

Study of flock structure and some morphological, productive and reproductive characters of Sudanese Desert goats in North Kordofan State-Sudan

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ABSTRACT: The current study was conducted during 2013 with the aim of studying flock structure and some morphological, productive and reproductive characters of Sudanese Desert goats in North Kordofan State. Data were analyzed using SPSS and results were presented mainly as frequencies and descriptive statistics. The average flock size was 23 heads and mainly composed of females (86.38%). The majority of studied animals are black in colour with fine short hair and long pendulous ears. Forehead is flat, profile straight or slightly dished. Most owners (64.32%) herded goats alone while some of them have mixed herds with cattle or camels. Feeding management depended mainly on natural pasture in addition to crop residues. The average age of puberty was 5.84 and 5.32 and that of first service was 6.46 and 5.94 months for males and females, respectively. Multiple births are common, age at first kidding was about 10.54 months, and the average kidding interval was about 210.52 days. Does are usually milked in early morning with a daily yield of 0.46 - 0.49 Kg. weaning age ranging from 2-4 months after a lactation period of about 108-124 days. The mean body weight of studied animals was 22.70 and 23.84 Kg for males and females, respectively. Body measurements for males and females, respectively, were height at withers (67.03 vis 68.37), body length (57.65 vis 57.10), heart girth (64.96 vis 67.06), length of neck (29.91 vis 30.24), ear length (21.37 vis 22.36), horn length (12.70 vis 15.34) and tail length (14.32 vis 14.45 cm).

Keywords: Desert goats, flock structure, doe, pendulous ear.

INTRODUCTION

The origin of Sudanese Desert goats is Savanna type, similar to West Africa long-legged. They are distributed north of 12 N but north of 10 N in Darfur and western Kordofan. They are reared under traditional agro-pastoral and pastoral systems in arid and semi-arid areas of western Sudan particularly in Kordofan region where they are well adapted to the local environmental conditions. During transhumance and nomadic migration they even extend into hyper-arid (Wilson, 1991). They are large animals, light grey often with brown markings and have small pendulous ears (Gaili, 1976). They are considered as an important integral component in most traditional production systems. Sudanese Desert goats are known as meat producing animals especially in rural areas. Goats in North Kordofan State are estimated at 3591 thousand heads forming about 27.43% of total farm animals in the state (Ministry of Animal Resources and Fisheries, 2009). Information about goat flocks and their husbandry under traditional system of production is somewhat lacking. The main objective of this work is to study and describe flock structure and some morphological, productive and reproductive characters of Desert goats in North Kordofan State.

MATERIALS AND METHODS

Study area

The study was conducted in Shiekan Province, North Kordofan State (longitudes 26:56' – 32:19' E and latitudes 12:13' – 16:34' N) during 2013. Rain fall is about 100-450 mm/year and least temperature, during winter, is about 10 °C and maximum about 42 °C during summer (El Obeid Meteorological Station, 2012). The vegetation includes that of low rain savannah in both sandy and clay soils. Rain-fed crops farming and traditional livestock raising are the main economical activities in the province. Small to medium flocks of goats usually graze pastures around villages and may sometimes fed agricultural by-products, while most large flocks move with herds of cattle and camels within the region.

Data collection

The study included a field survey (Body weights, measurements and some morphological characters) in addition to questionnaires. Nine villages were selected randomly to represent rural areas of the province. The total number of animals studied was 705 heads of different ages and sexes. Animals were grouped according to age into 4 categories (less than one year; one year; 1-2 years; 2-3 years and more than 3 years old). Then the following parameters were taken.

Body weights

A spring balance (50 Kg) was used for recording body weights.

Body measurements

A measuring tape was used for recording the following body measurements according to Owen (1977)

- 1- Height at withers (Hw.): from the highest point of the withers to the ground surface at the level of the front feet.
- 2- Body length (BL.): measured from the tip of the scapular to the pin bone
- 3- Heart girth (Hg.): measured around the circumference of the chest just behind the forelegs and along the xiphoid depression.
- 4- Length of the neck (NI.): from the atlas joint to the first thoracic spinal process.
- 6- Ear length (EI.): from the base of the ear at the skull along the dorsal surface to the tip of the ear.
- 7- Tail length (TI.): from the base to the tip of the tail.
- 8- The length of horns (HI.): from the base to the tip along the frontal surface.
- 9- Some morphological characters (Coat colour, hair and face shape) were also recorded.

