

INGESTIVE BEHAVIOUR OF BALADI GOATS AS MEASURED BY PALATABILITY OF COMMON AND UNCOMMON FEEDSTUFFS

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SUMMARY

Palatability of common and uncommon feedstuffs was examined by 16 dry female Baladi goats during 1994 and 1995. Eight goats were juveniles (6-12 months) and the others were adults (24-48 months). Feed intake/minute was used as a measure to evaluate the ingestive behaviour of goats for tested feeds.

Peels and pods were significantly ($P<0.05$) more palatable to both adult and juvenile goats (45.3 g/min) than green fodders (21.7 g/min) and dry fodders (6.1 g/min). The palatability of field weeds (28.6 g/min) by both adult and juvenile goats was significantly ($P<0.05$) higher than that of green and dry fodders. Foliages were consumed by both adult and juvenile goats (24.0 g/min) significantly ($P<0.05$) more than dry fodders. Rice straw was significantly ($P<0.05$) more palatable to juveniles (8.7 g/min) than to adults (5.9 g/min). Adult goats had significantly ($P<0.05$) higher feed intake/minute of pelleted concentrate mixture (44.2 g/min) than juvenile ones (24.2 g/min). Juvenile goats exhibited significantly ($P<0.05$) higher palatability of sun flower seed meal (11.4 g/min) than adults (7.6 g/min).

Keywords: Baladi goats, juvenile, adult, palatability, peels and pods, field weeds, foliages

INTRODUCTION

An essential basis for successful goat management is knowledge of ingestive behaviour. Studying ingestive behaviour makes untraditional feeding economically feasible. Feed intake of uncommon feedstuffs could enhance production by preparing goats for the change in food resources they encounter throughout life. Kenney and Black (1984a) showed that the palatability of a forage is determined by its ability to provide stimuli to the oropharyngeal senses of the animal, (e.g. taste, odour and texture). The more palatable the

food is, the more is its intake (Gherardi and Black, 1991). Eating time of feeds or forages may differ because of their palatability. Intake rate (feed intake/minute) was used as a parameter to assess the ingestive behaviour of different feeds (Kenney and Black, 1984 a,b; Kenney *et al.*, 1984 and Ortega – Reyes and Provenza, 1993).

It seems that age of goat is an important factor in determining the feed intake of different feedstuffs. Older goats had higher intake rates of forages than younger ones (Hooper and Welch, 1983 and Ortega-Reyes and Provenza, 1993).

Baladi goats-like other goat breeds- are known to consume different kinds of common and uncommon feedstuffs. The present work attempted to evaluate the palatability of the familiar and novel feeds that can be used in feeding juvenile and adult Baladi goats in Egypt. It is hoped that the results arrived at could enhance production and reduce feeding costs of indigenous goats.

MATERIALS AND METHODS

1. Animals

Sixteen dry (non-lactating and non-pregnant) female Baladi goats belonging to the Small Ruminants Experimental Station of the University of Cairo were used in this study. Eight of these were juveniles (6-12 months old) and the others were adults (24-48 months old). The average body weight was 13.5 kg for the juveniles and 27.5 kg for the adults. This research was carried out during the period from July 1994 till August 1995. Each animal had a unique number painted on both sides of its body.

2. Housing

Each group was housed in a 5.9m x 3.7m separate pen. Each pen with two built in 250cm x 53cm x 30cm troughs, one trough was used for forages and the other for concentrates. Animals to be observed were transferred to a nearby half shaded yard 8.6m x 4.2m with a 1.20m high fence (waiting yard). An adjacent yard with the same area was used to observe animals during the testing periods (test yard). All observations were recorded from a 2 meters high partially enclosed platform situated just outside one of the corners of the test yard. This situation allowed the observer to watch clearly the tested animals in the yard, without disturbing the animals. Movable wooden troughs 125cm x 45cm x 30 cm were located in the test yard.

3. Feeding

Goats were given liberal amounts of either Egyptian clover or sorghum according to their availability. A daily allowance of 750g concentrate mixture + 250g whole barley was given to each adult goat while each juvenile was

offered 500g concentrate mixture + 100g whole barley. The concentrate mixture consisted of 42% decorticated cotton seed meal, 25% wheat bran, 22% yellow corn, 5% rice bran, 3% molasis, 2% limestone and 1% common salt. Goats had free access to water while in pens.

