J. Agric. Sci. Mansoura Univ., 28(1): 205 - 218, 2003

FEED UTILIZATION AND GROWTH OF MAGHRABY CAMELS OFFERED GROUNDNUT RESIDUES HAY AS AN ALTERNATIVE FOR BERSEEM HAY

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ABSTRACT

Fifteen growing male Maghraby camels of 276 ± 4 kg body weight and about 18 months old were used in a 16-week growth trial. Camels were divided into 3 similar groups (5 in each) according to weight and age, which were randomly allotted into 3 dietary treatments. Treatments were offering camels *ad libitum* amounts of either berseem (*Trifolium alexandrinum*) hay (BH, control), groundnut residues hay (GRH) or a mixture of equal parts of the two hays (BH + GRH) in addition to barley grains offered as a common concentrate for all treatments at 1.5% (on dry basis) of camel body weight. The growth trial was followed by a digestion and N balance trial on 3 camels of each group, chosen randomly.

The results indicated that camels fed on GRH or BH+ GRH diets were superior in total weight gain by 17.2 and 14.7%, respectively over the control. The ADG showed similar trend. The DM intake from barley did not differ significantly among groups while hay DM intake was similar for GRH and BH+ GRH groups being higher than those of BH group by 11.4 and 8.1%, respectively. Camels on BH+ GRH diet tended to convert feed DM, TDN and DCP into gain more efficiently than those on GRH diet (by 2.37, 4.77 and 3.67%, respectively) or the control (by 11.76, 10.65 and 11.95%, respectively).

Digestibility of DM, OM, CP, EE and NFE were almost similar for all diets but digestibility coefficients of CF, NDF and all cell wall fractions of GRH diet were the highest followed by those of BH diet ($P<0.05$ for ADL and cellulose) while those of the mixture of BH+ GRH were the least ($P<0.05$). The TDN value of GRH diet was higher ($P<0.05$) than those of BH or BH+ GRH diets being similar, while DCP content did not differ significantly among diets. Nitrogen balance was the highest when GRH diet was fed followed by the BH+ GRH diet while it was the least with BH diet. Nitrogen balance as % of intake was similar for GRH and BH+ GRH groups being higher by 2.4 and 3.1%, respectively than the control. Urinary N as % of intake was the least for BH+ GRH diet followed by GRH diet while the highest value was that of BH diet.

It is concluded that growing male Maghraby camels fed on the diet with GRH as a sole roughage performed better than those offered diets with BH or a mixture of equal parts of the two hays. Moreover, feeding camels on GRH diet is more economic in terms of lower feed cost / unit gain or as a net income than feeding diets with BH or the mixture of the two hays.

Keywords: camel, groundnut residues hay, growth, digestion and N utilization.

INTRODUCTION

Groundnut (*Arachis hypogaea*), a summer leguminous crop in Egypt, is estimated to be produced at 187176 tones annually from an area of 143599 feddan (Ministry of Agriculture, 2001) due to the increase in its cultivated area particularly in new reclaimed sandy land. Therefore, abundant

amount of its residues is available annually, which can cause environmental pollution particularly if farmers burn it. On the other hand, there is a gap between animal needs and the available animal feeds in Egypt. In addition, berseem (*Trifolium alexandrinum*) hay, which is the main good quality roughage feed in Egypt during summer months, is available in limited amounts and is expensive. Moreover, previous studies indicated that sheep and goats performed similarly or better when berseem hay was substituted by groundnut residues hay in the diets (Gelaye *et al.*, 1990; Awadalla and Mohamed, 1997 and Talha *et al.*, 2001).

Camel (*Camelus dromedaries*) had a great capacity to produce meat particularly if well nutritionally reared. Now, camel had a more important situation as a meat-producing animal in Egypt. The number of slaughtered camels (in governmental slaughter houses) reached 109960 heads in the year 2000 compared to 74000 heads in the year 1990 representing 48.6% increase (General Authority of Veterinary Services, 1990 & 2001).

The objective of this study was therefore to evaluate the performance of growing male Maghraby camels in terms of growth, digestion coefficient and N utilization when groundnut residues hay is fed as an alternative for berseem hay in their diets.

MATERIALS AND METHODS

This experiment was carried out at Camel Research Unit located in El Bostan area of Nubaria and belongs to Animal Production Department, National Research Centre, Cairo, Egypt. Nubaria area is a new reclaimed land in the western desert of Egypt.

