PRELIMINARY PRODUCTION AND REPRODUCTION PERFORMANCE EVALUATION OF MID RIFT VALLEY AND BORAN SOMALI GOATS

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Abstract

Preliminary production and reproduction data from the program at the Adami Tulu Agricultural Research Center to characterize indigenous goats were collected and analyzed using descriptive statistics. Conception rate and kidding percentage were 79 and 74% and 124.6 and 100% for Mid Rift Valley and Boran Somali does, respectively. The kid mortality rate was 22 and 10% for Boran Somali and Mid Rift Valley goats, respectively. Mean birth, weaning, 6-month and yearling weights were 2.32 ± 0.46, 7.17 ± 1.6, 9.3 ± 1.72 and 13.04 ± 2.59 kg for Boran Somali and 1.5 ± 0.46, 6.32 ± 2.77, 7.87 ± 1.62 and 12.85 ± 2.55 kg for Mid Rift Valley kids, respectively. Mean daily and lactation (12-week) milk yields for Mid Rift Valley does were 0.415 ± 0.118 and 34.89 ± 9.94 kg, and 0.368 ± 0.105 and 30.87 ± 8.8 kg for Boran Somali does, respectively. For the second kid crop in this program, the mating season will be arranged so that harsh environmental conditions occur during gestation, in order to reduce kid mortality.

1. Introduction

Goats inhabit a wide range of environments, extending from tropical to cool temperate climates. The goat population of Ethiopia ranks high both in Africa and the world. According to Zelalem and Fletcher (1993), Ethiopia hosts 18 million goats. The majority of the goat population is in large flocks in arid and semi-arid lowlands, where they are kept by pastoralists in the southeast and west for milk production, slaughter and sale.

In the central highlands of mixed crop livestock farming system, small ruminants account for 40% of cash income and 19% of household meat consumption (Zelalem and Fletcher, 1993). Furthermore, goats are kept for a variety of economic reasons including savings, investment, security and insurance and social functions. About 15-15.5 million skins are produced annually, of which 80% of goat skins are recovered at the market. But, present productivity levels of goats are far below potentials, mainly because of the lack of attention given to small ruminant development efforts. Productivity per individual has often been reported to be very low. For example, annual meat production per animal slaughtered is only 8-10 kg, and milk production from indigenous goats is less than 0.5 kg/day even during early stages of lactation.

Despite the huge resource potential, production purpose and export opportunities, the production of goats remains an unexploited area of livestock production in Ethiopia. Although there are severe environmental constraints to increase goat productivity, there is considerable potential for goat production and research in the Mid Rift Valley, where goat milk and meat are both valued commodities.

In order to plan the rationale use of goat resources, a systematic description of the goat types is necessary. Breed characterization through performance evaluation, phenotypic characterization and DNA molecular genetic characterization is the first step in the urgent mission of genetic resource conservation. In 1990, FARM Africa began a national goat breed survey of Ethiopia, with the major objective of identifying and characterizing indigenous goat types in Ethiopia.

To formulate a sound goat improvement program through research and extension, efforts must be made to study the production and reproduction performance of indigenous goat types. In this regard, on-station and on-farm performance evaluation of animals deserves special attention. Thus, this study was conducted to assess the production and reproduction performance of Mid Rift Valley and Boran Somali goats and generate baseline information for future research.

2. Materials and Methods

2. 1 Description of the study area

2.2. Location

The Adami Tulu Agricultural Research Center is located in the Mid Rift Valley of Ethiopia, approximately 170 km south of Addis Ababa on the highway leading to Awassa. It is situated at an altitude of 1650 m, 7º9'N latitude and 38º 7'E longitude.

2.3. Climate

The area has an average rainfall of 760 mm and maximum and minimum temperatures of 27 and 12.7ºC, respectively. The soil is fine sandy, silt and clay with a proportion of 34:48:18.

2.4. Animals

This is a report of results obtained from the first kid crop of the main goat breeding program at the Adami Tulu Agricultural Research Center. The Mid Rift Valley and Boran Somali goat types (1.5-2.0 years old) were involved in this program, which was designed for 5-10 years.

2.5. Flock management

All experimental goats were allowed to graze outdoors during the day (08.00-16.00 hours) and housed during night in pens with wooden walls and roofs of corrugated sheet metal. In all cases does and the bucks were herded and housed separately. The flock grazed natural pasture throughout the year.

The mating was conducted from September 17 to October 29, 1998 for the Mid Rift Valley goats and from November 10 to December 21, 1998 for the Boran Somali goats. The total number of does in the breeding program was 102 and 120 for the Mid Rift Valley and Boran Somali, respectively. Average mating weights were 24 ± 2 and 31.6 ± 3.2 kg for Mid Rift Valley and Boran Somali, respectively. Bucks were allowed to pass the night together with the respective groups they were assigned to. Sire to dam ratios were 1:17 and 1:15 for Mid Rift Valley and Boran Somali, respectively. Finally, data for conception rate, kid mortality, kid birth, weaning, 6-month and yearling weights and daily and lactation milk yields were collected and analyzed using descriptive statistics (Agarwal, 1996).

3. Results and Discussion

Reproduction performance of the two goat types is given in Table 1. Out of the 102 young Mid Rift Valley female goats in the program, 81 were served and of the 120 Boran Somali females only 82 were served. Conception rates were 79 and 74%for Mid Rift Valley and Boran Somali, respectively. Sixty-one Mid Rift Valley goats gave birth to 76 kids between February 10 and March 20, 1999, with a 24.59% twining rate, while 56 Boran Somali goats gave birth to 56 single-born kids between the April 3 and June 1, 1999.

