

Observations on Prewaning Growth, Performance and Size of Desert Sheep Lambs in Sudan

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THE STUDY was conducted to investigate birth weight, weaning weight, preweaning growth rate and body dimensions at birth and weaning. 268 birth weight records were collected while 137 lambs were weighed at weaning.

Overall average birth weight was 3.4 ± 0.3 kg. Age of dam and type of birth had significant effects on birth weight while sex of the lamb did not exhibit a significant effect. The difference in birth weight between singles and twins was 1.2 and 0.9 kg for lambs born to young and old ewes respectively. Pre-weaning growth rate averaged 149.8 ± 1.4 g per day. Ram lambs grew faster than ewe lambs. Single ewe lambs and twin ram lambs had similar growth rate up to weaning.

At weaning, average body weight was 21.9 ± 5.8 kg. Ewe age and sex of lamb had no significant effect on weaning weight while type of birth had a significant effect on weaning weight. On average, the difference between singles and twins was 2.8 kg in favour of singles. Interaction of age of dam by sex and type of birth were found to have significant influence on both birth and weaning weights.

The Desert Sheep is the most numerous breed in Sudan. In recent years its husbandry has been undergoing changes from the traditional nomadic or village systems of production to more intensive ones with more expensive feeding. This was probably due to two main factors: (a) The availability of agricultural by-products due to the opening-up of large agricultural schemes in the country. (b) The increasing demand for sheep meat in the neighbouring countries.

The earlier studies which were undertaken on Desert Sheep were mainly on post-weaning growth rate (Osman, El Shafie and Mukhtar, 1968), carcass traits (Osman and El Shafie, 1967) and mortality and wastage (El Amin and Rizgalla, 1976). Few information is available concerning pre-weaning growth and characters related to it (El Amin, 1975).

The present study was undertaken to explore the potential of pre-weaning growth rate and body dimensions at weaning of the Desert Sheep.

Identification of breed resources and production potential are pre-requisite to developing proper breeding plans.

Material and Methods

A flock of sheep was maintained at El Huda Research Station in the Gezira scheme. The location and climatology of the station was described by Suliman, (1976). 388 ewes were involved in the study over two mating seasons.

During the breeding season, the flock was fed sorghum vulgate (Local name : Abu Sabecin) and / or sorghum Sudanense straw. In addition 0.5 kg of concentrates (cotton seed cake and dura. grain) per animal were fed daily. After six weeks the rams were separated and the ewes let out in the fields. Six weeks prior to lambing all pregnant ewes were supplemented with 0.45-0.9kg of cotton seed cake and dura grain per animal . Ewes which were due to lamb were separated and kept in lambing pens and fed for two weeks post-lambing. Thereafter, they were grazed with their lambs in the fields and supplementation was carried out whenever the conditions in the field were not favourable. The lambs were weaned at about 4 months of age. Data collected from the flock included among other things, birth weight weaning weight and body measurements. Weights were recorded at intervals of two weeks post-lambing. For the study of the effect of the ewe age on lambs birth weight and weaning weight, the ewes were classified as young (having 2 or less pairs of permanent incisors) and old (having 3 permanent incisors). Body measurements were taken on the same day as weaning weight. Weaning weight was corrected to 120 days.

Body dimension were recorded at birth and at weaning . They included height at withers, body length (from pin bone to point of shoulder), heart girth and chest depth. Statistical analysis were done according to Snedecor and Cochran (1967).

Results and Discussion

Birth and weaning weights

268 lambs were weighed at birth of which 137 were reweighed at weaning. The overall mean birth weight and weaning weight were 3.4 ± 0.3 kg (Table 1) and 21.9 ± 5.8 kg (Table 2) respectively.

Birth weight in sheep is important under sup-optimal conditions since survival of the newly born lamb depends largely upon it (Dawes and Parry,

1965). Hight and Jury (1969) and Bekedam and Van DerGref (1971) reported on the effect of birth weight on lamb survival and showed that survival increases at intermediate weights and decreases at both extremes. Since different breeds of sheep produce lambs of different birth weights and optimal birth weight that secures survival of lambs was suggested by Bradford (1972) to be 50% of the average birth weight of single lambs from mature ewes.

