

Eighth Annual Report

OF THE

STATE DAIRY COMMISSIONER

TO THE

GOVERNOR OF THE STATE OF IOWA.

FOR THE YEAR 1894.

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1895.

REPORT.

To His Excellency, HON. FRANK D. JACKSON, Governor of Iowa:

I hereby submit my report as Dairy Commissioner of the State of Iowa, for the year ending October 31, 1894.

I assumed charge of the office May 1, 1894, and in accordance with the custom established, my predecessor, Mr. Tupper, reported to me, in detail, the important transactions of the Department since his last annual report. The following is a summary of his report:

November 23, 1893, the Latimer creamery, Franklin county, owned by I. W. Meyer, was visited and milk from all of the patrons tested. The milk delivered by three patrons tested below standard. Complaint was entered against them for delivering skimmed and adulterated milk. Two plead guilty as charged, the third stood trial and was convicted in the justice court. On an appeal to the district court the defendant was discharged on account of defects in the information.

On the 27th of November, 1893, I filed informations against A. Gardner, John Barrett and J. H. Jecklin, of Dubuque, for selling milk that contained less than three pounds of butter fat to the hundred. The parties stood trial, were convicted as charged, and in each case were fined \$25.00 and costs, amounting in each case to \$31.00.

December 4th I received a list of dealers in oleomargarine in the Northern District of Iowa, to whom government licenses had been issued.

February 14, 1894, the law was changed by the legislature, making the fine not less than \$25.00 for violating the section requiring hotels, restaurants, etc., to display placards if they used oleomargarine.

This law I took immediate steps to enforce in all the principal cities of the State.

On March 6th I entered complaint against Miller & Bartlett, proprietors of a hotel in Des Moines for serving oleomargarine to their guests without displaying the necessary placards in their dining room. They entered a plea of guilty and paid a fine of \$25.00 and costs.

January 9th, Emil Kraax, Milk Agent for Muscatine, filed an information against Charles L. Schnier, charging the selling of milk that tested less than three pounds of butter fat to the hundred. Defendant plead not guilty, the charge was sustained, and the defendant appealed to the district court.

This prosecution raised the ire of the milk dealers of Muscatine and they placarded their wagons "Skimmed Milk." Their idea in this was to evade the law, there being no standard for skimmed milk when sold as such. The milk dealers failed in this, however, as their customers soon ceased buying from them.

Mr. Kranz employed a reliable man to accompany him and witness the gathering and testing of milk samples from the various dealers. In this manner frequent tests were made, and in a short time all the milk being sold in Muscatine, from which samples were procured, tested up to the standard without further recourse to the courts.

Dr. A. W. Cantwell, Milk Agent for Davenport, caused an information to be filed against Peter Ruch for selling skimmed milk as whole milk. Conviction was secured and a fine of \$25.00 and costs imposed. The case was appealed to the district court, where it is still pending.

March 30th, Dr. J. W. Fowler, Milk Agent for Dubuque, sent to this office a sample of alleged butter sold by G. H. Ranyan, which he believed to be butterine. This sample was forwarded to Professor Patrick, of Ames, for chemical analysis. The report of the result of the chemical analysis was placed in the hands of the internal revenue collector at Dubuque.

April 15th, E. W. Edger, Milk Agent for Burlington, filed an information against F. Earnst, charging him with selling skimmed milk as whole milk. Conviction was had and a fine of \$25.00 and costs imposed.

In addition to the foregoing prosecutions the following were reported by Milk Agents J. J. Miller of Sioux City, F. M. Brown of Cedar Rapids, J. W. Fowler of Dubuque, and R. Fleming of Council Bluffs:

January 15th, A. F. Cox, proprietor of Exchange Hotel in Sioux City, was prosecuted for serving imitation butter to guests contrary to law. A trial by jury resulted in conviction and the defendant was fined \$50.00 and costs, amounting in all to \$63.25.

January 23d, D. E. Baker, Sioux City, was tried and convicted of using imitation butter in his restaurant in violation of law. The court imposed a fine of \$5.00 and costs, amounting in all to \$13.20.

November 3, 1890, G. H. Banger, Cedar Rapids, was fined \$25.00 and costs for selling skimmed milk as whole milk. A like fine for the same offense was imposed on H. C. Springer, of the same city, December 15th.

January 13th, a second information was filed against A. Gartner, of Dubuque, for selling and offering for sale milk that tested below the legal standard. The fine imposed in this case was \$25.00 and costs.

February 16th, informations were filed against Fluetzsch & Son and F. Paley, and on the 19th one against W. W. Howie, all of Dubuque, for selling skimmed milk as whole milk. These cases resulted in convictions, each party being fined \$25.00 and costs.

February 19th, a trial by jury in the case of the State against A. Spenatzy, charged with selling skimmed milk as whole milk, resulted in the jury disagreeing. This being the third disagreement of juries in this case, the prosecution was dropped.

OLEOMARGARINE.

The contest between pure and imitation butter has been a long and hard fought battle. The friends of pure butter have many times, during the past eight years, felt that the fight was one-sided and the results unsatisfactory; but in all these years the representatives of the dairy interests of this country have not appealed to the people of the nation and of the several states for relief and protection, through the law-making powers, without receiving a hearing, and in most cases succeeded in having their wishes incorporated into national and state laws.

In Iowa the dairy interest began back in the 70's to assume large proportions in many counties of the State. For a few years its growth and development was wonderful, extending into most of the counties and becoming one of the leading industries of the State. Many creameries had been successful in producing a quality of butter unexcelled by that of any other state, and Iowa was fast becoming the greatest state of the Union in both the quantity and quality of her butter. The gold medal for the best butter in the world, at the Centennial Exposition held in Philadelphia in 1876, was awarded to John Stewart, of Manchester, Iowa.

About the year 1880 the manufacture of oleomargarine began to increase and soon became very extensive. The mixing of fine creamery butter with it and the selling of this combination for pure butter assumed large proportions. Nor was this all; a large demand sprung up for oleomargarine neutral from the creameries of the country. The greedy operators, and those who found themselves unable to compete with the large makers of imitation butter, began the mixing of this neutral with their creamery butter. The markets were flooded with this spurious article; confidence was lost; foreign trade reduced; prices fell and the business was demoralized and greatly injured.

The dairy interests became aroused and appealed to congress and the several states for relief. By united action the national oleomargarine law was passed August 2, 1886, and went into

effect the following November. The main features of this law are: retail dealers pay a license of \$48.00, wholesale dealers \$480.00, and manufacturers \$600.00 yearly; a tax of two cents per pound is collected on all goods manufactured; the kind of package used; the marking, branding and stamping of the package, when retailed, with the word "Oleomargarine" and notifying the purchaser as to the character of the article sold, are required.

The Legislature of this State passed a bill, approved March 27, 1886, establishing the office of Dairy Commissioner and regulating the manufacture, sale and use of imitation butter and cheese. The principal provisions of this law were as follows:

First—The act declared every article or substance made in the semblance of butter or cheese, other than that produced from pure milk and cream, to be imitation butter or cheese.

Second—The manufacturer must mark the package containing imitation butter or cheese with the true name of its contents.

Third—The party selling must inform the purchaser that he is buying imitation butter or cheese and furnish, with each sale, a printed statement in plain Roman type containing the name of the article sold.

Fourth—Hotels, restaurants, boarding-houses, etc., must accompany the serving of imitation butter or cheese, to their guests, by a placard containing the name, in English, of such article.

Under this act Governor Larrabee appointed the Hon. H. D. Sherman Dairy Commissioner for Iowa. Mr. Sherman entered upon the duties of his office May 1, 1886. He made a thorough canvass of the State, to ascertain the general condition of the dairy industry, and reported as follows:

"As the result of my investigations I learned that the dairy interest, generally, over the State was much depressed; that the industry had, the prior two years, been decreasing instead of increasing. Some creameries had closed; others were running, though making less butter than in former years. Individual dairymen had become discouraged and dissatisfied, and as a result discontinued to furnish milk or cream or make butter. Both dairymen and creamerymen had become fully convinced that they could not successfully compete in the manufacture and sale of butter against the manufacture and sale of oleomargarine. It is evident that had it not been for the timely intervention of legislation, the decline in the dairy industry would have been more signal and rapid than had been its development.

I also found unmistakable evidence that some eight or ten of the creameries in the State during the fall and winter of 1885-86, had mixed neutral with their butter and had sold the same for pure creamery butter. In addition, I learned

that during the same winter oleomargarine was sold in a majority of the towns of 2,000 inhabitants in the State and mostly disposed of as genuine butter. It was evident that the fraudulent manufacture and sale of oleomargarine was fast destroying the dairy interests of the State, first, by taking the place of genuine butter; and second, by ruining the reputation of our butter in eastern markets. Some of the adulterated butter found its way to New York City, where it was detected as such. The result was to cast a doubt and discredit upon all Iowa butter to the extent that commission men in New York hesitated about paying drafts on bills of lading of butter from Iowa.

After the enactment of our present dairy law, I received letters from leading dealers in dairy products at the east, congratulating the State, with the assurance that confidence would be restored in the dairy products of Iowa. From the best evidence obtainable, there is no doubt that the manufacture and sale of oleomargarine was discontinued in the State before the first of May, 1886, the law having been published the first part of the month preceding.

For the first eight months after our dairy law was enacted, the manufacturers and friends of oleomargarine were persistent and untiring in their efforts to continue the traffic in the State, deeming it no doubt valuable ground to hold. Circulars were sent out, advertising neutral oil and setting forth the profits and advantages afforded by its use. Agents canvassed the State to take orders for neutral or oleomargarine, and although they did not succeed in either, yet they published far and wide that oleomargarine was being used and sold in various portions of the State, and also that the dairymen were many of them mixing neutral oil with their butter. These reports were no doubt made to popularize the traffic in oleomargarine and cast reflections and discredit upon the dairy law.

Oleomargarine had, before the enactment of our present dairy law, obtained a strong foothold in our State, and if that position could be maintained by the oleomargarine interest a most desirable point would be secured, from the fact that there is probably no state where the manufacture and sale of oleomargarine is so universally unpopular. Hence the strong effort made by the manufacturers to hold their ground in Iowa. So persistent were they in their efforts to continue the traffic in the State that when the national law came in force, November 1, 1886, the manufacturers offered to pay the license for parties handling dairy products if they would sell oleomargarine.

I am able to report that after all the effort put forth by the oleomargarine interest, only two licenses have been issued in the State for the sale of oleomargarine, and none for its manufacture. On November 1, 1886, a retail dealer in the city of Clinton procured a license, and at the same time a jobber's license was issued to a party in Council Bluffs. These licenses expired on the 30th of April, 1887, and no permit has been issued in the State since that time. It is a matter of congratulation that the State oleomargarine law has been very generally observed and respected by the people since its first publication.

In the months of September and October, 1886, small quantities of oleomargarine were received in a few of the larger towns of the State; but the packages were properly marked, and, so far as could be ascertained, those who sold it at retail offered it to their customers for what it was, and thus complied with the State law. I was not able to secure a pound of oleomargarine which had been sold as butter."

The beneficial effect of both national and state legislation, as shown by the foregoing quotation from Commissioner Sherman's

report of 1887, commenced as soon as these laws went into effect and continued, in a large degree, during his entire term of office.

For the fiscal year, ending April 30, 1887, but two government licenses for the sale of oleomargarine were issued in Iowa; for the year ending April 30, 1888, there were eight licenses taken out in five cities; for the year 1889 six licenses were issued in six cities, and for the year ending April 30, 1890; the last year of Commissioner Sherman's term, there were but two licenses issued, confined to two cities.

In all of the reports issued by Commissioner Sherman he tells of the strong and persistent efforts, made by the oleomargarine and butterine manufacturers, to again get a foothold on Iowa soil; but up to the time of his retiring from office, May 1, 1890, they had been unable to make any headway. In his final report to his successor in office he says:

"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."

We also notice that up to this time those that took out retail licenses, except the representatives of the Armour Packing Company, did so at the latter end of the government's fiscal year, and only for two or three months. In other words, they were in the nature of experiments and issued during the months when good butter was scarce and prices very high. This was especially true of the licenses issued in the months of February and March, 1888, during which year the number increased to eight.

The beneficial effect these laws had upon the dairy industry is further shown by the increased number of creameries built and reported in operation in 1889. In 1887 there were 450 creameries; in 1888, 468; and in 1889, 693.

We doubt not the same increase occurred in other dairy states, for we believe confidence in the business was restored by the passage and rigid enforcement of the national oleomargarine law, supplemented by the enacting and enforcement of state laws in several of the states that produce and consume large quantities of butter.

These laws were made effective not only by state and government officials, but through the efforts of national and state dairy associations, and a large number of private individuals and firms who gave generously of their time and money.

Up to and including the fall and winter of 1890 this condition of affairs remained about the same; but in the spring of 1891 the oleomargarine manufacturers renewed the war with new and increased vigor. They managed to place licenses in nine cities in the State, which, together with one issued in November, 1890, made a total of ten licenses in force June 30, 1891, the end of the government year having been changed from April 30 to June 30.

The enemies of honest butter, encouraged by their success, still pushed their fraudulent business, and June 30, 1892, the government records showed that thirty-five retail licenses were in force in eighteen cities and towns, some of which were issued to dealers in towns having less than two thousand inhabitants.

Up to this time the licenses had, with the exception of those held by the agents of the manufacturer, been issued in the latter part of the government fiscal year, when the cost was small. But in the fall of 1892 dealers became convinced that they could sell the bogus article during all of the fall, winter and spring months; consequently we find that twenty-seven licenses were issued in thirteen cities and towns.

Commissioner Tupper's report of November 1, 1893, shows eighty licenses in force in twenty-four cities and towns, some as small as Pleasant Plain, having less than three hundred inhabitants. Upon taking charge of the office May 1, 1894, we found, after a careful examination, that there were then one hundred and three licenses in force in twenty-eight cities and towns.

Thus it will be seen that in the last three years the oleomargarine interest, backed by millions of dollars, with smart and hustling representatives in all our cities, had been able to place and sell imitation butter in all of the cities and in many of the small towns of the State.

This was accomplished in spite of both national and state laws and the earnest and active efforts of our State Dairy Commissioner, assisted by his milk agents in all cities of 10,000 or more inhabitants.

No sooner had the first grist of licenses been issued, in the spring of 1891, than Commissioner Tupper was after the holders to see that they complied strictly with the laws, both national

and state. The prosecutions came thick and fast, and the Commissioner, in his report of 1891 and 1892, tells of the difficulties of enforcement and the tricks and schemes that the trade resort to in order to sell the imitation butter and perpetrate fraud upon their customers; also the manner in which hotels and restaurants evaded the law and deceived their guests. We quote from his report of 1891, page 13, as follows:

"If parties take out licenses our friends should see that the package received by the customer is properly branded. Often where a rubber stamp is used the firm name is in large letters, but the word oleomargarine in letters so small as not to comply with the State law. In pressing the rubber stamp on the pad, a heavy impression is made by the name of the firm, and little or no ink is on the word oleomargarine, resulting in the name of the firm showing in large plain letters, while the word oleomargarine is so dim as to be hardly readable. The innocent purchaser does not read it, but thinks it an advertisement of the firm. The name is often stamped on a corner of the paper and folded in out of sight, or if the word is stamped on the butter dish it is placed on the bottom out of sight, unless the dish is held up over one's head. These are some of the tricks by which oleomargarine dealers try to evade the law and avoid publishing the fact that they are selling oleomargarine. Like dodges can be used in placarding the dining-rooms and restaurants and hotels. The Commissioner found that public sentiment was almost unanimously in his favor in enforcing the law, and he was aided not only by the officers of the law but by a host of good people in every town or city he visited."

The causes of the success of the oleomargarine manufacturers, in gaining a new foothold in Iowa, may be classed as follows:

First—The high price and scarcity of first-class table butter during the winter and spring of 1891.

Second—The large profit, per pound, realized by the retail dealer.

Third—The lack of vigilance and enforcement of the requirements of the federal laws by the internal revenue officers.

Upon these causes Commissioner Tupper expresses himself, in his report of 1891, page 11, as follows:

"The different samples of oleomargarine examined by the Commissioner of second grade, worth about 12 cents per pound in the market, but they usually retailed at 25 cents per pound. Owing to the scarcity of grain and the high price of corn the usual grain rations had been withheld from the cow and caused the flow of milk to run low. Western extra creamery butter was selling at 35 cents per pound in the New York market through the months of March and April. Dairy butter retailing at 30 cents per pound, which was 7 cents higher than western extras were for the corresponding months of the year previous, and fully 10 cents per pound higher than the corresponding dairy butter. The extreme prices, supplemented by the loose rulings of the internal revenue people, made the opportunity that the oleomargarine people were quick to take advantage of,

and for the first time in the history of the State, since our oleomargarine laws have been supplemented by our federal laws, has the sale of oleomargarine amounted to anything in the State of Iowa."

He also comments on the same subject in his report of 1893 page 5:

"The internal revenue officers have not exercised themselves to any great extent in enforcing the requirements of the federal law, which law makes it the duty of each licensed retail dealer to brand the outside wrapper of the customer's package with the word "Oleomargarine." In some of the states, when a dealer takes out a retail license, the department sends him the regulations governing the sale of oleomargarine under internal revenue laws, with a request that they be read and complied with. In this State this has never been done. In most cases where I have visited licensed dealers I have found a great deal of ignorance. If the federal oleomargarine laws were rigidly enforced, as they could and should be, for the internal revenue officers at Burlington and Dubuque employ eight or ten deputies—a number surely sufficient to attend to the work properly—our office would have no occasion to look after licensed dealers, for in complying with the federal law they would comply with the Iowa law."

Of the causes mentioned, the second, no doubt, was the most potent. The usual profit realized by the retail dealer in butter is from 2 to 5 cents a pound.

During the winter of 1893 and 1894 the cities of Iowa were flooded with butterine under dairy and creamery brands. The dairy brand was sold to the retailer at 12 cents and the creamery brand at 17, the former selling for 20 and the latter for 25 cents per pound, at retail, giving the retail dealer a profit of 8 cents per pound.

This excessive profit induced the dealer to resort to all manner of means to induce and deceive his customers into buying and using the counterfeit article. The effect of this traffic was felt by the creameries and dairies most severely.

The cities of Iowa having a population of 10,000 or more contain over 400,000 consumers and use, annually, about 20,000,000 pounds of butter or its substitute.

The creameries and dairies of the State had enjoyed the benefits of this home market for years. The aggressiveness of the butterine men had produced astounding results in our local markets. Most of the retail grocers in Des Moines, Davenport, Cedar Rapids, Burlington, and many of the smaller cities had taken out licenses during the fall and winter of 1893 and 1894, and were selling large quantities of butterine under a variety of fancy brands. The goods were put up in an attractive shape and were sold in large quantities to hotels, restaurants, boarding-houses and lunch-counters. The profits made by the retailer

were large, and he tried in every way to sell the bogus article in place of genuine butter. Shippers that had, in previous winters, found sale for large quantities of creamery butter in these cities, found themselves unable to dispose of their goods in even small shipments. Creamery butter at a reasonable price and a profit of from 3 to 5 cents per pound to the retailer, could not be sold to him, except what he was compelled to buy. He could buy butterine and sell it at a profit of 8 cents per pound, and it was the dollar he was after.

This same condition of affairs existed in other states and in the large markets of the East and also affected the great dairy industry, and men largely interested again became aroused and decided to take steps to protect themselves.

Last winter prominent men from the leading dairy states met at Chicago and formed the National Dairy Union. The object of this organization is to secure national and state legislation, in the interest of pure butter and cheese, and to assist in the efficient and thorough enforcement of such laws.

Iowa led the way in this noble work, and passed a law with the anti-yellow color provision as its corner-stone. The law went into effect July 4, 1894.

Soon after entering upon the duties of the office we had a pamphlet printed containing the State dairy laws. A marked copy was sent to each firm in the State holding a government license for the sale of oleomargarine. The object in doing this thus early was to inform the dealers of the changes in the law so that they would be fully advised before the time of renewing or taking out a license for the year beginning July 1, 1894.

We requested our milk agents at Dubuque and Burlington to examine the internal revenue records monthly, and report the names of parties applying for government licenses.

Two were issued in July, four in August, fifteen in September, and three in October, making a total of twenty-four, confined to eleven cities, three of which were held by dealers located in the Northern revenue district and twenty-one in the Southern.

Of the twenty-four licenses, Des Moines has eleven; five of these dealers informed us that had they fully understood the law they would not have applied for a license. The fact is, as represented to us by several dealers, both in Des Moines and other cities, that the agents of the wholesale dealers induced them to apply for licenses by representing that they could

furnish an article having a shade of yellow not artificially produced, that could be legally sold.

They claimed the law only prohibited the manufacture and sale of imitations artificially colored. These agents and attorneys for the manufacturers called upon us. After a lengthy hearing we maintained the position that imitation butter and cheese having a yellow color, no matter how produced, is prohibited by our law.

In one case the agent informed us that the goods having a yellow shade had been shipped but would be ordered returned, and that he would instruct his firm to discontinue the shipment of yellow and substitute goods having a white color for Iowa.

Personal examinations were made at Des Moines and Waterloo, and the state milk agents made examinations wherever called upon to do so. These examinations are easily made because of the record obtained from the revenue department. In most cases nothing but white goods were found, and the law relating to the branding and marking was complied with. In the few cases, where yellow goods were found, the dealers were glad to avail themselves of the privilege of returning the goods to the manufacturer and agreeing not to handle a contraband article in the future.

It was feared by some, when this measure was before the legislature, that its enforcement would require a great deal of time and a large amount of money; but we are glad to be able to say that it has been put into operation without a single prosecution or any material expense.

The only argument against this new anti-butterine law was that it discriminated against manufacturers in our own State, inasmuch as it prohibited them from manufacturing imitation butter, but the manufacturers outside of the State could ship it into Iowa in original packages. We have reason to believe that a small amount is coming into the State and being sold and used in this manner, but we expect this traffic to be short-lived.

The Hill or Grout bill is before congress and favorably reported to the House and will, without doubt, become a law. The bill provides:

"That all articles known as oleomargarine, butterine, imitation butter, or imitation cheese, or any substance in the semblance of butter or cheese not the usual product of the dairy and not made exclusively of pure and unadulterated milk or cream, transported into any state or territory or remaining therein for use, consumption, sale or storage therein shall, upon arrival in such state or territory, be subject to the operation and effect of the laws of such state or territory enacted

in the exercise of its police powers, to the same extent and in the same manner as though such articles or substances had been produced in such state or territory, and shall not be exempt therefrom by reason of being introduced therein in original packages or otherwise."

Our legislature last winter unanimously memorialized congress to pass this bill. With its passage the last prop will be knocked from under the fraudulent sale of oleomargarine and butterine and these goods will have to be sold upon their merits in Iowa, provided those interested in the dairy industry, in the State, will make their influence felt upon the law-making powers so that the necessary appropriations will be made for the maintenance and support of this department commensurate with the importance of the great industry it represents.

This office has been called upon by persons and committees, interested in the dairy industry of other states, to advise them in regard to our law and its workings; also to assist them in securing, in their own states, laws of a similar nature. The interest in this subject is so strong and the investments in this industry so large that it is but a matter of a short time before all of the states, where agricultural influences predominate, will have laws similar to those of this State and officers, together with means, to enforce them.

When this has been accomplished the butterine people will have to sell their compound upon its merits. As the history of oleomargarine in Iowa teaches, they are abundantly able to take care of themselves, for have we not seen them almost driven from the State and then, by abiding their time, carefully studying the conditions and taking advantage of the necessities of the trade, increase their business to an enormous extent? It now remains to be seen what new scheme they will devise, or whether they will try to establish a sale for their white goods on their own merits. If they decide to do the latter, we wish this early to inform those connected with the dairy industry that they have a strong and mighty competitor; one with abundant means and untiring business push and ability. Their goods will come into direct competition with poor butter, and by many will be preferred to it. The duty of the dairy and creameryman is to see that our home market is supplied at all times with a choice article of pure butter, put up in an attractive and convenient form for retail trade and at reasonable prices.

The creamerymen should encourage their patrons in following fall, winter and early spring dairying, so as to equalize the

production of butter, and by so doing make a more uniform price, thereby bringing the product of the dairy within the reach of all.

We are well aware that it is more convenient and less work for the creameries of Iowa to ship their butter in tubs and large lots to Eastern dealers than to put it up in bricks or rolls in order to supply the cities and larger towns in the State. These cities must be supplied with a good article of butter or the butterine men will take advantage of the situation and a repetition of the past may be the result. Complaints were made, during the session of the legislature last winter, by representatives of some of the counties in Southern Iowa, that it was impossible to get butter, in their cities, that was fit for table use. This is not as it should be, and the creamery and dairymen of the State should see that it does not occur in the future. The home market is worth looking after, and the reputation of the State demands that the butterine trade be kept as small as possible.

What is true of the Iowa market is true to a greater extent of the great Eastern markets. The butterine business is concentrated into the hands of a very few men. Their profits are enormous, they employ the ablest and best men obtainable to dispose of their goods, they study the convenience of the consumer and cater to all his notions and whims, their goods are put up in the most convenient and attractive manner and everything is done to push their business and sell their goods. The situation of the creameryman is quite different. He lives in the rural districts, operates a business of from fifteen to twenty thousand dollars a year, and is not able nor can he afford to spend the time and money in looking up a special market for his butter and in studying the wants of the retail dealer and consumer. His only recourse is to put his butter in the regulation package, ship it to some commission firm and wait for his returns.

The expense and manner of handling the product of the creamery or cheese factory has been discussed more or less in the past, and we are satisfied that there is much room for improvement, and many dollars can be saved in this branch of the industry by proper organization and management. Whatever plan may be adopted, it will not be a success unless whoever has charge of the project sees that the wants and wishes of the retail dealer and consumer are cared for. If the retailer wants his butter in tubs of a certain size, or bricks and rolls of

a certain size in boxes, he should have them, and the color, salt and flavor should all be uniform and made to suit the trade.

In order to regain the ground, that has been taken away from him by the butterine man, the creameryman and his agents must recognize the strong competition they are called upon to meet and attend to their business with the retailer and consumer in an honest and upright manner. He must furnish a first-class article in the most attractive shape, and place all second-class goods where they can be used without injury to the trade, and in no case allow goods that are "a little off" to be sold for and take the place of a first-class article. If there was as much study and attention given to the disposition and sale of our butter and cheese products as is shown in its manufacture, the markets would be better and prices more satisfactory. This part of the business needs the attention and careful study of the factoryman.

The names, location and date of issue of those holding government licenses for the sale of oleomargarine are as follows:

Kaufman & Hogar, Anamosa.....	August 1, 1894.
Wm. Ihere & Sons, Burlington.....	October 1, 1894.
Eli Brown, Council Bluffs.....	August 1, 1894.
M. J. Eagle & Co., Davenport.....	August 1, 1894.
P. J. Paulsen, Davenport.....	September 1, 1894.
Tri-City Packing Co., Davenport.....	July 1, 1894.
Chase Bros., Des Moines.....	July 1, 1894.
Al Grefe, Des Moines.....	September 1, 1894.
Grefe & Umfried, Des Moines.....	September 1, 1894.
Geo. B. Grimes, Des Moines.....	September 1, 1894.
C. Harrah, Des Moines.....	September 1, 1894.
C. C. Leach, Des Moines.....	September 1, 1894.
Lewis Bros., Des Moines.....	September 1, 1894.
Mac Rae Bros., Des Moines.....	September 1, 1894.
G. W. Neidig, Des Moines.....	September 1, 1894.
Chas. Steiglitz, Des Moines.....	September 1, 1894.
W. H. Waers & Bro., Des Moines.....	September 1, 1894.
G. H. Runyan, Dubuque.....	August 10, 1894.
G. H. Danforth, Hamburg.....	September 1, 1894.
Globe Tea Co., Ottumwa.....	October 1, 1894.
J. P. Peckler, Ottumwa.....	September 1, 1894.
Deal & Turnbull, Sioux City.....	October 2, 1894.
B. C. Potter, Sioux City.....	September 12, 1894.
James Byrnes, Waterloo.....	September 5, 1894.

THE CONDITION OF THE BUTTER AND CHEESE INDUSTRY.

BUTTER.

According to the annual reports of this Department the production of butter in Iowa, taking as a basis the railroad reports of butter shipments from stations in Iowa to points outside the State, reached its maximum in 1890; for the following three years the decrease was very rapid. We hope this decline in the make of butter has reached the lowest point, and, had it not been for the long-continued drouth of the past season, we have no doubt but that the showing for 1894 of the butter shipments would have exceeded that of last year.

The shipments of butter, as reported by the railroads for corresponding periods from 1890 to 1894 inclusive, after deducting 16 per cent of the gross weight for tare, are as follows, in pounds:

1890.....	71,255,796
1891.....	68,690,716
1892.....	60,112,931
1893.....	54,572,902
1894.....	52,649,284

We have made careful inquiries of representative men, engaged in the creamery business in each county of the State, in regard to the effect of the drouth, and received replies from sixty-four counties. Their statements show a decrease in the milk supply during the months of July, August and September varying from 10 to 75 per cent and making an average of 51 per cent for the counties reported.

The milk producers of the State have experienced in the past, and must expect in the future to pass through dry periods each summer of increasing duration, but never, in late years, has such a drouth been experienced in Iowa as that of the past year. We were without rain to speak of from May 15th to September 1st; the heat was excessive and the sunshine almost continuous. The pastures became burned early in the summer,

brooks and streams went dry and both old and new wells on the farms were taxed to their fullest capacity to furnish sufficient water for the stock. Under these circumstances it is not to be wondered at that with a shrinkage in the supply of milk of over 50 per cent, for the three months mentioned, there should have been a slight decrease in the amount of butter shipped during the year ending September 30, 1894, from that shipped during the year ending September 30, 1893.

The drouth does not seem to have discouraged the dairymen to any great extent, for out of sixty-four counties reported, thirty-three show the number of cows to be increasing; twenty-three show a decrease and eight report no change. In those counties where a decrease in the number of cows is reported many reasons are given, among which are: High price of feed; scarcity of hay; low prices paid for milk or cream; poor markets on account of the effect of oleomargarine and the closing of unsuccessful creameries.

Notwithstanding the discouragements to the industry, caused by the drouth, there are more creameries in operation in the State than there were last or any previous year. Taking this fact into consideration it may seem strange that by a comparison of the butter shipments of 1894 with those of 1890 a decrease of 18,606,512 pounds is shown. But the fact remains that the number of creameries has increased from 628 in 1890 to 806 in actual operation at the present time.

The territory covered by creameries, or the dairy districts of the State, has been gradually increased by the building of creameries. The principal cause, however, of the increase in factories is the dividing up of the already occupied territory, two or three creameries doing the work which had previously been done by one. There has been a gradual change, during these years, from the gathered cream to the separator system. The gathered cream factories covered a large territory and their output was large. When the change was made to the separator system it took two or more factories to take care of the amount of milk that was handled, in the shape of cream, by the gathered cream creamery previously occupying that territory. We can readily see that while there has been a gradual increase in the number of creameries in the State, by these changes, the quantity of butter produced has not increased.

THE BUTTER MARKET.

The butter market for the year ending October 31, 1894, has been low. The following is a comparison of prices, based on the New York market, for the past two years:

	Year ending Oct. 31, 1894.	Year ending Oct. 31, 1893.
November	\$.31	\$.28 1-5
December .....	.31	.27 4-5
January .....	.33 3-5	.25 5-8
February .....	.29 1-4	.27
March .....	.29 1-5	.22 1-2
April .....	.31 1-8	.25
May .....	.24 3-5	.17
June .....	.23 3-5	.18
July .....	.21 3-4	.18
August .....	.23 3-5	.23 3-5
September .....	.27 5-8	.25
October .....	.29 1-4	.25
Yearly average	\$.2771	\$.2530

The difference between the averages for the two years is 4.32 cents per pound in favor of 1893, and this shrinkage in values takes place notwithstanding the severe and extended drouth of the past summer. The highest monthly average for the past year was 28.20 cents, reached in the month of November, 1893, and the lowest was 17 cents, in the month of May, 1894. The owners of creameries have always looked for a higher market during and after a severe and extended dry season, but the past year was an exception. The prices for August, September and October were, on an average, 2.30 cents per pound lower than those of the previous year. The condition of the country had a great deal to do in bringing about the low prices of the past year. People that are out of work do not consume as much of the products of the farm and butter factory as they do when work is plenty and wages good. With the return of better times we expect to see a more satisfactory market for dairy products.

The extreme high and low prices that the markets experience each year are not desirable. It would be much better for all concerned if prices were more uniform during the entire year. There are several things that would help to bring this about, winter dairying being the most important. The patrons of our creameries should see that the yield of milk is more uniform throughout the year; this can be done by proper study and attention to details. Fresh cows should be added to the

herd when necessary and proper care and feed given to stock the entire year. When a uniformity in the supply of milk becomes general in our factories the prices for butter will not fall as low in the summer nor reach as high a point in the winter. High prices, although satisfactory at the time, may be dangerous in the final outcome, for the reason that as soon as they are beyond the reach of people with limited means, in our cities, the butterine man finds a market for his product, places his imitation goods in the hands of the retailer and from him to the consumer.

Another important factor of the market problem is the placing of the summer make of butter in cold storage for sale and use during the fall and winter months. In the early history of the dairy industry, before butterine became a disturbing element, a large part of the summer make, of the large factories of the state, was placed in cold storage and put upon the market in the fall and winter, when the price of fresh made goods was high. The cold storage goods sold, in those days, for from two to three cents below what fresh made goods would bring, but several cents higher than could be realized during the summer. In this way the market, during the summer, was relieved of the glut that would have existed had the entire make been offered for sale, and the same butter prevented the market for the best goods being extravagantly high during the winter months. Thus it will be seen that the speculator and the operator of cold storage plants became equalizing factors in the market and did a great amount of good.

On butterine entering the market it came in competition with the creameryman's cold storage butter at such prices that the factoryman and speculator lost money on the goods sold, and eventually the storage of butter was resorted to only in cases of necessity. The shrinkage, storage charges and interest on investment, taken from the price that the cold storage goods brought when compelled to compete with butterine, reduced the net price received so low that there was nothing in the business.

When winter dairying becomes more general and the butterine business is brought under control, so that the surplus in the summer's make of butter can be profitably placed in cold storage, then will this great industry of our State regain lost ground and push forward in its noble work.

CHEESE.

The cheese industry in Iowa has never been large, nor has it made for itself a name and reputation as has Iowa butter. In 1887, as shown by the reports of this office, Iowa had 52 cheese factories, 63 in 1888, 104 in 1889, 96 in 1890, 111 in 1891, 113 in 1892, 110 in 1893, and in 1894 (the present year) 64 exclusive cheese and 20 combined factories in which cheese is made during a part of the year and butter during the balance.

Forty-two counties in the State have cheese factories, most of these counties having but one or two. Those containing four or more are Monroe with 14, Appanoose with 5, and Decatur and Wayne with 4 each. In six counties new factories were opened, and in eleven counties where cheese factories were in operation last year, none are reported this year. While a large per centage of the creameries are located in the north half of the State, the reverse is the rule with cheese factories, there being 56 reported in the south and but 25 in the north half of the State.

Thirty-four of the 64 cheese factories report 841 patrons, making an average of 25 to each factory, or 1,600 for the 64 factories.

Thirty-four report the valuation of the plants as \$47,000, making an average of \$1,382 for each factory and making a total of \$88,448 for the 64 factories.

Thirty-two report the value of the manufactured product, for the year ending May 1, 1894, to be \$127,900, or an average of \$3,927 for each factory, making \$255,808 for the 64.

Thirty-one report 7,110 cows, which makes an average of 229 for each factory and a total of 14,656 for the 64 factories.

The reasons why the dairy industry has not developed more, in the direction of cheese, we are unable to give with any degree of confidence that they would be correct. We prefer to take more time to investigate the matter and report later. There is not much encouragement for the investor to put his money in an enterprise that is demoralized by the dishonest practices and frauds that are committed in its name. The country to-day is flooded with filled cheese and the manufacturer of oleo is sending out circulars advertising his pure (?) neutral for sale, and offering to ship the fraudulent stuff in any manner or form to prevent detection. The large cheese producing states of Wisconsin and Illinois have no laws prohibiting or regulating the

manufacture and sale of filled cheese. Our office is in receipt of letters from parties in Iowa, who have been through the Elgin district, who say that there are factories in that locality each of which has on its shelves in the curing rooms as much as \$35,000 worth of filled cheese. This fraudulent business has gone so far in the state of Wisconsin that the best men connected with the dairy industry of the state say it must be stopped. The most effective way to do this, in our opinion, is to have a national law passed by congress of the same nature as the oleomargarine law, and license its manufacture and sale.

In Iowa the same law that prohibits the manufacture and sale of any product in imitation of or as a substitute for butter, that has a yellow color, prohibits the manufacture and sale of filled cheese if colored yellow. We are not able to say whether this law is being violated or not. The only way to detect such violations would be to employ a chemist and make a business of sampling and analyzing cheese. So far this department, with the funds it has at its command, has not been able to do this; still it is our intention to make as much of an effort in this direction, during the next year, as we can under the circumstances. Had we a national law such as we mentioned before, every manufacturer and dealer would have a license and the State authorities could locate and watch the manufacturer and seller of filled cheese, and as the State law prohibits the manufacture, sale and use of the yellow article, little would be sold. There is no question but that the cause of the decrease in consumption and the decline in price of cheese is directly due to the extensive manufacture of filled cheese in this country. Cheese, unlike butter, is not a necessity, and when people buy it as a luxury they want to know that it is absolutely pure, and where a doubt exists as to its purity they will refrain from buying.

CREAMERIES AND CHEESE FACTORIES.

We publish in tabulated form, in another part of this report, the name, location and many other important facts in regard to the butter and cheese factories of the State. We find that ninety-six of the ninety-nine counties have either butter or cheese factories located within their borders, and that ninety-four of these counties have creameries. We have no reports of any factories being located or in operation in Fremont, Woodbury or Harrison counties. The counties of Appanoose and Monroe have cheese factories but no creameries. Linn county leads in the number of creameries, having 33; Jones and Delaware follow with 31 each; Dubuque and Bremer 29; Clayton, Black Hawk and Fayette 22; Winneshiek 21; Butler 19; Buchanan 18; Chickasaw, Grundy and Kossuth 17; Cedar 16; Palo Alto 15 and Sac and Story 14 each.

In the gross number of pounds of butter shipped from railroad stations, the large dairy counties arrange themselves as follows:

	Pounds.
Clayton	3,329,669
Delaware	2,809,837
Jones	2,667,024
Chickasaw	2,491,294
Fayette	2,484,233
Buchanan	2,451,750
Dubuque	2,429,745
Bremer	2,381,853
Linn	2,191,641
Butler	1,965,169
Black Hawk	1,887,410
Mitchell	1,731,843
Kossuth	1,567,699
Winneshiek	1,505,495
Cerro Gordo	1,481,975
Palo Alto	1,394,770
Allamakee	1,225,436
Total	55,647,137

It is of interest to notice how these counties, having such large dairy interests, stood the excessive drouth and low markets, as shown by the increase or decrease of the number of pounds of butter shipped during the year. Those that made an increase arrange themselves as follows:

	Pounds.
Cerro Gordo	944,520
Kossuth	870,889
Dubuque	843,115
Chickasaw	562,049
Clayton	496,614
Palo Alto	481,061
Delaware	60,139

Those that had a decrease are as follows:

Fayette	469,230
Buchanan	468,226
Winneshiek	389,370
Mitchell	377,816
Linn	332,846
Butler	108,077
Black Hawk	84,636
Allamakee	64,364
Bremer	54,187
Jones	41,050

In the counties having creameries the number reported from 27 is unchanged from that of last year; in 37 counties there has been an increase of 89, and in 30 counties a decrease of 72, making a net increase of 17 creameries. The greatest loss in any one county was 10 in Delaware, and the greatest gain was 10 in Dubuque.

The increase and decrease in the number of creameries is about equally divided between the older and newer dairy counties—a gain of 46 and a loss of 36 in the older, and a gain of 43 with a loss of 36 in the newer dairy counties.

If we draw an imaginary line from the northwest to the southeast corner of the State, touching the Mississippi river in the center of the east line of Lee, the counties through which this line would pass and all north and east of the line would contain 670 creameries, and the counties south and west of the line but 136.

There are 786 factories manufacturing butter exclusively and 20 in which both butter and cheese is manufactured, making a total of 806 factories in the State manufacturing butter. There are 64 exclusive cheese factories, which, with the 20 combined

butter and cheese factories, make a total of 84 factories in the State in which cheese is manufactured. The total number of both butter and cheese factories in the State, counting the combined factories but once, is 870.

Reports from 818, out of the 870 butter and cheese factories, show 448 as owned or operated by individuals or private firms, 231 by co-operative companies and 139 by stock companies.

Of the 806 creameries, 546 are operated on the separator system, 131 on the gathered cream plan and 103 are running on a combination of both systems. Twenty-three made no report on this subject.

Seven hundred and sixteen, out of 870 butter and cheese factories, receive milk. Of these 456 settle according to the amount of butter fat the milk contains, 197 by weight, or by the hundred pounds, and 63 fail to report.

Five hundred and twenty-eight butter and cheese factories report 48,487 patrons. This is an average of 92 patrons to a factory, or 80,000 for the 870 factories of the State. This, in round numbers, represents, with their hired help, from 450,000 to 500,000 people; or, in other words, there are at least one half million of people directly interested in the production of butter and cheese by the factories of Iowa. If to this number we add the people of the State that are interested in the private dairy and the farmers that make butter to supply the inhabitants of our cities, towns and villages, we will then begin to conceive of the magnitude of the great dairy industry of the State.

Five hundred and twenty-five, out of 870 factories, report that their patrons furnish the milk from 485,261 cows, showing an average of 924 cows to a creamery. If this average will hold good for those not reporting, the butter and cheese factories are receiving the milk from 803,880 cows. A fair valuation per head will show the investments in the dairy cattle that support these factories to reach into the millions.

Six hundred and twenty of the 870 factories report 998 persons employed in the factory and 2,431 in gathering milk and cream.

The valuation of 604 of the 870 factories is given as \$1,788,150, or an average of about \$3,000 to a factory. Using this as a basis the value of the 870 plants would be \$2,610,000.

The value of the manufactured product of 466 reporting, out of the 870 butter and cheese factories, amounts to \$7,899,097 for

the year ending May 1, 1894. This is an average of \$16,951 to a factory, or about \$15,000,000 for the product of the creameries and cheese factories of the State.

POSSIBILITIES OF THE DAIRY INDUSTRY IN IOWA.

There are now in the State 17 counties each of which shipped, during the past year, more than 1,000,000 pounds of butter, as shown in table VIII of this report. They shipped 35,647,137 gross pounds of butter; allowing 16 per cent for tare of packages, the average is 1,761,385 pounds per county. This amount at 20 cents net per pound makes a value of \$352,277. If the 99 counties of the State could be brought up to this average the value of our butter shipments would amount to nearly \$35,000,000 per annum. These figures are based upon the shipments that have been made to points outside of the State, and do not include any part of the butter consumed in this State. We would ask if such a result as this is not desirable? Thirty-five millions of dollars coming into the State for butter alone each year and circulating among our people! Would not Iowa be proof against panic and hard times?

Where in the State can you go and find better times, money more plenty, business better, the people happier and more contented than in our large dairy counties, such as Clayton, Delaware, Jones, Chickasaw, Fayette, Buchanan, Dubuque, etc.? The creamery settling for its milk monthly or semi-monthly keeps the money of the county in active circulation, the deposits in the banks are large, and merchants can transact business on a cash basis. Much better is this state of affairs than that in many of the counties of the State that are confined, to a great extent, to the raising of grain for sale and shipment. The farmers in these counties conduct their business on a yearly credit system, are carried from one year to another by the merchants and are large borrowers at the banks. When settlements are made at the end of the year their condition is but little, if any, better than at the end of the previous year. When a year

of drouth and crop failure, such as last year proved to be, overtakes them, they are in no shape to meet their obligations. The dairyman suffers but little when such times come, for he can make use of his fodder, make his regular daily trips to the factory and, when settling day comes, draw his money and deposit it in the bank.

There is no good reason why the South and West part of Iowa can not raise good milch cows, feed them well, build their own factories, and each county produce 1,000,000 or more pounds of butter annually. Before leaving this subject let us say a word in regard to the building of creameries and cheese factories. The reports received at this office show 70 idle creameries in the State. They are mostly located in localities that will not support them, and were built at extravagant prices. Those interested were largely influenced by men sent out for that purpose, regardless of the needs of the community, and many should never have been built.

When a creamery can depend, at the start, upon sufficient support to pay expenses, in any locality not occupied, it should be built, for it would then be safe to calculate that in a short time the patrons would increase their herds, their neighbors fall in line and sell their milk, and in that way put the plant, with good management on the part of the operator, on a paying basis before many months.

Creameries can be built costing from \$1,500 to \$3,000, and the latter figure should not be exceeded until the increase of business actually forces an enlargement of the plant. As before stated, many creamery projects have been worked up and factories built in our large towns as well as in the country. Farmers and business men have paid outrageous prices for some of these plants. All such schemes should be discouraged, for they are hurtful to the locality and have an injurious effect upon the development of the dairy industry generally.

NEW LAW REGULATING THE TESTING OF MILK.

The system of buying milk, according to the amount of butter fat it contains, is honest and just and has been rapidly growing in favor among dairymen. This method has been criticised on the ground that the factory operator had the matter entirely in his own hands, and that he could use larger test bottles than the regulation size and the readings would show less than the patron was entitled to. My predecessor, Mr. Tupper, met this complaint, in his travels among the creameries, and recommended a remedy that was enacted into a law by the last legislature. This law, called "An act to regulate the testing of milk," will be found in another part of this report, together with the other dairy laws of the State, published in full. The law requires all factories that buy milk by the test to use "reliable and accurate tests, and no such test shall be considered reliable and accurate unless the same shall be clear oil and free from any foreign substance, and produce such measurements of butter fat as would result from the use of a standard Babcock Milk Tester." The law further requires the creameryman to procure, from the Dairy Commissioner, a standard tube or bottle for testing milk, and makes it the duty of the Commissioner to furnish at cost such a bottle, marked with the letters "D. C." This test bottle is to be kept at the factory for the inspection of the patrons and for the purpose of verifying the tests.

There are 716 creameries and cheese factories that receive milk; of this number 456 report as receiving milk according to the amount of butter fat it contains, or by the test, 197 by the hundred pounds, and 63 make no report. Of the 456 factories buying by test, 316 have applied for and been furnished with standard test bottles as provided by law, leaving 140 not having applied. The Commissioner has several times notified the factories, that have not applied for a standard test bottle, but for some unaccountable reason they persist in not complying with the law. There may be some factories that are operated on the co-operative plan, that think for that reason the new law

does not apply to them. If this is the case, they are mistaken. Any factory that buys milk by the test, or uses the test to apportion earnings or dividends among its members, is required to have on hand a standard test bottle. With each standard D. C. test bottle sent the following certificate, filled out, with instructions as to the use of the test bottle, has been mailed to the applicant:

STATE OF IOWA,
DAIRY COMMISSIONER'S OFFICE,
Des Moines.

TO WHOM IT MAY CONCERN:

D. C. Test Bottle No. is furnished
for located at
County, Iowa, for the purposes set forth in chapter 47, Laws of the Twenty-fifth General Assembly.

I, W. K. Boardman, Iowa State Dairy Commissioner, do hereby certify this bottle, No., to be accurate, reliable and standard as established by law.

Dated this day of 189.....

..... State Dairy Commissioner.

Per Clerk.

The above numbered test bottle has been forwarded to you by mail this day.

Instructions for the Use of the Standard D. C. Test Bottle.

The accuracy of all the Test Bottles used in this factory should be verified by this D. C. Test Bottle. I would suggest two methods:

First—Milk Test: Be sure that the pipettes, or graduates, for measuring milk or acid are correct, that your acid is of proper strength,—which is anywhere between 1.82 and 1.83 sp. gr.—and both acid and milk should be at a temperature of 60° F.

From a small jar of fresh milk, well shaken, take a correct sample, place it in the D. C. Test Bottle, then take correct samples from the same jar, placing them in the bottles to be verified. (Shake the jar well between the taking of each sample.) Proceed carefully until the testing is completed. Note the amount of butter fat, as shown by the D. C. Test Bottle, and all bottles showing the same amount of fat as this bottle would be accurate; all others should be rejected.

Second—Mercury Test: Pat as near as possible enough mercury (quick-silver) in the D. C. Test Bottle to fill the neck from 0 to the 10 mark, insert a cork and carefully turn the bottle with the neck down. With a pair of dividers measure the scale by placing one point on the 0 and the other on the 10 mark; then remove the dividers, placing one point at the end of the cork, and the mercury should reach to the other point when placed against the neck of the bottle. If you have too much or too little mercury, add to or take from, as the case may be, until you have just enough to fill this measurement, then you have the right amount of mercury. With this mercury you can test the other bottles by pouring it from one to the other. (*Inside of bottles must be free from moisture.*) After pouring the mercury into a bottle insert a cork, turning the bottle neck down; with the dividers measure the mercury and then place one point at 0 and if the other point falls directly on the 10 mark the bottle is accurate, if not it should be rejected.

