MR. DECKER.—The rennet test is very much more sensitive to those conditions than the acid test.

MR. MONRAD.—That was really what got me, so I started in with the Harris test and found it was not close enough.

MR. DECKER.—Another thing I want to say: with very little rise in the per cent. of acid. I have seen milks up to 320, rennet test, and they would test about .12% of lactic acid, and by running it up to .04 or .05 of acid, it would make a difference of about 60 seconds in the rennet test. The next 10 seconds would show a wider range in the per cent. of acid. It is not the regular scale that runs down there.

MR. MONRAD.—But I understood you to say that they were related.

MR. DECKER.—They are at that one point, .3%.

MR. MONRAD.—You agree that the acid test cannot take the place of the rennet test?

MR. DECKER.—Yes, sir.

MR. ADEHOLD.—When I said that they found no relation up there, it was all through their testing, not at the time of setting.

MR. AUSTIN.—I would like to ask Mr. Decker how long he would leave it in the whey if you had .3%?

MR. DECKER.—You would already have about 3/4 inch with your .3% before you set the milk.

MR. ADEHOLD.—Have you tried that, Mr. Decker?

MR. DECKER.—You can curdle it, and by taking the curd in the rennet test, firming it up immediately, you will find that you have it.

CHEDDAR CHEESE MAKING.

Edwin Hauk, Neenah, Wis.

The past two seasons, in having charge of the factories operated by N. Simon & Co., of Neenah, I have observed there are a great many precautions to be taken in order to produce a fine cheese: A cheese that will demand the top market price. We know a cheese should be of the right height, neatly bandaged, close made, clean flavor, good body, and well cured. I have received the best results by being careful in teaching the patrons to deliver their milk at the factory as pure and sweet as possible, thereby producing my own lactic acid or starter. I had a sufficient quantity of starter to the milk, so as to have it ripen to the setting point shortly after the milk is received, and at a point to secure a good cook with time from setting to dipping, not to exceed two and one-half hours. This will give me sufficient acid, say 2 to 2 1/2 inches, on the curd, after maturing on the racks for about two hours; then grind, after which I air the curds for one-half hour, then wash down with warm water about 90 degrees Fahrenheit, just previous to salting.

I have experienced very little trouble in getting a fine cheese made, when receiving good, pure milk, and when I could secure a good clean starter. I visited patrons at their homes and explained to them the proper way to handle and care for their milk, so that it would produce a fine article, and also cautioned the makers in regard to their keeping the factories neat and clean, and I am assured that it did a great deal of good. But yet in the hot summer months we have to contend with more or less of tainted milk, and in many instances it is impossible to secure milk of every patron that is pure and free from taints. If we have tainted milk and an impure starter we cannot improve the quality of our cheese, but if we can secure a pure starter or prepare one by using the lactic ferment, we certainly can improve the working of the milk and obtain a better quality of cheese, and a larger yield as well.

Last season was my first experience in using the lactic ferment in preparing starters. We used it in several of our factories and found it very valuable in working up milk that was off flavor; it seemed to improve the flavor and quality of the cheese. No maker can afford to operate a factory without the lactic ferment, as in preparing his own starter he does not always know just what kind of flavors he is introducing into his milk.
DISCUSSION.

I find the best cheese made where the maker is neat and clean in his factory and precise with his work, and observes the changes in the working of the milk and curds from day to day. In this way he familiarizes himself in the best methods of handling the different grades of milk he receives, and turns out a better and more uniform class of goods. We weighed the green cheese every day from the hoops of all the factories, and kept a report of these weights. In this way we were able to note the differences in yield from day to day and be able to locate the causes of these variations.

MR. WINSOR.—I would like to ask if anyone has used the commercial starter—lactic ferment.

MR. ADEHOLD.—The first cheesemaker in Wisconsin that used it extensively was Mr. John Michaelis, and that was during the season of 1895, and it is now being used in a number of factories in Winnebago county. Three factories in Sheboygan county used it last season, one factory in Manitowoc county, and it ought to be used in all the rest of the factories.

I like to run up against Mr. Monrad. I am going to do it again. Mr. Monrad claims that the starter is just as good, just as effective, if it is made from perfectly pure milk as a starter that is made from commercial culture; but I find that it is not, in cheese making—that lactic ferment start has a great deal more control over the development of acid and the flavor of the curd than that made from common milk, even if it is fine milk.

