THE LESSONS OF LIVESTOCK IMPROVEMENT FAILURE : REVISING BREEDING STRATEGIES FOR INDIGENOUS MALAWI SHEEP?

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INTRODUCTION

Species (NLDMP 1999). In 1992 Malawi traditional livestock production systems, possible interventions, genetic improvement programmes and assessing benefits to farmers and the society have recently been the focus of research in Malawi (Banda et al., 1998; Huettner et al., 2001; Gondwe et al. 2001) and elsewhere (Ayalew 2000; Karugia et al. 2000). Historically, central government stations initiated breeding programmes. In 1964, Malawi became independent, and subsequently development oriented livestock improvement programs were subsidised. The prevailing systems are mixed crop-livestock farming and farm animals are kept by more than 50 % of the two million smallholder families. The major species are cattle (618 000 animals), goats (1.6 million animals), sheep (100 000 animals) and pigs (approx. 200 000 animals) and the 80 % of rural households, which keep local types of poultry. Government Livestock Centres, which for forty years had been supplying exotic × local crosses to smallholder farmers for further breeding and multiplication, virtually collapsed (Simpson 2000). No attempt has been documented, with the exception of earlier colonial efforts, to improve the farm animal species, through selection within local populations. In the centralised economy any semblance of a national livestock policy seemed increasingly to be an ad hoc response to specific donor proposals. In many African countries development projects were the driving forces to replace exiting indigenous populations through “improved” animals (Drucker et al. 2001). Interventions at farm level are hampered by the complex constraints of an agricultural sector dominated by livelihood oriented rural communities and a serious lack of trained professionals at all levels. Having experienced the failure of a top-down oriented approach for the implementation of breeding programmes it is not surprising, therefore, to observe a trend towards participatory and community-based development activities taking the farmers perspective into account. The objective of this short paper is to contribute towards the understanding of the traditional sheep production system.

MATERIAL AND METHODS

Data were collected from 12 randomly selected villages within the south eastern lakeshore area of Mangochi district in Southern Malawi covering an area of 54 000 ha. Temperatures are highest in October averaging minimums of 18.2°C and daily maximums of 31.7°C, and lowest in July averaging 14.1°C and 26.8°C, respectively. Average annual rainfall is 780 mm but varies considerably depending on altitude and location (data from Dept. Meteorolog. Serv., Malawi 2002). One hundred and six sheep farmers were willing to cooperate after having been approached through the traditional authorities assisted by administrative and professional
district staff. Field and veterinary extension staff attended the farmer meetings to explain the planned survey and monitoring study. Forty-five farmers were able to participate in the lamb monitoring study. Sheep are raised and kept free-range throughout the dry season (May to October) but usually herded or tethered during the rainy season (November to April) to avoid crop damage. Rarely were any feed supplements offered during any phase of the reproductive cycle.

**RESULTS AND DISCUSSION**

More than 50 % of the interviewed sheep farmers (n = 106) were female (60 vs. 40 %), were relatively older people (46 years of age, SD 17.5) and a high percentage (72%) were illiterate. The use of recording sheets or any recording systems requiring literacy was not possible. None of the interviewed farmers had received any visit or advice from veterinary extension staff over the last three years. All farmers surveyed had never participated in the recording of their animals nor were aware of output oriented, formalised breeding goals or selection criteria.

