RESEARCH OPINIONS IN ANIMAL & VETERINARY SCIENCES
ISSN 2221-1896
www.roavs.com

Evaluation of performance and carcass characteristics of camel-calves fattened with molasses

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Abstract

Twenty camel-calves were employed in this feeding trial for a period of 98 days. Calves were stratified according to body weight into two groups, then allotted randomly to two dietary treatments. Diet (A) consists of molasses feed while Diet (B) consists of sorghum grain feed. During the pre-experimental period (12 days), the experimental animals were maintained on sorghum Stover diet, the experimental diets were introduced gradually until full replacement took place. The results indicated that no significant differences ($P<0.05$) were observed in dry matter intake, rate of body weight gain, and feed conversion ratio. No significant differences were found (in percentage) between the two groups; in head, hide, four feet, intestine, stomach, mesenteric fats, kidneys, kidneys fats, liver, heart, lung and diaphragm. Also, no significant differences were found between the two groups in hot carcass weight, cold carcass weight and dressing percentage. This trial confirmed that no significant differences were found in chemical analysis, carcass colour and water holding capacity and cooking loss. This study was carried out to evaluate performance and carcass characteristics of camel-calves fattened with molasses that replaced sorghum grains which is the basal diet of most Sudanese people.

Keywords: Camel, Fattening, Molasses, Sorghum, Carcass

Introduction

Most of the world inhibitions, particularly in developing countries, are thought to be suffering from some sort of animal protein shortage. Exploitation of unconventional livestock such as camel is advocated as a means of increasing meat production and consumption.

The Sudan ranks among the top Arabic countries owing camels and statistics showed that the Sudan owing about 3.9 million heads of camels (Ministry of Animal Resources, 2006).

Animals in the Sudan are usually raised on natural pasture but they are finished on purchased feeds, mainly concentrates (sorghum grains and oil seed cakes). The Sorghum grains are main ingredients that used as a source of energy. Unfortunately, sorghum grains are used as human diets and as a major source of energy to other monogastric animals, particularly poultry. Hence, inclusion of molasses in camel diets will save on use cereal grains and reduce the cost of rations.

The aim of this study was to evaluate the performance and carcass characteristics of camel-calves fattened with molasses and sorghum grains feed.

Materials and Methods

Twenty (20) camel-calves (3 to 4 years old) with an average weight at 260.4 kg were purchased from a local livestock market and moved on feet pad to Kuku Livestock Experimental Station. On arrival, calves were ear tagged, treated against internal and external parasites.

Diets were prepared to be iso-nitrogenous and iso-caloric (table 1). Calves were stratified according to body weight into two groups and then allotted randomly to two treatments. Calves in treatment A were fed *ad libitum* on molasses feed plus 2 kg/head/day sorghum Stover and calves in treatment B were fed *ad libitum* on sorghum grains feed plus 2 kg/head/day sorghum Stover. The diets were introduced gradually and experimental diet took place after the 12 days.

The chemical composition of experimental diet is given in table (2). Water was available throughout the

experimental period, which lasted 98 days. Feeds were offered in one meal at 8.00 am and refusal was collected at the next morning. The feed intake was calculated as a difference between offered and refusal. Animals were individually weight on weekly basis.

Table 1: Ingredient composition of experimental diets

Ingredients	Experimental diets	
	Molasses A	Sorghum B
Molasses	48	-
Sorghum grain	-	44
Wheat bran	42	28
Groundnut hulls	-	24
Groundnut cake	8	2
Urea	1	1
Common Salt	1	1
Total	100%	100%

Table 2: Chemical composition of experimental diets (DM)

Item	Experimental diets	
	Molasses A	Sorghum B
Dry matter	90.7	93.4
Crude protein	13.78	13.84
Crude fibre	12.40	26.50
Ether extract	1.7	3.76
Nitrogen free extract	53.14	42.73
ME (MJ/kg/DM)	10.14	10.13

Feed were analyzed using standard methods (AOAC 1980).

12 camel-calves were slaughtered (6 animals form each group). The procedure of slaughter followed the local Muslims practice. The gut fill, empty body weight and hot carcass weight were obtained.

After carcass chilling for 24 hours carcass data were recorded. They included linear measurements and cold carcass weight. Then the carcass was split along the vertebral column into tow halves. The left side was prepared for cutting by removing the kidney and pelvic cavity fats.

