

FOURTH ANNUAL REPORT

OF THE

# State Dairy Commissioner

TO THE

GOVERNOR OF THE STATE OF IOWA,

FOR THE YEAR 1890.

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## REPORT.

*To his Excellency, HON. HORACE BOIES, Governor of Iowa:*

IN conformity with 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 the fourth annual report of this office.

The following letter bearing date of September 15th, 1890, from my predecessor, Mr. Sherman, in answer to a request to give information in reference to his work as Dairy Commissioner, from November 1, 1889, to May 1, 1890, will be of interest to dairy people generally:

"Your favor of the 11th instant, is duly received. As regarding a report of the condition of dairy matters last winter, the commission was not able to discover any frauds being practiced in this State by the oleomargarine men upon the dairy industry. There was but one license for the sale of oleomargarine issued in the State, except the one Armour & Company held for the sale of their own goods at Davenport. There was none reported selling oleomargarine in the State without a license. As regards gathering statistics, you know all about it.

During the winter I attended thirteen farmers' Institutes, at each of which I discussed the dairy question and its kindred interests. Further report I have none.

Yours very truly,  
H. D. SHERMAN."

Mr. Sherman had sent out printed blanks to all the creameries and cheese factories in the State, which when properly filled out gave much of valuable information on dairy matters. Many of these blanks, with questions answered, were returned to this office before the expiration of Mr. Sherman's term. The information received through this channel together with what has since been received by this office will appear in tabulated form in this report. At the time of entering upon my official duties, it appeared to be an important matter that the amount and value of dairy product



made in this State should be definitely ascertained, that we might know the value of the property that would be affected by the sale of oleomargarine in this State or other States, and of bogus cheese.

At the time of Mr. Sherman's third annual report, there were no government retail licences for the sale of oleomargarine, the last having expired on the 1st of May, 1889, except a retail license to Armour Packing Co. of Chicago, at Davenport, Iowa. The National Oleomargarine Laws require a license of \$48.00 per year from retail dealers; \$480.00 per year from wholesale dealers; and \$600.00 per year from manufacturers. Neither wholesale dealers nor manufacturers have ever taken out licenses in Iowa. Manufacturers and wholesale dealers selling oleomargarine to any party outside of their State are required by law to notify the Internal Revenue Collector into whose district it is shipped.

Mr. Lothrop, Internal Revenue Collector at Dubuque, Iowa, and Mr. A. H. Kuhlemire, Internal Revenue Collector at Burlington, Iowa, have very courteously and kindly agreed to notify our office whenever sales of oleomargarine shall be made within the scope of their jurisdiction. By this means we are able to trace it to its destination and ascertain whether the party receiving it is complying with our State law, which requires that every package or parcel sold in the State shall be branded, giving name of article and also the name and place of business of the manufacturer, and if purchased by hotel, restaurant, or boarding-house keepers, it must be accompanied by a placard in English of such article, printed in plain roman type.

The strong arm of the Federal Government is behind this law, and looks to its enforcement. Since the passage of the National Oleomargarine Law, placing a stamp-tax of 2 cents per pound on every package containing butterine, thus placing it within the jurisdiction of the Internal Revenue Department of the Government, a corps of marshals, and deputies, and secret service men in the employ of the Government, have constantly been on the alert to detect any violations of, or infractions against the just revenues belonging to the Government. If the exact truth could be known it would be found that but a small portion of one per cent of oleomargarine manufactured, escapes the tax.

The ingredients entering into the composition of butterine are enough cheaper than butter, that the payment of the 2 cents per pound, tax would work no hardship to the manufacturer of such goods, provided it could be sold any where near butter prices. But since the National and State law forces the dealers to sell it for what it

is, and not for butter, there has been no demand for it in this State. According to reports from Mr. Lothrop's office, there has only been one 50 pound package sold in this State during the last nine months.

The chief duties of the State Dairy Commissioner is to prevent the fraudulent sale of oleomargarine and of adulterated cheese.

#### IOWA AS A DAIRY STATE.

Iowa with its two hundred miles north and south, and its three hundred miles east and west, situated between two great rivers, and having an area of thirty-five million acres; a smaller proportion of which is unfit for cultivation than in any other equal area in the known world, may well feel proud of her natural resources and geographical position. Its distance from north to south being only three degrees of latitude, yet a distance sufficient to make a marked difference in climate. While Iowa generally speaking is a rolling, undulating prairie that gives good surface drainage, only a comparatively small portion of it being flat, where water stands in ponds, marshes and sloughs, and becomes stagnant and is unfit for cattle to drink, and in this way injuring dairy products, it is encouraging to note that in the wet portions of the State the county supervisors are taking an advanced step in the matter of digging open ditches, ten feet across, which drain the land of these portions of the State. This land in the near future will be as valuable as the more favored portions of the State, and can be used as advantageously for dairy purposes. The soil is a deep loam averaging from two to four feet in depth and is the accumulation of ages of decayed vegetable matter. The farmer has the satisfaction of knowing that no odds how deep he plows he will not get to the bottom. Its productiveness has only been tested to a limited extent. Its capabilities are comparatively untried.

Iowa has a medium climate. There is warm and hot weather enough to mature corn and all kinds of small grain, pastures and hay, and the winters are severe enough to tone up her people to be energetic and industrious. There is none of the lassitude that is engendered in some of the southern climates. The rainfall, until the last two or three years has always been sufficient to give us green pastures from spring to fall, and the drought of this season which extends from the Atlantic Ocean to the Rocky Mountains has only demonstrated that the soil of Iowa will stand more dryness, and will produce more crops than any soil in the United States. Nature designed Iowa to be, as she is, the dairy State of this Union. It only required that her population should be intelligent, which



they are in a pre-eminent degree, that her capabilities should be turned to the best account. Hence, we find that the first creameries started were on her soil, less than a score of years ago.

John Stewart, of Manchester, Iowa, received the gold medal for the best butter in the world, at the Centennial Exposition held in Philadelphia, in 1876. From that time on the business has increased year by year. The amount of creamery butter made in Iowa last year was forty-one and one-half million pounds.

For the first three years the creameries were confined to four or five counties clustering around Delaware county. It has gradually extended until there is scarcely a county in the State that does not have a creamery.

By the list of creameries as issued from this office in 1889, there are four hundred and forty-three creameries in twenty-four counties in the northeast corner of the State, commencing on the Mississippi river at the Minnesota line, thence running to the south line of Clinton county; thence north to the south-east corner of Jones county; thence west to the west line of Linn county; thence north to Buchanan county; thence west to the west line of Hardin county; thence north to the Minnesota State line. There are two hundred and fifteen other creameries scattered over the remaining seventy-five counties in the State.

There have been one hundred and three new creameries started this season; thirty-nine of them in the twenty-four counties, and sixty-four in the seventy-five counties. There have been a few old creameries discontinued and abandoned. There are less creameries in the south half of the State than in any section of the northern half. The farmers in the south half raised greater crops of corn and a larger area is planted to it. In the southern half of the State more hogs are fattened and more cattle turned off than in any northern part of the State. This form of husbandry has been so remunerative in the past that the farmers have not taken kindly to the confinement that is necessary in the milking of large dairies.

There is but a small proportion of the State outside of the great dairy interests in the northeast but has admirably adapted, for the protection of dairy products, both butter and cheese, and the dairy industry is spreading and increasing very fast year by year. Ultimately, the entire State will go largely into dairying.

#### IOWA CROP.

The crop of 1889 was a very large one; a vast crop of hay had been secured in prime condition, also the largest crop of sound

corn that had been raised for years. The oat crop yielded more bushels of heavy oats to the acre than had ever been known in this State; this made feed very plenty and cheap. The cows went into winter quarters in good condition. The winter was mild, the yield of milk and make of butter was correspondingly large for the winter months. The spring opened late, but with an abundance of feed on hand the farmers did not turn their cattle out onto the pastures until the grass was well started. Plenty of rains fell through the latter part of May and fore part of June, so that the pastures were in splendid condition and the make of butter was unprecedentedly large. A drouth set in the latter part of June, extending from the Atlantic Ocean to the Rocky Mountains. No rain fell in many parts of the country for ten weeks to three months. The pastures were dried up, becoming bare and brown in most parts of the State. The make of butter fell off thirty-five per cent in four weeks, and in many parts of the State fifty per cent in six weeks, and the same thing took place to a greater extent in all the dairy districts of the United States and Canada.

Northeastern Iowa suffered less severely from the drought than any other section of the State, being favored with rains before their pastures had become bare; in fact, some few counties on the line of the Illinois Central railroad, from Dubuque to Iowa Falls, suffered scarcely any from the dry weather.

There is a good, fair average crop of corn in northeastern Iowa. Oats do not yield well to the acre and weigh light to the bushel. An average crop of hay was secured by the people of this State in prime condition. The September rains, with what have fallen through October, have made fine pastures all over the State.

#### REVIEW OF MARKET FOR BUTTER.

The New York butter market was 15 cents per pound for western extras for November and December, running up to 27 and 28 cents in January and continuing at those figures until the middle of March. Western extras were quoted in New York at 20 cents April 1st, gradually receding to 16 cents May 1st. A very large make of butter during May forced the price down below 15 cents the first of June, and during June the price of western extras dropped to 13½ cents, the lowest price at which fine creamery butter had ever sold in the New York market. July 10th, the butter markets commenced to improve and as the drought continued the make of butter decreased and the price advanced. September



1st, butter reached 23 cents in New York for western extras but receded to 20 cents per pound, before the month was out. The decline has been recovered during the first half of October, and butter advanced to 25 cents per pound the 24th day of October. Taking everything into consideration the production of butter has been fairly remunerated the past year and the industry is in a flourishing condition with the prospect of high prices this coming winter, which will be necessary if the farmer gets a profit, as the price of feed of all kinds is very high.

#### INSPECTION OF CREAMERIES AND CHEESE FACTORIES.

The duties of the Iowa State Dairy Commissioner as designated by law are to prevent the fraudulent sale of imitation butter or imitation cheese and to see that the cheese and butter are made only from pure milk or cream. In the pursuance of this duty the commissioner may gain all the information he can that would be of interest to the dairy, but in doing this he has no right to add additional expense to the State. In the performance of his duty he has visited about seventy-five different creameries and cheese factories in the State. In none of them did he find the least indication of crooked goods being made. Only six of them were in an uncleanly condition. Eight of them had imperfect drainage, and two of them no drainage at all. Twelve of these older creameries need raising up and new foundations placed under them, with openings through it for ventilating purposes, as the ground under the creamery has become saturated with casene from the leakage of the floors, this makes a bad odor in the creamery after it has been shut up tight over night. Too many creameries are built with no regard to ventilation. From the separator creameries I have visited and the information gained from people, familiar with many more, I learn there has been quite a large per cent of gathered cream plants transformed into separator creameries. The size of the building as a rule is too small for the change. The creameries changed over in this way are inconvenient and inadequate for the business and a poor product is often times the result to such an extent, that what is saved from using the old buildings is lost and more with it. Many of the gathered cream creameries were built when their business was small and are not large enough for their present use. The creameries that have been constructed new this year are built on a larger scale, great pains being taken to put in dead air spaces in the walls similar to those used in the refrigerator; thus preventing the heat of summer or the

cold of winter, changing the temperature of the creamery to a great extent. These buildings are finished up in the inside with hard pine; the ceilings are high, ventilation perfect; this gives large, cool, airy rooms. Creameries are no longer buying cheap machinery, but the best the market affords; their engines, boilers, pumps, separators, vats and utensils are all first class. Much more attention is paid to have everything convenient, that labor may be saved thereby; like improvements have been made in the construction and furnishing the recently built gathered cream creameries. In only three or four instances to the question, do you receive all the milk of good quality, has the butter makers answer been, yes. It seems to be an almost impossibility to educate the patrons to fully realize the importance of having all the milk come to the creamery in good condition. In the separator system the night's milk has to be kept over till morning; it should be milked with clean hands from a well washed cow's udder, into a bright pail that has been properly scalded out. And the cow should stand in a stable that is sweet and clean, while the milking is being done. The milk should be strained through a double strainer of wire gauze and cloth which should be scrupulously clean. The can which receives it should be covered entirely with tin, as any displacement in the tin will expose the iron which rusts and has a tendency to taint the milk, because it cannot be kept clean. The cans should always be thoroughly scalded and properly aired out. In hot weather the milk should be airtated by falling a good distance into the can, so that the animal odors may escape. It should then be placed in cold water or ice-water until it is cold, when the cover can be placed over it. When these rules are followed the milk will always arrive at the factory in prime condition.

It is estimated that not less than one-third of the butter made in the creameries of Iowa is sold below the price of fine creamery butter. If this be so it entails a great loss on the patrons of such creameries. This occurs rarely on account of poor handling at the creameries. The fault is the patron's who fails to bring his milk or send his cream to the creamery in proper condition. How to educate all the patrons of creameries up to a proper dairy standard is the problem. If dairy meetings are called in the different counties where a full discussion of these questions can take place it will do a great good to the dairy interest. If the creamerymen can form an organization for the improvement of the quality of the butter made in each county, more can be accomplished in this way than in any other. The Dairy Commissioner will aid in any way that lies in his



power. The States of New York and Wisconsin, are employing expert butter makers and expert cheese makers to teach the art of butter making and cheese making to the dairy people of their States. It is claimed that these teachers are doing a grand work, that there is a visible improvement in the dairy products of these States. If this be so it will increase the out put of fine butter very materially, thus producing more competition in fine goods for the dairy people of Iowa to meet. If the dairy people of Iowa fail to take advanced steps in the direction of better butter they are retrograding and failing to keep up with the procession. There are no provisions made for public dairy instructors in this State. It is a good principle for democratic people when the State fails to give us the desired help we need, to go ahead and help ourselves. If the creamerymen will only organize by counties this winter more efficient work can be accomplished toward the improvement of the quality of the dairy goods than is done by the parental aid rendered by the States of New York and Wisconsin to their dairy people.

Poor milk and cream are often received at the factories because the management is afraid of offending the patrons who bring it in. The milk or cream is not very much off, yet is below the standard. The butter makers dare not reject it. It may be and often times is brought in from the most influential patrons. The Commissioner asked the proprietor of a large cheese factory if any milk of poor quality was taken in at his factory? his answer was, "plenty of it." Why do you take it? "Because if I don't the creamery across the way will and ask no questions." The cheese maker said the only way he knew of to partially cover up the defects of the poor milk was to add more rennet and work the cheese hard. We asked the proprietor of the large adjoining creamery about the quality of milk received by him; he reported "plenty of milk of poor quality received;" gave as a reason that "if it was refused the cheese factory across the way would take it and ask no questions." If the proprietors of each of these cheese factories and creameries would agree to buy no milk from patrons without first ascertaining the reason of their wishing to leave, and if the reason was, because complaint had been made about the quality of the milk they should not be received as a patron by either creamery. A close inspection at the weighing vat would at once eliminate all the poor milk from these two factories. A disposition on the part of the factory people to enlarge their business at the expense of their competitors has always had a strong tendency to degenerate the quality of the goods and on the other hand if individual creameries seemed to agree too

well and enforce stringent regulations as to the quality of the milk or cream, the patron becomes dissatisfied. It is usually those that have been selling thin milk or milk of poor quality, that are opposed on general principles to any rules that place them on an equality with their neighbors.