4. Pre-experimental Trials

Two weeks before starting the experiments, animals underwent daily routine similar to that of the testing procedure. Goats were fasted overnight to encourage active eating in the morning. Goats were driven together to the waiting yard at 08.00 a.m. then introduced one by one to the test yard for 15min. to get acquainted with the place and the feeds to be tested. Goats were returned to their pen at 13.00 p.m., where they received their conventional ration. Very similar procedure was suggested by Kenney and Black (1984a) and Kenney *et al.*, (1984) to get the animals used to the experimental routine. It was observed that animals could consume most of the feeds offered within two hours.

5. Experimental procedures

The palatability of common and uncommon feedstuffs was assessed as feed intake/minute. The feedstuffs used belong to one of the following classes: field crops (green and dry fodders), concentrates, by-products (foliages, peels and pods), and field weeds. The feedstuffs within each class were:

5.1. Field crops

5.1.1. Green fodders

- Clover (*Trifolium alexandrinum*).
- Sugar corn or sorghum (*Sorghum vulgare var. saccharatum*, Boeral).
- Darawa (*Zea mays L.*).

5.1.2. Dry fodders

- Clover hay.
- Post – mature clover straw "Rebba".
- Wheat straw (*Triticum aestivum*).
- Rice straw (*Oryza sativa*).

5.2. Concentrates

- Pelleted concentrate mixture.
- Ground concentrate mixture.
- Cotton seed meal.
- Sun flower seed meal.
- Rice bran.
- Wheat bran.

5.3. By – products

5.3.1 Peels and pods

- Prickly fig peels (*Opuntia cuna*).
- Water melon peels (*Citrullus lanatus*).
- Orange peels (*Citrus sinensis*, L.).
- Melon peels (*Cucumis melo* var. *reticulatus*).
- Sweet peas green pods (*Pisum sativum*).
- Peanut pods (*Arachis hypogaea*).

5.3.2. Foliages

- Fresh sugar cane bagasse (*Saccharum officinarum*).
- Colcasia residues (*Colocasia* spp.): non-eatable parts of colcasia stem.
- Carrots residues (*Daucus carota*): green parts of the plant.
- Cabbage residues (*Brassica oleracea* var. *capitata*): outer leaves.
- Faba bean foliage (*Vicia faba*): green parts of stem and leaves of the plant.
- Vegetative growth water melon (*Citrullus lanatus*): green stem and leaves.
- Vegetative growth of pumpkin (*Cucurbita moschata*): green stem and leaves.
- Newspapers.

5.4. Field weeds

5.4.1. Grasses weeds

- Jungle rice (*Echinochloa colonum*).
- Wild oat (*Avena fatua*).

5.4.2. Legume weeds

- Toothed medik (*Medicago polymorpha*).
- Vetch (*Vicia sativa*).
- Indian melilot (*Melilotus indica*).

Feed intake/minute was estimated by measuring two parameters:

Feed intake:

The difference between amount of food offered and the residual amount of feedstuff after exposure time. A springy balance, weighing to the nearest 5 grams was used.

Eating time:

Time spent eating during the test period (30 min) for each animal. It was estimated using a stop watch.

One kilogram of each of the previous feedstuffs (in case of concentrates only 1/3 kg) was offered in similar wooden troughs to every tested animal. It was observed, during the pre-experimental tests, that no more than one

kilogram of the tested feedstuffs and 1/3 kilogram of concentrates offered could be consumed during the test period (30 min). All trials were conducted from 08.00 a.m. to 01.00 p.m. Animals fasted overnight were individually introduced to the test yard and kept there for 30 min. in two consecutive days. The order in which goats were introduced was reversed daily. Three days before testing palatability of each uncommon feedstuff (by-products feedstuffs and field weeds), each animal was allowed to become accustomed to eat from these feedstuffs as suggested by Chapple *et al.*, (1987 a,b).

