PREPARING STARTERS AND RIPENING THE MILK.

Hugh Nisbet, Madison, Wis.

The subject assigned to me is a very important one, for on a starter the flavor and texture of the cheese greatly depends.

A pure culture is the best because it can overcome the undesirable fermentation to a greater extent, and has more effect in the ripening of milk. It ought to be made from skim milk, if obtainable, for it can be made more uniform and will sour evenly from top to bottom. Nearly all cheese makers have to use whole milk as it comes to the factory, and it should be the best and purest, preferably morning’s milk. The utensils used in the work must be good, kept thoroughly clean and sterilized every day.

In starting out, get four pounds of milk, and pasteurize to one hundred and sixty-five; hold for twenty minutes, then cool down to seventy, and add a bottle of lactic ferment. The temperature at setting should be that which will give the proper acidity the next morning. This four pounds will be enough to add to forty pounds of pasteurized milk which should be set in the evening so that it will be ready for use next morning; then you have a starter which will be good as long as you use clean cans, pure milk, and set at the proper temperature.

Always skim off the top before stirring up, as there are apt to be some undesirable germs dripping into the starter can from the surroundings; then save out one pound of startline for every ten of the starter to be made; at this stage it ought to be smooth in stirring, have a clean, sharp flavor and about five or six tenths of one per cent. of acid.

The ripening of the milk requires great skill in order to have good results. In summer, when the milk has a tendency to be fast working, it is best to make a rennet test early before adding any starter; if it has enough acidity, do not use any. If it is bad and off flavor, a good starter will aid greatly in overcoming the difficulty and make a better cheese in every respect. In fall and winter when the milk comes in sweet, the starter ought to
be added early, and the milk heated up to eighty-six. This will give the lactic acid a chance to develop and often get the vat set an hour or two earlier. Care must be taken to stir the milk smooth and regular in heating. The proper amount of starter to be used is that which will give the best result in the quality of the cheese, and very often will not vary far from one per cent.

Cheese made from milk with a pure culture does not need as much acid in the manufacture as they have a tendency to develop more in the curing, and using too much starter is a great mistake, as it will make a weak body, a dull, whitish color which is readily rejected by the buyer.

DISCUSSION.

Mr. Alves: How long do you gentlemen have a starter run before you have to renew it? That is, working in your factory, not in your experimental station.

Mr. Nisbet: Well, I do not always make a pure culture in the factory in the summer. In the fall I have made it and have run it as long as I needed it.

Mr. Alves: You said you would use a starter provided you had gassy milk. Now, when you take your milk in, do you know whether you are going to have gassy milk?

Mr. Nisbet: No, you cannot always tell, but you have a good idea from the way the milk is working.

Mr. Alves: My idea is to put the starter in at all times, because we have got a better starter than any one could furnish us.

Mr. Johnston: It seems to me you would be out of a starter most of the time according to that, because it would take you three days to make a starter, and the probability is, before those three days are over, your milk would be good again, so you would not need it. So I think if you advocate a starter, you must use it all the time, or none of the time.

Mr. Nisbet: I think it is proper to use it all the time.

Mr. Alves: Which do you think is the best, the home-made starter or the lactic ferment?
Mr. Nisbet: The pure culture I believe is the best.

Mr. Johnston: Did you ever have any experience with diluting milk, that is, cold cream milk by adding water to it instead of skimming, and having very good results?

Mr. Nisbet: I never tried it, I never added water to a starter.

Mr. Johnston: I have tried that, it makes the starter more mild and it is not as strong, and it seems to me we can keep our culture longer that way, by adding a little water before pasteurizing it. After we add the water, we pasteurize.

A Member: Why not add the lactic acid and not use the water?

Mr. Johnston: That may be all right enough, but it seems to me it is pretty hard work sometimes to get it as free as we want it. I find the better starter is made by adding a little water.

Mr. Noyes: That is a point where most people have to be careful. He states it is all right, he pasteurizes it after he adds the water, and takes the germs, if there are any germs, out of the water. Now, a person must be careful about that, and not add water afterwards and not have it pasteurized, because you know we have often typhoid germs and things of that kind that are in the water, if you are not careful to add that before it is pasteurized, you are liable to get bad results. I know a cheese maker that adds water that is not pasteurized after the milk has been pasteurized. Now, that is going contrary to the results that have been obtained. A great many cheese makers do not like a ferment for a starter, do not know how to keep it pure, and they do not have good results from it. I know cheese makers that always have had good results from it and sometimes a man does not have and you cannot teach him.

Mr. McKinnon: He says by adding this after the starter, if you do not want to sour it quite so much, because the acid will still continue in the cheese, am I right after the cheese is made?

Mr. Nisbet: They will develop some acid after they are made.

