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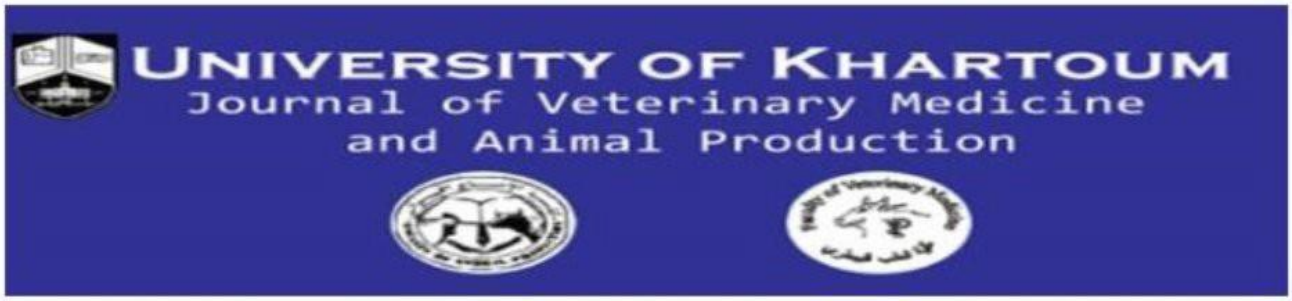

Management Practices and Body Characteristics of Sudan Desert sheep (Hamari type) Raised on Range condition at West Kordofan State Sudan.

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Abstract

The production potential of Hamari sheep, particularly flock size, structure, and management practices under range condition were investigated in Geibash locality, West Kordofan State, Sudan. The flock size was of three types, small (56), medium (156), and large (403). Breeding females constituted 50% of the flock, breeding male ranged from 3 to 5%, castrates represented 22 to 23% in small and medium flocks and 31% in large ones. Suckling lambs ranged from 5 to 7%, while weaned lambs constituted 3 to 8% in the different flocks.

Management practices included, weaning, castration, and branding of young which were done at the third month of age. Castration practice was mainly to control breeding and fattening. The main methods used were crushing of spermatic cords between two wood rods (92.1%), and the Burdizzo 7.9%. Identification of animal was done mainly by fire brandingear cutting. Feeding depended mainly on natural pasture. Live weight of Hamari sheep ranged from 35.03 ± 0.97 to 60.94 ±2.01 kg, four milk teeth to three pairs of permanent incisors. The mean weight of mature males was greater than that of mature females. Body measurements showed progressive increase with age and sex appeared to have significant effect on these parameters. The study recommends increase of the percentage of breeding females in sheep flocks, giving supplementary feeding to all flocks during summer when pasture deteriorates and abandoning of breeding control. Establishment of more water points (rain water harvesting and drilling of wells) will reduce energy lost in search of water. These practices will lead to increase of lamb crop. More human method of castration should be encouraged as the use of Burdizzo, rubber rings or chemical castration.

Key word: Hamari sheep, range condition, management practices.

المستخلص

هدفت هذه الدراسة لتقييم الإمكانات الإنتاجية للضأن الحمرى خاصة حجم و تركيبة القطيع، والممارسات الإدارية فى مراعيه الطبيعية فى محلية غبيش بولاية غرب كردفان ، السودان. أوضحت الدراسة إن تركيبة القطيع تشكلل من ثلاث أنواع، صغير، متوسط، وقطعان كبيرة، و أن متوسطات أحجامها بلغت 56 و 156 و403 راس على التوالى. تمثل النعاج