Animals and treatments

Fifteen growing male Maghraby camels of average 276 ± 4 kg body weight and about 18 months old (purchased from the local Bedwins around the experimental area) were divided into 3 similar groups according to weight and age and allotted randomly to 3 dietary treatments (T). Treatments were offering camels *ad libitum* amounts of either berseem (*Trifolium alexandrinum*) hay (BH, T1, control), groundnut residues hay (GRH, T2) or a mixture of equal parts of the two hays (BH + GRH, T3). In addition, animals of all groups received barley grains as a common concentrate at 1.5% (on DM basis) of camel body weight. Mean initial body weights of camel groups 1, 2 and 3 were 278, 274 and 276 kg, respectively. Camels were individually housed in separate semi-opened pens throughout the trial.

Feeding and management

Groundnut residues hay was obtained from El Bostan area as the residues after removal of the nuts. Camel weights were recorded at the start of the trial and thereafter at biweekly intervals till the end of the trial (16 weeks) before morning feeding and drinking and after fasting overnight (feed and water). Camels were individually offered their feeds. Barley grains was offered once daily at 7.30 a.m. while the hays were offered twice daily at 8

a.m. and at 2 p.m.. Feed residues (hay only, since barley was totally consumed) were removed and weighed once daily before morning feeding to estimate feed intake. The daily offered amount of barley grains were biweekly adjusted according to changes in body weights. Fresh water was introduced to each camel two times daily at 7.00 a.m. and at 3 p.m. using plastic containers. The ingredients composition of the experimental diets is shown in Table (1), while the proximate analysis and also the cell wall constituents of dietary feed ingredients and the consumed whole diets are presented in Table (2).

Table (1): Ingredients of the experimental diets (on dry matter basis)[1].

Ingredient, %	Diets		
	Control (BH)	GRH	BH+GRH
Barley	57.04	54.71	55.48
Berseem hay	42.96	-	22.26
Groundnut residues hay	-	45.29	22.26

[1]: calculated from the actual consumption of ingredients throughout the trial.

Table (2):Nutrient chemical composition of dietary ingredients and the consumed whole diets.

Item	Feeds			Diets		
	Barley	BH	GRH	BH	GRH	BH+GRH
DM, %	89.49	91.50	94.05	90.35	91.56	90.95
Nutrient, % of DM						
OM	93.28	83.47	88.77	89.07	91.24	90.09
Ash	6.72	16.53	11.23	10.93	8.76	9.91
CP	8.49	10.35	10.27	9.29	9.30	9.30
CF	9.59	31.51	30.86	19.01	19.22	19.20
EE	1.54	1.98	2.66	1.73	2.05	1.89
NFE	73.66	39.63	44.98	59.04	60.67	59.70
NDF[1]	28.67	38.47	51.87	32.88	39.18	36.02
ADF[2]	15.79	20.50	37.92	17.81	25.81	21.77
ADL[3]	2.17	11.25	6.85	6.07	4.29	5.23
Cellulose[4]	13.62	9.25	31.07	11.74	21.52	16.53
Hemicellulose[5]	12.86	17.97	13.95	15.06	13.35	14.24

[1] Neutral detergent fiber [2] Acid detergent fiber [3] Acid detergent lignin
[4] ADF-ADL [5] NDF-ADF

Digestion and nitrogen balance trial

At the end of the growth trial, 3 camels out of each group were randomly chosen to carry out a digestion and nitrogen balance trial. These camels were transferred to metal metabolism crates specially designed to allow for separate total collection of feces and urine (Figs. 1 & 2). Each crate was of 2.25m length, 1.20m width, and 2.0m height being constructed from metal bars. The front side had a rectangle-opening permit for easy feeding from a feeding box of 60 cm length, 40 cm width and 40 cm depth, which was clipped in front of the camel. The bottom of the crate was also from metal bars (1.20m width, with distances among bars of 3 cm each) equipped below

it with a galvanized metallic mesh of 1 cm x 1 cm pores to permit for feces collection. Under the metallic mesh there was a galvanized sloped sheet of iron has a metal funnel in the middle, connected with a rubber tube leading to urine container. The bottom of the crate was 40 cm high over the ground. Camels were maintained on their previous respective diets throughout the balance trial, which lasted for 14 days (7 days as a preliminary period followed by another 7 days for total collection of feces and urine). Five % daily samples of feces and urine were taken for analysis. Chemical analysis of feeds, feces and urine was determined according to AOAC (1996) methods while cell wall constituents (fiber fractions) of feeds and feces were determined according to Goering and Van Soest (1970).