After testing two or three bottles it would be well to re-measure the mercury, in the D. C. Test Bottle, as some might be lost in changing from one bottle to another. In order to avoid the loss, as much as possible, use a small paper funnel when pouring the mercury.

If the location of your D. C. Test Bottle should be changed to any other factory, notice should immediately be sent to this office in order that I may be able to keep the records of this department in proper shape.

W. K. BOARDMAN,

State Dairy Commissioner.

Some creameries in the State are using a 22 c. c. pipette instead of the 17.6 c. c. described and used by Prof. Babcock. In his description and explanation as to the use of his apparatus he condemns the use of any other than the 17.6 c. c. pipette, as follows:

In purchasing apparatus for this test parties should be sure to obtain pipettes containing 17.6 c. c. This precaution is necessary, as pipettes of several different sizes have been furnished with this test. This has been usually done on the plea that the larger pipettes give readings which will agree with the butter yield from the churn. This, however, is not the case, and can not be accomplished by any test, as the yield of butter depends so largely upon the skill of the dairyman. The test is designed to show the amount of pure butter fat in the milk, and not the butter which will be made from it.

Our report indicates that from 65 to 70 per cent of the factories of the State, that buy milk, are using the test and paying for the milk according to the amount of butter fat it contains. This is as it should be, and it is to be hoped that the balance of the factories will see it to their interest to adopt what we believe to be the only correct and just method of paying for milk. The time will come when the other solids in milk, besides fat, will be an element in determining its value.

The relation of the buyer to the seller, or of the creamery proprietor or operator to the patron, is so close, and the reputation each patron has among his neighbors is so dear to him, that it becomes a serious matter to accuse a patron of skimming or watering his milk. In those factories buying by the test this disagreeable and ugly duty is removed, and every man gets pay for his milk according to its real value in making butter, and the surplus of water, let it come from the cow or from the pump, does not increase the amount of the monthly pay check.

We have a law, approved April 3, 1892, which prohibits the selling of skimmed for whole milk. This law is the one that is operating so well and doing so much good in the cities of 10,000 or more inhabitants. The enforcement of the law, among the patrons of those creameries buying milk by the hundred

pounds, irrespective of the amount of butter fat it contains, is impossible to any great extent with the amount of help the Dairy Commissioner has at his command; nor do I think such a course would be advisable. It would have been different had not the discovery of the Babcock test, or some other reliable method, given the creameryman the power of eliminating the ruinous effects of the pump and the low per cent cow from his business. The creamery operator that still continues to conduct his business, ignoring the improvements of late years, should not complain if his yield of butter is small and his profits far from what he thinks they should be. He has the remedy in his own hands—the Babcock Test.

We publish in this report a full description of the Babcock Test and how to operate it, written by Prof. S. M. Babcock, of the Wisconsin Experiment Station. The dairy industry owes a debt of gratitude to the Professor for giving his invention to the world without adopting the usual course of first passing it through the patent office.

DESCRIPTION OF THE BABCOCK TEST.

BY S. M. BABCOCK.

A description of this test in its present form was given to the public in July, 1890, in Bulletin No. 24 from the Experiment Station. It was reprinted in the seventh annual report which appeared early in 1891. The demand for these publications was so great that Bulletin No. 31, giving fuller information regarding the use of the test, was issued in April, 1892. These editions were soon exhausted, and in order to meet the growing demand for information regarding the test and the precautions to be observed in making it, Bulletin No. 36 was issued in July, 1893. This was reprinted in the ninth annual report, sent out in September, 1893. The edition of Bulletin No. 36 is practically exhausted, and at the present rate of distribution the ninth annual report will last but a few months.

In all over 60,000 documents describing the test have been sent out by this station alone and, besides, the bulletins have been copied in whole or in part by many of the agricultural

papers and experiment station publications in this country and in Europe. In spite of the very general distribution of matter relating to this test, calls are received almost every day for information regarding it, and it has been thought advisable to reprint it in this report.

DESCRIPTION OF THE APPARATUS.

1. *Test Bottles.*—The form of the test bottles used in this test is shown in Fig. 8. They should be made of heavy glass and



Fig. 8.



Fig. 9.



Fig. 10.



Fig. 11.

should contain, up to the neck, not less than 40 c. c. Each division of the graduated scale upon the neck represents .04 c. c. Five of these divisions are equivalent to 1 per cent of fat when 18 gms. of milk are used in the test, it being assumed that the specific gravity of the butter fat, at the temperature at which the reading is made (about 120° F.) is 0.9. The graduation extends from 0 to 10 per cent, which is sufficient for all ordinary tests of milk. When it is desired to determine the fat in cream a longer scale is required, if the same quantity is taken for the test. To increase the length of the scale sufficiently for the purpose with bottles of the usual form is impractical, as such bottles would not only necessitate extra care in filling and cleaning, but would require a special machine for whirling. This difficulty has been overcome by the test bottle shown in Fig. 9, devised by Mr. J. M. Bartlett* of the Maine Agricultural Experiment Station.

This bottle differs from the regular test bottle in having a bulb blown in the neck, the graduation commencing below the bulb, which holds 10 per cent. With this bottle cream up to 23 or 25 per cent of fat may be tested in the same manner as milk.

In creameries where skim milk is to be tested, a few bottles containing double the amount of those mentioned above, or about 80 c. c. up to the neck, should be provided, as a double quantity of milk may then be taken. This will increase the quantity of fat, and proportionately diminish the error of reading. When this is done the divisions of the scale are equivalent to .1 per cent of the fat instead of .2 per cent, as is the case where only 18 grams of milk are used.

The divisions of the scale on the necks of the bottles should be uniform, and the lines should run straight across the neck, and not obliquely, as is sometimes the case.

When new, the lines and numbers of the scale are usually blackened so that they are easily distinguished, but after the bottles have been cleaned a number of times the color may be washed away, leaving the lines indistinct. They may be restored by rubbing over the scale with a lead pencil, or, if a number of bottles need attention, with a cloth having a little black paint upon it.

The bottles should be numbered in some way. A good method is to have the number stamped upon a copper ring which is slipped over the neck. Bottles are also made with the

*Bulletin 8, Second Series, Maine Agricultural Experiment Station.

upper part of the neck ground so that the number can be marked upon it with a lead pencil. I prefer to have the number marked upon the glass with a diamond or etched with fluorhydric acid.

Calibrating the Bottles.—The 10 per cent of fat represented upon the necks of the bottles corresponds to a volume of 2 c. c. It is divided into 50 equal parts, 5 of which are equivalent to 1 per cent. The accuracy of the scale may be approximately determined by filling the bottle to the 0 mark with water, and after wiping out the neck of the bottle with a piece of filter paper, measuring into the bottle 2 c. c. of water, with a delicate pipette, which should fill the bottle to the 10 per cent mark. If a chemical balance is available the calibration may be accurately made by weighing the bottle when it is filled to the 0 mark and again after it is filled to the 10 per cent mark with water, care being taken to wipe all of the moisture from the neck of the bottle before each weighing. The difference in weight should be 2 grams. The calibration may be more rapidly done by introducing 2 c. c. of mercury into the bottle and, after fitting a small cork into the mouth of the bottle, inverting it so that the mercury will flow into the neck; the length of the column of mercury may be measured with a pair of dividers; this length should correspond with the length of the scale from 0 to the 10 per cent mark. The same mercury may be easily transferred from one bottle to another by connecting the necks of the bottles with a short piece of rubber tubing and inverting them. In this way a large number of bottles may be calibrated with the same volume of mercury. In doing this care must be taken that no drops of mercury are left adhering to the sides of the bottles. As the specific gravity of mercury is 13.59, two cubic centimeters will weigh 27.18 grams. Where facilities for weighing are at hand, this quantity may be weighed out and 2 c. c. obtained with great accuracy, as slight errors in weight do not materially affect the volume. In comparing bottles in this manner the bottles should be clean and dry. Bottles which vary more than 0.2 per cent in the whole length of the scale from 0 to 10 per cent should not be used.

2. *Pipette for Measuring Milk.*—This may be of any form, but that shown in Fig. 10 with a wide opening at the lower end to allow the milk to run out rapidly is to be preferred. It should contain 17.6 c. c. when filled to the mark. A pipette of this size will deliver a little less than 17.5 c. c. of milk, which, if the milk

has the average specific gravity of 1.032, will weigh 18 grams. The pipette should be accurately calibrated. It may be tested by weighing the amount of mercury necessary to fill it to the mark. The weight of mercury should be 239 grams.

In purchasing apparatus for this test, parties should be sure to obtain pipettes containing 17.6 c. c. This precaution is necessary as pipettes of several different sizes have been furnished with this test. This has usually been done on the plea that the larger pipettes give readings which will agree with the butter yield from the churn. This, however, is not the case, and cannot be accomplished by any test, as the yield of butter depends so largely upon the skill of the dairyman. The test is designed to show the amount of pure butter fat in the milk, and not the butter which will be made from it.

3. *A Measure for Acid.*—A graduate or cylinder of glass, Fig. 11, with a lip to pour from and a single mark at 17.5 c. c., is the best form for general use.

It is not essential that this measure be accurately calibrated, as slight variations in the amount of acid used will not affect the results by the test.

The automatic pipettes, for delivering the proper amount of acid directly from the carboy to the test bottles, devised by Prof. Farrington* and Prof. Patrick,† may be used with advantage in laboratories or factories where large numbers of tests must be made each day. These devices, however, should only be placed in the hands of persons accustomed to handling delicate apparatus, as the glass parts are expensive and liable to breakage if carelessly handled.

4. *Centrifugal Machine.*—So far as I have seen, all of the machines made for this test by the leading dairy supply firms are suitable for the purpose. A machine should be capable of making from 700 to 1,200 revolutions per minute, according to the diameter of the wheel which carries the bottles. A small wheel should make more revolutions than a large one. A wheel less than 12 inches in diameter is not practical, and it need not exceed 20 inches. In machines where the motion is transmitted by belt or by friction the adjustment should be kept tight enough to avoid slipping, as otherwise the motion may be much less than is intended and result in an imperfect separation of the fat. Machines which carry an even number of bottles are

*Bulletin 16, Ill. Agr. Expt. Station, 1891.

†Bulletin 19, Iowa Agr. Expt. Station, 1892.

greatly to be preferred, as in such the bottles are placed directly opposite each other, thus making it easy to preserve the equilibrium of the apparatus when a few tests are made.

Recently a number of steam turbine machines have been introduced which have many advantages for factories where high pressure steam is available, as they maintain an even speed, prevent the cooling of the bottles and supply hot distilled water for filling.

5. *Commercial sulfuric acid* having a specific gravity of 1.82—1.83. The stronger acid is to be preferred. It is very important that the acid used have approximately the right strength. If it has a specific gravity much below 1.82, the casein may not all be held in solution and, being mingled with the fat, will give an unsatisfactory test. If the acid is only a trifle too weak the use of a little more may give a good test, but this cannot always be depended upon. If the acid is too strong it will act upon the fat, turning it to a dark color, and may attack the sugar of the milk to such an extent that portions of it will separate as a black sediment which accumulates just beneath the column of fat and prevents a satisfactory reading. If the acid is too strong, a good test may be obtained by using less of the acid. The acid should not be diluted.

The acid may be all right and give a satisfactory test when first purchased, and fail to give a good test after a little time. This is occasioned by the acid not being kept in a closed vessel, as under such circumstances the acid rapidly absorbs moisture from the air and soon becomes too weak. The acid should always be kept in a tightly stoppered bottle. The stopper should either be of glass or rubber, as a common cork is soon destroyed by the acid.

Occasionally acid is obtained which is of the proper strength, but which, owing to some impurities, fails to give a clear separation of the fat. Two or three lots of such acid, which blackened the fat even when used in small quantities, and with which it was impossible to obtain satisfactory results, have been met with. The cause of the trouble is unknown, and the best remedy is to change such acid for that from a different lot, as most of the sulfuric acid which has the correct specific gravity will be found to give good results.

When a carboy of acid is purchased the wooden case should not be removed from it, as by so doing the risk of breakage is greatly increased. At least one serious accident has happened

in a factory during the past year by carelessly handling a carboy of acid that had been removed from the case.

The acid should always be handled with great care, as it is very corrosive, causing serious burns when allowed to remain upon the skin, and destroying clothes when it comes in contact with them. Whenever acid is spilled upon the hands or clothes it should be washed off immediately, using plenty of water. It is advisable to have a bottle of ammonia water at hand with which to saturate spots where acid has been spattered upon clothes, as this will in most cases restore the color and preserve the fabric.

Boiling water should be provided for filling the bottles after they have been whirled for the first time, and for warming the contents of the bottles if the fat becomes too cold for reading. Distilled or rain water is to be preferred for filling the bottles, as hard water often causes bubbles to form upon the surface of the fat, making the reading difficult.

MAKING THE TEST.

Sampling the Milk.—Every precaution should be taken to have the sample represent as nearly as possible the whole lot of milk from which it is taken. Milk fresh from the cow, while still warm and before the cream has separated in a layer, may be thoroughly mixed by pouring three or four times from one vessel to another. Samples taken at once from milk mixed in this way are the most satisfactory of any. Milk that has stood until a layer of cream has formed should be poured more times, until the cream is thoroughly broken up and the whole appears homogeneous. No clots of cream should appear upon the surface when the milk is left quiet for a moment. With proper care any milk that has not coagulated or that has not been exposed to the air until the surface of the cream has become dried, may be mixed so that a representative sample may be taken. Milk should not be poured more times than is necessary, as extended mixing in this way is liable to churn the cream, forming little granules of butter that quickly rise to the surface. When this occurs it is impossible to obtain a fair sample and it is useless to make an examination. Milk is sometimes churned by being transported long distances in vessels that are not full.

It is impracticable to sample a large amount of sour milk, but a small sample of a pint to a quart may be thoroughly mixed by adding 5 per cent, by volume, of strong ammonia water,

which will dissolve the curd and permit a uniform mixture being made. When ammonia is added, the final results should be increased by 5 per cent. Sour milk may also be treated with concentrated lye to obtain an even homogeneous sample. Samples from sour milk are, however, never as satisfactory as those taken when the milk is in a proper condition.

SAMPLING MILK IN FACTORIES.

One of the chief obstacles to the introduction of the system of paying for milk according to its value, as shown by the amount of fat which it contains, has been the fear that representative samples of each patron's milk could not be obtained at the factory without much trouble and expense. Experience has shown, however, that this fear is ungrounded, and that any person competent to weigh the milk and keep the necessary records can take fair samples of each lot of milk received. This may be accomplished in several ways, one of the following being recommended. By stirring the milk with a long handled dipper after it has been poured into the weigh can and dipping out a small portion from which the test sample is measured by inserting a small tube in the bottom of the conductor pipe, through which a small portion of the milk continually escapes and is caught in a vessel placed to receive it. The same end may be attained by laying a small tube in the bottom of the conductor pipe, having it project a foot or more beyond the end, and placing a small vessel to receive the portion of milk which runs through the tube. Samples may also be taken with the "milk thief," which is a tube, with a valve at the lower end, that is lowered into the milk in the weigh can, taking a column of milk from the top to the bottom of the can. The Scoville sampling tube, invented by Prof. M. A. Scoville, of the Kentucky Experiment Station, is an improved milk thief which is one of the best instruments for taking samples of milk in factories, as it always gives an aliquot part of the milk delivered. A representative sample may be taken by any of these methods, but my preference is for the last one mentioned.

When milk is delivered at the factory only every other day, the cream often becomes so firm that clots of it quickly rise to the surface after the milk is poured into the weigh can. Such milk is difficult to sample, the result of the test usually being too low. I believe the most satisfactory sample will be obtained in such cases by mixing the samples in the weigh can

with a dipper, taking out a small portion which may be poured from one vessel to another until the clots disappear, after which the test samples should be measured. The best practice is to have the test bottles arranged in a case convenient to the weigh can and to measure the test samples directly into the bottles as the milk is received.

Measuring the Milk.—When the milk has been sufficiently mixed, the milk pipette is filled by placing its lower end in the milk can and sucking at the upper end until the milk rises above the mark on the stem; then remove the pipette from the mouth and quickly close the tube at the upper end by firmly pressing the end of the index finger upon it to prevent access of air. So long as this is done the milk cannot flow from the pipette. Holding the pipette in a perpendicular position, with the mark on a level with the eye, carefully relieve the pressure on the finger so as to admit air slowly to the space above the milk. In order to more easily control the access of air both the finger and end of the pipette should be dry. When the upper surface of the milk coincides with the mark upon the stem, the pressure should be renewed to stop the flow of the milk. Next, place the point of the pipette in the mouth of one of the test bottles, held in a slightly inclined position, so that the milk will flow down the side of the tube leaving a space for the air to escape without clogging the neck, and remove the finger, allowing the milk to flow into the bottle. After waiting a short time for the pipette to drain, blow into the upper end to expel the milk held by capillary attraction in the point. If the pipette is not dry when used it should be filled with the milk to be tested and this thrown away before taking the test sample. If several samples of the same milk are taken for comparison, the milk should be poured once from one vessel to another after each sample is measured. Neglect of this precaution may make a perceptible difference in the results, through the separation of cream, especially when the milk examined is rich.

Persons who have had no experience in the use of the pipettes will do well to practice a short time by measuring water into a test bottle before attempting to make an analysis.

Adding the Acid.—After the milk has been measured into the test bottle the test may be proceeded with immediately, or the bottles may be left for a day or two without materially changing the results; samples that have remained in the test bottles two or three weeks, and which had commenced to mold before

the acid was added, have given the same amount of fat as samples tested immediately after being measured. If the milk has become coagulated, the curd should be broken up by shaking the test bottle before the acid is added. It is advisable, however, that the test be proceeded with immediately after the samples are measured, if possible.

The volume of commercial sulfuric acid required for a test is approximately the same as that of the milk, or 17.5 c. c. for the ordinary test. If too little acid is added, the casein is not all held in solution throughout the test, and an imperfect separation of the fat results. If too much acid is used, the fat itself is attacked. The acid need not be measured with great accuracy, as small variations will not affect the result.

When all the samples of milk to be tested are measured ready for the test, the acid measure is filled to the 17.5 c. c. mark with sulfuric acid, and from this it is carefully poured into the test bottle containing the milk, that is held in a slightly inclined position for reasons given in directions for measuring the milk. The acid, being much heavier than the milk, sinks directly to the bottom of the test bottle without mixing with the milk that floats upon it. The acid and milk should be thoroughly mixed together by gently shaking with a rotary motion. At first there is a precipitation of curd from the milk, but this rapidly dissolves. There is a large amount of heat evolved by the chemical action, and the solution, at first nearly colorless, soon changes to a very dark brown, owing to the charring of the milk sugar and perhaps some other constituents of the milk.

Whirling the Bottles.—The test bottles containing the mixture of milk and acid should be placed in the machine and whirled directly after the acid is added. An even number of bottles should be whirled at the same time, and they should be placed in the wheel in pairs opposite each other, so that the equilibrium of the apparatus will not be disturbed. When all the test bottles are placed in the apparatus the cover is placed upon the jacket and the machine turned at the proper speed for about five minutes. The test should never be made without the cover being placed upon the jacket, as this not only prevents the cooling of the bottles when they are whirled, but in case of the breakage of bottles may protect the face and eyes of the operator from injury by pieces of glass or hot acid. The machine should be frequently examined to make certain that there is no slipping of belts or frictional bearings, which may cause too

slow motion and result in an imperfect separation of the fat. Managed in this way no extra heat is required, as that caused by the chemical action is sufficient to keep the fat liquid. If the bottles have stood after the acid is added, until the contents are cooled below 100° F., they should be warmed to about 200° F. by placing them in hot water before whirling.

Filling the Bottles with Hot Water.—As soon as the bottles have been sufficiently whirled they should be filled to about the 7 per cent mark with hot water. If practical, distilled or rain water should be used for the purpose. The bottles are most conveniently filled by placing a vessel containing boiling water above the machine, and by means of a syphon made from a small rubber tube with a glass tip, run the water directly into the bottles without removing them from the wheel. The flow of water can be perfectly controlled by a pinch-cock upon the rubber tube. If only a few tests are to be made, the bottles may be easily filled with a pipette, or by pouring from a graduate. The cover should then be replaced and the machine turned for about one minute, after which the fat should be measured.

If, when managed in this way, clots of curd or other matter are mingled with the fat, making the reading uncertain, the difficulty can usually be avoided by adding the hot water in two portions, filling the bottle at first only to the neck, and after whirling for about one minute adding sufficient hot water to bring the fat into the graduated neck, after which the bottle should be whirled and the fat measured.*

Measuring the Fat.—The fat when measured should be warm enough to flow readily, so that the line between the acid liquid and the column of fat will quickly assume a horizontal position when the bottle is removed from the machine. Any temperature between 110° F. and 150° F. will answer, but the higher temperature is to be preferred. The slight difference in the volume of fat due to this difference in temperature is not sufficient to materially affect results.

To measure the fat, take a bottle from its socket and, holding it in a perpendicular position with the scale on a level with the eye, observe the divisions which mark the highest and the lowest limits of the fat. The difference between these gives the per cent of fat directly. The reading can easily be taken to half divisions or to one tenth per cent.

* This latter method is now used by all State Milk Agents and is recommended by this Department.

The line of division between the fat and the liquid beneath is nearly a straight line, and no doubt need arise concerning the reading at this point, but the upper surface of the fat being concave, errors often occur by reading from the wrong place.



Fig. 12.

The reading should be taken at the line where the upper surface of the fat meets the side of the tube, and not from the surface of fat in the center of the tube, nor from the bottom of the dark line caused by the refraction of the curved surface. For instance, in Fig. 12 the reading should be taken from a to b and not to c or d.

The reading may be made with less liability of error by measuring the length of the column of fat with a pair of dividers, one point of which is placed at the bottom and the other at the upper limit of the fat. The dividers are then removed, and one point being placed at the 0 mark of the scale on the bottle used the other will be at the per cent of fat in the milk examined.

Sometimes bubbles of air collect at the upper surface of the column of fat and prevent a close reading; in such cases a few drops of strong alcohol (over 90 per cent.) put into the tube on top of the column of fat will cause the bubbles to disappear and give a sharp line between the fat and alcohol for the reading. Whenever alcohol is used for this purpose the reading should be taken directly after the alcohol is added, as after it has stood for a time the alcohol partially unites with the fat and increases its volume.

Whenever the fat is not quite clear, more satisfactory results may be obtained by allowing the bottles to stand until the fat has crystallized and then warm them, by placing the bottles in hot water, before taking the reading.

TESTING SKIM MILK, BUTTERMILK AND WHEY.

With all products like the above, which usually contain less than 1 per cent of fat, more accurate results are obtained by the use of a special test bottle which contains twice as much as the ordinary bottle. In such a bottle twice the usual amount of milk and acid can be taken, and the column of fat being doubled in length, may be read with greater accuracy. In this case the reading of the scale should be divided by two for the true per cent of fat. Less acid is required for whey than milk.

If only traces of fat appear in the neck of the bottle, the fat in the milk examined may be nearly 0.1 per cent, and this reading will be more nearly correct than estimates of from .01 to .05 per cent which often appear in the agricultural papers. The reason for this is that minute quantities of fat are either dissolved or not separated by the method. The amount of fat lost in this way is about the same for all milks; it is compensated for, when sufficient fat is present to form a complete layer across the neck of the bottle, by reading to the point where the fat meets the glass instead of at the concave surface.

In addition to Prof. Babcock's very complete article on the Babcock test we add a short article on cream testing that has been followed by this Department with satisfactory results:

CREAM TEST.

Use a pipette holding 6.04 c. c. This holds just one-third of the proper charge for making the test. Take 6.04 c. c. of cream and place in a common test bottle. Then add 12.08 c. c. (two pipettes) of water to the cream in the bottle. Add about two-thirds of a charge of acid, instead of a full charge, and proceed with the test as usual. A full charge of acid is not needed because there is less casein to be dissolved in the cream than in whole milk. The advantages of this method are that it is accurate and the cream can be tested in the common bottles. The special cream bottles are expensive, and as the necks are longer than those of the common bottles they are easily broken if the cover of the machine fits closely. To get the true percentage of fat in the cream the reading, when the test is made as above indicated, should be multiplied by three, because only one-third of the normal charge of cream was used.

COMPOSITE SAMPLE.

BY W. H. HELLMAN.

AGRICULTURAL EXPERIMENT STATION, AMES, IOWA.

The composite sample has been one of the principal factors in enabling the creameryman to fulfill the plan of paying for milk according to the fat content. It is a method by which creamerymen can collect small samples of a patron's milk from day to day and retain them in a receptacle until ready to make a test from the composite whole. This then is the composite sample. It has been found that to preserve these composite samples as they accumulate that it is necessary to add some form of preservative. Prof. Patrick found that corrosive sublimate (mercuric chloride) would do this, and after a thorough trial it has been found that the following outline, if followed, will give a method practical and applicable to any one wishing to use the composite sample with the corrosive sublimate for a preservative.

The outline is as follows: Number each patron and keep a list in the creamery, also number a jar (Mason's fruit jar is good) correspondingly with that of the patron. Set these jars on a rack for the purpose and charge them with the preservative. To do this put into each jar about 18 grains of corrosive sublimate, (this would be in bulk about as much as two common peas; a good way to do is to make a wooden ladle of such size that when full it will hold in quantity about as much as a pea or small grain of corn; put two of these ladles of the preservative in each jar and it will be enough to preserve a sample for a period of one month). Cover each jar tightly and place it on the rack; then as each patron brings in his milk take from it, by any process, a fair sample in quantity, amounting to about 15 cubic centimeters, (a tin measure holding that amount can be made for the purpose) and transfer it to the patron's jar on the rack. It is found that by the end of a four week's period this

will nearly fill a quart Mason's jar. As the period lengthens, every time before adding a sample, rotate the jars to emulsify the cream that has risen during the day and thus prevent incrustation of the cream at the surface. At the end of a four week's period these composite samples can be tested by the Babcock machine and the result will be a very good average of the fat content in the patron's milk for the period. It is important to have some coloring matter in the preservative to warn the unsuspecting of its presence since it is a deadly *poison*. Aniline red is a good color to add. The formula, one pound of corrosive sublimate and one ounce of aniline red thoroughly mixed by the apothecary when bought will be found satisfactory; it will give to the composite sample a red color and warn against its being mistaken for pure milk.

Should one wish for a shorter composite period, they can reduce the charge of mercuric chloride slightly and suit themselves about the details. Some reports say that monthly composites are given to flockiness of the cream; this, we think, can be overcome to a degree by keeping the Mason jars tightly closed at all times except when adding daily samples.

Should circumstances be such as to cause your composites to curdle with the charge mentioned, it can easily be increased to three ladles of preservative without doing any harm in any way.

Corrosive sublimate is, perhaps, the best preserver of composite samples yet found; a little practice will enable any practical creameryman to use it with reliable results.

CITY MILK INSPECTION.

Entering upon the duties of my office May 1, 1894, I found the law, governing the inspection of milk in cities of 10,000 or more inhabitants, in full and successful operation. The cities that come under the law are Burlington, Cedar Rapids, Clinton, Council Bluffs, Davenport, Des Moines, Dubuque, Keokuk, Muscatine, Ottumwa and Sioux City.

The Milk Agents selected by my predecessor were honest, faithful and competent, and changes have been made in but three cities, Des Moines, Ottumwa and Sioux City. The names of the present Milk Agents are as follows:

E. W. Edger	Burlington
F. M. Brown	Cedar Rapids
S. K. Lowell	Clinton
R. Fleming	Council Bluffs
Dr. A. W. Cantwell	Davenport
N. B. Rebkopf	Des Moines
Dr. J. W. Fowler	Dubuque
F. Harshman	Keokuk
Emil Kranz	Muscatine
E. B. Hill	Ottumwa
F. H. McCray	Sioux City

These agents have done a large amount of work for the small compensation received by them from the State, having made, during the last year, 3,984 individual tests in the eleven cities. The largest amount received by any agent, for this work, was \$117.00 and the least was \$54.00. In addition to testing the milk the agents have, on blanks furnished by the present Commissioner, reported upon the cleanliness of wagons, milk depots, cans and utensils and, in most cities, upon the sanitary condition of the dairies.

The condition of the dairy is a matter of the utmost importance, and we regret very much that the amount of funds, appropriated to this department, will not permit as thorough and frequent examinations as are necessary to insure the delivery of the cleanest and purest of milk to the residents of our cities.

The progress made in this direction is very marked, but with a more liberal appropriation it can be greatly improved.

The daily papers, in all the cities where agents are located, have published the reports of these tests and inspections. The effect of these public statements is exceedingly beneficial. The dealer who is selling good, rich milk is always anxious and willing to have the result of his test made public, and the seller of poor and adulterated milk soon finds his customers leaving him and patronizing those whose tests are higher, as shown by these published reports. This system of testing not only tends to induce the dealer to sell his milk unadulterated, as it comes from the cow, but makes it to his interest to feed, improve and take better care of his herd, to dispose of his poor cows and replace them with better stock.

The following letter from the Agent at Keokuk, on this subject, I deem worthy of publication:

KEOKUK, October 31, 1894.

W. K. Boardman, State Dairy Commissioner, Des Moines, Iowa:

DEAR SIR—Yours of the 30th at hand. Never had any prosecutions for violation of dairy law in this city. Had six, the first year the law was enacted, that were below 3 pounds of butter fat to the 100 pounds of milk. They are all out of the trade except J. L. Sample and D. Patterson. Mr. Sample has sold all of his old stock, and now his milk is among the highest in the amount of butter fat. All our dairymen are disposing of their poor stock and putting in cows that give richer milk. This is one reason why we have had a steady gain in the per cent of butter fat. A tother reason is better food and better stabling for stock. I think our dairymen are taking as much interest in the business as those in any other part of the State.

Yours respectfully,

F. HARSHMAN.

families, hotels, restaurants and boarding houses buying milk, and amount in dollars received, by the dairyman, for milk sold. From answers received the following table was prepared:

TABLE II.

INFORMATION RELATING TO THE SOURCE OF SUPPLY AND DISPOSITION OF MILK IN THE ELEVEN CITIES.

CITIES.	Population.	PERMITS ISSUED.			SOURCE OF SUPPLY AND HOW OBTAINED.			NO. OF FAMILIES AND PUBLIC SCHOOLS RECEIVING MILK.		Amt. received for milk during the year.	Yearly average per cap.
		Wagons.	Stores and depots.	Total.	Owens herd.	Owens herd and boys balance.	Boys all.	No. of cows.	No. of persons employ'd.			Families.	Hotels, boarding rooms, boarding houses, etc.
Burlington	39,500	4	30	34	739	739	2,972	32	\$59,526	\$7.34	
Cedar Rapids	23,000	4	41	45	450	450	2,475	32	63,542	\$4.96	
Clinton	22,000	4	41	45	450	450	2,475	32	27,440	\$1.25	
Council Bluffs	30,000	4	34	38	448	448	1,862	23	73,506	\$1.94	
Davenport	28,128	4	24	28	325	325	1,599	23	73,260	\$2.59	
Des Moines	42,247	4	34	38	1,550	1,550	6,712	150	143,989	\$2.30	
Dubuque	40,000	4	4	8	960	960	4,161	27	67,660	\$1.68	
Keokuk	18,000	4	2	6	321	321	1,599	21	34,738	\$1.93	
Muscatine	14,000	4	14	18	340	340	949	28	20,772	\$6.35	
Ottumwa	27,000	4	14	18	423	423	1,724	28	54,236	\$2.00	
Sioux City	27,800	4	14	18	414	414	2,005	28	54,300	\$1.93	
	350,073*	34*	284	318	37	7,315	32,211	460	\$635,450	\$6.50	

*The population here given was obtained from the mayors of the respective cities.
*17 wagons and 27 depots or stores estimated.

From this table we learn that the population of the cities, coming under this law, is three hundred and fifty thousand and, of this number, fully fifty per cent are dependent upon milk dealers for their supply of milk. The traffic amounted to \$623,450 for the past year and the average gross returns, from each cow, was \$85.63.

ADDITIONAL SAFEGUARDS NEEDED.

The prosecutions under the milk law, for the year ending November 1, 1894, were but 17. The dealers are, in our opinion, as honest as the average man in other lines of business. The number of individual tests, falling below the standard of 3 pounds of butter fat to the 100 pounds of milk, was only 37 out of 3,984, the total number of individual tests made. Of those falling below the standard, 17 were prosecuted as willful violators; the others were reprimanded from this office and warned not to repeat the offense.

The present law is good as far as it goes, but it stops short of accomplishing the desired result, namely: The furnishing

of milk to the city consumer, the invalid, the infant and the child, that is not only unskimmed but is also unadulterated. A milk dealer, under our present law, knowing that his milk is rich in butter fat—say 4 pounds per hundred—can adulterate it 25 per cent and still have it test 3.20 pounds of butter fat to the 100 pounds of milk. Milk treated in this way is not skimmed, but adulterated; nothing has been removed, but the per cent of butter fat and other solids has been decreased by the addition of water or ice. Prof. J. A. Miller, Department Chemist for the Department of Agriculture of the State of New York, has given this question careful attention and, in the Department's report, 1894, vol. I, page 279, he writes as follows:

"In order to secure some practical proofs that my deductions were not merely wild speculations, I undertook the dilution of several samples of average market milk and submitted them to a careful analysis. The results of the work, before and after dilution, are as follows:

SAMPLE NUMBER.	BEFORE DILUTION.			Per cent of water added.	AFTER DILUTION.		
	Per cent of water.	Per cent of solids.	Per cent of fat.		Per cent of water.	Per cent of solids.	Per cent of fat.
871	86.50	13.50	4.50	25	66.50	12.00	3.20
872	87.00	13.00	4.45	25	66.25	11.11	3.34
873	86.75	13.25	4.55	25	66.50	12.00	3.31
874	87.00	13.00	4.50	25	66.50	12.00	3.31
875	86.75	13.25	4.50	25	66.50	12.00	3.31
876	86.75	13.25	4.50	25	66.50	12.00	3.31
877	86.75	13.25	4.50	25	66.50	12.00	3.31
878	86.75	13.25	4.50	25	66.50	12.00	3.31

From this table it can be easily seen to what extent dilution may take place as the results of actual experiments and not of logical deductions."

On the subject of the composition of milk we quote from Bulletin No. 9, United States Department of Agriculture:

"While the composition of samples of milk obtained from different cows and produced under different conditions may show wide variations, a fair average composition may be given as follows: Water, 87 per cent, and solids, 13 per cent. The solids include fat, 2.9; casein, 8.5; albumen, 0.7; milk sugar, 4.7, and ash, 0.7. The casein and albumen are the materials containing nitrogen and are of special importance in cheese making. In general the ash, sugar and albumen are in solution, the casein in partial solution, and the fat in suspension, being mixed with the milk but not dissolved in it."

A great many of the states have recognized the importance of the other solids in milk besides the fat, and have provided that standard milk must contain a certain per cent of solids. The following shows the milk standard for the several states as established by law:

TABLE III.

MILK STANDARD.

STATES.	STANDARD FOR WHOLE MILK.				STANDARD FOR SKIMMED MILK.			
	Per cent of water not to exceed—	Per cent of total solids.	Per cent of solids by weight, by May and June.	Per cent of fat.	Sp. gr. at 60 deg. Fahrenheit.	Per cent of solids by volume.	Per cent of fat by weight.	Sp. gr. at 60 deg. Fahrenheit.
Iowa	87.50	12	3	3	1.030	4	1.030	1.030
Maine	87	12	3	3	1.030	4	1.030	1.030
Massachusetts	87	12	3	3	1.030	4	1.030	1.030
Michigan	87.50	12.50	3	3	1.030 to 1.035	4	1.030	1.030
Minnesota	87.50	12	3	3	1.030	4	1.030	1.030
New Hampshire	88	12	3	3	1.030	4	1.030	1.030
New Jersey	88	12	3	3	1.030	4	1.030	1.030
New York	88	12	3	3	1.030	4	1.030	1.030
Ohio	87	12.50	3	3	1.030	4	1.030	1.030
Oregon	88	12	3	3	1.030	4	1.030	1.030
Pennsylvania	87.50	12.50	3	3	1.030 to 1.035	4	1.030	1.030
Vermont	87.50	12.50	3	3	1.030	4	1.030	1.030
Wisconsin	87.50	12.50	3	3	1.030	4	1.030	1.030

It will be seen that in no case do the total solids fall below 12 per cent nor the fat below 3 per cent, and 88 per cent of water is the largest amount permitted. The Iowa law prohibits the adulteration of milk, but fixes no standard except the amount of butter fat it shall contain. In order to prevent adulteration and fraud of this kind our law, relative to the standard of milk, should be changed.

The most important use of milk in our cities is that of food for infants, children and invalids, and its quality and composition cannot be too carefully guarded if sickness, disease and death are not the result of its use. The residents of our cities, who are raising families, are at the mercy of the milk dealer, unless he can be compelled to furnish them with clean, pure and unadulterated milk, and it is a very grave question whether the State is doing right in confining the operation of the present milk inspection law to cities containing 10,000 or more people.

TUBERCULOSIS.

The probabilities and danger of tuberculosis being transmitted by the milk of tuberculous cows to the human race is now receiving careful consideration by the health authorities in many of the states. The experiment stations and the Bureau of Animal Industry at Washington are experimenting and studying the subject.

It was but a few years ago that tuberculosis was supposed to be a disease that ran in families and was inherited, but not contagious. The investigations of the last few years have established the fact that the disease is transmitted from man to animals, from animals to man and from man to man. The germ, that produces the disease, is called the "tubercle bacillus" and was demonstrated to exist by Robert Koch in 1882. It retains its vitality for several months under favorable circumstances, but dies in a few hours in direct sunlight. Milk heated to a temperature of 155° F., for from one-half to one hour, will be freed from the contagion, but freezing does not kill the germs.

Prof. James Law, of New York State, says that the disease is not hereditary and that but few calves from tuberculous cows have the disease when born. He also says that while it is not hereditary with man, some families have a susceptibility to the disease, and he has found this to be the case with cattle. Close buildings and lack of ventilation, dark stables, poor food, breeding too young and high breeding are mentioned as some of the predisposing causes.

It would be interesting to go into the subject and give the facts and theories in all their different phases, but it is more to our purpose to confine ourselves to questions of the danger of producing this disease from milk. Prof. James Law writes upon this subject as follows:

"Milk is more to be dreaded than meat because the udder is often the seat of tuberculosis, and the milk is usually taken uncooked. The danger is enhanced by the fact that this often is the necessary and only food of the infant and invalid, in which the germ is especially liable, through weak and imperfect digestion, to escape into the susceptible bowel.

In milk, as in the case of meat, a strong, vigorous digestion, does in some measure protect the consumer. Peuch fed a two months pig in five days four and one half quarts of milk drawn from a tuberculous udder, and killed in fifty-six days it proved quite sound. He inoculated four rabbits with the milk and all four became tuberculous. Again, in the absence of tuberculosis in the udder, the milk may be little, if at all, infecting. Gerlach, who produced tuberculosis in calves, pigs and rabbits by feeding the milk, found no result from certain tuberculous cows, while others infected a large portion. Nocard and McFadyean have been unable to infect rabbits, etc., with milk from an apparently sound udder of a tuberculous cow. The same has been my experience with milk from one cow in the last stages of chronic tuberculosis, and another having acute tuberculosis. Hollinger, Nocard and McFadyean claim that in the absence of tubercle in the udder the milk is not infecting. Whether true or not as an ultimate fact, this cannot be made a rule of action, as the following will show:

Hirschberger inoculated rabbits in the abdominal cavity, with the milk of twenty-nine tuberculous cows of which the udders were or appeared sound, and produced tuberculosis fourteen times. Bang inoculated from sixty-three tuberculous cows selected for their sound udders, and found the milk of nine of them infecting. A careful microscopic examination revealed tuberculosis in the udders of three of the cows, leaving six giving infecting milk in which, even after death and with all scientific appliances, no tubercle could be found in the udder. This is 0.5 per cent as tested by the microscope after death; it was 14.28 per cent as tested by the able veterinary professor during the life of the cows. Erast found ten cows in thirty-five with infecting milk, though the udders were sound. In one hundred and three animals inoculated, seventeen contracted tuberculosis, and of twelve calves sucking the cows, five became tuberculous. Drs. Smith and Kilborne (Bureau of Animal Industry, Bulletin No. 3) found the milk infecting in three cows out of six with apparently sound udders. One infecting cow and one non-infecting one had each tubercle in the lymphatic gland behind the udder. Forty-four per cent of the inoculated Guinea-pigs contracted tuberculosis; one in five from one cow, eight in ten from another and six in six from the third. In my own experience three calves, from healthy parents, sucking the apparently sound udders of three cows with general tuberculosis, all contracted the disease.

Instances of accidental tuberculosis of the human being through drinking the unsterilized milk are no longer wanting. In the practice of Dr. Siang, of Amorbach, a well developed five-year-old boy, from sound parents, whose ancestors on both male and female sides were free from hereditary taint, succumbed, after a few weeks illness with acute millitary tuberculosis of the lungs and enormously enlarged mesenteric glands. A short time before the parents had their family cow killed and found her the victim of advanced pulmonary tuberculosis. (Lydin.) Dr. Demme records the cases of four infants in the Childs Hospital at Berne, the issue of sound parents, without any tuberculous ancestry, that died of intestinal and mesenteric tuberculosis, as the result of feeding on the unsterilized milk of tuberculous cows. These were the only cases in which he was able to exclude the possibility of other causes for the disease, but in these he was satisfied that the milk was alone to blame.

After a lecture of the author's at Providence, R. I., a gentleman of North Hadley, Mass., a graduate of the Massachusetts Agricultural College, publicly stated that his only child, a strong, vigorous boy of one and one-half years, went

to an uncle's for one week and drank the milk of a cow which was shortly after condemned and killed in a state of generalized tuberculosis. In six weeks the child was noticeably falling off and in three months he died, a mere skeleton, with tuberculosis of the abdomen. The father could trace no tuberculosis among his near ancestors, but the mother's father and uncle had both died of it. She remains in excellent health.

Dr. E. O. Shakspeare (*Medical News*, March 30, 1892), attributes one-fifth of all deaths in infants and young children, feeding on milk, to tuberculosis, usually commencing in some part of the digestive organs.

These views are very positive and convincing and would seem to prove that very radical methods are necessary to protect our people from the dreadful disease. All authorities do not take the extreme view of the matter that Prof. Law does. Dr. T. Smith, of the United States Experiment Station at Washington, expresses himself as follows on the subject of tuberculosis and the public health:

"Much of the difficulty which arises when radical measures for the suppression of this disease are discussed is the economic value of the products of cattle—the meat and the milk. The somewhat heterogeneous views prevailing in this country concerning the use of the flesh of animals having but trifling tuberculous lesions are offset by the pretty definite attitude of European authorities, who claim that the meat from incipient cases of tuberculosis is entirely fit for food. This attitude enables Nocard, in his recommendations, to suggest the prompt fattening of all infected animals for the butcher. This difficulty has been solved temporarily, in this country, by turning the flesh of cattle which gave a reaction after the tuberculin test, even when the lesions were insignificant, into fertilizers. How far such destruction of food is called for in the interests of sanitation and sentiment is a question which must be left for future discussion and the wealth of the country to settle.

The use of the milk from infected animals is a question difficult to deal with when we consider on the one hand the clamors of public health and on the other those of the dairyman who finds it temporarily impossible to maintain his business if a large number of animals are at once withdrawn from his herd. It will be observed that Nocard does not forbid the use of the milk of incipient cases. Here also he avoids the stumbling block of reform in dairy matters by not making restrictions unnecessarily severe.

In order to obtain more information on the presence of tubercle bacilli in milk, the work reported by Dr. Schroeder on pages 75 to 87 was undertaken as a continuation of former investigations already published in Bulletin No. 3. These investigations, so far as they refer to single animals, confirm those of all former observers, that the milk of tuberculous animals is not so frequently infected as has been supposed. It may be laid down as a general rule that the milk of animals in the earliest stages of tuberculosis, and with perfect udders, does not contain tubercle bacilli. Only such as show signs of labored breathing and of emaciation, such as have enlarged external glands, or some difficulty with the udder or the uterus, should be looked upon with grave suspicion and their milk excluded at once from sale. If these extenuating circumstances be borne in mind by the public health officials, much hardship may now and then be avoided, and the

work of extermination of the disease be carried on more smoothly and more effectually in the end.

Another phase of this question which should not be overlooked is the relative danger of the air of cow stables to human beings. If more than three-fourths of all tuberculous cattle have been infected through the air of cow stables, why is not the air of stables equally dangerous to human beings frequenting them? It would certainly be of interest for public health officers to look into this matter more closely."

There seems to be no doubt but that steps should be taken, and authority given to some State Officer, to make a general inspection of the cows that are furnishidg milk to the people of the state. This Department is willing to co-operate in any measure that will be for the good of all concerned. We do not think that any radical course should be taken, but we do think that a great deal of good can be accomplished by a thorough physical examination of the cows.

Some of the milking herds of the state have, during the last few weeks, been tested with tuberculin. To what extent this should be done it is hard to tell at this time, but our judgment is that it is better to go slow and confine our attention, at first, to those aggravated cases in which there can be no doubt as to the existence of the disease. It seems to us that the question is one that the experiment stations of this country could be of great help in solving, and that the wholesale slaughter of our dairy herds should not be permitted until more knowledge is had on the subject.

There is no great cause for alarm and it is well not to arouse the public until some of the disputed points are settled. Certain questions are now established beyond the question of a doubt; act upon them and let time determine what is the next best thing to do.

ADDITIONAL PROSECUTIONS.

During my administration the following named persons have been prosecuted for violation of the milk law:

CEDAR RAPIDS.

June 1st. J. C. Milnis was fined twenty-five dollars and costs for selling milk containing less butter fat than the law requires. July 31st. R. Coultherd, and August 23d, A Backus were fined a like amount for the same offense.

September 29th. L. Beams was arrested for selling milk, from a wagon, without having a state permit which the law requires. The defendant was found guilty and paid a fine of ten dollars and costs.

CLINTON.

August 14th. M. C. Miller was before the court charged with selling milk that contained less than three pounds of butter fat to the one hundred pounds of milk. The charge was sustained and a fine of twenty-five dollars and costs imposed. The defense in this case was poor cows and poor feed.

COUNCIL BLUFFS.

May 16th. Frank Lewis plead guilty to the charge of selling milk below standard. The court imposed a fine of twenty-five dollars and costs.

August 17th. Henry Leonard and S. Carver were arrested; the charges being the operating of milk wagons without having taken out state permits. Affidavits were made, by the defendants, stating that they had mailed applications to this office for permits, enclosing the necessary fees, before informations were filed. The court, on the strength of the affidavits, released the defendants upon payment of costs in the cases.

DES MOINES.

June 29th. Wm. Gordon plead guilty to the charge of selling milk that contained less than three pounds of butter fat to

the one hundred pounds of milk. A fine of twenty-five dollars and costs, amounting in all to twenty-nine dollars and thirty-five cents, was paid by the defendant. The defendant sold milk from his store and bought the milk of another milk dealer. Mr. Gordon insisted that the milk sold by him was in the same condition as when bought. The tests made from two other samples also went below standard.

SIOUX CITY.

October 8th. A. Simoni & Co. were prosecuted for selling milk, from a store, without having procured a state permit from this office. The defendants plead guilty to the charge and were fined four dollars and seventy-five cents.

FINANCIAL STATEMENT.

FROM NOVEMBER 1, 1893, TO MAY 1, 1894.

Funds available Nov. 1, 1893		\$ 2,367.86
Commissioner's salary	\$ 750.00	
Commissioner's contingent expenses	348.53	
Clerk's salary	450.00	
Milk Agents' fees and contingent expenses	651.50	
Attorneys' fees	50.00	
Laboratory supplies	13.65	
Stationery and printing	31.50	
Office supplies	6.85	
Balance May 1, 1894	75.84	
		\$ 2,367.86 \$ 2,367.86

FROM MAY 1 TO NOVEMBER 1, 1894.

Funds available May 1, 1894		\$ 75.84
Amount appropriated, available July 4, 1894		10,000.00
Commissioner's salary	\$ 750.00	
Commissioner's contingent expenses	195.63	
Clerk's salary	450.00	
Clerk's salary (retiring clerk)	10.00	
Milk Agents' fees	430.75	
Laboratory supplies	115.73	
Office supplies	17.40	
Postage and envelopes	150.30	
Stationery and printing	67.45	
Printing dairy laws	51.00	
Freight and express	10.00	
Analysis and milk testing	10.10	
Balance November 1, 1894	7,817.39	
		\$10,075.84 \$10,075.84

RECAPITULATION.

Total funds available		\$12,367.86
Total expenditures from November 1, 1893, to May 1, 1894	\$ 2,291.02	
Total expenditures from May 1 to November 1, 1894	2,258.45	
Total expenditures from November 1, 1893, to November 1, 1894	\$ 4,550.47	
Balance of appropriations unexpended November 1, 1894	7,817.39	
		\$12,367.86 \$12,367.86
Collected for 359 permits, issued for the year ending July 4, 1894	359.00	
Turned over to the State Treasurer for permits issued	359.00	

TABLE IV.