These patrons commenced an agitation for a co-operative creamery. This agitation usually culminated in a new creamery on the co-operative plan. The dairy supply man is usually on hand to denounce the proprietors of the individual creameries as extortioners, who have been cheating the patron in an outrageous manner. As the agitation progresses a bitter feeling is engendered against the proprietors of the individual creameries; after the organization is made and officers elected the dairy supply man gets in his work and sells the new concern a large outfit. The engine and boiler are often of the poorest the market affords and the supplies are of the cheapest kind. The supply man aims to stuff the order to its greatest extent, selling the goods at the largest possible profit. Usually the patrons, when the trade is closed up, have been outrageously swindled. I have known instances of the dairy supply man taking a large order from co-operative creamery people, stating the amount of the order and claiming that the concern would not be running six months after it started. Many co-operative creameries that have been successful and are now running well, acknowledge these things. To run a creamery or cheese factory well requires a large technical knowledge of the business. Any mistakes made for lack of this knowledge means less money, whether the creamery be individual or co-operative. The committee is acquainted with a large number of individual creamery proprietors who have lost all they put into the creamery business, simply because they did not know how to run it and their patrons loose with them. I have known the patrons of a co-operative creamery pay out \$4,000 to educate the management. The mistakes of the managers brought that much less money into the treasury and the patrons received just that much less for their milk. The manager resigned and the patrons lost the benefits of his expensive education. A thorough business man took his place, who understood running a creamery, and has made a grand success of the same co-operative creamery. As there are many co-operative creameries running in the State and more starting, we would recommend that they employ, as managers, the best men they can find. The more the management knows of creamery business the less expense the patrons will be to, and the fewer mistakes he will



make. Through the co-operative system dairy knowledge has been more widely extended to the farmers of this State; many of them have been very unsuccessful and have survived the difficulties encountered from the start. It is more easy to start and operate a co-operative creamery now than a few years ago, because the business is more generally understood. If first-class butter makers and first-class help is employed and first-class creameries with first-class appliances used, the co-operative plan will usually be successful, and if so many ideas of the patrons in regard to the enormous profits of individual creameries will be eradicated, as this is the case in counties where both systems are running side by side. The bitterness is all gone and both systems are working together, shipping in the same car to save freight. There is business enough in the old creamery counties of Iowa for all, and let each creamery try and build up its own business without tearing down its neighbors business. Make dairy products only from milk or cream in prime condition, thus building up the dairy interests of Iowa.

#### CHEESE.

There is a very small proportion of the cheese made in the State sold abroad. Fully one-half of the cheese consumed is imported into the State. The prices realized this year have been more remunerative than butter, yet the business increases much more slowly than the creameries. But two new cheese factories were started this year in the State. The chief objection raised by the farmers against selling milk to cheese factories is, they cannot raise good calves and sell all their milk to cheese factories, and hence their farming would not be so diversified as it now is, as but few of them care to milk cows enough to consume the grain, hay, and pasture on the farm, they have to raise steers to do this. The wholesale men of Dubuque, Davenport, Burlington, Cedar Rapids, and Des Moines, report that the Iowa cheese this season is of very fine quality, that there has been little or no complaint made about it by their customers, and that the home demand is twenty-five per cent greater than it was last season. The factory people report they are not able to keep the cheese on the shelves longer than twenty-one days. We believe that next season they will buy their milk on its intrinsic value and will test it for butter fat. By this process the quality of full cream cheese will be greatly improved, as there are patrons in almost every cheese factory that think any kind of milk will do for the factory.

In portions of the State where cows are plenty it would pay the

communities to build and patronize cheese factories. The home market will pay a higher price for cheese than can be realized outside of the State, until there is enough cheese made in the State for home consumption. There have been no complaints about adulterated cheese or cheese stuffed with old store butter, made in the State. May 31, I visited Dubuque, examined the cheese in twelve grocery stores, which catered to the poorer class of trade, bought eight half pound samples of cheese; six of which were poor quality and indicating adulteration with the probability of its being stuffed with rancid butter or lard. The samples were sent by express to Professor Patrick of the Ames Experimental Station with the request that he should analyze them. There were two reasons why this was not done. The first of which was the samples should have been three times as large as they were. Secondly, Professor Patrick's duties as the chemist of the Iowa Experimental Station are defined by law and do not include this kind of work being done for the Dairy Commissioner's office.

Upon investigation, we found that the work done in the past for the Dairy Commissioner's Office, had simply been done as a matter of courtesy by Professor Patrick, and that there was no chemist designated by law to perform this service. Upon visiting Ames, Captain R. P. Speer, who has charge of the Iowa Experimental Station, kindly consented to allow the Chemical Department of the Station to do this work for the Dairy Commissioner's Office in consideration of five dollars (\$5.00) to be turned into the general fund of the Station, from this office. May 31, and June 4, 1890, there were about forty (40) people in the southern part of Mitchell County taken violently sick vomiting; some had acute pains in the stomach, and in some instances the sickness came upon them so suddenly that the persons attacked had to be carried in from the barn, where they had gone to milk, to the house, as they were wholly prostrated and unable to walk. This sickness was traced to cheese poisoning brought on by eating from a cheese sold by Wm. Horton, of Mitchell, Mitchell county, Iowa. The cheese was branded "Fowler Brothers' Company, Full Cream Cheese, Waterloo, Iowa, B." Mr. Horton reported that he had sold the cheese on a route southwest from Mitchell on one day and east of Mitchell on the following day, and on both routes the purchasers of the cheese had become violently sick, and that he had sold the same brand of cheese for the last seven years, and that it had always given good satisfaction, and he had no trouble before from this cause in that time.



About one-quarter of the cheese was unsold and on hand, of which a large sample was taken and expressed to Professor Patrick, at Ames, Iowa, who analyzed it by the full Garvermetic mode. It showed a suspicion of cheese poison, but no tyrotoxicon chrystals, although it colored litmus paper in such a way as to indicate cheese poison. \*

Dr. Bundy, of St. Ansgar, at about the same time sent a sample of another cheese of the same brand as above to the Board of Health, at Des Moines. He had eaten cheese from the sample and become suddenly and violently sick. The Board of Health pronounced the cheese poisoned. Dr. Bundy's case was the only case from that cheese. The Fowler Company's cheese has been sold in large quantities to the people of Mitchell County since that time and given good satisfaction.

On June 14, 1890, the Commissioner interviewed Fowler Brothers & Co. in regard to this cheese and they were unable to explain the cause. It is true that only once in a great while cheese-poisoning occurs, and when it does, it may be no fault of the factory; yet it is an established fact that active poisons do, in very rare instances, get into cheese. It may have its origin in the unsanitary condition of the factory or in the uncleanly condition of the milk cans.

Professor Victor C. Vaughn of Ann Harbor, University, Michigan, about two years ago discovered a poison in cheese which caused violent sickness in many people, which he called Tyrotoxicon; and has since determined by experiment that it was, beyond a doubt, produced by fermentation, and is now able to produce the poison by placing some Butric Acid Ferment in healthy milk and keeping it in a tightly stoppered bottle for from eight to ten days. The Iowa State Board of Health, in the Secretary's office at Des Moines, has samples of Tyrotoxicon Chrystals taken from cheese.

The above two cases are the only ones that have come to the notice of this office this year. My work, in this report, would be considered poorly done, if the rule for making good cheese were omitted. I find in the fifth annual report of the Dairy Commissioners of the State of New York, that the cheese industry in that State is of much larger dimensions and is considered of more importance than cheese making is considered in Iowa. The New York Dairy Commission employs experts to teach the art of cheese-making to the employees of the different cheese factories, hence, we quote the report of their expert and give the following rules as laid down by them, for the guidance of our cheese makers:

*First.* The milk is supposed to be of a normal standard. The temperature at which to add the rennet should be 30 to 36 degrees. Use sufficient rennet to coagulate in fifty to sixty minutes. The time to cut curd is when it will split clean and free from finger when put into the curd. Agitate the milk slightly until signs of coagulation appear. Stir gently with the hands for about five minutes before heat is applied. Apply heat gently, using one hour to bring the heat to 98 degrees in summer and 100 degrees in the autumn. Stir for ten minutes after the mass is heated to the desired point. Then stir occasionally until the curds seem well cooked and are firm to the touch. Now remove the whey. If the maker desires to use a curd stick, let him now throw the curd into the sink and let it drain. Stir it well and keep from matting until ready to apply the salt. If the maker wishes to grind, allow it to pack in the vat or sink. After the degree of acidity is reached the curd is to be cut up and ground. The salt can now be applied. In either case curd must be kept warm. Do not let it go below 95 degrees. Put to press at about 80 degrees. Apply the pressure gently for the first hour. Keep the cheese in the press until after dinner the following day. Keep all cloths, followers and hoops clean and sweet. Scald them every day. This is necessary to keep a clean, bright surface. Keep the cheese shelves clean. The temperature of the curing room should be kept at about 70 degrees, and the room well ventilated; yet no wind should be allowed to blow on the cheese. Know that your thermometers are correct. To make home-trade cheese, set at lower temperature, cook lighter, stir less, and salt less. Make it a point to retain moisture in your cheese.

#### REPORT OF WORK.

Arrived at Des Moines, April 29, 1890. Met the out-going commissioner, Mr. Sherman, at his office, who spent two days with me going over the books and very kindly explained to me his method of conducting the office, also showed me large correspondence from the different creamery-men and cheese factory people of the State, from which we have tabulated statistics which appear later in this report. Mr. Sherman took special pains to give valuable information in regard to many points concerning the dairy business. *The vital question is to inaugurate a system of buying milk on its intrinsic value for making pure butter and cheese.* Prof. Patrick of the Iowa Experimental Station, at Ames, has invented a simple milk test by which in twenty minutes twelve different samples of milk can be analyzed, giving the number of pounds of butter fat in a hundred pounds of milk. A large proportion of milk sold at the creameries, and all of it delivered to the cheese factories, is bought by the hundred pounds, regardless of how much butter or cheese it will make, or whether it is pure and unadulterated. It is a well known fact that different cows milk will vary from two pounds to five pounds of butter fat to the hundred



pounds of milk. It is generally held that the milk of different dairies of, say, from ten to twenty cows would average alike. The first analysis made by the Jessup Creamery Co., which first inaugurated the system of buying milk on its intrinsic value in Iowa, June 1, 1890, demonstrated the fallacy of this claim. The smallest test of a dairy was two pounds and eighty-six hundredths, and the largest test (Jersey cows) was five and sixty hundredths pounds of butter fat to one hundred pounds of milk. The variation between dairies of common-bred cows was fully thirty per cent. It is beyond any doubt that large numbers of cows kept in dairies yield no profit to their owners. The best dairy authorities hold that from fifteen to twenty per cent of the cows milked in this State run their owners in debt. This loss must be made up from the cows whose milk yield the owner a profit, before the dairy can be remunerative to its owners. Many farmers have done nothing toward ascertaining the difference between cows as to their milking qualities, hence, are not acquainted with the cow that yields a profit, neither do they know the cow that leaves her board bill unpaid. Thanks to Prof. Patrick for his unceasing labor in giving us a simple, cheap, and accurate milk test, by which not only the difference in the value of cows can be accurately ascertained, but also the true value of the milk they produce, by which in the near future the farmer will receive his just returns, according to the amount of fat in every one hundred pounds of milk. The poor cow will be weeded out from the herd and disposed of, and only the paying ones retained. The future sires of the herd will be selected from the cows having the best records. This process will improve and build up the dairy herds of the State to such an extent that the present average dairy standard will be "back numbers." Realizing in a measure the importance of the milk test, I visited the Iowa Experiment Station May 1st. Prof. Patrick was not at home. His able assistant, Mr. Charles Ward, exhibited, explained and operated the test for my benefit, by placing a sample of milk in one tube, adding acid, boiling it four minutes, until the oil came to the surface, then drawing out through an orifice at the bottom of the tube until the butter fat settled in the measuring tube where the amount of butter fat could be readily measured by the scale. The process was so simple that I operated it successfully upon the first attempt.

Thereupon I ordered a set of twelve test tubes for the State which have been used by the office this season in analyzing the different samples of milk taken from the milk peddlers who supply the people of our cities with milk. The Iowa Experimental Station

has worked more or less for the last three years on milk chemistry and has brought out many valuable facts with regard to milk unknown heretofore. It is owing to this work that the Experimental Station is held in such high esteem by the dairy people of Iowa. My home being in Mitchell county, and having an extended acquaintance with the creamery business as conducted here, I thought it the proper place to make an attempt to improve the quality of creamery butter, as it could be done without additional expense. The gathered cream system is the only one used by the creameries of this county. Four years ago co-operative creameries were started in this county and have gradually absorbed the great bulk of the business. Three individual creameries are all that is left out of fourteen, which guarantee co-operative prices so that the business is controlled entirely, as far as prices are concerned, by the co-operative creameries. These creameries have steadily diminished the expense of gathering cream and making butter. Two and one-half cents per pound, gathers the cream, manufactures the butter and places it on board the cars ready for shipment, the year round. To accomplish this cream on many routes is gathered only every other day, and in some instances only twice a week. The patrons were seldom, if ever, inspected with regard to their quality of cream or their facilities for taking care of milk. By the co-operative plan it is expected that all will share and *share* alike.

It is expected that each individual patron of a co-operative creamery will be so interested in the welfare of the creamery of which he himself is a part, as to *always* furnish cream, the raw material out of which butter is made, of such excellent quality that only butter of an unexceptional quality will be turned out. It is further expected and claimed that the business can be done economically, and the profits that accrue to the individual creamery owner will be divided among the patrons. It is also expected that the community being mutually interested in a business would talk it over and educate one another. Unfortunately these expectations can never be fully realized. In every neighborhood there are a few men with dispositions like the *hog* who are uneasy and dissatisfied unless by "hook or crook" they are getting a better deal than their neighbors. In the co-operative creamery business the bristles come in sight in a shiftless, often times dirty, care of the milk which produces cream of so poor a quality as to reduce the price of the entire make of butter. They think, and some of them say, "anything will do for a creamery." Others through ignorance, carelessness



and other kindred causes fall far short of being an ideal creamery patron. From some of the above mentioned causes Mitchell county creamery butter had fallen off in grade one cent to one and one half cents per pound, grading only Western extras in New York market. How to get that extra cent back is the problem. It was thought that by organizing the managers of all the creameries in the county, co-operative and individual, into an association for the purpose of improving the quality of this county's creamery butter would be unobjectionable, and if by so doing the quality of the butter could be so improved only one cent per pound, it would add \$15,000 a year to the patrons of creameries.

There are large sections of the dairy part of Iowa where gathered cream creameries are operated on individual and co-operative plan that are contending with the same difficulties as Mitchell county. The Commissioner expected to work out by county creamery organizations some of the most difficult problems. For this reason we will publish in this report the call for a creamery meeting in Mitchell county, and the results and failure of that meeting. Also the remedies suggested by the Commissioner to each creamery. As the remedies thus suggested are justly applicable to a large number of the gathered cream sections in other parts of the State we insert them for the benefit of all contending with like difficulties:

#### CALL FOR A CREAMERY MEETING.

There will be a meeting of the managers and owners of the creameries of Mitchell county, at the Court House in Osage, Tuesday, May 13, at 1 o'clock P. M., for the purpose of organizing a County Creamery Association.

The object of the society is, to make a united effort to improve the quality of Mitchell county creamery butter. This can only be done by forcing one-quarter of the patrons that furnish a poor quality of cream to furnish cream of as good quality as the other three-fourths of the creamery patrons do. This can be remedied by sending sound, competent men to inspect the patron's milk, and appliances for handling the milk, and teach the patron the proper mode of doing it. Then if a patron who is delinquent, will not make the change, he should be dropped and not allowed to sell cream to any Mitchell county creamery. This induces him to make as good butter as he can from poor cream. He should not be allowed to detract from the quality of his neighbor's butter.

One or more creamery superintendents and inspectors should be elected for the county, who should be competent to inspect each creamery; point out any defects in its construction, sanitary condition, ventilation, etc. He should be able to examine the work of the butter maker, point out and eliminate any incorrect method in use. He should be the adviser and counselor of the manager. He should also accompany the manager in his visits to the patrons, and be the final arbiter between patron and manager in case of a dispute.

