

to remove the fears of some sheepmen about possible hazards of heavy stocking with sheep.

### Beef Production Factor

The study high lighted the contribution of cattle to productive efficiency. The results showed quite clearly that if the grass produced on a well-managed grassland fattening farm is fully utilised, the lower output of lamb meat from a low sheep stocking rate can be made up by a compensating output of beef. Both on the 4 ewes per acre and on the 6 ewes per acre units the beef produced was sufficient to bring the total meat output to the same level as that obtained from lamb alone on the 8 ewes per acre farm. Unfortunately, since beef meat on the average is worth only half the value of lamb meat to its producer, gains from the cattle run were relatively less profitable. This finding is very significant both to the individual farmer and to the country as a whole because it means that the profitability of meat production is closely related to a high ratio of sheep to cattle.

### SECOND PHASE

In the second phase of the study the 4 ewes per acre unit has been managed in the same way as during the first 4 years. As the "standard" system this unit is a connecting link between the two stages of the study and enables reasonable comparisons to be made between the results of the first series and the results of the present series. The 6 ewes per acre and 8 ewes per acre farms were replaced by straight beef-producing units. On one the objective was the production of chiller beef from a herd of Aberdeen Angus breeding cows maintained on the area. The other has been a straight fattening farm on which the object has been maximum output of beef per acre with bought store cattle as the material.

### Beef Production

In this study there has been especial interest in the relative efficiency of the breeding cow as contrasted with the fattening steer and, of course, with straight cattle production as compared with production from both sheep and cattle. Interest in this phase of meat production stems from the general argument that some day it may be necessary for this country to restrict its lamb production because of market saturation. In this event beef is the only foreseeable alternative if the national production level is not to stand still. In any event, an expanding local population must increase the need for beef. Beef production is a subject on which we have little factual information, but this study provides a little useful material.

The three farm units used were approximately 50 acres each and were similar in soil and pasture type. Top-dressing was the same on each area. On the 4 ewes per acre farm 200 ewes were bought each February and

managed on the Ruakura-recommended system of set stocking from lambing until weaning and on rotational grazing at all other times. Twelve 18-month-old and 12 weaner cattle were also carried, the weaners being bought each autumn or winter, depending on the feed supply. The breeding unit carried a breeding herd of 30 Aberdeen Angus cows. Twelve weaner steers and 5 replacement heifers were kept each autumn and the remainder of the calf crop sold. Twelve steer progeny were fattened off at 2 to 2½ years as chillers.

The average stocking rate thus consisted of 30 cows, 12 weaner steers, 12 18-month-old fattening steers, and 5 replacement heifers on the 50 acres.

On the bullock-fattening farm part of the cattle were bought in autumn each year and wintered on hay grown on the property and the remainder were brought on in spring as pasture growth became more plentiful. On the average 40 steers were wintered and 20 to 30 bought in spring, giving an average output of between 60 and 70 fat cattle per year. All cattle were typical 3- to 4-year-old stores from hill country. All hay used for wintering cattle on the three farms and for facial eczema control on the 4 ewes per acre farm was grown on the properties concerned. Each was managed as an independent unit.

### Production Results

Mean output of meat per acre from the control area of 4 ewes plus cattle was 230lb. dressed weight. The breeding cow farm yielded 217lb. of dressed beef. The bullock area yielded 255lb. of meat per acre. The production of 230lb. of dressed meat from the 4 ewes per acre farm was 30lb. lower than that obtained in the first 4 years, when the figure averaged 260lb. This drop was due almost entirely to a lower beef output. The output of lamb meat was the same as in previous years. The drop in beef was due mainly to two relatively poor grass seasons, which resulted in poorer hay crops.

Production was also affected because in two seasons facial eczema precautions had to be taken and hay had to be diverted from use by cattle during winter to protection of the ewe flock. In these two seasons, in consequence, the cattle could not be bought until mid-winter, so that the area was deprived of part of its normal increment of beef.

The output from the breeding cow farm relative to that from the bullock farm substantiates the view that the breeding cow is a relatively inefficient producer of meat. Yield was nearly 40lb. of beef per acre less than that obtained from steer fattening. This figure reflects the lack of economy of maintaining approximately two breeding cows for the production of one

steer. In the same way, the fact that the bullock farm yielded 25lb. more meat per acre than did the fat lamb farm is some measure of the high feed cost of maintaining a breeding ewe.

It has already been pointed out that the continuance of the 4 ewes per acre unit throughout the two periods allows comparison of the relative production under the five systems of stocking studied so far. After the necessary adjustments for seasonal differences had been made relative productions were as follows:—

	lb. per acre
4 ewes per acre .. ..	245
6 ewes per acre .. ..	245
8 ewes per acre .. ..	240
Breeding cows .. ..	230
Bullock fattening .. ..	270

These figures can be described as the "expectancy" from different classes of meat-producing farms. This term has been borrowed from the dairyman, who evaluates his bull on the basis of the "expected" performance of his daughters. It is hoped that meat producers attempting any one of these systems will not be as frequently disappointed as dairy farmers are in obtaining the expected yields.

### Cattle Gains

Some of the more interesting results of this study relate to the gains made by the different ages and types of cattle under the different stocking systems.

On the fat lamb area the cattle tended to suffer from competition with sheep. Though the average rate of gain of the stock from 1 to 1½ years was very good at 1.3lb. per day, that of the fattening animals was relatively poor, averaging only 1lb. per day. This was due primarily to the fact that under fat lamb conditions fattening cattle in spring and summer have to share available feed with ewes and lambs, and if necessary have to take second place. Cattle of the same age and over the same period on the beef cattle farm averaged 1.4lb. per day.

On the breeding cow farm the best performance was shown over the calf stage. Of extreme interest was the gain of 370lb. during the first 6 months of life of calves born on this area, exactly the same as it was during their next 12 months. Average rates during these two periods were thus 1.8lb. per day from birth to weaning and 1lb. per day from weaning until 1½ years old. The poorer performance during the older stage was probably due to the fact that preference under this system had to be given to stock actually being fattened. Thus, their older mates from 1½ to 2 and 2½ years of age averaged 1.4lb. gain per day. Cattle produced on this area were of