Trials on the effect of thoroughly incorporating salt with curd, compared with lack of mixing it properly, demonstrated that the best results are obtained by thorough mixing of the salt and curd at the time of salting, allowing the curd to absorb the salt for a little time (twenty minutes), and again thoroughly stirring the curd before putting it into the cheese-hoop.

A new method of estimation of salt in cheese has been developed and has been applied to the determination of the salt content of cheeses of firm, normal, and tender bodies, as delivered to the grading-stores at various ports in the Dominion. The results show that a harsh body in New Zealand export cheese is, in most cases, due to oversalting.

Figures also are available showing the variations in salt concentration at different places in a cheese, and in different cheeses from one vat; and experiments are in progress which will provide information as to the rate of diffusion of salt in cheese.

Starters.

A considerable amount of experimental work was carried out to determine the effect of keeping starters under different cultural conditions. The main object was to discover, if possible, the reason for the loss in vitality which starters often exhibit in practice. So far, the only treatment which seems to cause a rapid loss in vitality is incubation of the culture for several days at a temperature of 85° F. instead of at the normal temperature of 68° F. Even under normal conditions, however, and with extreme care in treatment, the two starters which were under experiment during the season both ultimately failed to produce acid at a normal rate in the cheese-vat. Furthermore, strains of these same starters which were maintained in daily culture, in milk prepared from a single batch of milk-powder, similarly lost their vitality. This suggests that under the conditions of the experiment the daily chemical variations in the milk used for the propagation of starter are not the cause of loss in vitality of the culture, but that there is some other reason of which at present there is no knowledge. This series of experiments will be continued in the coming year.

During the course of the above experiments a laboratory test was devised which makes it possible to determine in a few hours whether the starter will produce acid at a normal rate when used in the cheese-vat. The test rarely fails to give a true indication, and ultimately it will be possible for a cheesemaker to determine by this means which of several mother cultures to use in his vats. When the test has been sufficiently standardized, details will be published.

Purity of the Milk-supply.

A considerable amount of work has been carried out in the laboratory on the differentiation of organisms present in starters. Methods have been devised for the determination of the proteolyte activity of lactic streptococci. These methods will be applied in an investigation of the part played by the various bacteria in the process of cheese-ripening, with the ultimate object of improving control of ripening by the use of selected starters or modification of the manufacturing process. In future years the work will proceed with the assistance of a grant from the Empire Marketing Board.

Work was carried out on the effect of certain common contaminant organisms in milk on the production of acid by starter organisms, and a paper on the subject was published in the *Journal of Dairy Research*. Further work on the same lines is proceeding.

A paper was published in the *Biochemical Journal* on the effect of sunlight on the reduction of methylene blue in milk. Further information on the mechanism of the reaction was obtained, and will be published in due course.

Throughout the season the milk used in the experimental factory was examined daily by several methods which can be used for the grading of milk. A long series of figures is thus in process of collection, which will prove useful in determining the significance of the different tests. The daily microscopical examination of the milk has also proved an efficient method of keeping mammitis in the dairy herd under control. Early cases of the disease can be immediately detected, and the animals isolated and treated.

It has been observed that certain weeds—viz., land-cress, lupin, and pennyroyal—are responsible for distinctly undesirable flavours in cheese.

Methods of Improving the Maturity of Export Cheese.

Experiments have been carried out to determine immediate practical measures for improving the state of maturity of export cheese at the time of arrival in the United Kingdom. Observations made on various lots of experimental cheeses show that under existing export conditions cheese is not considered sufficiently mature for average trade requirements till it is six months old. The present trial aims at securing definite data on the effects of (*a*) maintaining factory curing-rooms at a temperature of 60° F. (many are not heated and register 45°–50° F in the spring); (*b*) holding cheeses on factory curing-room shelves for periods longer than the present standard of fourteen days; (*c*) holding cheeses in the grading-stores for periods of up to four months before export (many spring makes particularly are held only for fourteen days); (*d*) the use of rennet at the rate of 5 oz. per 1,000 lb. milk instead of 3 oz.; and (*e*) restricting salt added to curd to reasonable quantities. The final results of this trial are not yet available, but the progress report indicates that good-quality cheese of a desirable mature flavour, made from milk to which 4 oz. rennet per 1,000 lb. milk is added and containing normal amounts of salt, results from holding well-made cheese on factory curing-room shelves for one month at 60° F., followed by a holding-period of six weeks in the grading-stores at 50° F. before export. Such cheese is much closer in texture than is corresponding cheese in the immature state, and cracks less on exposure of the cut surfaces to the air. On the other hand,