REPORT OF C. E. LEE, ASSISTANT DAIRY AND FOOD COMMISSIONER AND DAIRY SPECIALIST

HON. GEORGE J. WEIGLE,
Dairy and Food Commissioner.

Sir: I hereby submit a report of the duties performed by me during the year ending June 30, 1919, together with suggestions and general statements as to existing conditions and changes that should be made in order that the dairy industry may continue to make progress.

I have had general supervision of the dairy work which includes all of the inspection of dairies, butter and cheese factories, condensaries, skimming and cream buying stations, and the market milk supply.

Personal inspection was made of several of the large plants manufacturing butter sold to the local trade in the principal cities. Samples of the butter manufactured were obtained and submitted to the chemist. A large number of these samples were found to contain less than the required per cent of butter fat. Prosecutions were brought and conviction secured in every case where it was found that the methods used in the manufacture of the butter were such as to result in a product low in per cent of butter fat. As a result of this work factory operators are more watchful in the manufacture of butter containing an excessive amount of water and salt.

It was found necessary to bring action against employers or officers of two corporations more than once in order to check the sale of adulterated butter.

The reports submitted by each inspector in the field have been closely studied. In a number of cases it was found necessary to assist the men in making a reinspection of some of the factories. In other cases letters were written to the operators to follow up the work of the inspector and to learn what progress had been made to comply with state regulations. It was necessary to bring two factory operators in Dane County into court for persistent violation of the Statute relating to maintaining factory utensils and premises in an insanitary condition. In each case the fine imposed by the judge was fifty dollars and costs, with a statement by the court that if another violation occurred a jail sentence would be imposed.

Sometime was also devoted to the study of city milk problems to assist the men in their respective territories in dealing with the problems that arise in this line of work. In one city a large dairy man was found selling milk produced by a Guernsey herd and approximately one-fourth of the butter fat had been removed. In the city
of Wausau I assisted the principal of the high school, Ira C. Painter, in a two-day campaign in the interest of milk as a food, its production and distribution. A great deal of interest was shown in this work by the local board of health and school officials, as well as by the milk producers. One objection was raised by the producers against the plan proposed, that of requiring all cows to be free from tuberculosis as shown by tests, before the milk could be sold in the city, and this objection was raised on the cost of having the cows tested.

I have been called upon to assist factory operators in planning repairs on old buildings and in the erection of new ones. Two special trips were made for that purpose,—one of which was to assist the Arthur Creamery Company near Rewey in getting the new factory under way. Many others have been assisted by means of plans and suggestions sent from the office.

Some time has been devoted to the work done by the special dairy and food inspector stationed at Stoughton. Assistance was rendered to the Civil Service Commission in conducting the examination held on February 15 to secure a list of eligible dairy and food inspectors.

Considerable time has been devoted to the work of getting the five new men added to the inspectional force within the past year acquainted with the method of doing inspectional work. This has necessitated conferences in the field as well as in the office. It is very gratifying to be able to report that good results were obtained by all of these new men in the field.

In September of last year I assisted two men from the federal department in making a study of the methods used in the manufacture of Wisconsin creamery butter. The various methods used in the manufacture of the higher and lower grades were examined and no doubt were compared with the data obtained in similar studies in other states. They were given an opportunity to examine the grade of butter entered at the 1918 State Fair.

Early in the year I was requested to act as a member of the dairy and poultry division of the Food Administration. In that capacity I was called upon to advise and to act in all matters pertaining to that division. I was also appointed by the Food Administrator to act as a member of a committee to arbitrate in the matter of fixing the value of milk delivered to the condensary at Middleton. The patrons and the owners, the Valecia Condensed Milk Co., had failed to agree as to whether the price set by the Chicago Milk Producers' Association should also apply to Middleton territory.

As a member of that committee I suggested a plan that was agreed to by the other members of the committee, the Valecia Condensed Milk Co. and the patrons. The plan as set forth in the letter to A. H. Melville, Secretary of the Food Administration, on August 19, 1918 was the beginning of a new method of fixing milk prices.
Mr. A. H. Melville, Sec.,
Food Administration,
Madison, Wisconsin,
Dear Sir:

As a member of the committee appointed by you to arbitrate in the matter of fixing the price to be paid for milk by the operators of the Middleton Condensary to the patrons of the Middleton plant, I wish to make the following report:

I submitted to the committee this plan for a basis of settlement: The value per pound of butter fat should be based on the average Chicago market price for the month for 92 scoring butter. A differential of 6 cents shall be used as an additional value of the butter fat. This was fixed at 6 cents because it is the approximate difference between the average value of this grade of butter on the Chicago market for the month of July and the price paid by several creameries in Wisconsin.

In addition to a fixed price per pound of butter fat, the patrons of the Middleton Condensary shall be paid for their skim milk on the basis of the value of corn; namely, each hundred pounds of skim milk should be valued at one-half the price of a bushel of corn for the month. To determine the amount of skim milk that a farmer should be paid for, 35 per cent of the total amount of milk delivered should be considered skim milk. The price of corn as given in the report issued by the Wisconsin Department of Agriculture shall be considered official. The price of butter as given in the report of the Bureau of Markets, Chicago office, shall be considered official.

