner

TO THE

GOVERNOR OF THE STATE OF IOWA.

FOR THE YEAR 1889.

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## REPORT.

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*To his Excellency, HON. WILLIAM LARRABEE, Governor of Iowa:*

In conformity to the requirements of chapter 52, of the laws of the Twenty-first General Assembly, and amended by chapter 98, of the laws of the Twenty-second General Assembly, I have the honor to submit herewith my third annual report.

During the year ending November 1, 1888, the markets for dairy products had been quite uniform, there being no extreme fluctuations either up or down in the market prices of butter or cheese. Fine, fresh-made creamery butter sold in market, during summer and fall, at 18 to 24 cents per pound, and in winter for 25 to 30 cents. Such was the condition of the butter market at the time of making my last annual report. On the 15th of November, 1888, fine, fresh-made creamery butter was quoted in eastern markets at from 27 to 29 cents, with a fair, healthy tone to the markets. By the manipulations of the oleomargarine men and the board of trade at Elgin, Ill., butter was within a few weeks forced up to 41 cents a pound. This evidently was a scheme to make place for oleomargarine, by driving butter into disuse, as the supply of fine, fresh-made butter on the market did not warrant any such boom. The result of the inflated market was to put butter out of the reach of consumers, so that there was but little sale. A stagnation in the market followed, and sales could not be made at any figure. Soon the market broke, and although the price fell back to 29 and 30 cents, yet the scheme had done its work. The butter market was demoralized, and the dairy interests of the country have not entirely recovered from the ill effects at the present time.

### OLEOMARGARINE.

At the time of making my last report, there were no government licenses for the sale of oleomargarine held in this State, and it is

confidently believed that there was at that time no effort made to handle it in the State. When butter, the last of November and first part of December, was forced up to 40 cents a pound, the oleomargarine manufacturers were active, through their agents, in their efforts to have retail licenses issued for the sale of their goods, and many thousand licenses were taken out in different States in a short space of time. Grocerymen in different parts of this State, who retail butter to their customers, were approached by the agents of oleomargarine manufacturers, who offered to pay for a government retail license, for the sale of oleomargarine, for them, if the grocerymen would sell their goods. With all their efforts, they succeeded in placing only (4) four retail licenses in the State, as follows:

E. E. Harned, Ottumwa.  
D. D. Feacon, Council Bluffs.  
S. T. Shade & Co., Muchachinock.  
W. Blom, Keokuk.

Armour Packing Company, who are large manufacturers of oleomargarine at Chicago and Kansas City, also held retail licenses to sell at Burlington and Davenport.

The licenses above mentioned expired on the first day of last May, since which time there has been no license in the State.

The national oleomargarine laws require that all who sell oleomargarine shall have government license, and the State law requires that every package or parcel sold in the State shall be plainly branded, giving name of article and also name and place of residence of manufacturers. The two laws, when properly enforced, render it impossible for one to deal in oleomargarine in this State without advertising the business, and the sentiment of the people of the State is so generally opposed to the traffic in imitation dairy products, and the business is so unpopular, that there are but few localities where the grocerymen can afford to handle oleomargarine. So long as the National law is kept in force, and a vigilant watch kept up by the State to see that the requirements of the State law is enforced, there will be but a very limited amount of oleomargarine sold in Iowa.

The licenses issued at Ottumwa and Council Bluffs were in effect but dead letters, as the parties never advertised the fact that they had licenses, and they handled but a small amount of oleomargarine. The National oleomargarine law is such that the manufacturers are obliged to report to the revenue collectors all sales and to

whom sold, so that it can be ascertained the amount of oleomargarine that is shipped into the State.

I have always been treated very cordially by the United States revenue collectors—Mr. Byron Webster, of Dubuque and Mr. A. H. Kuhlemire, of Burlington, and their deputies. And I desire in this public manner, in behalf of the dairy industry of the State to express thanks and my appreciation of their generous efforts to assist me in the discharge of the duties of my office. It is a fact worthy of note that there has never been a license issued for the sale of oleomargarine in the northern district, including forty-nine counties of the State, and that in no case has any person taken out license the second time, thereby indicating that the traffic in oleomargarine is not a satisfactory occupation in this State.

There is no manufactory of oleomargarine in the State and never has been, and it is probable there is less sold than in any other State in the Union, except perhaps New Hampshire, whose State law requires that all imitation butter sold in that State, shall be colored pink, which of course amounts to prohibition. For it is a fact that all the market value there is in oleomargarine over that of lard and tallow, is derived from the fact that it is made to represent in color and appearance, genuine June butter.

Last winter the State of Wisconsin enacted a dairy and food adulteration law, creating a Dairy and Food Commissioner, with two assistants, to enforce the provisions of the law, and without doubt there will be less oleomargarine sold in that State and less stuffed cheese manufactured or sold than formerly. The enactment of a dairy and food adulteration law in the State of Wisconsin, plainly indicates that the State is in favor of protecting its people and their industries against adulteration, counterfeit and fraud.

During the last session of the legislature of the State of Illinois, there was an effort made to secure the enactment of a law in that State, protecting the manufactures of pure dairy products. The bill was opposed by the oleomargarine manufacturers of Chicago and their friends. There were hopes of the passage of the bill until it was discovered that its provisions covered the adulteration of cheese as well as that of butter. When it was found that the portion of the bill relating to the adulteration of cheese would not be eliminated, it is reported that some of the dairy and creamery men withdrew their support of the bill. If the report be true, it plainly indicates the position that some of the dairymen of that State hold with regard to the adulteration of the dairy product.

When we consider the kind and quality of cheese that is being

manufactured in northern Illinois, very largely in the factories, it is a question whether or not all the creamerymen are friends of the best interest of the dairy of the country, and in favor of pure dairy product.

The manufacturer of stuffed cheese is a kin to the manufacturer of oleomargarine and should come under the same law of control.

#### SUSPECTED BUTTER AND CREAM.

On November 16th I received a letter from a person at Onslow, stating that butter was being sold in that market that was suspected of being adulterated. I had a sample of the butter sent me by express, and, upon examination by the oil test, it was found to be an article of pure butter, evidently of good quality when first made, but it had been held in tub or jar during warm weather, which gave it a tallowy flavor, and under such conditions one not experienced in testing butter is liable to be deceived.

December 6th I received a letter from William Smay, of Colo, stating that he was getting cream from a patron that he thought to be adulterated. I advised Mr. Smay to send a sample of the cream to Prof. G. E. Patrick, of the experimental station at Ames, for chemical analysis. Which he did; and the cream was found to be an adulteration; and the result was to discontinue the cream trade with Mr. A. Felton, who furnished the cream.

December 24th I received a sample of butter from Dr. J. M. Shaffer, of Keokuk, for examination, which I found to be pure butter that had been held and exposed to a warm temperature, and had a tallowy flavor; but in order to satisfy Dr. Shaffer and myself I sent the sample to Prof. Patrick for chemical analysis, who reported it to be pure butter. The sample contained 87.5 to 88 per cent of insoluble fat acid and 4.4 to 4.6 per cent of soluble fat acid. All of which figures fall within the limit allowed for pure butter.

During the winter I examined butter from different parts of the State, and found no adulteration, with but one exception. In the latter part of June my attention was directed to Rowley, Buchanan county, as packages marked "butter" had been received at that point, shipped from Chicago. I found, on investigation, that parties at Rowley, at the time of the boom in butter, had bought a few thousand pounds of roll butter in Chicago, and shipped it to Rowley for the purpose of working over and packing in tubs. There was no fraud being practiced.

March 2d I received a sample of butter from the firm of John Moody & Son, of Perry, which, upon examination by the oil test, clearly showed that it was an adulteration, and a bungling one at that. I sent the sample of butter to Prof. G. E. Patrick for chemical analysis, and his report substantiated the fact that the sample was at least 50 per cent foreign fat (tallow). Upon receiving Prof. Patrick's report I immediately went to Perry and obtained the following facts: Messrs. Moody & Son operate a creamery in Perry, and during the winter season they also buy and work dairy butter; in the month of February, while working, they found some butter that excited their suspicion as not being all right, but they did not know from what source it came. A few days later Mr. William Ogden brought in some butter that had the same appearance as the former suspected lot. The butter was left with Mr. Moody, but not paid for, and Mr. Moody immediately sent a sample of the butter to me, and the result was as above described. When Mr. Ogden learned that he was suspected of crookedness, Mrs. Ogden came to town next morning (they live on a farm), and made all sorts of excuses to Mr. Moody. That the butter was some that they had prepared for their own eating at home, and it had been sent to market by mistake. She plead so hard that Mr. Moody allowed her to take the last lot of butter home with her. She also paid him back the money that had been received for the former lot. When I arrived at Perry, March 21st, with positive proof of fraud, Mr. Moody, in view of the facts as stated, desired that the case should not be prosecuted further than to publish in the city papers the fact that a farmer had been detected in offering for sale butter mixed with tallow; which was done. As I was not able to prosecute the fraud without the assistance of Mr. Moody, the case was carried no further. But the publication of the facts, as above stated, no doubt will be a warning to those who would be 'evil-doers in the vicinity of Perry. Of all the butter that I have examined in the State during the last year, the above is the only sample that has been found to be adulterated.

All the work of chemical analysis for this office during the last year has been done by Prof. G. E. Patrick, of the experimental station at Ames, without expense to the State; and I desire publicly to return thanks to Prof. G. E. Patrick for his prompt, courteous and generous treatment of this office.

## UNSALTED BUTTER.

The practice of gathering unsalted butter direct from the dairymen has been on the increase for the past several years. On the fifth of February I received a communication from a person at Winterset, stating that unsalted butter was being gathered in that vicinity and worked, colored, packed and branded "creamery" to the detriment of the gathered cream interest. The term creamery has been attached to butter made at a factory and originally signified fine butter; but some persons of late have been in the habit of branding almost every grade of butter creamery, in hopes, no doubt, that the name would add to its market value. I know of no law to prevent misrepresentation in the branding of butter, but the law of reclamation which is sure to follow when the butter reaches eastern markets. As a matter of economy I would suggest to those factory men who gather cream in winter, and especially when the dairy is scattered, to give the subject of gathering unsalted butter in winter, instead of the cream, careful thought and consideration. In winter the temperature is favorable for the dairy-man to obtain the cream, and a little instruction from the creamery-man in regard to setting the milk, ripening the cream and churning, will enable him to get a very fair article of fresh butter. When the butter is churned and all the buttermilk washed out, all that is needed for the dairy-man to do is to put the butter in a sack and let it drain. By the exercise of dairy intelligence and diligence a very good article of butter of even color and quality may be obtained by this process. The butter in winter need not be gathered oftener than five or six days, and by this plan there is no shortage on cream as is sometimes the case when the cream is gathered, which creates a difference between the dairy-man and the creamery-man. This plan can be operated at a much less expense than gathering the cream, and especially in winter, a very good article of butter can be obtained.

## DEVELOPMENT OF THE DAIRY.

Although prices for butter have ruled lower the present season than for many years, yet there has been a large increase in the production. It is, however, gratifying and encouraging to be able to report that there has been a very marked improvement in the quality of the butter made in creameries this year over that of any former year. The weather has been favorable for butter-making, and so far as my observation goes, up to the last of July, the make of

creamery butter was fine, at least far superior to the quality of other years. A large number of new creameries have been put in operation this year, and quite a per cent of them are operated on the co-operative plan. We now have 693 creameries, and produced in 1888, 41,576,548 pounds of butter in the State, and from report from each individual creamery we estimate the make of creamery butter will be fifteen per cent greater in 1889 than it was in 1888.

## CHEESE.

There have been quite a number of new cheese factories put in operation this year, and the make of cheese this year is probably fifteen per cent greater than that of any former year. We now have 164 cheese factories in the State.

The manufacture of cheese has been more remunerative than that of butter the past season. Mr. Watson, of Albia, Monroe county, writes me as follows: "The products of the dairy are low in price, yet I find ready sale for all the cheese I can make, and at fair prices." Mr. T. Little said to me, that he found ready sale for his cheese at fifteen days' old, and that he had sold no cheese this year for less than from eight to eight and one half cents per pound.

We yet import half the cheese we consume in the State. This would seem to be poor economy in a State where we have 1,240,000 milch cows. There is yet room for a large amount of soft, fat, full cream cheese, and it could be disposed of to the jobbing trade in the State, and realize at least one cent a pound more than could be obtained by shipping to eastern markets. I am glad to be able to report that there are but few persons making skim cheese in this State.

