content of the milk of both groups was depressed in the dry summer of 1944, the meal-fed group produced at a substantially higher level than that of the group receiving farm grown supplements alone. Furthermore, as mentioned earlier in this report, differences were observed in the curd characteristics during cheesemaking.

Dairy Cattle Growth.—From data accumulated from systematic weighing of all available dairy cattle at the Institute over a period of years it has been possible to plot preliminary growth curves for typical Jersey and Friesian cattle grown under conditions of reasonably good management and feeding. Figures have also been obtained on body-weight variation of mature animals throughout lactation and the dry period. These data show the degree to which spring-calving cows, even though well supplied with farm supplementary feeds both prior to and after parturition, lose body weight during the early part of the lactation before regaining and adding to their original condition.

The growth curves of normal dairy cattle frequently show that a break in the trend occurs during the first winter of the young animal's existence. This growth check is due to unfavourable winter feed and weather conditions. In order to determine whether such a check has any effect on the subsequent growth development and capacity for production of dairy stock, the respective performances of two groups of calves are being contrasted. One group, the control, were wintered in 1944 as yearlings under ordinary good conditions of feed and management. The second group were given a higher plane of nutrition during the winter months and established a maximum average advantage of 70 lb. per calf over the control group. When grass growth increased in the spring, both groups were run together and received identical treatment. In April, 1945, the winter high-plane-of-nutrition calves had retained and seemed to be maintaining an advantage of approximately 40 lb. per calf. It is thus interesting to note that, although the control group were not poorly wintered, part at least of the advantage of the group especially well wintered was retained through the summer and autumn of the following year.

Hormone Studies.—In 1943 a study was started to see whether, with the present knowledge of the physiology of milk secretion and using the commercially available hormones or their equivalents, it was practicable to increase milk and fat production. Work has been confined to (*a*) experiments on the initiation of lactation with diethylstilbestrol in cases of temporary or permanent sterility; (*b*) the production of iodinated protein having thyroid activity, and the testing of its effects on milk production and composition.

In fifteen dry sterile cows and virgin heifers treated with stilbestrol for periods of two to four months the resulting artificial lactations have given the following yield of butterfat: seven up to 50 lb., two from 50–100 lb., three 100–200 lb., one 214 lb., one 301 lb., and one 438 lb. The substantial productions achieved in some cases are a striking illustration of the possibilities which may lie ahead of this type of work. From the practical aspect the following points are noteworthy. There was great variation in response by different cows to the same treatment. Butterfat yields were below the natural potential production of the animal. A number of the animals were served and became pregnant after the treatment, showing that the injections did not necessarily impair further natural production. At times during the injections many of the animals were in prolonged œstrus. This condition, when accompanied by a relaxation of pelvic ligaments, predisposed the animals to fracture of pelvic bones and was the most objectionable managerial feature of the work. It appears as if some practical application of the technique might be possible, provided that means can be found for obtaining a more dependable response and that the dangers of prolonged œstrus be removed.

The administration of thyroxine and dried thyroid material is known to markedly influence the production and composition of milk. However, both of these materials are too costly for anything but small-scale experimental work. Larger-scale trials have lately become possible through the discovery that proteins may become thyroid-potent when treated with iodine under controlled conditions. After two small lots of a thyroid-potent casein material had been made successfully at the Institute a large batch of approximately 45 lb. was prepared utilizing cheesemaking equipment.

The effect of feeding varying amounts of thyroprotein to eight cows which had been brought into lactation with diethylstilbestrol has been studied. Significant increases in the production of milk and fat were obtained when the preparation was fed at the rate of 20–30 g. daily. The response in milk yield occurred two to three days after feeding commenced and fell off sharply as soon as feeding stopped. A striking rise was observed in fat percentage. It is interesting to note that this did not coincide with the rise in milk yield, but there was a considerable lag of the order of ten days before response in fat percentage. The same lag before fat content declined to normal was observed after stopping the feeding of thyroprotein. The effect on the percentage S.N.F. in milk was not consistent. Considerable interest has been attached to this point, as it had been suggested that the depression of S.N.F. content of milk during hot dry summers might have been linked with some change in thyroid activity. At dosage levels of 15–30 g. daily all cows showed significant increases in heart rate and losses in body weight, emphasizing the extra strain placed on the animal's metabolism and the dangers of overdosage.

Mastitis Work.—In collaboration with Dr. C. S. M. Hopkirk, of the Wallaceville Animal Research Station, studies are being made of the worth of a number of irrigants—*e.g.*, acriflavin, tyrothricin—which, it has been claimed, have value in the treatment of mastitis. This work is in its early stages, but it is evident that, although some irrigants have given a measure of success, none used so far have been strikingly effective in eliminating pathogenic organisms from the udder.

Pasteurization and Bottling of Milk.—The Institute continued to pasteurize and bottle milk on behalf of the Department of Health for the supply to schools in the Manawatu district.

Dissemination of Results of Work.—A large number of dairy-factory managers and first assistants from all parts of the Dominion attended the annual "week" held at the Institute on 9th, 10th, and 11th May, 1944, when research work carried out the previous season was described and discussed. This annual gathering is very much appreciated by managers and first assistants in the butter and cheese industries.

Arrangements have now been made to publish a quarterly bulletin for dairy factories which will be distributed to all concerned. This bulletin will deal with the work of the Institute and with technical developments in the dairy industry and it will enable the industry to keep closely in touch with research work in progress.