This plan was accepted by the other members of the committee, Professor J. L. Sammis of the Dairy Department of the University, and Mr. W. W. Powers of the Food Administration.

At the request of the Secretary of the Wisconsin Butter Makers’ Association, I was asked to lead the debate against the use of a neutralizer in cream before being churned into butter. There were two speakers for and two against. Since this is a question of vital importance to the future welfare of the butter industry of the state, the discussion is of general interest and a copy of my address at that meeting is submitted below.

**NEUTRALIZATION CANNOT PRODUCE QUALITY BUTTER**

It is an honor to be called upon to defend the already recognized reputation of Wisconsin's creamery butter against the practice of neutralization. The worst enemy of the local creamery, regardless of its ownership, whether cooperatively or individually owned, is the possibility of marketing cream that contains a high per cent of acidity, is tainted, and that neutralization can be resorted to before such cream is manufactured into butter. The best butter is made in those sections where the marketing of tainted, high acid cream has been reduced to a minimum. Local plants are handling the product and all of the patrons are more than anxious to aid in making good butter.
HIGH ACID CREAM TAINTED

Good, clean-flavored butter, the product that has aided in the agricultural development of the state, can only be manufactured from butter fat delivered to the creameries in milk or cream that is free from taints and objectionable flavors. Generally speaking, cream high in acidity when received at the churning plants is more or less tainted and cannot be made into strictly high grade butter. Wisconsin creamery men agree that cream that is high in acid is usually tainted. In other words, when a patron delivers cream three times per week, and the product is high in acid, the resulting butter is apt to be tainted, not because of the acid that was present but because of the taints that were present and that affected the butter fat. It is also a well-known fact that when the cream is delivered sweet, even if it has age, it is generally clean in flavor. Acidity and taints are closely associated and are usually found in the same can or ripener of cream.

PRODUCTION OF GOOD CREAM POSSIBLE

In the butter producing counties of the state, it is possible for every dairymen to produce and deliver cream that will make good butter. This is possible in the cheese and milk producing section as well, providing there is a limit of acidity and flavor permissible in cream when it is offered for sale. The names of several creameries in this state that demand a high quality of cream can be mentioned. The two factories in Waupaca County with an output of 873,205 pounds in 1918 are examples of what can be done in demanding cream of high quality. Many Polk County factories are in this class, and others in the central, eastern and southern sections are splendid examples.

HOW QUALITY IS LOWERED

In a certain section of Wisconsin there is located a large creamery company which for more than 20 years has aided in the development of the dairy industry. High quality butter has been their aim, although at times they have fallen short because of competition. During the past season, as in former years, I inspected two of their plants, making a special study of the quality of the butter manufactured. In discussing creamery problems with the manager it was brought out that it was exceedingly difficult to maintain the former standard against the buyers of cream who apparently had no consideration for quality. The manager had been approached by the field agent of the creamery company asking that he ship to them all cream that was too tainted to be used in the grade of butter demanded by their trade. The agent had said they could use this cream and would allow him two cents per pound butter fat in excess of cost.
In order that I might obtain more definite information I visited a cream buying station. The person in charge stated that in the three years that he had acted as a cream buyer not a single can of cream had been rejected, nor had he ever advised his patrons regarding the quality of their product or how it should be cared for. The same day another station was visited, and I found twenty-eight ten-gallon cans ready for shipment. The quality of this cream was such that butter scoring only 88 to 90 would have resulted. All of the cream seen that day was going to churning plants where neutralization of all of the cream received during the summer months is practiced.

Dairying a Dependable Industry

It is a well-known fact that dairying has been one of the greatest factors in placing the state in the lead in many agricultural activities. It has aided in the development of the northern cut-over lands, transforming them from an area of wilderness to one of many well-tilled farms. It has made the balance of the state rich in splendid homes and people, well-tilled farms, dotted with herds that are admired by prospective buyers from other states. It matters not if they are the lovers of the black and white or of those from the islands to the north of England they soon become satisfied that Wisconsin's many signs of prosperity may be directly attributed to the income from the dairy.

When men come to the state to learn of our methods, they soon become impressed with the local creamery, cheese factory or condensary established as a permanent institution to handle the product of the community.

Methods Have Changed

With the general progress of agriculture general methods of handling the products of the farm have changed. This is equally true of dairy products. Some fifteen years ago it was very common to find a large amount of milk being hauled to the butter factory for the purpose of being skimmed, the cream churned, and the skimmed milk taken back to the farm. Today the milk is skimmed at the farm and cream taken to the nearby creamery or placed in the cream haulers' wagon or shipped.

The reason for this is well known to all, and need not be discussed at this time. When these changes came, methods of factory operation had to be changed as this was a new problem.

