

*Sheep-breeding.*—In the Romney breed, rams are being progeny-tested for fleece weight, count of wool, carcass quality, and rate of growth of lambs. The influence of ewe conformation on fat-lamb quality is being measured by mating long- and short-legged Romney ewes with the same Southdown rams. The inheritance of wool count in Romneys is being examined by mating a fine- and a strong-wooled ram with groups of ewes, half of which are fine-wooled and the other half strong-wooled in each case. A small inbred flock of Romneys has been established to provide uniform sheep for experimental purposes.

*Effects of Castration on Lamb Quality.*—The carcass quality of ram, wether, and ewe lambs reared under the same conditions has been compared. Ram lambs yielded the heaviest carcass and, though quality was slightly inferior, they gave the greatest cash return per lamb.

*Tailing Experiments.*—Tests at Mamaku and Kirwee with a patent tailer indicated that it possessed no advantage over the knife in regard to subsequent rate of growth or mortality.

*Mastitis.*—The field investigations in collaboration with the Dairy Board to study the effect of environment on the incidence of mastitis have been continued. Trials have been made to determine the efficiency of antiseptic solutions in sterilizing teats. Measurement of quarter yields has suggested that there may be an inverse correlation between yield and leucocyte count even when clinical mastitis does not occur. In some cases pathogenic organisms could not be incriminated.

*Studies of Milking Methods.*—Preliminary investigations of the precise mechanics of the letting-down process in milking are in progress, and it is hoped that they will throw some light on the many problems associated with the milking process, including non-stripping. A special machine for recording the rate of flow of milk from machine-milked cows has been used for the purpose. In general, preliminary work indicated that a large proportion of cows will release their milk to the machine without the aid of even machine-stripping techniques, though some animals required machine-stripping, while others will not respond without the use of hand-stripping. As the season advances, the tendency to respond to stripping appears to increase.

*Artificial Insemination.*—In collaboration with the New Zealand Dairy Board, an attempt was made to extend the field use of artificial insemination by inseminating 3,000 cows in Cambridge, Whatawhata, and Manawatu areas with semen collected from 13 bulls stationed at Ruakura. Unfortunately, results were disappointing, the average rate of conception being only approximately 30 per cent. for the first round. The experiment was therefore discontinued after six weeks to enable farmers to get their cows in calf by natural mating. The reasons for the poor results have not been definitely determined. Only 5 of the 13 bulls were really satisfactory for artificial insemination, but it is certain that some weakness in technique also existed. The limited breeding period in New Zealand obviously presents real difficulties, which were intensified in the task of providing semen for over 100 cows daily. It is perhaps worth recording that, in spite of unsatisfactory results, 800 cows conceived to the 5 best bulls during the short period the service was operating. Further experimental work is being conducted to eliminate errors in technique. Sixty-four pedigree Friesian cows situated in Auckland, Waikato, King-country, Bay of Plenty, and Dunedin were inseminated from a bull situated at Ruakura, and 25 proved in calf. Three cows out of 5 conceived when inseminated at Ruakura with semen brought from Australia by air.

*Sterility in Dairy Cattle.*—The free semen-testing service was again available to farmers. Of the 192 bulls examined, 25 proved sterile and a further 55 were of low fertility. A survey is being made of cows of known breeding history culled for sterility. Lesions noted at autopsy are being recorded, and the possibility of any relationship between ovarian and pituitary dysfunction is being examined. This work is also being extended to ewes and sows.

*Hormone Studies.*—Studies have been initiated into the hormone status of pregnant dairy cows with a view, *inter alia*, of evolving a biological or chemical test for pregnancy.

*Contagious Abortion.*—Results are now available for 10,000 calves in 791 herds vaccinated in 1943. In these herds 22 per cent. of unvaccinated two-year-old heifers aborted in 1943, while the abortion rate in vaccinated heifers in 1944 was 3 per cent. In 17 herds results of two years' vaccination are available. In 1942 there were 38 per cent. abortions in 277 unvaccinated two-year-old heifers, in 1943 there were 6.3 per cent. abortions in 298 vaccinated two-year-old heifers, while in 1944 there were 1.4 per cent. abortions in 293 two-year-old vaccinated heifers and 1.9 per cent. abortions in 269 three-year-old heifers vaccinated as calves in 1942. Some 85,000 calves have been vaccinated this year.

*Dairy Cow Nutrition.*—During the past three seasons it has been demonstrated that calves which are rotated quickly through fresh paddocks enter the winter 70 lb. to 140 lb. heavier than those set stocked in a calf paddock. Continuation of set stocking during the winter of 1944 resulted in the death of nearly 50 per cent. of the calves. Under rotational grazing, drenching for internal parasites does not appear necessary, while under set stocking it has not proved effective. A ten-year project has now been initiated to examine the effect of plane of nutrition at different ages on lifetime production. Examination of the nutritive value of pampas grass has been continued. No difference in strain has been observed. Quality is affected by soil fertility, rate of growth, and maturity. It is unlikely that pampas grass will prove more than a maintenance ration, but where it suits a farmer's convenience to grow pampas instead of shutting up pasture for hay it may be valuable as a substitute for hay. A study of nutritive value of *paspalum* has been commenced. Considerable time has been devoted to devising suitable technique for dairy cow metabolism work, especially under grazing conditions.

*Copper Deficiency.*—Further work has confirmed the occurrence of copper deficiency on most peat soils in New Zealand. The effectiveness of top-dressing with copper sulphate has been demonstrated on dairy farms. After top-dressing, young and adult stock are healthy and remain free from peat scours and butterfat production is very materially increased.