LIST OF CITY MILK DEALERS FROM MAY 1, TO NOVEMBER 1, 1904.

Showing permit number where required; name and location; manner of delivering milk; number of tests; highest, lowest and average test; number of times milk has tested below standard.

BURLINGTON

Permit number.	NAME.	Manner of deliver- ing milk	Number of tests made.	Highest test.	Lowest test.	Number of times below standard	Average.
283	Binder Bros	Wagon	10	4.00	3.40		3.64
	Bosch, C. L.	Hand	1	2.25	2.20	1	2.20
326	Bowman, H. C.	Wagon	9	3.90	3.00		3.49
124	Buhrmaster, C. H.	Wagon	8	4.10	3.10		3.67
	Chester, C. F.	Hand	4	7.00	4.80		5.52
133	Dailey, C.	Depot	9	4.00	3.00		3.40
87	Deckstein, F.	Wagon	6	3.80	3.10		3.65
187	Ernst, F.	Wagon	9	3.90	3.00		3.51
301	Ernst, G. G.	Wagon	9	4.10	3.00		3.47
152	Grateknapp, H.	Hand	3	3.90	3.80		3.87
88	Gregg, B. F.	Wagon	8	4.30	3.60		3.86
158	Hall, G. M.	Wagon	3	4.90	4.20		4.50
136	James, J.	Wagon	7	3.90	3.00		3.47
	Kammann, W.	Hand	1	3.60	3.60		3.60
101	Koestens, H. C.	Wagon	7	3.80	1.90	1	3.14
122	Leak, Geo.	Wagon	6	4.10	3.00		3.42
121	Leak, H. D.	Wagon	4	4.00	3.40		3.75
310	Lichtenburg, F.	Wagon	3	3.70	3.00		3.43
	Lunimann, F.	Hand	2	3.60	3.00		3.60
135	Parsons, F. M.	Wagon	8	5.80	4.20		4.57
399	Perry, J. A.	Wagon	3	4.00	3.20		3.63
85	Pratt, C.	Depot	11	4.60	3.00		3.93
302	Rogers, F. L.	Wagon	7	3.60	3.10		3.29
89	Runge, A. A.	Wagon	1	5.00	5.00		5.00
232	Santl, A.	Depot	3	3.40	2.20	1	2.90
86	Stephens, T. L.	Wagon	2	3.60	3.40		3.50
273	Swendenburg, F. & Co.	Wagon	7	3.90	3.00		3.34
24	Swords, E. J.	Wagon	10	3.70	3.00		3.37
107	Thompson, W. H.	Wagon	3	3.60	3.30		3.43
120	Van Winkle, O. G.	Wagon	8	4.00	3.10		3.66
151	Vaughn, S. T.	Wagon	3	3.40	3.00		3.18
350	Vogelgesang Bros	Wagon	10	4.40	2.40	1	3.34
			185			4	3.80

CEDAR RAPIDS.

Permit number.	NAME.	Manner of deliver- ing milk.	Number of tests made.	Highest test.	Lowest test.	Number of times below standard.	Average.
195	Berry & Bear	Wagon	8	4.00	3.20		3.80
	Booth, S. C.	Hand	4	4.20	3.00		3.60
	Booth, A. C.	Hand	4	4.00	3.00		3.90
380	Beams, L.	Wagon	4	4.20	4.20		4.20
216	Brems, J. F.	Depot	1	4.00	4.00		4.00
284	Backus, A.	Wagon	3	4.60	3.60	1	3.76
71	Brock, N. G.	Wagon	6	5.00	3.20		4.50
126	Bunger, E. W.	Wagon	7	5.00	3.20		4.57
	Buchanan, A.	Wholesale	4	4.00	3.80		3.94
	Buchanan, G.	Wholesale	4	4.00	3.90		3.70
125	Cosither, R.	Wagon	3	4.40	3.40	1	3.56
	Dougan, W. J.	Wholesale	4	4.20	3.20		3.90
65	Golden, F. D.	Depot	11	4.40	3.40		4.00
	Gordon, J. W.	Wholesale	2	4.00	3.80		3.90
148	Groat, P. M.	Wagon	3	4.60	3.60		4.04
325	Hunter, W. H.	Wagon	5	4.00	3.00		3.60
283	Johanson, A.	Wagon	1	4.20	4.20		4.20
69	Kilmeyer, F.	Wagon No. 1	7	4.40	3.60		3.91
70	Kilmeyer, F.	Wagon No. 2	4	4.40	3.60		4.10
14	Kietherman, J. S.	Wagon	2	4.20	3.80		4.00
15	Kourtaj, J.	Wagon	7	4.60	4.00		4.46
73	Meeker, J. W.	Wagon	6	4.40	4.00		4.13
60	Miller Bros.	Wagon	7	4.20	3.40		3.91
68	Milnes, J. C.	Wagon	2	4.20	3.80	1	3.67
21	McDonald, E. E.	Wholesale	2	4.20	4.20		4.20
59	Putman, W. J.	Wagon	1	4.00	4.00		4.00
208	Peryman, T.	Wagon	8	4.40	3.40		3.97
64	Porter, J. S.	Wagon	6	5.00	3.80		4.17
	Putman, C.	Hand	1	3.40	3.40		3.40
282	Robb Bros	Depot	14	4.40	3.60		4.04
72	Sloan, J.	Wagon	0	4.40	3.60		3.96
157	Smith, S. G.	Wagon	1	3.80	3.80		3.80
267	Smith, C. F.	Wholesale	4	4.00	3.80		3.95
	Smith, A. H.	Wagon	2	3.40	3.00		3.20
312	Stoner, G.	Wagon	1	4.00	4.00		4.00
74	Suncliff, J.	Depot	3	4.01	4.00		4.00
304	Taft, C.	Depot	4	4.00	3.80		3.93
	Thurston, A. H.	Wholesale	2	4.40	4.00		4.20
133	Usher, J.	Wagon	9	4.60	3.60		3.87
182	Worner, J.	Wagon	2	4.00	3.80		3.90
269	Wendler, D. W.	Wagon	9	4.40	3.60		3.78
	Willard, D. W.	Wagon	2	4.20	4.00		4.10
13	Williams Bros.	Wagon	3	5.00	3.80		4.33
	Woodward, C.	Wholesale	4	3.60	3.00		3.25
			101			3	3.93

CLINTON

54	Bach, J.	Wagon	4	5.10	2.80	1	3.79
182	Bost, J.	Wagon	4	4.00	3.30		3.67
57	Boytton, O. L.	Wagon No. 1	3	4.30	3.20		3.23
58	Boytton, O. L.	Wagon No. 2	3	3.70	3.60		3.63

CLINTON—CONTINUED.

Permit number.	NAME.	Manner of delivering milk.	Number of tests made.	Highest test.	Lowest test.	Number of times below standard.	Average.
56	Clausen, C.	Wagon	4	4.30	3.70		4.00
49	Dieller, H.	Hand	1	4.10	4.10		4.10
7	Dunn, J. F.	Wagon	4	3.80	3.00		3.42
47	Gertzen, D.	Wagon	3	4.30			4.00
181	Haring, W. G.	Wagon	4	3.40	3.00		3.67
48	Johnson, A.	Wagon	2	3.70	3.50		3.60
50	Johnson, N.	Wagon	4	3.20	3.00		3.15
183	Miller, M. C.	Wagon	3	4.00	3.60		3.73
55	Morrissey, O.	Wagon	4	4.60	2.60	3	3.30
184	Nicolaissen, H.	Wagon	3	3.80	3.00		3.40
180	Oleson, J. S.	Wagon	4	4.00	3.50	2	3.67
33	Olsen, S.	Wagon	1	3.00	3.00		3.00
32	Paulsen, M.	Wagon	3	3.80	3.40		3.53
179	Paulson, C.	Wagon	3	3.50	2.80	1	3.13
51	Peterson, C.	Wagon	1	3.00	3.00		3.00
4	Schmidt, P.	Wagon	4	5.50	3.00		3.70
25	Seesar, C.	Wagon	4	4.50	3.10		3.62
			4	4.10	3.10		3.52
			69			6	3.51

COUNCIL BLUFFS.

111	Arnold, P. J.	Wagon	7	4.00	3.20		3.57
245	Baker, W. W.	Wagon	2	4.10	3.80		3.95
270	Brown, G. L.	Wagon	4	4.60	3.80		4.20
297	Carver, S.	Wagon	6	4.00	3.00		3.59
38	Corlie, E. W.	Wagon	3	3.40	3.20		3.27
251	Dalton, N.	Wholesale	1	4.00	4.00		4.00
329	Green, C.	Wagon	8	4.00	3.00		3.41
80	Hunt, J. F.	Wagon	3	3.60	3.20		3.40
244	Jensen, S.	Wagon	1	4.00	3.10		3.60
331	Johnson & Co.	Wagon	6	3.70	3.70		3.70
136	Johnson Bros.	Wagon	4	4.00	3.80		3.92
290	Larson, N. C.	Wagon	4	4.20	3.70		3.92
246	Leonard, H.	Wagon	8	4.40	3.40		3.87
246	Lewis, N. & Son	Wagon	8	4.20	2.20	1	3.57
110	Malby, D.	Hand	1	4.60	4.00		4.00
253	Martin, H. H.	Wagon	8	4.00	3.30		3.59
252	Milliard, F. O.	Wagon	8	4.10	3.10		3.47
250	Neilson, P.	Wagon	2	4.00	3.70		3.85
247	Nilson, N. P.	Wagon	3	4.00	3.70		3.90
247	Ommen, E.	Wagon	4	3.80	3.30		3.50
249	Peterson, F.	Hand	1	3.10	3.10		3.10
280	Ray, J.	Wagon	6	5.00	3.80		4.15
30	Reid, A. H.	Wagon	2	4.20	4.00		4.10
199	Scherrer, G.	Wagon	4	4.20	3.00		3.90
	Skodsholm, O.	Wagon	8	4.00	3.10		3.45
			130			1	3.60

DAVENPORT.

Permit number.	NAME.	Manner of delivering milk.	Number of tests made.	Highest test.	Lowest test.	Number of times below standard.	Average.
21	Arp, H.	Hand	2	3.80	3.20		3.50
200	Anderson, C. A.	Hand	1	5.00	5.00		5.00
257	Beyer, B.	Hand	1	3.40	3.40		3.40
201	Blunk, Wm.	Hand	1	4.00	4.00		4.00
263	Boltz, H.	Wagon	3	3.80	3.20		3.47
263	Bruh, H.	Wagon	1	3.60	3.60		3.60
263	Brusch, D.	Hand	1	4.60	4.60		4.60
196	Bruhn, Wm.	Hand	1	4.80	4.80		4.80
196	Cowiesall, J.	Wagon	3	4.10	3.40		3.63
344	Daasch, E.	Hand	1	4.20	4.20		4.20
372	Doeschler, J.	Hand	1	3.60	3.60		3.60
372	Dressel, F.	Wagon	1	3.80	3.80		3.80
344	Eckstein, J.	Hand	2	3.80	3.40		3.60
372	Eggers, H.	Hand	1	4.20	4.20		4.20
343	Ehler, A.	Hand	1	4.80	4.80		4.80
343	Einfeld, E.	Hand	1	5.00	5.00		5.00
75	Fleming, P.	Wagon	3	4.20	3.00		3.47
243	Frahm, H.	Wagon	3	3.80	3.00		3.17
358	Gankler, J.	Wagon	1	3.50	3.50		3.50
265	Garvey, M.	Hand	1	5.00	5.00		5.00
265	Gayman, T.	Wagon	3	3.40	3.00		3.20
163	Gerdes, J.	Wagon	3	3.80	3.30		3.53
145	Goetsch, H.	Wagon	2	4.20	3.40		3.80
289	Greenwald, J.	Hand	2	3.80	3.00		3.40
194	Honer, C.	Wagon	4	4.00	3.20		3.70
174	Honer, J.	Wagon	2	4.20	3.80		4.00
161	Hennings, D.	Depot	1	3.80	3.80		3.80
103	Herriman, H. C.	Wagon	1	3.20	3.20		3.20
215	Juergensen, J.	Wagon	6	3.80	3.30		3.57
76	Kanfufsky, J.	Wagon	1	3.60	3.60		3.60
18	Kellogg, H.	Wagon	1	3.20	3.20		3.20
292	Kuhlmann, H.	Wagon	1	3.00	3.00		3.00
260	Khuss, F. W.	Hand	1	4.80	4.80		4.80
193	Koch, J.	Wagon	3	4.00	3.80		3.93
178	Koep, H.	Wagon	3	4.00	3.60		3.77
178	Lange, H.	Wagon	2	4.00	3.80		3.90
290	Martens, J.	Hand	1	4.40	4.40		4.40
262	Maves, J.	Wagon	3	3.80	3.60		3.73
264	Mess, H.	Wagon	1	3.00	3.00		3.00
173	Miller, H.	Wagon	3	3.60	3.20		3.43
100	Moffat, A.	Wagon	4	3.80	3.00		3.33
208	Moffat, G. A.	Wagon	2	3.60	3.00		3.30
147	Nagel, H.	Wagon	5	3.80	3.20		3.56
149	Nason, B. F.	Wagon	1	3.40	3.40		3.40
149	Neubert, W.	Hand	1	3.80	3.80		3.80
149	Neuhans, G.	Hand	1	5.40	5.40		5.40
149	Nicola, J.	Hand	1	3.00	3.00		3.00
149	Nissen, J.	Hand	1	4.40	4.40		4.40
149	Oehler, A.	Hand	1	5.20	5.20		5.20
149	O'Laughlin, T.	Hand	1	5.20	5.20		5.20

DAVENPORT—CONTINUED.

Permit number.	NAME.	Manner of deliver- ing milk.	Number of tests made.	Highest test.	Lowest test.	Number of times below standard.	Average.
261	Peterson, P.	Wagon	4	3.80	3.20		3.40
	Peterson, C.	Hand	1	4.00	4.00		4.00
	Pieper, J.	Hand	1	3.60	3.60		3.60
359	Pieper, R.	Depot	1	3.80	3.80		3.80
	Poell, F.	Hand	1	3.80	3.80		3.80
198	Pumpkin, Wm.	Wagon	1	4.20	4.20		4.20
311	Ramm, M.	Wagon	1	5.20	3.00		3.83
188	Ramm, F.	Wagon	1	4.00	3.60		3.80
	Rausch, F.	Wagon	1	5.80	3.80		5.80
140	Reichert, P.	Wagon	4	4.80	2.60		3.83
313	Ruch, P.	Wagon	4	3.50	3.20		3.40
278	Rissmann, C.	Wagon	1	3.40	3.40		3.40
345	Sass, W.	Wagon	1	4.60	4.60		4.60
269	Schmidt, J.	Wagon	3	3.40	3.20		3.30
230	Schrum, M.	Wagon	3	3.60	3.20		3.43
306	Scroeder, C.	Hand	2	4.60	3.40		3.93
162	Severtsen, C. T.	Wagon	2	3.60	4.60		3.30
	Silk, C.	Hand	1	4.60	4.60		4.60
217	Springborn, P.	Wagon	3	3.50	3.60		3.16
150	Steen, F.	Wagon	4	4.50	3.80		4.00
	Smith, A. G.	Hand	1	4.20	4.20		4.20
	Stender, F.	Hand	1	5.00	5.00		5.00
	Swanson, N. P.	Hand	1	4.30	4.30		4.30
	Taylor, G.	Hand	1	5.20	5.20		5.20
143	Thiesen, P.	Wagon	4	4.30	3.50		3.92
	Wilhelm, C.	Hand	1	4.20	4.20		4.20
	Winkler, J.	Hand	1	4.00	4.00		4.00
169	Woeck, J.	Wagon	4	5.60	4.00		4.45
207	Zaro, J.	Wagon	3	3.60	3.40		3.47
			153				3.96

DES MOINES.

343	Anderson, A.	Wagon	3	3.60	3.00		3.27
137	Anderson, P. H.	Depot	6	4.60	3.60		3.90
	Arthur, R. C.	Wagon	3	4.70	3.20		4.10
	Bartlett, L. D.	Wagon	1	3.60	3.60		3.60
1	Blackman, F. M.	Wagon	8	4.00	3.40		3.51
	Booth, E. E.	Depot	2	4.60	3.60		3.50
	Borgenson, A.	Wagon	3	4.60	3.60		3.93
316	Bradon Bros.	Wagon No. 1	6	4.20	3.20		3.83
227	Brennan, J. O.	Depot	2	3.20	3.10		3.15
	Campbell, E.	Wagon	5	5.60	3.40		4.44
347	Childs, C. P.	Depot	1	3.60	3.60		3.60
44	Churchman, M. W.	Wagon	2	3.60	3.20		3.37
340	Clark, H. S.	Depot	1	3.80	3.80		3.80
106	Cruikshank, J.	Wagon	4	4.60	3.60		3.90
113	Des Moines Dairy Co.	Wagon No. 1	6	5.40	3.40		4.67
114	Des Moines Dairy Co.	Wagon No. 2	2	3.60	3.20		3.40
115	Des Moines Dairy Co.	Wagon No. 4	3	3.40	3.20		3.25

DES MOINES—CONTINUED.

Permit number.	NAME.	Manner of deliver- ing milk.	Number of tests made.	Highest test.	Lowest test.	Number of times below standard.	Average.
118	Des Moines Dairy Co.	Wagon No. 8	5	4.40	3.10		3.79
112	Des Moines Dairy Co.	Depot	3	3.80	3.80		3.48
	Dinnell, W. H.	Depot	1	3.80	3.80	1	3.60
33	Doolphin, A. A.	Wagon	3	3.70	3.30		3.35
2	Doulittle, J. W.	Wagon	5	3.60	3.00		3.43
	Evans, F. M.	Depot	4	7.00	3.20		5.00
	France, E. M.	Depot	6	4.00	2.80	1	3.45
328	Gordon, W.	Depot	5	3.80	2.40	2	3.10
310	Graham, M. J.	Wagon	3	4.60	3.20		3.60
66	Grand Avenue Creamery.	Wagon	6	4.60	3.20		3.73
297	Hagan, B.	Wagon	3	4.20	3.40		3.77
	Harding, A. W.	Wagon	3	4.50	4.00		4.17
	Harding, A. W.	Depot	4	4.60	3.00		3.97
130	Harrington, J.	Depot	1	3.40	3.40		3.40
	Hawks, C.	Depot	4	5.60	4.00		4.65
116	Homan, O. M.	Depot	4	4.60	3.10		3.47
61	Howard, T. G.	Wagon	3	3.60	2.80		2.53
229	Huntoon, H. M.	Wagon	5	4.00	3.10		3.66
	Imant, C. J.	Depot	3	4.40	3.60		4.10
46	Johnson, C. R.	Wagon	3	3.60	3.20		3.47
	Kreps, M. H.	Wagon	6	6.20	3.50		4.18
29	Lass, A. C.	Wagon	2	4.80	4.40		4.60
	Lazara, S.	Depot	1	3.50	3.50		3.39
81	Leipid & Petticrew.	Depot	4	4.80	3.60	1	3.18
266	Lewis, W. M.	Depot	2	4.40	3.60		4.00
	Libbie, L.	Wagon	4	2.90	3.20		3.32
31	Lowe, F. J.	Depot	4	4.00	3.40		3.65
42	McConnell Bros.	Wagon	5	3.70	3.30		3.32
	McKee, B. J.	Depot	1	4.00	4.00		4.00
32	McPherson, J. M.	Depot	2	4.60	3.20		3.47
	Maple, M. C.	Wagon	4	4.60	3.60		4.60
43	Mathes, C.	Wagon	5	3.80	3.30		3.28
303	Oleson, J.	Wagon	6	2.80	2.83		2.82
	Parker, W. J.	Depot	4	4.40	3.40		3.90
	Patterson, S.	Depot	1	3.50	3.50		3.50
231	Parton, F. G.	Wagon	6	4.80	3.80		4.15
211	Paul, H. A.	Depot	4	4.40	2.60	1	3.25
230	Paul, F.	Depot	1	4.60	3.60	1	3.33
144	Payton, W. W.	Wagon	5	3.60	3.30		3.44
142	Proctor Bros.	Wagon	3	3.40	3.60		3.23
	Reddish, J. R.	Depot	1	3.00	3.00		3.00
34	Reynolds, G.	Depot	5	3.40	3.00		3.20
298	Rhea, E. E.	Wagon	3	6.00	3.60		4.57
	Robinson, F. P.	Wagon	2	4.20	3.60		4.60
	Rogers, R.	Depot	7	3.90	3.00		3.60
364	Sanders, H.	Depot	2	4.00	3.60	1	3.60
373	Sarsfield, J. P.	Depot	1	3.40	3.40		3.40
	Sayre, D. E.	Depot	1	3.80	3.80		3.80
43	Schoenfeldt, G.	Wagon	4	3.60	3.20		3.47
105	Scott, W. W.	Depot	6	4.80	3.60		4.61
38	Smith, J. S.	Wagon	4	4.00	3.20		3.47

DES MOINES—CONTINUED.

Permit number.	NAME.	Manner of deliver- ing milk.	Number of tests made.	Highest test.	Lowest test.	Number of times below standard.	Average.
378	Stark & Miller	Depot	1	3.30	3.20		3.20
186	Stiebbins & Heavilin	Wagon	5	4.20	3.60		3.76
	Stiebbins, W. F.	Wagon	4	4.00	4.00		4.00
	Stitt, S. S.	Wagon	1	4.00	4.00		4.00
139	Stookey, D. M.	Wagon	5	4.20	3.60		3.80
	Stout, D. F.	Depot	1	2.00	2.00	1	2.00
	Stradley, W. W.	Wagon	1	3.60	3.60		3.60
241	Strickland, L. M.	Wagon	6	4.40	3.80		4.18
323	Stubbs, M. A.	Wagon	2	3.90	3.60		3.75
66	Terry, A.	Wagon	2	3.60	3.50		3.55
67	Terry & West	Wagon	4	3.50	3.20		3.57
254	Vail, J.	Depot	6	5.40	3.60		4.27
37	Van Linden, L. J.	Depot	6	4.00	3.30		3.64
140	Van Fleet, T.	Depot	4	4.10	3.20		3.62
306	Von Steuben, J. P.	Wagon No. 1	5	3.60	3.30		3.42
307	Von Steuben, J. P.	Wagon No. 2	5	3.90	3.20		3.46
117	Watts, J. C.	Wagon	6	4.00	2.40	1	3.50
	Weissinger & Womelsdorf	Depot	3	4.80	3.60		4.23
79	West, C. F.	Wagon	1	3.90	3.90		3.90
210	West, F.	Wagon	3	4.00	3.40		3.80
202	Wheeler, A. M.	Depot	3	3.40	2.40	1	3.07
228	Wilburg, A.	Wagon	3	5.00	3.00		3.80
315	Wilson, J. F.	Depot	3	3.60	3.00		3.23
138	Wilson, L. E.	Wagon	4	3.70	3.20		3.42
274	Wollbigge, F.	Wagon No. 1	6	3.80	3.10		3.43
275	Wollbigge, F.	Wagon No. 2	1	3.80	3.80		3.80
16	Womelsdorf, T. H.	Depot	3	6.00	4.73		4.73
40	Woodward & Morgan	Wagon No. 1	5	4.00	3.20		3.50
41	Woodward & Morgan	Wagon No. 2	2	3.00	3.00		3.00
286	Young, M. E.	Wagon	4	3.90	3.40		3.67
	Zickafoose & Son	Wagon	1	3.20	3.20		3.20
164	Zinn, D.	Depot	5	4.10	3.00		3.56
			357			13	3.68

DUBUQUE.

307	Barrett, J.	Wagon	5	4.20	2.80	1	3.32
	Bremer, J.	Hand	1	3.20	3.20		3.20
320	Brinke, C.	Wagon	3	4.00	3.00		3.47
170	Buckingham, T.	Wagon	5	4.20	3.40		3.76
	Farrell, T.	Wagon	2	3.80	3.60		3.70
	Felan, C.	Hand	1	3.60	3.00		3.60
271	Fluetsch & Son	Wagon No. 1	6	3.80	2.80	1	3.30
273	Fluetsch & Son	Wagon No. 2	1	3.80	3.80		3.80
94	Gadient, J.	Wagon	6	4.00	3.20		3.57
358	Gartner, A.	Wagon	8	4.00	2.80	1	3.30
95	Hemmi, E.	Wagon No. 1	5	4.00	3.40		3.74
363	Herron, H. L.	Wagon	5	4.00	3.00		3.45
190	Hofertlo, J.	Depot	2	4.40	4.20		4.30
92	Jecklio, J. H.	Wagon No. 1	6	4.00	3.20		3.82
93	Jecklin, J. H.	Wagon No. 2	2	4.00	3.00		3.84

DUBUQUE—CONTINUED.

Permit number.	NAME.	Manner of deliver- ing milk.	Number of tests made.	Highest test.	Lowest test.	Number of times below standard.	Average.
266	Knoekle, A.	Depot	6	4.20	3.00		3.47
175	Mueller, E.	Depot	2	4.80	3.80		4.30
176	Mueller, E.	Wagon	2	3.80	3.60		3.70
90	Meyer, H.	Wagon No. 1	6	5.60	3.20		3.62
91	Meyer, H.	Wagon No. 2	3	4.80	4.40		4.60
102	McKinney, C.	Wagon	4	4.20	3.00		3.50
165	Paley, F.	Wagon No. 1	4	3.60	3.00		3.00
168	Paley, F.	Wagon No. 2	1	3.00	3.00		3.00
167	Paley, A.	Wagon	6	4.00	3.40		3.65
340	Pfohl, F. J.	Depot	3	5.00	4.00		4.53
29	Pryst, R.	Wagon	3	4.20	3.60		3.87
98	Runyan, G. H.	Depot	7	4.20	3.00		3.49
101	Schlegel, M.	Wagon	5	4.00	3.20		3.76
97	Seemon, P.	Wagon	5	5.00	2.40	1	3.68
365	Sheridan, B.	Depot	4	4.00	3.00		3.70
267	Spenetzky, A.	Wagon	5	5.00	3.00		4.24
230	Sulter, L.	Wagon	7	3.80	3.00		3.25
222	Thorman, G. A.	Wagon No. 1	7	4.20	3.00		3.60
223	Thorman, G. A.	Wagon No. 2	2	3.40	3.00		3.20
224	Thorman, G. A.	Depot	2	4.60	4.00		4.30
321	Walker, C. H.	Depot	5	3.80	3.00		3.48
361	Wieland, A.	Depot	3	4.20	3.40		3.87
155	Wormington, E.	Wagon	2	4.00	3.00		3.50
			152			4	3.67

KEOKUK.

	Croughan, O.	Hand	1	4.00	4.00		4.00
26	Duffield, H.	Wagon	12	6.00	3.60		4.44
277	Emerson & Veith	Wagon	5	4.50	3.60		4.07
104	Ferris, R., Jr.	Wagon	9	4.40	3.60		4.15
130	Jaycox, J. L.	Wagon	11	4.40	3.60		4.02
129	Johnston, W. L.	Wagon	4	4.80	3.80		4.12
383	Kottener & Kofs	Wagon	3	4.50	3.90		4.20
250	Lang, F.	Hand	9	6.60	3.20		4.16
	Larson, J.	Hand	1	6.80	6.80		6.80
	Long & Hunt	Depot	3	4.20	3.00		4.03
221	Mackley, G. J.	Wagon	8	5.40	3.60		4.21
	Nelson, C. J.	Hand	1	5.20	5.20		5.20
306	Oertel, F.	Wagon	5	5.00	3.60		4.22
	Parrott, J.	Hand	1	3.80	3.80		3.80
	Patterson, D.	Wagon	3	4.40	3.20		3.73
348	Patterson, G. E.	Depot	3	3.60	3.20		3.40
281	Raber, C. N.	Wagon	9	5.00	3.20		4.06
	Rollins, J. L.	Hand	1	4.60	4.60		4.60
	Salford, C. C.	Wagon	9	4.10	3.70		3.92
83	Sample, J. L.	Wagon	6	6.00	5.40		4.90
128	Schappach, W. J.	Wagon	6	5.00	3.60		4.13
	Sisters of Charity	Hand	1	4.00	4.00		4.00
	Swanson, A.	Hand	1	4.00	4.00		4.00

KEOKUK—CONTINUED.

Permit number.	NAME.	Manner of delivering milk.	Number of tests made.	Highest test.	Lowest test.	Number of times below standard.	Average.
.....	Teiber, D.	Hand	1	4.00	4.00	.....	4.00
99	Wright, C. A.	Wagon	10	4.20	3.20	.....	3.66
84	Yenawise, W. H.	Wagon	9	4.20	3.60	.....	3.85
			132				4.22

MUSCATINE.

10	Bierman, H. R.	Wagon No. 1	14	4.40	2.60	1	3.70
11	Bierman, H. R.	Wagon No. 2	12	4.40	2.60	1	3.62
.....	Bodman, H. F.	Hand	1	3.00	3.00	.....	3.00
12	Danhert, I.	Wagon	13	4.20	2.80	1	3.58
134	Greenway, J.	Depot	7	4.80	4.00	.....	4.31
132	Harris Bros.	Hand	14	4.40	3.20	.....	3.54
.....	Jayn, H.	Hand	1	5.80	5.80	.....	5.80
.....	Knott, J.	Wagon	3	4.00	3.40	.....	3.73
197	Lake, P. B.	Wagon	6	4.40	3.00	.....	4.05
172	Lord, B. W.	Wagon	11	4.60	3.20	.....	3.93
3	Luendecker, C.	Wagon	15	5.80	3.20	.....	3.92
.....	Manley, M.	Hand	2	3.80	2.60	.....	3.70
78	Mittman Bros.	Wagon	14	4.60	2.80	1	3.64
200	Ogilvie, W. J.	Wagon	14	4.80	2.50	1	3.78
.....	Robertson, J. F.	Hand	2	5.20	5.20	.....	5.20
154	Thomas, J. J.	Wagon	1	3.40	3.40	.....	3.40
.....	Vricks, M.	Hand	3	7.00	5.00	.....	5.80
22	Will, C. H.	Wagon	11	4.80	3.00	.....	3.83
127	Will Bros.	Wagon	13	4.40	3.40	.....	4.03
			156			5	4.02

OTTUMWA.

.....	Armstrong, J. N.	Hand	1	6.20	6.20	.....	6.20
.....	Bowles, J. T.	Hand	2	5.40	4.30	.....	4.85
212	Bizer, J. F.	Wagon	3	4.20	3.60	.....	3.80
.....	Brower, B.	Hand	1	4.30	4.30	.....	4.30
.....	Coughlin, W. K.	Hand	1	5.60	5.60	.....	5.60
180	Daggett, E.	Wagon	3	5.20	3.00	.....	4.07
.....	Dana, K. P.	Hand	1	3.60	3.60	.....	3.60
276	Darner, F. W.	Wagon	1	3.40	3.40	.....	3.40
.....	Dimmitt, H. C.	Hand	1	4.50	4.80	.....	4.80
.....	Dobbias, F. M.	Hand	1	4.20	4.30	.....	4.30
.....	Dorothy, E.	Hand	2	3.30	3.20	.....	3.25
.....	Farrington, J. A.	Hand	1	3.80	3.80	.....	3.80
131	French, E. K.	Wagon	2	4.20	4.00	.....	4.10
226	Fullum, M. B.	Wagon	2	3.60	3.40	.....	3.50
.....	Galligar, J.	Hand	1	4.40	4.40	.....	4.40
.....	Galpin, J.	Hand	1	4.20	4.20	.....	4.20
.....	Gibbs, W. E.	Hand	3	4.80	4.40	.....	4.57
.....	Harris, M. B.	Hand	1	3.70	3.70	.....	3.70
.....	Harper, W. T.	Hand	1	4.50	4.50	.....	4.50
185	Harsh & Simmons.	Wagon	4	4.90	2.40	1	3.95

OTTUMWA—CONTINUED.

Permit number.	NAME.	Manner of delivering milk.	Number of tests made.	Highest test.	Lowest test.	Number of times below standard.	Average.
.....	Hartley, G.	Hand	1	6.00	6.00	.....	6.00
.....	Hill, E. B.	Hand	2	5.30	4.60	.....	4.95
.....	Hughes, E. P.	Hand	1	3.70	3.70	.....	3.70
.....	Israel, M.	Hand	1	6.00	6.00	.....	6.00
.....	Lewis & Johnson.	Hand	1	3.00	3.00	.....	3.00
.....	Major, A. J.	Hand	1	3.80	3.80	.....	3.80
.....	McMichael, P.	Hand	2	3.40	3.40	.....	3.40
204	Michael, B. F.	Wagon	4	4.70	3.40	.....	4.03
.....	Michaels, L. J.	Hand	1	4.60	4.60	.....	4.60
162	Montague, H.	Wagon	4	5.40	3.40	.....	4.42
.....	Moss, W. J.	Hand	1	6.00	6.00	.....	6.00
.....	Naylor, C.	Hand	1	3.80	3.80	.....	3.80
203	Newman, G. W.	Wagon	3	4.40	3.20	.....	3.73
.....	Nord, Wm.	Hand	1	5.00	5.00	.....	5.00
371	Parker, J. S.	Wagon	2	5.00	4.60	.....	4.80
.....	Rankin, W. W.	Hand	1	5.20	5.20	.....	5.20
.....	Rankin, A. E.	Hand	1	4.80	4.80	.....	4.80
210	Shreve, T.	Wagon	2	4.40	4.40	.....	4.40
213	Spanghower, I. L.	Wagon	3	3.60	3.20	.....	3.43
171	Stewart, A. L.	Wagon	2	3.40	3.40	.....	3.40
.....	Tripps, A. H.	Hand	1	4.00	4.00	.....	4.00
.....	Utterbach, J.	Hand	1	3.40	3.40	.....	3.40
.....	Webb, J. S.	Hand	1	4.00	4.00	.....	4.00
141	White, E. S.	Wagon	2	3.80	3.40	.....	3.60
.....	Yound, J. W.	Hand	1	4.30	4.20	.....	4.20
			73			1	4.28

SIOUX CITY.

294	Baby Milk Dairy.	Wagon	4	5.00	3.80	.....	4.22
.....	Bild Bros.	Wagon	2	3.60	3.20	.....	3.40
327	Bradstreet, A. J.	Wagon No. 1	3	3.60	3.20	.....	3.53
.....	Bradstreet, A. J.	Wagon No. 2	3	4.40	3.20	.....	3.84
240	Bradstreet, T. E.	Wagon	0	4.00	3.20	.....	3.43
259	Campbell, G. E.	Wagon	5	4.00	3.40	.....	3.68
.....	Daly, J.	Wagon	1	3.20	3.20	.....	3.20
253	Fahoy, M.	Wagon	6	3.60	3.20	.....	3.47
.....	Foran, C. J.	Wagon	1	3.40	3.40	.....	3.40
228	Franco, L.	Wagon	6	4.00	3.00	.....	3.53
356	Frisbie, W.	Wagon	1	4.00	4.00	.....	4.00
205	Heath, D. B.	Wagon	3	4.00	3.00	.....	3.60
295	Herman Bros.	Wagon	4	4.00	3.60	.....	3.82
.....	Jensen, G.	Wagon	2	3.60	3.20	.....	3.40
356	Jensen & Freese.	Wagon No. 1	6	4.00	3.40	.....	3.65
357	Jensen & Freese.	Wagon No. 2	3	4.40	3.20	.....	3.73
295	Jersey Milk Co.	Wagon	2	4.40	3.20	.....	3.80
305	Johnson, A. R.	Depot	5	4.40	3.40	.....	3.68
.....	Johnson, C.	Wagon	1	3.40	3.40	.....	3.40
223	Krumden, L.	Wagon	5	4.80	3.20	.....	3.88
.....	Morse, I. F.	Wagon	3	4.10	4.00	.....	4.03
.....	Metcalfe, M.	Wagon	1	3.40	3.40	.....	3.40

SIOUX CITY—CONTINUED.

Permit number.	NAME.	Manner of delivering milk.	Number of tests made.	Highest test.	Lowest test.	Number of times below standard.	Average.
293	Morgan, C. H.	Depot	4	3.60	3.60		3.60
108	Monlin, W. H.	Wagon No. 1	5	4.00	3.20		3.62
355	Neuguard, A.	Wagon	1	4.00	4.00		4.00
82	Olson, F., & Son	Wagon	4	4.20	3.00		3.62
333	Pegar & Britton	Wagon	2	3.80	3.80		3.80
236	Pfaff, C.	Wagon	9	4.40	3.00		3.89
237	Pfaff, L.	Wagon	6	4.00	3.20		3.59
---	Ray, W. D.	Wagon	2	4.00	3.80		3.90
332	Reese, C.	Wagon	3	3.60	3.40		3.50
---	Reynolds, J. F.	Wagon	1	4.40	4.40		4.40
---	Robinson, C. M.	Wagon	2	4.00	3.80		3.90
234	Rowe, J. N.	Wagon	7	4.00	3.00		3.57
354	Ruehl, J. H.	Depot	3	4.00	3.60		3.67
---	Schalke, W. O.	Wagon	1	3.00	3.60		3.00
349	Search, W.	Wagon	1	4.40	4.40		4.40
318	Shepherd, J. S.	Wagon	4	4.40	3.80		4.15
---	Simoni Bros.	Depot	3	3.40	3.60		3.10
335	Sioux City Creamery	Depot	4	4.20	3.40		3.90
333	Smithers, T. H.	Wagon	2	3.80	3.60		3.70
334	Sorrenson, C.	Wagon	7	5.00	3.60		3.91
5	Storer, A. W.	Wagon No. 1	5	4.20	3.80		3.90
6	Storer, A. W.	Wagon No. 2	1	4.00	4.00		4.00
353	Swanson, S. A.	Wagon	1	4.00	4.00		4.00
---	Taylor, E. F.	Wagon	2	3.60	3.60		3.60
296	Thompson, J. F.	Wagon	4	4.00	3.00		3.65
110	Treadway, T. P.	Wagon	8	4.40	3.00		3.62
324	Upton, J. L.	Wagon	1	4.00	4.00		4.00
---	Washington, A. L.	Depot	1	4.00	4.00		4.00
27	Wilcox, D. O.	Wagon	4	3.80	3.00		3.40
8	Woodcock, A. C.	Wagon No. 1	1	4.00	4.00		4.00
9	Woodcock, A. C.	Wagon No. 2	4	4.00	3.80		3.92
			176				3.72

TABLE V.

Shows the total number of dealers; total number of tests made; number below standard; the average for each city and the eleven combined from May 1st to November 1st, 1894.

	LOCATION.	Number dealers.	Number tests.	Number tests below standard.	Average test.
1	Burlington	32	185	4	3.80
2	Cedar Rapids	45	191	3	3.92
3	Clinton	22	69	6	3.51
4	Council Bluffs	26	120	1	3.69
5	Davenport	80	357		3.96
6	Des Moines	100	357	13	3.68
7	Dubuque	38	152	4	3.67
8	Keokuk	27	132		4.22
9	Muscataine	19	136	5	4.02
10	Ottumwa	45	73	1	4.28
11	Sioux City	53	176		3.72
		485	1,704	27	3.86

TABLE

LIST OF CREAMERIES AND CHEESE FACTORIES IN THE STATE,
FORMATION PERT

Office record number	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.
<i>Adair County.</i>			
50	Adair	Adair Creamery	Rowell & Beck
140	Fontanelle	Blue Grass Creamery	A. L. Stewart & Co.
181	Greenfield	Greenfield Creamery	J. W. Darby
278	Hebron	Hebron Creamery	A. R. Haskell & Co.
313	Orient	Orient Co-op. B. and C. Ass'n	C. J. Wiley, Sec'y
<i>Adams County</i>			
314	Carl	Carl Creamery Co.	Coats & Walker
166	Corning	Corning Creamery Co.	J. E. Anderson
30	Corning	Iowa Butter and Cheese Co.	F. M. Widner, Sec'y
311	Corning	Silver Glen Creamery	Bresoe & Anderson
315	Mercer Center	Mercer Center	Bresoe & Anderson
316	Nodaway	Nodaway Joint Siks. Cheese Co.	S. J. Simpson
317	Prescott	Prescott B. and C. Ass'n	C. T. Okoy
<i>Allamakee County.</i>			
318	Dorchester	New Albin Creamery Co.	New Albin Creamery Co.
319	Lansing	New Albin Creamery Co.	New Albin Creamery Co.
320	Lycurgus	Lycurgus Creamery	G. L. Hubbell, Sec'y
321	New Albin	New Albin Creamery Co.	New Albin Creamery Co.
60	Postville	Postville Farmers' Co-op.	Elison Orr, Sec'y
322	Postville	Union Creamery Co.	Union Creamery Co.
323	Quandahl	Arctic Spring Creamery	J. D. Johnson
324	Village Creek	Village Creek	New Albin Creamery Co.
139	Volney	Oswan Creamery Co.	A. G. Elvidge & Co.
325	Waterville	F'm's Co-op. Cr'y & Com'l Co.	A. Adeson, Sec'y
152	Waukon	Ludlow Co-op. Creamery Co.	A. G. Winter, Sec'y
39	Waukon	Oak Leaf Creamery	G. L. Hubbell, Sec'y
<i>Audubon County.</i>			
326	Brayton	The Danish Centrifugal Cr'y Co.	P. R. Peterson, Sec'y
327	Exira	Exira Creamery	F. P. Wilcox
328	Hamlin	West Hamlin Creamery Co.	S. Madson, Pres't.
329	Kimballton	The Danish Centrifugal Cr'y Co.	J. Anderson
330	Ross	Fest Bros	Fest Bros
<i>Appanoose County.</i>			
331	Iconium	Iconium Cheese Factory	H. A. Thompson, Sec'y
332	Moravia	Moravia Cheese Factory	Z. Main, Sec'y
333	Moulton	Moulton Cheese Factory	A. Dickson
334	Moravia	Star Cheese Factory	W. E. Parry
335	Ray	Ray	A. H. Doggett, Pres't.

VI.

ARRANGED BY TOWNS IN EACH COUNTY, TOGETHER WITH INFORMATION TO EACH.

	P. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION	PRODUCT MANUFACTURED.	Operated by an individual, co-operative or stock company.	Separator, gathered cream, or both.	Method of receiving milk—by the test or by the hundred.	Dairy Commissioner's test bottle number.	Office record number.
Adair	Adair	Adair	Butter	Ind	Sep'tr.	Test.		50
Fontanelle	Fontanelle	Fontanelle	Butter	Stock Co	Sep'tr.	Hd.		140
Greenfield	Greenfield	Greenfield	Butter	Ind	Sep'tr.	Hd.		181
Hebron	Orient	Orient	Butter	Ind	G C			278
Orient	Orient	Orient	But. & Ch.	Stock Co	Sep'tr.	Hd.		313
Carl	Carl	Carl	Butter	Ind	Sep'tr.	Hd.		314
Corning	Corning	Corning	Butter	Ind	S & G C	Test.		166
Corning	Corning	Corning	Butter	Stock	Sep'tr.	Test.		30
Corning	Corning	Corning	Butter	Ind	Sep'tr.	Test.		311
Corning	Corning	Corning	Butter	Ind	Sep'tr.	Test.		315
Corning	Corning	Corning	Skim S'n	Stock	Sep'tr.	Test.		315
Corning	Corning	Corning	Butter	Ind	Sep'tr.	Hd.		316
Nodaway	Nodaway	Nodaway	Butter	Co-op.	Sep'tr.	Hd.		317
Prescott	Prescott	Prescott	Butter	Co-op.	Sep'tr.	Hd.		317
New Albin	New Albin	New Albin	Butter	Stock Co	G C			318
New Albin	Lansing	Lansing	Butter	Stock Co	G C			319
New Albin	Lansing	Lansing	Butter	Stock Co	G C			320
Waukon	Waukon	Waukon	Butter	Stock Co	G C			321
Decorah	New Albin	New Albin	Butter	Co-op.	Sep'tr.	Test.		70
Postville	Postville	Postville	Butter	Stock Co	G C & S	Test.		60
Postville	Postville	Postville	Butter	Stock Co	G C & S	Test.		322
Quandahl	W. Union, Fay Co.	W. Union, Fay Co.	Butter	Ind	G C			323
Quandahl	Spg. Grove, Miss.	Spg. Grove, Miss.	Butter	Ind	G C			324
Quandahl	Lansing	Lansing	Butter	Stock	G C			160
Quandahl	Lansing	Lansing	Butter	Stock	S & G C	Hd.		136
Volney	Volney	Volney	Butter	Co-op.	G C			325
Waterville	Waterville	Waterville	Butter	Co-op.	Sep'tr.	Test.		175
Waukon	Waukon	Waukon	Butter	Co-op.	Sep'tr.	Test.		32
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		43
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		356
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		327
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		328
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		329
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		330
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		331
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		332
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		333
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		334
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		335
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		336
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		337
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		338
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		339
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		340
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		341
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		342
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		343
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		344
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		345
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		346
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		347
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		348
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		349
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		350
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		351
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		352
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		353
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		354
Waukon	Waukon	Waukon	Butter	Stock	S & G C	Test.		355

TABLE

Office record number.	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.
	<i>Benton County.</i>		
233	Atkins	Premont Creamery Co.	H. Fritz, Sec'y.
336	Belle Plaine	"Belle"	Hilton Bros. & Co.
337	Blairstown	Leroy Creamery Co.	G. M. Kirk, Sec'y.
5	Garrison	Siar Creamery	H. G. Speck, Mgr.
338	Mt. Auburn	Mt. Auburn	Rowe Bros.
339	Newhall	Model	G. M. Olmstead
340	Rogersville	Excelsior	R. E. Fairbanks.
81	Shellsburg		W. R. McGregor & Co.
49	Urbana	Farmers' Co-op. Creamery Co.	T. H. Ramer, Sec'y.
342	Van Horn	Van Horn Creamery	Gardiner & McKinn.
343	Vinton	The Vinton Creamery	Kowe Bros.
344	Walford	The Walford Creamery	A. J. Riley, Sec'y.
	<i>Black Hawk County.</i>		
63	Canfield	Canfield Co-op. Creamery Co.	O. E. Gaffin, Sec'y.
210	Benson	Benson Creamery Co.	Wm. Morgan, Sec'y.
345	Cedar Falls	Black Hawk Creamery Co.	J. Filkins, Sec'y.
346	Cedar Falls	Cedar Falls Creamery	
347	Crain Creek	Engelking's Creamery	J. Engelking.
70	Dewar	Pleasant Valley Dairy Ass'n.	W. F. Garrett, Sec'y.
262	Dunkerton	Farmers' Co-op. Ass'n.	G. S. Kieckner, Sec'y.
231	Dunkerton	Lester Creamery	G. W. Myerhoff
395	Eagle Center	Eagle Center Dairy Ass'n.	W. Holland, Sec'y.
348	Edwards	Edwards Co-op. Creamery	W. A. Wilson, Sec'y.
28	Finchford	The Union Creamery Co.	J. P. Churchill, Sec'y.
349	Gilbertsville	Gilbertsville Creamery Co.	
350	Hudson	Hudson Creamery Co.	D. Bedford, Sec'y.
351	Hudson	Rock Crk Farmers' Dairy Ass'n.	
127	Jaynesville	Mt. Vernon Creamery Co.	J. E. Rundles, Sec'y.
246	Jubilee	Co-op. Creamery Co. of Jubilee	H. G. Koob, Sec'y.
386	La Porte City	La Porte City Co-op. Cr'y Co.	W. Pegles, Sec'y.
332	La Porte City	West Lawn Creamery	M. L. Newton, Sec'y.
224	Louise	Louise Co-op. Creamery Co.	J. J. Lutz, Sec'y.
353	Reinbeck	Red Bird Creamery	J. Maehlein, Sec'y.
354	Waterloo	Farmers' Dairy Association	D. F. Hoover, Sec'y.
355	Waterloo	The Fowler Co.	The Fowler Co.
356	Waterloo	The Fowler Co.	The Fowler Co.
179	Waterloo	Mt. Hope Creamery Co.	W. A. Wilson, Sec'y.
	<i>Boone County.</i>		
357	Boone	Fountain Creamery	Samuel Leminger
358	Boxholm	Grant Twp. B and C Ass'n	
273	Luther	Luther Separator Creamery	E. E. Van Auken
359	Mackey	Mackey Grove Creamery	
94	Madrid	Madrid Creamery	U. Labords
360	Ogden	J. Reinhart	J. Reinhart
	<i>Bremer County.</i>		
270	Bremer	Bremer Creamery	H. Kaiser, Sec'y.
361	Buck Creek	Little Valley Creamery Co.	C. Glattey, Sec'y.
362	Denver	Farrington Creamery Co.	J. Homrighaus, Mgr.
363	Frederica	Douglas Center Creamery	J. R. Gunsalus, Sec'y.

VI.—CONTINUED.