**Husbandry and breeding management.** On average land holding size was small (1.4 ha, SD 0.65) and between one and 36 sheep were kept (mean 6.6, SD 5.2) on the surveyed farms. Small kraals (1.5 to 3.5 m²) with thatched roofs often raised above ground are mainly used. The recalled litter size at birth averaged 1.2 lambs (SD 0.4) and parity of the breeding females was estimated to be 2.8 (SD 1.7). On average 3.9 breeding females (SD 3.5) were recorded on surveyed farms. None of the farmers separated sheep by age or sex. Docking of female lambs was observed in 39 % of the visited farms but no other practices such as castration, weaning, animal health care, or selection for specific traits was observed. Castration to control breeding or mating was not an acceptable management practice in the prevailing free-range extensive system. Male and female sheep were not kept separate during grazing or overnight confinement. A total of 304 female and 80 male sheep were identified as being kept for breeding. The overall flock distribution showed that 42 % (n = 44) of all farmers do not own a ram and 44 % (n = 46) keep only one ram, whereas 39 % keep one or two ewes. Studies on goats (Banda et al., 1998) and poultry (Gondwe et al. 2001) have shown that traditional sire exchange systems are constrained to within villages or between relatives of the farmer. Assuming an average of 25 ewes and 6 rams in each of the twelve villages, no sire exchange and no adjustment for age the estimated approximate effective population size (Nₑ) (Falconer and Mackay, 1996), under communal free-range grazing would be less than 20 and the inbreeding coefficient higher than 5 % per generation. Decreasing reproductive and productive performance of small populations affects their competitiveness with other farm animals negatively over time and, finally, leads to extinction. We suspect that this process is ongoing because national population data for sheep show a slightly negative long-term trend (Banda et al., 1998). The lack of provision of services, a major prerequisite for intensified livestock breeding programmes, is one of the principal constraints. Farmers ranked lack of veterinary services (58%) and disease challenges (25%) highest closely followed by theft (17%). Most farmers use traditional medicine and devices to protect sheep from theft and sickness. In contrast, mortality of sheep was not perceived as a major problem (2.6%). Huettner et al. (2001) found in a study in northern Malawi a mean monthly mortality rate among small ruminants of 2.8%. The introduction of a community-based animal health service programme
reduced the mean monthly mortality rate by more than 50 % to 1.3% among users of the programme. However, mean small ruminant off-take rates did not differ significantly between users, partial-users and non-users of the programme. The authors reported a significant effect of the ecological zone resulting in a higher mortality rate in the Highlands than in the Plains or Lakeshores. Probably the higher degree of attention paid to small ruminants at the Lakeshores, which is strongly influenced by the Islamic religion compared to other areas, resulted in a significantly lower mortality rate.

Production and marketing. When farmers were asked for the reasons for keeping sheep the responses indicated a livelihood-oriented system. Almost all farmers intend to achieve income but only when cash is needed (n = 96). Sheep are also kept for home consumption (n = 72) or social and traditional reasons (n = 60). The average daily live-weight gain of sixty-eight lambs monitored from first weighing at an average age of 11 days to an average age of 94 days was 75 g (SD 20). Unpublished data from other field locations and on-station recording showed a similar growth rate for indigenous lambs in Malawi. The lamb survival rate was 91 % during the dry season when disease challenge is low compared to the wet season. It is of major importance to appreciate that this performance was basically achieved within the resource availability of the system and without any external inputs. Male, intact animals are preferred for slaughter for home consumption at ceremonies or for sale at the local market. For religious reasons castrated animals were not acceptable. If farmers decided to market animals 78% sold live animals to middlemen and 22% offered sheep meat at village markets. On average farmer revenue was 11.5 to 13.7 USD per animal but records for sex or weight of sold animals were not available. The decision to sell animals is determined by the need for cash income and not by the finishing stage of the animal or by specific market requirements. In 1973, similar behaviour was described for cattle farmers in southern Malawi (Mankhokwa and Oblitas, unpublished observation cited by Simpson, 2000), who sold 84% of animals only when cash was needed. However, cash income from the sale of animals is important to the survival of household members as soon as staple foods are finished, which usually occurs towards the end of the crop growing season. Livestock plays an essential role in this type of livelihood-oriented system. Any increased risk through less adapted animals would place the survival of the household members at risk.

CONCLUSION
The findings of this case study emphasize the value of sheep kept in small flocks in traditional low-input livelihood-oriented systems. Any intervention leading to the higher risk of animal loss resulting from less adapted genotypes would reduce the stability of the system. To improve food security through higher productivity of indigenous sheep or other livestock depends on the ability of communities to decide on and to implement appropriate breeding schemes in an increasingly degraded production environment. All other approaches have failed in Malawi as soon as external support or subventions were terminated. The most remarkable finding of the small study was, however, that all farmers were willing to cooperate and to provide information even when there was no intervention or any incentive offered. It is concluded, that a simple recording system should be feasible if ownership can be created among farmers. The most promising breeding strategy to improve and sustain the indigenous
sheep population is probably to address the issue of risk aversion through management measures and sire exchange initiatives rather than setting selection criteria for output-oriented traits, which cannot be matched without external inputs. A policy promoting and enabling communities to formulate a breeding goal and to form breeding groups could be the first step. The observed failure of crossbreeding programmes leads to the conclusion that the introduction of crossbred animals did not yield benefits to farmers under the Malawian conditions. It can be speculated that copying conventional breeding and selection strategies will not be functional without the integration of traditional behaviour and values. This is probably one explanation why so many breeding programmes have failed in the marginal environments of the tropics.

REFERENCES