The Reasons, Herd Characteristics and Management of Indigenous Gogo Sheep in Central Tanzania

Nziku ZC*, Katule A², Chenyambuga SW², Mruttu H³

¹Tanzania Livestock Research Institute (TALIRI) - West Kilimanjaro, Tanzania
²Department of Animal Science and Production, Sokoine University of Agriculture, Morogoro, Tanzania
³Ministry of Livestock and Fisheries Development, Dar es Salaam, Tanzania

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*For Correspondence

Nziku ZC, Tanzania Livestock Research Institute (TALIRI)-West Kilimanjaro, Tanzania, Tel: +255 (026) 2320853.

E-mail: czabron@yahoo.com

ABSTRACT

A study was conducted to describe factors motivating farmers to keeping indigenous Gogo sheep in central Tanzania. Perceived reasons, herd characteristics and management aspects of indigenous Gogo sheep were studied. The information is essential on ranking decision in priority for sheep characterization in the country. A total of 84 sheep farmers in Chamwino, Kongwa and Mpwapwa districts of Dodoma region were interviewed using questionnaire customized to the study objective. The name "Gogo" sheep was found to be named after the tribe name "Gogo people", are the native people in Dodoma regional. Income and food security were the main reasons. The population of Gogo sheep were perceived to increase in the study areas. The sheep are treated under very low management production system, still they perform. Strategies to characterize and conserve the sheep strain should be considered since the sheep breed/strain seems to be important for the native Gogo people of central Tanzania.

INTRODUCTION

Tropical areas are endowed with a wide variety of indigenous sheep breeds that have evolved to adapt to the prevailing harsh environmental conditions and traditional husbandry system [1]. However, low genetic potential among the indigenous tropical small ruminants is often assumed and breeding plans to replace these breeds by exotic breeds or to cross them with exotic germplasm are often implemented unsystematically [1,2].

In Tanzania small ruminants contribute about 22% to the national meat supply. These animals are owned by about 30% of the agricultural households in the country [3]. Today it is estimated about 3.6 million sheep in the country [3]. As is the case with most livestock species in the country, sheep flock is mainly composed of indigenous breeds and small percentage of improved especially with Blackhead Persian (BHP) [4]. The Maasai, Gogo, Sukuma and Blackhead Persian (BHP) are the common sheep breed [4]. The Blackhead Persian is the most well-known exotic breed in the country.

Information on why farmers own certain breed or strain of indigenous animals, perceived population trends, and management practices are useful in many ways [5], for example characterization purposes. Characterization of a breed or strain is the first step towards sustainable use or conservation of its genetic resource. Studies have shown that the outputs of characterization would save the need and cost of conserving unnecessarily large groups of ecotypes which may essentially be similar.

MATERIALS and METHODS

Description of the study area

The study was carried out in Dodoma region, Central Tanzania. The region lies at latitude 4° to 7° South and longitude 35°

to 37° East. It is a region centrally positioned in Tanzania Most of the area in the region is a plateau with the altitude ranging from 830 to 2000 m above sea level. The Dodoma region has a Savanna type of climate, which is characterized by a long dry season experienced between late April and early December, and a short single wet season occurring during the remaining months.

Sampling strategy

Dodoma region was selected for the study on the basis that the region is populated with the indigenous Gogo sheep, the breed of interest. In this region three districts, out of six were selected based on geographical location to serve the purpose, namely: Chamwino, Kongwa and Mpwapwa district. A total of 84 farmers were interviewed using a structured questionnaire formulated to obtain the basic information of interest. The information collected included the reasons for keeping the Gogo sheep, perception on the population trends, and management practices. The farmers interviewed were those keeping either sheep only or both in combinations with other livestock species. Farmers were involved in distinguishing pure indigenous Gogo sheep from the other ecotypes in their flock.

Statistical data analysis

The Statistical Package for Social Sciences (SPSS, 2007 V16.0) a computer program was used to generate simple descriptive statistics, e.g. frequencies and percentages.