## BUTTER-MAKING.

There are two distinct general divisions or systems of butter-making now practiced in this country. The first, the Individual Dairy System, where the butter is made on the farm, or where the cows are kept, and in small quantities at each place of manufacture. The other is termed the Creamery System, where the milk or cream of many dairies is taken to one place to be manufactured into butter. The creamery system is divided into two general classes, the gathered cream and the full milk; and the full milk is again divided into two systems, one where the cream is separated from the milk by the temperature system, and the other by the centrifugal system, or by the use of the centrifugal machine. Each

one of these methods or systems have their points of excellency as well as disadvantages, taken relatively. We will consider each system separately.

Although dairy butter is only made in small amounts at each dairy farm, yet it is estimated that at least 70 per cent of the entire butter product of the country is made on the farm, a portion of which is consumed in the family where it is made. The advantages of this system of butter-making are:

*First.* The skim-milk and the buttermilk are both kept on the farm, and, where the milk is held in sound condition, they form an important factor in feeding young stock, thereby maintaining the fertility of the soil.

*Second.* When the cream is to be obtained by the temperature system, the sooner after being drawn from the cow the milk is aerated, the animal odor expelled and set for creaming, the better and more satisfactory will be the results. In warm weather, in order to obtain the cream by the temperature system, the milk should be set in or submerged in cold water. It is an advantage and economy to use ice. The dairy system, when all the conditions are supplied, has advantages for creaming milk over any system that takes the milk from the farm.

*Third.* With the same amount of watchful care and dairy intelligence, together with conditions for controlling the temperature, a superior article of butter can be produced on the farm.

Some of the disadvantages of making butter on the farm:

*First.* It requires just as thorough conditions and the exercise of as much skill to make a small as for a large amount of butter, and these essential conditions are not generally found at the farm; therefore we are not able to obtain butter of a uniform color and quality at different farms.

*Second.* There are comparatively few of our dairy farmers' wives or daughters (for on them the making of dairy butter generally devolves) who have the time to give it the watchful care necessary for success, even if they have the dairy intelligence and skill.

*Third.* The markets are looking after butter of even color and quality in quantity, and this is the most serious drawback to the successful development of the individual dairy system. The want of a discriminating cash market for the product in small quantities. This class of butter at present is handled almost entirely by the groceryman or the store-keeper, who sells goods and who of necessity must pay the same price for all, good, bad and indifferent;

and, as a result, there is no inducement to the enterprising dairyman to try to make fine butter, except an occasional one, who is able to secure a special place to market his butter at relatively fair figures. But a majority of dairy farmers are not able to do this, and therefore it is more profitable to make other disposition of the milk product. Even in Vermont, where the dairymen have been educated to make butter on the farm for generations, and where each dairy farmer is supplied with the conditions necessary for making butter, the dairymen are now adopting the creamery system.

#### GATHERED CREAM CREAMERIES.

This method of handling the dairy product has many advantages over the present method of making butter on the farm. The cream of many dairies is separated from the milk on the farm, by the temperature system, and all taken to a factory to be made into butter, leaving the skim-milk on the farm for feeding purposes.

This system offers the farmer many advantages, for by it he only has the care of the cows, the milking and care of the milk to raise the cream. The creamery-man is at the expense of gathering the cream, making and marketing the butter. The dairy-man receiving for the butter in the cream per pound according to the market quotation for fine butter. This division of labor in the manufacture of butter no doubt is economical and profitable both to the dairyman and creamery-man as any other system, if supported by dairy intelligence on the part of all the producers of milk and thoroughness and honesty on the part of the creamery-man. By this system a large quantity of fine butter of even quality is produced. The reason why this system has not given more universal satisfaction is not so much the fault of the system as it is the indifferent manner of conducting the system. First, the can in general use for setting the milk to raise the cream, is not the best device, and second, the dairymen have failed to exercise the diligence and cleanliness in the care of the milk necessary to obtain all the cream in good condition.

Too often the open can has been set for creaming, exposed to impure odors, or the milk has not been properly cooled and kept cool during the time of creaming; or there has been a general lack of cleanliness in the manner of milking; or the care of the utensils used in handling the milk and in care of the milk; or a want of thoroughness, diligence and cleanliness has prevailed, and the sentiment

expressed by action. "It will do for the creamery," and this indifference on the part of the dairy man has been encouraged by the creamery-men in their inordinate desire to get large quantities of cream. If one creamery-man won't take it, another will, without regard to cleanliness or quality of cream. Thus, the enterprising, thrifty dairy-men are obliged to help pay double price for gathering the cream by having two teams travel over the same road when one could just as well do it, and also suffer in the price received, because obliged to pool his cream with that of an inferior quality. The difficulty in making this system an entire success has been the want of an educated patronage to produce cream in a uniform good condition. In this system of butter-making in order to obtain best results, every patron should be a thorough dairy-man, supplied with suitable conditions for obtaining the cream in the best condition. And when these conditions are had, there is nothing to be gained by adopting any other system.

The only thing to be improved upon is to shorten the cream routes so that the cream may be delivered at the creamery in good condition. After cream is taken from the milk, the sooner it is gathered and all treated alike, preparatory for churning, the better and more satisfactory will be the results. It will be observed that by this system complete success demands that the dairy-men have uniform conditions for handling the milk, so that it is held at a uniform temperature while creaming, and this for summer requires a bountiful supply of cold water or ice liberally used. It is not sufficient in warm weather, in order to obtain the cream, to merely reduce the temperature of the milk down to 55 or 58 degrees by the use of cold water about the can and then leave it; but the water must be changed, and unless it is changed and the temperature kept nearly uniform it is not possible to obtain all the cream; and this requires that some one attend to the milk every few hours, unless we have ice to use in the water. It is a great advantage to have ice to use, for by its use a more perfect separation of the cream is obtained in less time and in better condition. If milk is set or submerged in ice water soon after being drawn from the cow, all the butter fat will rise to the top of the milk within twelve hours and will show greater depth or measurement of cream in twelve hours than in twenty-four, for the reason that in rapid creaming more of the casein is carried up with the butter globule than when the cream rises slower. If the cream is allowed to stand on the milk twenty-four or thirty hours the casein will greatly precipitate and

leave the cream more dense and of greater butter value by measurement. The conditions at which different creams are raised are so different, and also the difference in time of skimming, renders it necessary to test the different creams. There are two methods of testing the butter value of cream in use: One known as the quart test, where a given quantity is churned and the butter weighed; the other by churning a small amount of cream in glass tubes and reducing the butter to oil and measuring the oil. By either method just and correct results of the butter value of different creams is obtained, if intelligently and honestly conducted. It is clearly demonstrated that the only just and equitable method of buying or pooling cream at the factory is according to its butter value obtained by the test churn, and not by measurement or volume of cream.

#### FULL-MILK CREAMERIES.

Full-milk creameries are where the milk is taken to the creamery for the purpose of obtaining the cream either by the temperature process or by the use of the centrifugal machine. When the cream is to be obtained by the temperature system the milk is most commonly set in deep cans about eight inches in diameter, and set in or submerged in cold water. The most desirable temperature for rapid creaming is from 40 to 45 degrees Fahrenheit, but to obtain this temperature requires the use of ice; 48 to 50 degrees is about as low temperature as any well or spring water in the State. The advantage of this system of creameries is that the milk is all delivered at the factory and all subjected to the same conditions, same temperature, and all treated in the same manner, and as a result should produce a uniform cream, which is an absolute necessity in order to obtain fine butter. By this process of creaming the creamery-man has entire control of the milk and cream, provided he is supplied with the proper conditions at the factory so that he can remove the cream from the milk at the proper time, and also set the cream at the proper degree of temperature for ripening, so that it will have attained the necessary degree of acidity at the time proposed to churn. The most satisfactory results are only obtained at this point by the exercise of dairy intelligence and careful observation of surrounding conditions each day. In this respect the full-milk system has advantage over the gathered-cream system, for, as now practiced, much of the cream that is gathered is over-ripe before it reaches the creamery, especially in summer. The disadvantage of the full-milk system of creaming by the temperature plan is

the necessity of delivering the milk twice a day, or morning and evening—especially in warm weather. This is considered burdensome by many dairy-men, and, as a result, they are in many localities demanding that the creamery-men put in the cream separator or centrifugal machine, for by its use the milk may be delivered once a day, provided the night's milk is properly aereated and cared for.

#### CENTRIFUGAL CREAMING.

The first cream separators exhibited in this country was in 1878, eleven years ago. At that time the machine was but a meager affair, capable of doing but a limited amount of business, and much doubt was entertained as to its utility or benefit to the dairy. But few of the machines were introduced into Iowa until four years ago, since which time the number put in operation in the State has doubled every year. There are now 500 machines in the State.

There have been many objections urged against the advantages and utility of the centrifugal machine, some of which have been answered in favor of the machine as the result of practical demonstration. At first it was claimed that a fine article of butter could not be made by the separator plan, that the grain of the butter was broken as the result of rapid motion in creaming. That the butter would not keep. That the skim-milk was poisonous to stock, for it killed the calves. As regards the first objection, it has been clearly shown by experiment and observation that the fault was for the want of a knowledge of how to handle the milk, cream and butter in connection with the machine. As a proof of this position there are now those in the State operating creameries on the centrifugal plan who are offered Elgin quotations for their entire make of butter for the year, and this price on the track at the point from which the creamery customarily ships. As regards the feeding value of separator skim-milk there is no doubt that it is equal in value to that of any other skim-milk out of which as large a per cent of the fat has been taken, provided the milk has been wisely and intelligently handled. The objection to any one of the three separate systems of creameries, gathered cream, full milk temperature system or centrifugal system is not so much the fault of the system as it is the imperfect and faulty manner of conducting the system. Milk begins to decay as soon as it is drawn from the cow, and in order to retard the process of decomposition, the animal odor and heat should be expelled from the milk by aerating immediately after

being drawn from the cow; especially is this necessary in warm weather.

It is a fact that good calves are being raised on separator skim-milk, but in order to do this the night's milk that is kept at home must have proper care and be kept in sound condition to deliver at the creamery, and when the skim milk is taken from the creamery it must be cared for and cooled down, and not allowed to stand out on the milk-stand two or three hours in the hot sun after it is returned from the creamery. If, as it is no doubt the case, sometimes, that milk is imperfectly cooled at night, and although it is not quite sour when it reaches the factory, yet is nearing the souring point, and if it is delivered by parties who make a business of gathering up great loads, and in order to do so drives from fifteen to twenty miles to make the round trip, and then the can of skim-milk is left for hours out in the sun after being returned to the dairy, there is no doubt that under such circumstances separator skim-milk is in poor condition for feeding calves. But this is not the fault of the system, but the imperfect manner of conducting the system. I met one man at a creamery this season with his load of milk who said he had to travel twenty-four miles to make his round trip to gather and return the milk. Another party at the same factory said his route was only twenty miles to make the round trip. This practice is handling the milk product at a disadvantage, and the dairy-man will not meet with entire success until there is improvement in this respect. Economy in dairying demands that the feeding value of the skim-milk be preserved, and it is a difficult matter to do this in warm weather if milk has to be on the road from four to six hours going to and from the creamery.

The matter of economy in the use of the separator as compared with the temperature system of obtaining the cream is yet a noted question to be solved in the future, but the fact exists that the dairy-men demand their introduction.

#### DAIRY EDUCATION.

There is no branch of agriculture in this country that is capable of greater improvement over the present methods and practices among farmers, than that of dairying. A large per cent of the cows kept for dairy purposes are unprofitable animals even if they were intelligently caerd for. They don't give milk enough to pay for their care and keeping. Again, when we consider the discrepancy that exists in the market price of different qualities of butter,

and that more than half of the product sells for the lesser price, the importance and advantages of improved conditions and practices and the exercise of greater dairy intelligence is apparent. In the year 1888 the average net price received by the manufacturers of creamery butter in Iowa, was twenty-one cents a pound, and no doubt this figure could have been increased by the exercise of greater care and dairy intelligence. For the creamery system, as practiced in the State, is far from being perfect. Yet imperfect as it is for the want of thoroughness, cleanliness and intelligent dairy system, the amount of returns to the State, for the product, shows a large advantage over the individual dairy system of making butter as now practiced. According to the census of 1884, and published in 1885, the make of dairy butter in Iowa was forty-eight and one third million pounds, and it is conservative to estimate an equal amount was made in 1888. From careful investigation we find that the net price to the producer of dairy butter did not exceed on an average of thirteen cents a pound for the year 1888. This leaves a discrepancy in the price of eight cents a pound less than was received for creamery butter, and shows a net loss to the State of \$3,846,000, a large per cent of which might be saved, provided conditions and practices no better than those of the creamery system, could be adopted. There is a growing demand for more butter and cheese of superior quality, and experience and observation teaches us that there is no longer any profit in dairying unless the cows, the milk, cream, curd, butter and cheese, be so handled that a superior product of butter or cheese is obtained. In all parts of the world where dairying is being followed to any extent, the importance of a better dairy education and the adopting of improved methods, and providing better conditions for handling the dairy product, is receiving more general thought and attention. Denmark, only a few years ago, exported only 2,100,000 pounds of butter; but by a system of dairy education, sending out expert buttermakers to instruct the dairy-maids how to make better butter (the most of the butter in that country is made on small farms) the quantity and quality of butter has increased and improved so that Denmark butter now has a world-wide reputation, and they now export annually 13,000,000 pounds.

