

Last year the hypochlorite rinse was used after as well as before milking. The objectionable scale which formed in the pipes after some months last season appears to have been due to the after-milking rinse, since this season there was very little scale. It should be emphasized that these trials were carried out under optimum conditions in the Massey College milking-shed. Without further trials on ordinary farms it is not possible to determine whether in the hands of the farmer the method described would have the same margin of safety as the normal "boiling water-caustic soda" method.

*Phosphatase Test.*—From time to time difficulty has been experienced with gradual decomposition of the phenyl-phosphate buffer used in the phosphatase test. Solutions more than a few days old gave positive blanks in the test, due presumably to the presence of free phenol. It was found that the water used for making up the buffer substrate was the critical factor. Even distilled water from some water-supplies was not satisfactory. Attempts are still being made to clarify the position by defining the necessary characteristics of the water to be used.

*Biological Assay of Vitamins.*—Assistance has been given to the Plant Chemistry Laboratory on the bacteriological side of the assay of vitamins of the B complex.

*Dairy Cow Nutrition.*—Characteristic of New Zealand dairying is the fact that, on the predominately grassland dairy-farms of the country, cows are subject to marked changes in the amounts of available food. For a number of years the effects of variation on the levels of feeding at various times in a cow's working lifetime have been studied at the Institute.

In continuation of this broad investigation of the effect of various levels of feeding on the health and production of dairy cattle and on the manufacturing qualities of the milk, the experimental herd is being used, starting from the 1945-46 season, for the study of the effects of high and low levels of winter feeding. The herd of fifty-six animals was divided into two similar groups of dry animals at the end of May, 1945. From this time until calving the cows in one group (high plane) were fed as well as possible on winter pasture, hay, and large quantities of silage, whilst the other group (low plane) received very little pasture, plus a small quantity of hay. After calving, all cows were fed similarly and as well as possible for the whole of the following lactation period. The trial was thus designed to determine the influence of plane of nutrition during the last two-three months of pregnancy on the subsequent performance of the animals.

The difference in feeding levels prior to calving was responsible for a marked difference in the condition of the two groups of calving. Over the average pre-calving period of eighty-one days, the low-plane group lost an average of 81 lb. body-weight, while the high-plane cows gained an average of 47 lb. Despite this wide difference in the condition of the dams, there was no significant difference in the birth-weights of the calves of each group, nor in the early growth of the two groups of young animals. The length of pregnancy was not affected. Any difference in the health of the two groups favoured the high plane animals in that more cases of ketosis and retention of afterbirth occurred in the low-plane group. There was no apparent difference in the incidence of mastitis, milk-fever, or grass staggers. The season's data on the production and composition of milk are not yet complete.

At intervals through the season the milk from the two groups of cows has been kept separate on several days and made into cheese to see whether any differences in behaviour in the vat were detectable. No difference was observed until March (about seven months after the difference in feeding treatment ceased), when, during a prolonged dry period the milk from the low-plane cows gave a softer rennet curd which was more difficult to bring to the desired state of firmness in the cheesemaking process. The difference in the final cheese was, however, only slight.

The properties of the butterfats from the two groups of cows showed some slight differences, but further work is required before these differences can be definitely related to the feeding conditions of the animals. The vitamin A potency of the butterfats also showed slight and persistent differences throughout the year. This experiment will be continued during the season 1946-47. Those cows remaining in the herd will be retained in their respective groups from season to season for the duration of the trial.