	F. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED.	Operated by an individual, co-operative or stock company.	Separator, gathered cream, or both.	Method of receiving milk—by the test or by the hundred.	Dairy Commissioner's test bottle number.	Office record number.
Atkins	Atkins	Atkins	Butter	Stock	Sep'tr.	Test.	286	233
Tama	Belle Plaine	Belle Plaine	Butter	Ind	G C			337
Blairstown	Blairstown	Blairstown	Butter	Co-op	Sep'tr.	Test.	7	336
Garrison	Garrison	Garrison	Butter	Co-op	Sep'tr.	Test.		3
Vinton			Skim milk	Ind	Sep'tr.	Hd.		338
Cedar Rapids	Newball	But. & Ch.	Cheese	Ind	Sep'tr.	Hd.		339
Rogersville	Shellsburg	Shellsburg	Butter	Ind	S & G C	Hd.	95	340
Shellsburg	Shellsburg	Shellsburg	Butter	Ind	S & G C	Hd.	95	81
Urbana	Center Point	Center Point	Butter	Co-op	Sep'tr.	Test.	56	49
Van Horn	Van Horn	Van Horn	Butter	Ind	S & G C			342
Vinton	Vinton	Vinton	Butter	Ind	S & G C			343
Walford	Walford	Walford	Butter	Co-op	Sep'tr.	Test.		344
Canfield	Dewar	Dewar	Butter	Co-op	Sep'tr.	Test.	78	63
Cedar Falls	Benson	Benson	Butter	Co-op	Sep'tr.	Test.	255	210
Cedar Falls			Butter	Co-op	Sep'tr.	Test.		345
Cedar Falls			Butter	Co-op	Sep'tr.	Test.		346
Crain Creek	Waterloo	Waterloo	Butter	Ind	Sep'tr.	Hd.		347
Dewar	Dewar	Dewar	Butter	Co-op	Sep'tr.	Test.	83	70
Dunkerton	Dunkerton	Dunkerton	Butter	Co-op	Sep'tr.	Test.	271	231
Dunkerton	Dunkerton	Dunkerton	Butter	Co-op	Sep'tr.	Test.	322	395
Eagle Center	Waterloo	Waterloo	Butter	Co-op	Sep'tr.	Test.		348
Waterloo	Waterloo	Waterloo	Butter	Co-op	Sep'tr.	Test.	34	28
Finchford	Winlow	Winlow	Butter	Co-op	Sep'tr.	Test.		349
Gilbertsville	Gilbertsville	Gilbertsville	Butter	Co-op	Sep'tr.	Test.		350
Hudson	Hudson	Hudson	Butter	Co-op	Sep'tr.	Hd.		351
Hudson	Hudson	Hudson	Butter	Co-op	Sep'tr.	Hd.	211	127
Jaynesville	Jaynesville	Jaynesville	Butter	Co-op	Sep'tr.	Test.	323	266
Jubilee	Jesup	Jesup	Butter	Co-op	Sep'tr.	Test.	343	246
La Porte City	La Porte City	La Porte City	Butter	Co-op	Sep'tr.	Test.		352
La Porte City	La Porte City	La Porte City	Butter	Stock	Sep'tr.	Test.	277	224
La Porte City	La Porte City	La Porte City	Butter	Co-op	Sep'tr.	Test.		353
Reinbeck	Reinbeck	Reinbeck	Butter	Stock	Sep'tr.	Test.		354
Waterloo	Waterloo	Waterloo	Butter	Co-op	Sep'tr.	Test.		355
Waterloo	Waterloo	Waterloo	Cheese	Stock	Sep'tr.	Test.		356
Waterloo	Waterloo	Waterloo	Cheese	Stock	Sep'tr.	Test.		357
Waterloo	Waterloo	Waterloo	Butter	Stock	Sep'tr.	Test.	213	179
Boone			Butter	Ind	Sep'tr.			357
Boxholm			Cheese					358
Luther	Luther	Luther	Butter	Ind	S & G C	Test.	330	273
Mackey			Butter					359
Madrid	Madrid	Madrid	Butter	Ind	Sep'tr.	Test.	111	94
Ogden			Butter	Ind	Sep'tr.			360
Bremer	Bremer	Bremer	Butter	Co-op	Sep'tr.	Test.	327	270
Buck Creek	Sumner	Sumner	Butter	Co-op	Sep'tr.	Hd.		361
Denver			Butter	Co-op	Sep'tr.	Test.		362
Frederica			Butter	Co-op	Sep'tr.	Test.		363

TABLE

Office record number.	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.
<i>Bremer County—Continued.</i>			
364	Frederica	Frederica Creamery	Gardner, Murphy & Co.
365	Grove Hill	Grove Hill Creamery Co.	N. C. Peck, Sec'y
366	Horton	Horton Creamery Stock Co.	F. L. Thompson, Sec'y
312	Janesville		The Fowler Co.
367	Knitrel	Maxfield Creamery Co.	W. Johnke
368	Klinger	Diekman Creamery	C. F. Diekman
369	Maxfield	Artesian Creamery Co.	H. Graening, Sec'y
370	Maxfield	Golden Key	W. & H. Meyerhoff
371	Maxfield	First Maxfield Creamery Co.	Wm. Milius, Sec'y
290	Plainfield	Cedar Vale Creamery	T. R. Carroll, Sec'y
175	Roxie	Western Douglass Creamery Co.	H. K. Barney, Sec'y
372	Seigel	Seigel Creamery Co.	Otto Beels, Sec'y
373	Sumner	Climax Creamery Co.	
374	Sumner	Red Clover Creamery	D. D. Hatch, Sec'y
375	Sumner	Spring Fountain Creamery	Wm. Meyer, Sec'y
376	Sumner	Gardner, Murphy & Co.	C. Romane, Mgr
377	Tripoli	Crane Creek Creamery	F. J. Westendorf, Sec'y
378	Tripoli	Fremont Creamery Co.	T. H. Shukaecht, Sec'y
379	Tripoli	Fond Lily Creamery	F. C. Ottroge
380	Tripoli	Potter's Siding Creamery Co.	Wm. Banay, Sec'y
126	Wapsie	Wapsie Valley Creamery Co.	Geo. Vanderwalker, Sec'y
130	Waverly	La Fayette Creamery Co.	B. Carnforth, Sec'y
191	Waverly	Riverside Creamery	E. Brula
200	Waverly	Victory Creamery	E. L. Farrington, Sec'y
381	Waverly	Washington Creamery Co.	J. Brandenburg, Sec'y
<i>Buchanan County.</i>			
297	Aurora	Aurora Creamery	Elliott & Speed
125	Brandon	Brandon Creamery	D. A. McLeish
382	Fairbank	Fairbank Farmers' Cr'y Co.	E. Sanborn, Sec'y
383	Hazleton	Hazleton Farmers' Creamery Co.	L. A. Frush, Sec'y
384	Independence	Independence Creamery	Weins & Shillinglaw
385	Independence	Pilot Grove Creamery	Weins & Shillinglaw
151	Jesup	Jesup Creamery Co.	Jas. Dalton, Sec'y
384	Lamont	Lamont Creamery Co.	Tom Kelsch, Sec'y
164	Littleton	Littleton Creamery Co.	J. A. Hoffman, Sec'y
47	Middlefield	Middlefield Creamery	J. J. Piank & Co.
387	Monti	Monti Creamery	J. A. Donnelly
212	Newtonville	Newtonville Creamery	W. W. Wilde
162	Otterville	Otterville Creamery Co.	W. F. Pratt, Sec'y
388	Quasqueton		C. Anderson
389	Quasqueton		W. D. Boies
390	Quasqueton	Quasqueton Co-op. Cr'y Ass'n	A. P. Burthous, Sec'y
24	Rowley	Rowley Co-op. Creamery Co.	A. F. Bosworth, Sec'y
391	Stanley	Stanley Creamery Ass'n	S. C. Irvine, Sec'y
392	Vista	Vista Creamery	D. A. McLeish
150	Winthrop	Winthrop Creamery	J. J. Piank & Co.
<i>Buena Vista County.</i>			
256	Alta	Alta Creamery	Clemons & Cornelinson
393	Alta	Maple Valley Creamery	H. C. Hauck

VI—CONTINUED.

F. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED.	Operated by an individual, co-operative or stock company.	Separator, gathered cream, or both.	Method of receiving milk—by the test or by the hundred.	Dairy Commissioner's test bottle number.	Office record number.
Boston, Mass	Sumner	Butter	Ind	Sep'tr	Hd		304
Grove Hill	Fairbank	Butter	Co-op	Sep'tr	Hd		365
Horton	Plainfield	Butter	Stock	Sep'tr	Test		366
Waterloo	But & Ch	Butter	Stock	Sep'tr	Hd		312
Knitrel		Butter	Ind	Sep'tr	Hd		367
Klinger		Butter	Ind	Sep'tr	Hd		368
Maxfield	Waverly	Butter	Co-op	Sep'tr	Hd		369
Key	Tripoli	Butter	Ind	Sep'tr	Hd		370
Denver		Butter	Co-op	Sep'tr	Hd		371
Plainfield	Plainfield	Butter	Co-op	S & G C	Test	370	220
Roxie		Butter	Co-op	Sep'tr	Test	268	175
Seigel		Butter	Co-op	Sep'tr	Test		372
Sumner		Butter	Co-op	Sep'tr	Test		373
Sumner	Sumner	Butter	Co-op	Sep'tr	Test		374
Sumner	Sumner	Butter	Co-op	Sep'tr	Hd		375
Sumner		Butter	Ind	Sep'tr	Test		376
Tripoli	Tripoli	Butter	Co-op	Sep'tr	Test		377
Tripoli	Tripoli	Butter	Co-op	Sep'tr	Test		378
Tripoli	Tripoli	Butter	Ind	Sep'tr	Hd		379
Tripoli		Butter	Co-op	Sep'tr	Hd		380
Tripoli		Butter	Co-op	Sep'tr	Test	150	126
Key	Tripoli	Butter	Co-op	Sep'tr	Test	154	130
Waverly	Waverly	Butter	Ind	Sep'tr	Test	228	191
Waverly	Shall Rock	Butter	Co-op	Sep'tr	Test	244	200
Waverly	Waverly	Butter	Ind	Sep'tr	Hd		381
Aurora	Aurora	Butter	Ind	Sep'tr	Test	355	297
Brandon	Mt. Auburn	Butter	Ind	Sep'tr	Test	149	125
Fairbank	Fairbank	Butter	Co-op	Sep'tr	Test		382
Hazleton	Fairbank	Butter	Co-op	Sep'tr	Test		383
Independence	Independence	Butter	Ind	Sep'tr	Test		384
Independence	Independence	Butter	Ind	Sep'tr	Test		385
Jesup	Jesup	Butter	Stock	Sep'tr	Test	174	151
Lamont	Lamont	Butter	Co-op	Sep'tr	Test	341	384
Littleton	Jesup	Butter	Co-op	Sep'tr	Test		54
Winthrop	Winthrop	Butter	Ind	Sep'tr	Test		387
Monti	Masonville	Butter	Ind	Sep'tr	Hd		388
Newtonville	Walker	Butter	Ind	S p'r	Hd	257	212
Otterville	Independence	Butter	Co-op	Sep'tr	Test	187	162
Quasqueton	Cheese	Ind					388
Quasqueton	Cheese	Ind					389
Quasqueton	Quasqueton	Butter	Co-op	Sep'tr	Test		390
Rowley	Rowley	Butter	Co-op	Sep'tr	Test	28	24
Stanley	Stanley	Butter	Co-op	Sep'tr	Test		391
Brandon	Independence	Butter	Ind	Sep'tr	Test		392
Winthrop	Winthrop	Butter	Ind	Sep'tr	Test	173	150
Alta	Alta	Butter	Ind	Sep'tr	Hd	313	256
Alta	Alta	Butter	Ind	Sep'tr	Hd		393

TABLE

Office record number.	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.
	<i>Buena Vista</i>	<i>County—Continued.</i>	
33	Marathon	Marathon Creamery	E. R. Stangland
208	Newell	Newell Creamery	C. Nielson
394	Newell	Cole	C. Nielson
395	Newell	Boere	C. Nielson
	<i>Butler County.</i>		
306	Aplington	Aplington Creamery	T. Dadswell
15	Aplington	Monroe Central Creamery	A. Outjes, Sec'y
397	Austinville	Austinville Creamery	Bode Bros
20	Aredale	Aredale Creamery	Haven & Moorhead
36	Bristow	Clover Lawn Creamery	Haven & Moorhead
598	Clarksville	Oak Grove Creamery	E. D. Wilcox, Mgr
399	Cluterville	Cluterville Creamery	A. B. Watson, Sec'y
400	Coster	Columbia Creamery	Re Hall
401	Greene	Cold Water Co-op. Dairy Ass'n.	J. W. Williams, Sec'y
402	Hitesville	Hitesville Creamery	T. Dadswell
158	New Hartford	Beaver Creamery Co	C. V. Jamerson, Sec'y
403	New Hartford	New Hartford Creamery	Wait & Curtis
404	New Hartford	Albion Creamery Co	E. G. Philo
222	Parkersburg	Diamond Creamery	Codner & Palmer
18	Parkersburg	Star Creamery	Clelland Bros
70	Shell Rock	Hawkeye Creamery	E. Town & Son
406	Shell Rock	Star Co-op. Creamery Co	D. Jerolaman, Sec'y
407	Shell Rock	Victory Co-op. Ass'n	E. L. Farrington, Sec'y
408	Shell Rock		J. Waite
	<i>Calhoun County.</i>		
271	Kissimee	Lake Side Creamery	L. E. Gutz
409	Lake City	Lake City Creamery	Boardman Bros. & Co
410	Malmo	Williams Creamery	Fonda Creamery Co
301	Pomeroy	Elite Creamery	J. H. Hanken
411	Pomeroy		Knoke & Son
412	Rockwell City	Rockwell Creamery	
	<i>Carroll County.</i>		
302	Arcadia	Arcadia Creamery	Ed. Rehker
339	Halbur	Excelsior Creamery	Hoelker Bros
413	Roselle	Rose Valley Creamery	C. Kohorst
414	Willey	Willey Creamery	B. Greteman, Mgr
	<i>Cass County.</i>		
85	Cumberland	Cumberland Creamery	E. D. Coats & Co.
415	Cumberland	Musena	E. D. Coats & Co.
416	Cumberland	Ostrus	E. D. Coats & Co.
417	Lewis	Lewis Co-op. Creamery	
213	Marne	Marne Co-op. Creamery Co	Olaf Reimen, Sec'y
	<i>Cedar County.</i>		
418	Bennett	Bennett Creamery	J. C. Templeton, Mgr
419	Cedar Bluff	Cedar Bluff Creamery Co	R. Kerstake
420	Centerdale		L. B. Pickiring, Mgr
421	Clarence	Cedar Creamery	H. L. Dean
422	Downey	Wapiesnemoc	Crozet & Gregg
423	Durant	Durant Butter and Cheese Ass'n	C. Sorgenfrey

VI—CONTINUED.

	P. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED	Operated by an individual or co-operatives or stock company.	Separator, gathered cream, or both.	Method of receiving milk—by the test or by the hundred.	Dairy Commissioner's test bottle number.	Office record number.
Marathon	Marathon	Marathon	Butter	Ind	Sep'tr	Test	39	33
Newell	Newell	Newell	Butter	Ind	Sep'tr	Test	233	208
Newell			Skim stat'n	Ind	Sep'tr	Test		394
Newell			Skim stat'n	Ind	Sep'tr	Test		395
Aplington	Aplington	Aplington	Butter	Ind	Sep'tr			306
Aplington	Aplington	Aplington	Butter	Co-op	Sep'tr	Test	17	15
Austinville			Butter	Ind	Sep'tr	Test	23	20
Bristow	Bristow	Bristow	Butter	Ind	Sep'tr	Test	43	36
Bristow	Bristow	Bristow	Butter	Ind	S & G C	Test		398
Clarksville	Clarksville	Clarksville	Butter	Co-op	Sep'tr	Hd		399
Cluterville	Dumont		Butter	Ind				400
Coster			Butter	Ind	G C			401
Greene	Greene		Butter	Ind	G C			402
Aplington			Butter	Ind	Sep'tr			158
New Hartford	New Hartford	New Hartford	Butter	Co-op	Sep'tr	Test	182	158
New Hartford	New Hartford	New Hartford	Butter	Ind	Sep'tr	Hd		403
New Hartford	New Hartford	New Hartford	Butter	Co-op	Sep'tr	Test	275	222
Parkersburg	Parkersburg	Parkersburg	Butter	Ind	Sep'tr	Test	20	18
Parkersburg	Parkersburg	Shell Rock	Butter	Ind	Sep'tr	Test	89	76
Shell Rock	Shell Rock	Shell Rock	Butter	Co-op	Sep'tr	Hd		406
Waverly	Shell Rock	Shell Rock	Butter	Co-op	Sep'tr	Test		407
Shell Rock	Shell Rock	Shell Rock	Butter	Ind	Sep'tr	Hd		408
Kissimee	Pomeroy		Butter	Ind	Sep'tr	Test	328	271
Nevada, Story Co	Lake City		Butter	Ind	G C			409
Fonda, Poca Co.			Butter	Stock	Sep'tr	Test		410
Pomeroy	Pomeroy		Butter	Stock	Sep'tr	Test	359	301
Pomeroy	Pomeroy		Butter					411
Rockwell City	Rockwell City		Butter	Stock	Sep'tr	Hd		412
Arcadia	Arcadia	Arcadia	Butter	Ind	Sep'tr	Test	390	302
Halbur	Halbur	Halbur	Butter	Ind	Sep'tr	Test	391	239
Roselle	Carroll		Butter	Ind	Sep'tr	Hd		413
Willey	Willey		Butter	Co-op	G C	Hd		414
Cumberland	Cumberland		Butter	Ind	S & G C	Hd	100	85
Cumberland	Cumberland		Skim stat'n	Ind	Sep'tr	Hd		415
Cumberland	Cumberland		Skim stat'n	Ind	Sep'tr	Hd		416
Lewis	Lewis		Butter	Co-op				417
Marne	Marne		Butter	Stock	Sep'tr	Test	259	213
Bennett	Bennett		Butter	Ind	S & G C	Hd		418
Cedar Bluff	Buchanan		Butter	Ind	Sep'tr	Test		419
West Liberty			Skim stat'n	Ind	Sep'tr	Hd		420
Tipton			Butter	Ind	G C			421
Downey	Downey		Cheese	Ind				422
Durant	Durant		Butter	Stock	S & G C	Hd		423

TABLE

Office record number.	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.
	Cedar County	<i>Continued.</i>	
100	Lowden	Golden Star Creamery	Aug. Hinrichs
425	Lowden		Aug. Hinrichs
426	Lowden		Aug. Hinrichs
427	Lowden	Lowden Farmers Creamery Co.	
428	Lowden	Union Creamery Co.	
429	Massillon	Western Star Creamery	Brookm'n, Schwartz & D'...
430	Plato	Hill Side	J. F. Zetter, Mgr
431	Springdale	Hopewell Creamery	C. G. Evis
432	Springdale	Hill Side	C. G. Evis
432	Stanwood		H. L. Dean
433	Tipton	Cedar Creamery	H. L. Dean
434	West Branch	Quaker	I. H. Shaver Cheese Co.
	Cerro Gordo County		
435	Clear Lake		S. Kennedy & Son
122	Clear Lake	Model Co-op. Dairy Ass'n	C. Paulson, Mgr
243	Mason City		S. Kennedy & Son
436	Meservey	Meservey Creamery	Jan. E. Hill
298	Owen Center	Owen Center Creamery	Fish & Coloin
437	Plymouth		S. Kennedy & Son
57	Portland	Portland Creamery	C. R. Fink
131	Rock Falls	Mayflower Creamery	J. F. Cochongat
278	Rockwell	Rockwell Creamery Co.	G. H. Fuller, Sec'y
438	Sheffield	Sand Ridge Creamery	D. O'Donnell, Sec'y
439	Swaledale	Swaledale Creamery	Jan. Hill & Co.
440	Thornton	Thornton Creamery	G. W. Kennedy
	Cherokee County		
300	Aurelia	Aurelia Creamery	Marsh & Kohan
441	Cleghorn	Cleghorn Creamery	Robinson Bros
442	Larrabee	Larrabee Creamery	E. E. Peck
443	Marcus	Marcus Creamery	Barcus Bros.
	Chickasaw Co.		
48	Alta Vista	Alta Vista Farmers Creamery Co.	Wm. Vick
146	Bassett	Bassett	Boston & Decorah Cr'y Co
285	Boyd	Boyd Farmers Creamery	J. W. Krieger, Sec'y
405	Deerfield	Deerfield Creamery Co.	
245	Devon	Devon Creamery Ass'n	E. P. Sheffield, Sec'y
160	Fredericksburg	Fredericksburg Butter Factory	J. W. Edson, Sec'y
145	Ionia	Ionia Creamery	Boston & Decorah Cr'y Co
89	Jacksonville	Jacksonville Co-op. Creamery Co.	C. E. Pierce, Sec'y
414	Jerico	Jerico Creamery Ass'n	M. Keamey, Sec'y
445	Lawler	Lawler Creamery Co.	J. J. McCarthy
231	Little Turkey	Little Turkey Creamery Ass'n	A. D. Kirshinan, Sec'y
446	Nashua	Nashua Creamery Co.	
1	New Hampton	New Hampton Creamery	J. H. Kolthoff
447	Niles Corners	Niles Corners Creamery Co.	
144	N. Washington	North Washington Creamery	Boston & Decorah Cr'y Co
448	Republic	Republic Co-op. Creamery Co.	J. W. Pierce, Sec'y
22	Williamstown	Williamstown Creamery	J. H. Kolthoff

VI.—CONTINUED.

F. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED.	Operated by an individual, co-operative or stock company.	Separator, gathered cream, or both.	Method of receiving milk—by the test or by the hundred.	Dairy Commissioner's test bottle number	Office record number.
Lowden	Bennett	Butter	Ind	S & G C	Hd.	117	100
Lowden		Skim stat'n	Ind	Sep'tr.	Hd.		425
Lowden		Skim stat'n	Ind	Sep'tr.	Hd.		426
Lowden		Butter	Ind	Sep'tr.			427
Lowden		Butter	Ind	Sep'tr.			428
Lowden		Butter	Ind	Sep'tr.	Hd.		429
Plato	Plato	Cheese	Ind	S & G C	Test.		430
Springdale	West Branch	Butter	Ind	Sep'tr.	Test.	41	431
Springdale	West Branch	Skim stat'n	Ind	Sep'tr.	Test.		431
Tipton	Tipton	Butter	Ind	Sep'tr.			432
Tipton	Tipton	Butter	Ind	S & G C			433
West Branch	West Branch	But & Ch	Stock	S & G C	Test.	203	434
Mason City	Clear Lake	Butter	Ind	Sep'tr.	Test.		435
Clear Lake	Clear Lake	Butter	Co-op	Sep'tr.	Test.	145	122
Mason City	Mason City	Butter	Ind	Sep'tr.	Test.	299	243
Meservey	Meservey	Butter	Ind	Sep'tr.	Hd.		436
Owen Center	Rockford	Butter	Ind	Sep'tr.	Test.	356	298
Plymouth	Plymouth	Butter	Ind	Sep'tr.	Test.		437
Portland	Portland	Butter	Ind	Sep'tr.	Test.	66	57
Rock Falls	Rock Falls	Butter	Ind	S & G C	Test.	155	131
Rockwell	Rockwell	Butter	Stock	Sep'tr.	Test.	291	278
Sheffield	Sheffield	Butter	Ind	Sep'tr.	Hd.		438
Meservey	Meservey	Butter	Ind	Sep'tr.	Hd.		439
Thornton		Butter	Ind	Sep'tr.	Hd.		440
Aurelia	Aurelia	Butter	Ind	Sep'tr.	Hd.	358	300
Cleghorn	Cleghorn	Butter	Ind	S & G C	Hd.		441
Larrabee	Larrabee	Butter	Ind	Sep'tr.	Hd.		442
Marcus	Marcus	Butter	Ind	Sep'tr.	Hd.		443
Alta Vista	Alta Vista	Butter	Co-op	Sep'tr.	Test.	55	48
Decorah	Bassett	Butter	Stock	S & G C	Test.	169	146
New Hampton	Boyd	Butter	Co-op	Sep'tr.	Test.	342	285
Deerfield	Deerfield	Butter	Co-op	Sep'tr.	Test.		405
Devon	Devon	Butter	Co-op	Sep'tr.	Test.	301	245
Fredericksburg	Fredericksburg	Butter	Co-op	Sep'tr.	Test.	184	160
Decorah	Decorah	Butter	Stock	S & G C	Test.	188	145
New Hampton	Lawler	Butter	Co-op	Sep'tr.	Test.	194	89
Jerico	Jerico	Butter	Stock	Sep'tr.	Test.		444
Lawler	Lawler	Butter	Co-op	Sep'tr.	Test.		445
Little Turkey	Lawler	Butter	Co-op	Sep'tr.	Test.	284	231
Nashua	Nashua	Butter	Ind	S & G C	Test.		446
Williamstown	Williamstown	Butter	Ind	Sep'tr.	Test.	2	1
Niles Corners	Niles Corners	Butter	Ind	Sep'tr.	Test.		447
Boston & Decorah Cr'y Co	Decorah	Butter	Stock	S & G C	Test.	167	144
Nashua	Republic	Butter	Co-op	Sep'tr.	Test.		448
New Hampton	Williamstown	Butter	Ind	Sep'tr.	Test.	25	22

TABLE

Office record number.	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.
449	Clark County. Woodburn Clay County.	Farmers' B. and C. Ass'n	I. N. Woods, Secretary
211	Dickens	Rose Bud Creamery	J. O. Varney
450	Dickens	Sioux Valley Creamery	C. W. Parsons
451	Everly	Spring Creek Creamery	E. Moeller, Sec'y
452	Spencer	Riverton Creamery Co.	O. B. Ross
453	Yankee	Star Creamery Co.	Wm. Warren, Mgr.
225	Clayton County. Communia	Communia Creamery	H. Wistrick, Sec'y
276	Edgewood	Bear Creek Creamery	H. F. Beyer
454	Edgewood	Farmers' Co-op Creamery	R. J. Great, Sec'y
277	Edgewood	Fidelity Creamery	H. F. Beyer
204	Elgin	Elkader Creamery	F. Shupbach
184	Elkader	Farmersburg Co-op Cr'y Co.	Jo. Lamm
299	Farmersburg	Garnaville Farmers' Cr'y Co.	C. Hinsch, Sec'y
171	Garnaville	Giard Creamery	E. W. Kregel
135	Giard	Farmers' Creamery Co.	A. O. Elvidge & Co.
436	Guttenburg	Highland Creamery Ass'n	C. Gregerson, Sec'y
163	Highland	Luana Farmers' Co-op Cr'y	John Waddings
457	Littleport	McGregor Creamery	R. M. Fonda, Sec'y
23	Luana	Clermont Valley Creamery Co.	Wm. Troutfetter, Sec'y
241	McGregor	Clermont Valley Creamery Co.	J. H. Sheehan, Sec'y
458	Nyburg	Clermont Valley Creamery Co.	J. H. Sheehan, Sec'y
138	Osborne	Osterdock Creamery Co.	A. O. Elvidge & Co.
359	Osterdock	Read Creamery Co.	E. A. Hush, Sec'y
92	Read	Osean Creamery Co.	H. W. Wilkie, Sec'y
137	St Olof	Strawberry Point	Chas. Massey, Sec'y
38	Strawberry Point	Volga City	John Koch, Sec'y
247	Volga City	Watson	
69	Watson		
460	Clinton County. Andover	Andover Creamery	T. W. Welter
461	Brown	Brown's Creamery	T. W. Welter
462	Charlotte	Charlotte Creamery	T. W. Welter
295	Delmar	Delmar Creamery	T. W. Welter
463	Elwood	Elwood Creamery	C. J. Schunter, Sec'y
464	Grand Mound	Grand Mound Creamery Co.	Von Oven & Heien
465	Goose Lake	Edon Valley Creamery Co.	W. C. Connor, Sec'y
467	Low Moor	Quigley Creamery	T. W. Welter
468	Quigley	Clover Leaf Creamery	Chas. Allen, Sec'y
93	Teed's Grove	Welton Creamery	C. Peterson
56	Welton	Wheatland Creamery	Welding & Co.
468	Wheatland		
469	Crawford County. Buck Grove	Thew's Cheese Factory	S. M. Thew
470	Buck Grove	Denison Creamery	Nilsson & Shuler
167	Denison		G. E. North
471	Kiron		Henry Kohl
472	West Side		W. M. Pruter

VI.—CONTINUED.

	P. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED.	Operated by an individual, co-operative or stock company.	Separator, gathered cream, or both.	Method of receiving milk—by the test or by the hundred.	Dairy Commissioner's test bottle number.	Office record number.
Woodburn	Woodburn	But. & Ch.	Stock	Sep'tr.	Test.		449	
Dickens	Dickens	Butter	Ind	Sep'tr.	Test.	256	211	
Dickens	Dickens	Butter	Ind	Sep'tr.	Hd.		450	
Everly	Everly	Butter	Co-op	Sep'tr.	Hd.		451	
Riverton	Riverton	Butter	Stock	Sep'tr.	Hd.		452	
		Butter					453	
Communia	Little Port	Butter	Co-op	Sep'tr.	Test.	278	225	
Edgewood	Edgewood	Butter	Ind	Sep'tr.	Test.	333	276	
Edgewood	Edgewood	Butter	Co-op	Sep'tr.	Hd.		454	
Edgewood	Edgewood	Butter	Ind	Sep'tr.	Test.	334	277	
Elgin	Elgin	Cheese	Ind	Test.		347	204	
Elkader	Elkader	Butter	S & G C	Test.		359	184	
Farmersburg	Farmersburg	Butter	Co-op	Sep'tr.	Test.	357	299	
Garnaville	Garnaville	Butter	Co-op	S & G C	Test.	199	171	
Decorah	Frollick	Butter	Stock	Sep'tr.	Hd.	159	135	
		Butter		Sep'tr.			456	
Volga City	Volga City	Butter	Co-op	S & G C	Test.	188	163	
		Butter		Sep'tr.			457	
Luana	Luana	Butter	Co-op	Sep'tr.	Test.	27	23	
McGregor	McGregor	Butter	Stock	S & G C	Test.	290	241	
Clermont	Clermont	Butter	Co-op	Sep'tr.	Test.		458	
Clermont	Clermont	Skimstat'n		Sep'tr.	Test.		459	
Decorah	Osborne	Butter	Stock	Sep'tr.	Test.	162	138	
Osterdock	Osterdock	Butter	Stock	S & G C	Test.	307	359	
Elkader	Elkader	Butter	Stock	Sep'tr.	Test.	109	92	
Decorah	St. Olof	Butter	Stock	S & G C	Test.	161	137	
Strawberry Point	Strawberry Point	Butter	Co-op	Sep'tr.	Test.	44	38	
Volga City	Volga City	Butter	Co-op	Sep'tr.	Test.	325	247	
Watson	Monroe	Butter	Co-op	Sep'tr.	Test.	80	69	
Delmar	Andover	Butter	Ind	Sep'tr.	Test.		460	
Delmar	Delmar	Skimstat'n	Ind	Sep'tr.	Test.		461	
Delmar	Charlotte	Butter	Ind	Sep'tr.	Test.		462	
Delmar	Delmar	Butter	Ind	Sep'tr.	Test.	353	295	
Delmar	Delmar	Butter	Ind	Sep'tr.	Test.		463	
Grand Mound	Grand Mound	Butter	Stock	Sep'tr.	Test.		464	
		Butter	Ind	Sep'tr.	Test.		465	
Low Moor	Low Moor	Butter	Ind	S & G C			466	
Quigley	Quigley	Butter	Ind	Sep'tr.	Test.		467	
Teed's Grove	Teed's Grove	Butter	Co-op	Sep'tr.	Test.	110	93	
Welton	Welton	Butter	Ind	S & G C	Test.	65	56	
		Butter		Sep'tr.			468	
Buck Grove	Buck Grove	Cheese	Ind		Hd.		469	
Buck Grove	Buck Grove	Butter	Ind				470	
Denison	Denison	Butter	Ind	S & G C	Test.	194	167	
Kiron		Butter	Ind				471	
West Side	West Side	Butter	Ind				472	

TABLE

Office record number.	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.
<i>Dallas County</i>			
473	Adel	Adel Creamery	Wm. Greely
156	Dexter	Dexter Creamery	K. C. Pierce
159	Granger	Granger Cr'y and Cheese Co	L. Swing, Sec'y
474	Perry	Red Star Creamery	Moody & Son
475	Redfield	Redfield Co-op Creamery Co	
228	Van Meter	Zeman Creamery	Wm. Zeman
164	Waukes	Waukes Co-op Creamery Co	J. S. Shannon, Sec'y
172	Woodward	Woodward Creamery	H. P. Calenky
<i>Davis County</i>			
476	Bloomfield	Bloomfield Creamery	W. H. Davis
51	Drakeville	Drakeville Dairy Ass'n	A. Fouts, Sec'y
114	Floris	Floris Creamery	C. B. Caldwell
477	Pulaski	Pulaski	J. J. Miller
<i>Decatur County</i>			
478	Garden Grove	Garden Grove	C. D. Mallette
479	Grand River	Grand River B. and C. Factory	
480	Le Roy	Le Roy B. and C. Factory	W. S. Washburn
481	Van Wert	Van Wert B. and C. Factory	L. F. Roberts, Sec'y
482	Weldon		Law Parr
<i>Delaware County</i>			
9	Almoral	Almoral Creamery Co.	F. L. Carpenter, Sec'y
483	Abbyville		G. Abby, Sec'y
484	Barryville	Barryville Co-op Creamery Co	C. C. Barry, Sec'y
189	Colesburg	Colesburg Creamery Co.	R. C. Currie, Sec'y
485	Delaware	Delaware Creamery	A. O. Kingsley
486	Delhi	Allison Creamery Co	Peter Lux, Sec'y
487	Delhi	Pleasant Valley Creamery Co	J. Burton, Sec'y
118	Delhi	Silver Spring Creamery	F. L. Beal, Sec'y
488	Dundee	Dundee Creamery	A. G. Hazelrigg
110	Earlville	Earlville Creamery	Klaus & Druescher
489	Earlville	Linwood Creamery Co	E. Foust, Sec'y
490	Ehler	Henderson's Creamery	F. Henderson
19	Golden	Golden Creamery	M. J. Sensor
119	Greely	Greely Farmers' Creamery Co.	L. Mathews, Sec'y
97	Hazel Green	Almira Creamery	Woodward Pierce
4	Hazel Green	Hazel Green Creamery	F. B. Dickey
98	Hazel Green	Hazel Green Co-op Creamery	F. L. Thompson, Sec'y
491	Hopkinton	Central Creamery Co.	John White
493	Hopkinton	Hopkinton Co-op Creamery	M. L. McGlade
290	Manchester	Keystone Creamery	W. Merrill
80	Manchester	Manchester Co-op Creamery Co	J. B. Rutherford, Sec'y
494	Manchester	Mead's Creamery	C. W. Mead & Son
66	Manchester	Ridge Farm Creamery	W. Childs
495	Manchester	Spring Branch Creamery	L. S. Gates, Sec'y
495	Oneida	Oneida Creamery	Klaus & Druescher
496	Petersburg	Bear Grove Creamery Co	F. T. Sandmeier, Sec'y
497	Petersburg	Petersburg Creamery	Joe Sherbring
498	Ryan	Ryan Creamery	F. B. Dickey
499	Sand Spring	Diamond Creamery No. 14	Simpson, McIntire & Co.

VI—CONTINUED.

	F. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED.	Operated by an individual, co-operative or stock company.	Separator, gathered cream, or both.	Method of receiving milk—by the test or by the hundred.	Dairy Commissioner's test bottle number.	Office record number.
Adel	Adel	Adel	Butter	Ind	Sep'tr	Hd.		473
Dexter	Dexter	Dexter	Butter	Ind	Sep'tr	Test	186	156
Granger	Granger	Granger	Butter	Co-op	Sep'tr	Test.	185	159
Perry	Perry	Perry	Butter	Ind	G C			474
Van Meter	Van Meter	Van Meter	Butter	Ind	Sep'tr			475
Waukes	Waukes	Waukes	Butter	Co-op	S & G C	Test	281	228
Woodward	Woodward	Woodward	Butter	Stock	S & G C	Test	190	164
							204	172
Bloomfield	Bloomfield	Bloomfield	Butter	Ind	G C			476
Drakeville	Drakeville	Drakeville	But & Ch	Stock	Sep'tr		69	51
Floris	Floris	Floris	Butter	Ind	Sep'tr	Test.	135	114
Pulaski	Pulaski	Pulaski	Butter	Ind	G C			477
Garden Grove	Garden Grove	Garden Grove	Cheese	Ind		Hd.	147	478
Grand River	Grand River	Grand River	But & Ch	Stock	Sep'tr	Hd.		479
Le Roy	Le Roy	Le Roy	But & Ch	Stock	Sep'tr	Hd.		480
Van Wert	Van Wert	Van Wert	Butter	Ind	Sep'tr	Test		481
Weldon	Weldon	Weldon	Cheese	Ind		Hd.		482
Almoral	Almoral	Almoral	Butter	Stock	Sep'tr	Test.	11	9
Abbyville	Abbyville	Abbyville	Butter	Co-op	Sep'tr			483
Barryville	Barryville	Barryville	Butter	Co-op	Sep'tr	Test	484	484
Colesburg	Colesburg	Osterdock	Butter	Co-op	Sep'tr	Test	226	189
Delaware	Delaware	Strawberry Point	Butter	Ind	Sep'tr	Test		485
Delhi	Delhi	Delhi	Butter	Co-op	Sep'tr	Test		486
Delhi	Delhi	Delhi	Butter	Co-op	Sep'tr	Test		487
Delhi	Delhi	Delhi	Butter	Co-op	Sep'tr	Test	141	118
Dundee	Dundee	Dundee	Butter	Ind	Sep'tr	Hd.		488
Earlville	Earlville	Earlville	Butter	Ind	Sep'tr	Hd.	100	110
Earlville	Earlville	Earlville	Butter	Stock	Sep'tr	Test.		489
Ehler	Ehler	Ehler	Butter	Ind	Sep'tr	Test		490
Golden	Golden	Golden	Butter	Ind	Sep'tr	Test	22	19
Greely	Greely	Greely	Butter	Co-op	Sep'tr	Test	370	119
Hazel Green	Hazel Green	Hazel Green	Butter	Ind	Sep'tr	Test	114	97
Hazel Green	Hazel Green	Hazel Green	Butter	Ind	Sep'tr	Test	6	4
Hazel Green	Hazel Green	Hopkinton	Butter	Co-op	Sep'tr	Test.	239	98
Hopkinton	Hopkinton	Hopkinton	Butter	Co-op	Sep'tr			491
Hopkinton	Hopkinton	Hopkinton	Butter	Co-op	Sep'tr	Test		492
Hopkinton	Hopkinton	Hopkinton	Butter	Ind	Sep'tr	Test		493
Manchester	Manchester	Cedar Falls	Butter	Co-op	Sep'tr	Test	85	290
Manchester	Manchester	Manchester	Butter	Co-op	Sep'tr	Test		80
Manchester	Manchester	Manchester	Butter	Ind	Sep'tr	Test		494
Manchester	Manchester	Manchester	Butter	Ind	Sep'tr	Test		66
Manchester	Manchester	Manchester	Butter	Co-op	Sep'tr	Test	70	96
Oneida	Oneida	Oneida	Butter	Ind	Sep'tr	Test		495
Petersburg	Petersburg	Oneida	Butter	Ind	Sep'tr	Test		496
Petersburg	Petersburg	Dyersville	Butter	Co-op	Sep'tr	Test		497
Petersburg	Petersburg	Petersburg	Butter	Ind	Sep'tr	Hd.		498
Ryan	Ryan	Ryan	Butter	Ind	Sep'tr	Test		498
Sand Spring	Sand Spring	Boston, Mass.	Butter	Ind	Sep'tr	Test		499

TABLE

Office record number	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.
<i>Fayette County—Continued.</i>			
132	Hawkeys	Hawkeys Creamery	Bortner & Wilkening
531	Ilyria		E. B. Shaw, Sec'y
180	Maynard	Crown Creamery Co.	Jas. Lewis, Sec'y
304	Maynard	Harlan Creamery Co.	A. F. Crawford, Sec'y
532	Minkler	Gran Creamery Co.	E. E. Shipley, Sec'y
117	Oelwein	Jefferson Creamery	J. H. Mayer, Sec'y
87	Oelwein	Oelwein Farmers' Creamery Co.	E. E. Day, Sec'y
237	Randallia	Randallia Creamery Co.	G. D. Torrey, Sec'y
13	Randallia	Pairview Creamery Co.	H. J. Grannis, Sec'y
533	Richfield	Farmers' Creamery	
534	Stanley	Stanley Creamery	
149	St. Lucas	The Farmers' Co-op. Creamery	J. J. Miba, Sec'y
535	Wadena	Farmers' Co-op. Creamery	
68	Waucoma	Waucoma Creamery	
536	Westgate	Westgate Creamery Co.	S. A. Sylvester, Sec'y
215	West Union	Union Creamery Co.	E. B. Shaw, Sec'y
34	West Union	West Union Farmers' Dairy Co.	C. P. Lake, Sec'y
<i>Floyd County</i>			
141	Charles City	Charles City Creamery	Krieger & Beard
537	Charles City	Elm Spring	White & Co.
538	Floyd	Floyd Co-op. Creamery Ass'n.	D. Wilbur, Sec'y
55	Marble Rock	Marble Rock Creamery	Fink Bros
539	Niles	Niles Creamery Ass'n.	J. Daly
8	Nora Springs	Nora Springs Creamery	Fink Bros
540	Powersville	Pleasant Grove Creamery	P. H. Powers
541	Rockford	Rockford Co-op. Dairy Ass'n.	T. Pippins
542	Ulster	Ulster Separator Creamery	A. P. Mott
<i>Franklin County</i>			
543	Ackley	Ackley Creamery	J. Martin & Son
544	Burdette	Burdette Creamery	J. Harris & Co.
67	Chapin	Chapin Creamery	Webster & Sanders
545	Dows	Bangs Factory	A. A. Bangs
26	Faulkner	Faulkner	Zeman Bros
261	Geneva	Geneva Creamery	I. W. Meyers
960	Hampton	Hampton Creamery	I. W. Meyers
96	Hampton	Hampton Co-op. Creamery Co.	F. Rodemeyer, Sec'y
259	Latimer	Latimer Creamery	I. W. Meyers
546	Latimer	Lion Creamery	C. Rasmussen
547	Reeve	Reeve Creamery	McKeller
161	Sheffield	Sheffield Co-op. Creamery Ass'n.	L. B. Carhart, Sec'y
<i>Greene County</i>			
548	Churdan	Churdan Butter Factory	S. C. Hoyt
263	Farlin	Farlin Co-op. Creamery Ass'n.	H. C. Pearl, Sec'y
549	Grand Junction		J. C. Harker
101	Grand Junction	Renner's Factory	Renner Bros
550	Jefferson	Jefferson C. and B. Factory	L. L. Heisel, Mgr
551	Jefferson	Jefferson Creamery	F. E. Greene, Assignee
552	Paton	Paton Creamery	G. E. White
188	Rippey	Rippey Creamery	Richardson & Remington
119	Scranton	Scranton Creamery	A. E. Applegate

VI—CONTINUED.

F. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED.	Operated by an individual, co-operative or stock company.	Separator, gathered cream, or both.	Method of receiving milk—by the test or by the hundred.	Dairy Commissioner's test bottle number.	Office record number.
Hawkeys	Hawkeys	Butter	Ind	Sep'tr.	Test.	196	192
West Union		Skim stat	Stock	Sep'tr.	Test.		531
Maynard	Maynard	Butter	Co-op.	Sep'tr.	Test.	214	180
Minkler	Maynard	Butter	Co-op.	Sep'tr.	Test.	562	304
Oelwein	Oelwein	Butter	Co-op.	Sep'tr.	Hd.		532
Oelwein	Oelwein	Butter	Co-op.	Sep'tr.	Test.	143	117
Oelwein	Oelwein	Butter	Co-op.	Sep'tr.	Test.	102	87
Randallia	Randallia	Butter	Stock	Sep'tr.	Test.	290	237
Randallia	Randallia	Butter	Stock	Sep'tr.	Test.	15	13
		Butter		Sep'tr.			533
		Butter		Sep'tr.			534
St. Lucas	Waucoma	Butter	Co-op.	S & G C	Test.	172	149
		Butter	Ind	Sep'tr.	Test.	53	535
Waucoma	Waucoma	Butter		Sep'tr.	Test.	53	68
Westgate		Butter		Sep'tr.			536
West Union	West Union	Butter	Stock	S & G C	Test.	202	215
West Union	West Union	Butter	Co-op.	Sep'tr.	Test.	40	34
Charles City	Charles City	Butter	Ind	Sep'tr.	Test.	164	141
Charles City	Charles City	Cheese	Ind		Hd.		537
Floyd	Floyd	Butter	Co-op.	G C			538
Marble Rock	Marble Rock	Butter	Ind	Sep'tr.	Test.	84	55
Charles City		Butter		Sep'tr.			539
Nora Springs	Nora Springs	Butter	Ind	Sep'tr.	Test.	10	8
Powersville	Powersville	Butter	Ind	Sep'tr.	Test.		540
Rockford	Rockford	Butter	Co-op.	G C			541
Ulster	Floyd	Butter	Ind	Sep'tr.	Test.		542
Ackley, Hard Co	Ackley	Butter	Ind	S & G C	Hd.		543
Burdette		Butter	Ind	Sep'tr.	Test.		544
Chapin	Chapin	Butter	Ind	Sep'tr.	Test.	137	67
Dows	Dows	Cheese	Ind				345
Faulkner	Faulkner	Butter	Ind	S & G C	Test.	51	26
Hampton	Geneva	Butter	Ind	S & G C	Test.	318	261
Hampton	Hampton	Butter	Ind	S & G C	Test.	317	260
Hampton	Hampton	Butter	Co-op.	Sep'tr.	Test.	113	96
Latimer	Latimer	Butter	Ind	S & G C	Test.	316	259
Latimer	Latimer	Butter	Ind	S & G C	Test.		546
Reeve	Reeve	Butter	Ind	Sep'tr.	Test.		547
Sheffield	Sheffield	Butter	Co-op.	Sep'tr.	Test.	307	161
Churdan	Churdan	Butter	Ind	Sep'tr.	Test.		548
Farlin	Farlin	Butter	Co-op.	Sep'tr.	Test.	344	263
Grand Junction	Grand Junction	But & Ch	Ind	Sep'tr.	Test.	118	101
Grand Junction	Grand Junction	But & Ch	Stock	Sep'tr.	Test.	351	250
Jefferson	Jefferson	Butter	G C				551
Paton	Paton	Butter	Ind	G C			552
Rippey	Rippey	Butter	Ind	Sep'tr.	Test.	234	188
Scranton	Scranton	Butter	Ind	Sep'tr.	Test.	193	119

TABLE

Office record number.	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.
<i>Grundy County.</i>			
553	Aplington	Pleasant Valley Twp. Creamery	Neihouse Bros.
218	Beaman	Beaman Creamery	P. McNelly
554	Conrad Grove	Farmers' Co-op. Creamery Co.	C. M. Desl.
115	Dairyville	Dairyville Creamery	N. H. Blom.
217	Fredsville	Fredsville Co-op. Co.	C. Olson, Sec'y
555	Grundy Center	Beaver Township Creamery	J. H. Sperry
556	Grundy Center	Colfax Creamery	J. H. Sperry
279	Grundy Center	Grundy Center Creamery	J. H. Sperry
557	Holland	Colfax Creamery	S. Nilssen
558	Holland	Holland Creamery	Farricks Bros.
559	Ivesta	Morrison Township Creamery	Geo. Shwark
560	Lincoln	Lincoln Spring Creamery	G. H. Patrick
561	Morrison	Morrison Creamery Co.	John Richmond, Sec'y
562	New Hartford	Fairfield Township Creamery	Graham Bros.
563	Reinbeck	Grant Township Creamery	T. P. Murphy, Sec'y
564	Reinbeck	Reinbeck Factory	The Fowler Co.
565	Wellsburg	Wellsburg Creamery	Martin & Faust.
<i>Guthrie County.</i>			
566	Bagley	Bagley Creamery Ass'n	Durham & Son
567	Jamaica	Jamaica Cheese Factory	Chadsey & Smith
568	Panora	Panora Creamery	
569	Yale	Yale Creamery	John Cronin & Co
<i>Hamilton County.</i>			
570	Blairsburg	Queen Creamery	J. E. Redding
229	Ellsworth	Ellsworth Creamery Co.	S. Sogard, Sec'y
571	Jewell	Jewell Creamery	C. E. Fenton, Sec'y
29	Kamrar	Gold Nugget Creamery	D. C. Bailey, Mgr.
573	Poplar Grove	Poplar Grove Creamery	N. H. Bowden
40	Radcliffe	Lincoln Creamery	H. Thompson, Sec'y
7	Randall	The Randall Farmers' Creamery	J. Clausen, Sec'y
12	Stanhope	Stanhope Creamery	I. Iverson
575	Williams	Williams Creamery	R. G. Clark & Co.
<i>Hancock County.</i>			
77	Britt	Crystal Creamery Co.	C. P. Christenson, Sec'y
574	Corwith	Corwith Creamery	Potter & Co.
575	Crystal Lake	Crystal Lake Creamery	Stoner & Davenport
576	Garner	Garner Creamery	S. E. Allen, Mgr.
577	Klemme	Klemme Creamery Co.	L. Sampson, Sec'y
<i>Hardin County.</i>			
91	Alden	Buckeye Creamery	G. Leitschwager, Sec'y
578	Cleves	Cleves Creamery	Sperry & Willoughby
579	Cottage	Cottage	Ryan & Christopher
580	Ellis	Ellis Cheese Mfg. Co.	W. I. Clark, Mgr.
581	Hubbard	Hubbard Creamery	E. F. Griffith
168	Hughes	Hughes Creamery	G. A. Lyne
44	Lawn Hill	Lawn Hill Creamery	Strayer Bros.
582	Radcliffe	Radcliffe Creamery	Crawford & Hill
583	Robertson	Robertson Creamery	J. Windecker & Son

VI—CONTINUED.