Our creamery butter does not grade as high by one cent per pound as it did before the test churn was introduced. By this method of organization and compulsory education, we can easily improve the quality of butter and regain our old standard. One cent per pound added to the price of each pound of Mitchell county creamery butter means fifteen thousand dollars more in the pockets of her farmers at the end of the year.

There is not a county creamery association in the State to-day. I have mapped out for you the work as done by the State of New York, by appropriations of money through its State Dairy Commissioner. We have no appropriation in this State for that purpose, but the course above outlined is more thorough and will bring greater returns in money than any other system I know of in use.

We will have on hand at the meeting, an exhibit of the workings of Prof. Patrick's "milk test" by which the percent of butter fat can be taken from one dozen samples in twenty minutes.

In this county the co-operative creamery system controls very largely the make of butter. Two or three individual creameries guarantee to pay co-operative creamery prices, which brings a uniform result to all the patrons. Let us take an advanced step, and each co-operative creamery co-operate with all the others in advancing the quality of our creamery butter.

Just as soon as it is known (and it will be at once) that we are making a united, systematic effort to improve the quality of our goods we will enhance their value.

Mitchell county ranks sixth in the amount of the production of creamery butter. We have always produced as good butter as any other county in the State that used the gathered cream system, as we do now. Every creamery and every patron in this county, should be willing to help improve the quality of creamery butter.

This is a matter that has long been discussed. I have consulted many of the managers of creameries, and all are anxious to have an organization of this kind and purpose. The Dairy Commissioner's office is willing to do all in its power to assist in this matter, and in fact expects to assist in organizing other associations in other counties.

You have one of the finest counties in the United States for the production of the finest butter. It simply depends upon yourselves whether you take the rank nature intended you to hold. At our meeting above referred to, the front seat will be reserved for creamery men and officers.

Farmers, we would like you to fill up the rest of the house.

We expect the hearty co-operation of the alliance men, as they ought to know the value of organizing. The eyes of every creamery man in the State are on you, and upon your action more depends than simply the zeal of the dairy interests of Mitchell county.

Respectfully,

A. C. TUPPER,  
Dairy Commissioner.

The meeting was largely attended by creamery managers, directors and patrons, quite a number of outside creamery men were also present. Also commission men, and dairy supply men were in attendance. The object of the meeting was fully explained by the



Commissioner. Stirring speeches were made by able creamery men from abroad, also, by creamery managers, directors and patrons. The first objection was made by a director to the effect, that the managers of co-operative creameries have no right to form such an organization without the consent of their patrons. The second objection was made by an ex-president of a co-operative creamery company and was somewhat on the pharisaical order viz., our creamery is so well organized, does its work so well, that we do not wish to enter into an organization that would help out our competitors in business.

His defense for this objection after the meeting adjourned, was, that there were *some* things every man had to do for himself. If one enters Heaven he must work out his own salvation.

The Commissioner's patience having been somewhat exhausted by this exhibition of supreme selfishness replied: "There is no known system of theology by which a man can enter Heaven if he cares nothing for the welfare of his neighbor; nor would Heaven be a desirable place of abode if filled with that class of people". The ex-president had been blinded by selfishness into this shortsighted course. These circumstances are brought out as samples of some of the difficulties that are likely to arise before county creamery organizations can be effected in this State.

No organization was effected at the meeting above referred to and the Commissioner commenced a campaign with the different creamery managers to have them inspect their patron's facilities for raising cream and to apply as far as they could to their creameries. The remedies that were suggested by the Commissioner to be used by the county organizations, and soon after we issued the following paper:

#### CO-OPERATION NECESSARY BETWEEN CREAMERIES.

It was supposed that a county creamery organization could be effected for the purpose of improving the quality of Mitchell county butter, without objection. At the creamery meeting two objections were raised.

*First*, the managers of co-operative creameries have no right to form themselves into a county organization without the consent of the directors and patrons.

*Second*, our creamery is so well organized that we have no need to help a county organization; if each creamery will do as we have done, it will not be needed.

The answer to the first objection is, that the point is well taken, but, what do you think of the men who would object?

Now, the answer to the second objection is, there is no creamery in Mitchell county but that needs a thorough system of inspection for its patrons.

A county organization, if formed, would be more effective than any other mode of improving the quality of butter and in bringing about the other reforms, and that there is an imperative need of it; that all intelligent dairy people see it and talk about it. Only one rule would have been necessary to improve Mitchell county butter, as issued by a county organization. No new patron shall be received by the management of any creamery in Mitchell county without first ascertaining from the manager of the creamery that the patron wishes to leave, whether the dissatisfaction arises from the quality he has been furnishing; if so, he shall not be received.

Without county organization, each manager can enter into an agreement to have this rule enforced with the management of every other creamery that surrounds his territory, even though the territory is outside of this county; he can then call a meeting of his directors, select one or more of them as route inspector (or any one else they see fit) whose duty it shall be to inspect each patron's cream, and to kindly show them any defects in their mode of handling their milk, and try and eliminate all defects. The patrons of co-operative or individual creameries, furnish the stock out of which butter is made; if the raw material is of poor quality, a miracle would have to be wrought before fine butter could be made out of it. For years, when an announcement is made by a skimmer on his arrival at the creamery, that he has a new patron from another creamery, a shout has gone up, no questions being asked as to the quality of the new patron.

Hence, little has been done to correct the careless and slipshod methods that have been constantly increasing and creeping into the gathered cream system, and no encouragement given to the three-quarters of the patrons who are furnishing nice cold sweet cream, as they have had to take at least one cent per pound less than they would have had to if it was all good cream. Creamery managers have in the past, put out some erroneous information with regard to handling cream, in order that the patron would be satisfied with the oil test.

If the following simple rules are followed by the patron, he will have no trouble in furnishing good cream: Bring cows in from pasture on a walk, running excites them, hurts the milk; then brush off udders, wash, if necessary to take off manure. If placed in a barn for milking, have it as clean as possible.

All tin utensils should be scalded before using.

Take milk from barn as soon as you have filled two pails, in order to retain the warmth in the milk; the higher the temperature of the milk, and the colder the water the better. The greater the difference between the temperature of the water and the milk, produces the best result. The sooner the milk is taken away from the odors of the barn, the better.

If the windmill is kept running, all the cream can be taken off at twenty-four hours' setting.

When cream is skimmed before the skimming wagon arrives, place the can back in the water tank, as it hurts it to allow it to warm up. If these rules are followed all the cream can be furnished cold and sweet to the creameries, and will not test over 75-100 of a pound to the inch. The smaller the test the patron has, the more pounds of butter he is getting pay for out of a hundred pounds of milk. To the few people who have by carelessness or other causes, furnished sour or rancid cream; thus taking one cent per pound



from all the butter sold by your creamery. You must correct your methods, if it is in your power.

You have no right to furnish goods of so poor a quality that your neighbor is injured by them, while slipshod methods and an incongruous mess of happenings has taken a cent per pound off from the price of all the butter. There is no one that suffers to the extent of yourselves. If you set your milk in the tank and let the water warm up, paying no attention to the temperature, you will only receive pay for two and a half to three pounds of butter from the hundred weight of milk; yet your test may be a pound and a quarter to the inch, or more, whilst your neighbor who properly scalds out all utensils, and sets his milk at a low temperature, and keeps it there all the time, will get four pounds of butter out of a hundred weight of milk, and his test may not be over 65-100 pounds per inch. You can verify this statement by weighing your milk; a can of which weighs from 32 to 33 pounds, and by keeping track of the number of cans and pounds of butter you receive out of the milk.

The agitation of this question has already created so strong a demand for the elimination of the evils that have crept into the gathered cream system of this county that the inspection of all the patrons' cream will take place in the future. As so much depends upon keeping the milk cold all the time, the skimmer will probably carry a floating thermometer; upon arrival at the patron's tank he will place it in the water; the temperature of the water being the same as milk. The record of the temperature can be kept beside the record of inches in the skimming book, and brought in each day to the creamery. This will enable the manager to determine who is furnishing sour cream.

A sample of every patron's cream is received at the creamery in the test tube. It would be fair to presume that after the patron is taught by inspectors how to handle their milk properly, and the record of their cream showed "high temperature" that the patron might have been careless in other directions, such as, rinsing out his cans in cold water, instead of scalding them; or he might have got manure in his milk, or been careless in some other direction.

Any cause by carelessness that creates bad odor or taint in the cream, can be readily detected at the creamery, as the bottle showing high temperature will be separated out from the rest and placed in water heated to 120 degrees; the corks taken out of them and smelt of by the manager or butter maker, and the scent will fasten any defects right where they belong.

The State Dairy Commissioner having commenced his work of improving the quality of Mitchell county butter, he will of necessity have to this season take an expert with him and inspect every creamery in Mitchell county.

He will also, some time during the summer cause to be inspected the cream of one hundred patrons of Mitchell county creameries, a record of these inspections will appear in the fourth annual report which comes out November first, and he sincerely hopes and trusts that in this report, the examinations of Mitchell county creameries and their patrons, will show up at least as good as any like reports from any other counties. If any private or co-operative creamery gets into trouble, and the management don't know the reason of it, I recommend them to employ Charles Penny of Stacyville, or Corneal Sheehan of Osage, as I consider them experts with regard to all creamery

business, and I intend to employ them on expert work for the work for the State.

Owing to the three last dry seasons, some patrons are scarce of water, and it will be impossible for them to keep their milk at a proper temperature; there will be no disposition to have these people dropped on the part of the creamery management, if they will do the best they can.

Yours truly,

A. C. TUPPER,  
*Iowa State Dairy Commissioner.*

Many farmers made this complaint after reading the paper just published which advocated the keeping of their milk as cold as possible all the time, that the cream might be sweet and thin when delivered to the creameries.

"The skimmer that gathers our cream takes it only every other day. We could keep it properly during that time, but when the Sunday's cream is added it makes cream three days old and there is so much milk that we have no room for it in the tanks. If the cream is sour it is the creamery managements fault, no blame attaches to us. The creamery must take the cream if in poor condition." It is no economy to gather cream every other day. The cream on all routes should be gathered at least four times a week, then no cream would be over two days old. It is a fact that the farmers are paying enough now to gather the cream every day. If the skimmers did not double and treble the same roads the same day. Every days' gathering produces the best result. All recognized dairy authorities agree that milk tends to deteriorate and decay from the moment it leaves the cow.

And hence, "It is insisted that churning should be done every day to the end that the passage of the butter from the milk pail to the tub may be reduced to the very shortest time. The late Hiram Smith had the best of facilities for raising and holding cream, in setting his milk in ice water. He had a more acute taste than one man in ten thousand and became satisfied from experiment that he could not hold cream in his dairy house over until the second day and make as fine butter as when he churned every day." If he could not do it, we cannot and gather cream every other day. We are now on the threshold of the best season, and for the next two months the most butter is made of any time during the year. Hundreds of separator creameries have started up new in the northwestern dairy States. The separator system eliminates many of the uncertain happenings out of butter making. The expense is greater than by our system. This large increase of



fine butter makes it much harder this year than ever before for our system to retain its old standard of quality. The managers of co-operative creameries want to please the patrons; if patrons are in favor of the best methods, even if it does cost more, let your agents know it; back them up if they should try to improve the quality of the goods. Be as earnest in their support as the stupid patron is in kicking about a poor test.

If inspectors are sent around to examine into the patrons' facilities for taking care of the milk, and to suggest the proper mode of handling it, it will cost you a nickle apiece. Now, don't hold that nickle so close to your eye as to obscure the vision of the dollar that is just beyond it if the quality of creamery butter is improved in this country, as it can be.

The Dairy Commissioner, by public agitation and private instruction, attempted to bring about an improvement in the quality of the butter, to bring about the same reforms as was expected by the County Creamery Organization. Each manager of the creameries arrange the inspection of the patron's milk as to facilities for properly taking care of it. Many wind-mills were erected, and new tanks put into the milk houses; many erroneous ideas were eradicated from the minds of the patrons in regard to the care of milk. The bulk of the every other day cream routes were changed so that it was gathered four times a week. A much larger proportion of the cream was brought to the creamery every day. The creameries were inspected closer as to cleanliness, ventilation, and drainage, so that to-day what creamery butter from this county that is sold in New York brings fully one-half cent above western extras. Seventy five per cent of the butter made in Mitchell county has been sold to parties in Washington. At present they are taking the entire make, except of creameries, at prices that give a greater net return than a half cent above western extras would do. The Commissioner has done as he said he would do, and has examined every creamery in the county except one. Eight-tenths of them were built to accommodate a much smaller business than they have now; all of them except two ought to build on refrigerator rooms large enough to hold a week's make of butter in one compartment and have room enough in another compartment for a power butter-worker and room sufficient for it to be operated. All the creameries were found in nice condition as to cleanliness, and each butter-worker seemed to be doing his work well. One or two of them were without screens, nor did they have anything to keep the flies out of the cream vats. I would make the further suggestion

that they book the cream outside the creamery, thus preventing the skimmer opening and shutting the doors and letting the flies in. The Commissioner has visited some seventy-five creameries outside of his own county, equally divided between separators and gathered cream creameries, and in many instances what he says in regard to his own county will apply equally well to those outside of it.

June 18, the Commissioner visited the Jessup creamery, they were running about twenty-one thousand pounds of milk per day, buying it on its intrinsic value, testing it by Professor Patrick's butter test. The company had built one of the best separator creameries in the State, costing something over five thousand dollars. The Jessup creamery company were the first in the State to take this new departure in the mode of handling milk. We publish in this report later on their success.

July 2nd, visited Algona, Iowa, saw the butter extractor work, which was operated by J. Wallace & Company. The Butter Extractor is a machine very similar to the Danish Western Separator. The bowl is larger at the bottom; in the center of the bowl is a trunnel wheel, the axis of which is a little to one side of the center. The swift velocity of the revolving milk causes it to turn rapidly and its motion churns the butter. It drops out from the machine through an orifice in the bottom on cakes of ice. The butter did not come in granulated form, but was in such a soft condition that the buttermilk would not wash out of it. To allow me to take the train, the milk was run through the machine as soon as it arrived at the factory. The machine works better when the milk has stood from six to eight hours. The butter on hand, made on former days, was destitute of proper grain and had a flat flavor. As Mr. Wallace & Company have been invited to report their success with this machine to this office, we will say no more.

The following letter written to C. J. Behr, Rockwell, Iowa, answers the question. In answer to your question of which is the most profitable to the patron, the gathered cream plan or the separator, when each are operated to the best advantage: If the patrons all furnish the cream in good shape, and the routes are large enough to reduce the average price of gathering cream for the year to one cent per inch, and not over a cent and a half per inch in the winter season, and the creamery has routes enough to fully employ the help in the creamery, or if there should be a few patrons that did not furnish cream up to standard quality, and yet not a sufficient number of them to materially injure the grade of the butter;



and further, the great majority of patrons must understand the necessity of setting the milk as soon as possible, after it has been drawn from the cow, in as cold water as their wells afford; or, what is better yet, in ice water and keeping it cold with fresh water or ice until the cream is all raised. By doing this, they will get as much butter from the hundred pounds of milk, less one-quarter to one-half pound as the patrons of separator creameries get. The average price for the year in the best run creameries of the gathered cream plan, is two cents and a half for the year. This price includes gathering the cream, all the expenses of manufacturing it into butter, and delivering it in tubs on board cars. The usual price for making up butter with the separator is four cents per pound, not counting the expense of drawing in the milk, which is usually ten cents per hundred. If the farmers could be educated to properly handle their milk and do the things described in this letter, the creameries under the gathered cream plan would produce the most "dollars and cents" for each patron. We had eight farmers weigh their milk the first two weeks of June; they furnished 29,000 pounds, it averaged 3.517 of butter from one hundred pounds of milk. At this time the separator people were making four pounds to the one hundred weight of milk, but their expenses were so much greater that the farmers did not receive as much money from them as was paid by the gathered cream system.