TABLE 1 Average birth weight of lambs (kg).

Ewe	Age*	Singles	Males twins	Singles	Females twins	Total
Young	N	65	28	73	34	200
	Mean	3.8	2.4	3.5	2.5	
	±	±	±	±	±	
	S.D.	0.8	0.7	0.7	0.7	
Old	N	17	16	14	21	68
	mean	4.2	3.3	4.2	3.3	
	±	±	±	±	±	
	S.D	0.7	0.8	0.7	0.6	

Young ewes with 2 or less permanent incisors.

Old ewes with 3 permanent incisors.

S.D. standard deviation.

It can be seen from Table 1 that males and singles were heavier at birth than females and twins only for that of young dams. It was also evident that lambs born to older ewes (3 pairs of permanent incisors) were heavier than that born for younger ewes (2 or less permanent incisors). The same trend was reflected at weaning (Table 2), though the differences were proportionately smaller than at birth.

The effect of age of dam, sex of lamb and type of birth of lambs and their interactions on lamb birth and 120 - day weaning weights are shown in Table 3. The age of the dam and type of birth of the lamb had a significant influence on birth weight. These results were similar to the results reported by Sacker and Trail (1966) for East African Black head sheep in Uganda and

Dass and Acharya (1970) for Bikanari sheep in India, but they were different from those of Ovejera (1969). The effect of age of the dam is probably mediated through a larger body size and consequently a better nourishment by older ewes to their foeti .

TABLE 2 Average weaning-weight (120 days) of lambs (kg).

Ewe age*		Males		Females		Total
		Singles	Twins	Singles	Twins	
Young	N	31	9	41	13	94
	Mean	24.0	21.0	21.0	18.6	
	±		±	±	±	
	S.D.	6.3	5.1	5.3	3.5	
Old	N	14	10	9	10	43
	Mean	25.5	19.8	22.8	22.6	
	±		±	±	±	
	S.D.	4.4	3.5	6.8	4.7	

*Young ewes with 2 or less of permanent incisors.

Old ewes with 3 permanent incisors.

S.D : standard deviation.

For type of birth the difference between singles and twins was 0.9 and 1.2 kg in the two ewe - age groups (old and young respectively). These results agree with Sacker and Trail (1966) and Frederikson, Price and Blackwell (1967).

Sex of the lamb in this study did not have an appreciable effect on birth weight.

Weaning weight represents an important turning point in the life of the lamb when it will be dissociated from its dam. It was found in this study that the age of the dam and sex of the lamb (Table 3) did not have a significant effect on weaning weight. This is contrary to the results obtained for birth

weight. It could possibly be that weaning was effected slightly later in the life of the lamb when the majority of maternal effects have subsided and the poor lambs were able to compensate for their hand earlier handicap. Thus the most important factor is the age at which lambs are weaned. A significant influence (Table 3) was found due to type of birth on weaning weight and a difference of 2.8 kg was obtained in favour of singles as compared with twins. Similar influences were reported by Chang and Rae (1970), El Tawil, Hazel, Sidwell Terril (1970) and Juma, Faraj, Eliya and Al - Aubaidy (1969).

TABLE 3. Analysis of variance of unweighed means of birth weight and weaning weights (120—days).

Source	Birth weight		weaning Weight	
	DF.	MS	DF.	MS.
Age of dam	1	1.080**	1	4.67 NS
Sex of lamb	1	0.005 NS	1	3.67 NS
Type of birth	1	2.111**	1	15.74**
Age × sex	1	0.008 NS	1	3.73 NS
Age × type of birth	1	0.056 NS	1	0.28NS
Sex × type of birth	1	0.018 NS	1	4.70 NS
Age × sex X type of				
Birth	1	0.183**	1	20.11**
Error	260	0.023	129	2.20

** = $P < 0.01$.

NS = Not significant.

Pre-weaning growth rate

Prewaning growth rate of lambs are shown in Table 4. The average preweaning growth rate was 149.8 ± 1.4 g per day. These results were higher than figures reported for other tropical breeds (Singh, Prasad and Singh, 1962) but were lower than those reported for crossbreds (Thrift, Whitman and Kratzer, 1973).