6. Statistical analysis of data

All statistical analyses were conducted using SAS (1995). Duncan's New Multiple Range Test was used to assess significance of differences among means of feed intake/ minute of different feedstuffs within each feed group. The effects of kind of feed, age of animal and the interaction between kind of feed and age of goat on the ingestive behavioural parameter were evaluated using the GLM procedure for repeated measures analysis of variance. All effects were assumed fixed except the random error, which was assumed normally and independently distributed with mean 0 and variance σ^2 .

RESULTS AND DISCUSSION

1. Palatability of field crops

1.1. Palatability of green fodders

It can be seen from Table (1) that the average feed intake/minute of clover was significantly ($P<0.05$) more than twice that of either darawa or sugar corn. Feed intake/ one minute of darawa was slightly higher but insignificant than that of sugar corn. Statistical analysis, Table (2), revealed a highly significant effect ($P<0.01$) of kind of green fodder on feed intake/minute. The obtained results confirm the generally known observation that clover is the most palatable green fodder in Egypt. Comparing darawa with sugar corn indicated that both are similarly palatable.

Results in Table (1) show that during one minute, adult goats ate significantly ($P<0.05$) more green fodders than juvenile ones. This result agree with that of Ortega - Reyes and Provenza (1993) who reported that adult goats had higher rate of intake of blackbrush pasture than young goats. Analysis of variance given in Table (2) showed that age of animal and interaction of kind of feed with age of animal had highly significant effects ($P<0.01$) on feed intake/minute of green fodders.

Table 1. Means (X) and standard errors (S.E.) of feed intake/minute (g/m) of common feedstuffs (field crops and concentrates) by Baladi goats

Feed	Average intake		Intake by			
	X	S.E.	Juvenile goats		Adult goats	
			X	S.E.	X	S.E.
1. Green Fodders :						
1.1. Clover	40.2 ^a	0.65	30.2 ^a	0.90	50.1 ^c	0.90
1.2. Darawa	13.4 ^b	0.65	9.2 ^b	0.90	17.5 ^d	0.90
1.3. Sugar Corn	11.7 ^b	0.65	9.6 ^b	0.90	13.7 ^e	0.90
2. Dry Fodders :						
2.1. Wheat straw	4.3 ^a	0.21	4.0 ^a	0.30	4.7 ^{ace}	0.30
2.2. Rice straw	7.3 ^b	0.21	8.7 ^b	0.30	5.9 ^d	0.30
2.3. Clover hay	6.7 ^c	0.21	4.6 ^{ac}	0.30	8.8 ^b	0.30
2.4. Rebba	5.3 ^d	0.21	5.1 ^{ce}	0.30	5.4 ^{de}	0.30
3. Concentrates :						
3.1. Pelleted concentrate mixture	34.2 ^a	0.75	24.2 ^a	1.07	44.2 ^e	1.07
3.2. Ground concentrate mixture	15.8 ^b	0.75	14.6 ^b	1.07	17.1 ^b	1.07
3.3. Sun flower seed meal	9.5 ^c	0.75	11.4 ^c	1.07	7.6 ^g	1.07
3.4. Cotton seed meal	15.8 ^b	0.75	15.9 ^b	1.07	15.8 ^b	1.07
3.5. Rice bran	3.8 ^d	0.75	3.5 ^d	1.07	4.0 ^{df}	1.07
3.6. Wheat bran	6.4 ^e	0.75	6.5 ^{fg}	1.07	6.3 ^{dfg}	1.07

Means under each factor within each group of feedstuffs followed by different superscript are significantly different ($P < 0.05$).

1.2. Palatability of dry fodders

It was found (Table 1) that during one minute, a goat consumed less than nine grams of any dry fodders offered to it. Feed intake/minute was highest for rice straw followed respectively by clover hay, rebba and was least for wheat straw. Differences between pairs of feedstuffs were significant ($P < 0.05$). In the meantime, kind of dry fodder had a highly significant effect ($P < 0.01$) on feed intake/minute (Table 2). It should be pointed out that the high intake of rice straw (7.3 g/min) was primarily caused by juveniles. In adults, the descending order of feed intake/minute was clover hay, rice straw, rebba and wheat straw, respectively. The relatively high intake of clover hay could be attributed to previous experience of adults with that feedstuff. Ortega-Reyes and Provenza (1993) working on goats and Mottershead *et al.* (1985) using sheep showed that feed consumption is affected by the amount of experience. Furthermore, Provenza and Balph (1988) indicated that dietary habits of adult herbivores are more stable than those of young herbivores. Meanwhile, wheat straw was the least palatable dry fodder. Table (2) shows that age of animal and interaction of kind of feed and age of goat had highly significant effects ($P < 0.01$) on feed intake/minute of dry fodders. The obtained results cast light on rice straw as a palatable roughage for juvenile goat. It comes first for juveniles, next only to clover hay for adults in respect to palatability. It is