MR. MONRAD.—Mr. Chairman, I will give right in, because my practical experience with lactic ferment was only in butter making. I have never made a cheese with lactic ferment, so I give right in.

MR. WINSOR.—The reason why I never tried it was because several makers told me it injured the keeping quality of the cheese, but if it is all right, I should like to use it.

MR. ADEHOLD.—I know an old butter maker who had made cheese said it did not keep as well.

MR. BAER.—I believe Mr. Schoenman has used this lactic ferment this last season. We would like to hear from him.

MR. SCHONMAN.—I used it somewhat this last summer, and I liked it very much, but I believe in using the lactic ferment, it is more in the extra work in putting in the starter than it is in the ferment. Of course, I would not object to using the ferment, but I believe a man who is very careful the other way would have very much better effects.

MR. DECKER.—Did you have any complaints from your buyers of sour flavor? Can we have a show of hands of those who have used starters? There are about 35. Now a show of hands of those who have had complaints of sour flavor in the cheese from the use of a starter. Not any of them. How many think it is a good thing? Practically all of those that have used it. There have been complaints from a few buyers that the starter gives a sour flavor to the cheese. It does not look as though the makers had had that experience here.

MR. MONRAD.—Mr. Decker, I think it is from the extra work, and not from the use.

MR. OARSWELL.—I think there are a great many of the boys that make a misapplication of the starter. If they use a starter and use it properly, and just enough to ripen the milk to the 2%, or the right figure, so that your curds will be ready to go on the rack at two and two and a half hours, you never will have a sour flavor, provided your starter is kept wholesome.

MR. DECKER.—I should like to ask these questions: When should a starter be used, and what per cent. of starter, and what should be the condition of that starter when it is put in.

MR. OARSWELL.—I should say I believe everybody will use that according to common-sense. If you have good milk that is already ripe, you do not want any in.

MR. DECKER.—But how high a per cent. should a starter be in?

MR. OARSWELL.—It ought not to be too much. I would never have over 25 pounds of starter for 2,000 pounds of milk, at the very highest ratio of starter.
MR. DECKER.—That is a little over 1½ then. How sweet should milk be before you use a starter? How long will it take to ripen?

MR. CARSWELL.—I would use enough starter so that I will be ready to go to work pretty soon after I have the milk in. But sometimes milk will come in so sweet in cold weather that you injure the quality of the cheese if you add starter enough to go to work in the morning. But if you let it stand after the starter is all in, say in an hour or an hour and a half your milk is ready to go to work in.

MR. FAVILLE.—Would it be proper for me to inquire just at this point why, with all these starters and rennet tests, etc., we do not get near as good cheese today as we did fifteen and twenty-five years ago? If any of these fellows can tell the reason? It is a fact. The complaint is well nigh universal that the cheese that is put upon the market in the city of Madison, or anywhere else, is not anything like the quality of cheese we used to get.

MR. ADERHOLD.—I believe the best way to answer that question (ran up against that more than once by the old makers) would be to set them to work again now, making cheese with the milk that we get.

MR. FAVILLE.—If the milk is not as good, and all of that, what is the use of preaching and talking?

MR. SPOONBR.—I believe these starters are a humbug. This gentleman spoke about some of the old cheesemakers. I have made cheese a good while: I have got cheese that I made last year that I will put down against any cheese in this state, and I never used a starter. The cheese is here. I would like to have you sample one. I never use any starter. I think that milk sprouts soon enough as a general thing, especially through the summer months. We want to hurry it out too quick. I find in my experience that if I can hold that curd in the whey for four hours, I will get a much better cheese. There is no question about it, and I never practiced using a starter.

Convention adjourned to meet at 2 p.m.

Convention met pursuant to adjournment.

WISCONSIN CHEESE PRODUCTS.

Dairy and Food Commissioner H. C. Adams.

The total annual cheese product of the United States is 260,000,000 pounds, in round numbers. New York produces almost one-half of this amount, and Wisconsin fully one-fifth. Nearly all the cheese made in the United States is produced in the states of New York, Wisconsin, Ohio, Illinois, Vermont, Iowa, Pennsylvania, and Michigan. There is imported annually into the United States $1,000,000 worth of cheese.

The following table shows the rise and decline of cheese exports since 1850:

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