I have been in a number of creameries run on the gathered cream plan where the farmers were taking care of the cream poorly, raising it in warmish water, where it came in in poor shape, many of them were not receiving over two and a half to three pounds of butter from a hundred weight of milk; the butter was of poor quality, and yet there was a sufficient number of patrons so that the gathering was cheap. The best thing that could have been done for them, was to have put in separators, as by this system, many of the incongruous mishappenings to the milk is eliminated. The patrons would receive enough more butter from a hundred pounds of milk, which would be of a better quality, to more than pay the extra expense of making the butter by separators.

This answers all of your questions.

Respectfully yours,

A. C. TUPPER,  
*State Dairy Commissioner.*

#### THE PATRICK MILK TEST.

About one year ago Prof. Patrick, of Ames, brought out a simple milk test. His was the only test at the State fair of 1889, and created quite a flurry of interest among creamery men. By placing twelve test tubes filled with milk and acid in a rack attached to a copper tea kettle pit, filling the hollow of the pit with sand and placing it on a kitchen stove, it would raise the butter fat to the top of the tub in about 20 minutes, then by drawing out part of the mixture through a small orifice below the measuring scale, the number of pounds of good butter fat in 100 pounds of milk could be read. It was designed by Prof. Patrick at that time to test the relative value of the different cows in a herd for butter making. He has steadily improved and simplified his methods so that creameries used his outfit this spring, and are buying milk on its intrinsic value for making butter. Jessup creamery, composed of as thorough a lot of creamery men and dairy people as can be found anywhere, put the test into use paying for the milk according to how many pounds of butter it would make to the 100 pounds and found that the milk of different dairies varied from 2.86 pounds to 5.60 pounds, and that the quality of the milk improved very materially the second time it was tested. The State Dairy Commissioner of Iowa has used the test in his office to find out the value of the milk of the cities of Des Moines, Cedar Rapids and Burlington, and intends to have samples every week from cities of over 20,000 people in the State, and by this means the milk of the cities in each case was very much improved after the test was applied. The officer is more than pleased with this test in the simple form in which it first came out; only by this or similar tests brought out in the last year would it be possible to test the milk of seven cities of Iowa when one considers the distance each one is from the other.

For the first time at the State fair the Professor exhibits his last and greatest improvement, viz., he places a cell or steam pipe in the bottom of an oblong box lined with zinc and filled with brine, connected with a like box filled with water. Since the introduction of the brine-bath in the oblong boxes with the steam pipes on the bottom, one can commence measuring milk into the tubs, then adding acid, after shaking the two together can place twelve tubes in each rack, thereby placing the first filled racks into boiling brine. You can then fill the third rack with tubes. Place the third rack in by the side of the second. When the rack is filled the first one will be ready to place in the water bath at 140°, and by the time



the fourth rack is filled the tubes in the first one are ready to read. This reduces the mode to just filling the tubes and reading them. Not a moment is wasted in waiting on the apparatus from start to finish if forty-five samples are to be worked.

Its action is automatic. The Patrick test is the easiest filled of any tube on the market and can be measured in the shortest time. All creameries have steam and by attaching the pipes in the boxes to the boiler, the only expense is buying the tubes, pipes and acid. Prof. Patrick has solved in the most simple manner and at a minimum expense of three-fourths cent on each test, the great problem of buying milk on its intrinsic value for butter. He has brought honor to the United States experimental station at Ames and to the State of Iowa. It is for the creamery men to put it in use at once.

Since the above was written two new milk tests have been invented and put within reach of dairy and creamery men; they are the Babcock and the Biemling tests. Both use centrifugal force for separating the fat from the milk, after the latter has been treated with acids. In other words they are centrifugal machines, carrying test bottles in which the milk and acid are mixed, and revolving them at a speed of 300 to 1,500 revolutions per minute. By the Babcock method a single test can be made in ten minutes, and by the Biemling method it is claimed that the same can be done in two minutes. This office has not yet actually tried either one of these tests, but from observation on different occasions it is our belief that both are reliable, and worthy of high commendation. Of the two, the Biemling *appears* to us preferable.

#### TESTING MILK OF CITIES, ETC.

The Iowa State dairy law classes all dairy products whether butter or cheese unless made from pure milk or pure cream, as imitation goods; this necessitates our office having sufficient apparatus to test the milk. At the present time the office can in a short time analyze twelve samples of milk and find out the amount of butter fat in each sample. If a sample should be below standard as to butter fat we have apparatus by which we can evaporate the water out of the milk and see what proportion of solids is in the milk. If the milk has been adulterated with anything that would increase its solids we are able to burn the solids up and have scales that will weigh sufficiently fine to ascertain if the ash amount to more than  $\frac{1}{4}$  of one per cent. Butter is the commonest article on our table, it is used at every regular meal and we can safely say that the conviction of all the consumers in this State is that they want it made

from pure milk or cream and for this reason the office has added a small laboratory so that the manufacturers of butter and cheese, if in doubt in regard to the quality of milk as to adulteration or otherwise the office can as it has tested their samples of milk when sent in. There is a stringent law on the statute books of the State, section 4042, against the sale of adulterated milk or milk diluted with water or milk from which any cream has been taken, or milk from which any part of the strippings has been held back, with severe penalty attached. But unfortunately its enforcement does not belong by law to this office. It is only of recent date that laws of this character have been enacted to protect the consumers of milk. Most of the States make it the duty of the Dairy Commissioner's office to test the milk as sold by milkmen to the people of the cities. While this office must test suspicious milk that is to go into the manufacture of butter and cheese, it can only test the milk as sold by milkmen to the consumers of the cities, without making additional expense to the State nor can this be obviated although it is a great oversight, until the meeting of the next legislature. As the centers of our population increase and our cities become larger there are more people that must depend upon milkmen for a supply of milk, and there are many thousands of poor families that depend on the milkmen's milk as food with which to raise their babies.

An analysis of cow's milk shows 86.80 water, 3.80 fat, 4.50 sugar, 4.20 caseine, .70 salts, 1.031 specific gravity. Analysis of human milk is 86.78 water, 3.38 fat, 7.50 sugar, 1.72 caseine, .56 salts, 1.032 specific gravity; by this comparison we find a great similarity between cow's milk and human milk, yet they differ very materially in their constituent parts. The water in each is almost identical, there is more fat in the cow's milk than in the mother's milk but the proportion is reversed with regard to sugar, being as seven to four. The caseine is more than double in cow's milk to what it is in mother's milk and the salts are 20 per cent more in cow's milk than in mother's milk, the specific gravity is about the same. A farmer can raise a good calf on skim milk by adding a little oil-meal to the milk but a babe can not be raised on skim milk and be fat and healthy for the following reasons: When the cream is taken from milk, that means the butter fat is gone and as a large excess of caseine which means curd is in cow's milk over mother's milk. The similarity between the two foods no longer exists; in the skim milk the per cent of fat is too small and the per cent of caseine very much too large. The proportion of sugar is also too small and salt too large; the difference considered to be of greatest importance by



physicians is, the great excess of caseine in skim milk over human milk. The skim milk is indigestible, often causing sickness which ends in death, when fed to infants.

The statement is made on good authority that two-thirds of our infant population are brought up on cow's milk, and that all children drink more or less milk; for this cause if there was no other it is absolutely necessary that there be an abundant supply of pure milk sold in our cities. The infants reared in well to do families can be and are properly fed under instructions from the doctor; the milk from two fresh cows is procured, it is diluted to some extent with water to reduce the excess of caseine, a little sugar is added to replace the lack of sugar in the cows' milk. The bottle is heated to a blood temperature and the instructions are that the babe be fed as often as if it drew its nourishment from its mother. There are many hundred mothers even in Iowa cities that do not belong to well-to-do families. Mothers who love their babes as only mothers can who have to depend upon the milkman for their child's food, and when milkmen sell that mother milk from which a part or all of the cream has been taken, they are not only taking money through false pretense, they are liable to take for the sake of a few paltry cents the life of a child.

Having gone through the various dairy commissioner's reports and especially of the New York State and observed the vast amount of labor necessary to prevent the sale of adulterated milk in the large cities. Having the necessary apparatus on hand, about the first of June upon my rounds of inspecting cheese, I gathered up 25 samples of milk as sold by the milkmen to the citizens of Des Moines; one-third of the samples were below standard, testing as low as one pound and fifty-four hundredths of butter fat to the hundred pound of milk. The office gathered about one hundred samples of milk from the milkmen of Des Moines in addition to those first named, during the months of June and July. These one hundred samples averaged 3.65 pound of butter fat to the one hundred pound of milk. The first twenty-one samples averaged 2.92 pounds of butter fat per hundred weight of milk. The quality of the milk of Des Moines steadily improved until we quit gathering samples about August 1st. We thought that we would give the milkmen a rest for a while, and then see if their milk would average as high a test as when we left off. September 2d, gathered twenty-one samples of milk from the milkmen of Des Moines which tested below three pounds of butter fat to the hundred weight. Samples of milk have been gathered from time to time since September 2d

and we are pleased to state the milk is almost all running above the standard. August 5th, gathered twelve samples of milk from the milkmen of Cedar Rapids; one-half of the samples were below standard; from half of them more or less cream had been taken. August 27th, the duties of my office taking me to Cedar Rapids, I gathered twelve samples of milk there sold by the milkmen on the streets of the city which tested somewhat better than their first samples. My duties taking me to Burlington where I made inspection of the cheese sold by grocery men, none of which showed adulteration, I gathered twelve samples of milk from as many different milkmen and sent it to the office at Des Moines where it was tested; a large proportion of it had been partially skimmed. Shortly after this I gathered twelve samples of milk from as many different milkmen in Dubuque, and forwarded them to the office in Des Moines. Eleven samples of this milk tested above standard; found only one poor sample which tested 1.70. October 1st, being in Davenport on business connected with the office, I gathered twelve samples of milk, from as many different milkmen, and sent them to the office in Des Moines, which, when tested averaged 3.78 1-12. During my visit to Cedar Rapids, Burlington, Dubuque and Davenport I appointed agents to gather the milk samples from the milkmen so that the office could receive from the cities from time to time when it was convenient to analyze it.

We wanted to ascertain if taking samples from the milkmen once a week would cause them all to sell pure milk. It did this. The office was in hopes that the Executive Council could see a way inside the law of paying a moderate compensation for this work, as the appropriation unexpended would be sufficiently large to do this. At an expense of \$1,500 per year the milk of Des Moines, Dubuque, Burlington, Cedar Rapids, Sioux City and Council Bluffs, could have been kept pure and free from adulteration when delivered to the people by the milkmen. The Executive Council doubted the propriety of these bills, looked up the law and found they could not be paid. The information gained by this office is worth more to the Commissioners than all it cost him. If the city councils in the above named cities will employ competent men to gather milk samples from the milkmen, express them to Des Moines, free of cost, this office will analyze them free of cost. This can be done without extra expense to the State. Owing to the improved appliances for testing milk, the labor is reduced one hundred fold over the old Garvermetec Analysis, and the milk of our cities can be inspected at a small cost. A tabulated statement of the milk,



tested from the different cities, giving name of city, date, name of milkmen and test of milk, appears later on in this report. All can judge of the efficiency of the system by comparing the test of the different samples.

### RESULT OF MILK TESTS IN THE LARGE CITIES.

#### CEDAR RAPIDS.

NAMES.	August 5.	August 28.	September 2.	September 15.	September 23.	October 6.
Thos. Perryman.....	3.35		3.25		4.20	3.28
J. F. Ryker.....	3.02	3.19				3.93
P. J. Beery.....	3.02	3.84	3.90	2.10	4.73	4.20
Fred. Helmeyer.....	4.46	3.32	3.90	4.20	5.64	4.98
A. Ling.....	3.54			3.93		
Austin Dockey.....	3.35	3.77	3.70	4.72	4.46	
W. H. Hunter.....	3.93	2.33	3.89	3.54		
R. Ellis.....	3.15			4.43		
James Wiley.....	3.80	3.12	4.00	4.14	3.93	3.67
Stephen Bryan.....	2.04		4.00			
W. J. Bartlett.....	2.36				3.80	
J. S. Porter & Sons.....	2.17	4.69	3.50	3.15	4.07	3.54
Williams Bros.....		2.85	3.65	4.07		3.80
Adelia Putman.....		3.25	3.80		4.33	
L. Bemmer.....		3.25				
Konly Bros.....		3.77			4.59	4.33
Chas. Lind.....		2.72			3.80	
C. J. DeBerard.....			3.85	4.20		
John Wilder.....			4.15			5.25
A. Dockery.....			2.10		3.54	3.94
Geo. Harmer.....				4.46	4.50	
John Wells.....						

#### BURLINGTON.

NAMES.	August 29.	September 7.	September 15.	September 23.	October 6.
C. J. Earnest.....	2.74	3.67	4.30		3.15
Z. H. Bonar.....	3.89	3.93		3.67	3.28
F. L. Stephens.....	3.47		6.43	3.67	3.93
H. D. Leak.....	3.47		3.93		
J. A. Perry.....	3.18	3.54			3.41
O. H. Burmaster.....	3.89	3.93			
H. C. Bowman.....	2.45		3.15	4.59	3.54
E. J. Teninty.....	2.74		4.59		
E. J. Swords.....	3.47	3.41	3.67		3.93
John Koestner.....	2.81		3.28		
E. P. Dunham.....	2.45			4.46	
Saint Vaughn.....		4.26	3.67		3.28
F. L. Rogers.....		4.46			3.41
Peter Galley.....		4.07			
Joseph Binder.....		4.98			
Fred Duckstein.....		3.73	3.67	3.28	3.67
Andrew Sentl.....		3.54			
Turner & James.....		3.15	3.93	3.67	3.28
F. M. Parsons.....			4.98		
E. G. Vanwinkle.....			3.93	3.93	*8.79
A. Hacker.....				3.41	
J. Vogelgrasing.....				3.28	
L. G. Pearson.....				4.20	
Average.....	2.96	3.89	4.13	3.81	3.49

\* Cream.

#### DUBUQUE.

NAMES.	September 11.	October 6.	October 29.
H. Meyer.....		4.59	
J. Gadiant.....		4.46	4.59
J. H. Jicklin.....		4.07	4.46
Philip Becker.....		3.41	1.97
E. Hemmi.....		3.67	3.67
John Singrin.....		3.54	3.14
C. H. Walker.....		3.93	
Paley Bros.....		3.28	4.46
J. Hein.....		1.70	
J. H. Jicklin.....		3.54	4.29
A. Gartner.....		3.80	
H. Meyer.....		4.20	
Michael Reeds.....		4.72	
Thomas Buckingham.....		4.85	
W. Eggenburger.....		4.59	4.33
John Barrett.....		4.72	4.72
R. Frysi.....		3.54	
Christman Bros.....		4.20	3.67
F. B. Jackson.....		4.67	
Warrington Bros.....			4.72
M. Schingie.....			4.07
Average.....		3.68	4.04







DES MOINES—CONTINUED.

NAMES.	June 11.	June 12.	June 16.	June 18.	June 20.	June 23.	June 25.	June 27.	June 30.	July 2.	July 7.	July 10.	July 14.	July 17.	September 1.	September 12.	September 16.
	3.65	3.24	3.28	3.85	2.88	3.08	3.63	3.78	3.61	3.41	3.54	4.32	3.54	3.67	3.67	3.70	3.93
Poindexter & Zickafosse																	
Redhead & Vail																	
Geo. B. Peak																	
Gus Schoenfeldt																	
A. Anderson																	
L. E. Proctor																	
J. B. Boyd																	
W. Scott																	
Thos. Barr																	
E. P. Flemming																	
D. W. Thomas																	
Average	3.65	3.24	3.28	3.85	2.88	3.08	3.63	3.78	3.61	3.41	3.54	4.32	3.54	3.67	3.67	3.70	3.93

## PLANS AND SPECIFICATIONS OF A SIDE HILL SEPARATOR CREAMERY.

BY O. T. DENISON.

