

547. Do you know anything of the process of manufacture of butter?—Yes.

548. Have you churned butter yourself?—No, I have not; but, at the same time, I know how it is done.

549. You say the churns used in New Zealand are not the right kind?—I do not say that of all the churns; but unless they were proper churns they were bound to spoil the butter.

550. How do these churns spoil the butter?—If you put paddles into the churn their action beats the butter up into putty. We like granulated butter, that comes out like grains of wheat. The barrel-churn, without beaters, turning end over end, is a good churn. The square churn is a good churn. The American swing-churn is superior to any of the other churns, but, to use it with machinery, I am doubtful as to their being able to keep it in equal swing. The butter should come out of the churn in a granulated form, and be washed thoroughly with cold water ere the grains are pressed, so as to extract as much as possible the butyric acid and caseine ere further pressing or working it.

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SATURDAY, 23RD AUGUST, 1890.

Mr. F. W. B. GREVILLE examined.

551. *The Chairman.*] You have a good deal of experience in dairy-farming?—Yes, I have made the dairying industry a study for the last six years.

552. You have heard the evidence given by the two experts who were examined before the Committee yesterday on this matter?—Yes.

553. You would therefore know the nature of the information which the Committee requires. We would be glad if you first made a general statement, giving the result of your experience?—As I have already said, I have made the dairy industry a study for the last six years. I have been engaged as a dairy-farmer myself. I have travelled around this part of the colony—that is, through the Wellington Province—for several years, observing the process of making butter adopted by farmers. I find that there is a total absence of information and knowledge about dairying; indeed, a general ignorance of the true principles of butter-making. The people who are engaged in that occupation have never had an opportunity of learning the proper, improved, and scientific methods of making butter. In the first place, there is an invariable absence of the necessary cleanliness in first taking the milk from the cows. This to a great extent influences the whole question of the manufacture of butter. It is the common practice of both men and women to go into the cow-yards in this district (Wellington) and milk the whole of the cows without washing either their own hands or the cows' teats. The result is that the milk is dirty when it goes into the dairy. It is tainted to such an extent that the quality of the butter is very much injured even before the milk goes into the milk-pans. Then there is the system known as the "shallow-pan" system. Under that system the dairyman has no control over the milk after it has been poured into the dishes. This, to a great extent, is responsible for a good deal of the second-rate butter that is made in this colony.

554. Do you mean that the dairyman has no control over it as regards temperature?—It is this way: Everything is left to chance; but by the system to which I am about to refer the temperature can be controlled. Take, for instance, if it is a warm day in November milk thickens at from twelve to eighteen hours; there is then a large loss of cream; one-third of the cream is often left in the thick milk, the milk thickening before the cream rises. Thus the shallow-pan system actually favours the loss of cream. Then, as if sufficient harm were not already done, when the cream enters the churn, and during the process of churning, 90 per cent. of the butter made in the colony is spoilt. There is not one dairyman in ten who knows how to manipulate the cream when it gets into the churn. It is spoilt by being overchurned. It is in this way that a great mistake is made. Instead of ceasing to churn when the butter breaks, as it is called, the average dairyman continues to churn until the butter goes into one large lump. In consequence of this, butter intended for export is irretrievably ruined. I may say that when the butter is knocked into a lump in that way there is incorporated with the pure butter-fat a large percentage of buttermilk. When butter made in that way is disposed of in the local market the real result is not manifest; it takes a few days before the buttermilk is seen to act injuriously on the butter. When that mistake has been made it is impossible to remedy it by any process except melting the butter, which ruins it completely. Then, even further continuing their error, they take a certain amount of, very often, coarse and poor salt, and, without caring to crush the lumps, they incorporate that with the butter. That is the system generally followed in small dairy-farms in the Wellington Province. In this way they manage to make as bad an article as possible. They have done everything they should not have done, and left undone everything they should have done.

555. You are making these remarks specially with reference to the export trade?—Yes; I agree with the gentleman who said before this Committee that butter can be got to England in first-rate order if that same butter has been properly made in the colony. But I will now proceed to suggest a remedy for the above state of things. The true remedies are the adoption of either the Cooley system or the Schwartz system of making butter or the separators. I may say, there is very little known in this colony of either the Cooley system or the Schwartz system. Not one in a hundred knows anything about them.

556. Would you be good enough to explain to the Committee the process which you call the Cooley system?—Yes, I will do so, briefly. The process is this: Immediately the milk is taken from the cow, while it is yet at a temperature of about 85°, it is poured into deep cans, about 18in. to 20in. in depth, with a patent lid; that allows the full can of milk to be plunged right under water in a tank or vat, say, about the size of this table.

557. *Mr. Hamlin.*] What would be the diameter of the can?—About 10in. The milk is acted on in this way: The temperature of the milk being 85° or 90°, the milk itself, being plunged into cold running water of, say, 45°, receives a sudden shock, an instant chilling, which drives the