	P. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED	Operated by an individual, co-operative or stock company.	Separator, gathered cream, or both.	Method of receiving milk—by the test or by the hand.	Dairy Commissioner's test bottle number.	Office record number.
Aplington			Butter	Ind	Sep'tr.	Hd.		553
Beaman	Beaman	Butter	Butter	Ind	G C		267	218
Conrad	Conrad	Butter	Co-op	G C				554
Dairyville	New Hartford	Butter	Ind	Sep'tr.	Hd.		206	217
Fredsville	Cedar Falls	Butter	Co op	Sep'tr.	Test.			555
Grundy Center	Grundy Center	Butter	Ind	Sep'tr.	Test.			556
Grundy Center	Grundy Center	Butter	Ind	Sep'tr.	Test.		330	279
Holland	Holland	Butter	Ind	Sep'tr.	Hd.			557
Holland	Holland	Butter	Ind	Sep'tr.	Hd.			558
Ivesta		Butter	Co-op	Sep'tr.	Test.			559
Lincoln	Morrison	Butter	Ind	Sep'tr.	Hd.			560
Morrison	Morrison	Butter	Co op	Sep'tr.	Test.			561
New Hartford	New Hartford	Butter	Ind	Sep'tr.	Test.			562
Reinbeck	Reinbeck	Butter	Co-op	Sep'tr.	Test.			563
Waterloo	Reinbeck	But. & Ch.	Stock.	Sep'tr.	Test.			564
Wellsburg	Wellsburg	Butter	Ind	G C				565
Jefferson	Bagley	Butter	Stock	G C				566
Jamaica	Jamaica	Cheese	Ind					567
Panora		Butter	G C					568
Yale	Yale	But. & Ch.	S & G C					569
Blairsburg	Blairsburg	Butter	Ind	Sep'tr.	Hd.			570
Ellsworth	Ellsworth	Butter	Stock	Sep'tr.	Test.		282	229
Jewell	Jewell	Butter	Co-op	G C				571
Kamrar	Kamrar	Butter	Ind	Sep'tr.	Test.		35	37
Poplar Grove	Poplar Grove	Butter	Co-op	Sep'tr.	Test.			572
Radcliffe	Radcliffe	Butter	Co-op	Sep'tr.	Test.			40
Randall	Randall	Butter	Co-op	Sep'tr.	Test.			9
Stanhope	Stanhope	Butter	Ind	Sep'tr.	Test.		14	12
Webster City	Webster City	Butter	Ind	G C				573
Britt	Britt	Butter	Stock	Sep'tr.	Test.		90	77
Corwith	Corwith	Butter	Ind	G C				574
Britt	Britt	Butter	Ind	G C				575
Forest City	Garner	Butter	Stock	S & G C				576
Klemme	Klemme	Butter	Co-op	G C				577
Alden		Butter	Stock	Sep'tr.	Test.		107	91
Grundy Center	Cleves	Butter	Ind	Sep'tr.	Hd.			578
Cottage	Cottage	Cheese	Ind	Sep'tr.	Test.		264	379
Ellis		Cheese	Stock		Hd.			580
Hubbard	Hubbard	Butter	Ind	G C				581
Hughes	Hughes	Butter	Ind	S & G C	Test.		216	168
Lawn Hill	Lawn Hill	Butter	Ind	S & G C	Test.		51	44
Radcliffe	Radcliffe	Butter	Ind	Sep'tr.	Test.		103	88
Radcliffe	Radcliffe	Butter	Ind	Sep'tr.	Test.			582
Robertson	Robertson	Butter	Ind	Sep'tr.	Test.			583

TABLE

VI.—CONTINUED.

Office record number.	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.	F. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED.	Operated by an individual, co-operative or stock company.	Separator, gathered cream, or both.	Method of receiving milk—by the test or by the hundred, or by the Commissioner's test bottle number.	Office record number.
<i>Hardin County—Continued.</i>										
584	Steamboat Rock	Steamboat Rock Creamery				Butter		Sep'tr		584
227	Union	Union Creamery Co	W. H. Barnes, Sec'y	Union	Union	Butter	Co-op	Sep'tr	Test	227
585	Whitten	Whitten Creamery Co	G. N. Carr, Sec'y	Whitten	Whitten	Butter	Co-op	G C		585
<i>Henry County</i>										
586	New London	New London Creamery	Wm. Sates, Pat	New London		Butter				586
45	Wayland	Hickory Grove F'm's D. Ass'n	C. H. Keyes, Sec'y	Merrimac		Butter	Co-op	Sep'tr	Test	45
587	Winfield	Winfield Creamery	Eiches Bros	Winfield	Winfield	Butter	Ind	G C		587
<i>Howard County</i>										
588	Bonair	Farmers' Creamery Ass'n	T. S. Johnson, Sec'y	Bonair	Bonair	Butter	Co-op	S & G C	Test	588
589	Chester	Chester Co-op. Creamery Co	E. O. Green, Sec'y	Chester	Chester	Butter	Co-op	G C		589
590	Cresco	Cresco Creamery	Wm. R. Oven	Cresco	Cresco	Butter	Ind	S & G C	Test	590
591	Cresco	Cresco Cheese Co	Boston & Decorah Cr. Co.	Cresco	Cresco	Butter	Co-op	S & G C	Test	591
592	Cresco	Merchants' Creamery	Kallow & House	Cresco	Cresco	Butter	Stock	S & G C	Test	592
143	Elma	Elma Creamery	Johnson Bros	Decorah	Elma	Butter	Stock	S & G C	Test	143
142	Lime Spring	Lime Spring Creamery	Boston & Decorah Cr. Co.	Decorah	Lime Spring	Butter	Stock	S & G C	Test	142
53	Lourdes	Lourdes Farmers' Creamery	F. Chibak, Sec'y	Lourdes	Lourdes	Butter	Co-op	Sep'tr	Test	53
593	Protovia	Protovia Creamery Ass'n	J. J. Lukes, Sec'y	Protovia	Cresco	Butter	Stock	G C		593
594	Riceville	Riceville Creamery	G. S. Carpenter	Riceville	Il Co	Butter	Ind	G C		594
<i>Humboldt County</i>										
209	Bode	Bode Creamery Ass'n	T. O. Hanson, Sec'y	Bode	Bode	Butter	Stock	S & G C	Test	209
595	Bradgate	Bradgate Creamery		Bradgate		Butter				595
43	Humboldt	Humboldt B. & C. Ass'n	G. L. Cruikshank, Sec'y	Humboldt	Ham. & Dak. City	Butter	Co-op	Sep'tr	Test	43
596	Livermore	Livermore Creamery		Livermore		Butter				596
305	Renwick	Renwick Creamery	W. T. Drennen & Son	Renwick	Renwick	Butter	Ind	S & G C	Test	305
128	Thor	Clover Creamery	I. Olson, Sec'y	Thor	Thor	Butter	Co-op	Sep'tr	Test	128
<i>Ida County</i>										
597	Battle Creek	Maple Valley Creamery	Crawford Bros	Battle Creek	Battle Creek	Butter	Ind	G C		597
598	Arthur	Arthur Cheese Factory	M. J. Blause	Arthur	Arthur	Butter	Ind	G C	Id	598
599	Galva	Galva Creamery	Jorgenson	Galva	Galva	Butter	Ind	Sep'tr	Id	599
600	Ida Grove	Ida Grove Creamery	Hubbard & Saunders	Ida Grove	Ida Grove	Butter	Ind	G C		600
<i>Iowa County</i>										
157	Genoa Bluff	Genoa Bluff Creamery	G. R. Howard	Genoa Bluff	Genoa Bluff	Butter	Ind	S & G C		157
601	Green Center	Green Center Cheese Factory		Green Center		Cheese				601
602	Ladora	Ladora Cheese Factory	D. D. Case	Ladora	Ladora	Cheese	Ind	S & G C	Id	602
603	Marengo	Marengo Creamery	Peterson & Leader	Marengo	Marengo	Butter	Ind	S & G C		603
604	Millersburg	Millersburg Creamery	L. W. Hattier, Sec'y	Millersburg	Millersburg	Butter	Co-op	G C		604
605	North English	North English Creamery	Maguire & O'Brien	North English	North English	Butter	Ind	G C		605
606	Parnell	English Cheese Factory	T. H. Shaver Cheese Co.	North English	North English	Butter	Ind	G C		606
607	Parnell	Parnell Co-op. Creamery		Cedar Rapids	Parnell	But. & Ch.	Stock	S & G C	Test	607
281	South Amama	Clover Creamery	D. Sandersfield	South Amama	South Amama	Butter	Co-op	S & G C	Test	281
608	Victor	Victor Creamery	Schoitzlein Bros	Victor	Victor	Butter	Ind	G C		608
609	Williamsburg	Williamsburg Creamery	J. M. Matthews	Williamsburg	Williamsburg	Butter	Ind	G C		609
<i>Jackson County</i>										
610	Andrew	Andrew Lily Creamery	C. R. Bell & Co	Andrew	Maquoketa	Butter	Ind	S & G C	Test	610
611	Bellevue	Rose Valley Creamery Co	Wm. Koppes, Mgr.	Bellevue	Bellevue	Butter	Stock	G C		611
612	Emeline	Brandon Co-op. Creamery Co	H. Rippepton	Emeline		Butter	Co-op	Sep'tr		612
249	La Motte	La Motte Creamery	Nammers & Butler	La Motte	La Motte	Butter	Ind	S & G C	Test	249
61	La Motte	Sterling Separator Creamery	Hoffman & Kettler	La Motte	La Motte	Butter	Ind	S & G C	Test	61

TABLE

Office record number	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.
	<i>Jackson County</i>	<i>ty—Continued.</i>	
613	La Motte	Sterling Separator Creamery	Hoffman & Kettler
84	Miles	Pioneer Creamery	O. W. Heynen
106	Monmouth	Monmouth Co-op. Cr'y Co	Geo. Sokol, Sec'y
614	Preston	Preston Creamery	T. W. Welter
364	Spragueville	Spragueville Creamery	A. Von Oven
615	Spring Brook	Spring Brook	C. M. Kegler
616	St. Donatus	St. Donatus	Nemmers & Butler
617	Union Center	Union Center	T. W. Welter
	<i>Jasper County</i>		
123	Baxter	Baxter Creamery	Harris & Co
242	Ira	Ira Creamery	Harris & Co
618	Kellogg	Farmers' Co-op. Dairy Ass'n	R. Itskin, Mgr
619	Lynnville	Lynnville Butter & Cheese Ass'n	
620	Metz	Gold Leaf Creamery	G. E. Rolfe
269	Newton	Malaska Creamery	H. D. Parsons
123	Newton	Oak Lawn Creamery	W. Jackson
621	Prairie City	Prairie City	Bousquet & Rhynsburg
41	Reasnor	Palo Alto Dairy Co	W. E. Caldwell, Mgr
	<i>Jefferson County</i>		
622	Fairfield	Fairfield Creamery	Jno. McLane
3	Four Corners	Kauffman's Separator Creamery	A. M. Kaufman
129	Germanville	Germanville Creamery Ass'n	W. H. Knerr
99	Salina	Salina Creamery	J. H. Allender, Pres
	<i>Johnson County</i>		
623	Frank Pierce	Frank Pierce Ch. & Butter Co.	Jno. Wagner, Sec'y
624	Iowa City		G. W. Brooks
625	Iowa City	Sharon Cheese Co.	F. M. Weeber, Sec'y
130	Lone Tree	Lone Tree Creamery Co	Kelly & Carl
626	Morse	Shamrock Cheese Factory	I. H. Shaver Cheese Co.
87	North Liberty	North Liberty Creamery	J. W. Andrie
627	North Liberty	Green Castle	J. W. Andrie
628	Oxford		J. J. Bell & Co
629	Solon	Cedar Co-op. Creamery	A. B. Sargent, Sec'y
630	Solon	Cedar Creamery	H. L. Dean
631	Solon	Solon Creamery	Fisher & Beck
632	Tiffin	Clear Creek Creamery Co.	E. Sangster
	<i>Jones County</i>		
71	Amber	Amber Creamery	W. H. Sanford
250	Amber	Hazel Green Co-op. Cr'y Co.	M. J. McNeely, Sec'y
72	Amber	Jackson Creamery	W. H. Sanford
633	Anamosa	Cass Center Creamery	J. S. Condit
197	Anamosa	Fawn Creek Creamery	J. S. Condit
240	Anamosa	Franklin Creamery	Vinton Smith
634	Bowen	Star Creamery	Geo. Ambuhl, Sec'y
635	Cascade		J. Hosh
636	Cascade		Dehner & Key
637	Center Junction		C. M. Hanna
638	Center Junction	Johnstown Creamery	C. M. Hanna
107	Hale	Enterprise Creamery	W. J. Mills, Sec'y

VI—CONTINUED.

	P. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED.	Operated by an individual, co-operative or stock company.	Separator, gathered cream, or both.	Method of receiving milk—by the test or by the hundred.	Dairy Commissioner's test bottle number.	Office record number.
La Motte			Skim Sta'n	Ind	Sep'tr.	Test		613
Miles	Miles	Butter	Ind	Sep'tr.	Test		98	84
Monmouth	Monmouth	Butter	Co-op	Sep'tr.	Test		124	106
Delmar	Freston	Butter	Ind	Sep'tr.	Test		321	264
Miles	Spragueville	Butter	Ind	G C				615
Spring Brook	Bellevus	Butter	Ind	G C				615
La Motte		Skim Sta'n	Ind	Sep'tr.	Test			616
Delmar		Skim Sta'n	Ind	Sep'tr.	Test			617
Jesup	Baxter	Butter	Ind	Sep'tr.	Test		140	123
Jesup	Ira	Butter	Ind	Sep'tr.	Test		298	242
Kellogg		Butter	Co-op	G C				618
Metz	Metz	Butter	Ind	G C				619
Newton	Newton	Butter	Ind	S & G C	Test		326	269
Newton	Newton	Butter	Ind	S & G C	Test		157	133
Pella	Prairie City	Butter	Ind	G C				621
Reasnor	Reasnor	Butter	Stock	S & G C	Hd		47	41
Fairfield	Fairfield	Butter	Ind	G C				622
Four Corners	Lockridge	Butter	Ind	Sep'tr.	Test		300	3
Germanville	Brighios	Butter	Stock	Sep'tr.	Test		153	129
Salina		Butter	Co-op	Sep'tr.	Test		116	99
Frank Pierce	Kalona	Cheese	Co-op	Sep'tr.	Test			623
Iowa City	Iowa City	Butter	Ind	G C				624
Iowa City	Iowa City	Cheese	Co-op		Hd			625
Lone Tree	Lone Tree	Butter	Ind	S & G C	Test		143	120
Cedar Rapids	Morse	But & Ch	Stock	Sep'tr.	Test		200	626
North Liberty	Iowa City	Butter	Ind	Sep'tr.	Test		32	27
North Liberty		Skim Sta'n	Ind	Sep'tr.	Test			627
Oxford		Butter	Ind	G C				628
Solon	Solon	Butter	Co-op	Sep'tr.	Test			629
Tipton	Solon	Butter	Ind	G C				630
Solon	Solon	Butter	Ind	G C				631
Tiffin		Butter	Co-op	Sep'tr.	Test			632
Amber	Amber	Butter	Ind	Sep'tr.	Test		85	71
Amber	Amber	Butter	Co-op	Sep'tr.	Hd		306	250
Amber	Amber	Butter	Ind	Sep'tr.	Test		89	72
Anamosa	Anamosa	Butter	Ind	Sep'tr.	Test			633
Anamosa	Anamosa	Butter	Ind	Sep'tr.	Test		257	197
Bowen	Bowen	Butter	Ind	Sep'tr.	Test		295	240
Cascade, Dub Co	Cascade	Butter	Co-op	Sep'tr.	Test			634
Cascade, Dub Co	Cascade	Butter	Ind	Sep'tr.	Test			635
Cascade, Dub Co	Cascade	Butter	Ind	Sep'tr.	Test			636
Scotch Grove	Centre Junction	Butter	Ind	Sep'tr.	Test			637
Scotch Grove	Centre Junction	Butter	Ind	Sep'tr.	Test			638
Hale	Hale	Butter	Stock	Sep'tr.	Test		125	107

TABLE

Office record number.	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.
	<i>Jones County</i>	<i>Continued.</i>	
251	Langworthy	Clover Leaf Creamery	H. A. L. Bigley, Sec'y
639	Langworthy	Langworthy Creamery	Simpson, McIntire & Co.
186	Martelle	Martelle Creamery	Jas. Sinclair
641	Martelle	Brookside	Jas. Sinclair
216	Monticello	Monticello Creamery No. 1	Simpson, McIntire & Co.
645	Monticello	Monticello Creamery No. 2	Simpson, McIntire & Co.
644	Monticello	Monticello Creamery No. 4	Simpson, McIntire & Co.
645	Monticello	Monticello Creamery No. 5	Simpson, McIntire & Co.
646	Monticello	Monticello Creamery No. 6	Simpson, McIntire & Co.
647	Monticello	Downerville Co-op. Creamery	F. M. Laughlin, Sec'y
648	Olin	Levsen Farmers' Co-op. Cr'y	A. J. Levsen
134	Olin	Olin Creamery	C. L. Passmon
85	Onslow	Coral Creamery	J. L. Bader
649	Onslow	Coral	J. L. Bader
650	Onslow	Onslow Cheese Factory	S. L. Gilbert
651	Onslow		A. J. Griswold
652	Onslow		John Fagan
653	Oxford Junction	Oxford Junction Creamery	Simpson, McIntire & Co.
654	Scotch Grove	Rose Creamery	C. M. Hanna
655	Wyoming	Maple Grove Creamery	Simpson, McIntire & Co.
656	Wyoming	Wyoming Creamery	Simpson, McIntire & Co.
	<i>Keokuk County</i>		
21	Delta	Delta B. & C. Mfg. Co.	E. M. Jacobs, Sec'y
657	Hedrick	Hedrick Creamery Co.	Sensiney & Hines
658	Keota	Keota Creamery Co.	S. E. Reisman
659	Keswick	Keswick Creamery	Sintchlen Bros.
660	Martinsburg	Martinsburg Creamery	T. E. Briggs
661	Ollie	Ollie Creamery	Sensiney & Hines
662	Richland	Richland Creamery	J. D. Eicher
663	Sigourney	Sigourney Creamery Co.	
664	Talleyrand	Talleyrand Factory	C. M. Tacker
665	Webster	Keswick Creamery	M. M. Wheeler
666	Webster	Webster	M. M. Wheeler
667	What Cheer	What Cheer Creamery	Baker & Funk
	<i>Kossuth County</i>		
640	Algona	Algona Creamery	H. C. Blossom
194	Algona	Algona Co-op. Creamery Co.	M. Schenk, Sec'y
668	Bancroft	Bancroft Co-op. Creamery Co.	J. Hackle, Sec'y
153	Buffalo Fork	Buffalo Fork Co-op. Cr'y Co.	F. A. Battersfield, Sec'y
32	Burt	Burt Co-op. Creamery Co.	G. S. Angus, Sec'y
669	Burt	Lake View Creamery	R. Lane
108	Burt	Lone Rock Creamery	Krienke & Kalkbrenner
390	Fenton	Fenton Co-op. Creamery Co.	G. W. Newell, Sec'y
670	Germania	Germania Co-op. Creamery Co.	
671	Hobart	Hobart Co-op. Creamery Co.	L. C. Adams, Mgr.
336	Irvington	Irvington Co-op. Creamery Co.	Z. C. Andress, Sec'y
194	Lotts Creek	Lotts Creek Co-op. Cr'y Co.	F. L. Ramey, Sec'y
288	Seneca	Seneca Co-op. Creamery Co.	M. Janson, Sec'y
672	Swea City	Swea City Co-op. Creamery Co.	J. E. Peterson, Sec'y

VI—CONTINUED.

F. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED.	Operated by an individual, co-operative or stock company.	Separator, gathered cream, or both.	Method of receiving milk—by the test or by the hundred.	Dairy Commissioner's test bottle number.	Office record number.
Langworthy	Amber	Butter	Co-op	Sep'tr	Test	307	251
Boston, Mass.	Amber	Butter	Ind	Sep'tr	Test		659
Martelle	Marielle	Butter	Ind	Sep'tr	Test	221	186
Martelle		Skim sta'n	Ind	Sep'tr	Test	222	641
Boston, Mass.		Butter	Ind	Sep'tr	Test	263	216
Boston, Mass.		Butter	Ind	Sep'tr	Test		643
Boston, Mass.		Butter	Ind	Sep'tr	Test		644
Boston, Mass.		Butter	Ind	Sep'tr	Test		645
Boston, Mass.		Butter	Ind	Sep'tr	Test		646
Monticello		Butter	Co-op	Sep'tr	Test		647
Olin	Olin	Butter	Co-op	Sep'tr	Test		648
Olin	Olin	Butter	Ind	Sep'tr	Test	158	34
Olin	Onslow	Butter	Ind	Sep'tr	Test	97	83
Onslow		Skim sta'n	Ind	Sep'tr	Test		649
Onslow	Onslow	Cheese	Ind	Hd.	48	650	650
Onslow	Onslow	Cheese	Ind	Hd.		651	651
Onslow	Onslow	Butter	Ind	Sep'tr	Test		652
Boston, Mass.		Butter	Ind	Sep'tr	Test		653
Scotch Grove	Scotch Grove	Butter	Ind	Sep'tr	Test		654
Boston, Mass.		Butter	Ind	Sep'tr	Test		655
Boston, Mass.		Butter	Ind	Sep'tr	Test		656
Delta	Delta	Butter	Co-op	S & G C	Hd.	24	21
Hedrick	Hedrick	Butter	Ind	Sep'tr	Hd.		657
Keota	Keota	Butter	Ind	G C			658
Keswick		Butter	Ind	G C			659
Martinsburg	Martinsburg	Butter	Ind	G C			660
Ollie		Butter					661
Richland	Richland	Butter	Ind	G C			662
Sigourney	Sigourney	Butter					663
Talleyrand	Keota	Cheese	Stock		Hd.		664
Webster	Webster	Butter	Ind	G C			665
Webster	Webster	Cheese	Ind		Hd.		666
What Cheer	What Cheer	Butter	Ind	G C			667
Algona	Algona	Butter	Ind	G C			640
Algona	Algona	Butter	Co-op	Sep'tr	Test	296	194
Bancroft	Bancroft	Butter	Co-op	Sep'tr	Test		668
Buffalo Fork	Burt	Butter	Co-op	Sep'tr	Test	176	153
Burt	Burt	Butter	Co-op	Sep'tr	Test	61	52
Burt	Burt	Butter	Ind	Sep'tr	Test		669
Burt	Burt	Butter	Ind	Sep'tr	Test	128	108
Fenton	Burt	Butter	Co-op	Sep'tr	Test	348	390
Germania		Butter	Co-op	Sep'tr	Test		670
Hobart	Hobart	Butter	Co-op	Sep'tr	Test		671
Irvington	Irvington	Butter	Co-op	Sep'tr	Test	280	336
Lotts Creek	Lotts Creek	Butter	Co-op	Sep'tr	Hd.	241	199
Seneca	Bancroft	Butter	Co-op	Sep'tr	Test	345	288
Swea City	Swea City	Butter	Co-op	Sep'tr	Test		672

TABLE

Office record number.	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.
		<i>ty—Continued.</i>	
216	Wesley	Wesley Creamery	Oleson Bros
219	West Bend	Garfield Creamery Co.	R. W. Berringtonhouse, Sec'y
116	Whittemore	Whittemore Co-op. Creamery Co.	J. B. Worden, Sec'y
		<i>Lee County.</i>	
673	Denmark	Denmark Cheese Factory	T. G. Currie
		<i>Linn County</i>	
674	Alburnette	Eureka Creamery Co.	J. W. Robins, Sec'y
675	Broadway	Broadway Creamery	F. B. Dickey
676	Cedar Rapids		H. G. Woodward & Son
677	Center Point		J. R. Gitcheell
46	Central City	Central City Creamery	Henderson & Nietert
2	Central City	Valley Farm Creamery	P. G. Henderson
678	Central City		P. G. Henderson
679	Coggon	Coggon Creamery Co.	M. L. Ware, Sec'y
680	Coggon	Deep Spring Creamery	
681	Coggon	North Side Creamery Co.	
682	Elmont	Elmont Creamery	S. B. Mills
306	Ely	Ely & Western Creamery Co.	J. C. Dvorak, Sec'y
683	Fairfax	Scotch Grove Creamery	P. G. Henderson
684	Lafayette	Lafayette Creamery Co.	G. W. Smith, Sec'y
685	Lisbon	W. S. Furness Creamery Co.	W. S. Furness, Sec'y
686	Marion	Indian Creek	Gray & White
687	Marion	Inland	Ed Clark
113	Marion	Marion Creamery	Gray & White
203	Prairieburg	Nickle Plate Creamery	M. A. Waddick, Sec'y
78	Prairieburg	Oak Leaf Creamery	Beatty Bros.
688	Robins	Eureka Creamery	J. M. Robinson, Sec'y
689	Springville		Irwin Paul
690	Springville		Irwin Paul
691	Springville	Uncle Sam	Ed Clark
177	Toddville	Monroe Creamery Co.	E. H. Cumberland, Sec'y
692	Troy Mills		Bince & Harvey
693	Troy Mills	Highland Creamery Co.	W. R. Cherry
694	Viola	Viola Creamery	A. L. Cory
16	Walker	Walker Creamery	H. J. Neiert
695	Waubeek	Cold Spring Creamery	A. L. Cory
696	Waubeek	Waubeek Creamery	A. L. Cory
697	Waubeek	Crown Creamery	J. G. Fox
698	Western College	Ely & Western Creamery Co.	J. C. Dvorak, Sec'y
		<i>Lousia County.</i>	
699	Fredonia	Fredonia Co-op. Creamery Co.	J. C. Byron, Sec'y
700	Letts	Letts Creamery	H. H. Hilderbrand & Son
701	Wapello	Wapello Creamery	
		<i>Lucas County</i>	
702	Derby	Derby B. & C. Mfg. Co.	J. J. George, Sec'y
73	Russell	Russell Creamery Co.	W. J. Marshall, Sec'y
		<i>Lyon County</i>	
703	Doon	Doon Creamery	F. M. Wells

VI—CONTINUED.

F. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED	Operated by an individual, cooperative or stock company.	Separator, gathered cream, or both.	Method of receiving milk—by the test or by the hundred.	Dairy Commissioner's test bottle number.	Office record number.
Wesley		Butter	Ind	Sep'tr.	Test.	302	246
West Bend	West Bend	Butter	Stock	Sep'tr.	Test.	268	219
Whittemore	Whittemore	Butter	Co-op	Sep'tr.	Test.	137	116
Fl. Madison		Cheese	Ind		Hd.		673
Robins	Alburnette	Butter	Stock	Sep'tr.	Test.		674
Hazel Green	Ryan	Butter	Ind	Sep'tr.	Test.		675
Cedar Rapids	Center Rapids	Butter	Ind	Sep'tr.	Hd.		676
Center Point	Center Point	Butter	Ind	Sep'tr.	Test.		677
Central City	Central City	Butter	Ind	Sep'tr.	Test.	53	46
Central City	Central City	Butter	Ind	Sep'tr.	Test.	4	2
Central City	Central City	Butter	Ind	Sep'tr.	Test.		678
Coggon	Coggon	Butter	Stock	Sep'tr.	Hd.		679
Coggon	Coggon	Butter	Co-op	Sep'tr.	Hd.		680
Coggon	Coggon	Butter	Ind	Sep'tr.	Hd.		681
Coggon	Central City	Butter	Ind	Sep'tr.	Hd.		682
Elmont	Elmont	Butter	Stock	S & G C	Test.	364	306
Ely	Ely	Butter	Ind	Sep'tr.	Hd.		683
Central City	Fairfax	Butter	Ind	Sep'tr.	Hd.		684
Lafayette	Alburnette	Butter	Stock	Sep'tr.	Test.		685
Lisbon	Lisbon	Butter	Stock	S & G C	Test.		686
Marion		Skim stat'n	Ind	Sep'tr.	Test.		687
Cedar Rapids	Marion	But. & Ch.	Ind	Sep'tr.	Test.	134	113
Marion	Marion	Butter	Ind	Sep'tr.	Test.		688
Argand	Coggon	Butter	Co-op	Sep'tr.	Test.	351	203
Coggon	Coggon	Butter	Ind	Sep'tr.	Hd.	91	78
Robins	Robins	Butter	Stock	Sep'tr.	Test.		688
Springville	Springville	Butter	Ind	Sep'tr.	Hd.		689
Springville	Springville	Butter	Ind	Sep'tr.	Hd.		690
Springville	Springville	Butter	Ind	Sep'tr.	Hd.		691
Cedar Rapids	Springville	But. & Ch.	Ind	Sep'tr.	Test.	210	177
Toddville	Toddville	Butter	Stock	Sep'tr.	Test.		692
Troy Mills	Walker	Butter	Ind	Sep'tr.	Hd.		693
Troy Mills	Walker	Butter	Stock	Sep'tr.	Hd.		693
Troy Mills	Viola	Butter	Ind	Sep'tr.	Hd.		694
Waubeek	Walker	Butter	Ind	Sep'tr.	Test.	18	16
Waubeek	Viola	Butter	Ind	Sep'tr.	Hd.		695
Waubeek	Viola	Butter	Ind	Sep'tr.	Hd.		696
Waubeek	Central City	Butter	Ind	Sep'tr.	Hd.		697
Waubeek	Central City	Butter	Ind	Sep'tr.	Hd.		698
Ely		Skim stat'n	Stock	Sep'tr.	Test.		698
Fredonia	Fredonia	Butter	Co-op.	G C	Test.		699
Letts	Letts	Butter	Ind	G C	Test.		700
Wapello	Wapello	Butter	Ind	G C	Test.		701
Derby		But. & Ch.	Stock	Sep'tr.	Hd.		702
Russell	Russell	Butter	Stock	Sep'tr.	Test.	84	73
Doon		Butter	Ind	Sep'tr.	Hd.		703

TABLE

VI—CONTINUED.

Office record number	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.	P. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED.	Operated by an individual, cooperative or stock company.	Separator, gathered cream, or both.	Method of receiving milk—by the test or by the hand.	Dairy Commissioner's test bottle number	Office record number
	<i>Madison County.</i>										
74	Macksburg	Cook Creamery Co	W. P. Love, Sec'y	Macksburg	Lorimer	Butter	Co-op	Sep'tr	Test	87	704
704	McBride	Ziemann	Wm. Ziemann	Van Meter		Skim statn	Ind	Sep'tr	Test		705
705	Patterson	Ziemann Creamery	Wm. Ziemann	Van Meter	Patterson	Butter	Ind	Sep'tr	Test		706
706	Pitzer	Pitzer Creamery	R. W. Stewart, Sec'y	Pitzer		Butter	Stock	Sep'tr	Test		
	<i>Mahaska County.</i>										
6	Barnes	Barnes Gold Medal Butter Co.	C. E. Reed, Sec'y	Barnes	Barnes	Butter	Stock	S & G C	Test	8	6
707	New Sharon	New Sharon Creamery	F. E. Crawford, Sec'y	New Sharon	New Sharon	Butter	Stock	G. C.			207
121	Union Mills	Union Mills Butter Co.	S. Hickok, Sec'y	Union Mills	New Sharon	Butter	Co-op	S & G C	Test	144	121
	<i>Marion County.</i>										
708	Bussey	Bussey B. and C. Mfg. Co.		Bussey	Bussey	Butter	Stock	S & G C			708
709	Durham	Farmers' B. and C. Mfg. Co.	J. W. Swigart	Durham		Butter	Co-op	Sep'tr	Test		709
710	Gosport	Gosport Creamery Co.	T. H. Krish	Gosport		Butter	Co-op	Sep'tr	Test		710
711	Knoxville	Knoxville Creamery	Bousquet & Rhynsburger	Pella		Butter	Ind	G. C.			711
712	Newburn	Newburn Creamery Co.	V. M. Bearden	Newburn		Butter	Co-op	Sep'tr	Test		712
713	Pella	Pella Creamery	Bousquet & Rhynsburger	Pella		Butter	Ind	G. C.			713
	<i>Marshall County.</i>										
714	Clemons	Mierva Valley Creamery Co.	John Van Meter	Clemons	Clemons	Butter	Co-op	G. C.			714
715	Haverhill	Columbia Creamery Co.	H. B. Kopel, Sec'y	Haverhill	Haverhill	Butter	Co-op	S & G C	Test		715
716	Haverhill	Haverhill Creamery	Mayer Bros.	Haverhill	Haverhill	Butter	Ind	G. C.			716
717	Le Grande	Farmers' Creamery Co.	J. F. Naagle, Sec'y	Le Grande		Butter	Stock	Sep'tr	Test	306	717
174	Liscomb	Liscomb Butter and Cheese Co.	C. F. Biersborn, Sec'y	Liscomb		Butter	Co-op	Sep'tr	Ind		718
718	Rhodes	Eden Creamery	A. Rhodes	Rhodes		Butter	Ind	G. C.			214
14	State Center	Farmers' Creamery Ass'n	E. G. Swift, Sec'y	State Center	State Center	Butter	Co-op	G. C.			14
	<i>Mills County.</i>										
720	Emerson	Blue Grass Creamery	W. M. Tolander	Emerson		Butter	Ind	G. C.			720
721	Malvern	Malvern Creamery	R. F. Norton	Malvern	Malvern	Butter	Ind	G. C.			721
	<i>Mitchell County.</i>										
722	Bailey	Lawn Spring Creamery Co.	W. I. Hall, Sec'y	Bailey	Bailey	Butter	Co-op	G. C.			722
723	Carpenter	Carpenter Creamery	Kennedy & Sons	Carpenter		Butter	Ind	Sep'tr	Hd.		723
724	Little Cedar	Little Cedar Creamery	W. B. Danforth, Sec'y	Little Cedar	Wheeler	Butter	Co-op	G. C.			724
725	McIntire	McIntire Creamery	Wm. Beard & Sons	Decorah	McIntire	Butter	Ind	Sep'tr	Hd.		725
726	New Haven	Farmers' Co-op. Creamery	E. E. Swan, Mgr.	New Haven	Osage	Butter	Co-op	G. C.			726
727	Orchard	Spring Creek Creamery	J. W. Rodes, Sec'y	Orchard	Orchard	Butter	Co-op	G. C.			727
728	Osage	Osage Co-op. Creamery Co.	A. Bartle, Sec'y	Osage	Osage	Butter	Co-op	G. C.			728
729	Riceville	Riceville Creamery	C. Carpenter	Riceville		Butter	Ind	G. C.			729
730	Rock Creek	Rock Creek Co-op. Cr'y Ass'n	S. J. Fasholdt, Sec'y	Osage	O-sage	Butter	Co-op	G. C.			730
731	Saint Ansgar	Farmers' Co-op. Creamery	J. F. Dermody, Sec'y	Saint Ansgar	Saint Ansgar	Butter	Co-op	G. C.			731
732	Stacyville	Stacyville Creamery	J. M. Westlake	Stacyville		Butter	Ind	Sep'tr	Hd.		732
	<i>Monona County.</i>										
733	Blencoe	Walnut Grove	W. H. Peake	Blencoe	Blencoe	Butter	Priv. Ind	Sep'tr	Hd.		733
	<i>Montgomery County.</i>										
102	Elliott	Elliott Butter and Cheese Co.	H. G. Barnes, Sec'y	Elliott	Elliott	Butter	Stock	Sep'tr	Hd.	119	102
734	Red Oak	Lincoln	E. T. Evans	Red Oak	Red Oak	Cheese	Ind		Hd.	108	734
735	Stanton	Stanton Creamery Ass'n	J. W. Finley, Sec'y	Stanton	Stanton	Butter	Stock	Sep'tr	Hd.		735
736	Villisca	Villisca Creamery		Villisca	Villisca	Butter	Ind	G. C.			736
	<i>Monroe County.</i>										
737	Albia	Albia Factory	S. S. Wyatt	Albia		Cheese	Stock		Hd.		737
738	Albia	Bluff Creek	J. K. Watson	Albia		Cheese	Stock		Hd.		738
739	Albia	Watson	Rowles Bros	Albia		Cheese	Ind		Hd.		739

TABLE

VI—CONTINUED.

Office record number	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY	NAME OF PROPRIETOR, SECRETARY OR MANAGER.	P. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED	Operated by an individual, co-operative or stock company	Separator, gathered cream, or both.	Method of receiving milk—by the manufacturer or by the manufacturer's test bottle number.	Dairy Commissioner's test bottle number.	Office record number
<i>Monroe County—Continued.</i>											
740	Albia	Mantua Cheese Ass'n	J. M. M. Roberts, Sec'y.	Albia	Albia	Cheese	Stock	Hd.	331	740	
741	Albia	Mantua Cheese Ass'n	Enix & Smith	Albia	Albia	Cheese	Ind.	Hd.		741	
742	Albia	Mantua Cheese Ass'n	S. G. Bone	Albia	Albia	Cheese	Ind.	Hd.		742	
743	Albia	Mantua Cheese Ass'n	J. Hollingshead	Albia	Albia	Cheese	Ind.	Hd.		743	
744	Albia	Mantua Cheese Ass'n	L. J. Parry	Albia	Albia	Cheese	Ind.	Hd.		744	
745	Albia	Mantua Cheese Ass'n	no. I. Tate	Albia	Albia	Cheese	Ind.	Hd.		745	
746	Eddyville	Pleasant Twp. Cheese Ass'n.	W. B. DeTar, Sec'y	Eddyville, Wap. Co.	Eddyville	Cheese	Stock	Hd.		746	
748	Hilton	Hilton Cheese Factory	Rowles Bros	Albia	Albia	Cheese	Ind.	Hd.		748	
747	Lovilia	Lovilia Cheese Factory	Stark & Co.	Lovilia	Lovilia	Cheese	Stock	Hd.		747	
749	Moravia	Union Cheese Factory	J. W. Scott, Sec'y	Moravia, App Co.	Moravia & Albia	Cheese	Stock	Hd.		749	
750	Selection	Monroe Cheese Factory	Kowles Bros	Albia	Albia	Cheese	Ind.	Hd.		750	
<i>Mascatawa County.</i>											
791	Atalissa	Penn Ave. Creamery	J. Long	Atalissa	Atalissa	Butter	Ind.	G C		751	
752	West Liberty	Cedar Valley	L. B. Pickering	West Liberty	West Liberty	Butter	Ind.	S & G C		752	
753	West Liberty	Lone Star Creamery	H. H. Hilderbrand & Son	West Liberty	West Liberty	Butter	Ind.	S & G C Hd		753	
754	Wilton Junction	Nickle Plate Creamery	G. W. Kelly	Wilton Junction	Wilton Junction	Butter	Ind.	S & G C Hd		754	
<i>O'Brien County.</i>											
25	Germanstown	Caledonia	Wm. Gehrls, Mgr	Germanstown	Paulina	Butter	Co-op	Sep'tr.	Test.	29	25
735	Hartley	Hartley	M. Baskins	Hartley	Sanborn	Butter	Ind.	Sep'tr.		735	
739	Sanborn	Sanborn	D. P. Wells	Sanborn	Sanborn	Butter	Ind.	S & G C	Test.	82	739
58	Sutherland	Sutherland	D. M. Sheldon	Sutherland	Sutherland	Butter	Ind.	S & G C	Test.	67	58
<i>Osceola County.</i>											
756	Ocheyedan	Farmers Co-op B. & C. Factory	W. E. Ely, Sec'y.	Ocheyedan	Ocheyedan	But. & Ch.	Co-op	S & G C	Test.	756	
75	Sibley	Clover Lawn	B. F. Webster	Sibley	Sibley	Butter	Ind.	Sep'tr.	Test.	88	75
<i>Page County.</i>											
737	Blanchard	Blanchard Butter and Cheese Co.	E. L. Kennon, Sec'y	Blanchard	Blanchard	Butter	Stock	Sep'tr.	Hd.	737	
758	Clarinda	Clarinda Creamery		Clarinda	Clarinda	Butter	Ind.	G C		758	
730	College Springs	College Springs	E. F. Badger	College Springs	Coin	Cheese	Ind.		Hd.	730	
760	Northboro	Northboro	W. H. Hatfield	Northboro	Northboro	Butter	Ind.		Hd.	760	
761	Shambaugh	Shambaugh Creamery	I. Shambaugh, Pres	Shambaugh	Shambaugh	Butter	Ind.	Sep'tr.	Hd.	761	
<i>Palo Alto County.</i>											
230	Ayrshire	Silver Lake Creamery Co.	C. Duhigg, Sec'y	Ayrshire	Ayrshire	Butter	Co-op	Sep'tr.	Test.	230	
275	Crippen	Crippen Creamery Co.	M. Joint, Sec'y	Crippen	Crippen	Butter	Co-op	Sep'tr.	Test.	275	
154	Curlew	Curlew Creamery Co.	T. T. Shaull, Sec'y	Curlew	Curlew	Butter	Stock	Sep'tr.	Test.	154	
297	Cylinder	Cylinder Butter & Cheese Ass'n	A. Satter, Sec'y	Cylinder	Cylinder	Butter	Co-op	Sep'tr.	Test.	297	
762	Depew	Fairview Creamery Co.	Wm. Moore, Sec'y	Depew	Emmesburg	Butter	Co-op	Sep'tr.	Test.	762	
763	Emmesburg	Maple Leaf Creamery Co.	A. Leishman, Sec'y	Emmesburg	Emmesburg	Butter	Stock	Sep'tr.	Test.	763	
764	Fairville	Nevada Creamery Co.	G. W. Downs, Sec'y	Emmesburg	Emmesburg	Butter	Co-op	Sep'tr.	Test.	300	
292	Fairville	Fairville Creamery Co.	C. H. Blockman, Sec'y	Fairville	Whitemore	Butter	Ind.	Sep'tr.	Test.	292	
764	Graettinger	Graettinger Creamery	Preston Fahnstock & Co.	Graettinger	Graettinger	Butter	Stock	Sep'tr.	Test.	764	
765	Graettinger	Lost Island Creamery Co.	L. C. Christianson, Sec'y	Graettinger	Graettinger	Butter	Co-op	Sep'tr.	Test.	765	
283	Mallard	Mallard Butter and Cheese Ass'n	J. W. Price, Sec'y	Mallard	Mallard	Butter	Co-op	Sep'tr.	Test.	340	
31	Osgood	Osgood Creamery Co.	L. P. Stillman, Sec'y	Osgood	Osgood	Butter	Co-op	Sep'tr.	Test.	31	
766	Ruthven	Highland Butter Ass'n	J. R. Brown	Ruthven	Ruthven	Butter	Co-op	Sep'tr.	Test.	766	
187	Ruthven	Ruthven Creamery	H. D. Remington	Ruthven	Ruthven	Butter	Ind.	Sep'tr.	Test.	187	
307	West Bend	West Bend Creamery Co.	J. B. Martin, Sec'y	Ruthven	Ruthven	Butter	Co-op	Sep'tr.	Test.	307	
<i>Plymouth County.</i>											
767	Merrill	Merrill Creamery		Merrill	Merrill	Butter	Stock	Sep'tr.		767	
768	Remsen	Remsen Creamery	M. Beck	Remsen	Remsen	Butter	Ind.	S & G C Hd		768	

Office record number.	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.
<i>Pocahontas County.</i>			
254	Fonda	Rosebud Creamery	W D Beswick
799	Laurens	Laurens Creamery	T. J. Beas & Co
273	Rolla	Gilt Edge Creamery	W. R. Rogers
<i>Folk County.</i>			
182	Grimes	Grimes B & C Co	W J. Stewart, Sec'y
195	Maxwell	Keystone Creamery	F. W. Hill
770	Mitchellville	Mitchellville Creamery	W J. Schall, Sec'y
17	Polk City	Tip-Top Butter Co	H. L. Case, Mgr.
771	Runnells	Runnells Creamery	
<i>Pottawattamie County.</i>			
772	Avoca	Avoca Creamery	R. Frost
135	Hancock	Hancock B. & C. Ass'n	F. R. Van Fossen, Sec'y
214	Minden	Silver Valley Creamery	H. C. Brandes
773	Minden	Minden Creamery	Jurgenson & Johnson
<i>Poweshiek County.</i>			
778	Brooklyn	Brooklyn Creamery	Hatter & Baird
774	Chester Center	Chester Center Cheese Factory	E. E. Parsons
779	Deep River	Deep River Creamery	Hatter & Baird
170	Grinnell	Fowler Creamery	J. W. Fowler
86	Grinnell	Grinnell Creamery	Smith & Matteson
775	Grinnell	Grinnell Creamery	J. E. Neely
776	Guernsey	Guernsey B. & C. Co	J. W. Rose
777	Hartwick	Hartwick Diamond B. Factory	L. Leyenberger, Sec'y
<i>Ringgold County.</i>			
780	Kellerton	Kellerton Creamery Co	F. C. Smith, Sec'y
781	Mt. Ayr	Liberty	J. E. Main, Sec'y
782	Redding	Redding Creamery	M. P. Hoffman, Pat
783	Tingley	Tingley Cheese Factory	C. C. Bosworth
<i>Sac County.</i>			
104	Auburn	Auburn Creamery	Boardman Bros & Co
105	Carnarvon	Carnarvon Creamery	Boardman Bros & Co
784	Carnarvon	Carnarvon Butter Co	Seaman & Hoon
11	Early	Delaware Center Creamery Co	C. N. Searle, Sec'y
380	Early	Early Creamery	G. W. Pattie
103	Early	Gold Medal Creamery	J. W. Wright
253	Lake View	Lake View Creamery	Donahoe & Ahern
785	Odebolt	Odebolt Creamery	R. Crichton
786	Odebolt	Rose Valley Creamery	G. Fuhlendorf
787	Sac City	Canon Valley Creamery	Elwood & Pettis
190	Sac City	Pearl Creamery	C. M. Culp, Mgr
788	Sac City	Sac City Creamery	D. Carr Early
274	Schaller	Eureka	C. F. Schroeder
789	Wall Lake	Wall Lake	Donahoe & Ahern
<i>Scott County.</i>			
790	Amity	Amity Butter Factory	Frye & Co
791	Buffalo	Buffalo Creamery	J. Ducther, Sec'y
792	Dixon	Dixon Creamery Co	Hener & Kuver
793	Donahoe	Donahoe Farmers Butter Co.	F. Keppey, Sec'y
223	Eldridge	Eagle Creamery	W. H. Kuehl

F. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED.	Operated by an individual, co-partnership or stock company.	Separator, gathered cream, or both.	Method of packing the test samples by the hauler.	Dairy Commissioner's test bottle number.	Office record number.
Fonda	Fonda	Butter	Ind	Sep'tr.	Test	311	254
Laurens	Laurens	Butter	Ind	Sep'tr.	Test	329	799
Rolla	Rolla	Butter	Ind	Sep'tr.	Test	329	273
Grimes	Grimes	Butter	Stock	Sep'tr.	Test	229	182
Maxwell	Maxwell	Butter	Ind	S & G C	Test	235	195
Mitchellville	Mitchellville	Butter	Stock	Sep'tr.	Test	19	770
Polk City	Polk City	Butter	Stock	Sep'tr.	Test	19	17
Runnells	Runnells	Butter	Co-op	Sep'tr.	Hd.	17	771
Avoca	Avoca	Butter	Ind	G C	Test	170	772
Hancock	Hancock	Butter	Co-op	S & G C	Hd.	361	135
Minden	Hancock	Butter	Ind	Sep'tr.	Test	361	214
Minden	Hancock	Butter	Ind	Sep'tr.	Test	361	773
Brooklyn	Brooklyn	Butter	Ind	G C	Test	375	778
Chester Center	Chester Center	Butter	Ind	G C	Test	375	774
Deep River	Deep River	Butter	Ind	G C	Test	197	779
Grinnell	Grinnell	Butter	Ind	Sep'tr.	Test	197	170
Grinnell	Grinnell	Butter	Ind	S & G C	Test	101	86
Grinnell	Grinnell	Butter	Ind	S & G C	Test	21	775
Grinnell	Grinnell	Cheese	Ind	Sep'tr.	Test	21	776
Guernsey	Guernsey	Butter	Co-op	S & G C	Test	278	777
Hartwick	Hartwick	Butter	Stock	S & G C	Test	278	778
Kellerton	Kellerton	Butter	Stock	Sep'tr.	Hd.	780	780
Mt. Ayr	Mt. Ayr	Cheese	Co-op	Hd.	Test	781	781
Redding	Redding	Butter	Stock	G C	Test	782	782
Redding	Redding	Cheese	Ind	Sep'tr.	Test	783	783
Tingley	Tingley	Cheese	Ind	Sep'tr.	Test	121	104
Nevada, Story Co	Auburn	Butter	Ind	S & G C	Hd.	122	105
Nevada, Story Co	Carnarvon	Butter	Ind	Sep'tr.	Test	184	784
Carnarvon	Carnarvon	Butter	Co-op	Sep'tr.	Test	13	11
Early	Early	Butter	Ind	Sep'tr.	Test	237	280
Early	Early	Butter	Ind	Sep'tr.	Test	191	103
Early	Early	Butter	Ind	Sep'tr.	Test	191	105
Early	Lake View	Butter	Ind	Sep'tr.	Test	248	205
Early	Lake View	Butter	Ind	Sep'tr.	Test	248	785
Odebolt	Odebolt	Butter	Ind	Sep'tr.	Test	786	786
Odebolt	Odebolt	Butter	Ind	Sep'tr.	Test	787	787
Odebolt	Odebolt	Butter	Ind	Sep'tr.	Test	237	190
Sac City	Sac City	Butter	Ind	Sep'tr.	Test	790	788
Sac City	Sac City	Butter	Ind	Sep'tr.	Test	331	274
Schaller	Schaller	Butter	Ind	Sep'tr.	Test	331	789
Wall Lake	Wall Lake	Butter	Ind	Sep'tr.	Test	374	789
Davenport	Davenport	Butter	Stock	Sep'tr.	Test	791	790
Buffalo	Buffalo	Butter	Stock	Sep'tr.	Test	792	791
Dixon	Dixon	Butter	Ind	G C	Test	793	792
Dixon	Dixon	Butter	Co-op	Sep'tr.	Test	793	793
Donahoe	Donahoe	Butter	Ind	Sep'tr.	Test	270	223
Eldridge	Eldridge	Butter	Ind	Sep'tr.	Test	270	223

TABLE

Office record number	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.
		<i>Continued.</i>	
794	Scott County	Green Tree Creamery Co.	P. Littig, Secretary.
795	Green Tree	Star Creamery	W. Curtis.
	<i>Shelby County</i>		
796	Elkhorn	Danish Separator Creamery.	H. P. Peterson, Mgr.
797	Harlan	Harlan Creamery Ass'n.	O. F. Graves, Sec'y.
	<i>Sioux County</i>		
798	Granville	Northwestern Creamery Co.	J. Eulberg, Mgr.
109	Hawarden	Hawarden Creamery Ass'n.	J. M. Lynn, Sec'y.
267	Hull	Hull Creamery.	L. E. Bourguin.
799	Ireton	Ireton Creamery.	C. H. Vanderhamm.
800	Sioux Center	Sioux Center Creamery.	J. A. Ranney.
	<i>Story County</i>		
248	Ames	Iowa Agricultural College.	Prof. Jas. Wilson.
252	Cambridge	Spring Valley Creamery.	B. Corrington.
801	Colo	Fairview Creamery.	N. W. Gales.
39	Gilbert	Gilbert Creamery Co.	T. B. Jones.
178	Iowa Center	Iowa Center Creamery.	J. Q. Moore.
193	Maxwell	Maxwell Creamery.	F. W. Hill.
176	McCallsburg	McCallsburg B. and C. Ass'n.	S. Reid, Sec'y.
308	Nevada	Milford Farmer's Creamery Co.	C. M. Minkler, Sec'y.
805	Roland	Indian Hill Creamery.	J. Harndoo, Pres't.
103	Roland	Roland Creamery.	Boardman Bros. & Co.
37	Roland	Roland Farmers' Creamery Co.	E. J. Ewanston, Sec'y.
32	Slater	Slater B. and C. Ass'n.	J. V. Peterson, Sec'y.
805	Story City	Story City Creamery.	S. K. Swenson & Co.
806	Zearing	Zearing Creamery.	E. S. Hoyt.
	<i>Tama County</i>		
804	Chelsea	Chelsea	Hilton Bros. & Co.
807	Dinsdale	Dinsdale	Rowe Bros.
808	Dysart	Dysart	L. H. Shaver Cheese Co.
809	Elberon	Elberon Cheese Factory.	C. Christianson.
810	Garwin	Garwin Creamery.	Hilton Bros. & Co.
811	Gladbrook	Gladbrook Creamery.	Rowe Bros.
812	Mooreville	Mooreville Creamery.	J. H. Stevens.
206	Montour	Montour Creamery Co.	Hilton Bros. & Co.
814	Tama	Tama Creamery.	J. B. O'Connor.
815	Traer	Traer Creamery.	Siegel & Son.
816	Waltham	Waltham Creamery.	
	<i>Taylor County</i>		
185	Bedford	Taylor Co. B. and C. Ass'n.	J. H. Baldwin.
817	Blockton	Blockton B. & C. Ass'n.	M. C. Brown, Sec'y.
818	Clearfield	Clearfield Creamery Co.	
819	Conway	Conway Creamery.	Simpson & Schonover.
820	Guss	Maple Grove Creamery.	W. L. Clark.
821	Iveyville	Iveyville Farmers' Co-op. Cr'y.	H. Lupton, Sec'y.
822	Lenox	Lenox B. and C. Ass'n.	McAlpin & Tomlinson.
255	New Market	New Market Creamery.	

