

Effect of dry season supplementary feeding on Desert sheep performance in North Kordofan State, Sudan

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Introduction

The breeding season in north Kordofan is usually planned to be in January–March so that lambing comes in the rainy season (Mukhtar, 1985). Because of the limited production inputs this exposes breeding and pregnant stock to nutritional stress, as the breeding and gestation periods are thus in the dry season when range lands are at their lowest nutritional quality (El-Hag *et al.*, 2007), which are reflected in the highest mortality of lambs born in rainy and early dry season (El-Hag *et al.*, 2001). There is two methods of controlled breeding in pastoral flocks by use of “kunan” so that lambs are dropped at early rainy season or using supplementary feeding (El-Toum, 2005). In order to improve the productive and reproductive capacity of smallholder ruminant animals, there is a need to look at ways of extending the availability and quality of feedstuffs produced on smallholder farms using simple and cost effective options, to face the lack of feed due to climate change.

Therefore, this paper focused on the effect of supplementary feeding pre-mating, late pregnancy and post-lambing period on ewe productive and reproductive performance and birth and weaning weight, for Desert sheep during climate change.

Material and Methods

The present study was conducted at Foja village, Bara locality, North Kordofan State, Sudan. Eighty (80) ewes with Four rams were selected during the normal breeding season (February–March) for this study.

Ewes were randomly divided into four groups A, B, C and D, (20 ewe/group). They were randomly assigned to supplementary feeding treatments with diet one, diet two diet three for group A, B and C respectively, while group D un supplemented with depend on pasture only as practice by farmers(control) (Table1).

All groups depend upon natural pasture grazing from 0800 to 1800 hr and in the evening they were kept indoors in enclosures. Groups A, B and C were offered their respective supplement feed during 30 days before estrus, 30 days after mating, 45 days before lambing and 90 days after lambing, whereby each diet was offered in the evening at 350 grams per ewe and day.

The data from feeding trials and reproductive traits were statistically analyzed according to complete randomized design using (SPSS, 2005). Duncan's Multiple Range Tests was also used to test significance differences among means; analysis of covariance was carried out.

Table 1. Ingredients of the experimental feed stuffs

Components (%)	Diet 1	Diet 2	Diet 3
Sorghum grains	40	35	30
Groundnut Cake	35	30	25
Groundnut Hulls	20	30	40
Shells	4	4	4
lick salt	0.25	0.25	0.25
Common salt	0.75	0.75	0.75

Chemical composition of the experimental feed stuffs

	Diet 1	Diet 2	Diet 3
DM%	96.38	97.16	82.84
CP %	27.5	18.6	16.86
CF%	23.33	34.10	36.07
EE %	7.49	9.89	7.76
NFE %	33.05	30.41	30.58
Ash%	8.63	7.84	8.73
ME(MJ/ Kg DM)	11.42	11.26	10.51

The metabolizable energy values were calculated from chemical composition according to Ellis (1981).
 $ME(MJ/Kg/DM)=0.012CP+0.031EE+0.005CF+0.014NEF$

Results

- ❑ The data concerning the effect of supplementation on some reproductive traits of is demonstrated in Table (2). There is significant ($P<0.05$) effects of supplementation on the conception rate among the four groups was 100 for A, B and D groups and 90% for control group D. The lambing rate attained 100% in groups A and B.
- ❑ High abortion rate was observed in group D than group C. No abortion and mortality rate was noticed in group A and B.
- ❑ Supplementation significantly affected mortality rate, where high rates was scored by group D.
- ❑ Feeding supplementary ration secured significant ($P<0.05$) effect on ewes prolificacy (litter size). Twinning rate was also highest in the group (A) 41%, group B 37% and 22% in group C while group D with no twins.

Table 2. Effect of supplementation on ewes reproductive traits

Animal Group	Conception rate (%)	Lambing rate (%)	Abortion rate (%)	Mortality rate (%)	Twinning rate %	Prolificacy
A	100	100	0	0	41	1.35±0.09 ^a
B	100	100	0	0	37	1.20±0.07 ^b
C	100	95	5	0	22	1.11±0.08 ^c
D	90	88.89	5.56	10	00	1.00±0.11 ^c
mean	97.5	95.97	2.56	2.50	1.00	1.17±0.09

^{abc} Values in the same column followed with different letters are significant at $P<0.05$

- ❑ The supplementary rations that given to the experimental ewes, had highly significant ($p<0.01$) effect on lamb birth weight (Table 3)
- ❑ lambs of animals on group A, group B and group C had significantly ($p<0.01$) maintained highly body weight as compared with control (un-supplemented) animal.
- ❑ Weaning weight at 90 days of age in supplemented groups A, B and C was significantly ($p<0.05$) effected by supplementation, and found to be heavier as compared with control group.

Table 3. Effect of supplementation on lambs birth and weaning weight

Animal Group	No. of lambs	Birth weight	No. of lambs	Weaning weight
A	27	2.32 ± 0.09 ^a	27	11.46 ± 0.19 ^a
B	24	2.11 ± 0.10 ^b	24	10.70 ± 0.20 ^b
C	21	2.02 ± 0.11 ^b	21	8.72 ± 0.21 ^c
D	16	1.80 ± 0.12 ^c	15	7.86 ± 0.25 ^c
Overall mean± SE	88	2.08 ± 0.11	87	9.97 ± 0.21

^{abc} Values in the same column followed with different letters are significant at $P<0.05$

Conclusions and Outlook

- ✓ Flushing and steaming-up to Sudanese Desert ewes during breeding period improved the reproductive performance of the ewes, with high conception and lambing rates in group A and B.
- ✓ Lambs born from supplemented ewes recoded better birth weight compared with these depend on natural grazing only. It would, therefore, be strategically to provide the grazing nomadic desert sheep herds with adequate feeds for reproduction during the mating periods, as well as for generating sufficient body reserves for meeting production and reproduction requirements during the dry season.
- ✓ It is recommended that, Supplementation during mating and late pregnancy should be undertaking using groundnut seed cake, groundnut hulls or other relevant local ingredients.

