

*Body of Butter and Butterfat Composition.*—For two years examinations have been made of butters from two localities where soft body in the butter occurs during the spring. The results for butterfat composition did not give any indication of the cause of the fault in body.

*Vitamin A Content of Butter.*—The samples of butter obtained for the study of butterfat composition in relation to body of butter were also examined for vitamin A content. It was shown that during the 1943-44 season a definite seasonal change in total A content occurred. The minimum total vitamin A content was reached over the months December, January, and February, and the maximum in July and August. The dry season in 1943-44 may have been responsible for the very definite minimum value observed. The spread of values from the average for the butters from the three factories was small, and the butters from all three sources showed a minima and maxima at the same time. The recent Ministry of Food order with reference to the labelling and advertising of food products in the United Kingdom has focused attention on the importance of a knowledge of the vitamin A content of New Zealand butter, and a survey of wider scope has been undertaken.

*Land Cress and Feed Taint in Cream and Butter.*—It has been previously reported that the mustard-oil produced from land cress on maceration is not responsible for the land-cress taint in butter, since water cress yields the same mustard-oil but does not cause land-cress taint when fed to cows. It has previously been reported, also, that land-cress taint does not always occur in cream following ingestion of land cress by the cows. Attempts have been made during the year under review to relate the incidence of land-cress taint in cream from cows fed land cress to the general condition of health of the cows. A connection between incidence of land cress taint and indole, or aceline, content in cream and butter was not found.

*Parchment Wrapping-paper for Butter.*—Examination of parchment paper causing the development of off flavours of butter in direct contact with the paper has shown that the high acidity in the paper was the causative agent.

*Packaging of Processed Cheese in Pliofilm.*—A special filling-machine for the packing of processed cheese in pliofilm has been developed and a batch of five thousand 3 oz. packages was prepared for a special ration.

*Cheese Spread.*—Trials have been made of the preparation of a cheese spread which retains the natural Cheddar cheese flavour.

*Cheese-mite Control.*—Work on this subject has continued in collaboration with the Entomology Division of the Plant Research Bureau. Trials made with dichloroethyl ether show that this substance has great promise as a means of controlling mites in curing-rooms. Its vapour is toxic to mites in very low concentrations, of the order of 0.45 mg. per litre, while its high boiling-point and consequent low rate of evaporation make its effects very persistent. It may be applied to curing-room shelves by spraying, provided the operator wears a respirator, and this will maintain a concentration highly toxic to mites throughout the whole atmosphere of the room for some days, the exact time depending on the amount of ventilation of the room, while in close proximity to the shelves conditions will be unsuitable to mites for probably several months. In a trial in a curing-room unaffected with mites the shelves were sprayed with dichloroethyl ether at the rate of 0.5 lb. per 100 square feet of shelving, corresponding to 1 lb. per 1,000 cubic feet of room space. Mite-infested cheeses were placed on the shelves the following day and the room was closed up again for a further two days. An examination then showed that a complete kill of mites had been secured. Treatment was carried out in August, 1944, and no reinfection had occurred by April, 1945.

*Starters for Cheese-manufacture.*—Isolated starter-rooms and other devices designed to exclude airborne bacteriophage infection of starter cultures have continued to give success in the maintenance of cultures. Detailed improvements are constantly being made, but the basic principles seem to be settled.

Trouble due to failure of acid development in the cheese-vat still occurs due to infection of the factory equipment and infection of the milk delivered from cans which have been used for the transport of whey. The former source of infection is easily checked by chlorination of the vats, pasteurizer, and piping, and factory-managers are tending to adopt such treatment as a routine procedure in the factory. Contamination arising from milk-cans is much more difficult to eliminate. Last year we tried and abandoned a pasteurization of the whey before distributing it to the farmers. Chlorination of the whey was also tried. It proved practicable but costly. The addition of about 4 lb. of chloride of lime to 700 gallons of whey was necessary to check the development of phage. Trials showed that this chlorinated whey did not harm pigs fed on whey and meat meal, in fact it remained sweet for several days, whereas untreated whey usually became "yeasty" and showed fermentation. But a cost of 1s. 6d. to 2s. per vat of cheese made it too heavy a price to pay for the elimination of a trouble which may occur only occasionally.

The tendency at present, therefore, is to overcome the trouble caused by phage infection of the milk by using a series of starter cultures in rotation. We have been able to isolate up to the present six single strains of streptococci suitable for use as starters which are entirely independent in their phage reactions. That is to say, a phage which attacks (and grows upon) any one of the strains will not attack any of the others. Thus it is possible to arrange that the starter in use in a factory on any particular day is not affected by the phage likely to be present in the milk. The system of using a series of cultures in rotation is gradually becoming more widely adopted by managers.

Laboratory work on starter streptococci and upon the phages which attack them has provided evidence that *Str. lactis* and *Str. cremoris* are distinct species. The phages which attack *Str. cremoris* tend to show a strain specificity, whereas those which attack *Str. lactis* are polyvalent. The "cremoris" phages do not in general attack "lactis" strains, and *vice versa*, although there are a few phage races in an intermediate group which attack strains of both species.

Work on the composition of the medium used for growing lactis streptococci has resulted in the discovery of a simpler medium which gives more rapid growth with an elimination of abnormal types of colony.

*Bacteriophage and Mastitis.*—An irrigated treatment with phage has been tried on a few cows suffering from staphylococcal mastitis. The cases are far too few to enable firm conclusions to be