customary to use wheat straw as a basic roughage for livestock including small ruminants. The comparatively high palatability of rice straw shown by the present results might change such current situation.

Table 2. Means (X) and standard errors (S.E.) of feed intake/minute (g/min) of uncommon feedstuffs (by-products and field weeds) by Baladi goats

Feed	Average intake		Intake by			
	X	S.E.	Juvenile goats		Adult goats	
			X	S.E.	X	S.E.
1. Peels and Pods :						
1.1. Peanut pods	7.1 ^a	2.54	9.2 ^a	3.59	5.0 ^a	3.59
1.2. Sweet peas green pods	39.5 ^b	2.54	29.6 ^{bd}	3.59	49.3 ^{ei}	3.59
1.3. Orange peels	55.0 ^c	2.54	44.1 ^{ci}	3.59	66.0 ^f	3.59
1.4. Prickly fig peels	67.2 ^d	2.54	35.5 ^{bc}	3.59	99.0 ^g	3.59
1.5. Melon peels	41.4 ^b	2.54	24.6 ^d	3.59	58.3 ^{ef}	3.59
1.6. Water melon peels	62.6 ^{cd}	2.54	34.6 ^{bc}	3.59	88.6 ^h	3.59
2. Foliages :						
2.1. Fresh sugar cane bagasse	13.7 ^a	1.42	16.6 ^{ad}	2.01	10.8 ^a	2.01
2.2. Newspapers	4.3 ^b	1.42	4.7 ^b	2.01	3.8 ^b	2.01
2.3. Colcasia residues	34.3 ^c	1.42	25.4 ^{ch}	2.01	43.3 ^f	2.01
2.4. Carrots residues	28.5 ^d	1.42	20.0 ^{ac}	2.01	37.0 ^g	2.01
2.5. Cabbage residues	36.7 ^c	1.42	25.2 ^{ch}	2.01	48.2 ^f	2.01
2.6. Vegetative growth of water melon	15.4 ^a	1.42	15.3 ^{ae}	2.01	15.4 ^{ae}	2.01
2.7. Vegetative growth of pumpkin	25.8 ^d	1.42	21.2 ^{cd}	2.01	30.4 ^h	2.01
2.8. Faba bean foliage	33.4 ^c	1.42	23.3 ^c	2.01	43.5 ^f	2.01
3. Field Weeds :						
3.1. Jungle rice	23.8 ^a	0.76	18.3 ^a	1.07	29.4 ^b	1.07
3.2. Wild oat	33.9 ^b	0.76	28.6 ^b	1.07	39.1 ^d	1.07
3.3. Toothed medik	28.5 ^c	0.76	24.2 ^c	1.07	32.9 ^e	1.07
3.4. Vetch	23.8 ^a	0.76	18.5 ^a	1.07	29.1 ^b	1.07
3.5. Indian melilot	32.7 ^b	0.76	26.6 ^{bc}	1.07	38.8 ^d	1.07

Means under each factor within each group of feedstuffs followed by different superscripts are significantly different ($P < 0.05$).

2. Palatability of concentrates

It is clear (Table 1) that the most palatable concentrate for goats was the pelleted concentrate mixture. Intake/minute of that mixture (34.2 g/min) was significantly ($P < 0.05$) higher than that of any other separate concentrate ingredient. Furthermore, during one minute, a goat consumed equal amounts of ground concentrate mixture and cotton seed meal (15.8 g/min). The differences in intake/minute of these concentrates and any other concentrate were significant ($P < 0.05$). Sun flower seed meal and wheat bran had a moderate palatability where the feed intakes/minute of these concentrates were 9.5 g/min and 6.4 g/min, respectively and the differences between their intake and that of other concentrates were significant ($P < 0.05$). Feed intake/minute of rice bran (3.8 g/min) was significantly ($P < 0.05$) lower than that of

