



Effects of Feeding Different Levels of Guar (*Cyamopsis Teragonoloba*) Germ on Fattening Performance of Sheep

I, Y. Turki, A, A. Hassabo, D. E., Ahmed, M. E. Khogali N, A. Talib, I., Omer M. E.

Department of Animal Production, Faculty of Science and Technology of Animal Production, Sudan University of Science and Technology, Khartoum North (Kuku), Sudan (www.sustech.edu).

ABSTRACT

The study was conducted to evaluate the effect of feeding different levels of Guar germ on fattening performance of sheep. Twelve Sudan desert lambs of an average body weight (17.6 kg) were used in feedlot performance trial for 60 days. Four rations: A control, B, C and D were formulated, they consist different levels of guar germ (0, 15, 25 and 32%, respectively). The rations were prepared to be iso-caloric and iso-nitrogenous by mixing, sorghum grains, guar germ, groundnut cakes, groundnut hulls, wheat bran, molasses limestone and salt. The animals were distributed randomly into four experimental groups; each group consisted of three lambs; they were fed individually their appointed diets. The dry matter intake and final body weight were not significantly ($P > 0.05$) affected by different inclusion rate of guar germ in the diet. Group B showed the highest daily DMI (948.55 ± 25.05 g/day) and final body weight (33 ± 7.00 kg) followed by group C of daily DM intake (883.51 ± 27.21 g/day) and final weight (30 ± 1.32 kg). The daily body weight gain and feed conversion efficiency (F.C.R) are significantly ($P < 0.05$) affected by variable levels of guar germ in the diets. Group B also was the best daily weigh gain (230.02 ± 12.40 g/day) and F.C.R. (5.77 ± 0.49) followed by group C which gained daily (187.43 ± 10.12) F.C.R. (6.44 ± 0.46). The results showed that guar germ can be added as a source of protein to the diet of sheep. It improved the body weight and F.C.R. where best results were obtained at 15% guar germ in the diet and can add other protein sources in the diet until 25% without affecting animal performance.

Keywords: Guar germ, protein source, sheep, performance

1. INTRODUCTION

Sudan is one of few countries of the world that could contribute greatly towards the alleviation of at least part of the present world deficit in animal proteins. This position is acquired due to its great potential resources of both live stock number and animal feed materials. The Sudan has an estimated sheep population of 20 million; two thirds of these numbers are sheep of desert breed [1]. Other breeds include Nilotic. Arid upland, arid equatorial, West African Fulani and many cross between these breeds [2]. Generally, mutton and lamb are the meats of choice and they fetch higher prices in the local market than the other types of meat. The problem of sheep production in the Sudan are numerous including the absence of scientific methods of application for feeding and the lack and high price of dietary feed, and shortage of ingredients, so there is a need to solve this problems by developing a system of feeding and the cast of production by uses other cheap rich protein sources by- products [3].

Guar germ is one of industrial by-product that remains after separating galactomannan gum from the guar seed. It is considered a cheap protein source for the ruminants and poultry nutrition. It has a potential value as a feed to animals with a high protein content ranging between 45–55% as reported by [4]. The high content of the meal protein offers a good source of essential amino acids [5]. The objective of this study is to examine the effects of different levels of guar germ in the diet on fattening sheep performance.

2. MATERIALS AND METHODS

Animals and feeds

Twelve Sudan desert sheep male lambs were purchased from Elsheikh Abu Zaid local market west of Omdurman. These animals were of an average live weight (17.6 kg). They are treated against internal and external parasites and injected with broad spectrum antibiotic, then ear-tagged. Four iso caloric and iso nitrogenous rations were formulated. Different levels of guar germ concentrations in diet were used (0, 15, 25 and 32%) A, B, C and D, respectively. The other ingredients of groundnut cakes, groundnut hulls, molasses, sorghum grain, wheat bran, limestone and salt were granulated and mixed as (%) of experimental diet is shown in table (1).

Feeding Trial

The experimental animals were stratified according to body weight in to four comparable groups. Then these groups were randomly distributed in to four dietary treatments (Table 1) animals of each group were put in a separate pen and fed *ad-libitum* the assigned diet for approximately, 10 days as an adaptation period. Then , each animal was put into a separate pen of two square meters and fed individually its assigned diet *ad-libitum* in a feeding trial for 60 days and offered clean water was available throughout the entire experiment. The feed was weighed and offered to the animals once a day at 7:30 am.



The feed refusals of each animal were weighed and recorded daily. The daily feed consumption of each animal was obtained by subtracting feed refusal from the feed offered.

Body weight gain

All lambs were individually weighed at the beginning of experimental period and then weekly through

the entire experimental period. Weighing was performed after on over night fasting.

Analysis of data

Data was analysis using analysis of variance applicable to a randomized complete-block design and means separated by least significance [6].

Table (1): Experimental diets composition

Ingredients	Rations			
	A%	B%	C%	D%
Molasses	10	10	28	41
Sorghum grain	50	50	36	18
Guar germ	0	15	25	32
Groundnut cake	18	3	–	–
Groundnut hull	9	9	9	7
Wheat bran	11	11	–	–
Limestone	1	1	1	1
Salt	1	1	1	1
Total	100%	100%	100%	100%
Total Crude Protein (CP)%	17.10	17.60	17.88	18.94
Total Metabolizable Energy (ME) Mj	11.24	11.15	10.50	10.58
Total Crude Fiber (CF)%	10.41	10.60	9.66	8.66

