

improve the resistance to such mechanical damage it would be necessary to increase the thickness of the tin coating. The thickness of tin at present applied to cans approached the maximum obtainable by hot dipping, but some improvement might be possible by reducing variations in thickness between one part of the can and another. The thickness of coating may be increased almost indefinitely by electroplating with tin. This method has been used in England with very satisfactory results for equipment subjected to hard wear. Laboratory experiments on similar lines in the Institute gave promising results. Such a treatment would, however, considerably increase the cost of a can.

(b) *Farm Separator Fat Losses* (A. K. R. McDowell).—A study of the effect of time of continuous running of a separator on the completeness of skinning showed that over two hours there was little significant change in efficiency.

(c) *Dairy Factory Drainage* (P. O. Veale).—During the season 1939–40 a study was made of the volume and composition of drainage waters from three cheese-factories of different sizes, one butter-factory, one dual-plant casein and butter factory, and one casein-factory. The results show that the volume of drainage varied from 0.26 to 0.84 gallons per pound of cheese made, 0.71 to 1.35 gallons per pound of butter made, and 1.68 gallons per pound of precipitated lactic casein curd. The morning and afternoon volumes of discharge were approximately the same. For all factories except the smallest in output, New Zealand factories discharge less drainage per unit of produce than those overseas. The drainage for lactic-casein factories was the highest in polluting-power, that for cheese-factories was intermediate, while butter-factory drainage was the least harmful. The greatest daily variation in quality of drainage occurred in the butter-factory at times when butter-milk was incorporated.

During the season 1939–40, and during the months of December and January, 1941, a study was made also of the effect of the discharge of factory drainage on the waters of a number of streams and rivers in Taranaki. It has been shown that the effect of factory drainage on the quality of the water in the natural streams is smaller than has been supposed. Where a stream is free-flowing and the dilution considerable, the stream may recover completely within a distance of 400 yards from the drainage outlet. With smaller dilutions the stream may be affected to a distance of one mile, and in one instance where the dilution was only 1 in 100 the effect of the drainage on the water of the stream was evident for $3\frac{1}{2}$ miles from the drainage outlet. These results were obtained from factories where care was taken to remove coarse and fine suspended particles from the drainage, and where whey, skim-milk, and buttermilk were not discharged into the drains.

DAIRY HUSBANDRY PROJECTS.

(a) *Suitability of Different Pasture Types for Milk-production* (W. Riddet and S. L. Green, of Dairy Research Institute staff, and E. B. Levy and W. G. Thurston, of the Plant Research Bureau).—At the beginning of the period under review three grazing-areas were sown out respectively with seed mixtures consisting of (a) mixed pasture and clover species, (b) perennial rye-grass and white clover, and (c) cocksfoot - white clover. Each area comprised a number of small fields so chosen as to make soil differences equally applicable to all three. Towards the conclusion of the period a further area was seeded down with the same mixtures in order to provide a total area of approximately 50 acres, capable of carrying and providing supplementary hay and silage for three groups each of twelve to fourteen milking animals. Attempts to measure differences in production in this first year were upset by the incidence of land cress in some of the young pastures and the ravages of grass grub in others, but this is not viewed as detrimental to the experiment as a whole, since the aim is to secure information from the pastures in their established state, and they have now developed good and typical sward. It is confidently expected to secure measurable results in the next grazing season.

(b) *The Influence of the Plane of Nutrition of Milking-cows on Pasture on the Yield and Composition of Milk* (W. Riddet and S. L. Green).—In attempts to seek an adequate explanation for the falling-off in the cheese-yielding capacity of milk during dry weather, it has been shown in trials carried out in recent years with cows kept indoors that the casein content of milk is depressed by a low plane of nutrition of the milking-cow. It has also been observed, again with cows kept indoors, that cows fed *ad lib* quantities of pasture may be on a low plane of nutrition. Accordingly an experiment was carried out between January and May in which a number of cows were maintained on a positive plane of nutrition at pasture by providing them with a supplementary ration of meal, fed according to their production, and a corresponding number balanced in respect of production were allowed to drop to whatever plane of nutrition the pasture and usual farm supplement of silage could provide. Records were kept of the live weight of the cows and of the daily production and composition of their milk. The results are now being worked up graphically and statistically.

(c) *The Relation of Frequency of Weighing, Sampling, and Analysing Milk to Degree of Accuracy in Results* (I. Dick and W. Riddet).—In connection with project (b) an attempt is being made statistically to secure accurate information from data recorded daily on the errors that may be expected in recording milk weights and analysing milk samples taken at varying intervals.

(d) *Feeding Meals to Calves being reared on Skim-milk and grazing Good Pasture* (S. L. Green and W. Riddet).—Twelve pairs of calves of the Friesian, Jersey, and Ayrshire breeds were used in an experiment to determine whether calves grow better fed on calf meal in addition to skim-milk when they are at pasture. The ration of milk fed to the "milk only" group was increased in amount to make it equivalent in digestible nutrients to the meal fed to the other group. Both lots were rationed according to weight and made satisfactory growth. The results showed that, when treated statistically, there were no differences in the two groups in respect either of increase in live weight or height at the withers. There were no obvious differences in the outward appearance of the two groups.