Denmark spends \$55,000 yearly for maintenance of dairy schools. The number of dairy schools in England is on the increase, and the subject of dairy education is receiving more general attention.

In the State of New York an appropriation has been made to

defray the expense of holding dairy conferences in different localities of the dairy portions of the State. The board of managers of the State Dairy Association decided to hold forty conferences this year. At these meetings modern butter-making is exemplified by persons competent to give instruction and explain the reasons for each process. At these conferences all the farmers, dairy-men and creamery-men in that part of the country are invited to attend. The object and purpose of holding dairy conferences is to bring before the farmers and dairy-men the most approved method of producing and handling dairy products; also to show, by practical work, how to make butter that will please consumers. These conferences are held to bring instruction to localities, to the people of neighborhoods, and give practical work and instruction, so as to improve the value of their milk and butter. This practical demonstration of making butter was one feature of the farm institutes held in Wisconsin last winter, and is to be inaugurated in connection with their institutes again this fall and winter. The legislature of the State of Wisconsin has looked with favor upon a system of farm instruction by means of farm institutes, which have been conducted so that dairying forms an important part of institute work. The State makes an appropriation of twelve thousand dollars (\$12,000) a year for the maintenance of the institute work. This liberal appropriation enables the managers to secure the most intelligent and practical help to assist in carrying forward the work of the institutes. According to report, the interest manifested in the institutes by the people where they are held has been steadily increasing. The only question of doubt has been to find an audience room large enough to hold the people. Certain it is, that Wisconsin has made greater improvement in her system of dairying the last ten years than any other State in the Union. Wisconsin possesses no natural advantages for dairying over those found in Iowa, but she may, by a system of liberal education, secure to her people greater profits in dairying than can be obtained by any State that fails to encourage modern improvements.

The importance of greater thoroughness, economy, and exercise of greater dairy intelligence, is not confined to any one State. There is no portion of the United States where dairying is practiced that is not greatly in need of reform.

Hon. J. K. Brown, Dairy Commissioner of New York states, that the average amount of income for each cow does not exceed thirty dollars (\$30) in that State. In Iowa, no doubt, the average amount is less than twenty-six (\$26), although I have no positive

data on the subject. For the encouragement of those who keep cows, and as an incentive to others to do better, I will give the figures of a few dairies in Jones county, Iowa. I will only give the figures of three annual dairies that sold their milk to full milk creameries, the skim-milk and buttermilk being returned to the dairy-man to take home for feeding purposes.

Mr. John Bates, of Monticello, gives the following figures for eight years, including 1881 and 1888, for a dairy of thirty cows, as follows:

Year.	Average pounds of milk per cow.	Amount received for milk per cow.
1881.....	5,690.....	\$ 47.90
1882.....	5,480.....	49.81
1883.....	6,000.....	48.56
1884.....	6,557.....	44.25
1885.....	6,638.....	42.08
1886.....	5,000.....	32.75
1887.....	5,070.....	36.28
1888.....	5,519.....	39.79

From the foregoing it will be seen that the average amount of milk per cow, for eight years, was 5,744 pounds, and the average amount received per cow was forty-two dollars and eight cents (\$42.08). To this sum should be added seven dollars (\$7.00) per cow, value of skim-milk and buttermilk, equaling an average income of forty-eight dollars and eight cents (\$48.08) per cow for the eight years. Mr. Bates is an ordinary farmer. He is no specialist, but he takes care of his cows.

Mr. Henry D. Smith milked 21 cows in 1888, and sold 107,323 pounds of milk, an average of 5,366 pounds to the cow, and received for the milk nine hundred and seventy-nine dollars and forty cents (\$979.40); also received for calves vealed, forty-four dollars and sixty-nine cents (\$44.69); calves raised on skim-milk, one hundred dollars (\$100), equaling one thousand one hundred and twenty-four dollars and nine cents (\$1,124.09), an income of fifty-three dollars and forty-three cents (\$53.43) per cow.

Mr. A. H. Huken, in 1888, milked twenty cows and sold 103,225 pounds of milk, an average of 5,162 pounds per cow, and received for milk and calves, \$943.17, an average income of forty-seven dollars and fifteen cents (\$47.15) per cow. It will be observed that Mr. Smith obtained about 90 cents a hundred for his milk, while that of Mr. Bates is figured at about 70 cents. The reason for this is, that Mr. Smith produced the greater portion in winter, while prices ruled higher.

## MILK TEST.

The importance and necessity of a simple, reliable milk test, that can be easily and quickly performed, has long been felt. Its value is for the use of the dairy-man to select and grade up his cows, as well as for the use of the creamery-man, where milk is bought or pooled by weight or measure.

The practice of paying the same price for different milks at butter factories, that vary twenty per cent in their relative butter values, has had a tendency to drive out of the creamery system some of the most enterprising dairymen, and not only that, but the tendency is to encourage the production of thin milk, to say nothing of the inducement to the unscrupulous to water or skim the milk before it is taken to the creamery. In my last report I made mention of Prof. Short's discovery of a milk test, which has been adopted by many creamery-men. The principal objection to the use of Prof. Short's test is the length of time required to make the test.

Within the present year, Prof. G. E. Patrick, of the experimental station at Ames, has perfected a milk test which requires much less time to make the test, and the results are equally satisfactory as those obtained by Prof. Short's method. The results of either one of these methods agree very closely with the full chemical or gravimetric test. I recommend all dairy-men and creamery-men to familiarize themselves with Prof. Patrick's method of testing the butter value of milk. The apparatus for making the test is simple and inexpensive, can be worked by any one, and is held for sale by J. F. McLain, of Ames, Iowa, with full directions. All tubes for measuring the butter fat, sold by Mr. McLain, will be previously tested under the supervision of Prof. Patrick, so that no inaccuracies may occur.

## BUTTER EXTRACTOR.

The latest and most wonderful invention of machinery, for the use of the dairy, is the butter extractor, invented by Mr. C. A. Johansson, of Stockholm, Sweden. This machine is in outward shape and appearance much like the cream separator or centrifugal machine now in use in this State for separating the cream from the other portions of the milk. The butter extractor operates the same as the centrifugal machine in separating the cream from the skim-milk, which process is based on the principal of specific gravity and

centrifugal force. In separating cream, the milk is introduced at the bottom of the bowl of the separator, which revolves with great rapidity. The fat in the milk is lighter than the other portions of the milk, and by centrifugal force the heavier portions seek the greater circumference of the bowl, while the cream remains nearer the center. The butter extractor separates the cream in the same manner as the cream separator, but when the cream fills out toward the center of the revolving bowl, it comes in contact with a device, a trundle wheel called a disturber, which is independent of the main bowl and free to act by itself. When the revolving cream comes in contact with the trundle wheel, the agitation is so great that the cream is again separated, sending the casings that surround the fat to the outer rim of the bowl, while the pure granular butter remains near the center and is discharged at the bottom of the bowl through a conductor or tube. It is claimed that the butter extractor will handle 1,500 pounds of milk an hour, turning out a pound of butter a minute while in operation. The milk is introduced into the machine at 62 degrees temperature. There are but two of the machines yet in this country. It is thought by some persons that the introduction of the butter extractor, will revolutionize the system of dairying in this country, while others must know more of its practical workings before indorsing it so strongly. At present there appears to be several difficulties in the way of the general use of the extractor and one is the markets demand sour cream butter and the extractor produces sweet cream butter. A serious objection to both the cream separator and butter extractor is their cost, which is double what it should be.

## STANDARD MILK.

The State Board of Health has adopted the following as a standard for milk.

Water (Maximum).....	86.87	
Butter fat (minimum).....	3.50	
Milk sugar (maximum).....	4.25	
Solids ..	} 13.13	
Salts (maximum).....		0.60
Ash (maximum).....		0.70
Casein (maximum).....		3.98
	100.00	

Specific gravity, 1029—1034.

## AGRICULTURAL INSTITUTES.

On the 8th of September, 1887, an association was formed at Des Moines for the purpose of holding agricultural institutes in different

parts of the State. Hon. C. F. Clarkson was elected president and Fitch B. Stacy secretary. During the winter of 1887, coming 1888, over twenty-five institutes were held under the direction of the officers before mentioned.

The institutes were generally very well attended by the farmers in the different localities, and by their deep interest it was shown that they were in earnest seeking the results of modern improvements, and anxious to learn of and adopt improved methods in their line of work. Much interest was awakened and good was accomplished by the institutes of 1887 and 1888. At the annual meeting of the Iowa Improved Stock Breeders' Association, held at Iowa City, December 5th and 6th, 1888, there was a special meeting of the Agricultural Institute Association held, at which the Hon. C. F. Clarkson offered his resignation as president of the Association, stating that his heart and spirit were in sympathy with the work, but that the flesh was weak under the weight of years; that he was not able to do the work that necessarily devolved upon the president.

A resolution of thanks was extended to President Clarkson, his resignation accepted, and Col. John Scott, of Nevada, elected president, and, as Mr. Fitch B. Stacy had removed from the State, Mr. Geo. Van Houten, of Lenox, was elected secretary.

At the annual meeting held at Des Moines January 10, 1889, Col. John Scott resigned the presidency and H. D. Sherman, of Monticello, was elected president, John R. Shaffer treasurer, and Geo. Van Houten secretary for the ensuing year.

At this meeting it was represented that there was a demand for a large number of institutes to be held during the winter, and there were no funds to pay the traveling expenses of those who would volunteer their services to assist in carrying forward the work. To supply this want of means, several of the State societies and a few individuals gave pledges to the amount of \$600, or so much as should be necessary to defray the traveling expenses of those who gave their time and services for the benefit of the association. During the winter there were twenty-eight institutes held in the State.

There was a number of other localities where institutes were asked for, but the work was begun so late in the season, and the laborers so few that they could not be supplied.

Of the twenty-eight institutes held I was able to attend thirteen, in addition to the discharge of my duties as Dairy Commissioner.

At each of the institutes that I attended I presented the claims of the dairy interest as a branch of agriculture that is capable of great

improvement over present conditions and methods of producing and handling dairy products. There was expended about \$238 to defray the entire expense of the institute work, including traveling expense of those generous men who volunteered their services, besides what was allowed by the State Agricultural College.

It is now proposed to incorporate the Agricultural Institute Association under the laws of the State, and then present the claims of the institute work to the Twenty-third General Assembly in hopes that the legislature may see and appreciate the importance of institute work, as exemplified in other States, and make a liberal appropriation for its maintenance. It is a matter of State interest, and should receive State encouragement.

#### IOWA BUTTER, CHEESE AND EGG ASSOCIATION.

The Iowa Butter, Cheese and Egg Association is an incorporated body under the laws of the State, that has held its annual meetings, for the discussion of topics connected with the dairy industry, for the last thirteen years, and each year the Association has published several thousand copies of its proceedings for distribution in this State. The entire expense of publishing these reports has been borne by the members of the Association, except for the year 1887, when the State and National Associations held a joint session at Manchester. By authority of a concurrent resolution, passed by the Twenty-second General Assembly, there was three hundred dollars (\$300), of that portion of the State funds that have been set apart for the use of the State Dairy Commissioner, applied toward paying for publishing the report of 1887. The three hundred dollars (\$300) is all the aid the Association has ever received from the State. The Association has done much to assist in the development of the dairy and creamery system in the State. The reports are of interest to all engaged in dairying. The Association is working for the benefit of an industry whose annual products amount to over sixteen million dollars (\$16,000,000) in the State. In view of the benefit the Association is to the State, I would earnestly recommend the Twenty-third General Assembly to make provisions for the publication of the annual report of the Iowa Butter, Cheese and Egg Association at State expense.

