DEVELOPMENT OF A BREEDING OBJECTIVE FOR BEEF CATTLE IN GHANA

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This thesis is dedicated to my late elder Sister,

Margaret Akua Addae Nsiah

who died on 21st. May, 1995, in the early stages of the thesis preparation

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ABSTRACT

Beef contributes slightly more than 30 % to Ghana's meat requirements. About 57 % of beef consumed annually is imported, with only 43 % being produced locally. Although Ghana has the potential for increased beef production, it has not achieved self-sufficiency in production. Constraints in animal production indicate that this impasse has resulted from lack of simple livestock production policy in the past. A policy on livestock production and development was passed recently, and the livestock industries in Ghana are undergoing major restructuring. The first requirement of such a programme which requires much research effort and planning is to identify the planned production, processing and marketing system(s). Using this information, the economic merit for various traits can be defined and subsequently the breeding objective for the individual livestock species.

The objectives of this work were to study the marketing and production systems of the beef cattle industry in Ghana and to calculate the economic values of traits of economic importance in N'dama and Zebu cattle. The results were used to draw guidelines needed for the genetic improvement of beef cattle in Ghana.

The marketing and production systems were studied using information in the literature. A computer model simulating life cycle production of breeding cow and growth performance of her offspring was developed to estimate economic values of survival, reproduction and growth performance traits, and food intake. Economic values were calculated based on difference between income and expense (profit) and with discount rates of 0, 10 and 20 %. They were defined as the marginal profit per cow per year resulting from 1 % change in the average level of each trait, whilst holding the level of all other traits constant. Income was partitioned between 3 year old bullocks and surplus heifers, and cull cow. Expenses included food, husbandry and marketing costs; these were calculated for all ages and class of stock.

The study of the production systems revealed that local cattle breeds are late maturing, with relatively small body size, poor reproductive and milk production capacities, but

are well adapted to their environment. On the other hand, Zebu have poor reproductive performance with large body size, medium milk yield and a relatively low adaptation. Trypanosomiasis was identified to be the most important environmental factor affecting the survival of cattle. Profit per cow per year of N'dama was on average 17 % more than that of the Zebu. Profit per cow per year almost doubled in both breeds, when food intake was removed from the objective, but the difference between the two reduced to only 7 % in favour of N'dama. Economic efficiency for N'dama and Zebu production systems were 31 and 24 % respectively. In general, survival traits had the highest economic value, followed by reproduction, growth rate and food intake, respectively. Predicted economic values for individual traits decreased with increasing discount rates. This was much more pronounced in reproductive traits than in all other traits. Removal of food intake from the objective tended to slightly increase the relative economic importance of reproductive traits and survival from birth to weaning, but trends in economic values almost remained the same.

It was concluded that smallholder cattle owners should be encouraged to use local breeds of cattle, whilst efforts are made to breed trypanotolerant larger cattle breeds.

Keywords: Beef cattle, Ghana, marketing and production systems, breeding objective, economic values, survival, reproduction, growth, food intake

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