VI—CONTINUED.

F. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED.	Operated by an individual, co-operative or stock company.	Separator, gathered cream or both.	Method of receiving milk—by the test or by the brand.	Dairy Commissioner's test bottle number.	Office record number.
Green Tree		Butter	Stock	Sep'tr.	Hd.		794
Long Grove		Butter	Ind.	G.C.			795
Elkhorn	Brayson	Butter	Stock	Sep'tr.			796
Harlan	Harlan	Butter	Stock	G.C.			797
Granville	Granville	Butter	Stock	Sep'tr.	Hd.		798
Hawarden	Hawarden	Butter	Ind.	Sep'tr.	Test.	129	109
Hull	Hull	Butter	Ind.	Sep'tr.	Hd.		267
Ireton	Ireton	Butter	Ind.	Sep'tr.	Hd.		799
Sioux Center	Sioux Center	Butter	Ind.	Sep'tr.	Hd.		800
Ames	Ames	But. & Ch.		Sep'tr.	Test.	304	248
Cambridge	Cambridge	Butter	Ind.	Sep'tr.	Test.	308	252
Colo	Colo	Butter	Ind.	Sep'tr.	Hd.		801
Gilbert	Gilbert	Butter	Ind.	Sep'tr.	Test.	99	39
Iowa Center	Gilbert	Butter	Ind.	S & G C	Test.	212	178
Maxwell	Maxwell	Butter	Ind.	S & G C	Hd.	225	193
McCallsburg	McCallsburg	Butter	Co-op.	S & G C	Test.	246	176
Nevada	McCallsburg	Butter	Stock	Sep'tr.	Test.	306	308
Nevada	Nevada	Butter	Stock	Sep'tr.	Test.	306	805
Roland	Roland	Butter	Stock	Sep'tr.	Hd.	120	103
Roland	Roland	Butter	Stock	Sep'tr.	Hd.	45	37
Roland	Roland	Butter	Stock	Sep'tr.	Test.	38	32
Slater	Slater	Butter	Ind.	Sep'tr.	Hd.		805
Chicago, Ill.	Story City	Butter	Ind.	Sep'tr.	Hd.		806
Zearing	Zearing	Butter	Ind.	Sep'tr.	Hd.		804
Tama	Chelsea	Butter	Ind.	G.C.			807
Dysart	Dysart	Butter	Ind.	S & G C	Test.		808
Cedar Rapids	Garwin	Butter	Stock		Hd.		809
Garwin	Garwin	Butter	Stock	Sep'tr.	Test.		810
Tama	Gladbrook	Butter	Ind.	G.C.			812
Vinton	Montour	Butter	Ind.	S & G C	Test.	226	206
Montour	Montour	Butter	Ind.	G.C.			814
Tama	Tama	Butter	Ind.	G.C.			815
Traer	Traer	Butter	Ind.	G.C.			816
Chicago, Ill.	Elberon	Butter	Ind.	G.C.			816
Bedford	Bedford	Butter	Stock	Sep'tr.	Test.	220	185
Blockton	Blockton	Butter	Stock	S & G C	Hd.		817
Clearfield	Clearfield	Butter		Sep'tr.			819
Conway	Conway	Butter	Ind.	Sep'tr.			820
Guss	Nodaway	Butter	Ind.	Sep'tr.	Hd.		821
Iveyville, Adams	Iveyville, Adams	Butter	Co-op.	Sep'tr.			822
Lenox	Lenox	Butter	Stock	S & G C	Test.	312	255
New Market	New Market	Butter	Ind.	Sep'tr.	Test.		

TABLE

VI—CONTINUED.

Office record number.	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.	F. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED.	Operated by an individual, co-operative or stock company	Separator, gathered cream, or both.	Method of receiving milk—by the test or by the hood.	Dairy Commissioner's test bottle number.	Office record number.
<i>Union County</i>											
823	Afton	Afton Creamery	G. W. Kelley	Afton	Afton	Butter	Ind	G C			823
42	Lorimor	Lorimor Creamery Co	W. H. Wylie, Sec'y	Lorimor	Lorimor	Butter	Stock	Sep'tr.	Test.	49	827
294	Talmage	Talmage Co-op. Creamery Co.	J. W. Beebe	Talmage	Talmage	Butter	Stock	Sep'tr.	Test.	352	294
<i>Van Buren County</i>											
824	Birmingham	Birmingham B and C. Mfg. Co.		Birmingham	Birmingham	Butter	Stock				824
825	Farmington	Farmington Creamery Co.	H. J. Kelly, Pres.	Farmington	Farmington	But. & Ch	Stock	G C			825
<i>Wapello County</i>											
826	Agency	Agency Creamery		Agency	Agency	Butter	Co-op	Sep'tr.	Test.		826
827	Blakesburgh	Blakesburgh Creamery	A. E. Nelson	Blakesburgh	Blakesburgh	Butter	Ind	Sep'tr.	Test.		827
326	Dudley	Dudley Cr'y and Milling Ass'n.	H. B. Lames, Sec'y	Dudley	Dudley	Butter	Co-op	Sep'tr.	Test.	270	326
828	South Ottumwa	South Ottumwa	Myres & Co.	South Ottumwa	South Ottumwa	Butter	Ind	Sep'tr.	Test.		828
<i>Warren County</i>											
829	Prole	Prole Creamery	I. Gates	Prole	Prole	Butter	Co-op	Sep'tr.	Test.		829
<i>Washington County</i>											
182	Brighton	Brighton Creamery	T. L. Emry & Son.	Brighton	Brighton	Butter	Ind	Sep'tr.	Test.	217	182
890	Crawfordsville	Crawfordsville Creamery	W. C. Wamsley	Crawfordsville	Crawfordsville	Butter	Ind	Sep'tr.	Test.		890
891	Daytonville	Daytonville Creamery	C. O. Nichols	Wellman	Wellman	Butter	Ind	G C			891
892	Dublin	Dublin Cheese Factory	T. A. Jones, Sec'y	Dublin	Washington	Cheese	Stock		Hd.		892
813	Kalona	Kalona Creamery	Jas. Huff	Kalona	Kalona	Butter	Ind	S & G C			813
833	Kalona	Deer Creek	Jas. Huff	Kalona	Kalona	Butter	Ind	S & G C	Test.		833
834	Nira	Nira Creamery	Ira Stoner	Hitesville	Nira	Butter	Ind	S & G C	Test.		834
835	Noble	Oak Ridge Creamery	B. Eicher	Noble	Noble	Butter	Ind	G C			835
836	Riverside	Riverside Creamery	E. Nicola, Mgr	Riverside	Riverside	Butter	Ind	G C			836
837	Washington	Washington	Hise Bros	Washington	Washington	Butter	Ind	Sep'tr.	Hd.		837
898	Wellman	Wellman Creamery	C. O. Nichols & Son.	Wellman	Wellman	Butter	Ind	G C			898
<i>Wayne County</i>											
839	Allerton	Allerton Creamery	L. N. Holdeman	Allerton	Allerton	Butter	Ind	G C			839
840	Clio	Clio Co-op. Cheese Co.	M. V. B. Wright, Sec'y	Clio	Clio	Cheese	Co-op		Hd.		840
841	Corydon	Corydon Cheese Factory	E. G. Cross	Corydon	Corydon	Cheese	Ind		Hd.	81	841
842	Humeston	Humeston Creamery	E. Holdeman	Humeston	Humeston	Butter	Ind	S & G C	Hd.		842
843	Lineville	Lineville Cheese Factory	M. DeHaan	Lineville	Lineville	Cheese	Ind		Hd.		843
844	Promise City	Avery's Cheese Factory	G. G. Avery	Promise City	Promise City	Cheese	Ind		Hd.		844
845	Seymour	Seymour Creamery Co.	B. S. Parker, Mgr	Seymour	Seymour	Butter	Stock	G C			845
<i>Webster County</i>											
235	Badger	Badger Creamery Ass'n		Badger	Badger	Butter		Sep'tr.	Test.	288	235
846	Burnside	Burnside Creamery	J. Goldworthy	Burnside	Burnside	Butter	Ind	Sep'tr.	Hd.		846
183	Dayton	Dayton Creamery	M. Daniels & Son	Dayton	Dayton	Butter	Ind	Sep'tr.	Test.	218	183
847	Duncombe	Duncombe Creamery	J. J. Claassen	Duncombe	Duncombe	Butter	Ind	Sep'tr.	Test.		847
291	Ft. Dodge	Ft. Dodge B. and C. Ass'n	F. B. Black, Sec'y	Ft. Dodge	Ft. Dodge	Butter	Co-op	Sep'tr.	Test.	349	291
848	Gowrie	Gowrie Creamery	F. S. Davis	Gowrie	Gowrie	Butter	Ind	G C			848
111	Mooreland	Mooreland Creamery	D. J. Skinner	Mooreland	Mooreland	Butter	Ind	Sep'tr.	Test.	132	111
90	Otho	Payne's Model Creamery	F. R. Payne	Kalo	Otho	Butter	Ind	Sep'tr.	Test.	105	90
95	Vincent	Vincent Creamery Co.	W. H. Woolsey, Mgr	Vincent	Vincent	Butter	Co-op	Sep'tr.	Test.	112	95
<i>Winneshago County</i>											
849	Buffalo Center	Buffalo Center Creamery	P. Bierle	Buffalo Center	Buffalo Center	Butter	Ind	S & G C	Test.		849
850	Buffalo Center	Lincoln Creamery		Buffalo Center	Buffalo Center	Butter	Ind	S & G C	Test.	268	850
851	Forest City	Northera Iowa Cr'y Co.		Forest City	Forest City	Butter	Stock	S & G C	Test.		851
851	Mount Valley	Mount Valley	Northera Iowa Cr'y Co.	Forest City	Forest City	Skim stat'n	Stock	Sep'tr.	Test.		851
852	Lake Mills	Logan Butter Factory	N. B. Thompson	Lake Mills	Lake Mills	Butter	Co-op	Sep'tr.			852

TABLE

Office record number	LOCATED AT OR NEAR—	NAME OF CREAMERY OR CHEESE FACTORY.	NAME OF PROPRIETOR, SECRETARY OR MANAGER.
<i>Winnebago County—Continued.</i>			
853	Lake Mills	W. & W. Creamery Ass'n	Ole T. Groe
854	Norman	Norman Creamery Ass'n	S. O. Dable, Sec'y.
<i>Winnesheek County.</i>			
855	Burr Oak	Silver Creek Creamery	M. D. Whitney, Sec'y
856	Calmar	Calmar Creamery	Poe Bros. & Co
139	Castalia	Castalia Creamery	Ossian Creamery Co.
857	Conover	Western Farm Creamery	C. J. Waiser.
858	Decorah	Decorah Creamery	Ice Cave Creamery Co.
859	Decorah	Glenwood Creamery	Johnson & Beard
148	Festina	Festina Creamery	Ossian Creamery Co.
147	Pt. Atkinson	Ft. Atkinson Creamery	Ice Cave Creamery Co.
899	Frankville	Frankville Creamery	Wm. Beard & Sons
861	Hesper	Anchor Creamery	H. F. Cleveland
862	Highlandville	Highlandville Creamery	J. H. Miller
863	Kendallville	Kendallville Creamery	Poe Bros. & Co.
864	Locust	Kjome Creamery	Larson Bros.
865	Nordness		O. Lomen, Sec'y
866	Ossian		Ossian Creamery Co.
870	Ossian	Scheidemantel Creamery	Scheidemantel Bros.
867	Ossian	Washington Prairie Creamery	E. J. Opdahl.
868	Ridgeway		Wm. Beard & Sons
869	Ridgeway	Ridgeway Co-op. Creamery	Ridgeway Co-op. Cr'y Co.
258	Spillville	Spillville Creamery Ass'n	Spillville Co-op. Cr'y Co.
886	Washington Prairie	Hubbell Creamery	W. W. & G. L. Hubbell.
<i>Worth County.</i>			
268	Kennett	Farmers' Co-op. Creamery Ass'n	Wm. Overholt, Sec'y
282	Manly	Hirandelle C. & B. Factory Ass'n	N. A. Ausenbus, Mgr.
287	Manly	Manly Co-op. Creamery	A. E. Miller, Sec'y
341	Nordland	Nordland Co-op. Creamery Ass'n	John Bergeson
257	Northwood	Farmers' Butter & Cheese Ass'n	G. Lilly, Mgr.
455	Silver Lake	Hartland Co-op. Creamery Ass'n	G. Ryerson, Sec'y
434	Somber	Brookfield Co-op. Cr'y Ass'n	J. B. Thompson, Prest.
232	Tenold	Farmer's Co-op. Creamery Ass'n	O. Harmon, Sec'y
<i>Wright County.</i>			
802	Belmond	Belmond Creamery	Northern Iowa Cr'y Co.
642	Clarion	Clarion Creamery	J. D. Deinson
719	Clarion	Farmers' Home Creamery	Northern Iowa Cr'y Co.
65	Dows	Dows Creamery	Northern Iowa Cr'y Co.
208	Dows	Jameson Factory	P. C. Jameson & Son
244	Goldfield	Goldfield Creamery	B. P. Scott.

VI—CONTINUED.

F. O. ADDRESS OF PROPRIETOR, SECRETARY OR MANAGER.	SHIPPING STATION.	PRODUCT MANUFACTURED	Operated by an individual, cooperative or stock company.	Separator, gathered cream, or both.	Method of receiving milk—by the test or by the hundred.	Dairy Commissioner's test bottle number.	Office record number
Lake Mills	Lake Mills	Butter	Co-op	G. C.			852
Norman	Norman	Butter	Co-op	Sep'tr.	Test		854
Burr Oak	Decorah	Butter	Co-op	G. C.			855
Calmar	Calmar	Butter	Ind	G. C.			856
Decorah	Castalia	Butter	Stock	S & G C	Test	168	139
Decorah		Butter	Ind	S & G C	Test		857
Decorah		Butter	Stock	S & G C			858
Decorah		Butter	Ind	G. C.			859
Decorah		Butter	Stock	S & G C	Test	171	148
Decorah	Pt. Atkinson	Butter	Stock	S & G C	Test	170	147
Decorah		Butter	Stock	S & G C	Test		860
Hesper		Butter	Ind	G. C.			861
Hesper		Butter	Ind	G. C.			862
Kendallville		Butter	Ind	G. C.			863
Locust		Butter	Ind	G. C.			864
Nordness		Butter	Co-op	G. C.			865
Decorah		Butter	Stock	G. C.			866
Ossian		Butter	Ind	G. C.			870
Decorah		Butter	Ind	G. C.			867
Decorah		Butter	Stock	G. C.			868
Ridgeway		Butter	Co-op	G. C.			869
Spillville		Butter	Co-op	G. C.	Test	318	886
Wancon		Butter	Ind	G. C.			886
Kennett	Kennett	Butter	Co-op	G. C.			268
Manly	Manly	Cheese	Co-op	Hd.		242	282
Folo	Manly	Butter	Co-op	G. C.			287
Nordland		Butter	Co-op	S-p'tr.	Test		341
Northwood	Northwood	Butter	Co-op	S & G C	Test	314	257
Silver Lake		Butter	Co-op	Sep'tr.	Test		434
Northwood		Butter	Co-op	Sep'tr.	Test		423
Tenold	Northwood	Butter	Co-op	Sep'tr.	Test	385	232
Forest City	Belmond	Butter	Stock	G. C.			802
Clarion	Clarion	Butter	Ind	G. C.			642
Forest City	Clarion	Butter	Stock	Sep'tr.			719
Forest City	Dows	Butter	Stock	G. C.			65
Dows	Dows	Cheese	Ind				208
Goldfield	Goldfield	Butter	Ind				244

TABLE
RECAPITULATION BY COUNTIES OF TABLE VI. TOGETHER WITH OTHER

COUNTY.	No. of factories No. mfg. butter, cheese, or both.			No. of individ- ual, co-opera- tive or stock companies.			Total No. of cream- eries No. operated as separator, gath- ered cream or both.					
	Total No. of factories.	No. mfg. butter.	No. mfg. cheese and butter and cheese.	No. reported.	Individual.	Co-operative.	Stock companies.	No. reported.	Total No.	Separator.	Gathered cream.	Separator and gathered cream.
Adair	5	4	1	5	3			5	5	4		1
Adams	7	0	1	7	4	1		6	6	5		1
Allamoree	12	12	1	13	1	3		13	12	13		3
Appanosee	5	5	5	5	3			5	5	4		
Anduson	5	4	1	5	3	1		5	5	4		
Benton	12	10	1	12	7	4		11	11	7		
Black Hawk	24	23	2	24	17	5		23	23	23		1
Boone	30	28	2	29	5	23		29	29	28		1
Bremer	20	18	2	20	11	8		18	18	18		
Buchanan	6	6	6	6	6	6		6	6	6		
Buena Vista	19	19	19	19	13	6		18	19	15		1
Butler	0	0	0	0	3	5		6	4	4		
Calhoun	4	4	4	4	3	1		4	4	4		
Carroll	5	5	5	5	5	3		5	5	3		1
Cass	18	15	2	15	13	2		14	16	7		6
Cedar	12	12	1	11	9	1		11	12	10		1
Cerro Gordo	4	4	4	4	4	4		4	4	4		
Cherokee	17	17	15	2	0	4		17	17	13		4
Chickasaw	4	2	1	4	2	1		4	5	4		
Clark*	5	5	1	20	4	10		6	22	16		6
Clay	23	22	1	11	9	1		12	12	10		2
Clayton	12	12	1	5	5	1		4	4	4		1
Clinton	5	4	1	7	4	2		1	8	5		2
Crawford	8	8	1	4	3	1		4	4	3		1
Dallas	4	3	1	5	2	3		3	3	3		
Davis	5	2	2	3	1	6		3	3	3		
Decatur	31	31	31	16	13	2		31	31	31		
Delaware	2	2	2	2	1	1		2	2	1		1
Des Moines*	3	3	3	29	13	11		26	29	25		3
Dickinson	22	22	22	4	2	2		4	4	4		2
Dubuque	4	4	4	16	3	10		3	3	2		2
Emmet	4	4	4	8	6	2		8	8	6		2
Fayette	22	22	22	2	3	1		2	2	2		1
Floyd	9	8	1	8	6	2		8	8	6		2

VII.

INFORMATION PERTAINING TO CREAMERIES AND CHEESE FACTORIES.

No. of factories reported.	Total No. By test.	By the 100. No. of factories reported.	No. of patrons	Total No. of fac- tories receiving milk. No. receiving milk by test or by the 100 lbs.	No. patrons furnishing milk or cr'm to creameries and cheese factories.	No. of cows producing milk deliv'ed to creameries and cheese factories.	Total No. of persons em- ployed by factories.			Total value of factories.	Total value of manufactured product.			
							No. of factories reported.	No. of cows.	No. of factories reported.		Value.	No. of factories reported.	Value.	
4	4	1	3	8	307	3	3,070	5	0	28	5	13,200	1	9,000
3	3	4	3	5	285	5	2,815	5	7	10	5	8,500	4	34,700
7	7	2	1	6	1,179	6	11,100	11	18	80	7	27,000	5	78,915
4	3	5	4	5	75	4	750	5	6	7	5	3,250	4	9,000
3	3	2	1	1	60	1	600	1	2	7	1	2,500	1	17,000
10	11	3	3	7	777	7	7,250	11	16	49	10	32,700	7	80,195
23	24	21	2	14	963	14	11,500	16	23	60	16	47,900	12	248,948
5	5	2	2	3	10	2	100	2	3	8	2	3,500		
29	29	16	13	14	896	14	10,552	16	27	38	3	44,700	13	273,088
15	15	16	3	14	1,444	14	20,740	15	29	107	15	55,000	14	396,263
6	6	4	5	5	270	5	3,170	5	9	22	5	11,800	5	33,750
12	16	8	4	10	1,350	10	14,630	13	20	35	13	32,400	10	274,015
4	4	3	1	3	120	3	1,404	3	4	3	3	9,000	3	29,318
4	3	3	2	2	133	2	430	4	7	6	4	14,000	3	20,745
4	4	1	3	3	120	3	1,250	4	4	12	2	6,000	2	20,000
12	15	6	7	12	752	12	6,310	12	19	36	16	26,700	9	85,060
11	11	8	3	6	489	6	4,333	12	13	18	6	30,400	6	72,000
4	4	4	4	3	195	3	1,830	3	6	4	3	9,500	2	34,000
17	17	17	12	12	1,476	12	17,800	15	28	102	15	67,800	13	390,517
4	4	1	3	4	181	4	2,160	4	6	14	4	10,200	4	37,879
21	23	19	2	18	1,991	18	21,793	19	38	165	18	87,250	16	680,036
9	12	9	8	8	508	8	5,239	9	13	21	9	26,500	8	67,100
2	2	1	1	1	12	1	144	2	3	3	2	4,000	1	2,500
6	6	5	1	5	414	5	5,456	7	13	40	7	24,500	2	45,000
1	1	1	1	1	400	1	2,000	4	5	10	4	11,500	3	21,340
5	5	1	4	2	63	2	582	2	3	4	2	4,500	2	7,521
28	31	24	4	23	1,203	23	19,810	24	39	83	21	64,000	20	463,430
1	2	1	2	2	235	2	3,100	2	4	6	2	4,500	2	4,500
25	27	23	16	16	952	16	14,350	16	25	56	13	50,200	15	254,375
4	4	4	3	3	112	3	1,113	3	3	3	3	9,000	2	9,500
17	22	15	12	15	1,495	15	21,900	17	29	115	16	54,700	15	469,460
6	7	5	1	5	575	5	6,315	6	12	42	6	15,000	6	288,000

TABLE VII.—

COUNTY.	No. of factories. No. manufac- turing butter, cheese or both.			No. of individ- ual, co opera- tive or stock companies.			Total No. of cream- eries. No. oper- ated as separator cream or both.				
	Total No. of factories.	No. mfg. butter.	No. mfg. cheese, and cheese.	No. reported.	Individual.	Co-operative.	Stock companies.	No. reported.	Total No.	Separator.	Gathered cream.
Franklin	13	11	1	12	10	2	1	11	11	5	6
Greene	9	6	1	6	8	8	1	11	11	5	6
Grundy	17	16	1	17	11	1	1	17	17	14	3
Guthrie	4	2	1	3	3	3	1	9	9	3	6
Hamilton	9	9	1	10	8	4	3	15	15	12	3
Hancock	5	5	5	5	2	1	1	12	12	8	4
Hardin	13	11	1	12	13	12	1	12	12	11	1
Henry	3	3	1	4	2	1	1	4	4	3	1
Howard	11	10	1	11	4	3	5	12	12	11	1
Humboldt	6	6	1	7	4	3	1	8	8	6	2
Ida	4	3	1	4	4	3	3	10	10	8	2
Iowa	11	8	1	10	7	7	1	15	15	12	3
Jackson	13	13	1	13	10	1	1	13	13	12	1
Jasper	9	9	1	8	6	1	1	9	9	8	1
Jefferson	4	4	1	4	2	1	1	4	4	3	1
Johnson	12	9	1	12	7	4	1	10	10	5	5
Jones	33	31	1	33	27	5	1	31	31	30	1
Keokuk	12	10	1	10	8	1	1	10	10	6	4
Kossuth	17	17	1	17	14	1	1	17	17	16	1
Lee*	33	31	2	33	31	3	9	33	33	31	2
Linn	3	3	3	3	2	1	1	3	3	3	0
Louisa	2	1	1	2	2	1	1	2	2	2	0
Lucas	4	4	1	4	4	1	1	4	4	4	0
Lyon*	4	4	1	4	1	1	1	4	4	4	0
Madison	3	3	1	3	3	3	3	3	3	3	0
Mahaska	6	6	1	6	3	1	1	6	6	3	3
Marion	6	6	1	6	4	1	1	7	7	7	0
Marshall	7	7	1	7	2	2	2	7	7	7	0
Mills	11	11	1	11	11	11	11	11	11	11	0
Mitchell	12	12	1	12	11	1	1	12	12	12	0
Monona*	4	3	1	4	2	1	1	4	4	4	0
Montgomery	14	14	1	14	9	5	3	17	17	17	0
Monroe	4	4	1	4	4	4	4	4	4	4	0
Muscatine	4	4	1	4	3	1	1	5	5	5	0
O'Brien	2	1	1	2	2	2	2	2	2	2	0
Osceola	5	3	1	4	3	1	1	5	5	5	0
Page	15	15	1	15	12	2	1	15	15	15	0
Palo Alto	2	2	1	2	1	1	1	2	2	2	0
Plymouth	3	3	1	3	3	3	3	3	3	3	0
Pecahontas	5	5	1	5	1	1	1	5	5	5	0
Folk	4	4	1	4	3	1	1	5	5	5	0
Pottawattmie	8	8	1	8	6	1	1	8	8	8	0
Poweshiek	4	4	1	4	4	4	4	4	4	4	0
Ringold	8	8	1	8	6	1	1	8	8	8	0
Sac	14	14	1	14	13	1	1	14	14	12	2

CONTINUED.

Total No. of factories receiving milk by test or by the 100 lbs.	No. patrons furnishing milk to creameries and cheese factories.	No. of cows producing milk delivered to creameries and cheese factories.	Total No. of persons employed by factories.		Total value of factories.	Total value of manufactured product.								
			No. of factories reported.	Value.										
11	13	10	1	7	825	7	6,878	9	13	53	9	21,200	5	76,700
505	6	5,225	8	14	4	2	23,300	4	40,900					
444	6	7,400	6	12	33	7	28,600	4	118,800					
100	3	700	2	5	8	2	6,500	2	11,000					
528	4	4,640	7	12	41	7	25,700	4	50,000					
340	4	2,180	4	4	14	5	13,300	3	13,500					
787	10	6,001	13	18	37	12	31,700	10	72,000					
928	6	1,405	6	12	9	9	10,500	1	5,000					
920	6	6,460	6	12	47	6	19,500	6	128,710					
205	4	2,230	4	7	6	4	15,000	4	39,500					
1	2	2	1	2	1	2	4,500	1	8,000					
3	5	2	1	7	1,070	7	8,300	9	13,287					
10	11	10	10	8,370	11	14	31	9	23,000	10	130,960			
5	6	1	7	1,100	7	8,200	8	14	42	8	18,000	6	64,340	
3	3	1	2	195	2	1,050	4	6	19	4	9,800	2	27,270	
8	8	7	1	6	538	6	2,714	8	10	16	7	17,800	5	35,990
33	33	36	3	16	709	12	7,225	16	23	32	16	44,000	14	168,200
1	4	4	7	1,040	7	8,040	9	16	38	9	20,800	5	71,120	
16	16	15	1	10	810	10	9,637	12	21	9	12	51,500	9	107,610
31	32	15	10	23	1,465	23	20,260	26	33	73	35	71,700	19	298,590
4	6	3	3	3,000	3	3	15	3	3	3	3	3,000	3	24,000
2	2	1	1	2	130	2	1,040	2	2	2	2	7,000	2	14,000
4	4	4	4	4	228	4	1,644	4	5	8	4	8,000	3	13,200
1	400	1	3,200	3	5	27	3	11,000	1	30,000				
3	3	3	1	1,070	6	9,520	6	10	40	6	20,100	4	120,850	
3	3	3	3	275	2	2,300	2	2	10	2	23,500	2	33,500	
3	3	3	6	1,500	6	16,800	7	10	35	7	13,200	7	273,500	
3	3	3	3	208	3	1,499	3	5	10	3	6,500	3	13,500	
14	14	14	4	4	47	4	426	4	5	4	4	2,700	4	8,940
1	2	1	3	200	3	2,550	4	6	20	4	12,600	4	56,340	
3	4	3	3	188	3	3	5	7	9	3	6,000	3	35,105	
3	3	3	2	2	2	2	2	11	2	6,000				
4	4	4	3	191	3	955	3	6	21	3	72,000	3	20,058	
15	15	15	15	929	15	11,374	15	25	1	13	46,000	13	172,957	
1	2	1	1	2	253	2	2,550	3	6	14	3	10,000	1	12,000
4	4	4	1	3	260	3	2,080	4	6	14	4	15,350	2	32,530
3	3	2	1	3	315	3	3,190	3	3	15	3	7,100	3	15,600
5	6	6	6	508	6	4,278	8	13	24	8	20,000	6	69,450	
2	3	2	4	201	4	2,285	4	5	4	4	4,000	4	21,500	
14	14	11	3	10	640	10	6,720	11	17	61	11	33,400	8	82,700

TABLE VII—

COUNTY.	No. of factories. No. manufacturing butter, cheese or both.			No. of individual, co-operating or stock companies.			Total No. of cream- eries. No. operated as separator, gathered cream or both.						
	Total No. of factories.	No. mfg. butter.	No. mfg. cheese and cheese.	No. reported.	Individual.	Co-operative.	Stock companies	Total No. reported.	Separator.	Gathered cream.	Separator and gathered cream.		
Scott	2	2	2	3	1	3	7	5	2	1	2		
Shelby	5	5	5	3	1	1	5	5	1	1	1		
Sioux	5	5	5	3	1	1	5	5	1	1	1		
Story	14	13	1	13	8	1	4	14	14	11	3		
Tama	11	10	1	11	9	1	1	11	11	11	3		
Taylor	3	3	3	6	2	1	1	8	2	6	3		
Union	3	3	3	3	1	1	1	3	2	1	3		
Van Buren	1	1	1	1	1	1	1	1	1	1	1		
Wapello	4	4	4	4	3	1	1	4	4	4	1		
Warren*													
Washington	11	10	1	11	10	1	1	10	10	4	3		
Wayne	7	3	4	7	5	1	1	3	3	2	1		
Webster	9	9	9	8	6	2	2	7	9	8	1		
Winnebago	7	7	7	7	2	3	2	7	7	3	1		
Winneshieck	20	20	20	20	9	4	7	20	20	14	6		
Worth	8	7	1	8	8	4	7	7	4	2	1		
Wright	6	5	1	6	3	3	1	4	5	1	3		
Clarke													
Des Moines													
Lee													
Lyon	6	4	1	6	4	1	1	5	5	4	1		
Monona													
Warren													
	870	786	64	20	818	448	231	139	783	806	546	131	106

*The information from counties having but one factory is shown, collectively, in the bracket.

CONTINUED.

No. of factories reported.	Total No. of factories. receiving milk. No. receiving milk by test or by the 100 lbs.			No. of patrons furnishing milk or cream to creameries and cheese factories.	No. of cows producing milk delivered to creameries and cheese factories.	Total No. of persons employed by factories.			Total value of factories.	Total value of manufactured product.			
	Total No. reported.	By test.	By the 100. No. of factories reported.			No. of factories reported.	In factory.	Collecting milk and cream.			No. of factories reported.		
4	5	3	1	240	4	1,700	4	8	4	9,300	3	16,850	
5	1	1	3	110	2	1,100	2	3	10	5,600	2	15,600	
5	5	3	4	219	4	2,098	5	10	4	17,300	2	11,000	
14	14	6	13	1,160	13	13,424	14	20	60	61,400	11	135,360	
5	5	4	6	973	6	8,920	7	13	29	19,000	6	67,900	
5	5	4	5	368	5	4,010	5	10	23	18,600	3	66,000	
2	2	2	2	300	3	2,750	3	4	4	10,100	2	17,000	
4	4	3	3	15	1	180	1	1	1	9,000	1	3,000	
4	4	3	3	100	2	775	2	3	16	6,000	1	3,000	
5	5	3	7	1,240	7	7,100	9	16	50	30,000	7	177,700	
5	5	5	6	870	6	6,160	6	13	29	14,550	5	64,640	
6	6	2	6	687	6	4,196	7	12	18	33,200	5	34,000	
5	5	5	3	638	3	6,380	3	5	10	12,300	3	85,600	
6	6	5	1	440	1	5,330	2	5	27	19,000	1	75,000	
6	6	5	4	839	4	7,460	5	8	23	12,800	3	85,000	
2	2	1	1	209	1	1,600	4	5	11	8,000	1	84,000	
4	5	2	5	305	5	1,498	5	6	10	10,100	5	17,400	
653	710	456	528	48,487	525	485,261	620	698	2,431	604	1,788,150	466	7,809,097

TABLE VIII.

COMPARISON OF CREAMERIES BY COUNTIES AND GROSS SHIPMENTS OF BUTTER BILLED FROM RAILROAD STATIONS IN IOWA TO POINTS OUTSIDE OF THE STATE.

This table shows the total number of creameries for the year ending November 1, 1893, to be 789; total number of creameries for the year ending November 1, 1894, to be 806, making an increase for 1894 over 1893 of 17.

It also shows the gross pounds of butter billed from stations in Iowa to points outside of the State for the year ending September 30, 1893, to be 65,086,787; deducting 16 per cent tare leaves net pounds shipped 54,572,902. Total gross pounds of butter billed out of the State for the year ending September 30, 1894, 62,677,719; deducting 16 per cent tare leaves net pounds shipped 52,649,284, showing a decrease for the year ending September 30, 1894, of 1,923,618.

COUNTY.	Number of creameries for the years 1893-4, showing increase or decrease by counties.				Gross pounds of butter shipped out of the State for the years ending Sept. 30, 1893-4, showing increase or decrease by counties.			
	1893.	1894.	Inc.	Dec.	1893.	1894.	Inc.	Dec.
Adair	5	5			173,800	118,535		55,265
Adams	4	6	2		255,296	211,453		43,843
Allamakee	12	12			1,287,700	1,225,436		62,264
Appanoose	6	5			12,240	31,800	12,560	
Audubon	6	5			221,030	213,780		7,250
Benton	10	11	1		469,225	463,671		55,554
Black Hawk	18	23	4		1,972,240	1,887,610		84,630
Boone	3	5	2		141,205	78,400		62,805
Bremer	23	20		3	2,337,139	2,281,052		56,187
Buchanan	18	18			2,859,976	2,451,750		408,226
Bensa Vista	6	6			823,128	468,351		354,777
Butler	16	16			2,073,227	1,993,190		168,037
Calhoun	3	6	3		384,338	983,055	298,237	
Carroll	6	4		2	525,478	430,072		95,406
Cass	6	5		1	301,010	242,084		58,926
Cedar	12	10		2	670,790	500,932		169,858

TABLE VIII—Continued

COUNTY.	Number of creameries for the years 1893-4, showing increase or decrease by counties.				Gross pounds of butter shipped out of the State for the years ending Sept. 30, 1893-4, showing increase or decrease by counties.			
	1893.	1894.	Inc.	Dec.	1893.	1894.	Inc.	Dec.
Cerro Gordo	10	12	2		537,455	1,481,975	944,520	
Cherokee	3	4	1		210,864	231,706	20,842	
Chickasaw	10	17	7		1,080,243	2,491,204	1,410,961	
Clarke	1	1			73,945	66,717		7,228
Clay	6	5		1	168,950	457,940	288,990	
Clayton	19	22	3		2,823,055	3,229,969	406,914	
Clinton	14	12		2	609,982	562,191		107,791
Crawford	6	6			91,911	86,756		4,155
Dallas	6	8	2		888,823	449,971		438,852
Davis	4	4			69,500	76,710	7,210	
Decatur	1	1			68,250	10,700		48,550
Delaware	41	31		10	2,749,098	2,850,857	101,759	
Des Moines	1	1			158,822	78,652		78,170
Dickinson	1	2	1		104,410	184,210	79,800	
Dubouque	19	29	10		1,586,030	2,429,745	843,715	
Emmett	9	4		5	262,500	148,640		54,250
Fayette	34	23		11	2,860,465	2,484,230		400,230
Floyd	9	8		1	864,710	719,420		145,290
Franklin	6	11	5		540,792	575,987	35,195	
Fremon	1	1			3,730	726		3,055
Greene	2	2			742,362	291,176		74,283
Grundy	17	12		5	511,228	820,657	309,429	
Guthrie	16	2		14	894,949	74,493		15,828
Hamilton	11	9		2	74,493	58,867		471,030
Hancock	11	5		6	1,302,170	920,570		67,320
Hardin	11	9		2	311,323	254,205		146,283
Harrison	13	11		2	1,058,625	912,342		11,119
Henry	2	0		2	23,801	12,687		2,898
Herrick	2	3	1		30,892	28,964		1,267,765
Howard	10	10			1,468,479	230,714		
Humboldt	4	6	2		219,642	530,219	310,577	
Ia	2	2			55,805	60,765	4,970	
Iowa	5	9	4		633,380	473,140		160,221
Jackson	11	13	2		983,921	947,253		28,068
Jasper	9	9			549,460	353,925		195,937
Jefferson	4	4			390,127	194,242		65,525
Jones	2	10	8		582,736	227,585		335,165
Keokuk	22	31	9		2,759,083	3,667,024	897,941	
Kossuth	16	19	3		548,968	320,560		228,127
Lee	10	10			690,810	1,567,099	876,289	
Linn	17	17			300,245	732,899	432,654	
Linn	17	33	16		4,434,487	2,101,641		202,810
Linn	2	3	1		158,046	84,840		73,200
Linn	2	2			150,645	143,385		8,260
Linn	2	1		1	82,665	154,082	71,417	
Linn	2	2			148,496	86,983		61,481
Linn	4	4			485,725	142,780		342,948
Linn	4	6	2		224,665	236,878	12,213	
Linn	9	7		2	500,774	500,543		45,231
Linn	2	2			18,950	54,957	36,007	

TABLE VIII.—CONTINUED.

COUNTY.	Number of creameries for the years 1893-4, showing increase or decrease by counties.				Gross pounds of butter shipped out of the State for the years ending Sept. 30, 1893-4, showing increase or decrease by counties.			
	1893.	1894.	Inc.	Dec.	1893.	1894.	Inc.	Dec.
Mitchell	12	11	1		2,109,661	1,731,845		377,816
Monona	1	1			2,180	16,045	13,865	
Montgomery	3	3			361,183	230,992		
Monroe	0	0			72,100			72,100
Muscataine	6	4	2		545,579	393,730		151,849
O'Brien	5	4	1		405,829	451,434	45,605	
Oceola	3	3			78,560			78,560
Page	3	3			329,580	59,733		18,173
Palo Alto	16	15	1		753,769	1,294,774	481,061	
Plymouth	18	18			321,295	324,956	2,761	
Pocahontas	3	3			317,114	687,679	370,565	
Polk	0	0			185,545	88,840		
Pottawattamie	6	6			62,383	91,641	29,258	
Poweshiek	1	1			652,068	421,832		230,175
Ringgold	6	6			163,720	115,309		11,540
Sac	17	14	3		833,677	882,035	28,348	
Scott	7	7			125,457	81,999		43,527
Shelby	12	12			24,370	15,575		8,797
Sionx	5	5			2,710	407,653	404,943	
Story	13	14	1		1,378,033	934,662		253,071
Tama	9	10	1		504,905	487,765		17,140
Taylor	1	1			136,832	161,374		25,448
Union	19	19			388,957	346,926		42,037
Van Buren	1	4	3		43,145	52,400	9,255	
Wapello	1	1			1,083,127	810,487		271,640
Warren	3	1	2		17,410	9,080		14,330
Washington	9	10	1		510,767	390,379		120,388
Wayne	3	3			239,260	351,359	91,999	
Webster	8	9	1		486,377	445,712		40,865
Winnebago	7	7			669,656	736,295	146,645	
Winnebush	18	21	3		1,894,865	1,505,495		389,370
Woodbury	0	0			211,305	353,694	742,191	
Worth	5	7	2		720,063	387,170		132,893
Wright	9	5	4		709,410	137,875		571,535
	*789	806	89		72,065,860,787	62,677,719	7,723,503	10,132,571

* Owing to an error, the number of creameries, as shown in the report for 1893, was 789 instead of 790.

† The total gross pounds of butter shipped out of the state for the year ending September 30, 1893, was 65,086,787, but appeared in the report of this Department for 1893 as 62,758,867, owing to an error.

NOTE.—In the report of the butter shipments, 434,192 pounds are estimated and based upon the amount shipped, last year, by the three roads not reporting.

FEEDING THE COW.

JAMES WILSON.

The average Iowa cow's milk makes one hundred and twenty-five pounds of butter a year, but the average cow in not well fed in summer nor properly fed in winter. Grass is abundant in May and June, but pastures are usually dry in July and bare in August and September. Our most enterprising dairymen feed green corn fodder when pastures fail, and a very few feed bran with it. During winter the corn plant is fed by a large majority without anything additional. A few feed oats, bran and shorts. Timothy or wild hay is fed to a considerable extent, but silage is made in comparatively few localities.

Our cow-feeding for milk is but a slight modification of steer-feeding for beef, while the products from the two classes are very different.

Labor in cow-feeding is as much avoided as possible by the majority because it is dear, and resort to better methods is only adopted when it will evidently pay. Cheap lands and cheap grains and fodders suggested present ways of feeding that will be abandoned as lands rise in value and better returns from them are imperative to pay interest on investments.

Comfortable barns are becoming general in the state where improved methods of feeding can be carried on that include a compounding of rations suited to the wants of the cow in producing milk; and without them the feeding of the by-products of the wheat, corn and flax mills could not be economically done, nor could roots form a part of the cow's rations after freezing weather sets in.

Until lately our dairymen have rested content with the high position occupied by their dairy products in eastern markets and the advantage of their position as producers over grain sellers. But the spirit of progress is leading them to enquire into the possibilities of better feeding, as enterprising individuals lead the way and carry the average of their herds beyond double the average of the herds of the state.

The drouth of 1894 cut short the hay crop of the state, and stopped the growth of the corn crop, so that, a majority of fields had to be put in shock at the silking period, instead of the denting period. This leaves many farmers at the beginning of winter with little else than corn fodder to feed with, and too, corn fodder with very little grain on it. The cow will not give much milk on this alone.

We are led at this point to inquire what the cow requires to give a good yield of milk. Milk consists of 87 per cent of water and 13 per cent of solids. Of the solids about 4 per cent is casein and albumen, nitrogenous elements that the cow must find in her feed substantially the same as we find them in her milk, and if they are not fed to her in her ration they will not be found in her milk, besides, they must be fed freely in her ration as she does not utilize all she is fed of any nutrient. The solids of cow's milk are quite uniform and if she cannot make casein for the lack of it in the plants she is fed, she cannot make fat.

Corn fodder is one part nitrogenous to thirteen carbonaceous. Observing experimenters note that the cow should have 2.5 pounds of digestible protein a day; to get that from corn fodder she must eat nearly one hundred pounds of it which is out of the question. In order then, that the cow may do good work something must be added to corn fodder that is more nitrogenous. Bran varies but averages one part of digestible protein to 4.2 of starchy matter or carbohydrates. Gluten meal is corn with the starch removed and has a nutritive ration 1:2.5; wheat, 1:3.4; barley, 1:7.2; rye, 1:8.3; linseed meal, 1:1.4; cotton seed meal, 1:1.2.

The nutritive ration is the proportion of digestible protein to digestible carbohydrates. These by-products have what corn fodder lacks. They sell at different prices, varying with distance from the mill.

The standard ration for a 1,000 pound cow is 24 pounds of dry organic matter; of this 2.5 pounds should be digestible protein, 12.5 pounds digestible carbohydrates and .4 pounds digestible fat, making 15.4 pounds of digestible matter. This makes a nutritive ration of 1:5.4. It is not always practical to feed the nutrients in these proportions. Plants low in protein are given in sufficient quantities to provide a sufficient amount of protein by all liberal feeders and where the feeder has it in his power to select the constituents of a ration this standard for a

milk cow is a good one. Western farmers have a super-abundance of carbohydrates now and progress in this direction will be made in providing the more nitrogenous plants, such as the clovers, peas, roots and highly nitrogenous cereals. Progress can also be made along these lines by cutting all the hay for the dairy cow at early blossoming, and the oat crop when the straw is two-thirds green.