#### THE NEW DAIRY LAW OF IOWA,

as amended by chapter 98, acts of the Twenty-second General Assembly:

#### CHAPTER LII.

##### PREVENT DECEPTION IN MANUFACTURE AND SALE OF IMITATIONS OF BUTTER AND CHEESE, AND CREATE DAIRY COMMISSIONER.

##### AN ACT to Prevent Deception in the Manufacture and Sale of Imitation Butter and Cheese.

*Be it enacted by the General Assembly of the State of Iowa:*

SECTION 1. That for the purposes of this act, every article, substance or compound, other than that produced from pure milk or cream from the same, made in the semblance of butter, and designed to be used as a substitute for butter made from pure milk or cream from the same, is hereby declared to be imitation butter; and that for the purposes of this act, every article, substance or compound other than that produced from pure milk or cream from the same, made in the semblance of cheese, and designed to be used as a substitute for cheese made from pure milk or cream from the same, is hereby declared to be imitation cheese; provided that the use of salt, rennet and harmless coloring matter for coloring the product of pure milk or cream, shall not be construed to render such product an imitation.

SEC. 2. Each person who manufactures imitation butter or imitation cheese shall mark by branding, stamping and stencilling upon the top and sides of each tub, firkin, box or other package in which such articles shall be kept, and in which it shall be removed from the place where it is produced, in a clear and durable manner, in the English language, the name of the contents thereof as herein designated, in printed letters in plain Roman type, each of which shall not be less than one inch in length by one half of an inch in width. Every person who by himself or another violates the provisions of this section, shall be deemed guilty of a misdemeanor and upon conviction thereof shall be fined not to exceed two hundred and fifty dollars, or by imprisonment in the county jail not to exceed sixty days.

SEC. 3. No person by himself or another shall knowingly ship, consign or forward by any common carrier whether public or private any imitation butter or imitation cheese, unless the same be marked as provided by section two of this act; and no carrier shall knowingly receive for the purpose of forwarding or transporting any imitation butter or imitation cheese, unless it shall be marked as hereinbefore provided, consigned and by the carrier receipted for by its name as designated by this act; provided that this act shall not apply to any goods in transit between foreign States and across the State of Iowa.

SEC. 4. No person shall knowingly have in his possession or under his control any imitation butter or imitation cheese unless the tub, firkin, box or other package containing the same be clearly and durably marked, as provided by section two of this act; provided that this section shall not be

deemed to apply to persons who have the same in their possession for the actual consumption of themselves or family.

SEC. 5. No person by himself or another shall knowingly sell or offer for sale imitation butter or imitation cheese under the name of or under the pretense that the same is pure butter or pure cheese; and no person by himself or another shall knowingly sell any imitation butter or imitation cheese, unless he shall have informed the purchaser distinctly at the time of the sale that the same is imitation butter or imitation cheese, as the case may be, and shall have delivered to the purchaser at the time of the sale a statement clearly printed in the English language, which shall refer to the articles sold, and which shall contain in prominent and plain Roman type the name of the article sold, as fixed by this act, and shall give the name and place of business of the maker.

SEC. 6. No keeper of a hotel, boarding house, restaurant or other public place of entertainment shall knowingly place before any patron for use as food any imitation butter or imitation cheese, unless the same be accompanied by a placard containing the name in English of such article, as fixed by this act, printed in plain Roman type. Each violation of this section shall be deemed a misdemeanor.

SEC. 7. No action can be maintained on account of any sale or other contract made in violation of or with intent to violate this act by or through any person who was knowingly a party to such wrongful sale or other contract.

SEC. 8. Every person having possession or control of any imitation butter or imitation cheese which is not marked as required by the provisions of this act, shall be presumed to have known during the time of such possession or control the true character and name as fixed by this act of such imitation product.

SEC. 9. Whoever shall efface, erase, cancel or remove any mark provided for by this act, with intent to mislead, deceive, or to violate any of the provisions of this act, shall be deemed guilty of a misdemeanor.

SEC. 10. Whoever shall violate any of the provisions of the third, fourth and fifth sections of this act shall, for the first offense, be punished by a fine of not less than fifty dollars nor more than one hundred dollars, or by imprisonment not exceeding thirty days, and for each subsequent offense shall be punished by a fine of not less than two hundred and fifty dollars nor more than five hundred dollars, or by imprisonment in the county jail not less than thirty days nor more than six months, or by both such fine and imprisonment, in the discretion of the court.

SEC. 11. The Governor shall, on or before the first day of April of each even-numbered year, appoint an officer, who shall be known as the Iowa State Dairy Commissioner, who shall have practical experience in the manufacture of dairy products, and who shall hold his office for the term of two years from the first day of May following his appointment, or until his successor is appointed and qualified. Said Commissioner shall give an official bond conditioned for the faithful performance of the duties of his office in the sum of ten thousand dollars, with sureties to be approved by the Governor. He may be removed from office by the Governor, with the approval of the Executive Council, for neglect or violation of duty. Any vacancy shall be

filled by the appointment of the Governor, and with the advice and consent of the Executive Council.

SEC. 12. The State Dairy Commissioner shall receive a salary of fifteen hundred dollars per annum, payable monthly, and the expenses necessarily incurred in the proper discharge of the duties of his office; provided, that a complete itemized statement of all expenses shall be kept by the Commissioner, and by him filed with the Auditor of State after having been duly verified by him before receiving the same. He shall be furnished a room in the agricultural department of the Capitol at Des Moines, in which he shall keep his office and all correspondence, documents, records and property of the State pertaining thereto, all of which shall be turned over to his successor in office. He may, if it is found to be necessary, employ a clerk whose salary shall not exceed the sum of fifty dollars per month. Said salaries and expenses to be paid from the appropriation provided for in section seventeen of this act. The Commissioner provided for by this act shall hold no other official position under the laws of Iowa, or a professorship in any of the State institutions.

SEC. 13. It shall be the duty of the State Dairy Commissioner to secure, so far as possible, the enforcement of this act. He shall collect, arrange and present in annual reports to the Governor, on or before the first of November of each year, a detailed statement of all matters relating to the purposes of this act, which he shall deem of public importance, including the receipts and disbursements of this office. Such report shall be published with the report of the State Agricultural Society.

SEC. 14. The State Dairy Commissioner shall have power in all cases where he shall deem it important for the discharge of the duties of his office, to administer oaths, to issue subpoenas for witnesses and to examine them under oath, and to enforce their attendance to the same extent and in the same manner as a justice of the peace may now do, and such witnesses shall be paid by the Commissioner the same fees now allowed witnesses in justices' courts.

SEC. 15. Whoever shall have possession or control of any imitation butter or imitation cheese contrary to the provisions of this act shall be construed to have possession of property with intent to use it as a means of committing a public offense within the meaning of chapter 50 of title 25 of the Code; provided, that it shall be the duty of the officer who serves a search warrant issued for imitation butter or imitation cheese, to deliver to the State Dairy Commissioner, or to any person by such Commissioner authorized in writing to receive the same, a perfect sample of each article seized by virtue of such warrant, for the purpose of having the same analyzed, and forthwith to return to the person from whom it was taken, the remainder of each article seized as aforesaid. If any sample be found to be imitation butter or imitation cheese, it shall be returned to and retained by the magistrate as and for the purpose contemplated by section 4648 of the Code, but if any sample be found not to be imitation butter or imitation cheese, it shall be returned forthwith to the person from whom it was taken.

SEC. 16. It shall be the duty of the court in each action for the violation of this act to tax as cost in the cause the actual and necessary expense of analyzing the alleged imitation butter or imitation cheese, which shall be in controversy in such proceedings, provided that the amounts so taxed shall

not exceed the sum of twenty-five dollars. It shall be the duty of the district or county attorney, upon the application of the Dairy Commissioner, to attend to the prosecution, in the name of the State, of any suit brought for the violation of any of the provisions of this act within his district; and in case of conviction he shall receive twenty-five per cent of the fines collected, which shall be in addition to any salary he may receive, to be taxed as costs in the case.

SEC. 17. That the unexpended portion of the appropriation provided for by section 17 of the 52d chapter of the Twenty-first General Assembly, is hereby appropriated for the next biennial period, or so much thereof as may be necessary for the proper carrying out of the purposes of the act; but not more than one half of said unexpended balance shall be drawn from the State Treasury prior to the 1st day of May, 1889. The amount hereby appropriated shall be expended only under the direction and with the approval of the Executive Council. And all salaries, fees, costs and expenses of every kind incurred in the carrying out of this law shall be drawn from the sum so appropriated.

SEC. 18. Chapter 39 of the acts of the Eighteenth General Assembly of Iowa, and all acts and parts of acts in conflict with this act, are hereby repealed.

SEC. 19. This act being deemed of immediate importance, shall take effect and be in force from and after its publication in the Iowa State Register and Iowa Homestead, newspapers published in Des Moines, Iowa.

Approved March 27, 1886.

Amendments approved March 28, 1888.

Law pertaining to milk, as enacted by the Thirteenth General Assembly, and found in the Code of Iowa, chapter 156, section 4042.

#### ADULTERATED MILK, CHEESE OR BUTTER.

SEC. 4042. If any person knowingly sell to another, or knowingly deliver or bring to another to be manufactured, to any cheese or butter manufactory in this State, any milk diluted with water, or in any way adulterated, or milk from which any cream has been taken, or milk commonly known as "skimmed milk," or shall keep back any part of the milk known as "strippings," with intent to defraud, or shall knowingly sell the milk, the product of a diseased animal or animals, or shall knowingly use any poisonous or deleterious material in the manufacture of cheese or butter, he shall, upon conviction thereof, be fined in any sum not less than twenty-five dollars nor more than one hundred dollars, or be liable in double the amount of damages to the person or persons, firm, association or corporation upon whom such fraud shall be committed.

#### REPORT OF BUTTER AND CHEESE IN SEPARATE COUNTIES.

The following table shows the number by counties of creameries and cheese factories, and also amount of butter and cheese made in factory, in each county in 1888. These amounts have been obtained

direct from the manufacturers, and are supposed to be correct, although there are a few factories that I was not able to obtain a report from, and the amount they produced is not included. It will be observed that in some instances, creameries or cheese factories are reported, but no butter or cheese, as the case may be. This is accounted for in part, from the fact that a large number of factories have been started in 1889, and the amount of butter and cheese reported is the make of 1888. For instance, Delaware county, now, has 43 creameries and only reports 810,020 pounds of butter, but 14 of the creameries of Delaware county have been put in operation since the beginning of the present year, and it is probable that the county will produce nearly double the amount of creamery butter this year to that of 1888. The table shows the number of creameries and cheese factories now in the State, which is an increase of 75 creameries and 60 cheese factories over the number in operation in 1888.