The questionnaires

200 questionnaires were designed and distributed randomly to owners regarding animal husbandry and some productive and reproductive characters of Desert goats. Statistical analysis was carried out using SPSS (Statistical package for Social Sciences, version 11.5, 2006), and the results were presented mainly as frequencies and descriptive statistics.

RESULTS AND DISCUSSION

Table (1) represents flock structure. It can be noticed that the flock is mainly (86.38%) composed of females with different ages and the percent of animals in the flock increases with age. This may be due to the role of goats in the study area where they are raised mainly for milk production, and old animals are always productive compared with younger ones. Also males more than 6 months old are almost slaughtered for local consumption as villagers prefer young goat meat. The general picture resulted from the questionnaires is that adult females formed most of the flock (61.7%) followed by female kids (24.68), male kids (7.1%) and lastly adult males (6.52%). Wilson (1991) reported flock size of about 20 goats per household in South Kordofan, and the flock structures related to milk or meat production are dominated by females, especially in age groups over 6 months. The author added that in South Darfur (Sudan) 46.5 % of flock < 6 months and total females 75.9 % (49.8 breeding > 10 months). Also in South Kordofan agro-pastoral sedentary system 38 % < 6 months; 15.7% 6-12 months (females 11.6% and males 4.1%); 32.7% 13-24 months (females 30.6% and males 2.5%); 13.2% > 24 months (all females) 55.4% breeding animals.

Table 1. Flock structure of Desert goats in North Kordofan state – Sudan

Category	Total No.	%	No of females	%	No of males	%
< one year	96	13.62	77	80.21	19	19.79
One year	128	18.16	97	75.78	31	24.22
1-2 years	135	19.15	124	91.85	11	8.15
2-3 years	141	20.00	119	84.40	22	15.60
3 years >	205	29.08	192	93.66	13	6.34
Total flock	705		609	86.38	96	13.62

The majority of animal studied were almost black in color with long pendulous ears. Only few goats (15.4%) have other colors such as brown or white. The classical color of Sudanese Desert goats is light grey often with brown markings (Mason and Maule, 1960); variable from white to black, grey common (Wilson, 1991) and also they may have variable colors ranging from white through light shades of grey and silver to fawn, brown, red and black or combination of these colors (Wilson and Clark, 1975). Also Abdurrahman and Ahmed (2007) stated that Sudanese Desert goats have variable colors from white to black or brown or combination of colors. But during the last few years producers of North Kordofan began to shift to dairy goats by crossing their Desert goats with Nubian goats which are characterized by black color and famous as the best milk producing goats in the country. The present results are similar to those of Wilson and Clark (1975), Wilson (1991) and Abdurrahman and Ahmed (2007) concerning the appearance of head and animal coat. Forehead is flat, profile straight or slightly dished while the coat has fine, short hair, but some goats have long hair on their hind quarters.