Single ram lambs (Fig. 1) grew almost in linear form, while twin ewe lambs were the lowest growing. There was an overlap between single ewe lambs and twin ram lambs as from the second week of age up to weaning time. It was found that twins were slow in preweaning growth than singles mainly due to a limited supply of milk. It can be seen from Fig. 1 that an accelerated rate of growth occurred between birth and 4 weeks (since these animals almost doubled its size of age). This seems to coincide with the period of maximum milk yield of the ewe (Owen, 1971).

TABLE 4. Preweaning growth rate of lambs (g/day).

Lamb		Lamb growth rate	
		Range	Mean \pm S.D.
Males	Singles	34 — 246	169.0 \pm 1.57
	Twins	91 — 238	149.0 \pm 1.30
Females	Singles	68 — 228	149.0 \pm 1.30
	Twins	64 — 170	132.0 \pm 0.95
			149.8 \pm 1.40

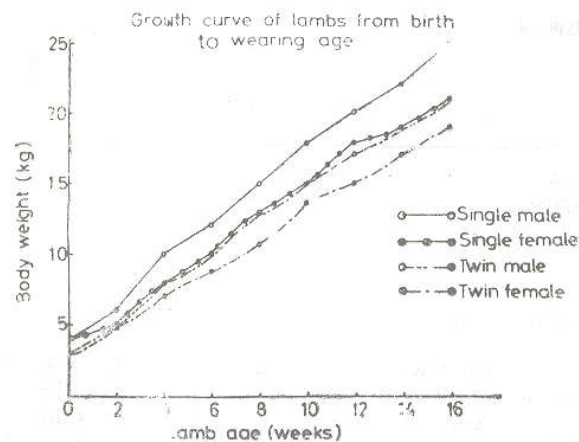


Fig. 1.

Body measurements

Body measurements recorded at birth and weaning are shown in Table 5.

TABLE 5. Body dimensions at birth and weaning (cm).

Dimensions	At birth(cm)	At weaning (cm)
1. Hight at withers	35.9±3.5	59.0±4.3
2. Body length	35.2±2.0	50.3±5.2
3. Heart girth	35.2±3.9	68.7±5.6
4. Chest depth	12.6±2.5	28.5±3.4

These measurements have almost doubled between birth and weaning.

In conclusion proper feeding and management of the Desert ewes prior and for at least one month post-lambing should be provided to capitalize on maternal effects for heavier birth weight and higher preweaning growth rate.

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بعض الملاحظات على النمو قبل الفطام وأحجام حملان الضأن

الصحراوي في السودان

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شمل البحث ٢٦٨ وزن حملان عند الولادة و ١٢٧ حملا عند الفطام وقد تمت دراسة الخواص الآتية : الوزن عند الولادة ، الوزن عند الفطام وفترة النمو بين الولادة والفطام .

بلغ وزن الحمل عند الولادة ٣٥٤ ± ٣ كيلو جرام وقد وجدنا أن عمر الأمهات ونوعية الولادة لها أثر كبير على الوزن عند الولادة . ولكن لم يوجد لجنس الحمل أى أثر واضح بين الحملان التي ولدت مفردة وتوائم ١٢ كيلو جرام و ٩ كيلو جرام للأمهات الكبار والصغار على التوالي .

تبين من نتائج البحث أن متوسط النمو قبل الفطام كان حوالي ١٤٩٨ ± ١٤ جراما في اليوم وقد ظهر أن درجة النمو عند الحملان الذكور كانت أكبر منها عند الإناث وقد قارب نمو الأخيرة نمو الحملان التوائم .

أضحى أن الحملان وصلت $٢١٩٩ + ٨$ كيلو جرام عند الفطام في حوالي ٤ شهور كذلك اختلف أثر الأم على وزن الفطام مما يدل على أن الفطام ربما كان متأخرا . كذلك وضع أن نوع الولادة له أثر كبير على وزن الفطام وذلك نسبة للاشتراك في لبن الأم في فترة ما قبل الفطام .