The mean litter size for Boran Somali does of 1.00 is similar to that reported by Girma (1996) and FARM Africa (1996). Girma (1996) in a study on performance potential of Somali goats and their crosses with Anglo-Nubians reported a mean litter size of 1.01 for Somali does; FARM Africa (1996) from the national goat breed survey of Ethiopia reported a 3% twinning rate for the same goat type. The low litter size of Boran Somali does as suggested by Girma (1996) has probably resulted from selection against multiple births by Somali and Boran pastoralists who believe that a doe with twin kids is less fit to the arid ecosystem as well as to the society where goats produce a large part of the milk for home consumption.

Table 1. Reproduction performance of Mid Rift Valley and Boran Somali goats.

Variables	Boran Somali	Mid Rift Valley

Number of does joined	120	102
Number of does served	82	81
Number of does kidded	56	61
Abortion/still births	4	3
Conception rate (%)	74	79
Kidding %	100	124.6

The live weight change and milk yields of the two goat types are presented in Table 2. Average daily and lactation (12-week) milk yields were 0.368 ± 0.105 and 30.87 ± 8.80 kg for Boran Somali and 0.415 ± 0.118 and 34.89 ± 9.94 kg for Mid Rift Valley goats, respectively. Average daily and lactation milk yields of Boran Somali goats were lower than found by Getnet et al. (1999) but slightly greater than findings of Lemma (1999). Getnet et al. (1999) reported an average daily milk yield of 1.03 ± 0.14 kg and lactation yield of 86.52 ± 11.76 kg for Boran Somali does supplemented with wheat bran, whereas Lemma (1999) noted milk production of 224.74 ml/day in early lactation for the same goat type. Low milk production of Boran Somali goats in the current study could be because does kidded at the onset of the main rainy season, which is characterized by cool, chilly and rainy days with short daily grazing periods that might have forced does to allocate more of their dietary energy for body maintenance than for milk production. Moreover, as it is true for other livestock species, milk yield during the first lactation is lower than in later lactations.

The average birth, weaning, 6-month and yearling weights of the two breeds were lower than observed by Skea et al (1990). In this study at Marimanti, Skea et al. (1990) observed 3.36 and 16.93 kg birth and weaning weights, respectively. Similarly, Lemma (1999) in his study to evaluate Somali and Gudji goats reported higher values (3.29 and 10.48 kg) than in the present study.

Low doe milk yield and unfavorable environmental conditions at kidding time and in the subsequent period might have been responsible for relatively low weights and high kid mortality. In the current study, the preweaning mortality rate was 22% for Boran Somali and 10% for Mid Rift Valley kids. This may be because dam milk yield was very low to support the growth of kids, causing kids allocate a large proportion of dietary energy for maintenance rather than growth. In addition, the period from birth to weaning is generally very critical to kid survival. For this reason the mating season for the second kid crop of this program will allow harsh environmental conditions to occur during gestation, in order to reduce kid mortality.

Table 2. Live weight changes and milk yield of the Mid rift valley and Boran Somali goats.

	Breed/Type				
Parameter	Boran Somali			Mid Rift Valley	
	Male	Female		Male	Female
Live weight, kg					
Birth	2.28 ± 0.54	2.36 ± 0.51		2.00 ± 0	1.00 ± 0
Weaning	7.38 ± 1.80	6.89 ± 1.20		7.46 ± 1.85	6.32 ± 2.77
6 months	9.50 ± 2.11	9.11 ± 1.34		8.35 ± 1.77	7.36 ± 1.29
Yearling	13.38 ± 3.40	12.68 ± 1.90		13.93 ± 2.72	11.76 ± 1.87
Milk yield, kg					
Daily	0.368 ± 0.105			0.415 ± 0.118	
Lactation	30.87 ± 8.80			34.89 ± 9.94	

Weaning weights for Mid Rift Valley goats were recorded at 92.46 ± 3.31 days of age with a range of 85 to 98 days, and were at 90.18 ± 2.02 days with a range of 87 to 93 days for Boran Somali kids. While 6-

month weights for Mid Rift Valley goats were determined at an age of 185.69 ± 3.07 (range of 179 to 191 days), and for Boran Somalie goats were at 183.81 ± 5.76 days (range of 176 to 193 days). For yearling weights, average ages were 369 ± 3 days with a range of 361 to 376 days for Mid Rift Valley and 359 ± 5 days for Boran Somali goats with a range of 352 to 370 days.

Male Mid Rift Valley kids were heavier than female kids, and singles were also heavier than twins at birth and weaning. At weaning male Boran Somali kids were heavier than female kids. This is similar to findings of Skea et al (1990). In the study on Somali kids at Marimanti, Skea et al (1990) found weaning weights of 17.45 and 16.32 kg for male and female kids, respectively.

Table 3: Mean birth and weaning weights (kg) of Mid Rift Valley kids by sex and birth type.

Birth type	Birth weight	Weaning weight
Single	1.69 ± 0.43	7.00 ± 2.00
Male	1.73 ± 0.38	7.71 ± 1.92
Female	1.63 ± 0.50	7.00 ± 1.61
Twin	1.23 ± 0.37	7.00 ± 2.00
Male	1.20 ± 0.32	6.91 ± 1.64
Female	1.25 ± 0.41	6.20 ± 1.74

4. Conclusion

Generally, production (kid live weight changes) and reproduction (daily and lactation milk yields) performance of the two goat types studied were low. Therefore, appropriate management and(or) interventions are necessary to increase the production and reproduction performance.

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