## No. OF CREAMERIES AND CHEESE FACTORIES.

COUNTY.	Number of creameries.	Amount of butter.	Number of cheese factories.	Amount of cheese.
Adair	3	50,000	1	35,000
Adams	1	130,294	2	27,532
Alamakee	8	1,211,525	1	.....
Appanoose	1	50,000	.....	.....
Audubon	2	124,620	4	82,820
Benton	6	1,223,888	2	24,118
Black Hawk	24	1,733,233	2	679,118
Boone	2	68,000	2	.....
Bremer	26	1,208,028	.....	.....
Buchanan	21	1,093,891	2	30,000
Buna Vista	2	149,800	.....	.....
Butler	24	1,362,418	1	.....
Calhoun	2	190,000	.....	.....
Carroll	4	244,000	1	.....
Cass	3	100,403	.....	.....
Cedar	12	704,400	.....	.....
Cerro Gordo	6	376,100	1	.....
Cherokee	1	54,000	.....	.....
Chickasaw	16	1,026,966	1	95,939
Clarke	2	140,000	.....	.....
Clay	3	135,000	2	40,000
Clayton	27	1,302,390	2	15,500
Clinton	13	388,596	.....	.....
Crawford	2	167,000	.....	.....
Dallas	2	300,000	1	9,250
Davis	2	117,537	6	54,400
Decatur	1	80,000	6	80,284
Delaware	44	810,020	3	37,000
Des Moines	1	95,000	1	35,000
Dickinson	1	70,000	.....	.....
Dubaque	24	745,155	.....	.....
Emmet	2	73,000	1	.....
Fayette	32	1,970,646	3	.....
Floyd	10	988,786	2	170,441
Franklin	5	521,280	2	32,106
Fremont	1	5,000	1	.....
Greene	4	270,000	3	45,134
Grundy	13	1,117,947	2	370,118
Guthrie	2	46,000	1	.....
Hamilton	2	75,000	1	.....
Hancock	2	72,000	.....	.....
Hardin	10	796,138	8	483,690
Harrison	2	4,000	1	3,000
Henry	2	122,411	7	94,050
Howard	8	904,575	1	23,000
Humboldt	4	353,200	.....	.....
Ida	1	.....	.....	.....
Iowa	7	427,330	4	13,000

## No. OF CREAMERIES AND CHEESE FACTORIES—CONTINUED.

COUNTY.	Number of creameries.	Amount of butter.	Number of cheese factories.	Amount of cheese.
Jackson	14	679,407	1	.....
Jasper	7	809,910	2	127,318
Jefferson	2	165,360	.....	.....
Johnson	5	265,000	2	94,000
Jones	44	2,243,218	8	103,840
Keokuk	2	580,151	5	30,000
Kossuth	2	467,140	1	.....
Lee	4	185,000	2	54,500
Linn	32	1,509,936	3	56,000
Louis	1	144,000	.....	.....
Lucas	1	50,000	.....	.....
Lyon	2	25,000	.....	.....
Madison	2	237,703	.....	.....
Mahaska	2	347,058	.....	.....
Marion	2	300,000	4	34,610
Marshall	5	637,957	2	8,638
Mills	2	190,000	.....	.....
Mitchell	13	1,407,825	.....	.....
Monona	2	4,160	1	54,750
Monroe	.....	.....	11	409,227
Montgomery	3	267,000	1	39,336
Muscatine	4	628,168	1	.....
O'Brien	2	40,000	3	.....
Osceola	1	47,040	.....	.....
Page	2	160,000	4	122,937
Palo Alto	3	176,000	.....	.....
Plymouth	3	142,264	.....	.....
Pocahontas	4	100,000	.....	.....
Polk	.....	.....	1	11,000
Pottawattmib.	2	85,000	.....	.....
Poweshiek	6	423,857	2	160,450
Ringgold	4	85,414	.....	.....
Sac	13	252,234	1	.....
Scott	1	50,000	1	52,000
Shelby	1	.....	.....	.....
Sioux	2	108,335	3	30,000
Story	9	448,738	.....	.....
Tama	5	250,000	1	52,531
Taylor	1	40,000	2	13,850
Union	2	86,811	4	27,968
Van Buren	3	95,750	2	25,000
Wapello	3	33,406	3	56,982
Warren	2	230,000	4	15,300
Washington	7	604,647	5	230,744
Wayne	4	50,000	3	135,540
Webster	.....	.....	.....	.....
Winnebago	7	674,870	.....	.....
Winnesheik	14	2,226,074	.....	.....
Woodbury	3	140,000	.....	.....
Worth	8	478,188	1	.....
Wright	4	230,000	5	9,658
Total	693	41,576,548	164	4,406,998

The foregoing table shows that there was 41,576,548 pounds of creamery butter and 4,406,098 pounds of factory cheese produced in Iowa in 1888. By investigation, we find that the average net price per pound received by the producers of creamery butter was 21 cents, and of factory cheese, 9 cents.

## ESTIMATE OF DAIRY PRODUCT.

Butter, 41,576,548 pounds, at 21 cents.....	\$ 8,731,075.08
Cheese, 4,406,098 pounds, at 9 cents.....	396,548.82
Equals .....	\$ 9,127,623.90

To this sum add the value of dairy butter, as was reported by the census of 1884, which was 48,320,757 pounds, at 13 cents 6,282,468.41

Which makes .....\$15,410,092.31

Now, if we add the value of the estimated increase of 15 per cent of factory butter and cheese produced in 1889, we have ..... 1,869,148.58

Which makes a total of.....\$16,779,235.89

The amount of dairy butter made on the farm I could not obtain without a thorough canvass and census of the State, which I had not the ability to do. I have therefore taken it for granted that there was as much made in 1888 as in 1884, the year the last census was taken.

All of the above figures and estimates are conservative, and the actual product will no doubt overrun this estimate.

H. D. SHERMAN,  
*State Dairy Commissioner*

## ACCOUNT OF FINANCE.

At the time of the enactment of our present State dairy law, in 1886, for the protection of dairy products against adulteration and counterfeit in Iowa, oleomargarine had gained so strong a hold that it was thought by the friends of the dairy interest that it would require a large appropriation to enforce the law for even two years. Thirty thousand dollars (\$30,000) was asked for, but the legislature made an appropriation of twenty thousand dollars (\$20,000), deeming that amount sufficient for two years. The operations of the law have now been enforced three years and a half, during which time oleomargarine has been practically kept out of the State. There has been absolutely no adulteration of butter or cheese practiced in the State during that time, and there has been but a limited amount of oleomargarine sold in the State, and then by authority of a United States government license. The reputation of Iowa's dairy product for purity has been fully established, and there is no State whose dairy product is freer from the taint of adulteration in eastern markets than that of Iowa.

All this has been accomplished, and there is not yet expended one half of the \$20,000 appropriation, as will be seen by the submitted financial report. The whole expenditure of the Dairy Commissioner's office to date, is \$8,815.05. To this amount add \$300, which sum was taken from the \$20,000 appropriation, by authority of a concurrent resolution of the Twenty-second General Assembly, to publish the proceedings of the Iowa State Butter, Cheese and Egg Association, and we have \$9,115.05 that has been drawn from the appropriation, leaving the sum of \$10,884.95 yet undrawn from the State treasury.

## FINANCIAL STATEMENT.

Commissioner's salary.....	\$ 1,500.00
Clerk's salary.....	550.00
Contingent expense.....	394.04
Telegraph service.....	1.25
Postage.....	82.00
Expressage.....	2.60
Stationery.....	2.50
Milk tester.....	9.60
P. C. Kenyon, stationery.....	24.25
L. S. Merchant, binding reports.....	63.75
L. C. Dahlberg, type-writer rent.....	7.00
Dahlberg, Irish & Co., type-writer supplies.....	1.40
Fred Hunter, stationery.....	1.50
Total.....	\$ 2,579.89
Balance of appropriation as reported November 1, 1888.....	\$ 13,494.98
Less error, amount disallowed in 1887.....	30.14
True balance of appropriation November 1, 1888.....	\$ 13,464.84
Amount of expenditures from November 1, 1888 to November 1, 1889.....	2,579.89
Total amount drawn from State treasury to date.....	9,115.05
Balance undrawn from State treasury.....	10,884.95

H. D. SHERMAN,  
State Dairy Commissioner.

## LIST OF CREAMERIES.

## ADAIR COUNTY.

Adair—Adair Creamery.  
Fontanelle—Fontanelle Creamery.  
Orient—Wiley, Slocum & Co.

## ADAMS COUNTY.

Corning—W. L. Williams.

## ALLAMAKEE COUNTY.

Lansing—Nieler & Bockhausen.  
New Albin—Bickel & Co.  
Postville—Hardin Creamery Co.  
Postville—Union Creamery Co.  
Quandahl—Johnson & Olson.  
Waterville—A. Jensvold.  
Waukon—J. E. Hubbell.  
Waukon—Waukon Excelsior Creamery and Cheese Factory; E. H. Miller, Secretary.

## APPANOOSE COUNTY.

Centerville—Lawrence Whitsell.

## AUDUBON COUNTY.

Audubon—Fisher Bros. & Co.  
Extra—Extra Creamery.

## BENTON COUNTY.

Belle Plaine—Hilton Bros. & Co.  
Blairstown—J. R. Morin & Co., Cedar Rapids.  
Garrison—Vinton Creamery Co.  
Mt. Auburn—G. B. Ginberick.  
Norway—J. R. Morin & Co., Cedar Rapids.  
Urbana—G. W. Gillman.  
Van Horne—J. R. Morin & Co., Cedar Rapids.  
Vinton—Vinton Creamery Co.

## BLACK HAWK COUNTY.

Cedar Falls—S. Smith; two creameries.  
 Cedar Falls—E. D. Peck.  
 Dunkerton—Meyerhoof Bros.  
 Eagle Township—J. & T. Siltsgard.  
 Finchford—H. C. Boyer.  
 Gresham—Fred Dickmann.  
 Gilbertville—Harris & Co.; five creameries; Jessup.  
 Hudson—S. B. Knudson.  
 Jubilee—Geo. Orth.  
 La Porte City—J. Wasson & Co.  
 La Porte City—West Lawn Creamery; J. L. Newton, Secretary.  
 Mt. Vernon Township—Mr. Timeon.  
 Orange Township—Brown & Son, Waterloo.  
 Waterloo—Thorpson & Harrod; six creameries.

## BOONE COUNTY.

Boone—M. A. Chamberlain & Son.  
 Mackey—John S. Gerber.

## BREMER COUNTY.

Bremer—Clansing & Kelling.  
 Buck Creek—Little Valley Creamery Co.  
 Crane Creek—Meyerhoof Bros.  
 Denver—J. W. Matthias & Son; two creameries.  
 Denver—Homrighaus, Rector & Co.  
 Fredrick—Brennan & Bro.  
 Key—Meyerhoof Bros.; three creameries.  
 Key—Wapsie Valley Creamery Co.  
 Kintell—Seehaas & Thies.  
 Maxfield—Meyerhoof Bros.  
 Maxfield—Hageman & Langhorst, Waterloo.  
 Plainfield—Fulton Bros.  
 Plainfield—S. S. Renfrew.  
 Sumner—Buck Creek Creamery Co.  
 Sumner—Little Valley Creamery Co.  
 Sumner—Gardner, Murphy & Co.  
 Sumner—Spring Fountain Creamery Co.  
 Tripoli—Dunker & Matthias.  
 Tripoli—A. H. Baany & Bros.  
 Tripoli—T. J. Dorn.  
 Waverly—Bruia & Leet.  
 Waverly—J. W. Matthias & Son.  
 Waverly—Chas. Schlaberg.

## BUCHANAN COUNTY.

Aurora—Farmers' Creamery Co.  
 Brandon—D. A. McLeish.  
 Fairbank—S. J. King.

Fairbank—Co-operative Creamery Co.; B. F. Ellis, Secretary.  
 Independence—Farmers' Co-operative Creamery.  
 Independence—Weins & Shillinglaw.  
 Jessup—Charles A. Marsh.  
 Jessup—Harris & Co.; two creameries.  
 Littleton—Farmers' Alliance Creamery.  
 Monti—Honlahan & Donnelly.  
 Newtonville—Wm. Lewis, Quasqueton.  
 Otterville—Farmers' Creamery Company, W. Pratt, Secretary.  
 Quasqueton—Farmers' Co-operative Creamery.  
 Quasqueton—W. H. Eddy.  
 Rowley—W. Brady.  
 Rowley—Farmers' Co-operative Creamery.  
 Shady Grove—Kenney Bros.  
 Stanley—Farmers' Creamery Co.  
 Winthrop—M. A. Chamberlain.  
 Winthrop—Farmers' Co-operative Creamery.

## BUENA VISTA COUNTY.

Newell—J. T. Norton.  
 Storm Lake—Buena Vista Creamery Co.

## BUTLER COUNTY.

Allison—C. B. Hyde.  
 Aplington—Markley & Dadswell; two creameries.  
 Aplington—Dadswell & Durand.  
 Butler Center—S. W. Williams & Son; two creameries.  
 Bristow—E. M. Haven.  
 Clarksville—Oak Grove Creamery Association.  
 Clarksville—Wm. Cronin & Son.  
 Dumont—L. Fortham & Co.; two creameries.  
 Greene—L. Fortham & Co.  
 Hitesville—Markley & Dadswell.  
 New Hartford—N. H. Bloom.  
 New Hartford—F. M. Wells.  
 New Hartford—A. M. Du Bois.  
 Parkersburg—Isaac Hall.  
 Parkersburg—S. Williams & Son.  
 Parkersburg—Smith & Powers.  
 Parkersburg—Palmer Bros. & Co.  
 Shell Rock—Town & Wheeler.  
 Shell Rock—J. H. Kublank.  
 Shell Rock—O. J. Wheeler.  
 Shell Rock—Wait & Curtis.

## CALHOUN COUNTY.

Lake City—Boardman Bros., Nevada.  
 Manson—Hillman Bros.

## CARROLL COUNTY.

Carroll—C. W. Adams.  
 Coon Rapids—Boardman Bros.; Nevada.  
 Glidden—A. J. Heaton.  
 Roselle—C. Kohorst.

