Member: Do you salt twice with salt brine?
Mr. Wilcox: I do not, I think that is too expensive.
Member: I do not think so. How often do you work your dry salt?
Mr. Wilcox: One working.

The Chairman: The next on the program is a paper on Overrun by John Schields, of Fall Creek, Wis.

Overrun.

John Schields, Fall Creek, Wis.

Ladies and Gentlemen:
Your secretary has asked me to prepare a short paper on the subject of overrun.

Overrun in the creamery business means the difference in the amount of pure butterfat which goes into any given churning, and the amount of finished butter from that churning. In
other words, the overrun is the excess of finished butter over the amount of butterfat from which this butter was made. The overrun plays an important part in the creamery business, and especially so where contracts are made by which the overrun has to cover manufacturing, selling and shipping expenses, as well as profits.

Twenty and even as late as ten years ago the subject of overrun was little known and received still less attention.

As competition grew sharper, the attention of the creamerymen naturally was drawn towards the widely varying difference between butterfat and finished butter, in different churnings. Chemists long ago told us that the greatest part of the overrun in butter consists of moisture or water, a lesser amount of salt and a very small amount of caseins.

These constituents are contained in butter in a purely mechanical way. They are the result mainly of washing, salting and working the butter under certain temperatures.

Soft butter will hold more moisture than hard butter.

The softness or hardness of butter may depend on several causes. Certain kinds of feed, when fed liberally, may cause either hard or soft butter, the period of lactation also influences the butterfat, and lastly the temperature at which cream is churned and the butter washed.

It was then found that soft butter would give a bigger overrun than butter of a much harder texture.

No sooner had this principle generally become known, then creamery men began to work in more water in theirs till the government stepped in and said 16 per cent water is the limit.

Since then most creamery men have contented themselves by working in water in their butter up to this limit.

The most common and probably the only methods employed, in getting the moisture in butter up to the limit, are first churning to large lumps in wash water of a much higher than the churning temperature, and second running the butter through the rollers in the wash water which is also of a higher temperature than that used in churning.
The object of these methods is to soften up the butterfat in which state it will hold and retain more moisture than at lower temperature.

In this way we have succeeded in getting the moisture content close to the limit, some even get a little past this point and in consequence thereof get into an unpleasant and costly acquaintanceship with the revenue officials.

I have said that we have succeeded in getting the moisture in our butter up to the limit. Whether we should call it success or retrogression is a matter of dispute. It is a fact that high temperatures such as are used to get a high percentage of moisture in the butter are detrimental to the body and grain. The same effect have over churning as well as over working, This gives a weak bodied butter, in other words, makes the butter salvy and greasy.

Some even claim that these methods and manipulations affect the flavor of the butter. There seems to be a silent controversy going on in this matter, some seem to say, “as long as it is all one price and as long as others, especially my competitors, are loading the butter with water, why should I not do it.” The opposition seems to say you should under no circumstances and regardless of your overrun use such temperature, or employ such methods, as will impair the body and grain of your butter.

It is with this matter the same as with the acceptance of poor cream. Poor, rotten cream will be accepted just as long as it is possible to sell the butter from such cream, or good butter also as long as the returns for poor bodied, greasy butter are the same as for the A No. 1 article, so long will the creamerymen load their butter with water to the limit, because in that way there is more profit in 16 per cent moisture, than in 12 or 13.

What the country is looking for is a method whereby 15½ per cent of moisture, as well as a perfect grain and body can be realized.

It seems to me that a contest would be in order, where special attention would be given to body and moisture and
their relation to each other, in other words the aim should be to learn which method would give the highest moisture content with a perfect body left.

We have yet the other constituent, overrun to consider, namely salt and casein. Salt is added to butter mainly as a matter of taste, it also adds greatly to the keeping quality of the product.

The salt content of butter varies. It may be a little or almost nothing, or it may go as high as four per cent. The saltiness of butter, that is, its taste to salt does not always depend upon the amount of salt in the butter, but the way it is worked in and dissolved. It is my opinion that butter containing 1½ per cent of salt poorly dissolved, will taste saltier than butter with 3 per cent of salt all dissolved.

Here is a pointer, give your salt plenty of moisture, and plenty of working without breaking the grain, but don’t be afraid to work. In this way you will work your salt in and your mottles out.

In regards to casein, this constituent of the overrun seems to be the least amenable to mechanical manipulation, it varies from around three-fourths of a per cent to a little over one per cent. Only a chemical analysis would show what could be gained or lost by different methods of handling the churn and with cream of different conditions.

In conclusion I wish to say to all buttermakers that the question of overrun is an important, a vital one. A buttermaker should not take his monthly overrun altogether for conclusive proof that he is doing either good or poor work as the case may be. Where it is difficult to get a correct daily average sample, go to work now in the winter time and weigh your cream from the vat into the churn, take a sample from each weight into a receptacle, take at least a duplicate test from this sample and you can get as close as it is possible to get to the correct amount of butterfat in your churn. After you are through churning you can figure out your overrun. Do this for a while, the longer the better, you may learn something in this way, which you entirely overlooked before.
Discussion.

