

The rotational system under which the starter used is changed from day to day is still proving successful in commercial practice in obviating failures due to phage present in the milk-supplies.

It has been found that sometimes a phage can exist in streptococcal culture in symbiosis with the bacterium and that where this happens the streptococcus is protected from the action of contaminant phages by the presence of the symbiotic phage. The discovery of this important principle opens up a new possibility in the protection of starter cultures from air-borne infection, but it is too early to say whether practical use can be made of the phenomenon.

*Investigation on Cheese-factories in the Hauraki Plains District.*—For the whole of the past dairying season an officer of the Institute staff has been stationed in the Hauraki Plains district and has maintained constant touch with six factories within a small radius. The principal object of investigation was to determine whether there was any special problem peculiar to the district in connection with starter management. It has been suggested in the past that starters were more liable to failure in the South Auckland district than in other cheese-producing areas. Experience this season has shown that there is no special starter problem in the Hauraki Plains district. Provided that starter cultures are handled correctly and given adequate protection from airborne contamination, they are just as readily maintained there as elsewhere.

Contrary to experience in other districts, however, stabilization of starter cultures did not lead to an immediate improvement in cheese-quality. In collaboration with Cheese Instructors of the Dairy Division of the Department of Agriculture, some attention was given to this problem. Unfortunately, the latter part of the season was a drought period, and the resulting abnormality of the milk made progress impossible. Two factors which may have a bearing are milk-quality which was poor in some factories, and system of manufacture of the cheese. There are indications that a system of manufacture rather different from that most successfully used in other districts may be necessary in the South Auckland district. These lines will need to be followed up next season.

*Standardized Cheese.*—Further comparisons this season of whole milk cheese and standardized cheese made from similar milk have confirmed previous findings that there is no technical reason why the quality of cheese containing 52 per cent. of fat in the dry matter should not be quite as high as that of whole milk cheese. As has been previously reported, it is necessary, of course to modify slightly the system of manufacture when standardized milk is being used because the cheese curd tends to lose its moisture more readily than does the corresponding whole-milk curd.

*Effect of Hydraulic Pressing of Cheese on Openness.*—During the past two seasons experiments on cheese-pressing have been carried out in commercial factories in collaboration with the Dairy Division, Department of Agriculture. Similar cheeses pressed in hand-screw presses and in constant pressure hydraulic presses were compared at fourteen days and three or four months for openness in texture. The results showed quite clearly that constant pressure at 150 lb. per square inch overnight practically eliminates mechanical openness in normal, well-made cheese. The type of press used has, of course, no influence on slit openness, which may develop after the cheese has been pressed.

*Cleaning of Milking-machines.*—The experiments described in the last annual report have been repeated this season with modifications. The results indicate that it is possible to clean a milking-machine satisfactorily and to produce high-quality milk regularly without the use of boiling water. The essential features of the cleaning process used this season were—

- (a) Immersion of the teat-cups and rubber milk-tubes in 0.5 per cent. caustic-soda solution between milkings :
- (b) Cleaning of the overhead milk-pipe and releaser by a water rinse, a treatment with detergent solution at 150° F. and a final water rinse :
- (c) A rinse of the whole assembled machine immediately before use with a solution containing 400 parts per million of available chlorine.