Cattle Breeding at P.A.T.I.
An Exercise in Up-grading

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The cattle now held at the Popondetta Agricultural Training Institute provide a good example of up-grading a herd of cattle through the use of high-grade bulls and careful selection techniques.

The first cattle received at P.A.T.I. were very poor quality. The original bull was one of a group of domesticated cattle which had gone wild. It was rounded up with others on Normanby Island and brought across to Popondetta. Other early additions to the herd came from a number of different D.A.S.F. herds, and were also of poor quality with little or no Zebu blood. With the arrival of a ¼ Africander/Shorthorn bull from Erap, a start was made to up-grade these original cattle. This was continued with the use of Brahman-cross bulls from Moitaka. At all times careful selection of the progeny of these bulls was carried out to ensure that the right animals were used in the up-grading programme.

The up-grading is illustrated in the following photographs. These photographs show the important characteristics which were selected for during the up-grading programme and the way in which the type of cattle at P.A.T.I. have improved through the use of these techniques.

Plates I and II show typical examples of the original cattle at P.A.T.I. *Plate* I is a photograph of the ¼ Africander bull brought from Erap. His coat is fairly short and fine, but not fine enough and the conformation of his hind quarters is not particularly good. He did, however, have ¼ Zebu blood (in this case Africander) and it seemed likely that some of his progeny would show some of the bull's better qualities. The cow shown in *Plate* II is a pure British breed (in this case an A.I.S.). She has the coarse, fairly long hair which indicates poor sweat gland development and hence inability to put up with high temperatures and humidity. Although she, as a dairy type, was not suited ideally to the breeding of beef cattle, she was likely to be a good mother because of her good milk supply. She would therefore serve as a useful start for the up-grading programme.

When these two cattle were mated, the progeny (shown in *Plate* III) showed some better qualities than the dam, for example a finer coat and thus a few more sweat glands, but her low growth rate indicated that she was not completely suited to the environment and that further up-grading was necessary.

She was therefore mated to the ¾ Brahman bull shown in *Plate* IV. This bull has a lot more Zebu blood, has a fine coat (more sweat glands) and is able to graze out during the day and grow well under hot conditions. The progeny from this mating is the heifer shown in *Plate* V and it is clear from this photograph how the quality has improved from the original cow seen in *Plate* II. She has better conformation, fine, short hair, loose skin folds and, most important, her high growth rate showed that she was performing well in the P.A.T.I. environment.

This heifer was therefore selected to be mated to a different ¾ Brahman bull (*Plate* VI). At *Plate* VII is a photograph of the progeny from this mating. From the photograph it is possible to see the very fine, short coat and the excellent hind quarter development—compare this with the poor hind quarter conformation of the original bull in *Plate* I. What the photograph does not show, however, is that this calf weighed over 400 lb at 7 months of age—almost 50 per cent better than the growth of the original cow we saw in *Plate* II.

The improvement in both weaning weight and the age of maturity are in fact the two outstanding factors which can be seen over the whole herd as a result of this up-grading programme. In 1967 calves were weaned at 7 months of age, with weaning weights ranging from 270 lb to 350 lb liveweight. In 1970 calves weaned at 7 months had liveweights of 400 lb to 450 lb. Similarly, 1968 calves had to