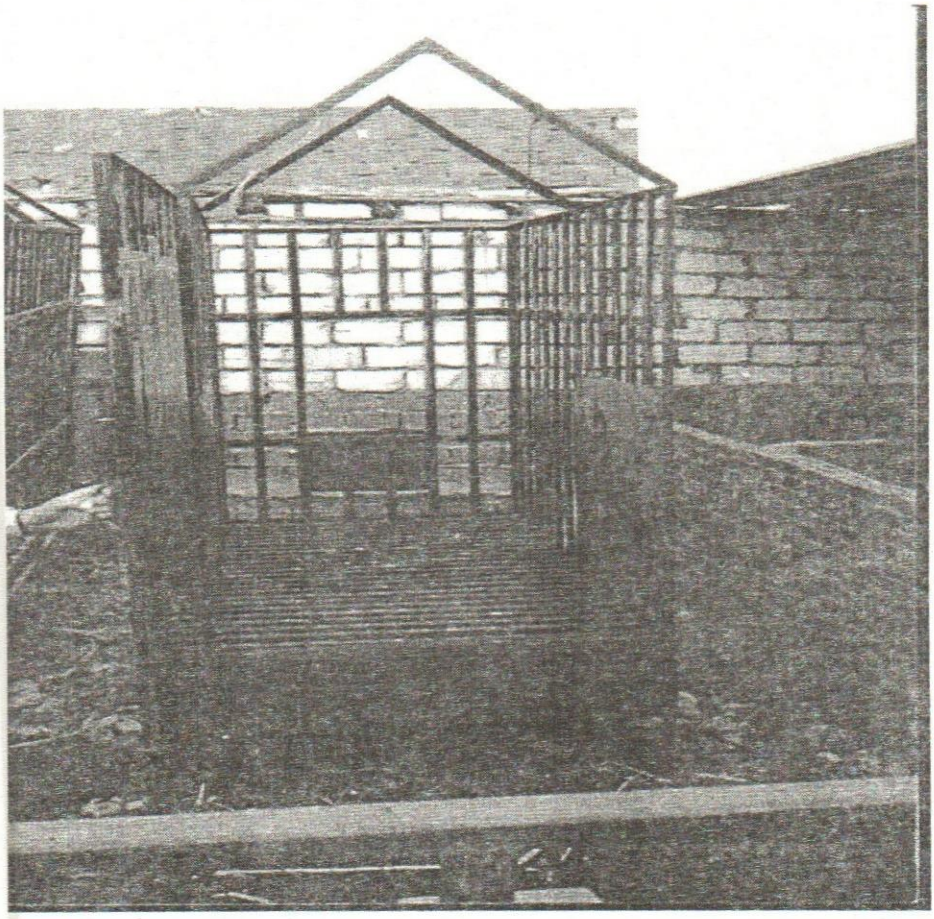

Fig. (1): Over view of an empty digestion and N balance crate.

Fig. (2): Over view of a digestion and N balance crate showing a camel inside.

Statistical analysis

Data were analyzed within each time period as one-way analysis of variance according to Neter *et al.* (1985) using SAS (1996). The following statistical model was used for describing the data: $Y_{ij} = \mu + T_i + e_{ij}$, where: Y_{ij} : is the observation of the trait under analysis of the ij^{th} camel , μ : is the overall mean, T_i : is the effect due to type of hay on the trait under analysis. e_{ij} : is the random error associated with Y_{ij} observation, assumed to be ND $(0, \delta^2)$. Differences among means were evaluated using Duncan multiple range test (1955).