RESULTS

Reasons of keeping Gogo sheep

The reasons of Gogo sheep are summarized in **Table 1.** Many (37.4%) of respondents said for income generation, about (33.7%) claimed for food security, followed by keeping for prestige (14.5%) or exchange with cereals (14.4%) which received similar weight (14.5%). The respondents claimed that Gogo sheep have the following qualities physical appearance (58%), disease resistance (30.7%), prolificacy (10%) and docility (1.3%). Chi-square test showed no significance differences between the districts for reasons, although they differ in percentages.

Table 1. Reasons of keeping and qualities of Gogo sheep in Central Tanzania.

	Location and frequency (%)			
	Chamwino	**Kongwa**	**Mpwapwa**	**Overall**
Reasons				
Income generation	50.1	25	37.1	37.4
Food security	21.4	46.4	33.3	33.7
Prestige	21.4	7.2	14.8	14.5
Live bank	7.1	21.4	14.8	14.4
Total				100
Qualities				
Physical appearance	58.8	60	54.8	58
Disease resistance	34	27.2	30.1	30.7
Lambing rate	7.2	12.8	11.3	10
Docile	0	0	3.8	1.3
Total				100

Herd characteristics

Table 2 show herd characteristics of Gogo sheep in the study areas. High proportion of farmers (47.8%) were those with 1-10 sheep population followed by 22.2% (>20), 18.1% (10-15) and 11.9% (15-20). Results in this table also indicated 67.6% of the respondents felt the population trend of Gogo sheep increasing while 25% (decreasing), 4.9% (stable) and 2.5% (they did not know). Chi-square test showed no significance differences between the districts for herd characteristics, although they differ in percentages.

Table 2. Herd characteristics of Gogo sheep population in Central Tanzania.

	Location and frequency (%)			
	Chamwino	**Kongwa**	**Mpwapwa**	**Overall**
Herd size				
10-Jan	89.2	32.1	22.2	47.83
>20	0	22	44.4	22.13
15-Oct	7.36	32.14	14.83	18.11
15-20	6.6	10.7	18.5	11.93
Total				100
Trend of Gogo sheep				
Increasing	57.1	67.9	77.7	67.6

Decreasing	42.9	32.1	-	25
Stable	-	-	14.8	4.9
Don't know	-	-	7.5	2.5
Total				100

Gogo sheep management

The house type, grazing time and access to water managements of Gogo sheep in Central Tanzania are presented in **Table 3.** The majority of farmers in the study areas practiced an extensive livestock rearing system. Animals were grazed on communal land and housed at night. The following were common housing systems observed in the study areas:

1. Kraal fenced with thorned trees/shrubs (Plates 1)

2. Animals share same residential house, but in separate rooms

3. Animals' house built adjacent to the wall of the residential house and share the roofing (Plate 2)

4. Animals are kept inside the residential house and the farmer places its bed alongside the entrance corridor.

The Kraal system was the most dominant housing type 42.9% (Chamwino), 78.6% (Kongwa) and 66.7% (Mpwapwa). Sheep were also kept in the residential houses and this accounted for 57.1% (Chamwino), 21.4% (Kongwa) and 33.8% (Mpwapwa). The animal houses were found to be within the homestead premises. The houses for animals and humans were either made of wooden bars, mud or earthen bricks roofed with thatch grass or soil. However, few houses were found to be roofed with corrugated iron sheets **(Figure 1).**

Figure 1. Kraal fenced with thorned trees/shrubs (Left) and Animals' house built adjacent to the wall of the residential house and share the roofing (Right).

During this study it was noticed that free range system is practiced with a minimum control of herdsman. The grazing hours of their animals varies between farmers depending on the grazing location and nature of the grass and season of the year. The majority (92.4%) grazed their animals for more than 4 h per day and few (7.6%) graze for more than 4 h. Also 88.4% of the grazing animals have access to water at least once in a day and few (11.6%) had more challenges to water daily water access. Chi-square test showed no significance differences between the districts for sheep management, although they differ in percentages.

Table 3. Management of Gogo sheep in Central Tanzania.