الأمهات 50 % من القطيع فى كل أنواع القطعان، بينما تمثل الفحول نسبة 3 % الى 5 %، أما الذكور المخصية فقد بلغت نسبتها 22 % الى 23 % فى القطعان الصغيرة و المتوسطة ووصلت نسبتها الى 31 % فى القطعان الكبيرة . الحملان الرضيعة مثلت نسبة 5% الى 7%، بينما الحملان الفطيمة بلغت نسبتها من 3 % الى 8 % فى أنواع القطعان المختلفة. الممارسات الإدارية شملت الفطام والخصى ووسم الحملان وهى تتم فى عمر ثلاث شهور. يستعمل الخصى كوسيلة للسيطرة على التناسل و التسمين، و أهم الطرق المستخدمة سحق الحبل المنوي بإستعمال عودين و يستخدمه 92.1 % من الرعاة و يستخدم 7.9 % من الرعاه آلة الخصى. أهم طرق وسم الحملان هى الكى بالنار وقطع طرفى او عمل شق بالأذن. إستراتيجية التغذية تعتمد كلياً على المراعى الطبيعية. أوزان الضأن الحمرى تراوحت بين 35 كجم الى 61 كجم في أعمار تروا حت بين الأسنان اللبنية الى عمر ثلاث أزواج من القواطع الدائمة. كما أوضحت الدراسة ان متوسط الأوزان فى الذكور الناضجة اكبر من الأناث الناضجة. قياسات الجسم إزدادت بزيادة العمر وللجنس تأثير معنوى على هذه القياسات. توصى الدراسة بزيادة نسبة النعاج البالغة فى قطيع الضأن وإعطاء تغذية إضافية خلال موسم الصيف حيث تتدهور المراعى و عدم التحكم فى التناسل. إنشاء مزيد من نقاط المياه (حصاد مياه – حفر آبار) سوف يوفر فاقد الجهد فى البحث عن المياه. كل هذه الممارسات سوف تؤدى الى زيادة إنتاج الحملان – توصى الدراسة أيضا بتشجيع إستعمال طرق خصى أكثر رأفة بالحيوان مثل آلة البيرديزو والحلقة المطاطية ومواد الخصى الكيميائية.

الكلمات المفتاحية: الضان الحمرى، حالة المرعى، الممارسات الادارية.

Introduction

Sudan is one of the largest countries in Africa with climatic variations which make it a suitable place for livestock production. The livestock population was estimated as 107.5 million heads; constituting 30.6 million heads of cattle, 40.6 million heads of sheep, 31.5 million heads of goat, and 4.8 million head of camel (M.A.R.F, 2017).Livestock share in the national income is about 25 %.The economic importance of sheep arises from the fact that sheep is the major source of meat for local consumption and export trade. Kordofan states are the major sources of sheep in Sudan. More than 41% of sheep flocks are found in these states constituting 10.7 million head mainly of Hamari type (M.A.R.F. 2017)

The objective of this work was to study flock structure and management practices of Hamari sheep in their natural grazing range, in Dar Hamar, in West Kordufan state, in addition to collection of live weight and body measurements of the different age groups of this sheep type.

Material and method:

The present investigation was carried out in Dar Hammar, which is located in south western Kordufan, approximately 140 kilometer west of Al Nehood Town, West Kordufan State, Sudan. The animals used in this study were indigenous sheep which were Sudan Desert sheep, Hamari type. Data collection was based on a survey in addition to body measurements and weights taken in the open range around Geibash city. Hamari sheep owners were objective of a semi structured questionnaire which was designed to generate the important and relevant information about flock size, structure, and demography, as well as the methods of husbandry practices. The animals were divided into four age groups according to dentition: which was based on permanent teeth eruption. These were:

1. Group one, milk teeth, (*Jaddah*).
2. Group Two, 1 pair of permanent incisor teeth, (*Thani*).
3. Group three, 2 pairs of permanent incisor teeth, (*Rabbaa*).
4. Group four, 3 pairs of permanent incisor teeth, (*Saddes*).

Live weight data were taken from 150 animals (males and females). Birth weight was recorded immediately post- partum, as well as sex and type of birth. All ewes were weighed at lambing to give post-partum weight. Body measurements were recorded using a steel tape, and a measuring stick according to Owen *et al*., (1977) and Singh, *et al.* Computer software was used for data analysis using the SPSS. Significant differences between means were tested using Duncan Multiple Range Test.

Results

1-Flock size and structure:

Flock size was found to vary between different farmers; table (1). It was 56, 156, and more than 400 animals in small, medium and large flocks respectively. Breeding males ranged from 3-5 % and breeding females were 50% of flock size for the different flocks. Castrates represented 22 % and 23% in small and large size flocks. Sucking ewe and ram lambs percentages ranged from 5-7% and were almost similar in the different flocks. Weaned lambs ranged from 5-6% for ram lambs and 3-8% for ewe lambs. Breeding males to female's ratio varied from 1:10 to 1:16.

