



## Growth Performance in Dromedary Camels under Two Feeding Regimen

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### ABSTRACT

This work was designed to evaluate the effect of diet on camels growth rate and daily gain. Forty five camels (18-24 months) of age, average weight at  $225 \pm 35$  kg were utilized in this study. The camels were divided into two groups, zero browsing group (15 Darfuri & 10 Butana) fed complete ration composed of (sorghum, 50%; groundnut cake 15%, molasses 10%, wheat bran 5%, dura husk 5%, urea 2%, bagas 12% and Common salt 1%). The 2nd group was a free browsing camel (11 Darfuri & 9 Butana) without any supplement. The animals were weighed weekly for 120 days after two weeks that served as adaptation period. The results revealed a significant increase ( $p < 0.05$ ) in mean body weight and average growth rate in zero browsing groups ( $321.5 \pm 38.5$ ) as compared to free browsing group ( $272 \pm 32.3$ ). The average total gain was almost double in zero browsing groups than free browsing groups. However, no significant differences were observed in weight gain, dry matter intake and feed conversion ratio between Darfuri & Butana in zero browsing groups. It is concluded that the dietary complete ration effect significantly on camel's growth rate and daily gains, and promote their body condition.

**Keywords:** Growth performance, daily gain, dromedary.

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### INTRODUCTION

Sudan is one of the largest camel (*Camelus dromedarius*) populated countries in the world. The total camel population of Sudan is estimated as 3 million heads (Ministry of Animal Resources, Sudan, 1999). In Sudan Camels provide mankind with a range of products and services, like wool, meat, milk and draught power. The one humped camel (*Camelus dromedarius*) has the capacity of being a better provider of food in the desert areas of the world than the cow which can be severely affected by heat and scarcity of feed and water. They are adapted

themselves to the ecosystem of dry and arid zones where are subjected to harsh conditions in addition to the severe fluctuations in the nutritional status, which in turn affect their general performance (Wardeh, 2004). The methods of camel keeping are now fast changing due the very severe and historical drought that hit several camel producing countries. These natural disasters had forced many camel herders to start settling (Darosa, 2005). Moreover, In order to reduce the alarming nutritional crisis, to make the ration economic and to have sustainable camel rearing practice, attempts were made to

formulate concentrate ration for camels. Thereafter, attempts regarding formulation of complete rations and their densification have been taken up successfully to develop a drought proofing technology for camels (Sharma and Dhuria, 2007). The aim of this study was to evaluate the effect of diet on live body weight gain in the camel calves.

#### MATERIALS AND METHODS

Forty five male camels (*Camelus dromedarius*) with age of (18-24 years) and average body weight (225±35 kg) were divided into two groups as zero browsing and free browsing group. Twenty five as zero browsing (15 Darfurian and 10 Butana types). Whereas, free browsing were (11 Darfurian and 9 Butana types). All animals were clinically healthy. After arrival at the site of the experiment (Camel Research Centre Tumbol) all animals were sprayed against ectoparasites, drenched with the Albendazol, and injected with a complete prophylactic course of Ivermectin and Oxytetracycline HCL. The first two weeks served as adaptation period. The camels were injected with multivitamins monthly.

**Table 1: Ingredients percentage of the experimental diets (as fed basis)**

Ingredients	%
Molasses	10
Crushed sorghum grains	50
groundnut cakes	15
Dura husk	5
Wheat bran	5
Urea	2
Bagas	12
Common salt	1
Total	100

Sorghum grains, groundnut cakes were milled to facilitate their mixing with each other and the other ingredients. Molasses and urea were added to the ration at each

**Feeds and Feedings:** In this study the camels supplemented with concentrate ration (Table 1) formulated according to National Research Council, (NRC) (1994) to meet the camel's requirements. The former diet was composed of traditional ingredients of crushed sorghum grains as the main source of energy and groundnut cake as the major source of protein, so as to reduce the cost of feeding; sugar cane molasses and urea were incorporated as major sources of energy and nitrogen respectively. Wheat bran was added to the diets to adjust their total metabolizable energy (ME) and crude protein contents. In addition, Dura husk (semema) was added to the concentrate diet as roughage. 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. The salt licking stones, and water were offered *ad libitum*. The feeding period was extended for four months (120 days) during which different measurements were conducted.

meal preparation (every 3 days) after dissolving urea in water in order to reduce urea accumulation in animal rumen which could lead to urea toxicity.

