

in the Institute's dairy factory. Equally good results have been obtained in some commercial factories, but others still experience difficulty in preserving the vigour of their starters, and it remains to be determined whether certain milks make these starters more susceptible to bacteriophage.

The systematic study of the problem of eliminating feed taint that occurs in butter and cream in certain districts has been continued. The results obtained up to the present show that feed taint can definitely be attributed to certain types of clover in the pasture, especially when they are in the actively growing stage, and that the trouble can be minimized or entirely eliminated by appropriate pasture and stock management methods. Work is now in progress at the Institute to determine the percentage of clover that can be present in a pasture without causing taint, and also to define the growth conditions of the plants which induce it.

The whole problem of the relationship of New Zealand pasture species to the composition of butterfat is one to which little attention has yet been given, and some fundamental work is in progress at the Institute with a view to correlating not only pasture type, but also soil type with the quality of butterfat.

Other investigations in progress at the Institute include a study of the factors affecting the keeping-quality of unsalted butter, studies in the neutralization of cream for butter-making, and a study of the factors affecting the loss of butterfat in the manufacture of butter.

The annual special course for dairy-factory managers was held for the purpose of discussing the results of research with representatives of the industry, and a large number of scientific papers were published.

WHEAT RESEARCH INSTITUTE.

The harvest period was the wettest ever recorded in New Zealand, and this resulted in severe sprouting of all wheat that was not harvested very early. Reports indicated that approximately 50 per cent. of the wheat handled by the mills was more or less severely damaged. The problem of assessing the degree of damage to the baking quality of the flour, and the proportion of sprouted lines that could safely be used in blends, fell to the Wheat Research Institute. The ready co-operation of millers with the Institute enabled the problem to be very successfully coped with, as was indicated by the relatively small amount of trouble experienced by bakers in the circumstances.

The appointment of a travelling baker expert by arrangement with the Wheat Committee to advise bakers at first hand in their bakehouse problems has proved to be a very successful innovation, the services of the expert having been largely availed of.

The long-range work of wheat breeding continues to expand. Approximately 350,000 bushels of Cross 7—the wheat produced by the Institute—were harvested in 1937, and the ease of handling, good-milling qualities, and high baking-quality have firmly established it in favour. Several other equally promising crosses are in the process of multiplication.

A large amount of laboratory work was carried out, including, in addition to the regular testing of wheats and flours, research on specific problems in cereal chemistry. Among the latter should be mentioned the experiments having as their object the discovery of a safe and effective bread improver, and in which remarkably successful results have been obtained with lemon juice.

LEATHER AND PELT RESEARCH.

During the past year special attention has been given to the difficult problem of assessing the quality of leather by scientific methods as a guide to improvement. The properties demanded of leather vary, of course, according to the use to which the leather is to be put and according to the varied requirements of the tanner, boot-manufacturer, and the ultimate user. There have been many attempts to correlate certain chemical properties of leather with quality, but the standards of quality set up were arbitrarily fixed without a direct relation to the properties of leather as determined under actual wearing conditions. In the work carried out by the Leather Research Laboratory a particular group of chemical constituents known as "water solubles" has been studied in relation to the wearing-value of the leather as determined by actual tests under wet and dry conditions, and some valuable correlations have been obtained.

The interesting and important work on the effect of seasonal variations on the structure and quality of lamb-skins, which was begun last year, has been continued this year, and the results confirmed. Casks of skins of known history which had been examined microscopically at the Leather Research Institute were sent to England for reports on the quality for various purposes of the skins made from them. The report received confirmed the conclusions arrived at by microscopic examination, and if further experiments to be carried out are in agreement with these findings there will be no doubt that not only seasonal variation, but also the climatic conditions under which the animal has lived prior to slaughter, are very important in relation to the quality of lamb-skins. An understanding of these facts should help considerably in more economic marketing.

Steps have been taken to set up a co-ordinated organization for research, representative of freezing-works, tanners, and footwear-manufacturers. Such an organization is unique and should enable each section of the industry to operate at optimum advantage in relation to the others.

SOIL AND LAND UTILIZATION SURVEY.

The soil and land utilization survey in Hawke's Bay has now proceeded sufficiently far to give a fairly complete picture of the agricultural resources of that province and the possibilities of developing and utilizing them more fully and efficiently. The Hawke's Bay soils, which have now been mapped over an area of 3,000 square miles, are in general of high natural fertility, except for phosphate, and the amelioration of the poorer soils presents no serious problems.