Concerning the husbandry of goats in the study area, most owners (64.32%) herded goats alone while 35.68% of them have mixed herds of goats with sheep, cattle or camels. Flock size in the study area is about 23 heads which compares favorably with Wilson (1991) and Abdurrahman and Ahmed (2007) who reported flock size of about 20 heads in Kordofan. All responders agreed on their dependence on natural grazing in addition to crop by products. Few of them, sometimes, use concentrates. The average age of puberty was 5.84 and 5.32 and that of first service was 6.46 and 5.94 months for males and females, respectively. Age at first kidding was found to be about 10.54 months. Constantinou (1981) concluded that age at puberty depended mainly on age and body weight, although under primitive husbandry does did not kid until two years old. He also found that weight was most important than age in determining time for sexual maturity. Wilson (1991) reported first kidding at 290 days of age with kidding intervals of 238 +41 days in Southern Darfur traditional system and about 9 months in Kordofan. Abdurrahman and Ahmed (2007) reported that first kidding in Darfur is in about 10 months old. In the study area kidding can happen all through the year following random mating. But most breeders prefer kidding during winter. Average kidding interval was 210.52 days, ranging from 196 – 392 days. Also Abdurrahman and Ahmed (2007) reported kidding interval of about 283 days in Kordofan. Multiple births are common in the study area; 59.4% single and 40.6% twin in first kidders and 43.5% single, 51.2% twin and 5.3% triplet in multiparous females. These results are almost matching with those reported by Wilson (1991) in Southern Darfur (69.8% single, 30.2% twin in first kidders and 39.0% single, 54.5% twin, 6.5% triplet in multiparous females). The author also reported 9-10 kids as lifetime production in Southern Darfur and 4-7 in Kordofan. Does are usually milked in early morning and sometimes may be milked in late evening with a daily yield of 0.46 – 0.49 Kg. weaning age ranging from 2- 4 months after a lactation period of about 108 – 124 days. All tropical breeds of goats are dual-purpose, milk and meat producers. Shkolink, (1980) reported yields of over 2 Kg daily from Black Bedouin does (Desert goat) weighing only 15-25 Kg.

Table (2) shows body weights and body measurements of male Desert goats, while table (3) shows the same parameters of female Desert goats. The mean body weight of males was 22.70 Kg, while that of females was 23.84 Kg. The differences in sex weights can be explained on the ground that most males kept in flocks are less than 6 months old while females may be as old as four years. These results are somewhat differ from those of Wilson (1991) and Abdurrahman and Ahmed (2007). The first author reported an average weight of 40-60 Kg for bucks and 32.7 for females. While the next authors reported the same weight for males and 27-32 Kg for does. Mohamed and Elimam (2007) reported body weights ranged between 15.8 and 35 Kg for males and 14.4 and 19.2 Kg for females at one and four years of age, respectively, in Desert goats of Elobeid area (North Kordofan). Ismail, (2011) reported range of body weights from birth to one year were 2.42-20.6, 2.6-22.3 and 2.53-21.6 Kg for females, males and overall mean. With the exception of horns, there were no big differences between males and females body measurements in the study area. Wilson (1991) described Sudanese Desert goats as large body size (65-85 cm), with prominent withers (male 69-83; females 65.5 cm). Length of ears in the study area was 21.37 and 22.36 cm and that of horns was 12.70 and 15.34 cm for males and females, respectively. Wilson (1991) and Abdurrahman and Ahmed (2007) reported that ears of Sudanese Desert goats are pendulous and measure about 12-20 cm in length. The authors also showed that 95% of Sudanese Desert goats have horns of about 30-35 cm long.

Table 2. Body weights and measurements of male Desert goats* in North Kordofan state – Sudan

Item	Body wt. (Kg)	Height at withers (cm)	Body leng.(cm)	Heart (cm)	girth (cm)	Neck (cm)	leng. (cm)	Ear leng.(cm)	Horn leng.(cm)	Tail leng.(cm)
Mean	22.70	67.03	57.65	64.96		29.91		21.37	12.70	14.32
S.D.	4.618	6.567	5.766	5.093		3.162		2.679	1.485	1.567

*= 96

Table 3. Body weights and measurements of female Desert goats* in North Kordofan state – Sudan

Item	Body wt. (Kg)	Height at withers (cm)	Body leng.(cm)	Heart (cm)	girth (cm)	Neck (cm)	leng. (cm)	Ear leng.(cm)	Horn leng.(cm)	Tail leng.(cm)
Mean	23.84	68.37	57.10	67.06		30.24		22.36	15.34	14.45
S.D.	4.441	6.488	5.497	6.069		3.614		8.400	6.517	1.791

*= 609

CONCLUSION

The results concluded that, flock size and structure of Sudanese Desert goats are almost the same in North Kordofan rural areas, and the management system is traditional pastoralist depending mainly on natural pasture. Hence negative effects on production and reproduction may be expected. Effective extension efforts combined with health services are needed to improve production and reproduction in the study area.

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