FIFTH SESSION.
Thursday Afternoon, 1:30 o'clock.

Meeting called to order by the President.

President: Prof. Benkendorf of Wisconsin has something to announce to the Wisconsin gentlemen.

Prof. Benkendorf: I want to announce if any of the buttermakers in Wisconsin or their managers or patrons have not signed up with me they want to do so because you must sign up with me in order to be eligible for the district prizes.

Mr. Griffin: Your Executive Committee went over the Secretary's and Treasurer's reports last night and found them correct as read. I make a motion that they be accepted as read.

Which motion was duly seconded and carried.

Chairman: Now, before opening the session we are fortunate again in having with us Mr. Owen and Miss Paulson with their charming music.

Mr. Owen sang some selections which were heartily applauded.

President: We are just behind two papers and one of them is mine. That could be very easily omitted. The other paper, though, I understand the gentleman from Wisconsin has, and we will call upon him now, "The Improvement in Quality of Butter at Wisconsin Creameries" by Mr. T. J. Warner.

Mr. Chairman, Fellow Buttermakers, Ladies and Gentlemen of the Convention: When I was asked to appear on a program I did not see how I could write a paper that would cover the subject. In the first place, if it concerned only one particular creamery a person might write something on the subject, but for the creameries as a whole it is a different proposition. Time has wrought many changes since the hand separator displaced the one at the factory.

In those times that milk was received, the patrons all understood that if they delivered milk that was not up to the standard, it would be rejected, but with the
advent of the hand separator, cream is being hauled farther and a tendency to deliver less frequently to the factory is the result.

Then comes the question: What can a buttermaker do to produce better butter? Why not pasteurize the cream?

Pasteurization, as applied to buttermaking, is a process of heating cream to a temperature which destroys practically all germ life and then cooling quickly to ripening temperature or lower.

It is not a cure for all existing evils, due to indifference on the part of cream producers, and, while proper pasteurization will improve the quality of butter made from both sweet and sour cream, it will not make it possible to produce high grade butter from raw material of indifferent quality.

The general adoption of pasteurization in buttermaking will have a tendency to encourage the grading of cream and paying for same according to quality, and grading cream, again, will make it possible to obtain better results from pasteurization than is possible under a system of mixing all grades of cream when delivered at the creamery. The object of pasteurization is to destroy undesirable germs and make a more uniform butter of better keeping quality, thus producing a more desirable product from the consumer's standpoint.

Many creameries have neglected to pasteurize in the past because there was no immediate increase in price for pasteurized butter, and, while the primary object of pasteurization from the producer's standpoint is to obtain a better price for butter, it is well to remember that the value of pasteurization must first be demonstrated to the buyer, as well as to the dealer and consumer, before a better price can be expected.

One reason why many buyers of butter do not advise the creameries to pasteurize, is that so much poor pasteurization has been done. This, however, is not the fault of pasteurization but an indication that pasteurization has not been properly applied.

When cream has been properly pasteurized, it generally results in an improvement of the finished product, and a number of creameries are receiving from one-half to two cents per pound more for their butter because of efficient pasteurization.
As the value of pasteurization is being constantly brought to the attention of butter consumers, there is sure to be an increased demand for pasteurized butter, and the creameries of the country should aim to satisfy this demand, even if it has to be done without increase in price.

Butter must always continue to meet the competition of cheaper substitutes, and this can best be done by keeping the quality of butter up to the highest possible standard, and if proper pasteurization will assist in making a better and more desirable product, it is good business on the part of the creameries to employ it where conditions will permit, and the question of who bears the extra expense should be given little consideration.

To obtain satisfactory results from pasteurization, it is necessary that cream be delivered with some regularity, and the average test of cream should be from 25 to 35 per cent butterfat, the latter being close to the ideal test of cream for pasteurization.

A creamery must be equipped with a continuous pasteurizer and cooler of ample capacity, or else have a modern ripener with large heating and cooling capacity.

The power plant must be large enough to furnish the necessary steam and power, and a liberal supply of cold water, in addition to ice or artificial refrigeration, is a great advantage.

The buttermaker must understand pasteurization in all its details, and an attempt to pasteurize without a skilled man in charge is sure to meet with failure.

The method of delivery will have much to do with the results obtained by pasteurization, and it is difficult to pasteurize and obtain good results when cream is delivered at all hours of the day.

When cream is received all day, it will be found most practical to start pasteurizing about three o’clock in the afternoon and then cool all cream received after that hour and hold it over until the next day. When a large amount of all kinds of cream is received at all hours of the day, it may be advisable to employ a double crew of men, in order that cream arriving late in the afternoon may be pasteurized and cooled in the evening, which would be better than to cool and hold it over night to be pasteurized the next day.
Much better results can be obtained of course, where cream is delivered on regular days and before a certain hour, as the buttermaker will then have a chance to pasteurize all cream the day it is received, and he will also know approximately how much cream will be delivered and have a chance to prepare the necessary amount of starter ready to add to the cream after pasteurization. In the case of sour cream, it is not necessary to ripen it for any length of time, but it is advisable to cool to churning temperature soon after pasteurizing.