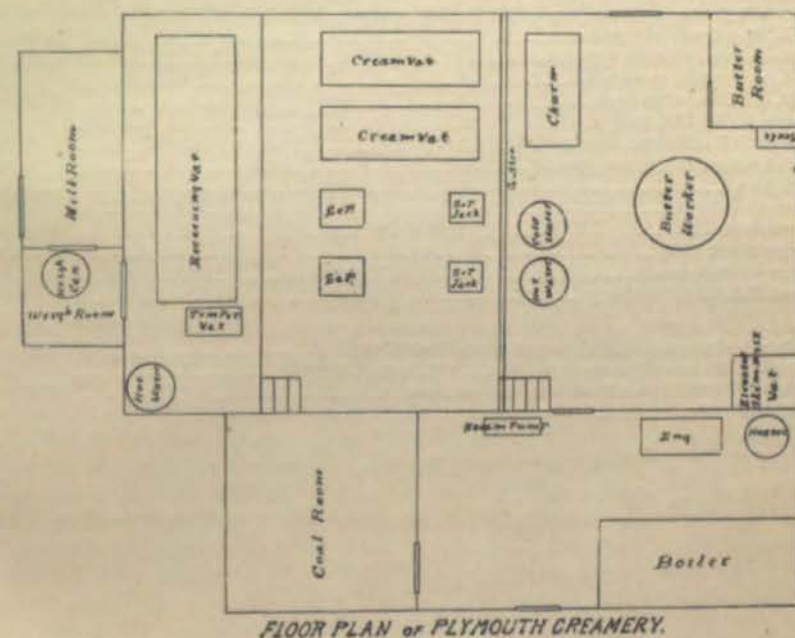
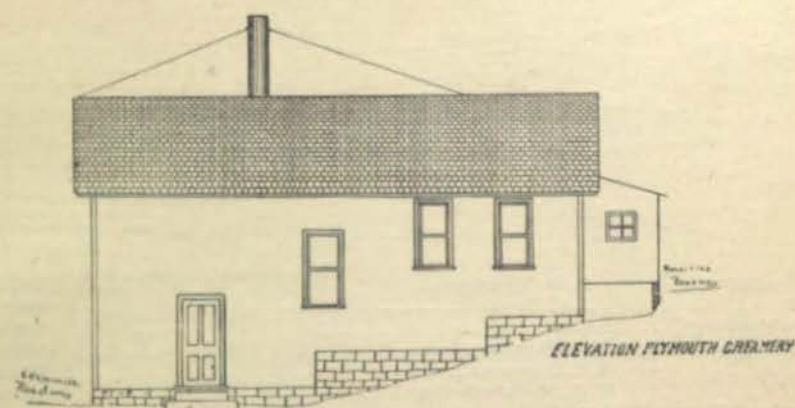
An inspection of the creameries in Iowa will disclose the fact that very many are planned and constructed so that the daily operating expenses must be more than they need be. These times of close competition compel closest economy of labor and incidental expenses in creamery operation. The first cost of the factory outfit does not cut so large a figure as does the daily operating expenses in proportion to the finished output of the factory. Liquids will run down hill, but it costs money to force them up hill. Now, if we can so construct our creameries that the milk will run into the factory, into the separators, the cream into the vats and churn, and the skim milk and buttermilk into the hauler's wagon by gravity, without lifting or pumping anywhere in the course, we save labor, expense and annoyance. Pumps will wear out, foul with milk, and damage rather than improve the quality of the butter. Pumping buttermilk from a vat or cistern surely leaves a portion of the poor, old sour stuff to utterly ruin for feed the buttermilk from the next day's churning. Few places in Iowa are so level that a suitable hill-side can not be obtained whereon a creamery can be constructed with such descent as to run the milk into and through the factory without using a pump and allow proper drainage.

The first essential in selecting a site for a creamery is an abundance of pure water; the next is drainage. Without these the best constructed factory must be worthless. Herewith is shown elevation and floor plan of a creamery built at Plymouth, Cerro Gordo county, Iowa, in spring of 1890, capable of handling twenty thousand pounds of milk per day with the labor of two men. The building is 24x40 feet and 12x32 feet. The churn floor is 17 feet, separator floor 14 feet, and the receiving vat floor is 8 feet, and the



milk and weigh room is 5 feet long. The milk room floor is 11 feet 2 inches above the churn floor—the first rise three feet, the next thirty inches; the next, to weigh-can floor, thirty-eight inches, and thence to the floor upon which the milk cans are set from the wagon, thirty. The patron has but to tip his can over and the milk pours into the weigh can standing on the scales, it is weighed, a three-inch gate lets it run into the receiving vat, thence it runs into the tempering vat, thence into separators, the cream running into the cream vats and the skim milk into its vat where the patron draws it into his can in his wagon, by opening a gate. The cream runs into the churn, the buttermilk runs from the churn through a short hose to a pipe under the separator floor, thence out to the vat from which it is drawn into barrels in the wagon by opening a gate. The building is 16 feet high, and over the churn floor is a storage room 12x15 feet, and a sleeping room same size, with bath tub furnished with hot and cold water. The drain is of tile, discharging into Beaver Creek, forty feet from the building. Butter room is 6x8 holding 100 tubs of butter, and supplied with ice from the upper floor.

A twenty-horse power boiler, set in brick-work, supplies the power and heats the building. A fifteen-horse power engine does the work. By use of the steam pump the boiler is fed through the closed heater, thus saving fuel, and water pumped under the milk and cream as needed, and for washing the floors. It is not presumed that this is a "model" creamery, but it is so much more convenient than those built on a level, and so much more economical in labor of operation, that the plan is offered to those contemplating building, hoping they may improve upon it.





## FINANCIAL STATEMENT.

Commissioner's salary, H. D. Sherman.....	\$ 750.00
A. C. Tupper.....	750.00
Clerk's salary.....	600.00
Contingent expenses, H. D. Sherman.....	350.43
A. C. Tupper.....	362.58
W. E. Stockwell, clerk.....	28.34
Redhead, Norton, Lathrop & Co., stationary.....	10.85
F. H. Hunter, office supplies.....	2.75
Richards & Co., scales.....	57.82
Hubbard, Ward & Co., chemicals.....	8.02
P. C. Kenyon, stationery.....	31.00
Etmer & Aurand, apparatus.....	55.86
A. L. West, merchandise.....	9.00
Otto Nelson, binding reports.....	45.00
E. J. Hoburger, apparatus.....	5.80
J. F. McLain, apparatus.....	37.80
Ferris M. Moffitt, livery.....	8.00
Moffitt & Parkhurst, livery.....	23.00
J. F. Dalley, two letter files.....	4.00
Printing.....	4.50
Stenography.....	10.95
Apparatus.....	16.75
Extra clerk hire.....	22.50
Type-writer rent.....	7.50
Iowa Printing Company.....	6.00
	\$ 3,227.35
Balance of appropriation as reported Nov. 14, 1889.....	10,884.95
Amount of expenditures from Nov. 1, 1890, to Oct. 1, 1890.....	3,223.00
Total amount drawn from treasury to date.....	12,342.40
Balance undrawn from State treasury.....	7,667.60
	\$ 20,000.00

## 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 purpose 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 purpose 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 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.

Letters were sent men in every county in the State containing a creamery or cheese factory, enclosing a list of the creameries and cheese factories as published in the Third Annual Report of this office; also, a stamped envelope for reply, requesting these men to revise and add to the list as published, and send to us, that we might have a full and correct list of all the factories doing business in each county in the State. A return card was on the envelope, and only two came back to us. We did not receive replies from over fifty per cent of those written to. If the creamery and cheese factory men do not care sufficiently about the business to have a correct list of these factories and creameries to reply when written to, we hope they will be modest enough to say nothing if mistakes occur. This office was created to help the dairy interests of the State, but the usefulness of our report depends largely on the dairy people, as there is no other source of information. We have not received reports from nearly all the creameries and cheese factories in answer to the questions sent out by this office. Letter after letter received no reply.

Allow this office to urge upon the dairymen all over the State this coming year, to answer *at once* the list of questions that will be sent you later on. In more than one way this may be beneficial to you. The office sends its report to all the leading dairymen in the country; also to many commission men, both East and West. These commission men watch eagerly for the names of new creameries and note the discontinuance of the old ones. We are supposed to send a correct and complete list. Please help us to have one for next year.

The following is a complete list of creameries as far as heard from:



## LIST OF CREAMERIES.

## ADAIR COUNTY.

Adair—Adair Butter and Cheese Association, F. Furst, Secretary.  
 Fontanelle—Blue Grass Creamery, E. & C. D. Newbury.  
 Orient—Wiley, Slocum & Co.

## ADAMS COUNTY.

Corning—Tube Rose Creamery, W. L. Williams.

## ALLAMAKEE COUNTY.

Lansing—Lansing Creamery, Nielander & Brockhansen.  
 Lycurgus—Lycurgus Creamery, J. E. Hubble, Waukon.  
 New Albin—New Albin Creamery, J. D. Bickel, Giard.  
 New Albin—New Albin Creamery, C. N. Beach.  
 Postville—Hardin Creamery Co.  
 Postville—Winow Creamery Co., E. R. Shaw, Secretary, West Union.  
 Quandahl—Arctic Spring Co., I. D. Johnson.  
 Waterville—Waterville Creamery, J. E. Hubbell, Waukon.  
 Waukon—Oak Leaf Creamery, J. E. Hubbell.  
 Waukon—Excelsior Creamery, Johnson & Bakke, Decorah.

## AUDUBON COUNTY.

Audubon—Audubon Valley Creamery, Fisher Bros. & Co.  
 Exira—Exira Creamery, G. E. Born, Secretary.

## BENTON COUNTY.

Belle Plaine—Hilton Bros. & Co., Boston, Massachusetts. L. D. Hilton, Manager, Belle Plaine.  
 Garrison—Vinton Creamery Co., Vinton, A. M. Rowe, Manager.  
 Gillespie—West Lawn Creamery Co., Vinton Creamery Co., Vinton.  
 Norway—J. R. Morin & Co., Cedar Rapids.  
 Prairie Creek—Vinton Creamery Co., Vinton, A. H. Rowe, Manager.  
 Shellsburg—Vinton Creamery Co., A. M. Rowe.  
 Urbana—Urbana City Creamery, C. W. Gillman.  
 Van Horn—J. R. Morin, Cedar Rapids.  
 Vinton—Vinton Creamery Co., A. M. Rowe, Manager.

## BLACK HAWK COUNTY.

Cedar Falls—C. J. Refshange.  
 Cedar Falls—S. Smith.  
 Dunkerton—Lester Creamery, O. E. Meyerhoff and Bros.  
 Eagle Township—Red Bird Joint Stock Co., Albert Vittum, Reinbeck.  
 Finchford—Finchford Creamery, H. C. Boyer.  
 Gilbertsville—Harris & Co.  
 Hudson—Hudson Creamery, L. B. Knudson.  
 Hudson—Rock Creek Creamery, L. B. Knudson.  
 Jubilee—Geo. Orth.  
 La Porte City—La Port & West Lawn Creamery, M. L. Newton.  
 La Porte City—Mound Creamery, J. Wasson & Co., Waterloo.  
 Orange Township—Brown & Son.  
 Waterloo—Thorpson & Harrod.

## BOONE COUNTY.

Boone—Boone Creamery, Stockslager & Chamberlain.  
 Luther—Luther Creameay, Stockslager & Chamberlain.  
 Mackey—Fountain Creamery, Stockslager & Chamberlain.

## BREMER COUNTY.

Bremer—Bremer Creamery, J. Kelling.  
 Bush Creek—Little Valley Creamery Co., C. H. Brooks.  
 Dickey—Douglass Center Creamery Co., W. F. Fee.  
 Denver—Douglass Center Creamery, T. J. Dorn.  
 Denver—E. F. Diercks.  
 Frederica—Douglass Center Creamery, J. C. Gonsalur.  
 Horton—Scott & Allen.  
 Key—Golden Key Creamery, O. E. Meyerhoff.  
 Knittel—Crane Creek Creamery, Leehare & Thies.  
 Maxfield Twp—Dickmann Creamery, Fred Dickmann, Klingar.  
 Maxfield Twp—John H. Engelking, Waterloo.  
 Maxfield—Artesian Creamer Co., Hagoman & Langhorst.  
 Minkler—Oran Creamery Co.  
 Plainfield—  
 Seigel—Seigel Farmer's Creamery Co.  
 Sumner—Sumner Creamery, Garden, Murphy & Co.  
 Sumner—Spring Fountain Creamery Co., Wm. Meyer.  
 Sumner—Creamery Co.  
 Tripoli—Perfect Creamery, Decker & Mathias.  
 Tripoli—Fremont Co-operative Creamery Co., G. W. Hazlett, Secretary.  
 Waverly—Riverside Creamery Co., Edd Brule.  
 Waverly—Artesian Creamery, S. W. Mathias & Son.  
 Waverly—Washington Creamery, John Brandenburg.

## BUCHANAN COUNTY.

Aurora—Aurora Farmer's Creamery, B. B. Warren.  
 Brandon—Brandon Creamery, D. A. McLeish.



Fairbank—Fairbank Creamery, S. J. King.  
 Fairbank—Fairbank Farmer's Creamery Co., E. Sanborn.  
 Independence—Independence Creamery, Weins & Shillinglaw.  
 Jesup—Jesup Creamery Co., L. S. Hovey, Secretary.  
 Littleton—Co-operative Creamery Co., E. B. Barclay.  
 Middlefield—Middlefield Creamery, A. J. Hazelrigg.  
 Monti—Honlahan & Donnelly.  
 Newtonville—W. W. Wilde.  
 Quasqueton—Quasqueton Co-operative Creamery, A. F. Burrhus.  
 Rowley—Farmer's Co-operative Creamery, A. F. Basworth, Sec.  
 Shady Grove—Kenny Bros.  
 Stanly—Stanly Farmer's Creamery Association, S. C. Irvine, Sec.  
 Winthrop—Winthrop Co-operative Creamery Association, J. F. Kinny,  
 Secretary.

## BUENA VISTA COUNTY.

Newell—Newell Creamery Company, M. J. Chaney, Secretary.  
 Storm Lake—F. Foster & Co.

## BUTLER COUNTY.

Aplington—Spring Hill Creamery, Durand & Dadswell.  
 Bristow—Clover Lawn Creamery, E. M. Haven.  
 Butler Center—Nickel Plate Creamery, S. Williams & Son.  
 Butler twp—Rose Hill Creamery, S. S. Renfrew.  
 Clarkesville—Oak Grove Creamery Association, E. D. Wilson, Manager.  
 Clarkesville—C. Clausing.  
 Clarkesville—Pleasant Valley, John Crane.  
 Clarkesville—Farmer's Co-operative.  
 Dumont—Dumont Farmer's Dairy Association, G. S. Brown, Secretary.  
 Dumont—Cuterville Creamery Company.  
 Dumont—Dumont Creamery, Lewis Forthum, Manager.  
 Dumont—Joint Stock Company.  
 Greene—Cold Water Creamery Association, Lewis Forthum, Manager.  
 New Hartford—A. M. DuBois.  
 Parkersburg—The Diamond Creamery, Smith & Powers.  
 Parkersburg—Star Creamery, Farmer Bros. & Co.  
 Shell Rock—Halls Eureka, E. Towne & Son.

## CALHOUN COUNTY.

Farnhamville—Shotwell & Davis, Perry.  
 Lake City—Boardman Bros. & Company, Odeboldt.  
 Manson—Hillman Bros.  
 Rockwell City—Rockwell City Creamery, Thomas Tennant.