	Location and frequency (%)			
	Chamwino	**Kongwa**	**Mpwapwa**	**Overall**
Housing				
Kraal type	42.9	78.6	66.7	62.6
Linked to residential house	57.1	21.4	33.8	37.4
Total				100
Grazing hours				
>4 h daily	-	-	-	92.4
<4 h daily	-	-	-	7.6
Total				100
Access to water				
Once daily	-	-	-	88.4
Less frequent	-	-	-	11.6
Total				100

DISCUSSION

Reasons for keeping Gogo sheep

The result **(Table 1)** shows the majority keeping the sheep as a means of income generation and food security for their families. The reasons are important for the people in the study areas. Since the area is so dry such that in some years they get

very erratic less rain [6] and the soil is affected by salinity and alkalinity. In that way farmers can sale the sheep and earn some income important to sustain their living. According to the studies, the sheep genetic resource is important to farmers because of its tangible benefits.

The mention qualities especially the physical appearance and disease resistance of Gogo sheep were absolutely meaningful under such societies. Under low input production system and harsh environments like in Dodoma, owning hard animals is important. But also both appearance and hardship are important elements motivating farmers to keeping such a breed or strain. In any breeding program, motivation of farmers is crucial part for sustainability. Especially, when setting up breeding goals those traits viewed important by the producers should be given priority.

Herd characteristics

Farmers own different animal species **(Table 2).** The dominant livestock types were cattle, goats, sheep, donkeys and chickens. The range of animal population at household level was goat (15-20), sheep (0-10), cattle (0-10) and donkeys (0-5). This herd sizes per household is lower than expected in traditional systems of agro pastoralists where large herds and flock are kept. Probably there are, shortage of grazing land. Contrary, may be was a result of the extended drought in 2009 which caused a massive deaths of livestock. According to Tesfaye [7] the populations of livestock are declining in traditional production systems due to rangeland degradation, frequent occurrence of diseases, drought, shortage of feed and water. The findings on livestock species owned by rural people were in conformity with those reported by Kunene [8]; farmers normally keep a diverse of livestock species. The findings by Chukwuka et al. [9] revealed that, small ruminants are useful to humans during periods of cyclical and unpredictable food shortages.

The observed increasing in population of Gogo sheep in the study areas, suggests that small ruminants have a potentially great role to play in the livelihood of the majority farmers in Central Tanzania. Similarly, the work by Mamabolo and Webb [10] and Solomon [11] indicated that in animal production systems the value of animal species increases in relation to its adaptation, capacity to make socio-economic contributions, capacity to fill market opportunities and potential for increasing productivity. Further it may be viewed that the adaptability characteristics of the sheep has influenced farmers in Central Tanzania to like the breed/strain. May be it is important now for breeders to establish a selective breeding program for the sheep in the area.

Management of Gogo sheep

The Gogo sheep were found to be kept together with other livestock species like goats and cow calves. At night they are sheltered because of thieves and predators (mainly hyenas). In the tropics predators like hyenas and foxes are the main contributors in losses of small ruminant stocks, especially young animals [12,13]. Two major forms of shelters are kraals made of thorns or trees and household houses with separate rooms for the animals. The kraal could be the simplest and less costly housing type but has high risk to both predators and thieves. The even worse, it involves clearing or bushes and hence causing negative effects to the environment. The houses are either made of woods, earthen bricks or mud- roofed with thatch grass, or soil, and few with corrugated iron sheets. The cohabitation of humans with animals may pose health hazards to predispositions of human zoonotic diseases. Sisay [14] indicated that poor animal sheltering favors diseases due to overcrowding. Communal grazing and watering of livestock is a common practice under extensive production practices [15,16]. However, uncontrolled mating, disease transmission and other risks may take advantage of this practice.

CONCLUSION

Gogo sheep have socio-economic and cultural values other than their physical products like meat, skin, manure, etc. The animals are considered as risk averters for rural families since they can be conveniently sold off to get money for family needs.

It is recommended that characterization of the Gogo sheep is crucial. Both quantitative and molecular genetic studies on the breed for comparison with other indigenous sheep breeds/strains are required.

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