Profitable dairying requires excellent feeding of the cow during her ten months milking period, and such feeding when she is dry as will best prepare her for maternity and future work. In addition to pasturage, provision should be made for summer drouths of such green cut feeds as will supply in themselves the protein elements. They should comprise plants suited to our climate and should be coming in to blossom in such succession as will provide a continuous supply during the growing season. Corn meal can be profitably fed with green crops, if the cow is losing flesh.

The spring pasture is usually abundant and through May and the first half of June pastures rarely fail. Winter rye is usually too far advanced for soiling purposes when our Iowa pastures begin to fail. Red clover is an excellent soiling crop and can be cut and fed with profit up to the time of blossoming and until the heads begin to turn brown. The best green feed is cut around the blossoming period. The cow needs succulent feed. Eighty per cent of most leguminous plants at this stage is water and the cow does her best milking when fed on plants in this condition. The aim of the dairyman should be to follow one plant with another so as to have them coming toward this stage in succession. Pasture grass and clover will meet all the cow's requirements until July, in most years. When pastures dry in late June and July a mixture of peas and oats grown together will be ready to supplement the pastures and follow red clover at this season and until the latter part of July when the second cut of clover from well manured lands will follow the peas and oats.

We have had encouraging success at the Agricultural College in growing peas and oats together for cutting to feed green to dairy cows. Bulletin No. 15, shows that we cut 24 tons of peas and oats from an acre, that a cow will eat amount of green feed depending upon the amount of grain fed with it. In 1891 cows in the stable fed on green peas and oats with 12 pounds of corn and cob meal daily ate from eighty to one hundred pounds

of peas and oats. In 1893 cows fed four pounds of corn meal daily with green peas and oats ate one hundred and twenty-five pounds daily of the latter. In 1894 cows fed nine pounds of corn and cob meal daily ate eighty to one hundred pounds of green peas and oats.

When cows were fed 12 pounds of corn and cob meal daily with green feed they gained in weight; when fed four pounds of corn meal daily they lost in weight; when fed nine pounds of corn and cob meal daily they remained stationary in weight.

The following varieties of peas yield as follows:

	Cured tons:	Green tons
Egyptian.....	3.6	13.2
Potter.....	4.4	11.8
Scotch Green.....	3.2	10.0
Green Field.....	4.3	14.2
Rennie's No. 10.....	5.5	14.2
White Marrowfat.....	3.6	10.9
Gold Vine.....	3.9	12.0
Black Eyed Marrowfat.....	3.6	10.7

The legume offers to the dairyman nutritive matter suited to milk making and the varieties come into blossom at different seasons of the year. It has been used by man as far back as we have history. The lentil that Rachael wanted from Leah's son was a bean or pea, the pulse that Daniel preferred to meat and wine was a legume. Rogers tells us that the English farmer grew them in the thirteenth century and we find them now suited to wet climates and dry climates wherever man has for any length of time had a habitation. Nature provided her wild cattle on the Iowa prairies with pea vines in the groves for their sustenance in winter, and we find a vetch growing wild on the prairie. It is our privilege to develop the wild legumes found in our soil, or acclimatize what succeeds in other lands, or transfer to our state from countries having similar climatic conditions varieties of this class of plants that succeed where heat, cold and moisture are similar to what we have.

The clovers succeed with us; the pea we have named answers our ends until August, when the peerless corn plant is fit to cut for green feed, but research at our station shows that while corn makes the very finest butter it is not complete in itself as a butter-making plant. If the cow has some pasture grass with her corn her flow of milk may be fairly well maintained, but when she is fed on corn alone her milk yield will not be up to what it would be if she had more protein in her feed. When

changed from green peas or clover to green corn her yield will shrink, but if changed from green corn to other palatable legumes her milk will increase. This has been repeatedly demonstrated at the Iowa station. Green corn fodder, ears and all, has a per cent of dry matter depending upon the stage of cutting. This dry matter has not enough of digestible protein to meet the requirements of the cow that should make a pound of butter a day, and one hundred pounds of green corn fodder is about the average amount she will eat. We must find plants that will suit our soil, grow in a dry time and be in bloom at this season.

The Iowa station grew Japan beans during the summer of 1894. They were green and vigorous during August. They are palatable and make very fine butter, equal to corn. The protein element is similar to the pea family. The per cent of fat in the milk increased above the green corn ration. The crop ripens about the last of August.

We followed the Japan bean with the Southern cow pea from Arkansas. Coming so far north this plant did not ripen at all, but is suited to late soiling for that very reason. Analyses made at the college during the summer of 1894 of green feeds given to cows during a soiling experiment show the following results:

Peas and oats had.....	20.70 per cent of protein.
Red clover had.....	15.82 per cent of protein.
Sweet corn had.....	11.63 per cent of protein.
Japan bean had.....	18.16 per cent of protein.
Cow pea had.....	24.16 per cent of protein.

There were averages from two or more analyses in each case.

When frosts came and green crops are out of date and the pasture is not sufficient to keep the cow up to good yields it will pay dairymen to have turnips to feed. We grew 24 tons of trimmed turnips to the acre at the college last summer, and 28 tons with the tops on. The turnip goes well with dry corn fodder or other dry feeds. They will keep well until January when mangels can take their place and be fed until spring. Experiments conducted during the winter of 1893-4 where the milks from cabbage, turnips, mangels, corn fodder and silage were made into butter at the college creamery under like conditions showed that butter from the cabbage would not keep, that butter from the turnips was pale but sold in the extra class, and that butter from mangels was colored naturally and

scored very fine, and that butter from corn fodder scored perfect and that butter from silage was one point in flavor below the butter from corn fodder.

The late state dairy convention, held at Ames, had addresses from two leading dairymen, Mr. Norton, of Cresco, Iowa, and Mr. Hayatt, of Sheboygan Falls, Wisconsin. Both give the cow succulent feed. Norton feeds silage, and his meal in water. Hayatt feeds turnips. Both succeed.

Now, that it is well settled that the corn fodder must be reduced by cutting, shreading, or threshing, I am of the opinion that wetting or steaming will pay, so that it may be made soft and succulent and have the meals mixed with it, insuring their mastication, rumination and more thorough digestion. We cannot now afford to waste corn fodder. We cannot afford to grow hay and waste corn fodder.

Siloing has been resorted to in many states. The silage is eaten more closely than corn fodder whole, or than corn fodder dry and cut small. Siloing retains moisture in the fodder and makes it softer and more easily eaten, and when all the corn fodder on a farm is to be utilized it is an economic method for the dairyman.

The comparative value of the silage and corn fodder for the dairy cow will be ascertained when softening and succulence are restored to the fodder.

To summarize the feeds of the year in their degree of importance and economy I would place:

First, pasture grasses as long as possible.

Second, leguminous plants to help the pastures.

Third, roots for fall and winter feeding.

Fourth, corn stover cut and soaked, or silage in winter.

Fifth, clover hay in preference to all others.

Sixth, mill feed when protein is required.

Seventh, corn meal when carbohydrates are required.

The profitable farm in the future will have the dairy cow as its centre of interest, around which will be grouped other departments, that will be auxiliary to the milk giver. Dairy products will grow in favor, as food for the people, as their comparative value becomes better understood.

The cow will furnish profitable employment the year throughout for more people than any other farm department in Iowa can be made to do. The products of the cow take less from the

farm than other lines of farm enterprise. The farmer who has dairying for his leading pursuit does not rob his soil.

The cow breeds meat-making animals and carries them along to the pasture and feed lot with her by-products. She works in conjunction with the brood sow and after weaning helps the sows toward grass and grain. The study of the cow in her varied relations to man and animals, to the soil and to the people, is a specialty that goes far toward a liberal education.

COTTON SEED MEAL.

Iowa is buying mill feeds quite extensively for the first time in many years. Cotton seed meal is being brought into the state and its use is new to our feeders, but in recent years it has been used extensively in the south for making beef and milk. The experiment stations located in the cotton growing states have reported on indications had from feeding it for these purposes and give us very encouraging extracts from their experiments. Cotton seed meal is quite similar to linseed meal, but it is still richer in protein, just the nutrient Iowa dairymen require to balance up corn stover, tame and wild hay, straw and other roughage low in protein. Owing to the low price of wheat in Europe cotton seed is not in usual demand there and it is much cheaper than it has been in past years, and consequently more markets are being sought for it, hence its advent in the northwest. With regard to the healthfulness, if fed judiciously, there need be no doubt; it has made a part of the ration for eastern and southern cows for a great many years and is recommended by all authorities on feeding as part of the ration. The Texas station reports feeding four pounds a day to dairy cows with good results, but we would advise a pound a day less, and also suggest careful feeding of it at the start until the cow becomes used to it. The nutritive ratio of cotton seed meal is 1:1.2; that of linseed meal, old process, is 1:1.7; and new process 1:1.4. The chemist, however, can only give us the analysis; there may be qualities about it that affect animals differently from linseed meal; it is said to be fatal to hogs and young animals, and the Texas station reports death from

feeding it, and so do practical feeders. The milk made from feeding it in moderate quantities makes good butter and is characterized by a high melting point, which makes such butter desirable for handling in warm latitudes. On the whole we regard cotton seed meal, a boon to Iowa dairymen, at present prices, \$18.00 a ton, at a time when mill feeds must be bought to keep the herd working profitably.

The Iowa station is feeding it to hogs in varying quantities and under as many conditions as Iowa farmers are likely to feed it. It is being fed to cows to ascertain its effect on butter and cheese, and to fattening steers to learn its effects on them. Young growing cattle also are being fed this meal as part of their ration, although reports are abroad that it is fatal to them. I am of the opinion that Iowa feeders can use cotton seed meal for feeding all animals if given in moderation, as such highly nitrogenous feed should be. Our people can afford to send to the cotton growing states for it to balance up our carbonaceous feeds, and in the future are likely to do so. With it all our stover, straws and wild hay can be fed to great advantage. So far its effects on hogs, steers and cows have been highly beneficial. An early bulletin will give the details in every case, but we never feed any nutriment so heavily as to get animals off feed. If Iowa farmers will begin its use by feeding a little, and observe its effects as they increase the ration, making it only such part of a ration as will balance up the carbonaceous fodders so common with us, we predict great benefit from it.

BEST METHOD AND RESULTS OF FEEDING SEPARATOR MILK TO CALVES.

C. F. CURTIS, B. S. A.

The claim is frequently made and fairly well supported that calves and stock cattle are now inferior to those of ten years ago. This condition is largely due to changed methods of farming. As stated by the Dairy Commissioner's letter requesting this communication—the large number of separator creameries now in operation and new ones being built, as well as the rapid changing from gathered cream to the separator method makes this subject an important one.

Upon what we make of the calf in the Mississippi valley depends the future of both the beef and the dairy industry of the United States, for the best dairymen and best beef producers are those who raise their own stock and they who keep in the foremost ranks can only do so by raising good calves as well as keeping good cows.

The few dairymen of the west who have developed herds reaching the 300 pound yearly butter mark are raising their best calves and from them go on increasing the capacity of their herds. The principle holds good in beef herds as well. If there is anything in heredity, and there is, no man who expects to continue in the cattle business can afford to ignore the calf.

We are confronted by another fact—the time has come when the calves in the leading agricultural states must be raised on separator skim milk. A few may keep strictly beef herds and allow the calves to run with the dam, but our lands are becoming too high priced for this practice to be profitable with ordinary herds. The separator is rapidly supplanting all other methods of recovering butter fats and this leaves the calf to subsist or languish on "blue separator milk." His fate is inevitable. It is not regarded as an auspicious prospect for the calf. Many have quit raising calves on account of the unsatisfactory results from separator milk and the deterioration of our cattle is due to the unsuccessful work of others.

At the late dairy convention held at the Iowa Agricultural College, perhaps nothing attracted more attention from those interested than a bunch of separator skim milk calves raised at the college and now being finished for beef at the age of sixteen or eighteen months with an average gain of about two pounds a day from birth. These calves have had practically nothing but separator milk and farm feeds. While I cannot take the space to detail here the recent experiments made in calf raising at the Iowa experiment station, a summary of the most important results may be of interest. Whole milk was first compared with skim milk, having the fat partially replaced by ground flax seed. A saving of \$1.11 per month on each calf was made in substituting flax seed for the butter fat of whole milk and nearly as good gains were made at one-third less expense. Whole milk gives the best results at the outset, but the skim milk calf goes on best after weaning and at the end of the first year makes a favorable comparison. Two experiments have been made to determine the best method of utilizing separator skim milk and the grains best adapted to be fed with it. It is fortunate that in both cases corn and oats have taken a higher rank for this purpose than have the more expensive nitrogenous grains. Until recently oil meal has been considered *par excellence* as calf feed and while it possesses high merit for this purpose it is not as good, nor as economical for feeding with skim milk as corn and oats. The reason is plainly apparent. Cow's milk, the natural and best food of the calf, has a nutritive ration of about 1 to 4, that is, it contains one part of casein to four parts of fat and sugar, making the usual allowance for fat in feeding. This proportion is best adapted to the needs of the growing calf. For fattening, a little higher proportion of fat is most efficient; add a little sweet cream to the ration of the whole milk calf and you will get even larger gains and fatter calves. This then gives us a clew to what the calf needs for the best results. When we put milk through the separator, however, we remove the fat and leave the proportion of albuminoids to carbohydrates 1 to 2. We have tampered with nature's ration and left only half as much of an important nutritive element as it originally contained. Manifestly what is needed is not more of what is most abundant, but what is lacking—fat or its equivalent in some form. If we give oil meal we do not furnish this but only increase the albuminoids already found in excess.

In two experiments made by the writer, calves of as nearly equal age and conditions as possible have been taken and fed in separate lots, some having separator milk and oil meal, others separator milk and corn meal, to which was added ten per cent of ground flax seed to partially replace the loss of fat due to skimming. In all cases good results have been obtained from these rations and thrifty calves resulted, but the lightest and most expensive growth has always come from the oil meal and milk ration. Corn and flax seed have, all things considered, given the best results. (See bulletins 19 and 25 of the Iowa Experiment Station.)

In the last experiment conducted along this line, six grade short-horn male calves ranging in age from one to two weeks were put on a separator milk and grain ration for ninety days with the following results: To one lot of two calves was fed 3008 pounds of separator milk, 250 pounds of hay and 58 pounds of oil meal, which produced a gain of 275 pounds at a cost of 2.1 cents a pound. Another lot had 3008 pounds of separator milk, 249 pounds of hay and 58 pounds of oat meal and gained 301 pounds at a cost of 1.9 cents a pound. Another lot had 3008 pounds of separator milk, 253 pounds of hay and 56 pounds of corn meal and ground flax seed (proportion 9 to 1 by weight) and gained 281 pounds at a cost of 1.9 cents per pound. In the above calculation separator milk was rated at 15 cents a hundred and grain and hay at prevailing market prices. In a former experiment of the same character two calves having a separator milk and oil meal ration made a gain of 115 pounds in sixty days; two, having separator milk and ground oats, 128 pounds; and two, having separator milk and corn meal 155 pounds.

In the second experiment the oats fed were ground and the hulls separated by means of a sand sieve, leaving only the oat meal for feeding. This method seems advisable for the young calf as the stomach is easily irritated by any excess of coarse food. The hay used should always be of a fine upland quality, and during the milk feeding period wild hay is preferable.

The above results, amounting to 1.7 pounds a day, on one lot, at a cost less than 2 cent a pound for feed, clearly demonstrates the possibility of good returns from separator milk and farm feeds. While these and even better results are attainable, there are some important conditions to be observed in successfully feeding separator milk. The milk used in both these

experiments was separated with a hand separator and fed while warm. The morning temperature taken just before feeding in the last trial averaged 88° and evening 89°, and it rarely varied more than two degrees and never fell below 86°. The temperature takes care of itself when milk is handled without delay with a hand separator at the farm.

The first condition to be observed then is uniformity and regularity in feeding. This is imperative. Sweet and sour, and warm and cold milk alternately will kill any calf. Another necessary precaution is moderate feeding. The young calf may safely have free access to good grain and hay but the allowance of skim milk must be limited. For the first two weeks we feed not more than seven and a half pounds (less than a gallon) at a feed. This is gradually increased up to about twenty pounds a day. Then, too, calves must have absolutely clean and dry quarters with ample sunlight and ventilation. Salt regularly but moderately. I am inclined to think a lump of rock salt the best method. The grains should be finely ground and may be fed dry or in the milk.

Where the cows are kept for milk, I am fully satisfied that the best and cheapest calves can be raised by having them dropped in the fall or early winter. By the time the fall calf is carried through the milk and grain feeding period it is ready to go onto the generous spring pasture, while with the spring calf the milk and grain feeding period covers the greater part of the first year and the calf rarely does as well either. This, together with the advantage of having the cow fresh in the winter, is an important consideration for the dairyman. German statistics show that cows coming fresh in December give over twenty-five per cent more milk during the year than cows coming fresh in May and June. This is a marked variation, yet it represents the records of over six hundred periods of lactation.

There is abundant reason why every effort should be made to raise good calves for a specific purpose; calves not adapted to any purpose, as the steer calf from dairy breeds, had better be disposed of young with least expense.

The problem of getting milk from the separator creamery in good condition for feeding is one that has not in all cases been solved. Patrons who live near the creamery, or haul their own milk, can usually have it returned sweet; but the long haul routes always suffer, and this fact stands in the way of the full patronage of the creamery, as many farmers claim that their

milk is practically worthless. This is one of the knotty problems affecting the relations of the creameryman and patron. There are three parties concerned and responsible in this matter—the creamery operator, the hauler and the patron; and good results will be impossible without the observance of right methods by each. To begin with, the milk must start right—clean, free from taints, animal odors, unwholesome feed, unclean cans and all other conditions that induce rapid souring. This is the work of the patron and unless it is carried out by all of the patrons, the whole product will be more or less injured. It is absolutely useless to expect to have good milk returned when it is on the verge of souring or contaminated with animal odors and filth when it starts for the creamery.

Too great care cannot be exercised in the management of the milk before it leaves the farm. Milk is often thought to be pure and free from objectionable taints and other odors when it is not. The atmosphere of the cow barn, no matter how clean, is not a fit place to expose milk for aerating or cooling—nor is any place where exists any foreign odor whatever. A case in point occurred recently in the management of the milk of the Iowa experiment station cows. The barn is new and unusually clean, the ventilation is good, the floors are all of cement, with a perfect system of underground drainage, having cemented pipes and closed bell traps. Yet in spite of all these conditions a plate of glass covered with a favorable medium for the development of bacteria, exposed five minutes in the feeding alley between two rows of cow stalls, by Mr. C. D. Reed, one of our post-graduate students in agriculture, revealed the presence of 4454 germs and 138 moulds on a surface equal in size to the top of an ordinary milk pail. The same surface exposed in open air showed about one fourth the number of germs found in the barn. Of course this number includes all kinds of bacteria; some are good and some bad. The action of the good ones is essential to the proper ripening of cream and the development of flavor. These minute organisms are always present and are exceedingly active agents for good or evil, and with the latter predominating it is apparent that dairy products are soon injured. Knowing a place of this kind to be unfit for keeping milk, the milk from the station cows was placed in an office room for cooling and keeping over night. As this room was about 8x12 with suitable lighting and ventilation, and kept clean, it was thought that it would make a good place for keeping milk; but it was soon

discovered that the milk was tainted and unfit for cheese making. Mr. McKay and the dairy students examined the milk at the creamery and concluded that it had become contaminated from being left in the barn. As this was not the case, further investigation was made, and it was found that the office room being across the alley from the horse's section of the barn, enough of the odor and ammonia from the horse stalls entered the room while the door was open to taint the milk. The milk soured quickly in addition to injury in flavor. Mention is made of this incident to illustrate how susceptible milk is to all surrounding influences.

Then the hauler must start early and haul the milk in a covered wagon or protected cans and get it to the creamery and back to the farms in the best possible condition. This much done, the rest devolves upon the creameryman and if he is equal to the demands of his position, he will see that there is no cause for complaint. This involves a careful inspection of every can when it is opened at the creamery, and the rejection of all milk that is even suspicious. The interests of all patrons as well as the creamery demands this precaution. Then it is incumbent upon him that the utmost cleanliness be observed in every utensil with which this milk comes in contact, and also, so far as possible, that it is properly handled by the haulers. The creamery is responsible for the public hauler and should see that good service is rendered.

CHEESE AND CHEESE-MAKING.

BY PROF. HENRY C. WALLACE, IOWA DAIRY SCHOOL—EDITOR OF THE CREAMERY GAZETTE, AMES, IOWA.

As it is taken from the cow, milk is one of the most perfect of single foods. It contains all of the elements necessary to nourish and develop the system. While milk contains small quantities of albumen, ash, citric acid, fibrin, etc., its main constituents, exclusive of water, are butter fat, casein and lactose, or milk sugar. The chief food products of milk are butter and cheese, and these differ radically in composition. Of the constituents of milk above enumerated, but one, the butter fat, enters prominently into the composition of butter. When a sample of the best Iowa butter is analyzed it is found to contain, approximately, eighty to eighty-five per cent butter fat, two to four per cent ash (which consists mostly of the salt added during the process of manufacture), very small amounts of casein, and the remainder water. When it is remembered that the animal system requires different kinds of nutrients to support life and produce growth and development, it will be seen that as a food butter occupies a very insignificant position. Indeed, it can hardly be termed a food. The body needs carbohydrates and fats to support respiration, keep up the animal heat, supply heat and line the muscles and tissues with a soft coating of fat, but it also needs, and must have, what is called protein for the purpose of building up the muscular system and keeping it in repair. The body might be likened to a machine which is built and kept in repair by the protein constituents of the food, while the carbohydrates and fats furnish fuel with which to run it. In view of this it will be seen that butter alone, which contains practically none of the materials necessary to build up and support the muscular system, would not support life for any length of time. In fact, butter is little more than a relish, and is agreeable and palatable only when used in connection with foods rich in the muscle-producing constituents which it lacks.

Cheese, on the other hand, is something more than a relish; it is a food. It contains not only the fatty portion of the milk, but also the casein, or in other words the protein compounds needed by the human body. Chemists tell us that a pound of well made cheese is worth as much for food as a pound and a half of beef, and we have a practical demonstration of its value in this respect in the habits of the peasants and laborers of Europe, who regularly use it as a substitute for meat. Cheese is eaten alone with a relish because it contains all the necessary elements of food, and it is doubtful if we have any other single food that will so well sustain a man under heavy work.

Taking the statements made in the preceding paragraph as true, it may well be asked why more cheese is not manufactured in this country, and especially in the dairy districts of the west. Iowa, for example, does not manufacture sufficient cheese for home consumption, and large quantities are annually shipped in from other states. There are, perhaps, two main reasons for this; first, the indisposition of the milk producers to sell milk to be made into cheese, and, second, the poor quality of our cheese as compared with that made in the eastern states.

The first of the reasons just given is largely due to natural conditions. Iowa is, perhaps, naturally the greatest grain growing state in the Union; but Iowa farmers have long since learned that there is no surer method of depleting the fertility of the soil than continuous grain growing, and as a consequence they are changing from a race of "soil robbers" to a race of stock growers; immense quantities of grain are still, and always will be, grown, but grass for pasture and winter forage has become one of the main crops and enters into the rotation on every well regulated Iowa farm. Owing to our luxuriant pastures and nutritious grains the dairy cows of Iowa average larger, perhaps, than those of any other state, and their calves when properly raised make prime beef. While in some restricted localities in the state intensive dairying is practiced and the calves are either killed when a few days old or shipped for veal within a few weeks, in general the Iowa dairyman prefers to raise the calves, grow them on his cheap grasses and finish them for the beef market with some of the rich grain raised on the farm. This being true he prefers to sell his milk for butter-making in order that he may have the skim-milk to feed the calves, and for the same reason he dislikes to sell milk

to be made into cheese; he has a very poor opinion of the value of whey as food for young calves.

As for the second reason given, namely, the poor quality of our cheese as compared with that made in other states, it may be said that the indisposition of Iowa farmers to furnish milk for cheese-making has naturally retarded the development of skilled makers. More than this, the desire on the part of manufacturers to get their money out of the cheese as soon as possible, or, in other words, to hurry the cheese to market, has developed methods which produce soft, hastily matured cheese that does not compare, either in palatability or food value, with properly made and well cured cheese. These methods of artificially ripening cheese and hurrying it to market in a few weeks have worked serious injury to the cheese trade, because the consumers have learned by experience that such cheese is not digestible, and have consequently drawn the general conclusion that all cheese is indigestible. As a matter of fact, properly made and well cured cheese is not only digestible but is really an aid to digestion. During the process of curing, the insoluble casein is gradually broken down and rendered soluble, or digestible, by the ripening germs, and few foods are more nutritious than well ripened cheese. While it may temporarily be to the advantage of the maker to hurry his cheese to market, and thus avoid the necessity for well made curing rooms and capital with which to hold it, such a practice will sooner or later prove disastrous to our cheese trade. When the consumer learns the difference between properly made, well cured cheese and the immature article so often found in our Iowa markets, he will let the latter severely alone.

To build up a profitable cheese trade in Iowa, then, two things at least are necessary. First, the milk producers must either arrange to have their cows calve in the winter so that the calves can be raised on the skim-milk and weaned before the cheese season opens, or they must learn to feed whey to advantage. It would be idle to say that whey is as valuable a food for animals as skim-milk. Its chief constituent is the milk sugar, but in addition to this it contains small quantities of casein and fat, in fact a little more of the latter than separator skim-milk. Still, whey is a valuable food stuff, if properly handled and used in connection with other foods. It is essential, however, that whey should be fed while still sweet, and to make this possible it should be pasteurized at the factory; or, in other words, it should

be heated to one hundred and fifty degrees F., as soon as drawn from the curd, and then immediately cooled. If this is done it can be kept sweet for about two days, and if with it are fed grains rich in the constituents in which it is lacking it will be found much more valuable than is generally supposed.

Second, we must improve the quality of our cheese by making it dryer and holding it longer in the curing room. If this is done, Iowa cheese will take its rightful position as one of our most nutritious food stuffs.

It seems hardly necessary to point out the disastrous results to the cheese interests, or rather the dairy interests, of the state should Iowa cheese-makers follow the example of those in some other states and permit themselves to be drawn into the manufacture of skim-milk or filled cheese. Of late it has been argued by those who have made a study of food questions, that in the manufacture of skim-milk cheese cheese-makers confer a favor to the poorer classes of our population by placing before them a very nutritious food at a low price. That cheese made from skim-milk is valuable as an article of food cannot be disputed. In many countries of Europe such cheese occupies a very prominent place in the diet of the peasantry and laborers, but the time has not yet come for it in this country. Our laboring classes are not yet compelled to subsist on the coarse fare of Europe, and as a rule they eat skim cheese only when they are deceived into believing it cheese made from whole milk and after they have paid full cream prices for it. If we had stringent laws which would make it impossible for unscrupulous dealers to palm off skim-milk cheese as the full cream article the principal objections to the manufacture of skim-milk cheese would be removed, but until we have such laws the manufacturer of skim-milk cheese must admit that, whether intentionally or not, he is usually a party to a gross fraud upon the consumer.

Much of what has just been said concerning skim-milk cheese applies with still greater force to filled cheese, except that in this case the manufacturer is knowingly a party to a fraud. It has been repeatedly urged that the foreign fat used in the manufacture of filled cheese is pure and wholesome and a legitimate article of food. Without discussing that question, and even admitting that these claims are true, the fact remains that the manufacture of such cheese is just as fraudulent as the manufacture of colored butterine, simply because it receives consideration on the market only when it masquerades as the genuine,

undulterated article. It is to the everlasting disgrace and shame of dairymen that among them should be found any who, for the sake of a few dollars, are willing to ally themselves with the manufacturers of butterine and other adulterated food products.

Passing to the practical operations of Cheddar cheese-making, the following discussion of the principles involved was first published by the writer in Bulletin 21 of the Iowa Experiment Station.

DISCUSSION OF THE PRINCIPLES INVOLVED IN CHEESE MAKING.

Ripening the Milk—The development and management of acid is the most salient feature in the manufacture of cheddar cheese. This is, perhaps, the chief reason why the cheddar method has been so generally introduced in this and other countries; the development and control of acid according to certain well established principles making it possible to produce cheese of about the same uniform quality under varying natural conditions and in different countries. As is now generally known, the acid in milk is produced by minute organisms called Bacteria, which gain access to the milk immediately after it is drawn from the cow's udder and multiply with marvelous rapidity. The acid is produced by the action of these organisms, or germs as they are more commonly called, upon the milk sugar, causing it to change to lactic acid. It should be noted that not all of the germs found in milk are capable of producing acid, but there always is a sufficient number of those that are. The first step in the development of acid by the cheesemaker is when he "ripens" the milk in the vat before introducing the rennet. By the term "ripen" we mean allowing the milk to develop a certain amount of acidity, to proceed a certain distance toward souring. It has been found by experience that it is best to have a certain amount of acid in the milk before the introduction of the rennet; there are several reasons for this. When the milk is ripened to a certain degree before the rennet is added time is saved for the maker, because it does not take so long to develop the required amount of acid in the after process. Again, the acid helps to expel the extra whey and thus gives a firmer, stiffer curd. The main reason, however, why it is better to ripen the milk will probably be discovered when the truth is known as to the relation between the rennet on the one hand and the germs which cause acidity on the other; there is as yet very little known about this.

It is evident to any person who has practical knowledge concerning the manufacture of cheese that there is danger in developing too much acid before the rennet is added. To make good cheese the acid must always be under the control of the maker; if it be allowed to get too great a start in the milk it passes beyond his control, and he must hurry the process as rapidly as possible and get the curd in the press before too much acid is developed. The result is a heavy loss of fat in the whey, and the cheese is of poor quality, curing imperfectly and giving poor satisfaction to both maker and consumer. In order to know the kind of milk with which he has to deal, the maker should apply a test to ascertain its ripeness as soon as it is heated up to eighty degrees. The most satisfactory method of determining the ripeness of the milk at this point is by means of a rennet test. While a maker who has a delicate taste and smell and who has had long experience in the business can determine the condition of the milk pretty accurately without any test, the most satisfactory way, both for beginners and makers of experience, is to use a test of some kind, and the latter are becoming so common now that most cheese-makers are familiar with them. We have used what is known as the Mondrad test with very satisfactory results; it is on the same principle as other rennet tests, but we think a little more sensitive.

If the milk is sweet and in good condition when it comes to the factory the temperature should be raised slowly. Rapid heating injures milk, and while it is sometimes necessary, as when the milk is too ripe, it should be avoided when possible. While the temperature is being raised the milk should be gently stirred at frequent intervals with a view to equalizing the temperature and preventing the cream from rising. The stirring must be done gently. Violent agitation when the milk is warm partly churns some of the fat, which shows itself on the surface in the form of white clots. The main object is to keep the fat as evenly distributed as possible, so that it will be caught and held by the casein when the latter is coagulated by the rennet.

Adding the Rennet—As before noted, the rennet test indicates when the milk is in proper condition to receive the rennet. The amount of rennet to use depends upon the season of the year, the length of time in which it is desired to market the cheese, the strength of the rennet and the condition of the milk as regards ripeness. For this reason it is impossible to say just how much rennet should be used. Each maker must

determine that for himself according to the conditions which surround him. In general it may be said, that enough rennet should be used to coagulate the milk fit for cutting in thirty to forty-five minutes. The rennet should be carefully measured in a graduated flask and diluted with water of the same temperature as the milk; this makes it easier to secure even distribution. The temperature at which the milk should be when the rennet is introduced may vary somewhat according to other conditions. In the experiment reported in the following pages it will be seen that this temperature varied from eighty-two to eighty-six degrees; eighty-four to eighty-six is usually considered best. The milk should be thoroughly, but gently, stirred for a minute and a half to two minutes after the rennet is added, then quieted down as quickly as possible by passing the dipper gently over the surface, and allowed to remain undisturbed until complete coagulation has taken place. Any agitation of the milk while it is undergoing coagulation causes a loss of fat in the whey. It is best to cover the vat with a canvas or muslin cloth while coagulation is taking place. This prevents the surface of the curd from becoming chilled if the room is cold and also keeps out specks of dirt and foreign matter.

Cutting the Curd—The time at which the curd is in the best condition for cutting is determined by passing the finger along about half an inch under the surface, first splitting the curd with the thumb; if the curd breaks clean before the finger, leaving only moisture in its wake, it is in fit condition for cutting. Beginners are apt to cut before the curd is firm enough; it is something that must necessarily be learned by experience. If the curd is cut too soft it does not retain its form and body in the after-stirring and manipulation and a great deal of fat will be lost in the whey. At this stage the curd is very tender and easily injured, and the amount of fat lost in the whey depends mainly upon the manner in which the curd is handled in the process of cutting and stirring. The old English method was to break the curd gently with the hands; then the wire breakers were introduced. The knives, as we now have them, were invented and first used in America. These knives are superior to any other instrument used for the purpose, for the reason that they cut the curd cleanly and bruise it very little. The point is to divide the curd thoroughly, but to do so in the gentlest manner and with the least possible agitation. The best instrument is the one that will pass through the curd with the

greatest ease and least amount of friction. The knives should always be kept sharp and clean.

The object in cutting is to facilitate the separation of the curd from the whey, and it should be performed in a manner least injurious to the curd and most favorable to the saving of the butter fat. It is best to use the horizontal knife first. The knife should be held in warm water for a moment or so before using, so that it will be of the same temperature as the curd. It should be introduced very carefully, placing it flat on the surface and cutting downward with the lower end until the latter rests on the bottom of the vat; then it should be slowly moved from one end of the vat to the other, turning carefully at the ends in such a manner that the curd will always be cut and never broken. When cutting is completed the knife should be removed as carefully as it was introduced, not lifting directly upward, but slowly lifting the lower end and cutting upward. After the first cutting the curd should be allowed to settle until almost entirely covered by the whey before being cut again. The reason for this is evident. The cut surfaces of the curd are very raw and tender and will part with the fat very easily on being crushed or mangled, or even much agitated. If the curd is permitted to remain undisturbed for a few minutes a film or coating will form over the cut surface, and there is much less danger of losing fat. When the curd is almost covered with the whey it is cut again, this time crosswise of the vat and with the perpendicular knife. Then, after allowing it to remain undisturbed for a few minutes, the hands are very gently inserted and whatever pieces of curd along the sides and in the corners have escaped cutting are gently raised to the surface and the curd cut again, lengthwise of the vat with the perpendicular knife. The fineness with which the curd is cut depends upon the condition of the milk and the season of the year. The object is to cut just fine enough to expel the moisture sufficiently and no finer. It is evident that the finer the curd is cut the greater the loss of fat in the whey, other things being equal. Usually the cubes of curd should be about the size of raisins. When the cutting is completed the curd should be allowed to settle for a few minutes, but it should be watched and prevented from matting. Then begin to stir very gently, lifting the curd from the bottom of the vat to the surface, and giving it a rotary motion so the pieces of curd will fall apart. This stirring should be continued for five or ten

minutes before any heat is applied. The object is to expose all sides of the freshly cut cubes of curd to the action of the whey, so that a film will form over the freshly cut surfaces and thus prevent the escape of fat.

"Cooking" the Curd.—Cooking is the term quite generally used in referring to the next process in the manufacture of cheese. That the term is a misnomer is evident to any one who is familiar with the process, for in the manufacture of first-class cheddar cheese the temperature is seldom raised above ninety-eight degrees and the curd is not cooked. From the time the curd is cut until it is put in the press it is handled with a view to accomplishing two things. 1. To expel the moisture, retaining only what is necessary to make a palatable cheese and insure perfect curing. 2. To develop a certain amount of acid. However, there appears to be a very close relation between the amount of moisture present and the degree of acid, as under normal conditions the acid is probably the most effective agent in expelling the moisture. The exact relations that heat, acid and moisture bear to each other in the manufacture of cheese are not yet fully understood. We know that the acid is caused by the action of certain germs, as has already been pointed out. We know that many of these acid producing germs grow best and develop acid most readily at a comparatively high temperature, say between eighty-eight and ninety-eight, so that as we raise the temperature more acid is produced. The acid causes the curd to contract, and as the curd contracts the moisture it contains is naturally forced outward. It would seem that the heat in itself does not play as prominent a part in expelling moisture from the curd as has heretofore been supposed; that while it is necessary, and one of the main features, in the manufacture of cheddar cheese, yet it mostly accomplishes the result sought indirectly instead of directly. The heat develops acid; the acid expels the moisture. Some careful experimental work will have to be done in this line before we will be able to clearly understand the exact bearing heat and acid and moisture have upon each other.

In order that the acid may be developed evenly and continuously in all parts of the curd, the temperature should be raised slowly and carefully. Those who do not understand the principle underlying this process and who think that the object is to cook the curd as they would poach an egg usually raise the temperature rapidly in order to get the curd cooked as quickly

as possible. The result is that the rapid raising of the temperature causes a firm coating to form over the exposed surfaces of the cubes of curd which prevents the escape of the moisture held inside. As a consequence they get a cheese that goes off flavor quickly and never cures properly. Such are never satisfactory cheese to sell and quite often they sour and become unfit for the market. It is necessary that the heat be applied so slowly that the cubes of curd have time to become heated through and through before a tough film is formed on the surface. When the heat has been properly applied, if one of the cubes of curd is broken open when it is in the condition to be removed from the whey it will be firm and stiff from one side to the other. On the other hand, when the heat has been applied too rapidly, the inside of the cubes will be soft and milky, a film having been formed on the surface before the moisture was forced out. With normal milk in good condition the heat should be applied in such a manner that the temperature will be raised about one degree in two and one-half to four minutes. It should not be heated faster than this unless the milk is in such condition that it is necessary to hasten the process to avoid too much acid.

While the temperature is being raised it is necessary to stir the curd frequently, to keep the temperature the same in all parts of the vat and to prevent the curd from becoming matted together. It should be stirred, however, no more than necessary to accomplish these ends. The manner in which the curd should be stirred is one of the most difficult things for the beginner in cheese-making to learn, and thousands of dollars worth of fat are annually lost in the cheese vats of the country because of improper stirring of the curd from the time it is cut until the whey is removed. Bearing in mind the manner in which the fat is retained in the curd it is plain that the more the curd is agitated the greater will be the loss of fat in the whey, other things being equal, and while it is necessary to stir frequently during the heating process to keep the temperature the same throughout the vat and to prevent the cubes of curd from matting together, more stirring than this is not only useless, but means a positive increase in the loss of fat in the whey. There is a knack in knowing how to stir curd in the whey. One maker will secure an even temperature and keep the cubes separate so gently and carefully that the minimum amount of fat will be lost, while another will stir so violently that he will lose more fat in the whey than his wages amount to, if he is handling large

quantities of milk. The stirring should be done in the gentlest possible manner. In a small vat it is best to use the hands only. In a large vat it is easier and more convenient to use a large wooden rake for the center of the vat, keeping the corners clear of curd with the hands. Care should be taken to avoid bruising the curd and crushing it against the sides and ends of the vat.

Ninety-eight to ninety-nine degrees is generally considered the proper temperature to reach in the heating of the curd in the whey. Shortly after this temperature has been reached, when the cubes of curd become so firm that they will not "run together," the curd can be allowed to settle to the bottom of the vat, being stirred up occasionally, until the proper degree of acidity is developed. Before allowing the curd to come in contact with the bottom of the vat for any length of time, however, the water surrounding the vat should be brought to the same temperature as the curd and whey, so that there will be no danger of the curd on the bottom of the vat becoming too warm. Unless the maker is careful in this matter the temperature is likely to run up higher than it should. In regard to the temperature to which the curd should be heated, there is a tendency among practical makers in some localities to stop at a lower temperature than has heretofore been considered best; some giving it as their belief that as satisfactory results are secured when heating is discontinued at ninety as when it is carried on up to ninety-eight. It should be noted in this connection that the investigations of some bacteriologists tend to show that many of the germs found in cheese do not grow well at a temperature above ninety-five, some, in fact, being retarded in growth at that temperature. However, it remains to be seen whether any of the germs of this nature are essential to the making of first-class cheese. The whole subject is open for careful experimental work, and the temperature to which it is best to heat the curd can only be determined when we have a more thorough knowledge of the forces at work which bring about the desired changes in the curd.

Acidity in the Whey.—The curd is allowed to remain in the whey until a certain amount of acidity is developed, the amount depending somewhat on the season, the locality and the condition of the particular curd in hand. The main purpose in developing acidity in the curd while it is still in the whey is to aid in getting rid of the moisture and to save time. Time is

saved in this manner, because, while the whey is still present there is more sugar available for the development of acidity than after the whey has been removed. The whey could be removed as soon as the temperature has been raised to the desired point, and while it was still sweet, and it would be possible to develop all the acidity in the curd; but it would be a slow process, requiring a great deal of time and watchful care, and there would be danger of retaining too much moisture in the curd. But, while the development of a certain amount of acidity in the whey is helpful and advantageous, the greatest care should be exercised so that the acidity can be arrested before it proceeds too far. In the latter case one of two evils is the result; either the natural process must be cut short and the curd hurried into the hoops before it is in the proper mechanical condition for pressing, or the amount of acid will be much greater than it should be at the time of pressing. In the first instance, there is usually too much moisture in the cheese, and not only are the body and texture poor, but the cheese goes off flavor quickly. In the second case, when too much acid is developed the cheese is likely to be hard and does not cure well, because the presence of too much acid tends to arrest the growth of the germs which cause ripening. The buttery consistency and "nutty" flavor characteristic of first-class cheese are lost, and it is impossible to make a really fine article if the development of acid is carried too far in the whey. It is the belief of many of the best cheesemakers, both in this country and England, that the whey contains elements inimical to the finest flavor, and that the sooner it can be removed the better. It is quite possible that some of the germs which develop undesirable flavors in cheese grow best in the whey, but we are as yet almost entirely in the dark as to the parts different germs play in the production of flavors in cheese.

As to the exact degree of acid that should be given in the whey, as shown by the hot iron test with which all cheesemakers are familiar, it necessarily varies with the season and the locality, and each maker must be governed by his own judgment in accordance with the surroundings. In making spring cheese we usually remove the whey when the curd shows threads an eighth of an inch long on the hot iron; in summer when the threads are about one-fourth of an inch long. In the fall we allow somewhat more acid to develop in the whey, the amount depending upon the market for which the

cheese is made. The demand in this State is for a softer cheese than would be best for shipping purposes, and consequently less acid is needed than would be necessary in the latter case.

In warm weather, when the acid develops rapidly, it is a good practice, especially for those who have large vats to handle, to remove one-half or more of the whey before very much acid is developed. This does not arrest acidification, but when there is only a small amount of whey on the curd it can be removed quickly when the proper time comes, and this is important.

Management of the Curd.—After drawing off the bulk of the whey the curd should be well stirred, to give the remainder of the whey an opportunity to escape, and matted on each side of the vat, keeping an open channel through the center through which the whey can run off as it is pressed out by the settling of the curd. The method of handling the curd at this point must necessarily depend upon its condition. Sometimes, instead of permitting it to mat it is dipped into a curd sink and well stirred, the length of time stirring is continued depending upon the amount of moisture in the curd, and then matted until sufficient acid is developed. At other times, when development of acid is rapid, it is not allowed to mat at all; simply dipped from the vat to the curd-sink, stirred according to the judgment of the maker, salted, stirred and put to press.

After the curd is matted firmly it should be cut into blocks six or eight inches across, so that it can be turned and piled. At this stage the curd is handled with two objects in view, to get it in the proper mechanical condition and remove the whey as thoroughly as possible, and to develop a certain amount of acid. The blocks of curd should be turned at intervals of ten to fifteen minutes to give the whey an opportunity to flow off easily, and then piled two deep at first and then three or four deep, unless the temperature of the make-room be rather high. Care should be taken to see that the whey is not allowed to stand in pools on the curd at this point. If this is permitted there is danger of too much moisture being retained in the curd, and of sour flavors being developed in the cheese.

It is important that the temperature of the curd be kept at ninety to ninety-six while the curd is in the matted condition. This is necessary, not only for the development of acid, but to secure the proper mechanical condition. If the make-room be cold, so that there is danger of the curd cooling quickly, the

latter should be covered with pieces of heavy cloth to prevent the radiation of the heat, and the water surrounding the vat can be kept at ninety-six to one hundred, as seems best. In the latter case, however, the curd should be placed on racks, so that it will not be exposed to the hot sides and bottom of the vat. Another aid in maintaining the temperature is to pile the blocks of curd three or four, or more, deep; and this is also necessary to secure the best mechanical condition. The idea is to keep the curd warm, thus making the conditions favorable for the growth of the germs which produce the acidity. It will not do, however, to simply pile the curd and permit it to remain in this condition, for the reason that most of these acid producing germs seem to require the presence of air to grow readily; so the blocks of curd should be turned and re-piled every ten to fifteen minutes, for the double purpose of exposing them to the air and to get rid of the whey that collects, as well as to maintain an even temperature in all parts of the curd and thus secure an even and regular development of acidity.

The degree of acid developed while the curd is in the matted condition necessarily varies with the season and the condition of the milk. In the spring we grind the curd when the threads string out from one-half to one inch on the hot iron, usually about three-fourths of an inch. In making summer and fall cheese we give one to one and two-thirds inches, depending upon the condition of the milk and the market for which we are making the cheese. Experience and judgment are necessary in this matter, as in everything connected with cheese making. As for mechanical condition, when the curd is in the best condition for grinding, it is flaky, and when torn apart splits instead of breaks. At this stage it has a peculiar odor, which has been likened to the breath of a healthy cow. The curd never attains the proper mechanical condition if the temperature be too low while it is in the matted condition.

Grinding the Curd.—The kind of mill best adapted to leave the curd in the most satisfactory condition after grinding and to cause the least loss of fat, we believe, has not been determined by careful experiments. Successful makers differ in opinions in this matter.

The temperature at which the curd should be put through the mill is something that we think is not entirely settled.

Among the best makers there is the belief that the temperature should be reduced below ninety before grinding, and we

think there may be good grounds for this belief. It is difficult to lay down any rule to govern this particular part of the process; in this, as in almost everything else connected with cheese making, the maker must modify his practice to meet the requirements of the particular curd in hand. Until we get some strong indications by experimentation as to the best temperature at which the curd should be ground, we shall be governed more by the condition of the curd mechanically and the amount of acid present; although, as stated above, we think it desirable to reduce the temperature to near ninety, and perhaps below, when it can be done without interfering with the other conditions. In other words, from the present state of our knowledge on this point, we regard the matter of temperature as secondary.

Salting the Curd.—The length of time that should elapse between grinding the curd and adding the salt must depend to a great extent upon the condition of the curd in hand. Sometimes the curd will be ready for salting in five to ten minutes after being ground, while at other times salting is best deferred for twenty minutes to half an hour, or more. After being ground the curd should be well stirred and thoroughly exposed to the air, thus giving the moisture an opportunity to evaporate, and the length of time it should be stirred before the salt is added naturally depends somewhat upon the amount of moisture in the curd and the amount it is desirable to have in the cheese. Normal curd is usually in fit condition to salt when it has been stirred fifteen to twenty minutes after having been ground. It will be noticed that the character of the curd changes somewhat during this period. The aroma of new made butter becomes pronounced as the curd is more exposed to the air, the odor no doubt being produced by the action of the germs in the curd, the conditions for their growth being most favorable at this point. As stirring is continued the mechanical condition of the curd changes, and when ready for salting it has a soft, silky feel, and when squeezed firmly in the hand a mixture of whey and butter fat oozes out between the fingers. If there be a certain temperature at which it is best to add the salt we do not yet know what it is. My experience indicates that about 80° is the best temperature at which to add the salt, but whether this temperature should be raised or lowered, as is more likely, is something that can only be determined by careful experimentation.

The amount of salt to use varies with the season, the condition of the curd as regards moisture and the length of time within which it is desired to market the cheese. The action of salt in expelling moisture from either butter or cheese is well understood, and also its preservative qualities. It retards the growth and reproduction of the germs which cause ripening and decay. Consequently, when quick curing cheese is desired, less salt is used than when the intention is to keep the cheese in the curing room for several months. In the spring and early summer less salt is used than in the fall and winter. In general it may be said that during the spring, when it is desired to place the cheese on the market as quickly as possible, one and one-half to one and two-thirds pounds of salt to the thousand pounds of milk should be used, while in the latter part of season this amount can be increased until two and one-half to three pounds, or more, can be used to the thousand pounds of milk. After the salt is added the curd must be well stirred to secure its even distribution. The length of time that should elapse from the addition of the salt until the curd is placed in the hoops naturally varies with the conditions. Usually, however, the curd is in fit condition for hooping within fifteen to twenty minutes after the salt has been added. Immediately after the salt is added it will be observed that the curd has a harsh, gritty feel on the surface, caused probably by the action of the salt on the casein; when this harsh feeling has entirely disappeared and the curd has become soft and slippery to the touch, it is ready for the hoops. In case there are disagreeable odors present in the curd it is improved by stirring fifteen to thirty minutes longer than usual.