Proximate muscle composition was determined on fresh muscle samples according to AOAC (1980). Water holding capacity was determined according to Grau and Hamm (1983). Colour measurements was done using a Hunterlab Tristimulus Coloriment. Model D25 M. 2, Hunter Lightness (L), redness (a) and yellowness (b) were recorded. Cooking loss was determined as the loss in weight during cooking and expressed as a percent of recooking weight.

The carcass was split into 14 joints (whole sale unit) following the methods described by Meat and Livestock Commission. (M.L.C, 1974).

Statistical Analysis

General linear Models (GLM) procedure of Statistical Analysis System (SAS, 1990) was used.

Results and Discussion

Feedlot performance of camel-calves fattened with molasses and sorghum grain feed are presented in table 3 studies on the use of molasses in camel rations are scarce, In this study final live weight daily gain, feed intake and feed conversion ratio were not significantly different between tow groups. The incorporation of molasses in camel-calves diet up to 48% had no undesirable effects ($P<0.05$) on average daily gain, feed intake and feed conversion ratio. This confirms that incorporation of sorghum grains in finishing diets is wasteful.

Carcass yield and characteristics of camel-calves fed molasses feed and sorghum feed were showed in table 4 . Slaughter weight , empty body weight, hot and cold carcass weight, and dressing percentage (hot, cold) were not significantly different between tow groups, These values were lower than those reported by Babiker and Yousif (1982), which could be attributed to differences in initial live body weight and duration of fattening period as well as the age.

Table 3: Feed lot performance of camel-calves fattened with molasses and sorghum grain feed

Parameters	Experimental diets		Level of significances
	Molasses A	Sorghum B	
Period of experiment (day)	98	98	-
Initial body weight (kg)	258.78±60.9	261.94±63.51	NS
Final body weight (kg)	319.95±75.5	322.29±68	NS
Total gain	61.17±17.50	60.35±19.8	NS
Average daily gain (kg)	0.62±0.18	0.61±0.21	NS
Daily feed intake (DM)kg/head	6.3±1.23	6.5±0.96	NS
Feed conversion efficiency kg feed/kg gain	10.16±4.51	10.65±577	NS

NS: Not significant

Table 4: Carcass yield and characteristics of camel-calves fed molasses feed and sorghum grain feed

Parameters	Experimental diets		Level of significances
	Molasses A	Sorghum B	
Slaughter wt(kg)	325.45±47.8	332.9±64.5	NS
Empty body wt(kg)	278.62±43.3	249.98±58.5	NS
Hot carcass wt(kg)	192.59±37.39	176.86±29.2	NS
Cold carcass wt(kg)	188.57±38.13	170.52±27.06	NS
Cutfill %	13.98±4.34	16.62±2.12	NS
Dressing% (hot/slaughter)	52.46±1.45	49.20±2.68	NS
Dressing% (hot/empty)	57.85±1.30	55.25±1.71	NS
Dressing% (cold/slaughter)	51.45±1.31	47.79±2.69	NS
Dressing% (Cold/empty)	56.57±1.30	54.34±5.04	NS

Table 5: Chemical composition of camel-calves meat fed molasses feed and sorghum feed

Parameters	Experimental diet		Significances level
	Sorghum A	Molasses B	
Moisture	74.51±0.05	74.23±1.13	NS
Protein	21.50±1.11	21.47±1.31	NS
Fat	3.65±0.54	3.65±0.49	NS
Ash	1.22±0.15	1.30±0.18	NS

Table 6: Water holding parameters and Meat quality of camel-calves meat fed molasses feed and sorghum feed

Parameter	Experimental diets		Significances level
	Sorghum A	Molasses B	
Colour	-	-	-
L	33.15±1.02	32.36±1.22	NS
A	18.35±0.80	18.93±0.66	NS
B	6.17±0.27	6.52±0.50	NS
Water –holding capacity	1.77±0.27	2.09±0.22	NS
Cooking loss%	40.51±1.20	39.38±1.2	NS

As seen in table 5 moisture, protein, fat and ash contents were similar in the meat from the tow groups. These values were higher than those obtained by EL-Iraqi et al. (1970) which my be due to difference in age and types of feed.

Water-holding capacity, colour and cooking loss were not significantly (P>0.05) different between tow groups. (Table 6). These results confirm the earlier conclusion that the system based on the feeding of sorghum grains diet is wasteful.

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