
The effect of feeding poultry litter with whole or crushed dura grains on performance of Sudan desert sheep.

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Summary

A total of 24 desert lambs were divided into four groups fed either of two levels of poultry litter (PL), 30% or 50%, so that with each level, dura grains were supplied either in whole or crushed forms. The daily dry matter intake (DMI) of the different rations was not affected with the level of (PL) in the ration, but was affected by processing (crushing) of the grains. Rations fed with the crushed dura was significantly ($P < 0.05$) consumed in larger amounts irrespective of the level of poultry litter in the ration.

The liveweight gains (LWG) of the lambs in the 4 treatments (30% PL with whole grains, 50% PL with whole grains, 30% PL with crushed grains and 50% PL with crushed grains) were 13.46, 13.41, 15.75 and 17 kg respectively for the total period. This parameter was not affected with the level of (PL) in the ration, but was significantly improved by processing ($P < 0.05$). The feed conversion ratio (FCR) and

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the dry matter digestibility (DMD) of the different treatments were found to be apparently improved for the lambs fed 50% (PL) and crushed grains.

No health problems were encountered with increasing (PL) level in the ration. It is concluded that (PL) can be included to the level of 50% in rations of fattening lambs, and the best performance was obtained with crushed grains.

Introduction

Feeding of (PL) mixed with other ingredients to the ruminants is expected to increase the crude protein level of the rations; because the crude protein level of the (PL) ranges between 22% to 35%. (PL) can be found very cheap because it is considered as waste and is available in large heaps in poultry farms, particularly in the Sudan. Thus inclusion of (PL) in ruminant rations is expected to reduce the feeding cost. Pathak *et al.* (1975) proved that steers can consume up to 2.76% of their body weight when fed rations containing 40% poultry droppings ensiled with maize fodder and molasses. It was also suggested that inclusion of poultry litter at the rate of 25% for dairy cattle and 40% for fattening steers, supported a reasonable level of performance (McDonald *et al.* 1981).

In a previous study at this station, when (PL) inclusion was up to 60% in rations for fattening lambs (Abdalla *et al.* 1989) it was noticed that DMI of the lambs was rather low, also there were some health problems.

the objective of the present study is to investigate the utilization of rations containing (PL).

Materials and methods

A total of 24 entire Sudanese lambs, at about 7 - 8 months of age and weighing about 18 kg LW each, were divided into 2 groups at random. The lambs which were born in El Huda Research Station, were fed either of 2 levels of (PL), 30% or 50%. Each group was further divided into 2 similar subgroups and were allocated at random to either whole or crushed dura grains (*Sorghum vulgare*), given with the particular level of (PL) so that there were 4 treatments A, B, C and D as in Table 1. The initial LW of the different animal groups was similar. Each lamb was penned separately and allowed an adaptation period of 3 weeks. They were allowed an individual feeding (*ad libitum*) and watering.

All lambs were dewormed at the beginning of the experiment and each one was weighed every fortnight during the whole experimental period which lasted for 60 days.

After the adaptation period, the quantity of feed supplied to each lamb was carefully weighed and recorded. The feed refusal was recorded fortnightly except during faeces collection when the refusal was recorded weekly.

In addition to (PL) and dura grains, each ration also contained wheat bran and groundnut hay (see Table 1). The (PL) was collected from a poultry farm managed in the deep litter open system, using conventional feeding troughs. The chemical analysis of the (PL) is 26.3% CP, 1.9% EE, 20.6% CF, 17.3% Ash and 26.5% NFE.

Digestibility determinations were done by total faecal collection for 7 days using sheep. The faeces were then sent

to the Central Nutritional Laboratory, Kuku, after conservation in a dry form.

Table 1: Ration ingredients, fresh as fed and proximate analysis of the experimental diets.

Item	Diets			
	A (Whole grains)		(Crushed grains)	
Poultry litter %	30	50	30	50
Dura grains %	30	30	30	30
Groundnut hay %	10	10	10	10
Wheat bran %	30	10	30	10
Chemical Analysis (% of DM)				
DM %	91.91	92.05	92.31	89.72
CP %	18.61	17.14	17.00	16.57
CF %	10.60	07.90	10.20	08.48
EE %	02.32	02.29	02.08	02.48
NFE %	48.90	53.34	54.00	49.94
Ash %	11.48	11.38	09.03	12.25
Ca	01.68	01.93	01.43	02.22
Mg	00.30	00.99	00.30	00.20

Within the first week of adaptation period, two lambs both from the group fed 30% (PL) died after showing symptoms of diarrhoea. Lambs died were replaced immediately by two other lambs. Other three lambs (2 of them also happened to be from 30% (PL) group) also showed symptoms of diarrhoea during the adaptation period but these were treated with sulphonamides and were able to continue till the end of the experiment. We considered that their effect is negligible because it happened early during the adaptation period.

Statistical analysis:

The data collected were examined for significant difference according to analysis of variance (Steel and Terrie, 1976).