## CARROLL COUNTY.

Breda—Breda Creamery, C. W. Adams, Carroll.  
 Carroll—Carroll Creamery, C. W. Adams.  
 Glidden—Glidden Creamery, A. J. Heaton.

Mount Carmel—Boardman Bros. & Co., Odeboldt.  
 Roselle—Rose Valley Creamery, C. Kohorst.

## CASS COUNTY.

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

## CEDAR COUNTY.

Clarence—Cedar Creamery, H. L. Dean.  
 Lowden—Golden Star Creamery, August Hinrichs.  
 Lowden—Lowden Creamery, Chas. Hintz.  
 Lowden—Golden Creamery, A. Neiting & Co., three creameries.  
 Springdale—Cold Spring Creamery, L. Pilkington.  
 Stanwood—Stanwood Creamery, M. R. Lemos.  
 Tipton—Cedar Creamery, H. L. Dean.

## CERRO GORDO COUNTY.

Burchinal—Burchinal Creamery Co., Hubbard Bros.  
 Clear Lake—Clear Lake Dairymen's Association, John Dawson, Secretary.  
 Mason City—Mason City Creamery Company, A. J. Miller, Secretary.  
 Plymouth—Plymouth Creamery, C. T. Denison, Manager.  
 Portland—Portland Cheese & Butter Factory, Chas. B. Fink.  
 Rockwell—Rockwell Creamery Co., C. J. Behr.  
 Thornton—C. K. Creamery, Van Vliet & Son.  
 Swaledale—Ford & Baxter.

## CHEROKEE COUNTY.

Cherokee—M. J. Robinson.  
 Larrabee—E. D. Peck.  
 Quimby—Quimby Creamery Co.

## CHICKASAW COUNTY.

Alta Vista—Farmer's Alta Vista Creamery.  
 Bassett—S. E. Allen.  
 Chickasaw—Baston & Decorah Creamery Co., Wm. Beard & Sons, Decorah.  
 Fredricksburg—F. Shurtle & Co.  
 Fredricksburg—Fredricksburg Butter Factory, I. W. Edson, Sec.  
 Jericho—Jericho Co-operative Creamery Co.  
 Lawler—Lawler Creamery Association, T. E. Ayers, Secretary.  
 Little Turkey—Little Turkey Creamery Association, A. Jones, Secretary.  
 Nashua—Riverton Creamery Co., S. S. Waterbury, President.  
 Nashua—Pleasant Grove Creamery, C. H. Powers.  
 Nashua—Greenwood Creamery, W. I. Woody.  
 Nashua—C. A. Woody.  
 New Hampton—Boston & Decorah Creamery Co., Wm. Beard & Sons  
 Decorah.  
 New Hampton—Jacksonville Co-operative Creamery Co.



New Hampton—New Hampton Farmer's Creamery Company.  
Williamstown—John W. Kotehoff.

## CLARKE COUNTY.

Murray—Murray Creamery, Wm. Taylor.  
Osceola—Osceola Creamery, John W. Hall & Co.

## CLAY COUNTY.

Dickens—Dickens Creamery Co., J. H. Walsh, Secretary.  
Spencer—Spencer Creamery, E. J. Whitmore.

## CLAYTON COUNTY.

Communica—Communica Creamery Association, Wm. Greve, Secretary.  
East Elkport—C. Schneff.  
Edgewood—Farmers Creamery Co., H. B. James, Secretary.  
Edgewood—Honey Creek Creamery, H. F. Beyer.  
Elkader—C. F. Stephens & Co.  
Elkader—Union Valley Creamery, C. S. Anderson.  
Farmersburg—Farmersburg Creamery, M. J. Flanagan.  
Garnaville—Garnaville Farmer's Creamery, J. J. Kann.  
Garnaville—G. W. Kennedy.  
Giard—Giard Creamery, J. D. Bickel.  
Luana—Spring Brook Creamery, W. W. Russell.  
Luana—Farmer's Creamery Company, W. H. Russell.  
Monona—Union Creamery Co., E. B. Shaw, Secretary, West Union.  
Strawberry Point—Iowa Union Creamery Co., K. W. Kingsley, Secretary.  
Strawberry Point—Strawberry Point Creamery Company, K. W. Kingsley, Secretary.  
Strawberry Point—A. O. Kingsley.  
Volga—J. W. Lorne.

## CLINTON COUNTY.

Andover—Andover Creamery, Heynen & Van Oven.  
Calamus—Empire Creamery, Muller & Wendel.  
Delmar—Delmar Creamery, Fred Salisbury & Co.  
Goose Lake—Heynen & Van Oven.  
Elwood—Wyoming Valley, D. M. Winsor & Co.  
Welton—Welton Creamery, R. M. Hinckley.  
Welton—Welton Co-operative Creamery Co.  
Wheatland—Spring Rock Creamery, H. L. Dean.

## CRAWFORD COUNTY.

Denison—Denison Creamery Co., E. Gultch, Secretary.  
Denison—S. M. Thew.  
Manilla—Manilla Creamery Association, T. A. Jackson, Secretary.  
Vail—Boyer Valley Creamery, John Moody & Sons.

## DALLAS COUNTY.

Dexter—Lyon Creamery, C. H. Lyon.  
Perry—Red Star Creamery, John Moody & Sons.  
Perry—Shotwell & Davis.

## DAVIS COUNTY.

Bloomfield—W. H. Davis.  
Pulaski—Pulaski Creamery, J. J. Miller.

## DECATUR COUNTY.

Leon—T. R. Mooney.

## DELAWARE COUNTY.

Abbyville—Willow Grove Creamery, G. Abbey.  
Almira—Almira Creamery, A. E. Anderson.  
Almora—J. B. Dunham.  
Delhi—Pleasant Valley Creamery, Bush & Klan.  
Delhi—Rose Creamery, C. M. Hanna, Scotch Grove.  
Delaware—D. M. Hall & Sons.  
Dyersville—Bear Grove Creamery Co., A. Lammers Secretary.  
Earlville—Russell & Martin.  
Ehler—James Henderson.  
Ehler—Washington Creamery Co.  
Greeley—Greeley's Farmer's Creamery Co., J. N. Barlow, Secretary.  
Golden—Golden Creamery Co., T. F. Clark.  
Hazel Green—Hazel Green Creamery, Frank B. Dickey.  
Hopkinton—R. P. Dunlap.  
Hopkinton—Cedar Hill Creamery, E. R. File.  
Hopkinton—Silver Spring Creamery, McConnell & Steiner; two creameries.  
Hopkinton—Platt & Winsor.  
Manchester—Spring Branch Creamery, L. S. Gates, Secretary.  
Manchester—  
Masonville—B. W. Kenyon & Co.; two creameries.  
Masonville—Laird & Co.  
Oneida—Oneida Co-operative Creamery Co.  
Oneida—Oneida Farmer's Creamery Co.  
Petersburg—Bear Grove Co-operative Creamery, H. Summers, Secretary.  
South Fork Township—Worthington Creamery, W. Lattner, Worthington.  
South Fork Township—Double Grove, H. F. Pierce, Monticello.  
South Fork Township—Diamond Creamery Co., J. W. Merrill, Manager, Monticello; three creameries.  
Thorpe—T. Wormleighton.  
Tower Hill—J. J. McAreavy.  
Union Town—N. B. Richardson.  
Union Town—G. File.

## DES MOINES COUNTY.

Burlington—Burlington Creamery, E. P. Dunham.



## DICKINSON COUNTY.

Spirit Lake—Spirit Lake Creamery, C. C. Dykins, Alpha.

## DUBUQUE COUNTY.

Bernard—Brown & Atchinson.  
 Balltown—Northwestern Creamery, Lewis Backer.  
 Balltown—Henry Cunniver.  
 Bankston—Woodland Creamery, Michael Ferring.  
 Cascade—Crystal Falls Creamery, Dehner & Kay; two creameries.  
 Cascade—M. B. Flannigan.  
 Cascade—W. C. Aitchison.  
 Cascade—Breitbach Bro's.  
 Dyersville—A. Lineback & Co.; two creameries.  
 Farley—A. C. Walker & Co.  
 Farley—Vipper & Heald; two creameries.  
 Fillmore—Dehner & Kay, Cascade.  
 Lattners—Jacob Breithbach.  
 Luxemburg—Unga Bros.  
 New Vienna—Bear Grove Creamery Co., John F. Sudmeyer, Manager.  
 New Vienna—Kerper & Neber.  
 Peosta—Dehner & Kay, Cascade.  
 Peosta—Gilt Edge Creamery, Beck & Gremmels.  
 Pine Oak—Wm. Simmons.  
 Richland Twp.—Dehner & Kay, Cascade.  
 Sherrills Mound—  
 Worthington—Spring Valley Creamery, Louis Board.  
 Worthington—Worthington Creamery, Wm. Lattner.  
 Worthington—Vipper & Heald.  
 Worthington—Wm. Lattner.  
 Zwingle—J. Weltz.

## EMMET COUNTY.

Estherville—J. W. Wilson.  
 Swan Lake—A. M. Demming.

## FAYETTE COUNTY.

Alpha—Bethel Creamery, E. F. Beebe, Secretary, Alpha.  
 Alpha—Ace Webster, Waucoma.  
 Bethel Twp.—Alpha Farmer's Creamery Co., E. B. Hathaway.  
 Brush Creek—Brush Creek Creamery Co.  
 Clermont—Union Creamery Co., E. B. Shaw, West Union.  
 Elgin—Union Creamery Co., E. B. Shaw, West Union.  
 Fayette—Fayette Creamery Association, J. W. Winson, Secretary.  
 Hawkeye—Hawkeye Creamery, Brown & Rogers.  
 Maynard—Crown Creamery Co., J. C. Lewis.  
 Maynard—Harlon Creamery Co., A. F. Crawford, Secretary.  
 Olewein—Jefferson Creamery, H. W. Wing, Secretary.  
 Olewein—Olewein Farmer's Creamery Co., A. Hanson.

Randalia—Randalia Creamery Co., J. C. Darnell.  
 Randalia—Fairview Creamery Co., E. Mathews, Secretary.  
 Richfield—Richfield Creamery Co., F. Pleggenkuhle, Secretary.  
 Stanley—S. C. Irvines, Manager.  
 St. Lucas—Ace Webster, Waucoma.  
 Wadena—Steamboat Mound Creamery, James Leahy.  
 Waucoma—Ace Webster, two Creameries.  
 Westgate—Westgate Creamery Co., S. A. Sylvester, Secretary.  
 Westgate—Corbleys Grove Creamery Co.  
 West Union—Union Creamery Co., E. D. Shaw, Secretary.  
 West Twp.—Dover Springs Creamery, P. J. Rowland & Son.  
 West Union—Illyra Creamery Co.

## FLOYD COUNTY.

Charles City—Fussell & Prest.  
 Floyd—Floyd Co-operative Creamery Association, D. Wilbur, Secretary.  
 Green—Cold Water Co-operative Dairy Association, Lewis Forthum.  
 Marble Rock—Marble Rock Creamery Co., C. H. Oakes, Manager.  
 Niles—Niles Creamery Association, J. C. Daily, Secretary.  
 Nora Springs—Cottage Grove Dairy Ass'n, J. T. Cochonour, Secretary.  
 Powerville—Pleasant Grove Creamery, P. H. Powers.  
 Riverton Twp.—Riverton Creamery, S. S. Waterbury, President, Nashua.  
 Rockford—Rockford Co-operative Dairy Association, W. C. Wamsley.  
 Rudd—Rudd Creamery Co., Chas. A. Howard.

## FRANKLIN COUNTY.

Geneva—Geneva Creamery, H. C. Clark.  
 Hampton—Hampton Creamery, I. W. Myers.  
 Hansell—J. W. Hansell.  
 Sheffield—Sheffield Creamery, L. B. Carhart.

## GREENE COUNTY.

Dana—W. L. Addy.  
 Jefferson—Morgan & Cunningham.  
 Peyton—Peyton Creamery, G. E. White.  
 Rippey—Rippey Co-operative Creamery Co., W. J. Beaman.  
 Scranton City—Co-operative Creamery Co., H. J. Worsley, President.

## GRUNDY COUNTY.

Beaman—Hilton Bros. & Co., C. A. Hilton, Manager, Tama.  
 Colfax Twp.—Colfax Spring Creamery, W. S. Carrington.  
 Conrad Grove—Farmer's Co-operative Creamery Co., A. Lewis, Secretary.  
 Dairyville—Dairyville Creamery, N. H. Blom.  
 Fairfield Twp.—F. M. Wells, New Hartford.  
 Fredsville—Danish Creamery, J. & T. Sleafsgard.  
 Grant Twp.—J. & T. Sleafsgard, Fredsville.  
 Grundy Center—C. S. Shuler.  
 Grundy Center—J. H. Sperry, three creameries.



Grundy Center—National Creamery, W. S. Carrington.  
 Lincoln—Lincoln Spring Creamery, B. S. Harrison.  
 Morrison—J. & T. Selfsgard, Fairville.  
 Morrison—Lincoln Spring Creamery Co., M. E. Hunter, Secretary.  
 Wellsburg—Dadswell & Durand.

## GUTHRIE COUNTY.

Guthrie Center—Farmer's Butter & Cheese Association.  
 Panorama—W. L. Hitchins.  
 Stuart—Farmer's Creamery Co.

## HAMILTON COUNTY.

Ellsworth—S. G. Johnson & Co.  
 Jewel Junction—Jewel Creamery Co., S. M. Blake, Secretary.  
 Stratford—Star Creamery, J. M. Daniels & Son, Dayton.  
 Kamrar—D. C. Bailey.  
 Stanhope—Stanhope Creamery, Iverson Bros.  
 Webster City—Polar Grove Butter Factory, W. H. Dygart & Co.  
 Williams—R. G. Clark & Co., Webster City.

## HANCOCK COUNTY.

Britt—Britt Co-operative Creamery, W. H. Baker, Secretary.  
 Garner—Garner Creamery, S. W. Merton.

## HARDIN COUNTY.

Ackley—Martin Bros.  
 Ackley—W. Johnson.  
 Alden—Alden Creamery, M. Prichard, Secretary.  
 Eldora—Eldora Creamery, J. W. Buckingham.  
 Hubbard—Hubbard & Lawn Hill Creamery Company.  
 Lawn Hill—Hubbard & Lawn Hill Creamery Company.  
 Robertson—Wilkins & Windker.  
 Whitten—Whitten Creamery Co., Geo. M. Carr, Secretary.

## HARRISON COUNTY.

Dunlap—B. F. Roberts.  
 Logan—Logan Creamery Company.  
 Missouri Valley—Co-operative Creamery Company.

## HENRY COUNTY.

New London—Co-operative Creamery Company.  
 Swedesburgh—W. M. Tolander.  
 Winfield—Brighton Creamery, Recksher & Emry.

## HOWARD COUNTY.

Chester—Farmer's Co-operative Creamery Co., Torry Avery, Secretary.  
 Bonair—Bonair Co-operative Creamery Co., T. K. Johnson, Secretary.

Cresco—Merchant's Creamery Co., W. Kellow, Jr., Pres.  
 Cresco—B. P. Norton.  
 Cresco—Golden Rule Creamery, Cresco Creamery Co.  
 Elma—Beard & Douglass.  
 Lime Springs—Lime Springs Creamery, Cresco Creamery Co.  
 Lourdes—Lourdes Creamery, Cresco Creamery Co.  
 Lowther—Co-operative Creamery Co., William Brown, President.

## HUMBOLDT COUNTY.

Bode—Wm. R. Rassing.  
 Dakota—Baker, Savage & Co.  
 Humboldt—  
 Livermore—J. Small, President.

