

with frequently great delay in the matter of shipment, and often absence of cool-storage both on shore or on ship; and I think it is not a matter of why we do not export large quantities of good butter, but why we export any entitled to this character.

Some of the difficulties I have mentioned beset every producer of butter throughout this colony, even the most successful and well-managed factories. At the same time, they are all possible of amelioration, if not removal; and under such conditions only can our export of butter take rank in the English market with the continental butters.

The object to be attained to this end is, in my opinion, extreme cleanliness, low temperature, and thorough washing. It is also necessary that the product should be equable and packing uniform.

To obtain this result, the butter-factories should be large, and situated as near as possible the exporting facilities; in fact, in the present condition of carriage, there being no refrigerating-carriages on the railways, I would urge their erection at the chief centres, and carry the cream to them, rather than the butter. I would urge co-operation amongst small centres of the farming population, and the erection of separators only where the skim-milk can be at once returned to the farms and the cream forwarded to the factories. In churning and the subsequent washing the temperature of the milk and the surrounding air should not exceed 60° Fahr., the water used being of the same temperature, and in every way suitable for the purpose; the butter when completed and packed, being stored at a temperature above freezing, but below 55° Fahr., that of 40° Fahr. being the most favourable for this purpose. In shipping, the cool-chamber requires to be of this degree of cold also, as it has been found injurious to butter to reduce it below the freezing-point.

In packing for market, which is a matter I have given a great deal of attention to, I have invented and patented a mode of so enamelling or coating wood as to render it impervious to water, fat, or brine, and thus able to carry the finest-flavoured butter without in any way contaminating it from the influence of the wood. I have no desire to dwell upon my own action in this matter, but would bring before your Committee the fact that the largest exporters of butter in Australia were last year a syndicate in Sydney managed by the Fresh Food and Ice Company. This firm obtained from the company with which I am connected 14,000 boxes, in which the whole of their butter was exported to England, realising throughout the highest price of any forwarded from these colonies. So successfully have this syndicate carried on its operations that our firm has undertaken to supply 20,000 boxes during the ensuing season, 2,000 of which have already been shipped. I may add that the Fresh Food and Ice Company have exported their butter in these boxes during the last three years.

Now, this butter which has attained such commendation, and so high a price in London, is manufactured in the manner I have suggested, being churned, washed, and packed in the cool-chamber, the water being also brought to the required temperature. By this means there is a minimum risk of the importation of the germs of ferments, with an almost certain arrest of the development of those which may be present.

Now, to attain this requirement of low temperature at the smallest cost is a matter which I respectfully suggest should be taken up by your Committee, and would urge that inquiry be made in reference to a patent taken out by Mr. L. Perkins, in England, termed the "Arktos," referred to in "The Journal of the Society of Chemical Industry," of the 31st May, 1889. This invention is for the production of cold air by a very ingenious adaptation of the ammonia process, and carries out its entire operation without the use of any machinery. This process appears to be eminently successful, if not in obtaining great degrees of frost, at all events of attaining easily the temperatures of which I have spoken; and I can see no reason why it should not also be applied to railway-carriages as well as in the factories. However the temperature is brought to the required degree, it is, to my mind, of the utmost importance that, from the time subsequent to churning to that of delivery at its destination, London or elsewhere, the temperature should never exceed 45° Fahr.

Assuming that the conditions required in these notes are obtainable, then I am satisfied that we have the intelligence in this colony to produce the finest butter in large quantities. It will be a matter of consideration the cultivation of the most valuable foods for this purpose, and I would bring before your Committee's notice several papers I have written in reference to the growth of sugar-beet, not alone for the production of saccharine matter, but also for the improvement of our dairy-produce from the waste of the sugar-factories.* Unfortunately, less has been done in this direction than was hoped; but I have no hesitation in saying that it is but a matter of time before this is carried into effect.

The manufacture of condensed milk is a matter which I will not enter upon other than to request that inquiries should be made into the latest mechanical developments, especially with regard to vacuum machinery. The remarks in reference to improvement of foods for dairy-stock apply with still greater force to this branch of dairy-produce, the want of consideration on this point having proved fatal to the success of factories erected for the manufacture of condensed milk.

In conclusion, I beg to forward some papers by post which give more fully than I desire in this report the details of our manufacture of boxes, and opinions in connection therewith; but I would also remark that we are indebted to the New Zealand Government Inspectors of Dairies and others for urging that none but the finest butter should be packed in our boxes. I would, however, say, in reply, that from this colony, with a fairly equable and moderate temperature, with abundance of water, and in many parts the finest imported grasses, none but the finest flavoured butter should be exported or even made.

I have, &c.,

Flax and other Industries Committee.

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* "Transactions of the New Zealand Institute," and communications to the Hon. the Colonial Secretary.