At the farm a milk house or some other suitable place for the separator had to be provided. At first the cream was not cared for so as to result in a good product. As time went on there was a marked improvement; today there are factories making butter from cream skimmed on the farm that is equal in quality to the so-called "whole-milk butter", and this has all been accomplished by education and cooperation.
QUALITY OF RAW MATERIAL

High quality raw material is necessary to make a superior finished article. Even the well-known limburger cheese must have its beginning in milk that is near perfection. Evaporated or condensed milk will not possess recognized quality unless the milk is low in acid and free from taints when it enters the hot wells.

It is not possible for the operators of condensaries to even attempt to build up reputations when they accept milk that must be neutralized. If the milk received must be corrected by neutralization, the finished product will not be of standard quality.

Our men who have spent years in Wisconsin’s factories realize that high acid tainted cream cannot be made into butter that will win the gold medal or please the critical buyer.

INFLUENCE OF CREAM QUALITY

Bulletin No. 210, issued in June 1911, by the Wisconsin Experiment Station, has this to say on the influence of the quality of cream on the butter industry:

“At one time Wisconsin was considered a state where a large proportion of the butter was manufactured in factories where nothing but whole milk was received. Only a few years ago some of the commission men on South Water Street, Chicago, were heard to remark: ‘A large proportion of the good butter which reaches the market comes from Wisconsin. This is accounted for by the large number of creameries in that state receiving whole milk.’

‘Whole milk factories receive the milk daily during the summer months and three to four times per week during the winter. This insures milk of such quality that good butter can be manufactured. With the system of using farm separators came less frequent deliveries; factory men paid more attention to quantity than to quality. There was no system of cream grading. Butter fat in tainted off-flavored cream and that delivered in whole milk or clean-flavored cream was paid for at the same price. All of this has had its effect upon the quality of butter. In order to make good butter, the butter fat in the milk or cream must be free from taints. There is a direct relation between the two.

“There must be a change in the general method of factory operation with reference to quality of cream received before a marked improvement in the quality of the butter will be noticeable. Good butter can be made from farm-skimmed cream of clean flavor. In the future the ability of the product of the creamery industry of Wisconsin to compete upon the central markets will be determined largely by the quality of the butter manufactured. The butter merchants are beginning to recognize that there is now a wider range in the quality
of creamery butter than formerly, and that in the future each consignment of butter must be paid for according to quality.

"Good butter will always be in demand but the under grades do not move readily; hence, the manufacturers or the patrons must suffer. The public will continue to demand good butter and unless it can be purchased many will buy substitutes. It is therefore of concern to the creamery industry of the state to give attention first of all to quality."

In the same bulletin a table is presented giving the average score placed upon the butter entered in the scoring exhibitions conducted by the Dairy Department of this state. This has furnished valuable information with reference to the influence the kind and quality of the raw material have upon the quality of the butter manufactured therefrom.

Butter that was made from whole milk scored 93.48, 92.15, 92.75, and 93.68 for four years, and butter made from farm-skimmed cream scored 92.48-91.72, 91.24, and 91.78 for the same four years.

**FACTORY SYSTEM FAVORS QUALITY**

The factory system of the state in its organization is such that cream of fairly good quality is received. In many plants it may be classed as having excellent quality. Factories are in charge of men who favor the manufacture of butter from high grade cream only. Nearly all of the men who in the past have at times resorted to neutralization now prefer to receive cream that has not lost its original flavor. Not long ago a well-known creamery man made the statement, "We neutralize but we would rather receive the product that is free from taints and high acid." Professor G. L. McKay on December 4, addressed a letter to the Dairy and Food Commissioner of Wisconsin. This statement appeared among others: "Everybody, I think, must realize that the quality of the cream has an important bearing on the finished product. It is true that possibly neutralization will be continued from year to year, as there will always be some who will neglect the care of their cream." A mighty clear statement of why neutralization is resorted to. Many butter makers when asking for help to secure positions specify: "I would like to get a position in a creamery receiving a good grade of cream."

**NO ECONOMIC NECESSITY FOR NEUTRALIZATION IN WISCONSIN**

The 850 butter factories now in operation are in charge of men who, at one time or another, have had training at the Wisconsin Dairy School, an institution of recognized standing, or have come indirectly under its influence. Very few of these men have received any training in the use of neutralizers, mainly because neutralization of cream is not considered a factor in the production of good butter.
One of the main arguments set forth by these men who favor neutralization is that it is an economic necessity to save a valuable food product. Such an argument has no place when dealing with the cream produced by Wisconsin dairymen. There is no excuse for high acid tainted cream for we have an abundance of cold water to use in keeping the cream cool and sweet. Cold springs are found everywhere. Furthermore, our dairymen, even if located somewhere in the northern woods, can and do place upon the market clean-flavored sweet cream. As an example of what can be accomplished under adverse conditions, let me tell you what happened a few years ago. At the close of a talk before a group of dairymen in Burnett County in August, a dairymen asked me to examine a can of cream that contained his entire output for one week. This cream had been hauled for ten miles and the month was August. Yet, that cream was good and could have been used for table purposes. Why? Because the cream was cold and had been properly cared for. The can was covered with freshly cut grass and two blankets. Contrast this treatment of cream with what I have seen in some cream buying stations where cans of cream received after 3:00 P.M. would not leave for its destination until 3:00 P.M. the next day, no ice in sight, no cold water, covers wired down to prevent them from being raised by the swelling of the cream and a fifteen hour railroad journey to follow. Which butter would you prefer?