Plate I.—¼ Africander bull

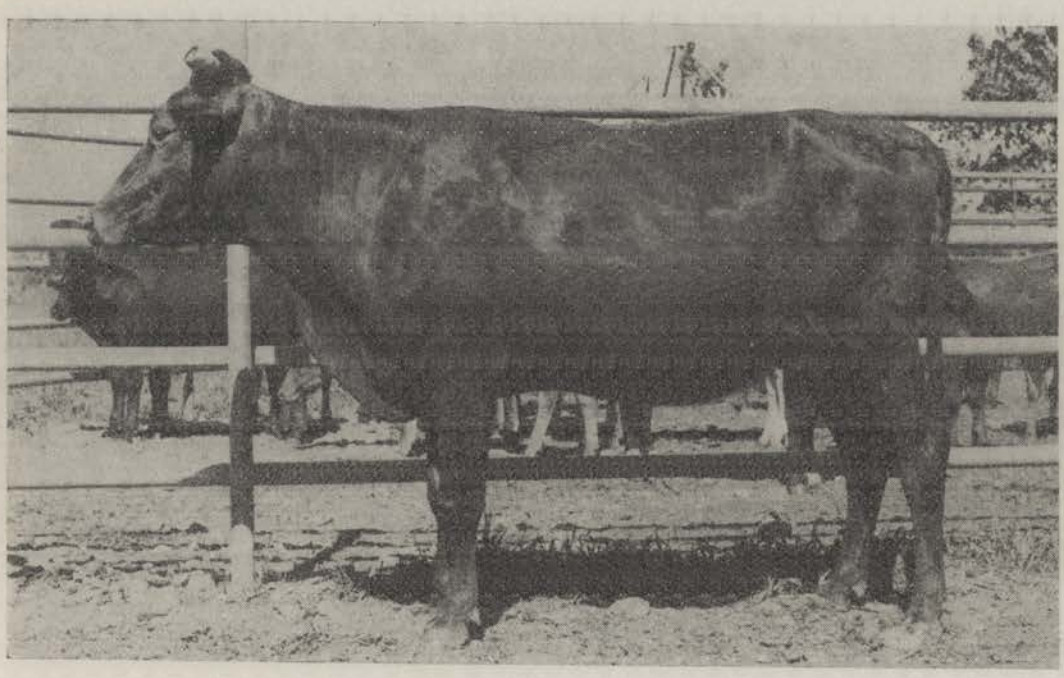

Plate II.—A.I.S. cow

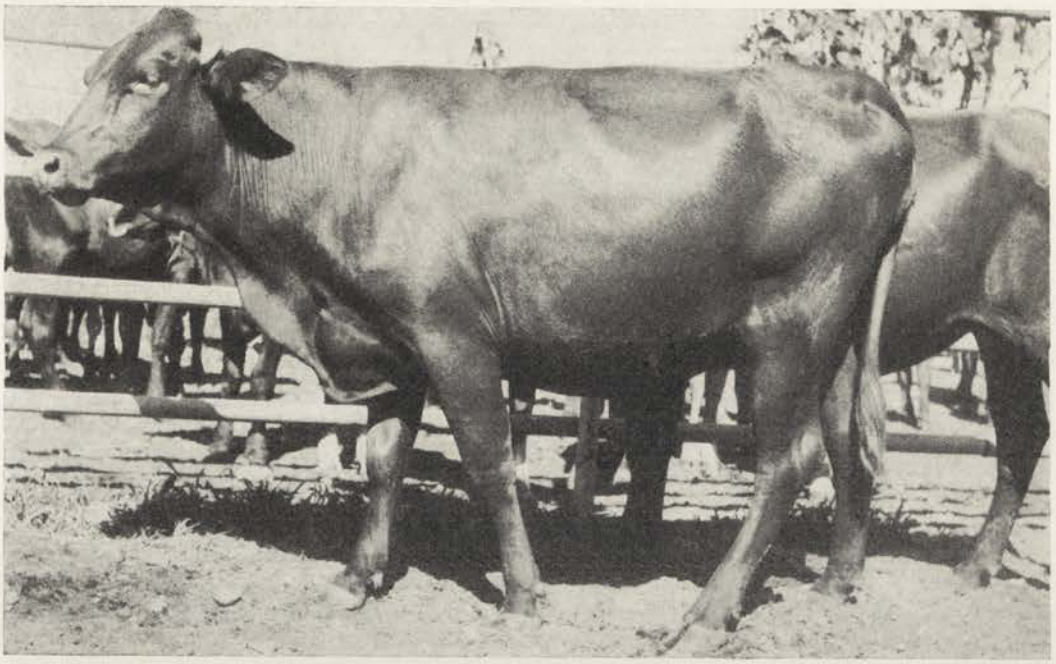

Plate III.—Progeny of the first mating