Table 2. Analysis of variance of some factors affecting feed intake / one minute of different feedstuffs within various groups of feeds by Baladi goats

Feed group	Source of Variation									
	Kind of feed (K)		Age of animal (A)		Interaction of (K x A)		Residual			
	d.f.	M.S.	d.f.	M.S.	d.f.	M.S.	d.f.	M.S.	d.f.	M.S.
Green fodders	2	8171.58**	1	2755.77**	2	538.35**	90	13.48		
Dry fodders	3	58.73**	1	11.93**	3	65.39**	120	1.46		
Concentrates	5	3813.65**	1	473.22**	5	575.56**	180	18.23		
Peels and pods	5	15040.51**	1	47342.86**	5	4865.22**	180	206.64		
Foliages	7	4337.79**	1	6519.06**	7	971.12**	240	64.80		
Field weeds	4	722.15**	1	4506.64**	4	12.77	150	18.35		

** P < 0.01

other concentrates. The effect of kind of concentrate on feed intake/minute was found to be highly significant ($P < 0.01$) (Table 2).

It is interesting to notice (Table 1) that during one minute, goats consumed significantly ($P < 0.05$) higher amount of pelleted concentrate mixture than ground concentrate mixture, a matter which reveals that the concentrate mixture is more palatable in the pelleted form. The obtained result is in accordance with that reported by Weston (1974) who found that lambs on the whole grain diets consumed 20% more feed ($P < 0.01$) than those on the ground grain diets. Moreover, Gall (1981) indicated that size of the particles of eaten food is known to be one of the major constituents of taste.

On the other hand, adult goats had significantly ($P < 0.05$) higher feed intake/minute of pelleted concentrate mixture than juvenile ones. The case was reversed for sun flower seed meal, as juvenile goats showed significantly ($P < 0.05$) higher feed intake/minute of it than adults (Table 1). Since sun flower seed meal is a novel feed, it was less accepted by adult goats than by juveniles. Such interpretation receives confirmity from the findings of Provenza and Balph (1988) who indicated that adults accept new food less readily than young ones. Meanwhile, no significant differences were found between juvenile and adult goats in feed intake per one minute of other concentrates (Table 1). Table (2) shows that age of goat and interaction of age of animal and kind of feed exerted significant effects ($P < 0.01$) on feed intake/minute of the different concentrates.

3. Palatability of by – products

3.1. Palatability of peels and pods

It is apparent from data in Table (3) that the highest value of feed intake/minute of peels and pods was that of prickly fig peels (67.2g/min) followed respectively by water melon peels (62.6 g/min), orange peels (55.0 g/min), melon peels (41.4 g/min) and sweet peas green pods (39.5 g/min). Peanut pods were the least palatable feed (7.1 g/min). Differences in feed intake/minute due to kind of feed of the tested peels and pods were statistically significant ($P < 0.01$) (Table 2). The previous results may suggest that: a) Baladi goats prefer peels than pods, b) they like peels with higher content of sugar and c) green pods (sweet peas pods) are more palatable than dry pods (peanut pods). Preference of peels to pods might arise from their sweet taste. This result is different from that found on sheep by Goatcher and Church (1970 a,b) who reported that sheep were least sensitive to the sweet taste and most sensitive to the bitter taste.

It is striking that prickly fig peels were so palatable to Baladi goats. It is one of the most delicious, cheap and popular summer fruits in Egypt. Cultivated area of prickly fig increased from 2167 feddan in 1982 to 3535 feddan in 1994 (63.13% increase) (Agricultural Statistics Yearbook, Egypt, 1996). Prickly fig peels are considered as wastes and are of no use what so ever. It

may be recommended to feed goats kept by labourers in towns and by small holders in villages by that zero price feedstuff. Meanwhile, it is not uncommon to use other peels and pods especially melon and water melon peels for feeding small flocks of goats. It may be suggested to raise temporary flocks of goats near vegetable and fruit processing factories to get benefit of using their by-products in feeding these flocks.