## IOWA COUNTY.

Genoa Bluff—Genoa Bluff Creamery, Geo. R. Howard.  
 Homestead—D. Sanderfield.  
 La Dora—Fountain Creamery, R. M. Switzer, Manager.  
 Marengo—E. S. McDonald.  
 Williamsburg—Williamsburg Creamery, Mathew & Breas.

## JACKSON COUNTY.

Andrew—Lily Creamery, King & McComb.  
 Baldwin—Diamond Creamery Co., J. W. Merrill, Manager, Monticello.  
 Bellevue—Chrystal Springs Creamery, Eli Cole, Sr.  
 La Motte—La Motte Creamery, Eli Cole, Sr., Bellevue.  
 La Motte—Sterling Creamery, Chas. R. Fuller, Manager.  
 Miles—Heynen & Van Oven.  
 Miles—Forest Creamery, Forest Bros.  
 Sharon—Diamond Creamery Co., J. R. Graft, Supt., Wyoming.  
 Spragueville—Heynen & Van Oven, Miles.  
 Spring Brook—C. M. Kegler.

## JASPER COUNTY.

Kellogg—Farmer's Co-operative Dairy Association, O. F. Adams, Secretary.  
 Metz—Farmer's Co-operative Association, H. L. Moffitt.  
 Newton—C. W. Hart.  
 Newton—The Malaska Creamery, H. D. Parsons.  
 Prairie City—Pattee & Ryan.

## JEFFERSON COUNTY.

Batavia—John McLane.

## JOHNSON COUNTY.

Frank Pierce—Washington Cheese & Butter Co.  
 Iowa City—Johnson County Creamery, Brook & Brown.  
 Lone Tree—Lone Tree Creamery, S. G. Kelly, Wilton Junction.



Oxford—Brook & Brown.  
Solon—Cedar Creamery, H. S. Dean, Tipton.

## JONES COUNTY.

Amber—W. H. Sanford.  
Anamosa—W. T. Shaw.  
Anamosa—I. S. Condit.  
Argand—Kehoe & Hogan.  
Cascade—J. L. Bader.  
Cascade—J. Hosch.  
Martelle—J. R. Morin & Co., Cedar Rapids; three creameries.  
Monticello—D. M. Hall & Sons; four creameries.  
Monticello—Double Crow, H. F. Pierce.  
Monticello—J. M. Hofacre.  
Monticello—G. W. & G. L. Lovell.  
Monticello—Diamond Creamery Co., J. W. Merrill, Manager; thirteen creameries.  
Olin—Orlin Creamery, Lamb Bros.  
Onslow—S. L. Gilbert.  
Richland Township—Crystal Falls No. 4, Dehner & Kay, Cascade.  
Scotch Grove—Rose Creameries, C. M. Hannah; two creameries.  
Wyoming—Diamond Creamery Co., G. R. Graft, Superintendent; eight creameries.

## KEOKUK COUNTY.

Hedrick—Hedrick Creamery, J. F. Fish.  
Keota—Keota Creamery, S. E. Reisman.  
Keswick—Johns, Wilson & Davis.  
Martinsburg—W. T. Miles.  
Richland—Richland Creamery, Eicher Bros.  
Sigourney—Sigourney Creamery Co., Theo. A. Schuerzlein.

## KOSSUTH COUNTY.

Algona—Algona Creamery, Boardman Bros. Nevada.  
Algona—J. Wallace & Co.  
Bancroft—J. Wallace & Co., Algona.  
Burt—Burt Co-operative Creamery, Geo. S. Angus, Secretary.  
Wesley—Wesley Creamery, Lawson & Oleson.  
Whittemore—Whittemore Creamery, Boardman Bros., Nevada.

## LEE COUNTY.

Ft. Madison—Ft. Madison Creamery, T. F. Curvier.  
Houghton—J. Houghton & Son.  
West Point—West Point Creamery, Harry D. Stoddard.

## LINN COUNTY.

Broadway—Broadway Creamery, Frank B. Dickey.  
Buffalo Township—Double Crown Creamery, H. F. Pierce, Monticello.  
Cedar Rapids—Woodward, Desflinger & Co.; two creameries.  
Cedar Rapids—J. R. Morin & Co.; two creameries.  
Center Point—J. R. Gitchell.  
Central City—Valley Farm Creamery, P. J. Henderson; three creameries.  
Central City—L. E. Minchart.  
Coggan—Farmer's Creamery, M. O'Hara, Secretary.  
Coggan—North Side & Nickel Plate, Brazelton & Son.  
Elmont—Elmont Creamery, S. B. Mills.  
Fairfax—J. Spellerberg.  
Marion—Eureka Creamery, W. W. Gray.  
Marion—Round Grove Creamery, W. Fleming.  
Palo—Palo Creamery, N. H. Richards & Co.  
Prairieburg—Diamond Creamery Co., J. W. Merrill, Manager, Monticello; two creameries.  
Prairieburg—Brazelton & Beatty.  
Prairieburg—Minthort & Cook.  
Robins—Farmer's Creamery Co.  
Springville—Irwin Paul; three creameries.  
Springfield—Spring Creamery, A. D. Hill.  
Tray Mills—Bruce & Long.  
Walker—Walker Creamery, H. J. Nietert.  
Walker—Highland Creamery Co., H. F. Gutzler.  
Waubeck—Crown Creamery, J. G. Fox.  
Waubeck—C. A. Huston, three creameries.  
Waubeck—Waubeck Creamery, A. L. Covey.

## LOUISA COUNTY.

Clifton—Clifton Creamery Co., Blair & Kelley.  
Letts—H. H. Hildebrand.  
Morning Sun—D. H. Morrison.  
Wapello—Wapello Creamery Co.

## LUCAS COUNTY.

Chariton—Marshall, Van Horn & Co.

## LYON COUNTY.

Inwood—Inwood Creamery, Ringheim, Anderson & Co.

## MADISON COUNTY.

Winterset—Jefferson Creamery, Wm. Schoen.  
Winterset—B. Tucker & Co.



## MAHASKA COUNTY.

Fremont—Fremont Creamery.  
 Indianapolis—Indianapolis Creamery, Dave Baker.  
 New Sharon—New Sharon Creamery, Vickers & Crawford.  
 Rose Hill—Rose Hill Creamery Co.

## MARION COUNTY.

Knoxville—Bousquet & Rhynsburger, Pella.  
 Pella—Bousquet & Rhynsburger.

## MARSHALL COUNTY.

Haverhill—  
 Minerva—Minerva Valley Creamery, S. M. Gause, **Clemens**.  
 Rhodes—Eden Creamery, Bechtelheimer & Rhodes.  
 State Center—State Center Creamery, C. W. Sibley.  
 Clemens—Minerva Valley Creamery, S. M. Gause.

## MILLS COUNTY.

Malvern—Malvern Creamery Co., Norton & Paddock.

## MITCHELL COUNTY.

Bailey—Lawn Spring Creamery, T. J. Wheeler.  
 Brownville—Brownville Co-operative Creamery.  
 Little Cedar—Little Cedar Creamery Co.  
 Mona—Frank Penny & Co.  
 Orchard—Spring Creek Creamery, J. C. Lee.  
 Osage—Osage Co-operative Creamery Co., D. C. Rogers, **Secretary**.  
 Osage—Rock Creek Creamery Co., Otto Miller, **Secretary**.  
 Osage—Cedar Valley Creamery, Tupper Bros.  
 Riceville—J. S. Potter.  
 Stacyville—Farmer's Co-operative Creamery Co., Jacob Decker, **President**.  
 St. Ansgar—The Farmer's Co-operative of St. Ansgar, H. S. Hang, **Secretary**.

## MONONA COUNTY.

Blencoe—Round Grove, J. D. Yoemans & Co.

## MONTGOMERY COUNTY

Grant—F. H. Lanneke.  
 Villisca—Villisca Creamery, J. B. Rose, **Secretary**.

## MUSCATINE COUNTY.

Atalissa—Penn Avenue Creamery, Jacob Long.  
 Sweetland—G. W. Kelly, Wilson.

West Liberty—Cedar Valley Creamery Co., Pickering & Kelly.  
 West Liberty—H. H. Hildebrand, **President**.  
 Weston—Lily Lake, G. W. Kelly; two creameries.  
 Wilton—S. G. Kelly.

## O'BRIEN COUNTY.

Southerland—Star Creamery Co., S. L. Austin, **Secretary**.

## OSCEOLA COUNTY.

Sibley—Clover Lawn Creamery, G. B. Grey.

## PAGE COUNTY.

Blanchard—Blanchard Butter and Cheese Co., F. O. Winchell, **Manager**.  
 Clarinda—Clarinda Creamery, J. S. Chiles.

## PALO ALTO COUNTY.

Ayrshire—Silver Lake Creamery, G. H. Pendelburg, **Secretary**.  
 Curlew—Curlew Creamery Co., A. P. Blackman, **Secretary**.  
 Emmetsburg—Boardman Bros., Nevada.  
 Fairville—Fairville Creamery Co., Henry Gremmels, **Secretary**.  
 Ruthven—Highland Creamery Co.  
 Ruthven—Lost Island Creamery Co.

## PLYMOUTH COUNTY.

Remsen—Remsen Creamery, M. Beck.

## POCAHONTAS COUNTY.

Gilmore City—Gilmore City Creamery Association.  
 Laurens—John Wallace & Co., Algona.  
 Rolfe—John Wallace & Co., Algona.

## POLK COUNTY.

Bondurant—Bondurant Creamery, R. R. Paine, **President and Manager**.  
 Washington Twp.—Keystone Creamery Co., T. W. Hill, Maxwell.

## POTTAWATTAMIE COUNTY.

Avoca—Avoca Creamery, R. Frost, **Manager**.  
 Oakland—Oakland Creamery, B. G. Crafts, **Manager**.

## POWESHIEK COUNTY.

Brooklyn—O. E. Spencer.  
 Chester Center—Chester Center Creamery, C. B. Smith.  
 Deep River—Deep River Creamery, Phelps, Kelley & Hatter.



Grinnell—Grinnell Creamery, Pierce & Mattison.  
Montezuma—Vickers & Crawford.

## RINGGOLD COUNTY.

Liberty Center—Cook & Wilber, Manager.  
Mt. Ayr—Cook & Wilber, Manager.  
Shannon—O. W. Oaks & Son.  
Wirt—Cook & Wilbur.

## SAC COUNTY.

Auburn—Auburn Creamery, Boardman Bros. & Co., Odeboldt.  
Carnaroon—Carnaroon Creamery, Boardman Bros. & Co., Odeboldt.  
Clinton Twp—Barrett & Carlton, Early.  
Coon Valley, Elwood & Pettis, Sac City.  
Early—Early Creamery, Barrett & Carlton.  
Lake View—Lake View Creamery, Donahue & Ahern.  
Odeboldt—Rose Valley Butter Co., A. L. Chandler, Secretary.  
Sac City—Pearl Creamery, A. D. Peck, two creameries.  
Sac City—S. A. Hoyt.  
Wall Lake Twp—Wall Lake Creamery Co., Donahue & Ahern, Lake View.  
Delaware Twp—Delaware Creamery Co., J. Kinney, President, Sulphur Springs.  
Challer—J. L. Watson.

## SCOTT COUNTY.

Big Rock—Cedar Creamery, H. L. Dean, Tipton.

## SIOUX COUNTY.

Calliope—Ace Webster, Waucoma.

## STORY COUNTY.

Ames—Ames Creamery Co.  
Colo—Pleasant Hill Creamery, Wm Smay.  
Colo—Gale & Reed.  
Elwell—Highland Creamery, Richardson & Paine.  
Kelley—Kelley Creamery, A. Wirtman.  
Maxwell—Maxwell Farmer's Creamery Co., J. R. Wood, Secretary.  
Roland—Roland Creamery, Boardman Bros. Nevada.  
Story City—John Swan.

## TAMA COUNTY.

Berlin—Berlin Creamery Association.  
Dysart—Vinton Creamery Co.  
Gladbrook—Hilton Bros. & Co., Boston, C. A. Hilton, Manager.  
Mooreville—Vinton Creamery Co., A. M. Rowe, Manager, Vinton.  
Tama—Hilton Bros. & Co., Boston, C. A. Hilton, Manager.  
Traer—Vinton Creamery Co., A. M. Rowe, Manager, Vinton.

## TAYLOR COUNTY.

Bedford—Taylor County Butter & Cheese Ass'n, W. W. Hyde, Manager.  
Blockton—Blockton Butter & Cheese Co., M. C. Brown, Secretary.

## UNION COUNTY.

Afton—Afton Creamery, Hatter & Phelps, Deep River.  
Thayer—Hedrick, Seeley & Co.

## VAN BUREN COUNTY.

Birmingham—Birmingham Butter & Cheese Association.  
Farmington—Farmington Creamery Co.  
Milton—A. Woodard & Co.

## WAPELLO COUNTY.

Chillicothe—Chillicothe Creamery, Peter Nelson & Co.  
Eddyville—J. L. McGlothler.  
Ottumwa—Baker Bros.

## WARREN COUNTY.

Indianola—Indianola Creamery, B. S. Schermerhorn, Des Moines.  
Indianola—Samuel L. McClure.

## WASHINGTON COUNTY.

Brighton—Brighton Creamery, Ricksher & Emery.  
Crawfordsville—  
Noble—Oak Ridge Creamery, Benjamin Eicker.  
Riverside—Riverside Creamery, Nicols Bros.  
Washington—Washington Creamery, Hise Bros.  
Wellman—Daytonville Creamery, C. O. Nichols & Co.

## WAYNE COUNTY.

Allerton—Allen Creamery Co., W. H. Johnson, Manager.  
Humeston—Wayne County Creamery, I. Halderman & Son.  
Promise City—Hawkeye Creamery, Wm. Furguson & Son.  
Seymour—Walnut Springs Creamery, J. J. Barrickman & Co.

## WEBSTER COUNTY.

Burnsides—Burnsides Creamery Co., A. Cramer, Manager.  
Dayton—Dayton Creamery, J. B. Baxter.  
Dayton—Daniels Creamery, J. M. Daniels & Son.  
Ft. Dodge—Ft. Dodge Butter & Cheese Ass'n, S. Fallon, Secretary and Manager.  
Gowrie—Gowrie Creamery Co., F. S. Davis.



## WINNEBAGO COUNTY.

Forest City—E. V. Cady.  
 Lake Mills—W. & W. Creamery, Ass'n, L. N. Thoe, President and Mang'r.  
 Lake Mills—Lake Mills Creamery Association.  
 Norman—Nysteun Bros. & Lervick.  
 Norman—

## WINNESHIEK COUNTY.

Burr Oak—Silver Creek Creamery Co., D. Grazier, Sec'y and Manager.  
 Calmar—Calmar Creamery, Boe Bros. & Co.  
 Decorah—Ice Cave Creamery, Wm. Beard & Sons.  
 Decorah—Glenwood Creamery, Johnson & Bakke.  
 Frankville—Wm. Beard & Sons, Decorah.  
 Highlandville—Lewis T. Fosse.  
 Hesper—Wm. Beard & Sons, Decorah.  
 Locust—Albert Christian.  
 Nordness—Nordness Creamery Co., E. G. Opdohl, Sec'y, two creameries.  
 Ossian—Ossian Creamery Co., Wm. Beard & Sons, Decorah.  
 Ossian—Scheidemantel Bros.  
 Ridgeway—Wm. Beard & Sons, Decorah.  
 Spillville—Wm. Beard & Sons Decorah.  
 Spillville—Ice Palace Creamery, Frank Nockels.  
 Washington Prairie—Prairie Farm Creamery, W. W. & G. L. Hubbell,  
 Waukon.

## WOODBURY COUNTY.

Correctionville—Palace Creamery, Reynolds & Ayers.  
 Sioux City—Haley & Chase.  
 Smithland—Smithland Butter & Cheese, Mfg Ass'n, A. A. Christie.