**Table 2: Chemical composition and energy concentration of the experimental diet (as % of DM)**

Parameters	Experimental diet (as % of DM)
Dry matter	96.5
Crude fiber	9.22
Crude protein	16.4
ME,MJ/KgDM	11.32MJ/KgDM 2466Kcal/Kg
Ca	0.77
P	0.14

Metabolizable energy was calculated according to MAFF (1975) formulae:

For experimental diets was:

$$ME (MJ/kg DM) = 0.012CP + 0.03EE + 0.005CF + 0.014NFE.$$

Where, CP is crude protein, g/kg DM; EE is ether extract, g/kg DM; CF is crude fiber, g/kg DM; and NFE is nitrogen free extract, g/kg DM.

Where crude protein (CP) and the other components of the equation were expressed as g/kg DM.

#### Statistical analysis:

The statistical analysis was performed using SPSS. The analysis of variance (two paired Student *t* test) was used to evaluate the effects of complete ration on camel weight gain.

#### RESULTS AND DISCUSSION

Growth performance of camel-calves fattened with complete ration were presented in Table( 3). In this study the

results revealed an increase ( $p < 0.05$ ) in mean body weight and average growth rate in zero browsing groups as compared to free browsing camel. The average total gain was almost double in zero browsing groups than free browsing camels. However, no significant differences were observed in weight gain, dry matter intake and feed conversion ration between Darfuri & Butana types in zero browsing camels (table 4). These results agreed with those of Mohamed (2006) and Bakkar *et al.* (1998); and higher than that obtained by Sahani *et al.* (1998), Faye *et al.* (2001) and Al Saiady *et al.* (2006). These results could be due to the difference in the management system, the nutritive value of the diet distributed to the animals and the breed characteristics.

**Table 3: Feed lot performance of zero browsing and free browsing camels**

Parameters	Zero browsing	Free browsing	Sig
Period of experiment(day)	120	120	—
No. of animals	25	20	—
Initial body wt. kg/day	225 ± 35.2	230 ± 25.9	NS
Final body wt. kg/day	321 ± 38.5	282 ± 32.3	*
Total weight gain kg	96 ± 17.3	52 ± 19.5	*
Average gain/kg/day	0.800 ± 0.08	0.433 ± 0.04	*
Feed intake (DM) kg/day	4.44 ± 0.11	—	—
Feed Conversion Ration	5.8 ± 1.09	—	—

\*= significant , (Means± SE)

NS= not significant

**Table 4: feed lot performance of Darfuri & Butana camels**

Parameters	Darfuri	Butana	Sig.
Period of experiment(day)	120	120	—
No. of animals	25	20	—
Initial body wt. kg/day	227 ± 32.2	224 ± 30.5	NS
Final body wt. kg /day	321 ± 35.3	321 ± 34.5	NS
Total gain (kg)	94.8 ± 9.3	97.8 ± 17.2	NS
average gain/ kg /day	0.790 ± 0.11	0.810 ± 0.06	NS
Feed intake (DM) kg /day	4.44 ± 0.12	4.34 ± 0.25	NS
Feed Conversion Ratio	5.8 ± 1.58	5.5 ± 1.53	NS

\*NS = not significant, (Means ± SE)

Sig= significant

In conclusion, the availability of the complete ration provided to the camels improved their nutritive value. Therefore it is highly recommended to provide this complete ration to export camels. Furthermore, crushed sorghum which was added to the diet to a level of 50% without negative effect, but good results were obtained at level 16% of crude protein.

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