Plate IV.—First ¾ Brahman bull

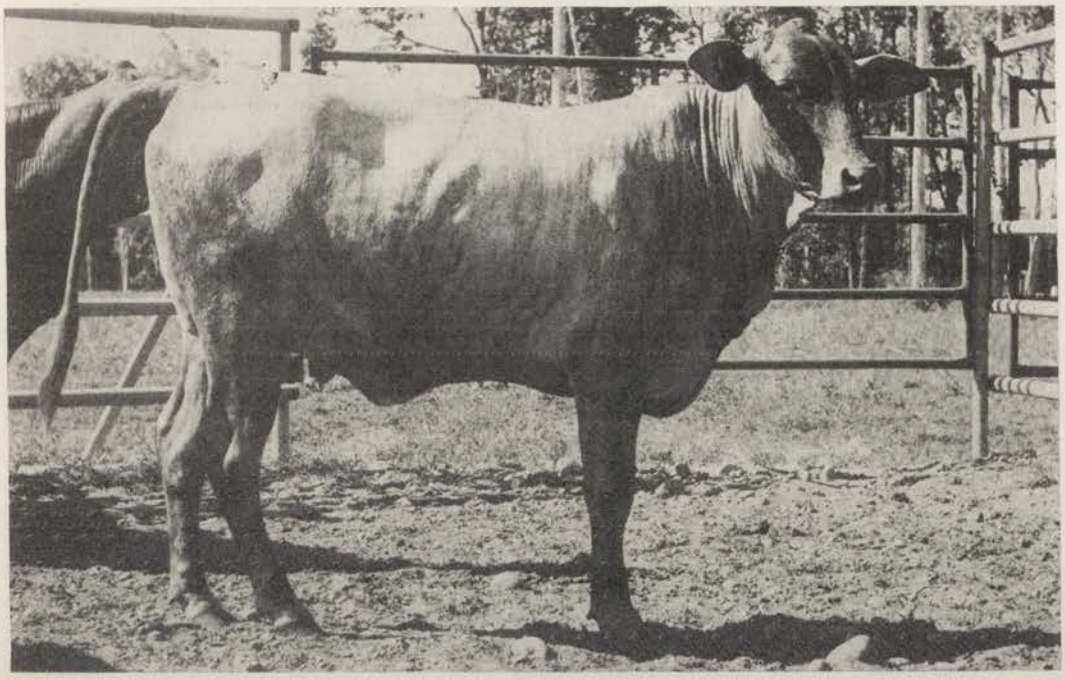

Plate V.—Progeny of the second mating, showing better conformation, fine short hair and loose skin folds