At the dairy department of the Wisconsin College of Agriculture where a large amount of butter is made from various grades of cream, none of it aside from class demonstration is neutralized before being churned into butter. This in itself should convince Wisconsin men that it is not necessary to add to cream before it is churned a substance entirely foreign to it. Very few of the largest and best organized factories of the state have in the past resorted to neutralization of cream before it is made into butter. The highest price for butter fat to cream producers of the state for the year 1918 was paid by the operators of factories receiving cream that was not neutralized. According to reports from the Bureau of Markets, Chicago, the highest quotations are made on butter in the whole milk class.
United States Department of Agriculture
Bureau of Markets

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The above facts show that if Wisconsin butter were made from neutralized cream it would be placed outside of the whole milk goods.
NAVY BUTTER

During the past year a great deal of Wisconsin high-grade butter was manufactured to supply the demands of the Navy. This was made possible for the reason that in some Wisconsin factories clean-flavored raw material was received and no neutralizers were used. The credit for the high standard in Navy butter belongs to the Dairy Division, United States Department of Agriculture. The Navy butter is made from sweet cream and the raw material cannot contain beyond a specified maximum of acidity when received at the factory. A great deal of this butter is made in Wisconsin for a special trade and the firm dealing in that product received a very flattering compliment from the Government inspector who made inspection of the product held in cold storage and commandeered by the federal government. A prominent resident of Chicago, who is an expert on butter, wrote me on October 22, 1918 as follows: "This letter relates to butter yet is purely personal. I have had to eat butter of the common or garden variety. I would like to arrange for my family to get regularly each week five pounds of good, freshly churned, sweet cream, unlimed butter. I wonder if you can help me out on this matter?"

A representative of a firm buying a great deal of our high grade butter made the statement in the office a few weeks ago: "No neutralizer is ever, to our knowledge, used in the manufacture of the butter demanded by our trade. In fact, we would not permit of its use." All of the butter bought by this firm is made from pasteurized cream.

NEUTRALIZATION WOULD RETARD GROWTH

The development of the dairy industry of the state would be retarded if neutralization were resorted to in the manufacture of the bulk of its creamery butter for the reason that the value of all of this product in the state would be reduced fully $2,000,000 annually as the result of the lowering of the grade. There would then be no market, no distinction between whole milk and centralized butter.

The work of the dairy and food inspectors has not only aided in securing better factory conditions; they have visited many dairy farms where milk and cream are produced, thus securing better dairy conditions in general. The problems of housing the cows, proper feeding and the erection of dairy houses have been discussed freely by our state men. They have also made suggestions regarding the importance of producing good clean-flavored cream. In this they have met with a marked degree of success. They have had to contend with a few dairymen who have argued that the cream buyer has never said a single word regarding the quality of his product.

This work will be continued but its value will be greatly impaired when it becomes generally known by the dairymen that their product, produced under ideal conditions must meet upon the open market a product that is made from an inferior raw material.
THE FUTURE OF THE INDUSTRY AT STAKE

The dairy industry of the state is not in its infancy, but it is still making progress. Each year many new factories are built in order that the equipment and the facilities for handling may be the best. There is a general feeling of stability and cooperation between the patrons and the local plant. Hence, it would not be a wise policy for the factory operators and makers to adopt a method in the manufacture of butter which is used by those who are not in position to aid the industry.

Our product has stood the test of years. It has made good; the consumers have not been deceived. It would therefore not be well to even consider the advisability of a free use of neutralizers in cream handling. The consumer of butter has a right to be informed of what he is buying. The butter made from neutralized cream has not the quality found in butter made from the unneutralized product.

In March I was called upon to address the North Dakota State Dairymen’s Convention held at Grand Forks. I have also spoken before a large number of local groups in the state.

MARKET MILK PROBLEMS

Many new problems have arisen in connection with the inspection of market milk. These are largely due to the advance in the price paid to the producers and the fact that the consumers are unwilling to pay the corresponding increase per quart for milk delivered by the dairymen or dealers. Many of the larger plants were not able to secure efficient men to take charge of the various departments, and for this reason sanitary conditions were not always maintained.

The value of butter and cheese has also had its influence on the supply of milk available, not alone for the larger cities but in those sections where the village or city depends upon dairymen to furnish milk and cream. Many dairymen held that it was more remunerative to sell milk or cream for the purpose of being manufactured into butter or cheese than to bottle the product and deliver it to the city trade. In many cities evaporated milk has taken the place of fresh milk for table use when the latter was not available.

During the winter months all of the men devoted nearly all of their time to city milk problems, making inspections of the plants as to sanitary conditions and the quality of the milk and cream received. Samples of milk and cream were also obtained from the wagons when making regular deliveries, in order to learn if the product sold complied with state regulations. The number of violations was not greater than in former years in the smaller villages or cities, while in some of the larger cities there seems to be a tendency on the part of a few not to consider the question of quality or standard as an essential factor of success in the retail milk and cream business.