RESULTS AND DISCUSSION

Feed composition

Chemical composition of dietary ingredients and the whole diets are given in Table (2). Crude protein and CF contents of GRH were similar to those in BH but GRH had higher contents of OM, EE and NFE with lower content of ash compared to BH. The data (Table 2) also showed that GRH was characterized by its higher contents of NDF, ADF and cellulose with lower contents of ADL and hemicellulose compared to BH. Accordingly, all the experimental diets were similar in CP and CF contents while differed in other nutrients. The GRH diet showed the highest concentrations of OM, EE, NFE, NDF, ADF and cellulose followed by BH+GRH diet while the BH diet was the least. The reverse trend was observed for ADL and hemicellulose %. However, the chemical composition of certain plant or plant residue depends mainly on certain factors such as fertilizer, soil and location. In accordance with the present results, Awadalla and Mohamed (1997) found that groundnut hay is similar to berseem (*Trifolium alexandrinum*) hay in CP content. In addition, they reported that groundnut hay had higher % of OM, NFE and cellulose with lower % of ADL compared to berseem hay.

Growth performance

Data of growth performance of experimental camels are shown in Table (3) and is illustrated in Figs. 3 and 4. At the start of the growth trial, body weight was similar for all camel groups, but final body weights at the termination of the trial (16 wks) was the same for camels fed GRH or BH+ GRH diets being heavier by 3.2 % than those of the control offered BH. These differences were insignificant. Camels offered GRH or BH+ GRH diets gained similar weights throughout the trial, being higher by 17.2 and 14.7%, respectively than the control. Similar trend was observed for average daily gain in weight (ADG). Figure 3 illustrated that almost throughout the biweekly periods of the growth trial, GRH fed camels were the highest in ADG followed by those on BH+GRH diet while those on BH diet were the least. Figure 3 also showed that, ADG of experimental camels increased till the 8th week and decreased during the 2nd half of the study.

Dry matter intake from barley grains was very close for all camel groups, while camels' consumption from groundnut residues hay was higher than the mixture of the two hays by 3% and higher than BH consumption by 11.35%. This indicates higher palatability of GRH than BH and was reflected on a similar trend for total DM intake or DM intake as % of body weight. Figure 4 illustrated that throughout the biweekly periods of the growth study groundnut residues hay was consumed at a higher amount than the mixture of the two hays while BH was consumed at the least amount. Furthermore, Figure 4 also showed that hay intake by all camel groups was increased with the advancement of age and weight as the trial progressed. Camels of the experiment consumed an average feed DM of 2.7% of BW as an overall mean. Mohamed *et al.* (1997) reported DMI values ranged from 2.61 to 2.71% of BW for Maghraby camels fed rations containing olive pulp and

grape by-product. Dietary TDN and DCP intake were the highest for GRH fed group followed by those fed BH+ GRH while camel group fed on BH recorded the lowest value. Differences in TDN intake between GRH or BH+ GRH fed groups and those of the control were 9.8 and 5.7%, respectively. The corresponding differences in DCP intake were 6.8 and 4.2%, respectively. Data in Table (3) also showed that, DM, TDN and DCP intake increased during the 2nd half of the trial compared to the 1st half. This was mainly due to the effect of increased weight.

Table (3): Growth performance of growing male Maghraby camels fed diets containing berseem hay, groundnut residues hay or a mixture of the two hays.

Item	Diets			±SEM
	Control (BH)	GRH	BH+GRH	
Initial body weight, kg	278	274	276	7.5
Final body weight, kg	375	387	387	12.1
Total weight gain, kg	96.6	113.2	110.8	8.78
Average daily gain, g	863	1011	989	78
Barley DM intake, kg/d	4.91	4.98	4.99	0.14
Hay DM intake, kg/d	3.70	4.12	4.00	0.15
Total DM intake, kg/d	8.61	9.10	8.99	0.28
TDN intake, kg/d				
0-8 wks	5.02	5.41	5.28	0.16
8-16 wks	5.83	6.49	6.18	0.21
0-16 wks	5.42	5.95	5.73	0.18
DCP intake, g/d				
0-8 wks	531	557	551	17
8-16 wks	617	668	644	22
0-16 wks	574	613	598	19
DM intake, % of BW				
0-8 wks	2.63^{a}	2.73^{b}	2.71^{b}	0.02
8-16 wks	2.63^{a}	2.76^{b}	2.69^{c}	0.02
0-16 wks	2.63^{a}	2.75^{b}	2.71^{b}	0.02
Feed conversion				
kg DM/ kg gain				0.60
0-8 wks	9.28	8.14	7.97	0.70
8-16 wks	11.37	10.59	10.32	0.64
0-16 wks	10.29	9.30	9.08	
kg TDN/ kg gain				
0-8 wks	5.85	5.32	5.08	0.39
8-16 wks	7.16	6.93	6.58	0.45
0-16 wks	6.48	6.08	5.79	0.41
kg DCP/ kg gain				
0-8 wks	619	548	530	40
8-16 wks	758	714	686	47
0-16 wks	686	627	604	43

SEM: Standard Error of Mean.