## WORTH COUNTY.

Fertile—Co-operative Butter & Cheese Ass'n, Jones & Phillips, Managers.  
 Grafton—Rock Creek Creamery, Martin McNamara.  
 Kensett—Farmer's Co-operative Creamery Ass'n.  
 Manly—Manly Co-operative Creamery Ass'n, W. H. Meldrin, Secretary and Manager.  
 Northwood—Farmers' Butter & Cheese Ass'n, I. N. Bolton, Secretary.  
 Silver Lake—Silver Lake Creamery, Nysteun Bros. & Lervick.

## WRIGHT COUNTY.

Belmond—Belmond Creamery, H. A. Duer.  
 Clarion—Clarion Creamery, J. D. Denison.  
 Clarion—G. W. Wheeler.  
 Dows—J. W. Fillmore.  
 Eagle Grove—Eagle Grove Creamery.  
 Goldfield—McMurtry Bros.

## LIST OF CHEESE FACTORIES.

## ADAMS COUNTY.

East Nodaway—Nodaway Joint Stock Co., L. L. Bullock, Secretary.

## APPANOOSE COUNTY.

Iconium—Iconium Cheese Co., W. E. Rouse.  
 Moravia—Moravia Cheese Factory, W. A. Eastlock, Manager.  
 Moulton—Moulton Cheese Factory, August Post, Secretary.  
 Moulton—Dickson & Guil.  
 Walnut City—G. G. Hampton.

## AUDUBON COUNTY.

Exira—E. Smith.  
 Exira—W. Smith.

## BENTON COUNTY.

Atkins—Highland Cheese Factory, Shaver & Olmstead, Cedar Rapids.  
 Garrison—Excelsior Cheese Factory, Wilson & Kerr.  
 New Hall—Shaver & Olmstead Cheese Co., Shaver & Olmstead, Cedar Rapids.

## BLACK HAWK COUNTY.

Waterloo—The Fowler Co.

## BREMER COUNTY.

Janesville—The Fowler Co.

## CARROL COUNTY.

Glidden—A. J. Heaton.

## CEDAR COUNTY.

West Branch—Shaver & Olmstead, Cedar Rapids.

## CHICKASAW COUNTY.

Williamston—John H. Kotehoff.



## CLAY COUNTY.

Spencer—Lone Pine, O. B. Ross.

## CRAWFORD COUNTY.

Buck Grove—S. M. Thew.  
Boyer Twp—Cold Spring Factory, S. E. Wright, Dunlap.

## DAVIS COUNTY.

Milton—V. Naggle.  
West Grove—Samuel Blumer.

## DECATUR COUNTY.

Garden Grove—Geo. M. Pence.  
Garden Grove—High Point Cheese Co., F. F. McKibben.  
Leon—Chastian & Chastian.  
Weldon—Geo. M. Pence, Garden Grove.

## DELAWARE COUNTY.

Sand Spring—Charles Crocker.  
South Fork Twp.—W. Lattner, Worthington.

## FLOYD COUNTY.

Charles City—Elm Spring Cheese Factory, White, Triggs & Co.  
Charles City—East Branch, F. C. Kruger, Secretary.

## FRANKLIN COUNTY.

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

## GREENE COUNTY.

Grand Junction—Davenport & Harker.  
Grand Junction—Cooper, Newell & Co.

## GRUNDY COUNTY.

Grant Twp—L. C. Vanderlip, Cedar Falls.  
Reinbeck—The Fowler Co., Waterloo.

## GUTHRIE COUNTY.

Carey—John Ross.  
Grant Twp—D. Y. Cowden, Adair.  
Herndon—Chodsey Bros.

## HANCOCK COUNTY.

Britt—Britt Cheese Factory, Stephen Hill.

## HARDIN COUNTY.

Cottage—Cottage Cheese Factory, W. A. Caraway.  
Ellis—Ellis Cheese Mfg Co., W. Carpenter.  
Owasa—A. L. Harris.

## HOWARD COUNTY.

Cresco—Miner Creek Cheese Factory, M. M. Forry.

## IOWA COUNTY.

Green Center—Green Center Cheese Mfg Co., J. H. Yoder.  
Ladora—D. D. Case.

## JASPER COUNTY.

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

## JOHNSON COUNTY.

Frank Pierce—Washington Butter & Cheese Co., Peter Kettles, Secretary.  
Iowa City—Sharon Cheese Co., J. F. Jones.

## JONES COUNTY.

Bowen—T. W. Little.  
Monticello—Diamond Creamery Co., J. W. Merrill, Manager.  
Onslow—J. A. Griswold.  
Onslow—S. L. Gilbert.

## KEOKUK COUNTY.

Webster—Webster Cheese Co., G. S. Morgan, Secretary.  
Webster—M. D. Johnson.

## KOSSUTH COUNTY.

Whittemore—John Wallace & Co., Algona.

## LEE COUNTY.

Denmark—Thos. F. Currier, Ft. Madison.

## LINN COUNTY.

Burnett—Star Cheese Factory, Shaver & Olmstead.

## MARION COUNTY.

Bussey—A. J. Jones.



## MONROE COUNTY.

Albia—H. W. Walker, Secretary, three factories.  
 Albia—Union Center, R. P. Bell, Secretary.  
 Albia—Monroe Cheese Association, Chas. Hickenloper, Secretary.  
 Albia—Mantua Cheese Association, John M. Roberts, Secretary.  
 Albia—M. & J. Watson.  
 Blakesburg—Urbans Cheese Association, Herman Snow, Secretary.  
 Eddyville—Pleasant Twp. Cheese Association, W. G. Berry, Secretary.  
 Hilton—Young America Cheese Co., P. E. Enix.  
 Hilton—Albert Hilton.

## MONTGOMERY COUNTY

Red Oak—Lincoln Cheese Co., E. T. Evans, Manager.

## MUSCATINE COUNTY.

Wilton—S. G. Kelly.

## PAGE COUNTY.

College Springs—C. L. Meacham.  
 College Springs—A. Stanton.  
 College Springs—Blanchard Butter & Cheese Co., Fred O. Winchell,  
 manager.  
 Northboro—Wm. T. Hatfield.

## POWESHIEK COUNTY.

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

## RINGGOLD COUNTY.

Tingley—Jacob Frame.

## SIOUX COUNTY.

Alton—Alton Cheese Factory, Wm. Strouks.  
 Orange City—Orange City Cheese Factory, C. Slotemaker.  
 Sioux Center—Sioux Center Cheese Factory, Henry Meylink.

## TAMA COUNTY.

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

## TAYLOR COUNTY.

Blockton—Blockton Butter & Cheese Co., M. C. Brown, Secretary.

## UNION COUNTY.

Lorimer—Wm. Groesbeck.

## VAN BUREN COUNTY.

Milton—V. Nagle.

## WAPELLO COUNTY.

Kirkville—Kirkville Cheese Association.

## WARREN COUNTY.

Meldora—Stacy Bros.

## WASHINGTON COUNTY.

Clay—Clay Cheese Co., O. Meacham, Secretary.  
 Dublin—Dublin Cheese Co., L. B. Oliver, Secretary.  
 Nira—Nira Cheese Co., I. N. Carr, President.  
 Westchester—Westchester Cheese Co.

## WAYNE COUNTY.

Corydon—W. M. Littell.  
 Lineville—Lineville Cheese Factory, M. DeHaan.

## WRIGHT COUNTY.

Dows—Geo. C. Jameson & Sons, two factories.



## BUTTER SHIPMENTS OF RAILROAD COMPANIES.

The Dairy Commissioner considered it an important matter to ascertain the amount of butter shipped from the State of Iowa during the year ending October 1. The value of Iowa dairy products ought to be known so that the people of the State may comprehend its magnitude and be aware of the vast importance of the dairy industry which is constantly menaced by the sale of oleomargarine, not in Iowa but in other States. The manufacturers of oleomargarine are constantly on the watch for opportunities to repeal or to eliminate a part of the National Butterene Law. The Dairy Commissioner, by correspondence and personal interviews, secured the consent of all the railroad companies doing business in the State, through the following request:

## TO THE GENERAL TRAFFIC MANAGER OF RAILROAD COMPANIES.

The Iowa State Dairy Commissioner's Office would respectfully request that your office issue orders to each of your station agents in Iowa, to ascertain the full amount of butter in gross pound, shipped by them out of the State of Iowa, from October 1 1889, to October 1, 1890, and that this information be sent to the General Office.

We further request that this information be furnished the Iowa State Dairy Commissioner's Office with a pledge on our part to consider the same private, except in ascertaining how much butter was shipped out of the State.

We wish this information for the following reasons:

*First.* It is the only way in which we can gain accurate statistics of butter shipments of the State, the statements furnished by the different creameries not always being correct, and some creameries we do not receive reports.

*Second.* We have no other way of ascertaining the amount of butter shipped out of the State which was not made by creameries. The information we seek would be very valuable, as it affords the only accurate statistics of the butter production of the State, and would establish a basis from which future supplies could be closely estimated.

Very Respectfully,

A. C. TUPPER,  
State Dairy Commissioner.

The railroad people through their traffic managers made no objections to furnishing the information. It entailed a very large expenditure of time on the part of the station agents, most of whom were at this time crowded with work. If our office had to compensate the men who did the work at 25 cents per hour, this information would have cost thousands of dollars. The fact that the request was complied with shows that the railroad people are friendly to our people and willing to grant favors even though they cost time and money.

The Dairy Commissioner's office does tender heartfelt thanks for the people of the great Dairy Industry of Iowa to the management of the different railroad doing business in the State; we also return thanks to the different station agents for the assistance they rendered this office in doing the work.



## BUTTER AND CHEESE SHIPMENTS.

The following is the amount of butter, in gross pounds, billed out of the State, shipped by the railroad companies doing business in Iowa, for each county in the State, for the year ending October 1, 1890.

[NOTE.—Counties that ship to large establishments in the cities, as Burlington, Ottumwa, Chariton, are entitled to a division of the butter received at such points. Many counties ship only creamery butter; for such these figures are approximately correct. The counties marked \* are intersected by the Chicago & Northwestern Railroad, from which we have been unable to obtain statistics.]

COUNTY.	Number of creameries.	Amount of butter shipped by rail-road.	Number of cheese factories.	Amount of cheese as reported by manufacturers.
Adair	3	107,417	1	50,946
Adams	1	140,004	1	170,417
Allamakee	10	447,230	5	91,230
Appanoose	12	5,180	1	154,000
Audubon	10	149,771	1	350,000
*Benton	13	435,945	1	345,000
Black Hawk	3	2,328,380	1	345,000
Boone	3	575	1	345,000
Bremer	25	2,550,029	1	345,000
Buchanan	15	3,161,517	1	10,000
*Buena Vista	12	586,045	1	10,000
Butler	17	2,734,646	1	10,000
*Calhoun	4	1,171,418	1	10,000
*Carroll	5	27,520	1	10,000
Cass	3	321,249	1	10,000
*Cedar	1	306,175	1	10,000
Cerro Gordo	8	1,231,409	1	10,000
Cherokee	3	466,735	1	10,000
Chickasaw	16	2,380,661	1	10,000
Clarke	2	271,137	1	10,000
Clay	17	380,339	1	10,000
Clayton	17	2,808,278	1	10,000
*Clinton	8	577,507	1	10,000
*Crawford	4	16,464	1	10,000
Dallas	3	1,322,436	1	10,000
Davis	12	16,390	1	10,000
Decatur	1	10,580	1	10,000
Delaware	35	2,881,526	1	10,000
Des Moines	1	408,703	1	10,000
Dickinson	1	217,908	1	10,000
Dubuque	28	1,810,100	1	10,000
Emmett	2	162,370	1	10,000
Fayette	25	3,076,111	1	10,000
Floyd	10	1,370,845	1	10,000
Franklin	4	754,128	1	10,000
Fremont	0	1,022	1	10,000
Greene	5	229,908	1	10,000
*Grundy	14	1,217,512	1	10,000
Guthrie	3	13,388	1	10,000
*Hamilton	7	814,200	1	10,000
Hancock	2	267,562	1	10,000
*Hardin	8	780,859	1	10,000
*Harrison	3	64,005	1	10,000
Henry	3	65,525	1	10,000

## BUTTER AND CHEESE SHIPMENTS—CONTINUED.

COUNTY.	Number of creameries.	Amount of butter shipped by rail-road.	Number of cheese factories.	Amount of cheese as reported by manufacturers.
Howard	9	1,970,540	1	19,900
*Humboldt	4	479,975	1	19,900
*Ida	0	0	1	19,900
Iowa	5	860,254	1	4,257
*Jackson	10	1,187,835	1	144,162
Jasper	5	1,246,394	1	144,162
Jefferson	1	364,366	1	144,162
Johnson	5	627,458	1	144,162
*Jones	42	2,432,820	1	144,162
*Keokuk	6	645,668	1	144,162
*Kossuth	6	600,654	1	144,162
Lee	3	742,879	1	144,162
*Linn	36	3,109,654	1	144,162
Louisia	4	175,725	1	144,162
Lucas	1	314,907	1	144,162
*Lyon	1	216,005	1	144,162
Madison	2	287,770	1	144,162
Mahaska	4	532,880	1	144,162
Marion	2	515,465	1	144,162
Marshall	5	817,573	1	144,162
Mills	1	14,200	1	144,162
Mitchell	11	2,168,318	1	144,162
*Monona	1	57,865	1	144,162
Montgomery	2	244,605	1	144,162
Monroe	0	54,816	11	577,638
Muscatine	6	602,808	1	577,638
*O'Brien	1	166,128	1	577,638
*Osceola	1	39,024	1	577,638
Page	2	387,722	4	100,667
Palo Alto	6	245,045	1	100,667
*Plymouth	1	273,835	1	100,667
*Pocahontas	3	349,032	1	100,667
*Polk	2	118,048	1	100,667
*Pottawattamie	2	298,461	1	100,667
*Poweshiek	5	561,426	2	171,547
Ringgold	4	65,673	1	8,400
*Sac	13	0	1	8,400
Scott	1	70,250	1	8,400
*Shelby	0	23,225	1	8,400
*Sioux	1	70,430	3	87,500
*Story	8	642,084	1	87,500
*Tama	6	415,762	1	87,500
Taylor	2	24,145	1	87,500
Union	2	116,948	1	87,500
Van Buren	3	66,395	1	87,500
Wapello	3	2,450,636	1	87,500
Warren	2	2,675	1	87,500
Washington	6	735,630	4	330,290
Wayne	4	99,032	2	82,206
*Webster	5	1,094,617	1	82,206
Winneshiek	5	1,067,890	1	82,206
Winneshiek	16	2,671,726	1	82,206
*Woodbury	3	602,319	1	82,206
Worth	6	953,546	1	82,206
*Wright	6	637,774	1	82,206
Total	628	73,666,677	96	4,727,821

The foregoing table shows a shipment of 73,666,677 gross pounds of butter from the State; if to this we add 50 pounds per capita for the butter consumed at home or 100,000,000 pounds, we have 173,666,677 pounds as the result of the butter interest in Iowa.



ALGONA, IOWA, December 1, 1890.

HON. A. C. TUPPER:

*Dear Sir:* I am not ready to report yet on the Extractor. We have another machine which is a great improvement on the one we had when you were here; but it is still not perfect. Their newest machine is not out yet.

Yours truly,

J. WALLACE & Co.

# FIFTH ANNUAL REPORT

OF THE

## State Dairy Commissioner

TO THE

GOVERNOR OF THE STATE OF IOWA

FOR THE YEAR 1891.

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PRINTED BY ORDER OF THE GENERAL ASSEMBLY.

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DES MOINES:

G. H. RAGSDALE, STATE PRINTER.

1891.