

Evaluation of Malawi Zebu and its Crosses on Smallholder Dairy Farms in Mzuzu, Northern Malawi

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Abstract

The situation of smallholder dairy farmers was investigated in Mzuzu, Northern Malawi in 1998. Initially a baseline survey using a structured questionnaire was conducted among all 204 smallholder dairy farmers in the Mzuzu area. The intensity of management was scored in three groups using information on health management, housing, nutritional and reproductive management. The average farm size was significantly different ($P < 0.05$) between levels of management averaging 8.3 ha, 12.7 ha and 14.5 ha for low, medium and high intensity of management. The major constraints mentioned by dairy farmers were related to dairy cow's health management closely followed by nutritional problems and marketing issues such as low milk price and far market place. The dairy cow population of the area ($n = 379$) consisted of 9.5 % Malawi Zebu, 35.4 % F1 (Friesian x Zebu), 39.0% BF (Friesian x F1) and 16.1% BBF cows. The mean annual cash income from milk sales was 9241 MK (SD: 2140) with considerable variation between low (MK 4343), medium (MK 9035) and high intensity (MK 14 345) of dairy management. Contributions from milk sales ranged from 30 to 50% of total household income. In a subsequent study 40 lactating dairy cows from the same population were monitored over six months. An analysis of the variable costs (without labour) of milk production showed that Malawi Zebu were only 14 MK per year compared to F1 and BF ranging from 331 to 1549 MK depending on intensity of management. The annual gross margin (without labour) was 761 MK for Zebu at low intensity of management. F1 and BF cows ranged from 1662 MK to 3426 MK showing a positive correlation between gross income and intensity of management. The study results indicate dependencies between genotype and management level under smallholder dairy conditions. Preliminary results show the local Malawi Zebu appears to be highly efficient in a low-input low-output system. Therefore the population should be kept as an animal genetic resource. Further data on lifetime productivity and risk assessment are required before conclusions should be drawn.

Key words: smallholder dairy, Malawi Zebu, gross margin, Malawi

Introduction

Efforts to launch crossbreeding programmes to establish dairy cows for distribution to smallholder farmers date back to the late 50ties. After forty years of substantial governmental and international donor support approximately 8000 crossbred cows of various grades of Holstein-Friesian x Malawi Zebu produce on average less than 1000 kg per cow per year (Wollny et al., 1998). No data were available on the economic performance of the smallholder dairy farming system. The objectives of the study are:

- Evaluate the economic situation of smallholder dairy farms using Malawi Zebu and its crosses for dairying in Mzuzu milkshed area
- Analyse assumed interactions between management and genotype

Material and Methods

In the Mzuzu area all 206 dairy farmers were interviewed (structured questionnaire). The area comprises of 11 200 ha at an average altitude of 1 200 m above sea level. The mean annual temperature is 20⁰ C and the mean annual rainfall are 1750 mm with the rainy season lasting from November to April. Genotype of dairy cows was identified through investigating the origin of the animal. Intensity of management was scored in three groups using information on health management, housing, nutritional and reproductive management. In a subsequent study 40 lactating dairy cows from the same population were monitored over six months. Information on actual fixed and variable costs was collected directly from the area and used for gross margin analysis. The achieved milk price was MK 4.90 for delivery to the collection point or MK 10.00 when directly sold. Farmers keeping crossbred animals were supposed to deliver to the collection point.

Results

Table 1: Herd size of dairy farms by genotype (n = 379 cows)

	n	mean herd size	%
Zebu	36	8	9.5
F1 (Friesian x Zebu)	134	3	35.4
BF (Friesian x F1)	148	3	39.0
BBF	61	2	16.1

Table 2: Characteristics of dairy farms by management level (means; n=204 farms)

Level of Management	Number of farms	Size of farm (ha)	Income milk sales p.a. (MK)	Percentage of total income
I	79	8.3	4343	35
II	66	12.7	9035	49
III	59	14.5	14345	51

Ranking of cluster of constraints to dairy production identified by interviewed farmers (n = 206):

1. Animal Health problems (diseases, drug pricing and availability)
2. Genetics (lack of suitable dairy cows)
3. Labour
4. Nutritional problems (feed availability, grazing area)
5. Market and marketing (distance to market, milk price)
6. Theft (theft of animals)

Table 3: Mean daily milk yield by genotype and management level

Genotype	n	Management	LS means	S E
Zebu	9	I	1.70 ^a	. 30
F1	5	I	2.70 ^b	. 37
F1	5	II	5.80 ^c	. 14
F1	4	III	5.90 ^c	. 16
BF	6	I	6.80 ^d	. 21
BF	4	II	7.10 ^e	. 18
BF	7	III	7.50 ^f	. 13

Means denoted by different superscripts are significantly different (P<0.05)

Table 4: Actual gross margin (GM) per kg milk produced with and without assumed labour costs by genotype and management level over six months in MK.

Genotype	n	Management	GM 1	GM 2
Zebu	9	I	1.20	4.85
F1	5	I	2.81	4.08
F1	5	II	2.18	4.09
F1	4	III	1.55	3.06
BF	6	I	1.87	3.93
BF	4	II	1.96	3.84
BF	7	III	3.04	4.43

GM 1 = gross margin with feed, transport, drug and assumed labour costs in MK

GM 2 = gross margin with feed, transport, drug without labour costs in MK

Conclusion

The results suggest dependencies between genotype and management level under the prevailing smallholder conditions in Malawi. A lower efficiency was observed for BF versus F1 under low or medium level of management. If no labour costs are included the gross margin analysis indicate the Malawi Zebu cow appears to be the most efficient genotype in a low-input low output system. Further information on lifetime productivity, real costs of providing a crossbred dairy cow to the farmer and a risk assessment is required before conclusions should be drawn. It is highly recommended to maintain the indigenous Malawi Zebu as a genetic resource and promote its utilisation.

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References

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