This department must continue to urge that the larger cities should, in a measure, regulate the production and distribution of market
milk. This would simplify the work of the regular inspectors of this department. No city, however, should be left entirely without inspection by the state for the reason that many local problems arise that are not easily handled by the local authorities. We must continue to urge that milk and cream be sold only from those dairies where all the cows are known to be free from tuberculosis and in the state of health prescribed by the State Live Stock Sanitary Board. It is very important that market milk inspection be made more frequently than heretofore. Winter and summer conditions are not alike. Problems arise at certain seasons and can best be taken care of when they occur. Dairy inspection from the viewpoint of market milk production should be frequently made and especially at a time when the cows are housed. Every dairy man should be urged to provide a suitable place where the milk may receive proper care until it is delivered. Some means should also be provided for the proper cleaning and sterilizing of all utensils used in handling milk.

Every effort possible should be made to acquaint the consumers with the facts pertaining to the value of milk as food, its use in cooking and in the feeding of infants.

**THE MILK SITUATION IN OSHKOSH**

On December 16, 1918 an inspection was made of the milk and cream supply of this city. A total of thirty-six samples of milk was bought as the dealers or dairymen were making their daily deliveries. Seventeen of these were found to contain more or less sediment. Twenty-one samples of cream were bought and eleven of these contained less than the standard of 18 per cent butter fat.

These results plainly show the need of inspection.

**BUTTER FACTORY PROBLEMS**

Wisconsin still maintains its place in the manufacture of creamery butter. A slight decrease in the number of factories in operation, due to the extension of cheese territory, the development of the condensing industry and the increase in the number of cream buying stations, has to a small extent reduced the total make.

Many of the large local plants have maintained their usual output and have made an effort to take care of the cream produced in the territory they operate. The income from the sale of butter will far exceed that of any previous year because of the higher prices butter has brought upon the market as compared with any previous twelve-month.

Factory conditions have improved but not as extensively as they would had there not been a shortage of building material and of labor. In a few cases the old buildings have been replaced by new ones.

Many of the buildings now in use are not suitable and should in the
very near future be replaced by new structures or undergo extensive repairs.

The quality of the butter manufactured in many localities compares favorably with the quality in previous years. In fact less complaint has come to this office regarding the butter made in the so-called local factories this year than ever before. This is not true of the product made by the creameries depending upon cream buying stations or shippers for their source of raw material. The difference in the quality of the butter made by these two groups of factories is largely due to the difference in the quality of the cream when it is delivered to the churning plants.

Nearly all of the operators of creameries not depending upon local supply for cream and some of the local plants have resorted to the use of a neutralizer in treating the cream before it is churned. It has been my observation that when cream is so treated it is of a lower quality than the cream that is churned without the addition of lime, etc.

The treating of the cream at the factory by a neutralizer is an evil that is growing, and for the future of the industry and the reputation of our product, this system must be discouraged. Wisconsin dairymen can and will produce cream that can be made into good butter without being treated, but since they have found that there is a market for the stale, high acid tainted product they are going to follow the road of least resistance.

An effort should be made to get the factory operators and station men to cooperate for better quality cream to be used in the making of butter. If the standard is not raised the competition thus created will force the creameries now working on a quality basis to lower their standard. The so-called “centralized” or “standard” butter which is the neutralized product is always quoted at a lower figure on all principal markets than the higher grades, the product made from clean-flavored cream. The centralized product is usually offered in car lots and this makes the selling price higher than if sold the same as the product of the local creamery.

**Butter Sold Locally Not the Best**

The bulk of the butter sold to the local trade by the grocery stores in nearly all of the principal cities of the state is not of highest quality. This condition exists because the factories making the highest grade of butter are not located in the large cities and the operators of these plants sell the entire output in the large markets, such as Chicago, New York, etc. These local groceries are supplied daily largely by operators of the so-called “centralizing” plants.

Regardless of the kind of raw material that may be used, or how the cream may be treated before it is churned, the butter is placed upon the local markets in cartons bearing the words “fancy creamery butter” or “churned from purest cream” or “made from selected
cream”, etc. This is a condition that should not be permitted to go on. A law should also be enacted requiring butter made from neutralized cream to be so labeled when offered for sale within the state.

A great deal of butter sold locally has also been found to be deficient in butter fat. The average per cent of fat in ten samples collected from one concern was 75.9%. The fine imposed for the first offense was $35.00 and for the second $60.00 and costs, with one case pending. When butter with this low per cent of fat is made, the company defrauds the consumer to the extent of 7.5 pounds of butter in every 100 pounds sold, or 4.5c on every pound. The fine imposed, therefore, is not sufficiently high to stop such fraudulent practices. The creamery operator who comes in competition with a large corporation manufacturing butter such as referred to has no chance or assurance whatsoever that he may continue in business and pursue honest methods.

In the future a larger number of samples of butter must be collected than heretofore and if the maximum fine imposed by the state does not correct the existing evil, a change in the law must be asked so as to permit of larger penalties. The minimum fine for the second offense should be $100.00 and for the third offense thirty days in jail.