Mr. McKinnon: Now, I would like to find out if acid really
does develop in that time with this lactic ferment that we have added, this additional starter, or is it because we have failed to get the whey out of the curd? Is it not a fact that we have cooked up too rapidly? You know a cheese maker likes to get his curd out of the whey inside of an hour and a half. Now, this starter has a tendency to make it necessary to get that out of the whey in a short time, and by hurrying it up in that way, do you not make the other mistake of failing to get the moisture all out, or that part of it remaining in the curd before it is taken out of the whey. A few years ago, we had a man in our section of the country who came from New York state and he laid down this principle for us, after bringing us up to that: First, get the whey out of the curd and as soon thereafter as you can, get the curd out of the whey. Now, you see that does not sound very much different, but there is a great deal of difference. First get the whey out of the curd—how are you going to get that out? You have got to cook it out. Now, this lactic ferment, this starter, and cooking it for an hour, or an hour and a half in order to get all the moisture out that we should have gotten out in the first place, what will be the result? We have what we call in our section of the country a soft sort of a cheese.

Mr. Moore: What is your reason for thinking that a pure culture starter is better than a lactic ferment starter?

Mr. Nisbet: Well, it has got the pure lactic acid, and that is what we want in cheese making.

Secy. Baer: Do you consider the Douglas, that we use in butter making, a desirable flavor to be used in milk to make up into cheese? Would you recommend using it?

Mr. Nesbit: I prefer the Hansen's.

Mr. Johnston: Last year I saw a starter that ran over two years, and I presume it is running yet. Mr. Millar may know of it, it was at Bright. Mr. Noyes asked about whether they added water to the milk at the time they added the lactic acid. When they started originally, the operator put the water in every day, and then he put in his lactic acid and it is one of the finest starters I have ever seen. I believe with this gentleman right here, that water is a good thing. Mr. McCready says, why not
add less acid? You have not always got control, you do not know what the weather is going to be, whether the starter may get sharp or not. After what experience I had with it, I found out it was a very good thing to add, as the starter does not go off half as quick as it does when you do not use it, because when the weather gets warm and you have not a good place to keep it, it gets too sharp for you. I would like to hear from Mr. Millar on that; they use water over there I believe, and I think it is the proper thing to use.

Mr. Millar: I might say that one or two of our factorymen have been successful in carrying a starter over two years. In reference to this one at Bright, I am not quite sure whether it is still in use, but I expect it is; I have not heard anything different. We always use water in making a starter and as a rule it is put in before the milk is pasteurized, so as to be sure that if there is anything there in the water that is not right, we destroy it. The Bright factory is well equipped and in a sanitary condition, and everything that could be desired, good water and so on, therefore it is not absolutely necessary, but we take the precaution to have the water pasteurized with the milk. We use about one-third of water, one pail of water to two pails of milk, and there is another advantage in working up your starter. We find that we can make a very nice smooth starter with additional water and use all whole milk. Very often it is a little bid harder and more lumpy to get down into smooth consistency such as we like. We use a culture prepared at the Ontario Agricultural College and get excellent results, in fact, you can carry a starter as long as you care to, and there is a clean man in connection with it. I might say some of our makers prefer using four or six small cans instead of large cans for the pasteurizing. For instance, if you want to use a certain amount of starter, you can use one of these cans to-day and preserve it until you care to use it. In that way it is not necessary to make a starter every day, you can carry it three or four days, and still have a culture. I think that is better than putting your starter all in one can. Now, I will not say to use a starter every day; I do not think it is necessary in our country at least, of
course conditions differ, and I would not for a moment lay down for you cast iron rules, but I will say in our country we find that about six months in the year but very little starter is required; you will find that nature supplies sufficient lactic acid so that it is not necessary to use the starter. We find that the maker who is anxious to use a large starter and hurry the curds off the vat is very apt to get rough, mealy cheese. You cannot develop a curd in an hour and a half and make a fine cheese. Sometimes it is necessary when the milk is very ripe to hasten the process, but when it is not necessary, it is best not to do it.

Mr. Moore: I would like to ask what means he takes to preserve the starter in order to carry it three or four days so as to have a nice starter on the fourth day when he is going to use it again.

Mr. Millar: The starter is simply left in the cans and kept at a fairly low temperature. These cans are kept covered up tight and left there until you want to use them without disturbing them. When we come to use the starter, we take out probably two inches of the surface, we skim that off before breaking it up; so that if there is any contamination in the air, we get rid of it in that way.

DRAWING OFF THE WHEY AND HANDLING THE CURDS ON THE RACKS.

F. F. Zimmerman, Mt. Horeb, Wis.

Mr. President and Fellow Cheese Makers:

I feel that the subject assigned me,—Drawing Off Whey and Handling of Curds on the Racks—is one of the most important features in the manufacture of Cheddar cheese.

Good judgment is an essential factor that comes into play at this point of cheese making and a cheese maker not qualified with the ability to determine when his whey is ready to draw can not be classed as an up-to-date cheese maker.