The Chairman: Any questions you want to ask Mr. Schields?

Mr. Holgerson: At what temperature do you hold your wash water?

Mr. Schields: As a great man once said, that is quite personal. I use it four degrees warmer than the buttermilk.

Mr. Larson: Was the speaker referring to whole milk and gathered cream or simply cream when he spoke of butterfat in the churn and the amount of butter made to determine the overrun?

Mr. Schields: I meant where it is impossible to get a correct average sample to find out how much butterfat you have in that churning.

Mr. Larson: Do you receive milk at your creamery or just cream?

Mr. Schields: Milk and cream.

Mr. Larson: Did I understand you to say the overrun was the difference between the butterfat you have in the churn and the amount of butter made?

Mr. Schields: I did not say that. You might figure overrun in two ways—the actual overrun you make day by day from your churn and the monthly overrun. There may be quite a difference between the two.

Mr. Larson: I understood you to say that the overrun was the difference between the butterfat delivered into the churn and the number of pounds of butter made from that given churning.

Mr. Schields: That is what I said.

Mr. Larson: Is that a fact?

Mr. Schields: The overrun is the difference between the butterfat and the finished butter.

Mr. Larson: When do you determine butterfat, when you receive your milk and cream, or when you put it into the churn?

Mr. Schields: When you figure the overrun on the monthly statement or after you figure the monthly business,
but if you take the daily average sample you get it the other way.

**Mr. Larson:** I find a great many of the boys in the field are somewhat at sea as to the proper way of calculating the overrun. The overrun is nothing more or less than the difference between the original fat contained in the milk and cream delivered at the creamery and the total amount of butter made.

**Mr. Shields:** That is my idea.

**Member:** Overrun seems to be quite a question. Today they talk about leaky butter. What causes leaky butter, does anybody know?

**The Chairman:** Churning at too warm a temperature, or having the wash water at too high a temperature might cause leaky butter.

**Member:** That means the boys have to look out for the high wash water. One more point to look out for is not to churn at too high a temperature. It is safe to churn as cold as possible, but not cold enough to get the butter lardy. Wash water may be higher than churning temperature but not too high.

**The Chairman:** Any other questions?

**Mr. Sauer:** What is the highest overrun Mr. Shields gets?

**Mr. Shields:** I have had overrun all the way from 12 to 23½ per cent, that is from the churn, by weighing the cream into the churn and testing from that.

**Mr. Sauer:** Is 23½ a lawful overrun?

**Mr. Shields:** That depends on the moisture content of the butter.

**Mr. Sauer:** Can you get it without too much moisture?

**Mr. Shields:** That overrun was lawful but I would not guarantee the body of the butter, so if anybody is here that can give us a method by which we can incorporate 15 per cent moisture and have a good bodied butter, that is the man I would like to meet.

**Member:** Is it necessary to have the wash water any warmer than the milk to incorporate a large amount of water?
Mr. Schields: There is a difference in localities. I experimented for a long time with common temperatures and I never could get more than 12 to 13 per cent moisture. I have heard of men that could with 52 degrees and 54 degrees wash water get 15 per cent moisture, but I do not know whether that was due to their method of manufacture or the locality in which they lived.

Mr. Larson: Relative to the 23½ per cent overrun, the United States standard for butterfat is 82½ per cent of fat, and the state legislature saw fit to incorporate this standard into the state law. There is a ruling, as I understand it, of the department that butter must not contain to exceed 16 per cent water. The standard is 82½ per cent fat, regardless of moisture, casein or salt, therefore it is absolutely impossible to make 23½ per cent overrun with 82½ per cent fat.

Mr. Schields: That rule is not enforced so we do not pay any attention to it.

Mr. Larson: I asked a creamery manager whether he used a moisture test and he said “No, I have not been picked up on that. I do not think there is any danger.” The next time I visited his creamery he had paid over $1300 and was using the moisture test every day.

Mr. Schields: I would not advise it either, I shall buy a test.

Mr. Kayser: I would like to ask Mr. Larson for further information concerning this. What buttermaker or what commission man buying butter for that matter, knows what per cent of butterfat his butter contains? It is the standard, there is no question about that, but I do not know what per cent of butterfat my butter contains and I do not know of any buttermaker that does.

Mr. Larson: There are tests you can make of butterfat but the revenue officers are the only ones that have been taking action in this matter, and it is true that the centralizers are trying to get the fat standard reduced and that may be done some day. I hope to see the time when we will have only one standard, that to be the butterfat standard, and the rest
of the ingredients that make a pound of butter will take care of themselves. That may be determined by the Babcock test if so desired. Of course these laws are not enforced by the United States department or the state department at the present time, but we do not know how soon they will be, consequently it might be well to give them attention.