CHEESE FACTORY PROBLEMS

There has been an increase in the number of cheese factories. This is due to prevailing high prices obtained for cheese as compared with butter. Many plants formerly making only butter are now operated and equipped to make both cheese and butter. The territory has been extended northward in the counties of Lincoln, Langlade, Oconto and Marinette. It has also been extended westward from the so-called north central cheese district into the counties of Eau Claire and Chippewa. The number of cheese factories has also increased in the well-established creamery section of St. Croix, Polk and Barron Counties. A number of new plants have been erected in the counties of Vernon, Crawford and Grant. Very few changes, however, have taken place as to the number of cheese factories in operation in the older districts of the lake shore region, including the counties of Winnebago, Fond du Lac and Dodge, and the Swiss cheese region of southern Wisconsin.

Since no figures have been compiled since 1917 on the output of dairy products and their value, no comparison can be made. It is safe to estimate that the make this year will approach the 300,000,000 pound mark, valued at nearly $100,000,000.

FACTORY CONDITIONS MUST IMPROVE

There must be a marked improvement in the general conditions of many of the buildings now used as cheese factories. Every effort should be made by this department to show the factory operators that
in a large measure the future of the industry depends upon whether or not the buildings are suitable.

In many localities the milk producers own the building and lease it for one or more seasons to someone who will take the responsibility to act as the operator. These dairymen do not fully realize that their plant has outlived its usefulness and that sooner or later a modern building must be provided. Many of these buildings now used as cheese factories were erected at a time when the milk supply was less than one-half of what it is at the present time; hence a very crowded condition in the factory prevails.

With the passing of war-time conditions when it was not possible to secure building materials, extra efforts should be made by the men in the field to study each factory as to its construction, suitability and the possibility of its being maintained in a sanitary condition. It is not always possible to make changes or repairs during the season of high production, but it should be understood that at the close of the season the recommendations suggested should be carried out or the present license should be revoked and a permit not granted to a new operator.

In many localities it would be a wise policy to advocate the erection of a new building rather than to make repairs on the old structure. In such cases it would be advisable for some factories to make a slight change in location in order to provide more suitable drainage than obtained at present.

In many localities where Swiss, Brick and Limburger cheese are made, the present curing rooms may be adequate and only the erection of a making room necessary. Too many buildings used as cheese factories are not provided with a suitable intake room. This makes it impossible for the maker to examine the condition of milk until it is in the weigh can, and no chance whatever to see the condition of the cans. In many factories it is not possible for the maker to see the man who delivers the milk unless he should stand before the opening through which the milk is poured.

Such conditions must be done away with, or very little may be expected in securing improvement in the quality of the cheese manufactured in many of these plants.

There is also a great need of improvement in the methods used in handling the whey before it is returned to the patrons. Very often the whey tank is located in a room where it is not accessible for thorough cleaning. At other places this tank may be located some distance from the factory, either above or below the surface of the ground, and not easily supplied with the needed hot water for cleaning.

In the foreign cheese districts each patron generally furnishes his own container for whey and in many plants he is required to keep it clean. This often means a neglected container. The place of loading the whey, regardless of the location of the tank or containers, is very often found neglected, creating a nuisance and foul odors. To over-
come these conditions factory operators should be required to provide a suitable place for the farmers' whey tank or containers, have them so protected and constructed as to be easily cleaned. The place of loading the whey should be provided with a platform constructed of concrete or other suitable material, and provided with a drain outlet. Such platform should at all times be kept clean and free from foul odors.

**QUALITY CHEESE MUST BE MAINTAINED**

The future of the cheese industry of Wisconsin will in a large measure depend upon the standard maintained by those who are directly or indirectly responsible for the manufacture and handling the state's entire make. It is needless to say that many of the factory operators and makers at all times place upon the market a finished product that could safely bear the name "Made in Wisconsin", but there is a large amount of cheese that does not come up to this standard.

This lower grade of cheese is the result of many complex problems, namely,

1. Many unsuitable plants, already referred to.
2. Factories in charge of men lacking in the standard necessary to produce good cheese.
3. Competition between factory operators for the milk of a given territory is so keen that the makers fail to closely inspect the raw material.
4. The present method of marketing American cheese tends to shorten the time that the cheese is held at the factory; hence no knowledge by either the maker or the operator as to the quality of the cheese when cured.
5. A lack of cooperation between dealers in maintaining a standard as to quality of cheese that should be maintained for the best interest of the future of the industry.
6. Too many men engaged in the operation of factories and in the making of cheese who lack proper training and experience.
7. Too little use is made of the sediment and the curd tests at the intake.
8. Very little is done by the various cheese organizations to place the makers on a higher plane.
9. A tendency on the part of some operators and makers to manufacture cheese containing a high per cent of water.
10. The improper handling of the curd with a view of increasing the loss of fat in the whey, thus increasing the income derived from the sale of whey cream.