Results and discussion

Table 2 shows the DMI of the lambs in the different treatments. It is found that feed intake was not affected by inclusion of (PL) up to 50%. This is true whether the dura grains used in the ration was in the whole form or processed (crushed). This result is in agreement with a previous study when feeding (PL) to lambs (Abdalla *et al.*, 1989) where it was found that DMI of lambs offered 40% or 50% (PL) was not different. On the other hand, crushing of the dura grains increased the DMI significantly ($P < 0.05$). This is true with ration containing 30% (PL) as well as for that with 50% (PL). This result of increasing DMI of rations given with crushed grains is a finding different from that reported by Fraser and Orskov (1974) when working with fattening lambs. however, they used barley grains.

In the present study, the DMI was found to be 4.2 and 4.31 of initial body weight of lambs fed 30% (PL) and 50% (FL) respectively. This is comparable with results obtained by El Khidir *et al.* (1983) when used Balanite Kernel cakes for fattening lambs. Similarly El Hag and El Hag (1981) reported DMI of fattening lambs to be nearly the same as the results in the present study although they used 20% poultry droppings.

Table 2: Performance of the lambs.

	etary groups				SEM
	A	B	C	D	
No. of animals	6	6	6	6	
Feedlot period (days)	60	60	60	60	
Initial bodywt. (kg)	18.75	18.33	18.58	19.08	3.33
Final bodywt. (kg)	32.08	32.00	34.33	36.08	4.37
Average daily gain (gm)	223	223	262	282	1.96
DMI (kg day)	1.21	1.27	1.41	1.42	0.09
FCR	5.92	6.43	5.79	5.51	0.85
DMD %	75.06	72.79	72.79	76.62	4.18

On the other hand, Pathak *et al.* (1975) reported a lower DMI when feeding 40% (PL) for fattening calves. The consumption of ration D with 50% (PL) in the present

experiment is higher than that reported by Mansour *et al.* (1988) when fattening lambs with blood meal. However, lambs used in that experiment were younger and were finished at a lower liveweight.

In a previous study with (PL), Abdalla *et al.* (1989) reported a very low DMI (0.97 kg, 1.02 kg and 0.7 kg-day for lambs fed 40%, 50% and 60% (PL) respectively), which might be attributed to the inclusion of molasses in that experiment in which the ration becomes wet leading to the smelling of the offensive and nasty odour of (PL) which would lead to decreased feed intake.

In the present study, no molasses or water was added and that would explain the elevated DM1, but this point may need further study.

The LWG was not affected by the level of (PL) in the different rations ($P > 0.05$). This is in agreement with a previous study (Abdalla *et al.*, 1989) which means that the inclusion of (PL) at the rate of 50% in rations of fattening lambs is beneficial as it decreases the feeding cost without depressing LWG. In this respect, ration D with 50% (PL) and crushed grains resulted in LWG at the rate of 283 gm/day. This is higher than that reported by El Khidir *et al.*, (1983), Mansotir *et al.* (1988) and El Tayeb *et al.* (1988) but is comparable with that reported by El Khidir *et al.* (1984) using peanut hulls and urea for sheep fattening,

The high performance of lambs fed ration D containing 50% (PL) and crushed grains indicates that protein and energy content of this ration is fairly balanced, in the sense that sufficient protein and sufficient carbohydrates were exposed

for ruminal fermentation to satisfy the microbial needs for proteins and energy.

The FCR for the different treatments is shown in Table 2. Ration D appeared to be having the lowest conversion ratio, although not significantly different from that of other rations ($P > 0.05$). However this result indicates that 50% (PL) in rations of fattening lambs is efficiently utilized. The FCR reported in this experiment is similar to that found by Mansour *et al.* (1988) using 10% blood meal, also similar to that reported by Ahmed and Suleiman (1988) who also fattened lambs with blood meal, but our results for FCR were better than that reported by El Tayeb *et al.* (1987) when using cotton seed cake and dura grains for sheep fattening.

The dry matter digestibility (DMD) of the different rations is presented in Table 2. The only significant difference among the different feeding regimen is DMD of ration D compared with that of ration C ($P < 0.05$). This result is following the same trend of improved performance of lambs fed rations containing 50% (PL) with crushed grains. On the other hand, values for DMD of the different treatments observed here are higher than that reported earlier, Gerald and David (1975), Holzer and Levy (1976), although the latter authors were working with cattle. Similarly, El Hag and El Hag (1981) reported a rather low DMD when fattening sheep with dry poultry excreta, but the initial weight of their lambs were higher than these of our experiment.

The present result with processed grains is similar to a previous result obtained by Abdalla (1979) when feeding different forms of grains to pregnant ewes and found a

significant ($P < 0.01$) higher DMD of diets containing rolled barley.

It is concluded that fattening lambs are capable of utilizing rations containing 50% (PL) and the best result is obtained when the ration contained crushed grains.

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