

The first two methods, even if successful in overcoming the trouble, would involve extra expenditure. The last method costs nothing, but involves greater skill on the part of the factory-manager both in handling the starter cultures and in adjusting the treatment of the vats each day, since no two starter cultures behave exactly in the same fashion. Granted that the extra skill is forthcoming, the third method gives excellent results. It has been operating in several large factories for the greater part of a dairying season. Continued experience in commercial practice will ultimately indicate the soundest methods to adopt. The fundamental point is that it is now possible in any given case of failure of acid development in cheese-vats to define the immediate source of the trouble and to advise on remedial measures.

Bacteriophage and Mastitis.—A tentative start has been made on an investigation into the possible use of phage as a cure for mastitis in dairy cows. Several phages active against staphylococci from cases of bovine mastitis have been isolated, and it was found possible to irrigate an udder with relatively large quantities of phage preparation without adverse effect on the cow or even on milk-production. Attempts are being made to procure phages active against mastitis streptococci, but all this work cannot be pursued in any sustained fashion until it is possible to procure adequate skilled assistance.

Openness in Cheese.—Towards the end of last season it was suggested that “mechanical” openness in cheese (as distinct from “slit” openness) might be due to a pressure of carbon dioxide originating from the milk itself. It was shown that the addition of sodium bicarbonate to cheese curd resulted in mechanical openness in the cheese. The appearances were indistinguishable from those associated with naturally-occurring mechanical openness. It has not been possible, owing to shortage of staff, to develop the above hypothesis further, but during the present season there has been progress in the field towards a cure for mechanical openness. On the recommendation of Mr. L. H. Jones, Instructor in the Dairy Division of the Department of Agriculture, several factories in the Wairarapa district fitted hydraulic cheese-presses which enable the cheese to be kept under a constant pressure of about 160 lb. per square inch overnight. The grading points scored by the cheeses made in these factories early this season suggested very strongly that they did not show as much openness as in the past. In order to get more evidence of the point, it was arranged, with the co-operation of the Dairy Division, to conduct a trial at REXDALE Dairy Factory. Over a period of a fortnight the curd from two vats was hand-pressed while the curd from another two vats was hydraulically pressed. Examination of the cheeses at the grading port after a fortnight indicated that the cheese from the hydraulic presses were significantly freer from mechanical openness than those from the hand presses. It still remains to be seen whether the difference in openness persists as the cheese ages. Experiments carried out by the Institute about fourteen years ago did not indicate that hydraulic presses (at a pressure of about 100 lb. only) improved the texture of cheese. Possibly the very greatly changed conditions of manufacture nowadays, the improved milk quality, and the use of more active starters, together with a higher pressure in the hydraulic presses, account for the difference in result.

Dairy Cow Nutrition Projects.—During the 1943-44 production season, groups of cows were again maintained on pastures of three classes—i.e., perennial rye-grass and white clover, cocksfoot and white clover, and a mixed sward containing a wide variety of pasture species. No outstanding differences in the health of the cattle or in the yield and composition of milk have yet been observed which could be attributed to the sward differences.

Throughout the year an attempt has been made to contrast the production and composition of milk from cows kept on an adequate plane of nutrition by the addition of meal to their normal farm ration with that from cows receiving pasture and the usual farm supplements of hay, silage, and roots. During the extremely dry summer and autumn experienced in the season of 1943-44, the production of the meal-fed cows was maintained at a higher level than that of the contrasted group, but the meal-feeding did not prevent a fall in the solids-not-fat content of the milk at this time. This result seems to indicate that some environmental factor distinct from the availability of nutrients was responsible for differences observed in milk composition.

Hormone Studies.—(a) *Milk Secretion in Dairy Cattle:* A number of cows from which a season's production would have been lost through temporary or permanent sterility have been treated with diethylstilbestrol, and substantial productions of milk and fat have been obtained from some of these animals. The composition of the milk and the trend of the lactation curves were normal, but the level of production was in all cases below previous natural production records. The addition of further hormones is being tried in an attempt to increase the productivity of these artificially-induced lactations. Encouraging results have been obtained with preparations having thyroid potency.

A study is in progress of the preparation of potent thyro-protein. This material will provide a cheap source of a valuable tool for research, and facilitate further trials of the effect of thyroid-active material on milk secretion, particularly of its value to increase production and its effect on the health of dairy stock so treated.

(b) *Parturition in Pigs:* It has been suggested that one cause of still-birth in pigs is slow delivery at parturition. In experiments extending over two farrowing periods, a New-Zealand-prepared pituitrin solution was injected into sows at farrowing to determine whether the rate of birth of young pigs could be thus increased. The sows appeared quite refractory to this preparation, which gave no speeding up of parturition even with particularly heavy doses.

Dairy Cattle Growth.—Comprehensive data covering the size of New Zealand dairy animals are at present unavailable. By systematic weighing of all dairy stock at the Institute throughout their lifetime a study is being made of the growth rate of young stock and the variation in weight of mature animals of different size and at different times throughout the productive cycle.

The growth rates of two groups of calves, one receiving a diet pasture and skim-milk and the other being fed similarly but for the substitution of $\frac{1}{2}$ lb. meal for an equivalent amount of skim-milk, have been contrasted over the growth period from six weeks until twenty-four weeks of age. In two separate seasons' trials no significant difference was recorded between the respective groups.