**SWISS CHEESE INDUSTRY SUFFERS**

Wisconsin for years has maintained a national reputation in the manufacture of Swiss cheese. The markets have been good for the home product. The lack of importation of this class of cheese during the period of the war has opened up new fields where our high grade goods might be placed.
Prices have been high and the patrons of those factories where good cheese was made during the entire season have been paid well for their milk. In some factories the loss has been exceedingly high for the reason that many of the large cheeses developed defective spots while passing through the curing stage. These cheeses are commonly called "stinkers". To what extent the Swiss cheese industry has suffered during the past season from this cause alone cannot be estimated. The patrons of the factories where this kind of cheese was made have lost several thousand dollars. It was impossible for this department to take care of all the requests of operators for help that came in during the past season. Inspector Lehnerr has done valuable work in dealing with this problem in a practical way. He has obtained results in so far as his time permitted.

There are other problems confronting this industry and unless something is done in the very near future to aid the Swiss cheese makers, the state may receive a very severe setback. It has been reported that California is making very rapid progress in the manufacture of Swiss cheese. Ohio is another state where this kind of cheese is extensively made. The dairy division of the Department of Agriculture at Washington is making a study of some of these problems and help from that source may be expected.

It would seem advisable at this time that steps be taken to secure the cooperation of the dairy division in placing a man in Green County and adjacent counties to deal with these problems. Such a man should be a trained bacteriologist and could work in cooperation with Mr. Lehnerr who has a greater knowledge of the practical problems involved in the making of Swiss cheese than is possessed by any other state employee.

The Swiss cheese makers are exceedingly busy during the summer months; hence they do not take the time to study these troublesome problems. To further their interest in cheese making and to make them more efficient, local meetings should be arranged during the winter months. Mr. Lehnerr could be placed in charge and render valuable assistance in discussing with these men in a practical way how to overcome the losses that occur due to defective cheese.

**Dairy Farming Makes Progress**

The war-time conditions that have prevailed during the past few years have not to any visible extent interfered with the normal progress of dairy farming. In certain localities the feed situation due to the rather high price of mill feeds has reduced production when the dairymen depended upon these feeds for concentrates.

In certain territories the dairymen have changed their attitude with reference to how their product shall be made up, for the reason that prices paid for fluid milk delivered to condenseries and milk plants was at times considerable higher than could be obtained for the same product sold to factories manufacturing butter. Cheese fac-
tories have also taken more than the usual share because cheese has maintained a higher price than butter. Many dairymen did not consider that the feeding value of skimmed milk and whey increased persistently with the value of other feeds.

There has been but little increase in the number of condenseries, milk powder and milk receiving plants, although there has been an increase in the volume of milk handled by these institutions. The increase in the manufacture of ice cream has also created a demand for the output of evaporated milk and regular cream.

In the so-called cheese districts, interest in dairying has increased, more cows are being milked and a greater interest in production of milk during the late fall and winter months has arisen. Many new factories have been erected to take care of added territory and increased production.

The creameries established in the regular butter producing counties located north and west of the Wisconsin River have held their own even if there has been several markets created in that territory for fluid milk. Some of the factories located on the border of cheese districts have installed equipment so as to make both butter and cheese. Whether cheese or butter will predominate will depend largely upon the market price of these two commodities in the future.

Many farmers are taking an active interest in cowtesting association work, and all other lines of activity, having for their object better cows and more efficient herds. All of this is evidence that milk production is still very popular with many Wisconsin dairymen.

Many new barns and silos were built during the past year, making it possible to provide good stable conditions and desirable feed at lowest possible cost. Personal interviews with many dairymen located in nearly all of the leading dairy centers have convinced me that they are interested in the style of farming that will insure a steady, regular income. They agree that the prices paid for milk and for the butter fat in cream have been high, but the income has been cut accordingly by the extra labor costs, high priced feeds, etc. The balance, however, is on the side of the dairymen providing they have conducted their business in such a manner as to obtain the greatest returns for feed used and labor expended.

No figures were compiled showing the production for 1918 but the 1917 report as to pounds of cheese and butter manufactured converted into milk on the basis of 10 pounds of milk being equivalent to 1 pound of cheese, and 25 pounds of milk equivalent to 1 pound of butter, gives the total milk production for the state as follows:

| Milk used for cheese made in factories | 2,772,674,440 |
| Milk used for cheese made on farms | 8,412,620 |
| Milk used for butter made in factories | 2,533,132,125 |
| Milk used for butter made on farms | 198,812,000 |
| Milk used for condensaries | 747,540,078 |
| Milk for other than butter, cheese and condensed milk | 912,237,750 |
| Milk shipped out of the state | 245,000,000 |
| Milk used for ice cream | 40,000,000 |

**TOTAL** | **7,458,189,013**
With the normal increase the production for 1919 should be approximately 8,000,000,000 pounds. The value of cheese will approximate $100,000,000; butter $45,000,000 and milk to condenseries and milk plants $30,000,000. This, together with the added value of factory by-products, etc., will make the total value of the dairymen's income much higher than ever recorded in Wisconsin's history of dairy progress.