Means within row with different superscripts differ (P<0.05).

Means within row without superscripts are not significantly different (P>0.05).

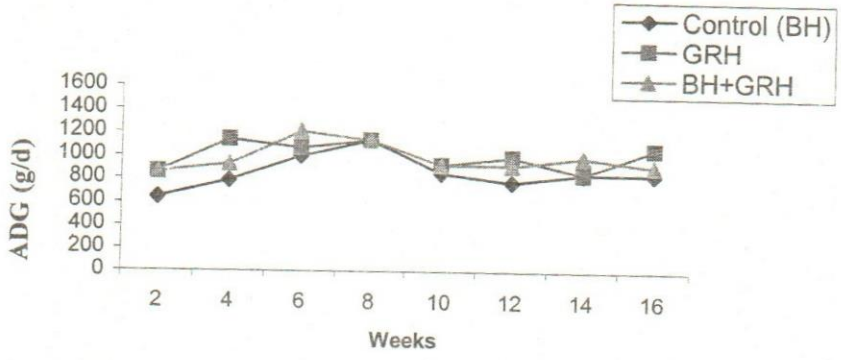

Fig.(3): Average daily gain (ADG) of Maghraby camels during two weeks intervals.

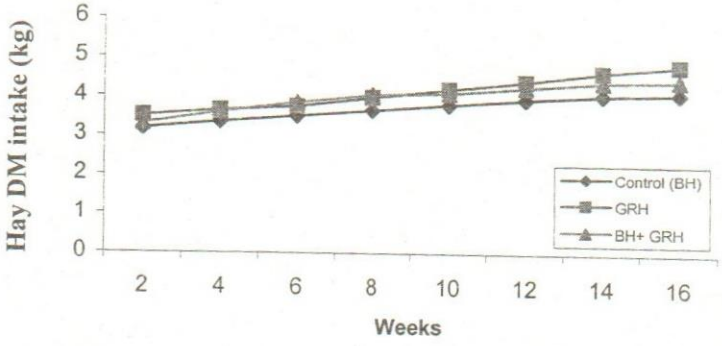

Fig. (4): Intake from different hays by Maghraby camels (h/d) in two weeks intervals.

Camels fed on BH+GRH diet converted feed DM, TDN and DCP into gain more efficiently than camels on GRH diet (by 2.37, 4.77 and 3.67%, respectively) and than those on BH diet (by 11.76, 10.65 and 11.95%, respectively). However, these differences were insignificant. Data also indicated that all camel groups were more efficient in converting feed DM, TDN and DCP into gain during the 1st half of the trial than the 2nd half. This may be due to the effect of camel weight and age, which were reflected on lower feed intake with higher daily gains during the 1st half, when they tend to form meat than depositing fat, compared to the 2nd half.

Daily gains of camels of the present study were relatively higher than those (0.550 to 0.880 g/d) reported by Mohamed *et al.* (1997) for growing Maghraby camels fed rations containing olive pulp and grape by-product. Also, the present daily gains are considered higher than those reported by Shawket (1999) for camel calves fed different levels of fresh saltbush (0.692 to 0.750 g/d). Nagpal *et al.* (1999) found that camel calves fed on whole plant parts of groundnut (*Arachis hypogaea*) showed higher (P<0.01) ADG than those grazed in a 3-tier silvipasture system for 7 h daily (427 *vs* 237 g/d). In agreement with the present results, with other ruminant species, Gelaye *et al.* (1990) found that at the termination of a 20-week growth study, goats fed peanut hay were heavier (P<0.10) and their rate of gain was higher (P<0.10) with better DM conversion (P<0.05) than goats fed alfalfa or a mixture of the two hays. The same authors also found that when goats were given free access to either peanut or alfalfa hays; they voluntarily consumed more (P<0.07) peanut hay than alfalfa hay throughout the study period. Also, Awadalla and Mohamed (1997) reported insignificant increase in DM intake by mature lambs fed groundnut hay compared to others fed berseem hay. Moreover, Talha *et al.* (2001) reported a slightly higher daily gain without significant differences in DM intake for lambs fed a 40% BH ration compared to another ration of 40% groundnut (vines) hay. They also found that lambs fed the groundnut vines hay utilized dietary DCP better than those fed the berseem hay diet (0.59 *vs* 0.78 kg DCP/ kg gain).