## CASS COUNTY.

Atlantic—A. C. Burton.  
 Atlantic—Peter Landmesser.  
 Griswold—Cheney & Forsyth.

## CEDAR COUNTY.

Clarence—H. L. Dean, Tipton; two creameries.  
 Clarence—M. B. Launo.  
 Lowden—A. Niething & Co.  
 Lowden—August Hinricks.  
 Lowden—J. Friend & Co.  
 Mechanicsville—J. R. Morris & Co., Cedar Rapids.  
 Springdale—Levi Pilkington.  
 Tipton—H. L. Dean.  
 West Branch—Levi Pilkington.

## CERRO GORDO COUNTY.

Clear Lake—Clear Lake Dairy-man's Association.  
 Creamery—S. H. C. Class.  
 Mason City—Mason City Creamery Co.; O. T. Deulson, President.  
 Plymouth—Plymouth Creamery Association.  
 Rock Falls—Rock Falls Co-operative Creamery.  
 Rockwell—Felthouse Bros. & Co.

## CHEROKEE COUNTY.

Cherokee—J. S. Robinson.

## CHICKASAW COUNTY.

Bassett—S. E. Allen.  
 Bradford Township—S. S. Waterbury, Nashua.  
 Bradford—A. A. Moody.  
 Bustl—Beard & Allen.  
 Chickasaw—Decorah & Boston Creamery Co.  
 Dresden Township—John H. Holthoff, Williamstown.  
 Fredricksburg—Haskett & Padden.  
 Ionia—Allen & Beard Bros.  
 Lawler—Little Turkey Creamery Co.  
 Lawler—Farmers' Co-operative Creamery Co.; F. E. Ayers, Secretary.  
 Nashua—P. H. Powers, Greene.  
 New Hampton—Decorah & Boston Creamery Co.  
 North Washington—Hentges & Bro.  
 Richland Township—Moody Bros., Nashua.  
 Stapleton—Ace Webster, Lawler.  
 Utica Township—Mr. Day.

## CLARKE COUNTY.

Murray—Wm. Taylor.  
 Osceola—J. W. Hall.

## CLAY COUNTY.

Peterson—H. Kr. Hansen.  
 Spencer—J. H. Welch.  
 Spencer—E. J. Whitmore & Co.

## CLAYTON COUNTY.

Communica—Communica Creamery Co.  
 East Elkport—C. Shnepf.  
 Edgewood—Edgewood Co-operative Creamery.  
 Edgewood—Farmers' Creamery Co.  
 Edgewood—H. F. Beyer.  
 Elkader—C. F. Stearns.  
 Elkader—C. S. Anderson.  
 Elkader—J. J. Kann.  
 Farmersburg—Farmers' Creamery Association.  
 Garnavillo—G. W. Kennedy.  
 Garnavillo—Joseph Kann.  
 Giard—J. D. Bickel.  
 Hardin—A. Candee.  
 Hardin—C. C. Lang; butter and cheese.  
 Luana—W. H. Russell.  
 Monona—Union Creamery Co.  
 Osborne—James Byrnes; two creameries.  
 Postville—Union Creamery Co.  
 St. Olaf—Embretson & Larson.  
 Strawberry Point—Farmers' Co-operative Creamery.  
 Strawberry Point—J. E. Baird.  
 Strawberry Point—Jowa Union Creamery Co.  
 Strawberry Point—James Byrnes.  
 Strawberry Point—Kingsley Bros.  
 Strawberry Point—G. H. Schofield.  
 Volga—John Lowe.  
 Volga—James Leahy.

## CLIXTON COUNTY.

Andover—Heymen & Von Oven, Milo.  
 Bryant—H. Hansen.  
 Bryant—H. B. Atwood.  
 Bryant—H. Kruse.  
 Calamus—Muller & Wendel.  
 Delmar—F. Salsbury & Co.  
 De Witt—Boston Creamery Company; 2 creameries.  
 Elwood—D. M. Windsor & Co.  
 Elwood—Diamond Creamery Company, Monticello.  
 Pleasant Valley—H. L. Dean.  
 Welton—R. M. Hincley.  
 Wheatland—A. Fuller.

## CRAWFORD COUNTY.

Denison—S. M. Thew.  
Vall—Clayton & Nagle.

## DALLAS COUNTY.

Dexter—C. H. Lyon.  
Perry—John Moody & Son.

## DAVIS COUNTY.

Bloomfield—Eicher Bros.  
Pulaski—J. J. Miller.

## DECATUR COUNTY.

Leon—Hudson Bros.

## DELAWARE COUNTY.

Adams Township—John Holyhaw, Barryville.  
Almira—Anderson & Flint.  
Almoral—J. B. Dunham.  
Colesburg—E. Laird & Co.  
Delhi—Allison Bros.  
Delhi—Delhi Co-operative Creamery.  
Delhi—C. M. Hanna.  
Delaware—D. M. Hall & Son, Monticello.  
Dundee—E. Laird & Co.  
Earlville—Russell & Martin.  
Ehlers—G. A. Abbey.  
Ehlers—James Henderson.  
Ehlers—Washington Creamery Co.  
Golden—A. E. Anderson.  
Golden—F. L. Clark.  
Greeley—Greeley Creamery Co.  
Hazel Green—Farmers' Co-operative Creamery.  
Hazel Green—F. B. Dickey & Co.  
Hopkinton—McConnell & Stelner, 3 creameries.  
Hopkinton—R. S. Dunlap.  
Hopkinton—Platt & Winsor.  
Hopkinton—August File.  
Hopkinton—N. B. Richardson.  
Manchester—Spring Branch Co-operative Creamery.  
Manchester—Manchester Co-operative Creamery.  
Masonville—B. W. Kenyon.  
Masonville—E. Laird & Co.  
Oneida—Oneida Co-operative Creamery.  
Oneida—Farmers' Creamery Co.  
Petersburg—E. Laird & Co.  
Prairie Township—B. W. Kenyon, Masonville.

South Fork Township—Diamond Creamery Co., Monticello; 3 creameries.  
Thorpe—Fred Wormleighton.  
Tower Hill—G. Abbey.  
Tower Hill—F. P. Ryan, Ehlers.  
Tower Hill—J. J. McAreavy, Ryan.  
Ryan—B. W. Kenyon.  
Uniontown—N. B. Richardson.  
Uniontown—G. File.

## DES MOINES COUNTY.

Burlington—E. P. Dunham.

## DICKINSON COUNTY.

Spirit Lake—C. C. Dyking.

## DUBUQUE COUNTY.

Balltown—Lewis Backers.  
Balltown—Henry Cummyer.  
Bankston—Michael Ferring.  
Cascade—M. B. Flannigan.  
Cascade—Breitback Bros.  
Cascade—W. C. Aitchison; 3 creameries.  
Cascade—Dehner & Kay.  
Dyersville—A. Limback & Co.; 2 creameries.  
Farley—A. C. Walker & Co.  
Farley—Vibber & Heald; 2 creameries.  
Fillmore—Dehner & Kay, Cascade.  
Luxemburg—Ungs Bros.  
New Vienna—Kerper & Neber.  
Peosta—Michael Ferring.  
Peosta—Jacob Breitback.  
Peosta—Dehner & Kay, Cascade.  
Peosta—Beck & Gremmels.  
Pin Oak—Wm. Simmons.  
Richland Township—Dehner & Kay, Cascade.  
Sherrill's Mound—Jacob Breitback.  
Worthington—Lewis Board.  
Worthington—Wm. Lattner; 3 creameries.  
Worthington—Vibber & Heald, Farley.  
Worthington—A. A. Beck.  
Zwingle—W. C. Aitchison, Cascade.

## EMMET COUNTY.

Estherville—G. W. Wilson.  
Swan Lake—G. W. Hawk.

## FAYETTE COUNTY.

Alpha—Alpha Farmers' Creamery Co.  
Alpha—Ace Webster, Wanoma.  
Bethel—E. F. Beebe, Alpha.

Bethel—Ace Webster, Waucoma.  
 Brush Creek—Brush Creek Creamery Co.  
 Clermont—G. L. Weeks.  
 Elgin—Chas. Anderson.  
 Elgin—G. L. Weeks.  
 Fayette—Geo. Whiteley, President.  
 Fayette—J. W. Winston, Secretary.  
 Hawkeye—Brown & Rogers.  
 Illyra—Illyra Creamery.  
 Maynard—G. H. Lattimer, Secretary, Westgate.  
 Maynard—Crown Creamery Co.; J. C. Lewis, Secretary.  
 Maynard—Harlem Creamery Co.; A. F. Crawford, Secretary.  
 Oelwein—Jamison Bros.  
 Oelwein—Jefferson Creamery Co.  
 Oelwein—McDonald & Edwards.  
 Oelwein—Oelwein Farmers' Creamery Co.  
 Randalla—Randalla Creamery Co.  
 Randalla—Fairview Creamery Co.  
 Randalla—Gurnsey Smith.  
 Stanley—S. C. Irvines, Manager.  
 Wadena—James Leahy.  
 Waucoma—Waucoma Farmer's Creamery Co.  
 Waucoma—D. P. Moody.  
 Waucoma—Ace Webster.  
 Westgate—Corbley's Grove Creamery, G. H. Lattimer.  
 Westgate—Westgate Creamery Co.  
 West Union—Union Creamery Co.  
 West Union—P. L. Rowland & Son.  
 West Union—Illyra Creamery Co.

## FLOYD COUNTY.

Charles City—Kelley & Salmon.  
 Floyd—Floyd Co-operative Creamery Co.  
 Marble Rock—C. H. Oakes.  
 Niles—Niles Creamery Association.  
 Nora Springs—Cottage Grove Dairy Association.  
 Pleasant Grove—P. H. Powers, Greene.  
 Riverton Township—S. S. Waterbury, Nashua.  
 Rockford—Rockford Co-operative Dairy Association.  
 Rudd—Farmers' Co-operative Creamery Association.  
 Greene—Co-operative Creamery, L. Forthum, Manager.

## FRANKLIN COUNTY.

Faulkner—H. C. Clock.  
 Geneva—H. C. Clock.  
 Hampton—I. W. Meyers.  
 Hansell—J. W. Hansell.  
 Sheffield—Sheffield Creamery.

## FREMONT COUNTY.

Sidney—B. F. Clare.

## GREENE COUNTY.

Dana—W. L. Addy.  
 Grand Junction—W. L. Addy.  
 Jefferson—Morgan & Cunningham.  
 Paton—Geo. E. White.

## GRUNDY COUNTY.

Beaman—Hilton Bros. & Co.  
 Black Hawk Township—C. C. Schuler, Grundy Center.  
 Dairyville—N. A. Blom.  
 Fairfield Township—J. & T. Silfgard, Cedar Falls.  
 Fairfield Township—F. W. Wells.  
 Grant Township—J. & T. Silfgard, Cedar Falls.  
 Grundy Center—W. S. Carrington.  
 Grundy Center—J. H. Sperry; 2 creameries.  
 Grundy Center—C. C. Schuler.  
 Melrose Township—Wm. Hartman.  
 Morris—J. & T. Silfgard, Cedar Falls.  
 Wellsburg—Dadswell & Durand.

## GUTHRIE COUNTY.

Panora—W. L. Hitchins.  
 Stuart—L. N. Weisman.

## HAMILTON COUNTY.

Ellsworth—S. G. Johnson & Co.  
 Stratford—J. M. Daniels & Son.  
 Webster—James Miracle & Co.  
 Webster City—W. H. Dygert & Co.  
 Webster City—R. G. Clark & Co.  
 Williams—A. C. Clark & Co.

## HANCOCK COUNTY.

Britt—Farmers' Co-operative Creamery; C. S. Brocon, Secretary.  
 Garner—S. W. Merten.

## HARDIN COUNTY.

Ackley—Webb Johnson.  
 Ackley—Martin Bros.  
 Alden—Alden Creamery.  
 Alden—Alaska Creamery Co.  
 Eldora—J. H. Smith.  
 Hubbard—C. D. Andrews & Co.  
 Lawn Hill—Lawn Hill Co-operative Creamery.  
 Steamboat Rock—Iowa River Creamery.  
 Whitten—Wm. Hartman.  
 Whitten—Whitten Creamery Co.; W. Rodwell, Secretary.

## HARRISON COUNTY.

Dunlap—B. F. Roberts.  
Missouri Valley—Geo. Richardson.

## HENRY COUNTY.

Swedesbury—W. N. Tolander.  
Winfield—Huskins & Emery.