A great deal must be done during the coming year to show the dairymen that the future of the industry will in a large measure depend upon the quality of product delivered to condenseries, butter and cheese factories and milk plants. The volume of business should not be considered unless due consideration is given to quality. The losses from lack of quality in cheese referred to elsewhere in this report is only one item. Losses from inferior quality in butter may very easily reach the $1,000,000 mark.

It is important that all activities by the various organizations be directed at the root of the evil, lack of quality in the raw material, rather than to the manufacture of a product from raw material which is tainted in flavor and defective in workmanship.

**Whey Cream Production Increases**

The prevailing high prices paid for butter fat during the past year have naturally increased the number of factories that have installed equipment for the handling and the skimming of the whey. The operators of the smaller factories located in the foreign cheese district should also consider this problem from the viewpoint of saving human food and an additional income for the dairymen.

There is a good market offered for whey cream by factory operators who make butter from both whey cream and regular cream and also by cream buying stations or by shipping direct to creameries located within the state and in Illinois, Iowa or Minnesota. The price paid for whey cream, in most cases, is the same as that paid for cream shipped by dairymen.

According to the reports on file in this office by the inspectors in the field there are still a large number of cheese factory operators and makers who do not realize that whey cream is a product to be used as food for man. Whey holding tanks are located in unsuitable rooms, not protected from flies, dust and filth. Pipe lines poorly washed, jets used that cannot be cleaned, whey holding tanks are rusty and poorly washed. No provision is made in many factories for the proper care of the cream until it is delivered to the creamery or railroad station.

These conditions must be corrected. So far the inspectors have been working with a view of obtaining results by persuasion and education and prosecution. Progress by this method has been very unsatisfactory. It is therefore advisable that more drastic methods
be pursued in order that whey cream may be produced and sold in compliance with state standards and regulations.

NUMBER OF CREAM BUYING STATIONS INCREASES

There has been a marked increase in the number of cream buying stations in operation during the past season. Many of these are located in the northern counties where dairying has not developed to the extent that a creamery can be maintained. Other stations are located in cheese factory territories in order that a ready market may be provided for whey cream and also in creamery sections.

When these stations are located in villages or cities where a creamery is established, competition is created that very often has a tendency to lower the standard of the cream produced by many of the dairymen. Creamery operators as a rule are more alert than the station men as to the flavor, acidity of the cream and the general condition of the cans. This makes it exceedingly difficult for the butter maker in charge of the local creamery to maintain his standard when he knows that they will lose patronage.

The changing of the law by the 1919 legislature placing the cream buying stations under the licensing system will make it possible to maintain a closer supervision of these station men. They should be placed under the same rules and regulations as the operators of creameries and cheese factories. The standard for quality in cream delivered to cream buying stations should be the same as that maintained by the butter factory operators. Provision should also be made to properly handle the cream while in the station.

Wherever possible the men in the field should inspect the cream received at both the stations and butter factories. Recently one dairymen was told that the cream in his possession was unfit for human food and if it was offered for sale prosecution would follow. His reply was: “Nearly all of the cream received by the —— is not much better because no standard is maintained by the operator.” If these conditions continue in that territory prosecution of the guilty parties will follow.

All cream received at stations is made into butter by factory operators located either within or outside the state; hence all parties interested regardless of location should cooperate on the basis of quality.

If all of the dairymen of the state, and nation as well, who depend upon the butter industry as a source of income from the sale of butter fat in cream, understood the relation between quality and progress, the situation would not be what it is at the present time. The most effective means by which this end may be reached is education and elimination of markets for the tainted, stale, high acid cream.
Means of Transportation for the Field Men

During the past year three new cars were purchased, making the total number of cars used by the dairy and food inspectors six. Two of the men are using their own cars, and only one man depends on the railroad and livery in making his territory.

It has been found that when the men are using their own cars or those furnished by the department, a much larger territory is covered at less expense than if the inspector depends upon the railroad and livery. Actual comparison as to the cost of inspection cannot be made because of the difference in territory and the nature of the work performed, and because new men were placed in charge of the work in one-half of the counties.

One of the men who has been with the department for several years and always depended upon local livery in making inland points reported that it was impossible to make much progress because livery was not available unless engaged several days in advance. He also reported that the rates were much higher than prevailed in former years.

When the men are furnished with cars, it is possible to cover a much larger territory than by any other means of transportation. The number of inspections made each week is increased, besides making it possible to take care of the requests for special inspection in various points of the territory at a saving of time and expense.

At times inspectors are called upon to make certain factories or dairies early in the morning or late in the evening. When they have their own means of transportation in making such points the actual cost is much reduced.

It is the opinion of the men using state owned cars that their efficiency is maintained at its highest point and the expenses greatly reduced. The department should adopt the policy of furnishing each inspector with a car unless he wishes to operate his own machine on a fixed mileage basis. At present the allowance is 10c per mile. It is doubtful if the department can maintain the cost of operating its cars at an average figure much less than that. All cars do not give the same results even under similar care in operation. The roads in certain counties are much harder to travel; hence there is a great difference in the yearly cost of operating expenses.