As for age effect on palatability, it is clear (Table 3) that with the exception of peanut pods, adults consumed significantly ($P < 0.05$) higher amounts/minute of any of the offered feeds than juvenile goats. The relatively low intake/minute of peanut pods by adult goats could be attributed to previous experience as they are not accustomed to feed on cellulosic dry feeds such as peanut pods. Age of goat and interaction between peels and pods kind and age of animal were found to have highly significant ($P < 0.01$) effects on feed intake/minute (Table 2).

3.2. Palatability of foliages

The foliages could be arranged descendingly (Table 3), in respect to palatability, into four categories: a) cabbage residues, colcasia residues and faba bean foliage, b) carrots residues and vegetative growth of pumpkin, c) vegetative growth of water melon and fresh sugar cane bagasse and d) newspapers. Differences in palatability (feed intake/one minute) within each category were not significant but difference between any feed of the category differed significantly ($P < 0.05$) from these belonged to other categories (Table 3). Differences in feed intake/one minute due to kind of foliage were found to be highly significant ($P < 0.01$) (Table 2).

It is obvious (Table 3) that adult goats exhibited higher intake of the offered foliages than juveniles except fresh sugar cane bagasse and newspapers. Again, as in other groups of feeds, the juvenile goats showed a tendency to eat more than adults of low-quality feeds, a matter that may be attributed to previous experience of adults. The relatively low feed intake/minute of sugar cane bagasse might be due to its high content of crude fibers. This result is in accordance with that reported by Fahmy *et al.* (1997) who found that bagasse had a poor nutritive value and a high content of crude fiber. Differences due to age of goat in feed intake/minute of the tested foliages were found to be highly significant ($P < 0.01$). Also, the feed intake of foliage/minute was significantly ($P < 0.01$) affected by the interaction of age of goat and kind of foliage (Table 2).

4. Palatability of field weeds

Results in Table (3) show that during one minute, an individual goat consumed significantly ($P < 0.05$) more quantities of wild oat (33.9 g/min) and Indian melilot (32.7 g/min) than thoothed medik (28.5 g/min), jungle rice (23.8 g/min) and vetch (23.8 g/min). Meanwhile, goats had significantly ($P < 0.05$)

lower feed intake/minute of jungle rice and vetch than that of other field weeds (Table 3). Kind of weed exerted a highly significant effect ($P<0.01$) on feed intake/minute of the different field weeds (Table 2). It is clear from the previous results that wild oat as well as Indian melilot are the most palatable weeds for goats compared with other field weeds studied.

Adult goats had significantly ($P<0.05$) higher feed intake/minute of all field weeds studied than juvenile goats (Table 3). Furthermore, age of goat had a highly significant influence ($P<0.01$) on feed intake/minute of field weeds (Table 2).

5. Comparisons among palatabilities of the different groups of feedstuffs

It is apparent (Table 4) that peels and pods were by far more palatable to goats than any other category of feedstuffs. The eaten amount by a goat of peels and pods/minute (45.3 g/min) was significantly ($P<0.05$) higher than that consumed of any of the five materials studied. In this context, results in Tables (1 and 3) show that during one minute, a goat consumed higher amount of prickly fig peels (67.2 g/min), water melon peels (62.6 g/min), orange peels (55.0 g/min) and melon peels (41.4 g/min) than did for clover (40.2 g/min). Field weeds came next by an amount of 28.6 g eaten /minute/ animal and the differences between them and other materials were significant ($P<0.05$) (Table 4). Feed intake of foliages (24.0 g/min) and green fodders (21.7 g/min) did not differ significantly but both were significantly ($P<0.05$) higher than those of concentrates (14.3 g/min) and dry fodders (6.1 g/min) (Table 4). Meanwhile, data in Table (5) show that feed intake/minute was significantly ($P<0.01$) affected by group of feedstuffs.