**Member:** Mr. Larson says the fat standard is 82½ per cent. Why is it that in some places it is only 80 per cent? In Iowa it is only 80 per cent of fat and 16 per cent moisture, which allows four per cent for casein and salt.

**Mr. Larson:** I do not know that the standard in Iowa is 80 per cent, but I do know that the U. S. standard is 82½ per cent.

**Member:** I took the dairy course at the Ames College, and they claim 80 per cent fat is their standard.

**Mr. Shields:** I believe Mr. Larson is right, the U. S. standard and Wisconsin standard is 82½ per cent. Perhaps Iowa reduced it there because the sentiment there was to reduce the standard on fat. I am in favor of Mr. Larson’s idea of judging butter by its fat content. Then we can not manipulate the product as is done now. Now all we have to do is to keep within the moisture content, then put in as much salt or casein as we please, because no one looks after that.

**Mr. Larson:** The moisture standard is being enforced today. A creamery man in Wisconsin the other day had an experience through incorporating casein in his butter. One or two educators (?) went up and down the state for $100 or $200 showing how to do those things. A creamery man invested, followed their advice and shipped out quite a large quantity of the butter. He lost between $500 and $600 on the output because of the incorporation of an excessive amount of casein. The butter soured on him and became cheesy and that caused his loss. I want to drop this warning,—do not try to incorporate casein or you will have trouble with it.

**Mr. Carswell:** I would like to say something in regard to the moisture question and I can say, to my sorrow, that what I say is from experience. The old saying is that he who talks
from experience knows something about it. I have been up against the U. S. Revenue department, in fact, it has a case of mine there now and I do not know how it will be decided. I am not ashamed to admit this openly because I do not believe there is a buttermaker in this audience that had the same experience that I had last summer. We made from two to five churnings a day during the summer. I have three different helpers and almost always have two competent men to do the churning. I spend my time doing the testing, taking in the cream, etc., so a good many days I do not churn the butter at all. Someone said every churning should be tested. I agree with that but like the other buttermakers, with all I have to do there is not time for this, consequently I test as often as I possibly can, but every once in a while four or five churnings would go through without being tested for moisture. I got one shipment of butter made last July that was held up in November, when I heard about it. The butter was bought and put in cold storage, but we have to stand responsible for it just the same. I would like to see how many buttermakers in this audience can stand up and say they do not send out a churning of butter that contains more than 16 per cent moisture. Of course 16 per cent is the standard for butter. I do not believe I am the only one that let butter go through without testing it for moisture, but it is up to everyone of us to do it; if we have not enough help we must have more to do this testing.

**Member:** I think it would be a good deal better to test twice a month and test every churning for moisture and not pay over $600 and a license besides.

**Mr. Carswell:** Do you test for moisture every day?

**Member:** Yes Sir. We are not running a large plant, only one churning a day.

**Mr. Carswell:** If I only tested twice a month I would not have the creamery I have today. Those little things do not matter when you are up against the centralizing competition. If you do not do business the way the farmer wants to do business he will take his stuff to the other fellow if he treats him
right, the way he expects to be treated in these up to date times. Therefore, if it costs four cents extra to do these things right, I believe that is the way we ought to do them.

Mr. Larson: I appreciate as well as anybody in the house what it is to be taxed and over-taxed with work as a butter-maker. The creamery management of this state and every other state is away behind as regards furnishing ample help and apparatus sufficient to work with that would protect them and the buttermakers, but it is of vital importance that every sample of cream delivered at a creamery be tested every day, as Mr. Carswell does, and it is just as important that the butter that goes out of the creamery be tested to know exactly what kind of butter goes out, and if a creamery has not sufficient help it should have it. The creamery management of this state and of every other state should see that they have help, and if they have not the help when those misfortunes come to them they must simply charge the bill to neglect.

Member: While we are talking about moisture, I would like to know if you have your butter in the refrigerator two or three days, then put the trier in to test for moisture, and you find the fat run over that trier is it possible then to get the correct amount of moisture in that tub? Is not part of that moisture squeezed out?

The Chairman: They have a different way of taking samples now. A sample is taken out of the top and then out of the sides.

Mr. Larson: When the revenue officers test for moisture they strip the tub. They have a little instrument in V shape. They strip right across and take probably a half pound from the top of the tub, from one side of the tub and then across, then take it from the bottom because the moisture content is different from the top to the bottom. The total amount taken is about one pound. Their reason for doing that is to overcome the plugging of the tub in four or five places and making it objectionable to butter buyers. In that way it can be easily done and the samples accurately taken.
The Chairman: Is there anything else to come before this meeting? The banquet will be this evening at 7 o'clock at the Commercial Club. The meeting will convene tomorrow morning at 9 o'clock at this hall.

We will now stand adjourned.

FRIDAY MORNING SESSION.

Meeting called to order at 9:30 by Mr. R. C. Green.

The Chairman: The first on the program this morning is the reading of the address of Hon. J. Q. Emery, by Mr. Henry Larson, Mr. Emery not being able to be present.