Pressing the Curd.—The main object in pressing is to secure a firm, compact cheese, and to remove the extra moisture. The temperature at which it is best to put the curd to press is another of those points that has not been entirely determined as yet. In this connection there are two things to be kept in mind, the amount of fat lost in the press drip, and the flavor of the cheese. As to the amount of fat lost in the drip, it is really insignificant. While in some cases the drip shows a high per cent of fat there is so little of it usually that the actual loss of fat is very small, indeed. As for the bearing the temperature at which the curd is put to press has upon the flavor of the cheese, some of those who are entitled to be ranked as authorities hold that it affects it materially, and that in order to secure the best

flavor the curd should go into the press at a temperature of 78° to 80°. This is another matter that must be determined by careful experimentation.

The hoops should be of nearly the same temperature as the curd at the time the latter is placed in them; if they are cold there is danger of the curd in contact with them becoming chilled, and failing to form a close, firm rind. Cold hoops and cold press rooms have been fruitful sources of trouble to makers, and cracked rinds can frequently be traced to this cause. The pressure should be applied with a view to secure a close knitting together of the curd, hence it must be done slowly and gradually. If pressure is applied too violently the loss of fat in the whey will be much greater than it should, and what is worse, the curd will be crushed out of shape, making it pasty and destroying the body of the cheese. As soon as the whey starts through the openings in the hoop, pressure should be discontinued for ten minutes, or more, then increased slightly and again stopped for a few minutes, and so on until the curd is under almost full pressure. In this condition the curd should remain for ten to fifteen minutes, when the hoops should be taken from the press, the cheese turned and the bandages pulled up and folded over the ends so that they will fit the cheese smoothly. The cap cloths should be rinsed in warm water and a little of the latter sprinkled on the ends of the cheese, when the latter should be returned to the hoops and replaced in the press under strong pressure. The pressure should be increased as much as possible the last thing in the evening and the first thing on returning to the room in the morning. Ordinarily eighteen to twenty-four hours is a sufficient length of time for cheese to remain in the press, although in certain cases, as when the curd has not knit well together, or has been pressed too much on one side or the other, it is better to press sometime longer.

On taking the cheese from the press the cap cloths are removed—they should peel off neatly without any abrasion of the rind—and after the cheese has been exposed to the air in the curing room for an hour or so, in order that the surface moisture may evaporate, the ends are greased with melted butter or grease made for the purpose. If butter is used it should be put on hot so that a good rind will be formed, and the ends rubbed for a few minutes. Of late we have been using a prepared grease that is giving satisfactory results. On the

side of each cheese should be plainly marked the date on which it was made. The cheese should be turned and rubbed on the ends every day and the shelves kept clean and dry. The idea in turning is to secure an even distribution and evaporation of the moisture in the cheese, and to expose both ends to the air. If turning is neglected, the end next to the shelf, being filled with moisture which has gradually settled to it, will decompose. There is sometimes trouble caused by the ends of the cheese becoming colored, usually a reddish color. This can frequently be traced to the boards of which the shelves are made. If unseasoned pine boards are used they will very often color the cheese. The remedy is to use only well seasoned lumber in the curing room, particularly avoiding knotty and pitchy boards. If the shelves are not kept clean the ends of the cheese will become colored more or less, and the same thing frequently results if the air in the room is too heavily laden with moisture, the coloring in the latter case being probably due to the action of certain germs.

Ripening.—One of the most desirable characteristics of the old cheddar cheese was that it was usually well ripened before being placed on the market. The process of ripening was carried on for several months, and when placed on the market the cheese was buttery, of fine flavor and digestible. In this country there is a good demand for young cheese, and this, coupled with the fact that good curing rooms and considerable capital are required to hold the product of the factory for three to five months, the time required for thorough ripening, has brought about the practice of selling cheese within a few weeks after they are made. Among critical customers, however, first-class, well ripened cheese command a premium of several cents a pound, and the demand for cheese of this kind will grow as the consumers become educated to an understanding of its value.

IOWA STATE DAIRY LAWS.

MILK LAW.

CHAPTER 50, LAWS TWENTY-FOURTH GENERAL ASSEMBLY.

AN ACT to repeal section 4042 of the Code of 1873 and provide a substitute therefor, and to enlarge the duties and powers of the State Dairy Commissioner, and to provide an appropriation therefor.

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

SECTION 1. IMPURE MILK—PENALTY FOR VIOLATION.—That section 4042 of the Code of 1873 is hereby repealed and the following is enacted in lieu thereof: If any person or corporation shall sell or exchange, or expose for sale or exchange, deliver or bring to another for domestic use, or to be converted into any product of human food whatsoever, any unclean, impure, unhealthy, adulterated, unwholesome or skimmed milk, or milk from which has been held back what is commonly known as strippings, or milk taken from an animal having disease, sickness, ulcers, abscesses or running sore, or was taken from an animal fifteen days before, or less than five days after parturition, shall upon conviction thereof be fined not less than twenty-five dollars (\$25.00) nor more than one hundred dollars (\$100.00), and be liable in double the amount of damages to the person or persons upon whom such fraud shall be committed. *Provided*, That the provisions of this act shall not apply to skimmed milk when it is sold as such.

SEC. 2. SKIMMED MILK DEFINED.—For the purposes of this act milk which is proved by any reliable method of test or analysis, to contain less than three pounds of butter fat to the one hundred pounds of milk, shall be regarded as skimmed or partially skimmed milk.

SEC. 3. ENFORCEMENT.—It is hereby made the duty of the Dairy Commissioner to enforce the provisions of the foregoing sections.

SEC. 4. MILK AGENTS' COMPENSATION.—The State Dairy Commissioner is hereby authorized to appoint agents in every city having over ten thousand inhabitants, in the State of Iowa, who are to collect the samples of milk as sold in such cities, and it shall be their duty to forward such samples to the office of the Commissioner in Des Moines in such manner as he shall direct. The compensation of such agents at any one time, shall not be more than three dollars (\$3.00) for collecting and delivering the same to the express companies.

SEC. 5. NUMBER OF COLLECTIONS.—The number of times samples are collected in each city of more than ten thousand inhabitants shall not exceed an average of thirty times during any one year.

SEC. 6. CLERKS' HIRE INCREASED.—The State Dairy Commissioner, if it shall be found necessary, may increase the clerk hire of his office twenty-five dollars (\$25.00) per month.

SEC. 7. MILK DEALERS' PERMIT; PENALTY FOR VIOLATION.—Every milk dealer who runs a milk wagon, milk depot, or sells milk from a store, in the cities that

have over ten thousand inhabitants, in the State of Iowa, shall obtain a permit from the State Dairy Commissioner's office, for which he shall pay the sum of one dollar (\$1.00) annually. The Commissioner shall keep a book in which shall be registered the name, location and number of each dealer in milk, and a record of each analysis. Whoever violates the provisions of this section, upon conviction thereof, shall be fined not less than ten dollars (\$10.00) nor more than twenty-five dollars (\$25.00).

SEC. 8.—POWER TO TAKE AND INSPECT. The Dairy Commissioner or his agents shall have power and authority to open any can or vessel containing milk which is offered for sale, and may inspect the contents thereof and may take therefrom samples of milk for analysis.

SEC. 9.—APPROPRIATION. That there is hereby appropriated out of any money in the state treasury, not otherwise appropriated, the sum of twenty-five hundred dollars, or so much as may be necessary for the purpose of carrying out the provisions of this act.

Approved April 8, 1892.

CHAPTER 46. LAWS TWENTY-FIFTH GENERAL ASSEMBLY.

A LAW prohibiting the manufacture, sale and use of any imitation butter and cheese, and regulating the manufacture, sale and use of substitutes for butter and cheese not having a yellow color.

AN ACT to repeal sections 1, 2, 3, 4, 5, 8, 10 and 15 of chapter 53 of the acts of the Twenty-first General Assembly, and to repeal section 6 of chapter 52 of the acts of the Twenty-first General Assembly as amended by senate file No. 51 of the Twenty-fifth General Assembly, and approved February 12, 1894, and to enact substitutes therefor; to prohibit the manufacture, sale, keeping for sale and fraudulent use of substances designed as imitation butter and cheese, and to regulate the manufacture, sale and keeping for sale of any substance designed to be used as a substitute for butter and cheese.

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

SECTION 1.—LAWS REPEALED. That sections 1, 2, 3, 4, 5, 8, 10 and 15 of chapter 53 of the acts of the Twenty-first General Assembly, and section 6 of chapter 52 of the acts of the Twenty-first General Assembly as amended by senate file No. 51 of the Twenty-fifth General Assembly, and approved February 12, 1894, are hereby repealed and the following enacted in lieu thereof.

SEC. 2.—DEFINING IMITATION BUTTER AND CHEESE. That for the purpose of this act every article, substitute 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. 3.—PROHIBITING THE COLORING YELLOW OF SUBSTITUTES FOR BUTTER OR CHEESE. No person shall coat, powder or color with annatto or any coloring matter whatever, any substance designed as a substitute for butter or cheese, whereby such substitute or product so colored or compounded shall be made to resemble butter or cheese, the product of the dairy.

No person shall combine any animal fat or vegetable oil or other substance with butter or cheese, or combine therewith or with animal fat or vegetable oil or combination of the two or with either one or with any substance or substances whatever, any annatto or compound of the same, or any other substance or substances, for the purpose or with the effect of imparting thereto a yellow color or any shade of yellow, so that such substitute shall resemble yellow or any shade of genuine yellow butter or cheese, nor introduce any such coloring matter or such substance or substances into any of the articles of which the same is composed. *Provided*, nothing in this act shall be construed to prohibit the use of salt, rennet and harmless coloring matter for coloring the products of pure milk or cream from the same.

No person shall by himself, his agent or employe, produce or manufacture any substance in imitation or semblance of natural butter or cheese, nor sell, nor keep for sale, nor offer for sale, any imitation butter or cheese made or manufactured, compounded or produced in violation of this section, whether such imitation butter or cheese shall be made or produced in this state or elsewhere.

This section shall not be construed to prohibit the manufacture and sale, under the regulations hereinafter provided of substances designed to be used as a substitute for butter or cheese and not manufactured or colored as herein prohibited.

SEC. 4. LAWFUL SUBSTITUTES—HOW MARKED.—Every person who lawfully manufactures any substance designed to be used as a substitute for butter or cheese shall mark by branding, stamping or stenciling upon the top and side of each tub, firkin, box, or other package in which such article shall be kept and in which it shall be removed from the place where it is produced, in a clean and durable manner, in the English language, the words, "substitute for butter" or "substitute for cheese," as the case may be, in printed letters, in plain Roman type, each of which shall not be less than one inch in length by one-half inch in width.

SEC. 5. SHIPPING.—No person, by himself or another, shall ship, consign or forward by any common carrier, whether public or private, any substance designed to be used as a substitute for butter or cheese, and no carrier shall knowingly receive the same for the purpose of forwarding or transporting unless it shall be manufactured and marked as provided in the preceding sections of this act, and unless it be consigned by the carrier and receipted for by its true name; *provided*, that this act shall not apply to any goods in transit between foreign states across the state of Iowa.

SEC. 6. HAVING IN POSSESSION.—No person shall have in his possession or under his control, any substance designed to be used as a substitute for butter and cheese unless the tub, firkin, box, or other package containing the same be clearly and durably marked as provided by section 4 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.

Every person having in possession or control of any substance designed to be used as a substitute for butter or 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 product.

SEC. 7. SELLING.—No person by himself or another shall sell or offer for sale any substance designed to be used for a substitute for butter or cheese under the

name of, or under the pretense that the same is butter or cheese; and no person by himself or another shall sell any substance designed to be used as a substitute for butter or cheese, unless he shall inform the purchaser distinctly at the time of the sale that the same is a substitute for butter or cheese, as the case may be, and shall deliver to the purchaser at the time of the sale a statement clearly printed in the English language, which shall refer to the article sold, and which shall contain in prominent and plain Roman type a statement that the substance so sold is a substitute for butter or cheese, as the case may be, and such statement shall also give the name and place of business of the maker.

SEC. 8. HOTELS; EATING ROOMS; PLACARD; PENALTY FOR VIOLATION.—No keeper or proprietor of any bakery, hotel, boarding house, restaurant, saloon lunch counter or place of public entertainment, or any person having charge thereof or employed thereat, or any person furnishing board for others than members of his own family, or for any employes where such board is furnished for a compensation or as a part of the compensation of any such employe shall keep, use or serve therein either as food for his guests, boarders, patrons, customers or employes, or for cooking purposes, any imitation butter or cheese as defined in section 3 of this act, and in using or serving any substance designed as a substitute for butter or cheese as herein defined, he or they shall display and keep posted a card opposite each table in a conspicuous place where the same may be easily seen and read in the dining room, eating room, lunch room, restaurant, bakery, hotel, boarding house, saloon or place of public entertainment, and place where such substance designed as a substitute is sold, used or disposed of, which card shall be white and in size not less than ten by fourteen inches; upon which shall be printed in plain black, Roman letters not less in size than one inch in length and one-half inch in width the words "substitute for butter used here," or "substitute for cheese used here," as the case may be, and said cards shall not contain any other words than the ones above prescribed. Any person or persons violating the provisions of this section shall, upon conviction thereof, be punished by a fine of not less than twenty-five dollars, nor over one hundred dollars, or by imprisonment in the county jail for not over thirty days.

SEC. 9. PENALTY FOR VIOLATION.—Whoever shall violate any of the provisions of sections 3, 4, 5, 6 or 7, of this act shall, for the first offense, be punished by a fine not less than fifty dollars, nor more than one hundred dollars, or by imprisonment not exceeding thirty days; and for each subsequent offense, 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 fine and imprisonment, in the discretion of the court.

SEC. 10. POSSESSION CONSTRUED; SEIZURES.—Whoever shall have possession or control of any imitation butter or imitation cheese, or any substance designed to be used as a substitute for butter or 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 23, 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, or any substance designed to be used as a substitute for butter or 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, or substance designed to be used as a substitute for butter or 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, or a substance designed to be used as a substitute for butter or cheese, it shall be returned forthwith to the person from whom it was taken.

Approved April 24, 1894.

UN-REPEALED SECTIONS OF CHAPTER 32 LAWS TWENTY-FIRST GENERAL ASSEMBLY.

SECTION 7. NO ACTION ON CONTRACT.—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. 9. DEFACING OR REMOVING MARKS.—Whoever shall deface, 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. 11. APPOINTMENT OF DAIRY COMMISSIONER.—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 by and with the advice and consent of the Executive Council.

SEC. 12. SALARY; OFFICE; CLERK.—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. DUTIES; REPORTS.—It shall be the duty of the State Dairy Commissioner to secure, so far as possible, the enforcement of this act. He shall collect, arrange and present in annual reports to the Governor on or before the first day 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. SECURING EVIDENCE.—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. 16. PROSECUTION; COST.—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 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. APPROPRIATION.—That the unexpended portion of the appropriation provided for by section 17 of the 52d chapter of the acts 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 purpose of the act; but not more than one-half of said unexpended balance shall be drawn from the state treasury prior to the first 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 30 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.

MILK TESTING LAW.

CHAPTER 47, LAWS TWENTY-FIFTH GENERAL ASSEMBLY.

AN ACT to regulate the testing of milk.

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

SECTION 1. ACCURATE TESTS; PROCURE TEST BOTTLES; EVIDENCE OF PROOF; PENALTY FOR VIOLATION.—Any person by himself or agents, servants or employes, or any corporation, its agents, servants or employes who shall operate a creamery, cheese factory, or condensed milk factory in this state, and who shall use a chemical milk test for the purpose of determining the quantity of butter fat in milk purchased or received from the patrons of such creamery, cheese factory or condensed milk factory, is hereby required to use reliable and accurate tests, and no

such tests shall be considered reliable and accurate, unless the same shall be clear oil and free from any foreign substance, and produce such measurements of butter fat as would result from the use of a standard Babcock milk tester. And every such person or corporation so engaged, and who shall use a chemical milk test, as aforesaid, is hereby required to procure from the State Dairy Commissioner's office one standard tube or bottle for testing milk, which shall be certified and marked, as provided in section 2 hereof, and which said test tube or bottle, so certified and marked as aforesaid, shall be kept for the inspection of such patrons and for the purpose of verifying the tests so used by such person or corporation.

And in any cause of action in any court arising between such person, corporation or factory and a patron thereof, the burden of proving such milk test to be reliable and accurate shall be upon such person, corporation or factory, and he shall show or establish that the test by him made, and the results therefrom, correspond with or are equivalent to the measurement of the butter fat which would result from the use of the standard Babcock milk tester.

Any person operating such creamery or factory, as aforesaid, or any agent, servant or employe of such person, or of any such corporation so engaged, who shall violate the provisions of this section, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punished by a fine of not less than fifty dollars, nor more than one thousand dollars, or by imprisonment in the county jail not more than thirty days.

SEC. 2. DUTIES OF DAIRY COMMISSIONER.—It is hereby made the duty of the State Dairy Commissioner to keep on hand a supply of standard Babcock test tubes or bottles for testing milk, and he shall furnish to any person or corporation desiring the same, one such tube or bottle, and upon request shall certify the same to be accurate, reliable and standard, and shall place thereon the letters "D. C." as a permanent mark thereon, such tube or bottle so furnished to be at the actual cost thereof.

SEC. 3. 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 *Des Moines Leader*, newspapers published in Des Moines, Iowa.

Approved April 24, 1894.

CHAPTER 155, LAWS TWENTY-FIFTH GENERAL ASSEMBLY. APPROPRIATION LAW. AN ACT providing an appropriation for conducting the office of the State Dairy Commissioner, and for paying the expenses thereof.

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

SECTION 1. That the unexpended portions of the appropriation provided by section 1, chapter 99 of the laws of the Twenty-fourth General Assembly, and by section 9, chapter 50 of the laws of the Twenty-fourth General Assembly, is hereby appropriated for the next biennial period, and there is further appropriated the sum of \$10,000 of any money in the treasury not otherwise appropriated, or as much thereof as may be necessary, for the proper carrying out of the purposes of the acts establishing this commission, but not more than one-half of the amount herein appropriated shall be drawn from the state treasury prior to the first day of May, 1895; the amount hereby appropriated shall be expended only under the direction and approval of the Executive Council.

Approved April 24, 1894.

"NO MAN CAN CLAIM A RIGHT TO PERPETRATE A FRAUD."

The following is taken from a certified copy of a decision, obtained by this Department, of the United States Supreme Court as rendered by Mr. Justice Harlan, in the case of *Benjamin A. Plumley v. The Commonwealth of Massachusetts*.

This was an action brought to test the validity of the anti-color provisions of a law, in the state of Massachusetts, which prohibits oleomargarine from having a color that causes it to look like butter.

As the court decides the law to be constitutional, and as our law embodies the same features, the decision becomes a document of great interest to all interested in pure dairy products, to such an extent that we have decided to publish it in full in this report.

The following quotations are to be found in the decision:

"THE CONSTITUTION OF THE UNITED STATES DOES NOT SECURE TO ANY ONE THE PRIVILEGE OF DEFRAUDING THE PEOPLE."

"IT COMPELS THE SALE OF OLEOMARGARINE FOR WHAT IT REALLY IS BY 'PREVENTING ITS SALE FOR WHAT IT IS NOT.'"

"THE STATUTE SEEKS TO SUPPRESS FALSE PRETENSES AND TO PROMOTE FAIR DEALING IN THE SALE OF AN ARTICLE OF FOOD."

SUPREME COURT OF THE UNITED STATES.

No. 406.—OCTOBER TERM, 1894.

Benjamin A. Plumley, Plaintiff in Error, } In error to the Supreme Judicial
vs. } Court of the Commonwealth of
 The Commonwealth of Massachusetts. } Massachusetts.

[December 10, 1894.]

Mr. Justice Harlan delivered the opinion of the court.

Plumley, the plaintiff in error, was convicted in the municipal court of Boston upon the charge of having sold in that city on the 6th day of October, 1891, in violation of the law of Massachusetts, a certain article, product and compound, known as oleomargarine, made partly of fats, oils and oleaginous substances and compounds thereof, not produced from unadulterated milk or cream but manufactured in imitation of yellow butter produced from pure unadulterated milk and cream.

The prosecution was based upon a statute of that commonwealth approved March 10, 1891, and entitled "An act to prevent deception in the manufacture and sale of imitation butter." By that statute it is provided as follows:

"SECTION 1. No person, by himself or his agents or servants, shall render or manufacture, sell, offer for sale, expose for sale or have in his possession with intent to sell, any article, product or compound made wholly or partly out of any fat, oil or oleaginous substance or compound thereof, not produced from unadulterated milk or cream from the same, which shall be in imitation of yellow butter produced from pure unadulterated milk or cream of the same: *Provided*, That nothing in this act shall be construed to prohibit the manufacture or sale of oleomargarine in a separate and distinct form, and in such manner as will advise the consumer of its real character, free from coloration or ingredient that causes it to look like butter.

"SEC. 2. Whoever violates any of the provisions of section one of this act shall be punished by a fine of not less than one hundred nor more than five hundred dollars, or by imprisonment in the house of correction for a term not exceeding one year.

"SEC. 3. Inspectors of milk shall institute complaints for the violation of the provisions of this act when they have reasonable cause to believe that any of its provisions have been violated; and on the information of any person who lays before them satisfactory evidence by which to sustain such complaint, said inspectors may enter all places where butter or imitation thereof are stored or kept for sale, and shall also take specimens of suspected butter and imitations thereof and cause them to be analyzed or otherwise satisfactorily tested, the result of which analysis or test they shall record and preserve as evidence; and a certificate of such result, sworn to by the analyzer, shall be admitted in evidence in all prosecutions under this act. The expense of such analysis or test, not

exceeding twenty dollars in any one case, may be included in the costs of such prosecutions. Whoever hinders, obstructs, or in any way interferes with any inspector in the performance of his duty shall be punished by a fine of fifty dollars for the first offense, and one hundred dollars for each subsequent offense.

"Sec. 4. This act shall not be construed to impair or prevent the prosecution and punishment of any violation of laws existing at the time of its passage and committed prior to its taking effect." *Acts and Resolves of Mass.* 1891, c. 58.

The defendant was found guilty of the offense charged. The court adjudged that he pay a fine of one hundred dollars and on default thereof stand committed in the common jail of Suffolk county until the fine was paid. Such default having occurred, a writ of commitment was issued under which he was taken for the purpose of imprisoning him in jail until the fine was paid.

He sued out a writ of *habeas corpus* from the Supreme Judicial Court of Massachusetts upon the ground that he was restrained of his liberty in violation of the Constitution and laws of the United States.

In his petition for the writ the accused set forth, in substance, that at the time and place charged he offered for sale and sold one package containing ten pounds of oleomargarine, manufactured from pure animal fats or substances and designed to take the place of butter produced from pure, unadulterated milk or cream. He also alleged that the oleomargarine in question was manufactured by a firm of which he was an agent, and the members of which were citizens and residents of Illinois engaged at the city of Chicago in the business of manufacturing that article and shipping it to various cities, towns, and places in Illinois and in other States and there selling the same; and that all oleomargarine manufactured by that firm and by other leading manufacturers was a wholesome, nutritious, palatable article of food, in no way deleterious to the public health or welfare.

The petitioner claimed that the statute of Massachusetts was repugnant to the clause of the Constitution providing that the Congress shall have power to regulate commerce among the several states; to the clause declaring that the citizens of each state shall be entitled to all the privileges and immunities of citizens in the several states; to the clause providing that no state shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States, nor deprive any person of life, liberty, or property without due process of law, nor deny to any person within its jurisdiction the equal protection of the laws; to the clause declaring that private property shall not be taken for public purposes; and to the act of Congress of August 2, 1886, entitled "An act defining butter, also imposing a tax upon and regulating the manufacture, sale, importation, and exportation of oleomargarine." 24 Stat. 209, c. 840; *R. S. Suppl.* 503.

The case was heard before one of the justices of that court and was reported to the full court on the petition and on the following facts and offer of proof:

"The proceedings are as alleged in the petition. The article sold by the petitioner was the article the sale of which is forbidden by chapter 38 of the acts of 1891. Oleomargarine has naturally a light-yellowish color, but the article sold by the petitioner was artificially colored in imitation of yellow butter.

"The allegations concerning the quality or wholesome character of the article sold are not admitted. The petitioner offers to prove the allegations of the petition in respect to the character and qualities of the article, and the commonwealth objects to such proofs as immaterial, and the petitioner is to have the benefit of his offer if found material.

"It is admitted that the article sold was sent by the manufacturers thereof in the state of Illinois to the petitioner, their agent in Massachusetts, and was sold by him in the original package, and that in respect to the article sold the importers and the petitioners had complied with all the requirements of the act of Congress regulating the sale of oleomargarine, and it was marked and distinguished by all the marks, words and stamps required of oleomargarine by the laws of this commonwealth."

It was adjudged that the prisoner be remanded to the custody of the keeper of the common jail to be therein confined, the opinion of that court being that the statute of Massachusetts was not in violation of the constitution or laws of the United States, and, consequently, that the petitioner was not illegally restrained of his liberty. 156 Mass., 236. The present writ of error brings up that judgment for review.

The learned counsel for the appellant states that Congress in the act of August 2, 1886, has legislated fully on the subject of oleomargarine. This may be true so far as the purposes of that act are concerned. But there is no ground to suppose that Congress intended in that enactment to interfere with the exercise by the states of any authority they could rightfully exercise over the sale within their respective limits of the article defined as oleomargarine. The statute imposed certain special taxes upon manufacturers of oleomargarine, as well as upon wholesale and retail dealers in that compound. It is expressly declared (section 3) that sections 3233 to 3241 inclusive and section 3243 of the Revised Statutes, Title, Internal Revenue, "are, so far as applicable, made to extend to and include and apply to the special taxes" so imposed, "and to the persons upon whom they are imposed." Section 3243 of the Revised Statutes is in these words: "The payment of any tax imposed by the internal revenue laws for carrying on any trade or business shall not be held to exempt any person from any penalty or punishment provided by the laws of any state for carrying on the same within such state, or in any manner to authorize the commencement or continuance of such trade or business contrary to the laws of such state or in places prohibited by municipal law; nor shall the payment of any such tax be held to prohibit any state from placing a duty or tax on the same trade or business, for state or other purposes." It is manifest that this section was incorporated into the act of August 2, 1886, to make it clear that Congress had no purpose to restrict the power of the states over the subject of the manufacture and sale of oleomargarine within their respective limits. The taxes prescribed by that act were imposed for national purposes, and their imposition did not give authority to those who paid them to engage in the manufacture or sale of oleomargarine in any state which lawfully forbade such manufacture or sale, or to disregard any regulations which a state might lawfully prescribe in reference to that article. *Licence Tax Cases*, 5 Wall, 462, 474; *Fevre v. Commonwealth*, 5 Wall, 475; *United States v. Drwitt*, 9 Wall, 41.

Nor was the act of Congress relating to oleomargarine intended as a regulation of commerce among the states. Its provisions do not have special application to the transfer of oleomargarine from one state of the Union to another. They relieve the manufacturer or seller, if he conforms to the regulations prescribed by Congress or by the Commissioner of Internal Revenue under the authority conferred upon him in that regard from penalty or punishment so far as the general government is concerned, but they do not interfere with the exercise by the states of any authority they possess of preventing deception or fraud in the sales of property within their respective limits.

The vital question in this case is, therefore, unaffected by the act of Congress or by any regulations that have been established in execution of its provisions. That question is, whether, as contended by the petitioner, the statute under examination in its application to sales of oleomargarine brought into Massachusetts from other states is in conflict with the clause of the Constitution of the United States investing Congress with the power to regulate commerce among the several states. This is the only question the learned counsel for the petitioner urges upon our attention, and, in view of the decision in *Powell v. Pennsylvania*, 127 U. S. 678, is the only one that we need consider.

It will be observed that the statute of Massachusetts which is alleged to be repugnant to the commerce clause of the Constitution does not prohibit the manufacture or sale of all oleomargarine, but only such as is colored in imitation of yellow butter produced from pure unadulterated milk or cream of such milk. If free from coloration or ingredient that "causes it to look like butter," the right to sell it "in a separate and distinct form, and in such manner as will advise the consumer of its real character," is neither restricted nor prohibited. It appears, in this case, that oleomargarine, in its natural condition, is of "a light-yellowish color," and that the article sold by the accused was artificially colored "in imitation of yellow butter." Now, the real object of coloring oleomargarine so as to make it look like genuine butter is that it may appear to be what it is not, and thus induce unwary purchasers, who do not closely scrutinize the label upon the package in which it is contained, to buy it as and for butter produced from unadulterated milk or cream from such milk. The suggestion that oleomargarine is artificially colored so as to render it more palatable and attractive can only mean that customers are deluded, by such coloration, into believing that they are getting genuine butter. If any one thinks that oleomargarine, not artificially colored so as to cause it to look like butter, is as palatable or as wholesome for purposes of food as pure butter, he is, as already observed, at liberty under the statute of Massachusetts to manufacture it in that state or to sell it there in such manner as to inform the customer of its real character. He is only forbidden to practice, in such matters, a fraud upon the general public. The statute seeks to suppress false pretenses and to promote fair dealing in the sale of an article of food. It compels the sale of oleomargarine for what it really is, by preventing its sale for what it is not. Can it be that the Constitution of the United States secures to any one the privilege of manufacturing and selling an article of food in such manner as to induce the mass of people to believe that they are buying something which, in fact, is wholly different from that which is offered for sale? Does the freedom of commerce among the states demand a recognition of the right to practice a deception upon the public in the sale of any articles, even those that may have become the subject of trade in different parts of the country?

Several cases in this court were cited in argument to support the contention that the grant of power to Congress to regulate interstate commerce extended to such legislation as that enacted by the commonwealth of Massachusetts. Let us see whether those cases announce any principle that compels this court to adjudge that the states have surrendered to the general government the power to prevent fraud in the sales of property.

Railroad Co. v. Husen, 95 U. S. 465, 473, involved the validity of a statute of Missouri, which was so framed as to prevent the bringing into that state of any Texan, Mexican, or Indian cattle between March 1st and December 1st in any

year, whether free from disease or not, or whether their coming into the state would be injurious to its inhabitants or not. If they were brought into Missouri for the purpose of carrying them through that state without unloading them, such burdens and restrictions were imposed as amounted to an exclusion from its limits of any cattle such as those described in the statute. This court held that the Missouri statute was neither a quarantine nor an inspection law; that its object and effect was to meet at the borders of Missouri a large and common subject of commerce and prohibit its crossing the state line during the larger part of each year, and to obstruct interstate commerce and discriminate between the property of citizens of one state and that of citizens of other states. The statute was, consequently, adjudged to be unconstitutional.

Minnesota v. Barber, 136 U. S. 313, 322, involved the validity of a statute of Minnesota which, by its necessary operation, excluded from the markets of that state all fresh beef, veal, mutton, lamb, or pork, in whatever form, and although entirely sound, healthy, and fit for human food, taken from animals slaughtered in other states; and which directly tended to restrict the slaughtering of animals, whose meat was to be sold in Minnesota, to those engaged in such business in that state. The court said: "If the object of the statute had been to deny altogether to the citizens of other states the privilege of selling, within the limits of Minnesota, for human food, any fresh beef, veal, mutton, lamb, or pork, from animals slaughtered outside of that state, and to compel the people of Minnesota, wishing to buy such meats, either to purchase those taken from animals inspected and slaughtered in the state, or to incur the cost of purchasing them, when desired for their own domestic use at points beyond the state, that object is attained by the act in question. Our duty to maintain the Constitution will not permit us to shut our eyes to these obvious and necessary results of the Minnesota statute. If this legislation does not make such discrimination against the products and business of other states in favor of the products and business of Minnesota as interferes with and burdens commerce among the several states, it would be difficult to enact legislation that would have that result."

Brimmer v. Robson, 138 U. S. 78, 82, involved the validity of a statute of Virginia relating to the sale, in that commonwealth, of unwholesome meat. The statute was held to be unconstitutional as prohibiting, by its necessary operation, the sale in Virginia of beef, veal, or mutton, although entirely wholesome, if from animals slaughtered one hundred miles or over from the place of sale. The court said: "Undoubtedly, a state may establish regulations for the protection of its people against the sale of unwholesome meats, provided such regulations do not conflict with the powers conferred by the Constitution upon Congress, or infringe rights granted or secured by that instrument. But it may not, under the guise of exerting its police powers, or of enacting inspection laws, make discriminations against the products and industries of some of the states in favor of the products and industries of its own or of other states. The owner of the meats here in question, although they were from animals slaughtered in Illinois, had the right, under the Constitution, to compete in the markets of Virginia upon terms of equality with the owners of like meats from animals slaughtered in Virginia or elsewhere within one hundred miles from the place of sale. Any local regulation which, in terms or by its necessary operation, denies this equality in the markets of the state is, when applied to the people and products or industries of other states, a direct burden upon commerce among the states, and, therefore, void." This case was followed in *Wright v. Wright*, 141 U. S. 62, 66, where

this court held a statute of Virginia, relating to the inspection of flour brought into that commonwealth, to be unconstitutional, because it required the inspection of flour from other states, when no such inspection was required of flour manufactured in Virginia.

So in *Walling v. Michigan*, 110 U. S. 446, 459, which involved the validity of a statute of Michigan imposing a tax upon persons not residing or having their principal place of business within the state, but engaged there in the business of selling or soliciting the sale of intoxicating liquors to be shipped into the state from places without it, but not imposing a similar tax upon persons selling or soliciting the sale of intoxicating liquors manufactured in that state. The statute was held to be in restraint of interstate commerce, and therefore void. It having been suggested that the tax imposed was an exercise of the police power of the state for the discouragement of the use of intoxicating liquors, and the preservation of the health and morals of the people, this court said: "This would be a perfect justification of the act if it did not discriminate against the citizens and products of other states in a matter of commerce among the states, and thus usurp one of the prerogatives of the national legislature."

It is obvious that none of the above cases presented the question now before us. Each of them involved the question whether one state could burden interstate commerce by means of discriminations enforced for the benefit of its own products and industries at the expense of the products and industries of other states. It did not become material in any of them to inquire, nor did this court inquire, whether a state, in the exercise of its police powers, may protect the public against the deception and fraud that would be involved in the sale within its limits for purposes of food, of a compound that had been so prepared as to make it appear to be what it was not. While in each of those cases it was held that the reserved police powers of the states could not control the prohibitions of the federal constitution nor the powers of the government it created, (*N. O. Gas Co. v. La. Light Co.*, 113 U. S. 650), it was distinctly stated that the grant to Congress of authority to regulate foreign and interstate commerce did not involve a surrender by the states of their police powers. If the statute of Massachusetts had been so framed as to be applicable only to oleomargarine manufactured in other states, and which had been made in imitation of pure butter, the case would have been wholly different. But we have seen that it is not of that character, but is aimed at all oleomargarine artificially colored so as to cause it to look like genuine butter and offered for sale in Massachusetts.

In none of the above cases is there to be found a suggestion or intimation that the Constitution of the United States took from the states the power of preventing deception and fraud in the sale, within their respective limits, of articles in whatever state manufactured, or that that instrument secured to any one the privilege of committing a wrong against society.

Referring to the general body of the law, from whatever source derived, existing in each state of the Union and regulating the rights and duties of all within its jurisdiction, even those engaged in interstate commerce, this court, speaking by Mr. Justice Matthews, said in *Smith v. Alabama*, 124 U. S. 465, 476, that "it was in contemplation of the continued existence of this separate system of law in each state that the constitution of the United States was framed and ordained with such legislative powers as are therein granted expressly or by reasonable implication." It was, consequently, held in that case that a state may enact laws and prescribe regulations, applicable to carriers engaged in interstate and foreign

commerce, to insure the safety of persons carried by them as well as the safety of persons and things liable to be affected by their acts while they were within the territorial jurisdiction of the state. So, in *Dout v. West Virginia*, 129 U. S. 114, 122, which involved the validity of a state enactment making it a public offense for any one to practice medicine in West Virginia without complying with certain prescribed conditions, this court, speaking by Mr. Justice Field, said: "The power of the state to provide for the general welfare of its people authorizes it to prescribe all such regulations as, in its judgment, will secure or tend to secure them against the consequences of ignorance and incapacity as well as deception and fraud."

If there be any subject over which it would seem the states ought to have plenary control, and the power to legislate in respect to which, it ought not to be supposed, was intended to be surrendered to the general government, it is the protection of the people against fraud and deception in the sale of food products. Such legislation may, indeed, indirectly or incidentally affect trade in such products transported from one state to another state. But that circumstance does not show that laws of the character alluded to are inconsistent with the power of Congress to regulate commerce among the states. For, as said by this court in *Shellock v. Alling*, 89 U. S. 99, 100: "In conferring upon Congress the regulation of commerce, it was never intended to cut the states off from legislating on all subjects relating to the health, life, and safety of their citizens, though the legislation might indirectly affect the commerce of the country. Legislation, in a great variety of ways, may affect commerce and persons engaged in it without constituting a regulation of it within the meaning of the constitution. * * * And it may be said generally, that the legislation of a state, not directed against commerce or any of its regulations, but relating to the rights, duties, and liabilities of citizens, and only directly and remotely affecting the operation of commerce, is of obligatory force upon citizens within its territorial jurisdiction, whether on land or water, or engaged in commerce, foreign or interstate, or in any other pursuit."

But the case most relied on by the petitioner to support the proposition that oleomargarine, being a recognized article of commerce, may be introduced into a state and there sold in original packages, without any restriction being imposed by the state upon such sale, is *Lily v. Hardin*, 135 U. S. 100.

The majority of the court in that case held that ardent spirits, distilled liquors, ale and beer, were subjects of exchange, barter, and traffic, and being articles of commerce, their sale while in the original packages in which they are carried from one state to another state, could not without the assent of congress be forbidden by the latter state; that the parties in that case, who took beer from Illinois into Iowa, had the right, under the Constitution of the United States, to sell it in Iowa in such original packages, any statute of that state to the contrary notwithstanding; and that Iowa had no control over such beer until the original packages were broken and the beer in them became mingled in the common mass of property within its limits. "Up to that point of time," the court said, "we hold that in the absence of Congressional permission to do so, the state had no power to interfere by seizure, or any other action in prohibition of importation and sale by the foreign or non-resident importer." p. 124.

It is sufficient to say of *Lily v. Hardin*, that it did not in form or in substance present the particular question now under consideration. The article which the majority of the court in that case held could be sold in Iowa in original packages, the statute of that state to the contrary notwithstanding, was beer

manufactured in Illinois and shipped to the former state to be there sold in such packages. So far as the record disclosed, and so far as the contentions of the parties were concerned, the article there in question was what it appeared to be, namely, genuine beer, and not a liquid or drink colored artificially so as to cause it to look like beer. The language we have quoted from *Leisy v. Hardin* must be restrained in its application to the case actually presented for determination, and does not justify the broad contention that a state is powerless to prevent the sale of articles manufactured in or brought from another state, and subjects of traffic and commerce, if their sale may cheat the people into purchasing something they do not intend to buy and which is wholly different from what its condition and appearance import. At the term succeeding the decision in *Leisy v. Hardin*, this court in *Rahrer's case*, 140 U. S., 545, 546, sustained the validity of the act of Congress of August 8, 1890, 26 Stat. 313, c. 728, known as the Wilson act, and in the light of the decision in *Leisy v. Hardin*, said, by the Chief Justice, that "the power of the state to impose restraints and burdens upon persons and property in conservation and promotion of the public health, good order and prosperity, is a power originally and always belonging to the states, not surrendered by them to the general government nor directly restrained by the Constitution of the United States, and essentially exclusive," and that "it is not to be doubted that the power to make the ordinary regulations of police remains with the individual states, and cannot be assumed by the national government."

The judgment of the court below is supported by many well considered cases.

In *People v. Arenburg*, 105 N. Y., 123, 129, 130, the precise question now before us came before the court of appeals of New York. That court, after referring to its decision in *People v. Marx*, 99 N. Y., 377, 383, adjudging a statute of New York relating to the manufacture of oleomargarine to be in violation of the fundamental right and privilege of every American citizen to adopt and follow such lawful industrial pursuit, not injurious to the community, as he may see fit, said: "Assuming, as is claimed, that butter made from animal fat or oil is as wholesome, nutritious and suitable for food as dairy butter; that it is composed of the same elements and is substantially the same article, except as regards its origin, and that it is cheaper, and that it would be a violation of the constitutional rights and liberties of the people to prohibit them from manufacturing or dealing in it, for the mere purpose of protecting the producers of dairy butter against competition, yet it cannot be claimed that the producers of butter, made from animal fat, or oils, have any constitutional right to resort to devices for the purpose of making their product resemble in appearance the more expensive article known as dairy butter, or that it is beyond the power of the legislature to enact such laws as they may deem necessary to prevent the simulated article being put upon the market in such a form and manner as to be calculated to deceive." "If it possesses," continued the court, "the merits which are claimed for it, and is innocuous, those making and dealing in it would be protected in the enjoyment of liberty in those respects, but they may legally be required to sell it for and as what it actually is and upon its own merits, and are not entitled to the benefit of any additional market value which may be imparted to it by resorting to artificial means to make it resemble dairy butter in appearance. It may be butter, but it is not butter made from cream, and the difference in cost or market value, if no other, would make it a fraud to pass off one article for the other." Again: "The statutory prohibition is aimed at a designed and intentional imitation of dairy butter, in manufacturing the new product, and not at a resemblance in

qualities inherent in the articles themselves and common to both." The court, therefore, held that artificial coloring of oleomargarine for the mere purpose of making it resemble dairy butter came within the statutory prohibition against imitation, and "that such prohibition is within the power of the legislature, and rests upon the same principle which would sustain a prohibition of coloring winter dairy butter, for the purpose of enhancing its market price by making it resemble summer dairy butter, should the legislature deem such a prohibition necessary or expedient."

In *McAllister v. State*, 72 Md., 390, the court of appeals of Maryland sustained the validity of a statute of that state declaring it unlawful to offer for sale as an article of food an article in imitation and semblance of natural butter. The object of the statute being to protect purchasers against fraud and deception, the power of the legislature, the court said, following the previous decision in *Pierce v. State*, 63 Md., 596, was too plain to be questioned.

In *Waterbury v. Newton*, 31 Vroom, 531, the New Jersey supreme court sustained the validity of an act that forbade the sale of oleomargarine colored with annatto. In response to the suggestion that oleomargarine colored with annatto was a wholesome article of food, the sale of which could not be prohibited, the court said: "If the sole basis for this statute were the protection of the public health, this objection would be pertinent, and might require us to consider the delicate questions, whether and how far the judiciary can pass upon the adaptability of the means which the legislature has proposed for the accomplishment of its legitimate ends. But, as already intimated, this provision is not aimed at the protection of the public health. Its object is to secure to dairymen and to the public at large a fuller and fairer enjoyment of their property, by excluding from the market a commodity prepared with a view to deceive those purchasing it. It is not pretended that annatto has any other function in the manufacture of oleomargarine than to make it a counterfeit of butter, which is more generally esteemed, and commands a higher price. That the legislature may repress such counterfeits does not admit, I think, of substantial question. Laws of like character have of late years been frequently assailed before the courts, but always without success." It was further held by the court that the statute of New Jersey was not repugnant to the clause of the Constitution empowering Congress to regulate commerce among the states, but that the package there in question, and which had been brought from Indiana, became on its delivery in Jersey City subject to the laws of New Jersey relating generally to articles of that nature. 50 N. J. L., 535, 537.

So in *State v. Marshall*, 64 N. H. 549, 551, 552, arising under a statute of New Hampshire, relating to the sale of imitation butter, the court said: "Butter is a necessary article of food, of almost universal consumption, and if an article compounded from cheaper ingredients, which many people would not purchase or use if they knew what it was, can be made so closely to resemble butter that ordinary persons cannot distinguish it from genuine butter, the liability to deception is such that the protection of the public requires those dealing in the article in some way to designate its real character. * * * The prohibition of the statute being directed against imposition in selling or exposing for sale artificial compounds resembling butter in appearance and flavor, and liable to be mistaken for genuine butter, it is no defense that the article sold or exposed for sale is free from impurity and unwholesome ingredients, and healthy and nutritious as an article of food."

In *State v. Addington*, 77 Mo. 110, 118, the court, referring to a statute prohibiting the manufacture and sale of oleaginous substances, or compounds of the same, in imitation of dairy products, said: "The central idea of the statute before us seems very manifest; it was, in our opinion, the prevention of facilities for selling or manufacturing a spurious article of butter, resembling the genuine article so closely in its external appearance as to render it easy to deceive purchasers into buying that which they would not buy but for the deception. The history of legislation on this subject, as well as the phraseology of the act itself, very strongly tend to confirm this view. If this was the purpose of the enactment now under discussion, we discover nothing in its provisions which enables us, in the light of the authorities, to say that the legislature, when passing the act, exceeded the power confided to that department of the government; and unless we can say this, we cannot hold the act to be anything less than valid."

To the same effect are *Powell v. Com'th* 114 Pa. 305; *Butler v. Chambers*, 36 Minn. 69, and *Weideman v. State*, 56 N. W. Rep. 688.

In *Railroad Co. v. Husen*, above cited, the court, speaking generally, said that the police power of a state extended to the making of regulations "promotive of domestic order, morals, health and safety." It was there held, among other things, to be, "within the range of legislative action to define the mode and manner in which every one may so use his own as not to injure others," and that "the police powers of a state justified the adoption of precautionary measures against social evils," and the enactment of such laws as would have "immediate connection with the protection of persons and property against the noxious acts of others."

It has therefore been adjudged that the states may legislate to prevent the spread of crime, and may exclude from their limits paupers, convicts, persons likely to become a public charge, and persons afflicted with contagious or infectious diseases. These and other like things having immediate connection with the health, morals, and safety of the people, may be done by the states in the exercise of the right of self-defence. And yet it is supposed that the owners of a compound which has been put in a condition to cheat the public into believing that it is a particular article of food in daily use and eagerly sought by people in every condition of life, are protected by the Constitution in making a sale of it against the will of state in which it is offered for sale, because of the circumstance that it is in an original package, and has become a subject of ordinary traffic. We are unwilling to accept this view. We are of opinion that it is within the power of a state to exclude from its markets any compound manufactured in another state, which has been artificially colored or adulterated so as to cause it to look like an article of food in general use, and the sale of which may, by reason of such coloration or adulteration, cheat the general public into purchasing that which they may not intend to buy. The Constitution of the United States does not secure to any one the privilege of defrauding the public. The deception against which the statute of Massachusetts is aimed is an offense against society, and the states are as competent to protect their people against such offenses or wrongs as they are to protect them against crimes or wrongs of more serious character. And this protection may be given without violating any right secured by the national Constitution, and without infringing the authority of the general government. A state enactment forbidding the sale of deceitful imitations of articles of food in general use among the people does not abridge any privilege secured to citizens of the United States, nor, in any just sense,

interfere with the freedom of commerce among the several states. It is legislation which "can be most advantageously exercised by the states themselves." *Gibbons v. Ogden*, 9 Wheat. 203.

We are not unmindful of the fact—indeed, this court has often had occasion to observe—that the acknowledged power of the states to protect the morals, the health and safety of their people by appropriate legislation, sometimes touches, in its exercise, the line separating the respective domains of national and state authority. But in view of the complex system of government which exists in this country, "presenting," as this court, speaking by Chief Justice Marshall, has said, "the rare and difficult scheme of one general government, whose action extends over the whole, but which possesses only certain enumerated powers, and of numerous state governments, which retain and exercise all powers not delegated to the Union," the judiciary of the United States should not strike down a legislative enactment of a state—especially if it has direct connection with the social order, the health and the morals of its people—unless such legislation plainly and palpably violates some right granted or secured by the national Constitution or encroaches upon the authority delegated to the United States for the attainment of objects of national concern.

We cannot so adjudge in reference to the statute of Massachusetts, and as the court below correctly held that the plaintiff in error was not restrained of his liberty in violation of the Constitution of the United States, the judgment must be affirmed.

Mr. Justice Jackson, now absent, was present at the argument and participated in the decision of this case. He concurs in this opinion.

Judgment affirmed.

True copy.

TEST: JAMES H. MCKENNA,

[SEAL]

Clerk Supreme Court U. S.

IN CONCLUSION.

In conclusion I desire to thank the proprietors and operators of the creameries and cheese factories of the State who have answered my requests for information; to those who have not replied to the several requests, I would ask that in the future they give our communications prompt and favorable consideration. You should be interested in the development and good name of this great industry, and the more correct we can state the facts and the more complete we can make the showing, the better it will be for all concerned.

The kindness of the railroads in furnishing us with the amount of the shipments of butter to points outside the State is of much value, and deserving of our gratitude.

I also wish to thank, in the name of this Department, Professors Wilson, Curtis, Wallace and Heileman, of the State Agricultural College, for their very able articles furnished for publication in this report. They are doing a grand and noble work in the agricultural and dairy departments at Ames, where those desiring to become proficient in practical dairying can go for instruction in all branches of this work.

W. K. BOARDMAN,

Iowa State Dairy Commissioner.

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