Utilization of diets containing Dura *(Sorj'hum vulgare)* grain husk and poultry litter for fattening lambs

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SUMMARY

An experiment was conducted with 24 entire Sudanese desert lambs to study the effect of inclusion of Dura *(Sorghum vulgare)* husk on the performance of fattening lambs. Three rations (A,B and C containing 0, 10 and 30% dura husk, respectively) were used. A constant level of Poultry litter (50%) and groundnut hay (10%) in addition to different levels of wheat bran and dura grains were included, in the rations.

From the results it was found that lambs fed ration B with 10% dura husk had significantly ($P<0.01$) higher performance in terms of dry matter intake (DMI) and live-weight gain (LWG) compared to those fed 10% wheat bran (ration A). However, the digestibility coefficient of the latter (ration A) was observed to be significantly ($P<0.01$) higher than that of both rations B and C. Generally, ration C with 30% dura husk had significantly ($P<0.01$) reduced the performance of the lambs.

The conclusion drawn from the experiment indicated that dura husk can be substituted for wheat bran at the rate of 10 % in rations of fattening lambs.

INTRODUCTION

The continuous dependence upon the conventional feeds would not only increase the prices of animal products, but also could create a continuous competition between man and animal for feeds such as the cereals. It is thus essential to seek relatively cheap feeding stuffs by utilizing more agricultural by-products, which are available in abundance.

In a previous study, it was found that poultry litter (PL) could be incorporated successfully in diets of fattening lambs at the rate of 50% (Abdalla *et al.,* 1989). On the other hand, a tremendous amount of dura husk is available wherever Dura plant is grown and harvested. In the Sudan the husk is just ignored by the farmer, however, the ruminants, which did not ignore this by-product, were observed to consume it among other substances in the farm.

The objective of the present study was to examine the effect of feeding Dura *(sorghum vulgare)* husk and PL on performance of fattening lambs.

MATERIALS AND METHODS

Twenty four Sudanese Desert lambs were allocated at random to either of 3 rations: A, B and C, containing 0, 10 and 30% dura husk, respectively in addition to other ingredients (Table 1). The lambs, which were born at El Huda Research Station, were about 5 months of age, and weighing on average about 14 kg at the beginning of the experiment. Each lamb was penned, fed and watered separately during the experimental period. All lambs were de-wormed at the beginning of the trial and were weighed regularly every fortnight during the whole fattening period, which lasted for 56 days.

Table I. The Ingredients (as fed) of the Different Rations

Ration	A		
Ingredients %			
Poultry litter	50	50	50
Dura grains	30	30	
Wheat bran	10		10
Dura husk		10	30
Groundnut hay	10	10	10

Poultry litter (PL) was collected in the same way as mentioned previously (Abdalla, et al., 1989) while the groundnut hay and dura husk were collected from the neighboring farms after the harvest of groundnut and dura thrash. The rations were mixed manually so that 100 kg of the ration was formulated at a time. Each ration was then allocated to the lambs of the respective group. The lambs were fed ad libitum all the time except during the pre-experimental period. Water was available to each lamb in a separate bucket.

Fecal collection for the digestibility study was carried out with 3 animals in each group. The feces were collected during 8 days period, using locally made canvas bags, which were fixed to the posterior part of the animals. The feces, and feed materials were treated and analyzed according to AOAC (1984).

Statistical analysis of data was done by analysis of variance (ANOVA) as mentioned by Steel and Torrie (1976).

RESULTS AND DISCUSSION

Table 2 shows the chemical composition of the different rations and Table 3 shows the chemical composition of the different ingredients. It could be seen from Table 4 that lambs fed ration B, that contained 10% dura husk and PL were able to consume 1.55 kg per day of feed, which was observed to be significantly ($P<0.01$) higher compared with that consumed by animals in group A (1.29 kg/ day) or C (1.16 kg/day). This result shows that wheat bran can be successfully substituted by dura husk since ration B contained 10% dura husk but not wheat bran. However, ration C with 30% dura husk resulted is the lowest DMI. This is not unexpected because ration C showed the highest fiber content (30%) compared with the other 2 rations (21.1% fiber). Moreover, the quality of fiber in dura husk could also be another reason for the low DMI of ration C.

Table 2. The Chemical Analysis (%DM) of the Different Rations.