Those who wish to make only the very best butter will find it necessary to have all the cream delivered sweet before ten or eleven in the forenoon, in order that it may be pasteurized while it is yet sweet. This method of delivery also gives time to ripen the cream with a good starter and have it cooled down to churning temperature before evening.

Thin cream is one of the difficulties with which the buttermaker has to deal when pasteurizing, and the objections to it are so many that it becomes almost as much of a problem as poor quality.

It is impractical to pasteurize thin cream, and this is especially true when it contains from .3 to .4 per cent of acid, as such cream will curdle very easily when heated and the loss in the buttermilk will be excessive. Thin cream also has a tendency to make salvy and poor-bodied butter, which again effects the flavor and keeping quality. Thin cream requires more vat capacity, more steam to heat, more water and ice to cool, more churn capacity, more time and power to churn; it does not permit the use of a large starter, as it is already to thin for good churning. The farmer, also, loses by producing thin cream. He first loses a lot of good skim-milk, and in addition, he has more cream to cool, and more to handle and haul to the creamery. In fact thin cream is a disadvantage from every point of view. Cream testing around 20 per cent is worth two cents less per pound of fat, than is cream testing around 30 per cent, and why not pay less for it?

A creamery troubled with thin cream should pay two cents less per pound of fat for cream averaging less than 25 per cent for the month, as it is the only way to make the producer understand the disadvantage of delivering thin cream.
Two methods of pasteurization are in general use, viz., the continuous or flash method, and the intermittent or vat method.

With the continuous or flash method, the cream flows through the pasteurizer in a continuous stream, and is rapidly heated up to a temperature of 180 degrees F., and from the pasteurizer the cream is passed over the cooling coil, lowering the temperature quickly to the ripening point or below.

With the intermittent or vat method, the cream is first heated in the ripener to a temperature of 143 degrees F., held at this temperature about 20 minutes, and then cooled as quickly as possible to ripening temperature or lower.

The intermittent or vat method of pasteurization, may be successfully used under all conditions where pasteurization is practicable. It may be used in the creamery where regular delivery is practiced, and it is the most practical method where cream is delivered with less regularity.

The vat method is well adapted to conditions that may exist in different localities, and it has certain advantages over the continuous method.

There is no question, that sooner or later we will be compelled to pasteurize, and in my opinion it would be far better to show the consuming public that we are ready to give them what they want before we are going to be forced to it. I believe it would be a credit to the dairy industry, if all manufacturers of creamery butter would make the best product possible, which can only be done by proper pasteurization, regardless of the quality of the raw material.

President: We have listened to the paper of Mr. Warner on pasteurization. Inasmuch as we discussed that question yesterday I think it will be unnecessary to discuss it today.

We have a matter that is going to hold the attention of all manufacturers of butter in the near future, or at least it should. Up to about two years ago the butter business, cheese business or milk business paid little attention to the standards brought about by different municipalities, state or health authorities. We have paid little attention to it, and in order that we may not have unjust standards foisted upon us we should take an interest in the dairy product when the question of
standardizing comes up, because if we who are in the business are not prepared to go before Congress and give them the correct information regarding it we can't hope to get standards that will be easily and readily adopted both from the consumer's viewpoint and the manufacturer's. So we have with us this afternoon Prof. N. W. Hepburn of Champaign, Illinois, who will give us a paper on "Butter Standards."

**BUTTER STANDARDS.**

By Prof. N. W. Hepburn, University of Illinois, Champaign.

Mr. President and members of the National Creamery Buttermakers' Association: The warm welcome which I have received here since coming to Wisconsin has made me doubly glad for this opportunity of appearing on your program.

The fact that "Butter Standards" has been given a place on your program is evidence to me that there is perhaps some unrest with respect to the conditions which now exist, indicating perhaps that the law, or standards, under which we now manufacture our butter, may be either inadequate or too severe. By way of familiarizing ourselves again with the regulations under which we now operate, let me read the definition of butter as it is given in the Act of August 2nd, 1886, Section I:

"Butter defined: that for the purpose of this Act, the word butter shall be understood to be the food product usually known as butter, and which is made exclusively from milk or cream or both, with or without common salt, with or without the addition of coloring matter."

Butter is further defined by an Act of Congress, approved May 9, 1902, as "the clean, non-rancid product made by gathering in any manner the fat of fresh or ripened milk or cream into a mass which also contains a small portion of the other milk constituents with or without salt, and contains not less than 82.5 per cent of milk fat."

"The definition of adulterated butter as contained in the Act of May 9, 1902, embraces butter in the manufacture of which any process or material is used where-