Nutrient digestibility

Nutrient digestibility coefficients of different experimental diets are presented in Table (4). Digestibility of DM, OM, CP, EE and NFE did not differ significantly due type of roughage fed, but digestibility of CF, NDF and all cell wall fractions of GRH diet were higher than those of BH diet (P<0.05 for ADL and cellulose) and those of the mixture of the two hays (P<0.05). This may be attributed to the lower ADL concentration in GRH (Table 2). Van Soest and Mertens (1977) reported a negative correlation (-0.61) between digestibility and ADL content. Moreover, Van Soest (1982) reported that high concentration of lignin in feed depressed digestibility of DM and other nutrient fractions. The TDN value of GRH diet was higher (P<0.05) than those of BH+GRH and BH diets, which were very close. The DCP content did not differ significantly among diets, but there was a tendency to be increased with GRH diet. Differences in DCP content between GRH diet and those of BH and BH+GRH diets were only 1 and 1.4%, respectively. In accordance with the present results, Gelaye *et al.* (1990) found that goats fed peanut hay digested fiber and other nutrients more efficiently than those fed alfalfa hay. Also Awadalla and Mohamed (1997) found that CF, ADF and cellulose digestibility values by lambs were higher for groundnut hay than for berseem (*Trifolium alexandrinum*) hay. They further reported higher estimated TDN value for groundnut hay than berseem (*Trifolium alexandrinum*) hay. Furthermore, Talha *et al.* (2001) reported higher (P<0.05) TDN value by sheep fed a 40% groundnut vines hay ration compared to those fed another ration of 40% berseem (*Trifolium alexandrinum)* hay.

Table (4): Digestion coefficients and nutritive values of diets containing berseem hay, groundnut residues hay or a mixture of the two hays by growing male Maghraby camels.

Item	Diets			±SEM
	BH	GRH	BH+GRH	
No. of animals	3	3	3	
Barley DM intake, kg	5.63	5.81	5.81	.10
Hay DM intake, kg	4.11	4.83	4.45	.36
Digestion coefficients, %				
DM	72.2	74.2	72.1	.87
OM	72.9	72.5	71.3	.89
CP	69.5	70.8	69.8	.79
CF	60.5^{ab}	62.2^{a}	59.4^{b}	.50
EE	59.3	60.8	59.9	.76
NFE	72.3	73.6	71.8	.82
NDF	62.2^{ab}	64.3^{a}	60.4^{b}	1.95
ADF	56.3^{a}	57.0^{a}	53.2^{b}	2.00
ADL	43.2^{b}	46.7^{a}	40.5^{c}	3.12
Cellulose	61.0^{b}	62.3^{a}	59.1^{b}	1.60
Hemicellulose	75.3^{ab}	77.2^{a}	73.2^{b}	2.03
Nutritive values, %				
TDN	63.0^{b}	65.4^{a}	63.78^{b}	.33
DCP	6.67	6.74	6.65	.11

SEM: Standard Error of Mean.
Means within row with different superscripts differ (P<0.05).
Means within row without superscripts are not significantly different (P>0.05).

Nitrogen utilization

Nitrogen utilization by Maghraby camels offered diets with different hays is presented in Table 5. Data indicated that daily N intake by camels offered GRH or BH+GRH diets were higher than those of camels offered the BH diet by 9.5 and 5.4%, respectively as a reflection of DM intake. Similar trend was observed for N excretion in feces with a relatively smaller corresponding differences (4.8 and 4.3%) resulting in increased absorbed N by 11.7 and 5.9% for the same respective groups over the control (BH). In addition, urinary N of camels fed BH or BH+GRH diets were similar being lower by 9.77 and 9.25%, respectively relative to camels fed on GRH diet. Hence, N balance of camels offered GRH diet was higher than that of camels offered BH+GRH diet by 3.1% and than that of camels fed BH diet by 12.3%, while camels offered BH diet showed the least value. Nitrogen balance as % of intake was similar for groups fed GRH or BH+GRH diets with a tendency to be higher by 2.4 and 3.1%, respectively relative to those of BH fed group.

