THE COOLING OF MILK FOR CHEESEMAKING.

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INTRODUCTION.

The recommendations which will be found in these pages are based on the results of an extensive series of experiments which were carried out by members of the staff of the Dairy Division during the seasons of 1908 and 1909. Full details of the experiments, of which only a summary is given herein, will be found in the reports of the Dairy and Cold Storage Commissioner for 1909 and 1910, and these reports will be sent to any person who applies for them.

Inasmuch as the recommendations referred to are against the practice of aerating or exposing the milk to the air in any manner, it may be advisable to offer a few words of explanation on that point.

The aeration of milk intended for cheesemaking has been advocated for 20 years or more, and until recently it was generally believed to be beneficial. It is a rather curious fact, however, that one cannot find a single instance of a careful and reliable experiment the results of which are in favour of aeration. Belief in the practice was probably strengthened by the fact that marked improvement was noticeable in the quality of Canadian cheese during the years following the adoption of aeration. In the light of present knowledge, it is clear that this improvement should be attributed to better methods of cheesemaking, and to the work of instruction which was begun about the same time, rather than to the practice of aeration.

The process of cheese manufacture is essentially a process of fermentation. The whole art of cheese making consists in the control of those fermentations which arise from the germs that find entrance to the milk after it is drawn from the cow. The skilful cheesemaker of to-day secures the proper fermentation in the milk and cheese by the use of carefully prepared fermentation 'starters.'

At the time when the practice of aeration was first introduced, the intelligent use of the starter was quite unknown and unpracticed. Undoubtedly, the aeration of milk facilitates the introduction of the germs of fermentation, but as the introduction is uncontrolled and depends to a large extent on chance, the result is very uncertain. In addition to the uncertainty, the entrance of undesirable germs is favoured quite as much as is the entrance of those which are useful.

With the use of the starter, the aeration of milk is not only superfluous, but in most cases, positively harmful, by counteracting the beneficial effect of the starter.

As the role of bacteria in cheesemaking came to be better understood, dairy students began to realize that the practice of aeration was contrary to the principles of dairy bacteriology and to doubt its value in the handling of milk. It was found that in those dairies of England and Scotland where the very finest of Cheddar cheese is made, the milk is never aerated in the sense that it has been in this country. Observant cheesemakers have noticed that they frequently received better milk from patrons who never aerated it, than they did from those who followed the practice. By degrees leading instructors and others became convinced that aeration of milk was not only unnecessary, but might be positively harmful. Prof. Dean of Guelph, after experiments at the College, reported against aeration, and American experimentalists failed to find any benefit in the practice. There was, however, very little authoritative data upon the subject, and it was with a view of supplying this data that the experiments already referred to were undertaken.