Table 4. Means (X) and standard errors (S.E.) of feed intake/minute (g/min) of different feed groups by Baladi goats

Feed groups	Average intake		Intake by			
	X	S.E.	Juvenile goats		Adult goats	
	X	S.E.	X	S.E.	X	S.E.
Green fodders	21.7 ^a	1.57	16.4 ^{ae}	2.22	27.1 ^{cd}	2.22
Dry fodders	6.1 ^b	1.36	6.0 ^b	1.93	6.2 ^b	1.93
Peels and pods	45.3 ^c	1.11	29.6 ^{cg}	1.57	61.0 ^f	1.57
Foliages	24.0 ^a	0.96	19.0 ^a	1.36	29.1 ^c	1.36
Field weeds	28.6 ^d	1.22	23.2 ^d	1.72	33.9 ^g	1.72
Concentrates	14.3 ^e	1.11	12.7 ^e	1.57	15.8 ^{ae}	1.57

Means under each factor followed by different letters are significantly different ($P<0.05$).

Table 5. Analysis of variance of some factors affecting feed intake/minute of different feed groups by Baladi goats

Source of variation	d.f.	Mean squares
Feed group (FG)	5	29983.20 **
Age of animal (A)	1	28193.06 **
Interaction of (FG x A)	5	5327.44 **
Residual	1012	237.26

** P < 0.01

It is interesting that the a forementioned ranking was similar for juvenile and adult goats. But adults consumed greater amounts of feedstuffs belonged to the different categories (Table 4). Nevertheless, adults' feed intake/minute of the concentrates or the dry fodders did not significantly differ from those of juveniles. However, difference in feed intake/minute due to age of goat was significant ($P < 0.01$) (Table 5). In the meantime, interaction of group of feedstuffs and age of animal exerted a highly significant effect ($P < 0.01$) on feed intake/minute (Table 5).

The previous argument reveals that peels and pods are, to a great extent, more palatable than the common and uncommon feed groups used or supposed to be used for feeding goats in confinement in Egypt. Attention must be focused on using these residues in feeding goats.

ACKNOWLEDGEMENT

The authors gratefully acknowledge Dr. G.M. Ashmawi, Professor of Sheep and Goat Production, Faculty of Agriculture, Cairo University for valuable assistance throughout this study.

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السلوك الغذائى للماعز البلدى مقدراً بواسطة إستساعة المواد الغذائية الشائعة والغير شائعة الإستخدام

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أختبرت إستساعة المواد الغذائية الشائعة والغير شائعة الإستخدام لدى ١٦ أنثى من الماعز البلدى خلال عامى ١٩٩٤ و ١٩٩٥. كانت ثمان منهم فى طور النضج (٦ - ١٢ شهر) والباقى ناضجة (٢٤-٤٨ شهر). تم تقدير المأكول الغذائى/دقيقة واحدة لتقييم السلوك الغذائى فى الماعز للغذاء المختبر.

كانت قشور الثمار و أغلفة قرون النبات أكثر إستساعة (٤٥,٣ جم / دقيقة) معنويا (إحتمال أقل من ٠,٠٥) لكل من الماعز الناضجة والماعز التى فى طور النضج من الأعلاف الخضراء (٢١,٧ جم/دقيقة) والأعلاف الجافة (٦,١ جم/دقيقة) . وكانت إستساعة الحشائش الحقلية (٢٨,٦ جم/دقيقة) للماعز الناضجة والماعز التى فى طور النضج أعلى معنويا (إحتمال أقل من ٠,٠٥) من تلك للأعلاف الخضراء و الجافة. تناولت كل من الماعز الناضجة والتى فى طور النضج المخلفات النباتية الثانوية (٢٤ جم/دقيقة) بدرجة أكثر معنويا (إحتمال أقل من ٠,٠٥) من تناولها للأعلاف الجافة. كان قش الأرز أكثر إستساعة معنويا (إحتمال أقل من ٠,٠٥) للماعز التى فى طور النضج (٨,٧ جم/دقيقة) عنه للماعز الناضجة (٥,٩ جم/دقيقة).

كان المأكول الغذائى/ دقيقة واحدة من مخلوط الأعلاف المركزة فى صورة مكعبات أعلى معنويا (إحتمال أقل من ٠,٠٥) للماعز الناضجة (٤٤,٢ جم/دقيقة) عنه للماعز التى فى طور النضج (٢٤,٢ جم/دقيقة). أظهرت الماعز التى فى طور النضج إستساعة أعلى معنويا (إحتمال أقل من ٠,٠٥) لكسب عباد الشمس (١١,٤ جم/ دقيقة) عن الماعز الناضجة (٧,٦ جم/ دقيقة).