## HOWARD COUNTY.

Chester—Farmers' Co-operative Creamery Co.; Torrey Avery, Secretary.  
Cresco—Cresco Creamery Co., Platt & O'Malley.  
Cresco—Merchants Creamery Co.  
Cresco—Byron P. Norton.  
Elma—Decorah & Boston Creamery Co.  
Lime Springs—Cresco Creamery Co., Cresco.  
Lowther—Co-operative Creamery Co.  
Paris Township—Cresco Creamery Co.; Cresco.

## HUMBOLDT COUNTY.

Bode—Wm. L. Rossing.  
Dakotah—Baker, Savage & Co.  
Humboldt—Baker, Savage & Co.  
Renwick—John Wallace & Co.

## IDA COUNTY.

Holstein—Reynolds, Jones & Co.

## IOWA COUNTY.

Genoa Bluff—Geo. E. Howard.  
Homestead—D. Sandersfield.  
Ladora—Levi Lewis.  
Ladora—R. M. Switzer.  
Marengo—E. S. McDonald.  
North English—Boyd & Co.  
Williamsburg—Mathews & Dwyer.

## JACKSON COUNTY.

Andover—Heynen & Von Oven, Miles.  
Andrew—Kling & McComb.  
Baldwin—Diamond Creamery Co., Monticello.  
Bellevue—Ell Cole, Sr.  
Bellevue—Herman Ellenghouse.  
Fulton—J. J. Black.  
Garry Owen—James Leonard.  
La Motte—Ell Cole, Sr.  
La Motte—J. R. Thurston.  
Miles—Heynen & Von Oven.

Preston—Heynen & Von Oven, Miles.  
Richland Township—W. C. Althison, Cascade.  
Spragueville—Heynen & Von Oven, Miles.  
Springbrook—Chris Kegler.

## JASPER COUNTY.

Baxter—Hess D. Preston.  
Kellog—Kellog Co-operative Creamery.  
Metz—Farmers' Co-operative Creamery; Melvin English, manager.  
Newton—C. W. Hart.  
Newton—Hess D. Parsons.  
Newton—L. T. Welty.  
Prairie City—Potter & Ryan.

## JEFFERSON COUNTY.

Batavia—John McLane; two creameries.  
Fairfield—John McLane.

## JOHNSON COUNTY.

Frank Pierce—A. Sweeney.  
Iowa City—Brooke & Brown.  
Lone Tree—S. G. Kelley, Wilton.  
Oxford—Brooke & Brown.  
Solon—H. L. Dean, Tipton.

## JONES COUNTY.

Amber—Hartman & Sanford.  
Anamosa—Shaw & Dutton.  
Anamosa—W. T. Shaw.  
Anamosa—S. M. Condit.  
Argand—Kehoe & Hogan.  
Bowen—Star Creamery.  
Cascade—J. L. Bader.  
Cascade—J. Hesch.  
Cascade—W. B. Flarity.  
Martelle—J. B. Morin & Co., Cedar Rapids; three creameries.  
Monticello—D. M. Hall & Son; two creameries.  
Monticello—H. F. Pierce; three creameries.  
Monticello—G. W. & G. L. Lovell.  
Monticello—Joseph Hofacre.  
Monticello—Diamond Creamery Co.; operate twelve creameries in Jones county, centering at Monticello.  
Olin—Lamb Bros.  
Onslow—S. L. Gilbert.  
Scotch Grove—C. M. Hanna, three creameries.  
Wyoming—Diamond Creamery Co.; operate eight creameries, centering at Wyoming, in Jones county.

## KEOKUK COUNTY.

Delta—James Dickson.  
 Harper—Wm. G. Schuertzein.  
 Hedrick—Fisk Bros.  
 Keota—S. E. Relsman.  
 Keswick—Johns, Wilson & Davis.  
 Martinsburg—W. T. Miles.  
 Richland—Eicher Bros.  
 Sigourney—Theo. A. Schuertzein.

## KOSSUTH COUNTY.

Algona—Boardman Bros.  
 Algona—John Wallace & Co; three creameries.  
 Bancroft—John Wallace & Co., Algona.  
 Wesley—Lawson & Olson Bros.  
 Whittemore—Boardman Bros., Algona.  
 Whittemore—Fairville Creamery Co.

## LEK COUNTY.

Ft. Madison—T. G. Currier.  
 Houghton—J. Houghton & Son.  
 West Point—Wm. Schulte.  
 West Point—H. D. Stoddard.

## LINN COUNTY.

Broadway—F. B. Dickey & Co.  
 Cedar Rapids—Woodward, Derflinger & Co.  
 Cedar Rapids—J. R. Morin & Co.  
 Center Point—J. R. Gitchell.  
 Central City—P. G. Henderson.  
 Central City—F. McLeod & Co.  
 Central City—L. E. Minehart.  
 Coggon—Farmers' Creamery; M. O'Hara, secretary.  
 Coggon—Brazelton & Son.  
 College Township—J. R. Morin & Co., Cedar Rapids.  
 Fairfax—Joseph Spellerberg.  
 Lafayette—John Neitert, Walker.  
 Lisbon—H. L. Dean, Tipton.  
 Marion—Mr. Flemming.  
 Marion—Mr. W. Gray.  
 Monroe Township—J. R. Morin & Co., Cedar Rapids.  
 Mt. Vernon—F. F. Woodward.  
 Otter Creek Township—John Neitert, Walker.  
 Palo—N. H. Richardson & Co.  
 Paris—S. B. Mills.  
 Prairieburg—Diamond Creamery Co., Monticello.  
 Prairieburg—Brazelton & Co.; two creameries.  
 Robins—J. R. Morin & Co., Cedar Rapids.  
 Springville—Irwin Paul; three creameries.

Springville—A. D. Hill.  
 Troy Mills—J. A. Berry.  
 Walker—H. Neitert.  
 Walker—Highland Creamery Co.  
 Walker—John Barnard.  
 Waubeek—J. G. Fox.  
 Waubeek—Huston & Cory; three creameries.  
 Waubeek—E. D. Hill.  
 Western College—J. R. Morin & Co., Cedar Rapids.

## LOUISA COUNTY.

Clifton—Blair & Kelley.

## LUCAS COUNTY.

Chariton—Marshall, Van Horne & Co.

## LYON COUNTY.

Doon—Dehlie Bros.  
 Inwood—Ringheim, Anderson & Co.

## MADISON COUNTY.

Jefferson Township—Wm. Schoen, Winterset.  
 St. Charles—Peek & Cheek.  
 Winterset—Byron, Tucker & Co.  
 Winterset—Smith & Johnson.

## MAHASKA COUNTY.

New Sharon—Vickers & Crawford.  
 Rose Hill—Rose Hill Creamery Co.

## MARION COUNTY.

Knoxville—B. S. Schermerhorn & Co., Pella.  
 Pella—B. S. Schermerhorn & Co.; 2 creameries.

## MARSHALL COUNTY.

Gilman—C. B. Smith, Chester Center.  
 Harverhill—Mayer Bros.  
 Marshalltown—Byers & Elliott.  
 Rhodes—Bechtelheimer & Rhodes.  
 State Center—C. W. Sibley & Co.

## MILLS COUNTY.

Glenwood—D. B. Lufkin.  
 Malvern—Malvern Creamery; R. F. Morton, Manager.

## MITCHELL COUNTY.

Bailey—Farmers' Co-operative Creamery Association.  
 Little Cedar—Little Cedar Creamery Co.  
 Mona—Frank Penney & Co.  
 Orchard—Farmers' Co-operative Creamery Association.  
 Osage—Co-operative Creamery Co.  
 Osage—Rock Creek Creamery Co.  
 Osage—Frank Penney & Co.  
 Osage—Tupper Bros.  
 Osage—Little Cedar Co-operative Creamery Co.  
 Riceville—J. S. Potter.  
 Rock Creek—Co-operative Creamery Co.  
 Stacyville—Frank Penney & Co.  
 St. Ansgar—Farmers' Co-operative Creamery.

## MONONA COUNTY.

Onawa—Henry Kramer.  
 Ticonic—Warren Bros.

## MONTGOMERY COUNTY.

Grant—F. H. Lanneke.  
 Red Oak—W. A. Wilson.  
 Villisca—J. B. Rose.

## MUSCATINE COUNTY.

Sweetland—G. W. Kelley.  
 West Liberty—Cedar Valley Creamery Co.  
 West Liberty—H. H. Hildebrand.  
 Wilton—S. G. Kelley.

## O'BRIEN COUNTY.

Sheldon—M. F. McNutt.  
 Sutherland—Farmers' Co-operative Creamery Association.

## OSCEOLA COUNTY.

Sibley—Geo. B. Gray.

## PAGE COUNTY.

Clarinda—Chiles Bros. & Co.  
 Essex—F. E. Richardson, Shenandoah.

## PALO ALTO COUNTY.

Emmetsburg—Boardman Bros., Algona.  
 Fairville—Fairville Creamery Co.  
 West Bend—John Wallace & Co.

## PLYMOUTH COUNTY.

Akron—A. O. Viall.  
 Le Mars—A. O. Viall.  
 Remsey—M. Beck.

## POCAHONTAS COUNTY.

Fonda—H. C. Beards.  
 Gilmore City—Gilmore City Creamery Association.  
 Laurens—John Wallace & Co., Algona.  
 Rolfe—John Wallace & Co., Algona.

## POLK COUNTY.

Bondurant—Bondurant Creamery.

## POTTAWATTAMIE COUNTY.

Avoca—Avoca Creamery; R. Frost, Manager.  
 Oakland—Crofts & Huntington.

## POWESHIEK COUNTY.

Brooklyn—E. O. Spencer.  
 Chester Center—C. B. Smith.  
 Deep River—Phelps, Kelley & Hatter.  
 Grinnell—Pierce & Mattison.  
 Grinnell—C. B. Smith, Chester Center.  
 Montezuma—J. G. Chrisman.

## RINGGOLD COUNTY.

Liberty Center—Cook & Wilber.  
 Mt. Ayr—Cook & Wilber.  
 Shannon—O. W. Oakes & Son.  
 Wirt—Cook & Wilber.

## SAC COUNTY.

Auburn—Boardman Bros., Nevada.  
 Carnaroon—Carnaroon Creamery.  
 Clinton Township—Barrett & Carleton, Early.  
 Coon Valley—Elwood & Pettis, Sac City.  
 Early—Barrett & Carleton.  
 Fletcher—Donahue & Ahern.  
 Lake View—Donahue & Ahern.  
 Lake View—Coon Valley Creamery Co.  
 Odebolt—Boardman Bros., Nevada.  
 Sac City—A. D. Peck.  
 Sac City—Coon Valley Creamery Co.  
 Wall Lake—Donahue & Ahern.  
 Wall Lake—Rose Valley Butter Co.

## SCOTT COUNTY.

Big Rock—H. L. Dean.

## SHELBY COUNTY.

Defiance—Nelson Learned.

## SIOUX COUNTY.

Alton—Groebel, Henkels & Handel Bros.  
Calliope—Webster Bros.

## STORY COUNTY.

Ames—Ames Creamery Co.  
Cambridge—Boardman Bros., Nevada.  
Colo—Wm. Smay.  
Elwell—Richardson & Paine.  
Kelley—A. Wirtman.  
Maxwell—Maxwell Farmers' Creamery; J. R. Wood, Secretary.  
Nevada—Boardman Bros.  
Roland—Boardman Bros., Nevada.  
Story City—John Swan.

## TAMA COUNTY.

Berlin—Berlin Creamery Association.  
Dysart—Vinton Creamery Co., Vinton.  
Gladbrook—Hilton Bros. & Co., Boston, Mass.; C. A. Hilton, Tama City, Manager.  
Tama—Hilton Bros. & Co.  
Traer—Vinton Creamery Co., Vinton.

## TAYLOR COUNTY.

Bedford—L. W. Sherick.

## UNION COUNTY.

Afton—C. E. Curtis.  
Thayer—Hedrick & Stroup.

## VAN BUREN COUNTY.

Bentonsport—Chas. Bixler.  
Keosauqua—John McLane.  
Milton—A. Woodard & Co.

## WAPELLO COUNTY.

Chillicothe—Peter Nelson.  
Eddyville—J. L. McGlothler.  
Ottumwa—Ottumwa Creamery.

## WARREN COUNTY.

Indianola—Sammel McClure.  
Indianola—B. S. Schermerhorn & Co.