Rations	A		
DM %	93.66	94.46	94.20
CP	15.58	13.76	11.32
EE	3.20	2.02	1.90
Ash	14.77	23.89	23.36
CF	21.14	21.07	30.56

Table 3. The Chemical Analysis (%) of the Different Ingredients.

Ingredient	DM	CP	EE	CF	Ash	Ca	P
Poultry litter	92.58	26.29	1.86	20.6	17.33	1.71	0.98
Dura grains	94.50	13.23	2.50	2.46	2.15	0.05	0.31
Wheat bran	93.50	16.83	3.23	12.66	5.44	0.17	0.73
Dura husk	95.65	6.25	1.64	38.85	6.09	0.30	0.14
Groundnut hay	94.50	7.66	2.27	33.59	10.79	0.17	0.06

Table 4. Feedlot Performance of Lambs fed Dura husk and Poultry Litter.

	A	B	C	SEM	LS
Experimental period	56	56	56		
No of Animals	8	8	8		
Initial live weight kg	13.70	14.25	14.20		
DMI(kg/ day)	1.29	1.55	1.16	0.06	**
LWG gm/ day)	195.11	220.16	144.11	21.14	**
FCR (kg feed/ kg gain)	6.83	7.1	8.39	0.89	NS
DMD %	75.11	64.99	53.90	5.57	**
OMD %	81.04	71.27	63.11	5.04	**
ME (MJ/kg DM)	12.23	10.75	9.52		
ME intake (MT/day)	15.82	16.66	11.08		

SEM = Standard error of the mean
LS = Level of significance
*** Significant at (P<0.01)*
NS = Not significant
ME (MJ) is calculated according to formula:
ME (MJ/Kg) = DOM X 4.4 X 0.82 X 4.184.

The overall DMI intake of lambs reported in the present experiment (1.32 kg/day/ lamb) is comparable with that reported by EL Khidir *et al.*, (1983) when fed cotton seed cake and Balanite kernel cake to fattening

sheep. Similarly, the results were comparable to those reported with fattening lambs fed groundnut hay and cotton seed cake (Mansour *et al.,* 1986). On the other hand, the study results are higher than those reported by El Hag and El Hag (1981) who fed dried poultry excreta to lambs. However, El Khidir *et al.,* (1988) whose lambs were heavier than those in this experiment reported much higher DMI (1.6 kg/day/lamb) when feeding high molasses diet.

It was seen from the present experiment that ration C with 30% husk gave the lowest LWG and the difference was highly significant ($P<0.01$) when compared with gain produced by ration B with 10 % husk. However, LWG of ration A and B were not substantially different ($P>0.05$) indicating that dura husk at the rate of 10% can replace the same amount of wheat bran, with good performance results for fattening lambs.

Generally, the LWG as well as FCR reported in the present work were reasonable compared with those reported by Mansour, et al. (1988) who fed diet containing 10% blood meal to fattening lambs. Study results are also similar to those found by Ahmed and Suleiman (1988) who fed blood meal to fattening lambs, and those of Suleiman et al. (1989) with sorghum stover and cotton seed cake, as well as those of El Khidir et al., (1983) when they used Balanite kernel cakes.

Although ration C with 30% husk appeared to be having the highest conversion ratio, such difference was not significant ($P>0.05$). Thus, the entire 3 rations showed the same rate of conversion. This may be explained by the reduced intake of ration C, probably due its slow passage of digesta through the alimentary tract. Thus, more time is allowed for digestion and absorption of the ingested materials of ration C, leading to more efficient conversion.

Although the rate of consumption of ration B was significantly ($P<0.01$) higher than that of ration C, the digestion of the two rations was observed to be similar. However, the DMD and OMD of ration C was significantly ($P<0.01$) lower than that of ration A. This could be due to the high percentage of indigested fiber in ration C, resulting in inferior performance produced by this ration. In general, the over-all DMD reported in the present experiment is lower than that found by Abdalla *et al.,* (1989) when feeding fattening lambs with different levels of poultry litter. However, the present results of DMD were higher than those reported by Holzer and Levy (1976) when feeding dairy cattle with poultry litter. Similarly, study results of DMD were higher than those of lambs fed sorghum stover and cotton seed cake (Suleiman *et al.,* 1989) .

It is concluded that Dura husk could be incorporated in the rations of fattening lambs to substitute about 10% of wheat bran in rations containing poultry litter. However, introduction of the husk at rates of 30% was found to lower the performance of lambs, probably due to lowering of the feeding value and digestion of such high rate of the husk in the ration.

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