Sheep regularly succumbed to 0·01 ml. of blackleg culture, whereas guinea-pigs survived the inoculation of 0·05 ml. of the same culture. Challenge experiments showed that satisfactory immunity was conferred by blackleg vaccine.

Foot-rot.—As reported last year, an attempt was made to eradicate foot-rot from the Experimental Station at Manutuke. Since then 800 lambs have been brought on to the Station, and in some lines there were as many as 6 per cent. of bad cases of foot-rot. All feet were carefully examined, and affected sheep were treated in isolation before they were turned into the main paddocks. No cases of foot-rot have occurred in these since January, 1947, and there are to-day some 650 sheep of all ages completely free from foot-rot. In February, 1948, an attempt was made to eradicate foot-rot from Ruakura. Here the difficulties are much greater on account of the large number of sheep, the much greater area, and the large number of small flocks involved in the various experiments. If eradication proves successful at Ruakura, it should be possible on any farm in New Zealand.

Dairy Cattle Breeding Projects

Artificial Insemination at Ruakura: Training of Technicians.—During the winter mating an attempt was made to train six technicians. Although they could be considered rather better than the average class of man-power likely to be available for insemination work, the fact that only three of them reached a consistently satisfactory level of performance emphasizes the difficulty likely to be experienced in training any considerable number of satisfactory technicians.

Dose-rate Levels: Uterine Technique.—Comparisons of three dose-rate levels were made during the early part of the season. From 500 to 600 cows per group were inseminated with dose rates of 25 million, 50 million, and over 50 million sperms per dose. Analysis of the results in terms of the relation of dose rate, storage time, effect of bulls, and effect of technicians suggests the following conclusions:—

(1) Doses of 25 million sperms were as effective as larger doses.
(2) Storage time did not affect conception rate any more with this dose rate than with higher doses.
(3) Results varied with bulls, but even with the weakest in fertility results with 25 million sperms were no worse than with higher doses.
(4) Experienced technicians obtained better results with the low dose rate than did less-experienced operators.

The all-over conception rate was slightly under 50 per cent. for the spring-grade experimental group. This is somewhat lower than the previous year and suggests a rather lower level of quality of the semen used. As before, results varied widely in different herds. With a proved technician the fourth week showed an average conception rate of 43 per cent., though in three herds 67 per cent. of 55 cows inseminated held. A less-experienced technician showed rather poor results in the early part of the season, conceptions ranging from 37 per cent. to 40 per cent., but towards the end of the season he got 65 per cent. of conceptions.

Cervical Technique.—Opportunity was taken during the season to test the possibility of obtaining reasonable conception rates with the cervical technique modified by using very small quantities of concentrated semen. It was argued that the low efficiency of the cervical technique with small doses of sperm might in part be due to a portion of the injected material flowing out of the cervix immediately after insemination, so that the effective dose rate became too low. To test this 50 cows were inseminated with 0·15 c.c. of semen containing 50 million sperms. Results were very poor, only 14 cows holding. For routine work the cervical technique appears to be quite unsuitable.

Distant Group.—The group organized in the Manawatu by the Herd Recording Department of the New Zealand Dairy Board experienced considerable trouble and results were poor. It appears that definite transport and storage problems existed,