## WASHINGTON COUNTY.

Brighton—Rieksler & Emry.  
Crawfordsville—Nimrod Lease.  
Dublin—Dublin Cheese Co.  
Noble—Benjamin Eicher.  
Riverside—Nicola Bros.  
Washington—Hise Bros.  
Wellman—C. O. Nichols & Son.

## WAYNE COUNTY.

Allerton—Allerton Creamery Co.; P. M. Phillips, Manager.  
Humeston—E. M. Halderman & Co.  
Promise City—Wm. Ferguson.  
Seymour—J. J. Barcimer.

## WEBSTER COUNTY.

Dayton—J. B. Baxter.  
Ft. Dodge—Ft. Dodge Farmers' Creamery Co.  
Gowrie—Shotwell & Davis.

## WINNEBAGO COUNTY.

Forest City—Hubbard Bros.  
Forest City—Mrs. E. V. Cady.  
Lake Mills—Winnebago Creamery Co.; G. M. Opsund, President.  
Lake Mills—Larson & Twito.  
Leland—Winnebago Creamery Co.  
Norman—Knudson & Davids.  
Norman—Nystuen Bros. & Lervick.

## WINNEBISH COUNTY.

Calmar—Boe Bros. & Co.  
Decorah—Wm. Beard & Son.  
Decorah—E. R. Miller & Co.  
Decorah—Johnson & Bakke.  
Frankville—Wm. Beard & Son, Decorah.  
Ft. Atkinson—Wm. Beard & Son, Decorah.  
Hesper—Wm. Beard & Son, Decorah.  
Highlandville—Evensen & Foss.  
Nordness—E. G. Opdahl.  
Ossian—Farmers' Co-operative Creamery Association.  
Ossian—Beard Bros. & Eldridge.  
Ossian—Scheidmantle Bros.  
Ridgeway—Wm. Beard & Son, Decorah.  
Spillville—Frank Nockels.

## WOODBURY COUNTY.

Correctionville—Reynolds & Ayers.  
 Sioux City—J. D. Farr & Co.  
 Smithland—Smithland Butter and Cheese Manufacturing Association.

## WORTH COUNTY.

Fertile—Fertile Creamery and Cheese Association.  
 Grafton—Martin McNamera.  
 Hironelle—Farmers' Co-operative Creamery Co.  
 Kensett—Farmers' Co-operative Creamery Co.  
 Manly—Manly Co-operative Creamery.  
 Northwood—Co-operative Creamery Co.; 2 creameries.  
 Northwood—Northwood Dairy Association.  
 Silver Lake—Nystuen Bros. & Lervick.

## WRIGHT COUNTY.

Belmond—Dner & Son.  
 Clarion—John Denison.  
 Dows—Mr. Evans.  
 Goldfield—McMurtry Bros.

## LIST OF CHEESE FACTORIES.

## ADAIR COUNTY.

Adair—D. G. Cowden.

## ADAMS COUNTY.

Brooks—Brooks Southwestern Cheese Factory; J. A. Moses, Manager.  
 East Nodaway—Nodaway Joint Stock Cheese Co.

## APPANOOSE COUNTY.

Iconium—Iconium Joint Stock Cheese Co.; W. E. Rowls, Manager.  
 Moulten—Moulten Cheese Factory; August Post, Secretary.  
 Moravia—Moravia Cheese Co.  
 Walnut City—G. G. Hampton.

## AUDUBON COUNTY.

Extra—Smith & Ball.

## BENTON COUNTY.

Atkins—Highland Cheese Factory; Shaver & Dows, Cedar Rapids.  
 Garrison—Excelsior Cheese Factory.

## BLACK HAWK COUNTY.

Janesville—The Fowler Co., Waterloo.  
 Waterloo—The Fowler Co.

## BLONE COUNTY.

Boone—J. H. Boggs.  
 Luther—C. Luther & Co.

## BUCHANAN COUNTY.

Quasqueton—R. L. Wright.  
 Rowley—W. D. Boise.

## BUTLER COUNTY.

Parkersburg—G. F. Younker.

## CARROLL COUNTY.

Glidden—A. J. Heaton.

## CERRO GORDO COUNTY.

Portland—Portland Cheese Factory; Chas. Frink.

## CHICKASAW COUNTY.

Williamston—John H. Kelthoff.

## CLAY COUNTY.

Sioux Rapids—Mr. Eeley.  
Spencer—Oliver Ross.

## CLAYTON COUNTY.

Luana—C. C. Lang.  
Luana—R. M. Fonda.

## CRAWFORD COUNTY.

Buck Grove—S. M. Thew.

## DALLAS COUNTY.

Dexter—H. D. Lenocker.

## DAVIS COUNTY.

Bloomfield—A. D. Fishdale.  
Milton—Geo. Kays.  
Pulaski—Enos Hartzler.  
Pulaski—Chris. Windmer.  
Troy—Peter Linsinger.  
West Grove—Samuel Bloomer.

## DECATUR COUNTY.

Garden Grove—Geo. Pence.  
Garden Grove—High Point Cheese Co.  
Lamon—Wm. Lewis.  
Leon—Leon Cheese Factory; J. M. Chaslain, Manager  
Weldon—Geo. Pence.

## DELAWARE COUNTY.

Manchester—A. G. Thompson.  
Sand Spring—Charles Crocker.  
Tower Hill—C. Schwingruber.

## DES MOINES COUNTY.

Danville—A. S. Marchant.

## DUBUQUE COUNTY.

Worthington—Wm. Lattner.

## EMMET COUNTY.

Estherville—L. W. Mitchell.

## FAYETTE COUNTY.

Elgin—John Fredrick.  
Elgin—Chris. Miller.  
West Union—Geo. Gilson.

## FLOYD COUNTY.

Charles City—East Branch Cheese Factory.  
Charles City—White, Trigg & Co.

## FRANKLIN COUNTY.

Hampton—J. D. Patton.  
Hampton—Refsinder & Russell.

## FREMONT COUNTY.

Tabor—H. E. Gates.

## GREENE COUNTY.

Grand Junction—Cooper Newell & Co.  
Grand Junction—Harker & Davenport.  
Grand Junction—Renner Bros.

## GRUNDY COUNTY.

Grant Township—Grant Township Cheese Factory; L. P. Vanderslip, Manager,  
Cedar Falls.  
Reinbeck—The Fowler Co.

## GUTHRIE COUNTY.

Casey—John Rays.

## HAMILTON COUNTY.

Stratford—J. M. Daniels & Son.

## HARDIN COUNTY.

Alden—Geo. F. Burton.  
Cottage—W. A. Caraway.  
Ellis—Ellis Cheese Factory; W. Carpenter, President.  
Eldora—J. H. Smith.  
Hubbard—N. S. Martin.  
Iowa Falls—F. Burton.  
Owasa—A. L. Harris.

## HARRISON COUNTY.

Dunlap—S. E. Wright.

## HENRY COUNTY.

Baltimore Township—L. L. Beery.  
 Mt. Pleasant—Wm. Campbell.  
 Mt. Pleasant—James M. Holland.  
 Mt. Pleasant—J. L. Ross & Son.  
 New London—Dan. M. Campbell.  
 Wayland—Nicholas Rich.  
 Wayne—W. S. Zickefoose.

## HOWARD COUNTY.

Cresco—Minor Creek Cheese Factory; Wm. Kellon, Jr., Secretary.

## IOWA COUNTY.

Greene Center—Greene Center Cheese Co.; J. K. Yoder, Secretary.  
 Ladora—Levi Lewis.  
 Ladora—D. D. Case.  
 Marengo—E. S. McDonald.

## JACKSON COUNTY.

Garry Owen—Benj. Baker.

## JASPER COUNTY.

Baxter—E. S. Allen.  
 Newton—N. W. Lewis.

## JOHNSON COUNTY.

Frank Pierce—Frank Pierce Cheese Co.  
 Iowa City—Sharon Cheese Co.

## JONES COUNTY.

Bowen—Theo. Little.  
 Montloello—Diamond Creamery Co.  
 Onslow—S. L. Gilbert.

## KEOKUK COUNTY.

Butler—Obed Wells.  
 Delta—Smith & Kline.  
 Richland—Clay Cheese Factory.  
 Webster—Webster Cheese Factory.  
 Webster—M. D. Johnson.

## KOSSUTH COUNTY.

Whittemore—John Wallace & Co.

## LEE COUNTY.

Denmark—James Rice.  
 Denmark—T. G. Currier, Ft. Madison.

## LINN COUNTY.

Burnett—Star Cheese Factory; Shaver & Dows, Cedar Rapids.  
 Fairfax—Joseph Spellerberg.  
 Springville—Farmers' Cheese Co.

## MAHASKA COUNTY.

Oskaloosa—Tom Thornburg.

## MARION COUNTY.

Bussey—A. J. Jones.  
 Pleasantville—Pleasantville Cheese Factory.  
 Pleasantville—Mrs. I. E. Metcalf.  
 Pleasantville—I. M. Metcalf.

## MARSHALL COUNTY.

Rhodes—Mrs. R. E. Logan.  
 Van Cleve—Geo. Yarham.

## MONONA COUNTY.

Blencoe—J. D. Youmans & Co.

## MONROE COUNTY.

Albia—H. W. Watson.  
 Albia—Bluff Creek Cheese Association; J. Foster, Secretary.  
 Albia—Mantua Cheese Co.; J. M. Robbins, Secretary.  
 Albia—Union Cheese Co.; R. P. Bell, Secretary.  
 Albia—Monroe Cheese Association.  
 Albia—J. M. & E. Watson.  
 Albia—Pleasant Township Cheese Co.  
 Albia—Urbana Cheese Co.  
 Bluff Creek—Salem Cheese Co.; L. Lewis, Secretary.  
 Hilton—Hilton Cheese Co.; A. Hilton.  
 Hilton—Young America Cheese Co.; P. E. Enix, Secretary.

## MONTGOMERY COUNTY.

Red Oak—Lincoln Cheese Factory.

## MUSCATINE COUNTY.

Wilton—S. G. Kelley.

## O'BRIEN COUNTY.

Oakland—Crofts & Huntington.  
 Pringhar—Pringhar Cheese Factory; W. S. Armstrong, Manager.  
 Sheldon—W. S. Armstrong, Pringhar.

## PAGE COUNTY.

College Springs—C. L. Meacham.  
College Springs—Fred O. Winchell.  
College Springs—A. Stanton.  
Worthboro—Wm. Hatfield.

## POWESHIEK COUNTY.

Chester Center—C. B. Smith.  
Grinnell—J. E. Neely.

## SAC COUNTY.

Lake View—Donahue & Ahern.

## SCOTT COUNTY.

Davenport—David Ankin.

## SIOUX CITY.

Alton—Wm. Strouks.  
Orange City—Slotemaker & Van Ufford.  
Sioux Center—H. Meylink.

## TAMA COUNTY.

Toledo—Evergreen Cheese Factory; E. Mericle, Manager and Secretary.

## TAYLOR COUNTY.

Conwa—G. W. Dean.  
Lenox—J. B. Hewitt.

## UNION COUNTY.

Afton—Wm. Groesbeck.  
Lorimer—S. W. Groesbeck.  
Tingley—Jacob Trane.  
Tingley—C. C. Bosworth.

## VAN BUREN COUNTY.

Cantril—T. H. Dye.  
Milton—Geo. Kays.

## WAPELLO COUNTY.

Blacksburg—Urbana Cheese Factory.  
Eddyville—Geo. Elder.  
Kirkville—Kirkville Cheese Association.

## WARREN COUNTY.

Indianola—J. D. McCoy.  
Medora—E. P. Stacy.  
Milo—Herman Nelmeyer.  
Norwalk—Warren Cheese Factory.

## WASHINGTON COUNTY.

Clay—Clay Cheese Co.  
Dublin—Dublin Cheese Co.; L. B. Oliver, Secretary.  
Nira—Nira Cheese Co.; I. N. Carr, President.  
Noble—John Hertig.  
Westchester—Westchester Cheese Factory; A. G. Lacet, Secretary.

## WAYNE COUNTY.

Corydon—W. M. Littell.  
Lineville—M. DeHaan.

## WOODBURY COUNTY.

Smithland—Smithland Butter and Cheese Co.

## WORTH COUNTY.

Northwood—Bolton Bros.

## WRIGHT COUNTY.

Belmond—M. Packard.  
Belmond—Fred Lulek.  
Clarion—Geo. C. Jameson & Sons.  
Dows—A. A. Bangs.  
Dows—Geo. C. Jameson & Sons.