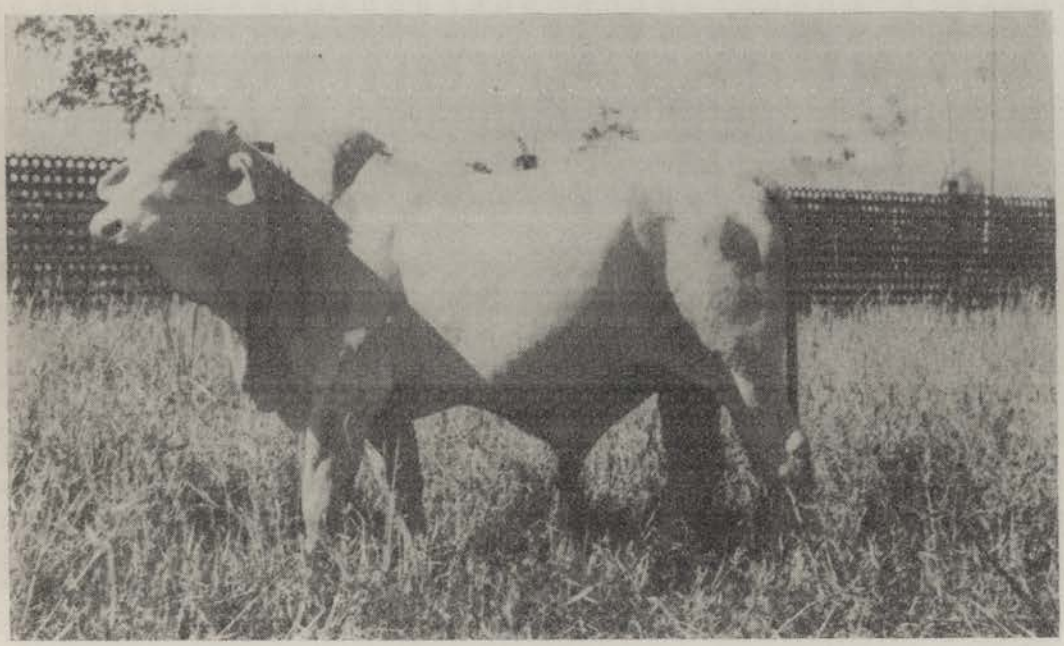

Plate VI.—Second $\frac{3}{4}$ Braham bull

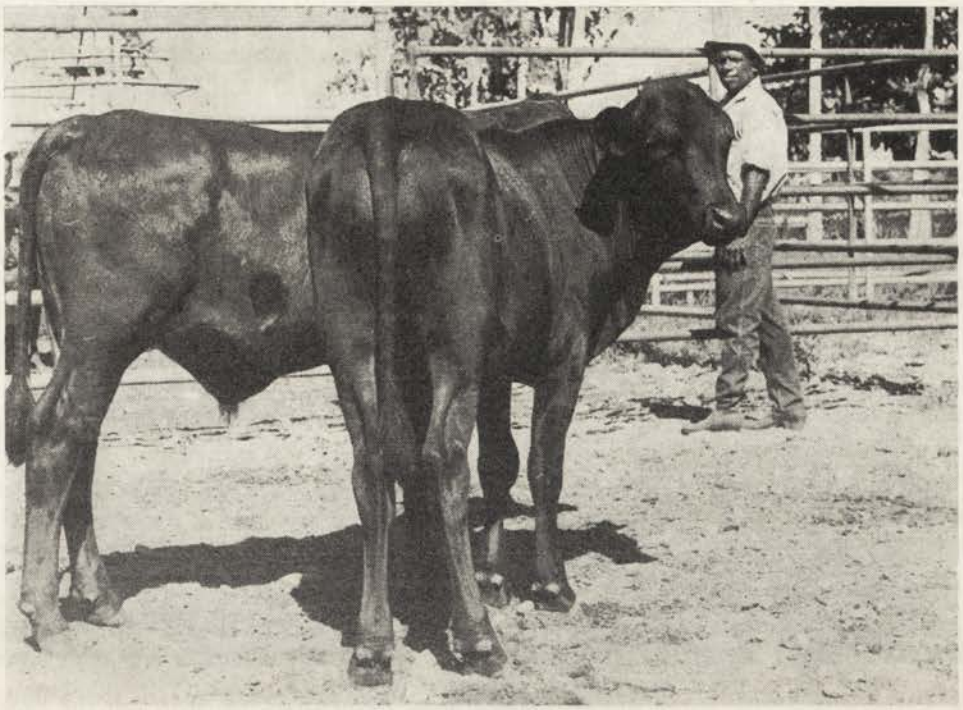

Plate VII.—Progeny of the third mating. These 7-month old calves show excellent hind quarter development and are already over 400 lb liveweight

be kept to an age of 2 years to reach 600 lb liveweight for mating. Most of the 1969 calves, however, exceeded 600 lb at 16 months of age. Thus the benefits of the up-grading programme can be seen not only in the photographs shown here, but also in the growth and reproductive performance of the cattle. On a commercial farm this would be more evident as increased profit.

The work being done at the New Guinea Lowlands Livestock Station, Erap, on the evaluation of different levels of Zebu blood, together with the results of further up-grading programmes on herds such as the P.A.T.I. herd, will help to show just how far these programmes can be taken. For example, it may be that too much Zebu blood will result in poor reproductive performance. The results shown by the P.A.T.I. programme, however, indicate that a considerable improvement can be gained by up-grading at least to the level of ½ Brahman.