Furthermore, urinary N as % of absorbed N was the least for the group fed the diet containing the mixture of BH+GRH followed by those fed on GRH diet while the control camels offered BH diet showed the highest value. This may indicate a well balanced absorbed essential amino acids from GRH protein and also may indicate a more balanced combination of absorbed

essential amino acids when GRH was fed with BH as a mixture. Romero *et al.* (1987) observed more rumen by- pass CP from peanut hay than alfalfa hay. The performed protein could be digested post-ruminally to supply essential amino acids needed for growth. The present results are in accordance with those of Yacout and El Badawi (2001) who reported a N balance value of camels fed on a diet with 10% CP of 67 g/d which was coupled with daily gain (829 g/d) that is close to those observed in the present study. Also, Awadalla and Mohamed (1997) reported insignificantly higher N balance for lambs fed on groundnut hay compared to those fed on BH. The same authors further found that N balance as % of intake was higher ($P<0.05$) for groundnut hay than BH.

Table (5): Nitrogen utilization by growing male Maghraby camels fed diets containing berseem hay, groundnut residues hay or a mixture of the two hays.

Item	Diets			±SEM
	BH	GRH	BH+GRH	
No. of animals	3	3	3	
Barley DM intake, kg	5.63	5.81	5.81	.10
Hay DM intake, kg	4.11	4.83	4.45	.36
N intake, g/d	144.5	158.2	152.3	7.8
Fecal N, g/d	44.1	46.2	46.0	5.5
Absorbed N, g/d	100.4	112.1	106.3	9.6
Urinary N, g/d	35.1	38.9	35.3	3.4
N balance, g/d	65.2	73.2	71.0	3.8
N balance, % of intake	45.2	46.3	46.6	2.3
Urinary N, % of absorbed	35.0	34.7	33.2	2.4

SEM: Standard Error of Mean.
Means within row are not significantly different ($P>0.05$).

Economic evaluation

Results of economic evaluation of using GRH in camel diets are shown in Table 6. Although, total DM intake / camel was higher for camels on GRH and BH+GRH diets than those on BH diet, total feed cost showed a reverse trend. This was due to the far lower price of GRH compared to BH (380 *vs* 200 LE/ton). This was reflected on lower feed cost/ kg gain for GRH and BH+GRH fed groups. Since total weight gain was similar for GRH and BH+GRH group being higher than those of BH fed camels, income was the greatest with GRH feeding followed by BH+GRH feeding while camels fed on BH diet recorded the lowest income. Economic efficiency relative to the control followed similar trend. Similarly, Mostafa *et al.* (1999) found that feeding lambs on a peanut hay ration achieved cheaper cost than that of alfalfa hay ration. Moreover, Talha *et al.* (2001) reported lower feed cost / kg gain by 15.6% for lambs fed a 40% groundnut (vines) hay ration compared to another of 40% berseem (*Trifolium alexandrinum*)hay.

Table 6: Economic efficiency of feeding growing male Maghraby camels on diets containing berseem hay ,groundnut residues hay or a mixture of the two hays.

Item	Treatments		
	Control (BH)	GRH	BH+GRH
No. of camels	5	5	5
Initial body weight, kg	278	274	276
Final body weight, kg	375	387	387
Total weight gain/ camel, kg	97	113	111
Total DM intake/ camel, kg[1]	964	1019	1007
Total feed cost/ camel, L.E.[2]	590	522	566
Feed cost / kg gain, L.E.	6.08	4.62	5.10
Price of weight gain/camel, L.E.[3]	679	791	777
Income/ camel, L.E.[4]	89	269	211
Relative economic efficiency [5]	100	302.3	237.6

[1] **During the 16-week experimental period.**
[2] **During the 16-week experimental period and on the basis of prices (L.E. / ton as fed) of 680 for barley, 380 for berseem hay and 200 for groundnut residues hay.**
[3] **Selling price was 7 L.E. for kg body weight.**
[4] **Price of total weight gain – total feed cost.**
[5] **Assuming that economic efficiency of the control equals 100.**

CONCLUSION

It is concluded that growing male Maghraby camels fed on diet with GRH as a sole roughage performed better than those offered diets containing BH or a mixture of equal parts of the two hays. Moreover, feeding camels on GRH diet is more economic in terms of lower feed cost / unit gain or as net income during the trial than feeding diets with BH or a mixture of equal parts of the two hays.

