Performance testing of Malawi Zebu cattle started in 1966 with emphasis on bull selection for gain and feed conversion efficiency with the ultimate objective of selecting breeding sires. Although there has been progress in livestock production in areas where the performance tested bull were issued, a lot more progress is expected from the modified selection programme which looks at bull as well as cow improvement for beef production through improved reproduction.

INTRODUCTION

Malawi lies between 9 and 17° south; 33 and 36° east. The population is 7.1 million and is growing at 3% annually (MANDA et al 1985). Ninety percent of the people live in rural areas and in 1980, 84% of the labour force was engaged in agriculture.

In Malawi, protein is obtained from meat, fish, beans and milk. The cattle population has risen from 0.3 million head in 1960 to 0.9 million in 1983 (ANON, 1983) with a ratio of cattle to people of 1:6. Reproductive and productive factors have been identified as limitations to the female reproductive efficiency which is exemplified by long calving intervals, low calving percentages, in some instances high calf mortality rate (prenatal or preweaning), seasonal fertility, low conception rates which should have resulted from inbreeding or indiscriminate mating and use of inferior males as sires for production and reproduction (fertility). Since 1966, selection within Malawi Zebu for production and reproduction purposes was emphasized on bulls, although there were some studied on cows’ performances at various levels.

Cow Performance.

There are very few incidences of abortions in the Malawi Zebu cows, but the major problem is low conception rates whereby a cow will have a calf once every other year. Hence selection for this character has been for those that calve every year. In the research herds, conception rates with first service can be as high as 85% and these usually calve without any problems. Ministry of Agriculture (1966-1985) observed a variation in calving intervals where younger females tended to have shorter calving intervals than older stock although they were not significantly different. Cows that calve every year
calving intervals of 333 days while those that calve every other year have calving intervals of 401 days. Hence it is very common to have varying calving intervals depending on the age of the cow.

Variations in birth weights in calves have also been observed in respect to dam age groups. Birth weights of 21.4, 21.2, 19.8 and 21.7 kgs were recorded for dams aged 3-4, 5-6, 7-8, 9 and above, respectively. When a comparison was made on heifers and cows that either calved or were barren the previous year, birth weights were 20.6, 20.3 and 21.1 kgs respectively. It appeared that cows that missed calving the previous year compensated by dropping heavier calves. Two hundred day corrected weaning weights, if dams are divided into four age groups as above, were 127.4, 126.5, 131.1 and 155.6 respectively. There appears to be a tendency of older cows having heavier calves at weaning and selection based on weaning weights has therefore reflected the mothering ability.

The recommended breeding period is December to March and with this system, the calving pattern for cows that calve has been 2, 53, 32 and 13% for September, October, November and December, respectively, with calvings concentrated in October. It appears that sexual activity is low immediately after bull exposure to cows. It has been reported by Koning (1977) that females were more fertile in September (a period when there is generally low feed supply) and that calvings were concentrated in June. It is worth mentioning that Koning worked with a sample of village cattle with year round breeding system while the research cattle are bred in December to March hence the calving peak in October.

However, Konings' findings clearly illustrate the phenomenon of long calving intervals in a way that if a cow missed a bull during the period of high sexual activity (fertility), it would not have a chance of conception until next year hence calving every other year.

Selection in rural smallholders' herds for breeding stock has not been practiced intensively. To reduce indiscriminate mating and inbreeding, farmers are persuaded to castrate their inferior looking males and sell or slaughter any stock with obvious defects. It was this need for having superior breeding stock that enhanced the Bull Performance test programme in mid 1960's.

Bull Performance Testing.

Characteristics of interest were selection for traits with direct economic importance and relatively high heritability for gain and feed conversion efficiency. Bull calves of about 250 days old were selected for performance testing immediately after weaning based on weaning weight (90% above group mean). The advantages were that the programme allowed a critical selection at an early age resulting in early culling, screening of bulls before going into the breed improvement programme, and provided a critical progeny appraisal of selected bulls that would be available for production of semen for use in artificial insemination. Since bull calves were housed in pens during performance testing, few numbers could be handled at a time and this was later reflected on slowness of dissemination of improved blood into commercial herds. Bulls were issued to farmers and some retained at the research stations when they reached an age of 2 1/2 years. In this bull performance testing, structural soundness was based on conformation score, girth, length, height, gain during the test period (120 days) and scrotal circumference. Conformation score
ranged from A to D with A as the best and D the worst. Girth, length and height averaged 150, 113 and 105 cm, respectively. Gain on test averaged 83 kg and scrotal circumference averaged 20 cm at yearling. In most cases calves that were lighter at the start of the test had heavier weights at end of the test, and similarly, calves that gained a lot of weight in pens lost weight or remained constant on pasture. After issuing the bulls to farmers, most of them did not perform very well due to changes in environment. However, it was reported from various farmers that there were observable improvements in cattle production as regards heavier birth weights. This could be explained as a recess of reaction in inbreeding. The shortcomings of this approach to selection were mainly that no detailed progeny testing let alone monitoring of the performance tested bulls were conducted. The performance testing in pens did not represent performance environment in the field (as explained by loss of condition or death of some bulls) which is basically on pasture. Furthermore, the bulls were not screened for reproductive capabilities in terms of sperm quality and quantity which is also a major character besides fast growth rates. The new approach to selection is designed to improve on the previous performance testing.

CURRENT SELECTION PROGRAMME

Performance testing in cows. In the new selection programme, cows to form an elite herd of Malawi Zebu are those that have at least three consecutive lactations and are selected upon the performance of their calves from birth to weaning. Prior to this, cows are condition scored and physically evaluated so that those cows with obvious defects are culled. The 200 day corrected weaning weights are adjusted for age of the dam by adding 15, 10, 5 and 0% of corrected weaning weights to the respective corrected weights if dams are of 2, 3, 4, 5 or more years, respectively (DALTON, 1983). Weaned calf weight has a medium heritability and is easy to measure and it responds to selection (DALTON, 1983). The general dams' reproductive efficiency, active ovaries, freedom from birth problems, calving intervals, survival, growth and mothering abilities are recorded. Weaned calf weights are used to rank each dam and comparing each individual with the average of the group each year.

Performance testing in bulls.

All bull calves from same crop year are left to run together on the pasture starting at weaning. Weaning weights are adjusted to 200 days and treated as in cow performance above. Initial culling of the bull calves is at one year old at which calves with obvious defects are culled. Structural soundness is monitored through condition scoring at which time scrotal circumferences and weight-band weight estimates are compared with scale weights to calculate a correlation factor. Adjusted weights, scrotal circumferences, condition scoring, weight-band weight estimates are carried out at 2 and 3 years of age. During the 2-3 year period, semen evaluation will be conducted looking at volume, concentration, percent live, colour and motility. Any bull calves performing badly at year one and two are culled while those reaching year three will be accepted as good performers unless they are sterile or reproductively defective. Furthermore, bulls with extreme wild temperament are culled. Additional variables for analysis will be correlation analysis for scale weights and weigh-band weights as this would facilitate weighing of cattle in rural areas where scales may not be available. Correlation between scrotal circumference and semen volume will be calculated. A selection index
based on weaned calf weights, 2 and 3 year adjusted weights will be obtained. The current programme is in its first year and its duration is 10 years.

CONCLUSION

There is variation in the type and performance within the Malawi Zebu and selection for growth rate and reproduction will improve the breed eventually. This programme once completed will shed light on the desirable characteristics the breed has for beef production and may lead to reduction in massive importation of exotic beef breeds.

REFERENCES


