Research Application Summary

Breed preference, selection criteria and production performance of dairy cattle in the selected smallholder dairy farms in Zimbabwe

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Abstract

This study identified breed preferences, production performance and selection criteria used in selecting dairy breeds in Zimbabwe. A questionnaire based survey was conducted on 109 smallholder dairy farmers in Zimbabwe and data were analyzed using SAS version 9.1.3. Crossbreds were preferred by farmers compared to pure indigenous and exotic dairy breeds. Milk yield and growth rate were the prefered selection criteria. There was no significant difference observed in the average milk yields/herd/ day in Guruve (8.98 ± 6.11), Marirangwe (9.54 ± 5.12) and Nharira-Lancashire (8.20 ± 5.13) smallholder schemes.

Key words: Breed selection criteria, growth rate, milk yield, Zimbabwe

Résumé

Cette étude a identifié les préférences de race, le rendement de production et les critères de sélection utilisés dans le choix des races laitières au Zimbabwe. Un questionnaire a été administré sur 109 fermiers de laiterie au Zimbabwe et les données ont été analysées en utilisant la version 9.1.3 de SAS. Des hybrides ont été préférés par des fermiers par rapport aux races indigènes pures et exotiques de leur laiterie. Le rendement en lait et le taux de croissance étaient les critères de sélection préférés. Il n'y avait aucune différence significative observée dans les rendements moyens en lait/troupeau/jour chez les petits exploitants de Guruve (8.98 ± 6.11), de Marirangwe (9.54 ± 5.12) et de Nharira-Lancashire (8.20 ± 5.13).

Mots clés: Critère de sélection de race, taux de croissance, rendement en lait, Zimbabwe

Background

Dairy farming is an important means to improve the nutritional status and income generation from poor African households. This has led to the implementation of several developmental projects in favour of dairying (Munangi, 2007). The concept of smallholder dairying was therefore adopted as a possible means

of increasing milk production to meet this demand and to improve milk supply, especially to the rural population situated far from the formal distribution centers (Mupeta, 2000). Smallholder dairy farming is characterized by low milk production due to the use of inappropriate cattle breeds, shortage of feed, inadequate managerial skills and poor disease control measures. The objective of the study was to identify breed preferences, production performance and selection criteria used in selecting the breeds in smallholder dairy sector.

Literature Summary

Generally, it has been pointed out that the selection of the specific breed is mainly due to its adaptability to harsh environmental conditions and disease challenge, and difficult access to other breeds (Janssen-Tapken *et al.*, 2004). Exotic breeds should be subjected to selection for specific production traits and an explanation of adaptation is needed Milk production in the tropics has been limited by the extreme climate, by low quality tropical feeds. Indigenous breeds such as *Mashona, Tuli* and *Nkone*, even under suitable environment with sufficient feeding, have generally low genetic potential for milk production. The low dairy production potential in indigenous cattle has prompted the use of exotic dairy breeds (Bebe *et al.*, 2003; Ngongoni *et al.*, 2006).

Study Description

A purposive sampling survey of 109 smallholder dairy farmers in *Guruve, Marirangwe* and *Nharira-Lancashire* in Zimbabwe was conducted between October and December 2009. Structured questionnaires through interviews were used for data collection. Statistical analyses were carried out using SAS software version 9.1.3.

Research Application

In total, proportion of farmers kept crossbreds in Guruve were 22.49%, 16.75% in Marirangwe and 14.36% in Nharira-Lancashire as compared to beef (29.69%) and dairy (16.75%) breeds. The abundance of crossbreds amongst the three districts signifies that they were preferred by farmers as compared to pure indigenous and exotic dairy breeds. This was because they were tolerant to heat and diseases in arid agro-ecological regions. There were significant differences (P<0.05) in the proportion of farmers who selected breeds on the basis of milk yield and growth rate between the three schemes. This implied that at least one of the three dairy development schemes had a higher proportion of farmers who selected their breeds on the basis of milk production and the growth rate of the breeds. There was no significant difference observed in the average milk yields

Table 1.   Percentage farmers using the different breeds and crossbreds.

	Guruve	Marirangwe	Nharira
Dairy breeds			
Red Dane	1.44	3.35	0.48
Jersey	1.91	1.91	0
Holstein-Friesian	3.35	2.87	0.96
Ayrshire	0	0.48	0
Total	6.70	8.61	1.44
Beef breeds			
Mashona	13.88	3.83	0.48
Brahman	3.35	0.96	0.48
Afrikaner	1.91	0	0
Hereford	0.48	0	0.48
Sussex	0	0.48	0.48
Tuli	0	0.48	0.48
Simmental	0	0	0
Nguni	0.48	0.48	0.48
Nkone	0	0.48	0
Total	20.1	6.71	2.88
Crosses			
Mashona x Beef breeds	6.70	6.22	1.44
Mashona x Dairy breeds	10.53	3.35	0
Exotic dairy breeds x Ex. dairy breeds	1.91	2.87	0.48
Exotic dairy breeds x Ex. beef breeds	2.87	3.83	1.91
Exotic beef breeds x Ex. beef breeds	0.48	0.48	10.53
Total	22.49	16.75	14.36

$X^2 = 138.36$ and $P<0.05$ ($P = 0.001$).

Table 2. Proportion of farmers selecting breeds on specific criterion by district.

Criteria	Proportion of farmers (%)			$X2$ (or H) Value
	Guruve	Marirangwe	Nharira-Lanc	
Milk yields	58.97	27.1	23.36	12.92*
Fat yields	50	50	0	0.96
Body weight	47.37	10.53	42.11	2.11
Growth rate	35.71	14.29	50	9.01*
Fertility	0	100	0	9.1
Disease tolerant	39.02	36.59	24.39	1.83
Feeding behavior	11.11	55.56	33.33	0.48
Draft power	64.67	12.5	20.83	5.82
Breeding	33.33	66.67	0	0
Beef production	70	0	30	0
Drought resistant	25	45	30	5.35

* Significantly different at $P < 0.05$. NB: The chi-square value approximates the Kruskal-Wallis statistic (H-statistic) when N>5.

(litres) per herd per day in Guruve (8.98 ± 6.11), Marirangwe (9.54 ± 5.12) and Nharira-Lancashire (8.20 ± 5.13) DDP.

Recommendations

Environmental condition should be considered when choosing breeds for dairy production. It is essential that extension strategies promote the use of appropriate breeds, ensure that selection criteria are well defined as well as their impact on improving milk production.

Acknowledgement

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