A = 0% Guar germ, B = 15% Guar germ, C = 25% Guar germ, D = 32% Guar germ

3. RESULTS AND DISCUSSION

Daily dry matter intake (DMI) and final body weight

Final body weight (kg), daily dry matter intake (g), daily weight gain (g) and feed conversion ratio are showed in table (2). Dry matter intake (DMI) was not significantly affected by the levels of guar germ in the rations offered. The findings of present study agree with [7] who reported no differences in intake, acid detergent and crude protein digestibility retention in nitrogen between diet containing ground nut cakes or guar meal 5% urea molasses complex based diet. In experiment designed to determine effects of different levels of guar meal on the performance of dairy cows; treatments were including 4 levels of guar meal: T1) 0, T2) 4, T3) 8, T4) 12% of DM that substitute to soybean meal. Treatments effect on DMI (kg/d) was not significant ($P > 0.05$) [8]. But our findings disagreed with the results reported by) who demonstrated that increasing level in the diet significantly depressed the DMI [9], this might be due to difference in the percentage of inclusion rate of guar germ in each research. Lambs fed diet of 15% guar germ consumed higher amounts of feed 948.55 ± 29.22 g followed by lambs fed diet of 25% guar diet 883.51 ± 27.21 g. The lowest values of the above parameters were

obtained by lambs fed on control and 32% guar germ as 868.97 ± 25.05 g and 839.44 ± 25.26 g dry matter intake (DMI), respectively. Similar results obtained by [10] who proved that inclusion of guar germ at different levels up to 40% in the diet had significantly affected dry matter intake. No significant difference was observed among dietary treatments for final body weight. This parameter followed the same trend as noted for daily feed intake in which the lambs fed 15% guar germ in the diet; had highest final body weight of 33.00 ± 7.00 kg followed by lambs fed 25% guar germ of 30.50 ± 2.32 kg, control group of 27.67 ± 2.89 kg and 32% guar germ in diet of 26.33 ± 3.21 kg [11] reported that guar meals hull and germ had a lower feed intake 6.96kg and 7.23kg, respectively and daily weight gain 870.9 and 934.0 g, with poor feed conversion ratio 8.06 and 7.97 for bulls fed diet contained 25% guar germ and guar hull, respectively.

Daily weight gain

Highly significant difference ($P < 0.01$) was detected in the cost of body weight gain which was seem to be very high in lambs fed 15% guar germ 230.02 ± 12.40 and lowest ($P < 0.01$) in lambs fed 32% guar germ 124.40 ± 8.45 . No significant differences were observed for daily gain among lambs fed 15%, 25% and control. The values of above parameters were 230.02 ± 12.40 , $187.43 \pm$



10.12 and 174.62 ± 81.41 g respectively. Control diet had insignificant difference ($P > 0.01$) with 32% guar germ group. This result is confirmed by the findings of [10] who replaced ground nut cakes by guar meal up to 30%. They reported that guar germ meal increased body weight gain equally to groundnut cakes in calve diets. In the present study best gain of 230.02 ± 12.40 was obtained by lambs fed diet content 15% guar germ, followed by lambs fed 25% guar germ of 187.43 ± 10.12 , this would confirm the finding of [10]. That guar germ meal could replace up to 30% groundnut cake (GNC). Other workers added guar

germ till for 50% in rations of growing buffalo calves [12]. Similarly, guar germ meal found to increase body weight gain equally to groundnut cake in calves diets [10]. Both guar meal and ground nut cakes have similar protein degradability at the same rumen outflow rate [10]. While [11] stated that effective degradability values of dietary ground nut cake protein source were slightly higher than dietary guar germ protein sources at the same outflow rate. In this study 15% guar germ was superior that other dietary groups including the control diet group.

Table (2): Effect of different guar levels % in diets on performance of sheep

Diet parameter	A	B	C	D	F-Test
Initial average weight (kg)	17.00 ± 1.75	17.98 ± 1.79	18.15 ± 1.81	17.51 ± 1.51	
Daily (DMI) intake (g)	868.97 ± 25.05 a	948.55 ± 29.22 a	883.44 ± 27.21 a	839.44 ± 25.26 a	NS
Daily weight gain (g)	174.62 ± 8.14 ab	230.02 ± 12.40 a	187.43 ± 10.12 a	124.40 ± 8.45 b	**
F.C.R. (feed/g/gain/g)	6.38 ± 0.46 a	5.77 ± 0.49 a	6.44 ± 0.46 a	6.75 ± 1.53 b	*
Final body weight (kg)	27.67 ± 2.89 a	33.00 ± 7.00 a	30.50 ± 1.32 a	26.33 ± 3.21 a	NS

- A = 0% Guar germ, B = 15% Guar germ, C = 25% Guar germ, D = 32% Guar germ
 -Means within column with same superscripts are not significantly different.
 - NS: Not significant. - * : Significant at level 0.05. - **: Significant at level 0.01

Feed Conversion Ratio (F.C.R.)

Feed conversion ratio was influenced by dietary treatments. The lambs fed diets content 0%, 15% and 25% guar germ had significantly improved feed conversion ratio (F.C.R.) of 5.77 ± 4.91 for sheep fed 15% guar germ followed by 25% guar germ 6.44 ± 4.64 and control 6.38 ± 6.90 than sheep fed of diet contained 23% guar germ which was recorded 6.75 ± 1.57 g feed/g gain F.C.R.[9] recorded that F.C.R. was influenced by different inclusion rate of gaur germ in the diet. He signed feed conversion ratio of 5.18 feed g /gain g for sheep fed on diet containing 5% guar meal. The results here for this parameter followed the same trend as noted for daily gain (g) which lambs fed 15% had improved feed conversion ratio (F.C.R.) followed by 25% and control group.

4. CONCLUSION

Inclusion of guar germ at different levels in the diet of sheep resulted similar dry matter intake and final body weight which found to improve both body weight gain and feed conversion ratio (F.C.R.). The best results obtained at 15% guar germ level in the diet.

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