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الانتفاع بالغذاء والنمو للجمال المغربي المغذاة على دريس عرش الفول السودانى كبديل لدريس البرسيم

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استخدم فى هذه الدراسة والتى استمرت مدة ١١٢ يوما عدد ١٥ جمل نامى من النوع المغربى وزنها ٢٧٦ ±٤ كجم وعمرها ١٨ شهر. حيث قسمت الحيوانات إلى ثلاثة مجاميع متماثلة من حيث الوزن والعمر(٥ جمال فى كل مجموعة)، ثم وزعت عشوائيا على ثلاث معاملات غذائية هى تغذية الجمال فرديا حتى الشبع على دريس البرسيم المصرى (مجموعة المقارنة) أو دريس عرش الفول السودانى أو مخلوط من دريس البرسيم + دريس عرش الفول السودانى بنسب متساوية وذلك بالإضافة الى تقديم حبوب الشعير فى جميع المعاملات بمعدل ١,٥% (على أساس المادة الجافة) من وزن الجسم الحى. أجريت أيضا تجربة هضم وميزان أزوت عقب انتهاء تجربة النمو باستخدام ثلاثة حيوانات من كل مجموعة اختيرت عشوائيا.
وقد أظهرت النتائج أن الجمال المغذاة على عرش الفول السودانى أو مخلوط عرش السودانى مع دريس البرسيم تفوقتا فى الزيادة الوزنية خلال تجربة النمو بمقدار ١٧,٢ ، ١٤,٧% على التوالى على مجموعة الجمال المغذاة على دريس البرسيم. لم تختلف كمية المأكول من الشعير بين المعاملات بينما كان استهلاك عرش السودانى متماثلا مع مخلوط عرش السودانى و الدريس حيث كانا أعلى استهلاكا عن دريس البرسيم بمقدار ١١,٤، و ٨,١% على التوالى. مالت المجموعة المغذاة على مخلوط العرش و الدريس لأن تكون أكفأ عن الجمال المغذاة على عرش السودانى أو المغذاة على دريس البرسيم فى تحويل المادة الجافة أو مجموع المركبات الغذائية المهضومة أو البروتين المهضوم للعليقة إلى زيادة وزنية.
كانت معاملات هضم المادة الجافة، والعضوية، والبروتين الخام، والدهن الخام، والمستخلص الخالى من الأزوت متماثلة بين المعاملات، بينما كان معامل هضم الألياف الخام و مكونات جدر الخلية أعلاها فى حالة العليقة المحتوية على عرش السودانى تلاها عليقة دريس البرسيم ثم أخيرا العليقة المحتوية على عرش السودانى + دريس البرسيم. كانت القيمة الغذائية لعليقة عرش السودانى كمجموع المركبات الغذائية المهضومة أعلى معنويا عن عليقة دريس البرسيم أو العليقة المحتوية على عرش السودانى + دريس البرسيم واللتان كانتا متماثلتين بينما لم تختلف القيمة الغذائية كبروتين مهضوم معنويا بين العلائق. كان ميزان الأزوت أعلاه فى حالة عليقة عرش السودانى تلاها عليقة العرش + دريس البرسيم ثم أخيرا عليقة دريس البرسيم. كان ميزان الأزوت كنسبة مئوية من المأكول متماثلة بين مجموعة عرش السودانى ومجموعة عرش السودانى+ دريس البرسيم حيث كانا أعلى بنسبة ٢,٤ ، ٣,١% على التوالى عن مجموعة دريس البرسيم. كان أزوت البول كنسبة مئوية من المأكول هو الأقل فى حالة عليقة مخلوط عرش السودانى + دريس البرسيم ثم عليقة عرش السودانى بينما أظهرت عليقة دريس البرسيم أعلى قيمة.
من هذه النتائج يمكن استخلاص أن تغذية الجمال المغربى النامية على عليقة محتوية على عرش الفول السودانى أظهرت أفضل أداء مقارنة بتلك المحتوية على دريس البرسيم أو مخلوط دريس البرسيم +عرش الفول السودانى. وعلاوة على ذلك فإن التغذية على العليقة المحتوية على عرش الفول السودانى بمفرده كانت الأكفأ من الناحية الاقتصادية لتكاليف الغذاء سواء من حيث انخفاض تكلفة انتاج كجم زيادة فى وزن الجسم أو كإجمالى الربح خلال فترة التجربة.