Table (1): Flock Size and Structure of Hamari sheep:

Items	**Flocks size**		
Flock size	**Small**	**Medium**	**Large**
Number of flocks	11	14	10
Flock size mean	55.9±2.99	156.2±2.64	403.1±23.23
Breeding males (%)	5	3	4
Breeding females (%)	50	48.5	48
Castrates (%)	21.5	31	23
Sucking ram lambs (%)	6.5	4.7	6
Sucking ewe lambs (%)	7	4.7	5
Weaned ram lambs (%)	5	5.1	6
Weaned ewe lambs (%)	5	3	8

2- Management Practices:

The survey showed that Hamari sheep flocks were reared under traditional pastoral system of management characterized by communal grazing on natural pasture as the main source of feed in addition to crop residues when available. There were seasonal migrations of animals in search of food and water in the vast range lands throughout the year. By the advent of early summer rains at June (*Al Rushash*) flocks moved south of Geibash locality (*Al saeed*) where fresh grass and Forbes growth were stimulated by the early showers. This grazing locally called (*shogara*) extended to August. Management practice during this period was castration of excess males not needed for breeding. By the beginning of June ewes started lambing, and at the age of 15-30 days lambs were identified by specific marks. Identification of the animals was performed by fire branding, ear cutting (*shaq*) or both of them, table (2).

By the end of September sheep flocks moved to the north returning to Geibash city, this period was called (*Durat*) season and extended up to November. Castration (*Khassee*) and weaning (*Feitam*) or (*fadder*) were the main management practices done at (*durat*) when the lambs reached (3-4) month of age. During this period sheep flocks depended on crop residues for their nutrition. During winter which extended from December to February when ambient temperature was low and water melon crop was available animals were given this crop as a feed supplement. Summer (the dry season) extends from March to the end of June and was the most difficult season for the animals in Dar Hammar. The ambient temperature was high, and the range was scanty and depleted of nutrients. The flocks spent summer period near watering points (*Dunkes*) in Geibash city or in the surrounding villages.

Table (2): identification type of Hamari sheep:

Type of identification	percentage
Ear cutting	39
Branding	8
Ear cutting + Branding	45
No identification	8

According to the questionnaire farmers who have large flocks, did not give any supplementary feeding to their sheep and their strategy of feeding depended on grazing on natural pasture only. They only gave salt during watering. Flock owners with medium flock size practiced grazing and gave feed supplements to pregnant ewes, young lambs, and weak animals.

3- Body measurements:

As seen in table (3) live weight increased significantly ($p<0.01$) with age increase. The increase was significantly consistent for head length, trunk length, heart girth, belly girth, wither height and rump height. Ear length, and tail base width showed significant ($p<0.01$) increase after the eruption of the first pair of permanent incisors, while the neck length and the hip width increased significantly ($p<0.01$) up to the eruption of the first pair of permanent incisors only.

The effect of sex on live weight and body measurements of Hamari sheep is given in table (4). Live weight, face length, tail width and wither height were significantly ($p<0.01$) greater in males than in females. Head length, trunk length, neck length, heart girth, rump height, and hip width were significantly ($p<0.01$) greater in females. No significant differences were observed for ear length and belly girth, but the latter was greater in females than males.

Discussion

Management practices:

According to this study, flocks of Hamari sheep depended mainly on grazing on natural pasture and that salt was given during watering in the dry season. Agricultural by-products were available only during *dura t*period and were given to improve the nutritional status of small and medium flocks. El-Hag, *et al.*, (1998) reported that supplementary feeding practices of ewes prior to mating and late pregnancy in North Kordufan gave an increase in feed consumption rate, reduced abortion, resulted in higher lamb birth weight, reduced ewe weight loss and mortality.

Castration was most extensively practiced by sheep flock owners to produce fat castrates, avoid unneeded breeding, and induce temperament in males. Kent, *et al.* (1993) and Omer, (2009) reported that the main objectives of castration were to prevent bad behavior violence, unwanted breeding and produce fat lambs. The method of castration employed was most traditional and less humane, where the spermatic cords were crushed between two wood sticks without anesthesia, however veterinary instruments as Beurdizzo are being used by about 8 % of the flock owners, a trend which is to be encouraged. Breeding was controlled by *Kunan* (a thin cord with two knots at its ends, one knot as inserted around prepuce and the other is tied around the neck of testicle), a practice which is being used by all sheep breeders in the Sudan. Wilson, (1999) reported that breeding was controlled in sheep in the Sudan by the use of Kunan in addition to castration using Beurdizzo instrument.

Table (3): Live weight (kg) and body measurements (cm) of Hamari sheep at different ages:

Item	Milk teeth 6 moth	Pairs of permanent incisors			Level of Significance
		1 Pair	2 Pairs	3 Pairs	
Live weight	35.03 ± 0.97^{a}	37.27±0.85^{b}	54.15±0.8^{c}	60.94±2.01^{d}	**
Head length	33.32 ± 0.83^{a}	34.50±0.41^{b}	37.70±0.53^{c}	40.32±0.78^{d}	**
Ear length	18.65 ± 0.28^{a}	19.18±0.19^{a}	20.08±0.34^{b}	21.13±0.30^{c}	**
Trunk length	67.68 ± 0.67^{a}	69.91±0.88^{b}	78.95±0.69^{c}	84.06±1.04^{d}	**
Face length	24.15 ± 0.55^{a}	24.84±1.22^{b}	25.73±0.25^{c}	25.65±0.50^{c}	**
Tail length	57.18 ± 1.08^{a}	57.40±0.82^{a}	64.10±0.96^{b}	68.10±1.39^{c}	**
Tail base width	12.24 ± 0.37$_{a}$	15.91±0.29^{a}	18.55±0.34^{b}	18.68±0.53^{d}	**
Neck length	27.09 ± 0.65^{a}	29.42±0.32^{b}	35.75±0.45	35.45±0.64^{c}	**
Heart girth	73.21 ± 0.76^{a}	75.82±0.54^{b}	87.70±0.64^{c}	91.68±0.92^{d}	**
Belly girth	76.56 ± 0.87^{a}	81.22±0.61^{b}	96.25±1.07^{c}	102.90±0.90^{d}	**
Wither height	71.56 ± 0.43^{a}	73.00±0.58^{b}	80.73±0.45^{c}	83.03±0.78^{d}	**
Rump height	73.91 ± 0.47^{a}	74.47±0.58^{b}	82.98±0.46^{c}	85.35±0.61^{d}	**
Hip width	15.41 ±0.47^{a}	18.36±0.38^{b}	27.28±0.37^{c}	28.06±0.34^{c}	**

Means with the same letter are not significantly different ($p<0.01$).
** = ($p<0.01$).

Table (4): live weight (kg) and body measurements (cm) in Hamari sheep according to sex:

Item	Male	Female	Level of Significance
Number	80	70	-
Live weight	46.93±1.45	45.27±1.51	**
Head length	33.55± 0.74	34.61±0.52	**
Ear length	19.45± 0.23	19.99±0.22	NS
Trunk length	74.33±0.91	75.21±0.98	**
Face length	29.76±0.60	22.99±0.28	**
Tail length	61.91±0.93	60.70±0.84	**
Tail base width	17.35±0.27	16.67±0.36	**
Neck length	31.43±0.53	32.29±0.57	**
Heart girth	81.18±0.88	82.24±1.14	**
Belly girth	86.11±1.18	91.50±1.45	NS
Wither height	77.18±0.67	76.43±0.68	**
Rump height	79.06±0.63	79.27±0.70	**
Hip width	19.73±0.68	24.76±0.56	**

Means with the same letter are not significantly different ($p<0.01$).
** = ($p<0.01$).
NS= not significant

Flock owners of Hamari sheep were found to wean lambs when they reached 3 to 4 month of age, mainly during the *durtat* season. Ahmed (2008) also reported that weaning was usually accomplished at 4 to 5 month of age. Carles (1983) reported that weaning in tropical sheep breeds was at an early age of 2 to 6 month.

In the present study, live weight increased significantly ($p<0.01$) with age. The live weight was 35.03±0.97 kg in lambs with milk teeth *(Jaddah*) and 60.94±2.01 kg in rams with three pairs of permanent incisors (*Sadeth*).

According to the study findings males were heavier than females. This finding agreed with reports of Hassmat (1968) who reported that males were heavier than females at all ages. Mohammed (2004) reported that body weight of rams were heavier than that of ewes. Also Omer (2009) found that in sheep males average body weight was heavier than that of females. Body measurements increased with age and that the significant increase in measurements of head, trunk length, heart and belly girth, wither and rump heights could be due to different growth rates of tissues where early maturing parts grow at faster rates than late maturing ones, and to the effect of sex on body weight and measurements where androgens favor greater development of the head and forequarters in males and estrogens favor development of the hind quarters in females.

Conclusion:

Flocks size and structure of Hamari sheep varied between farmers, and breeding

female's constituted most of the flock. Management was traditional. Breeding was controlled by the use of kunan on breeding rams. Castration was practiced extensively as a method of breeding control and fatting. The feeding depends on natural pasture.

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