

GROWTH PERFORMANCE OF MALE ZARAIBI GOATS FED TEOSINTE FORAGE IN RATIONS DIFFERING IN ROUGHGE: CONCENTRATE RATIO

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ABSTRACT

This work was carried out on male Zaraibi goats to investigate the effect of using Teosinte forage in two roughage : concentrate (R/C) ratio (40:60 and 60:40) on growth performance, feed conversion and some blood constituents as well as economical efficiency. Eighteen male Zaraibi goats were divided into three equal groups (BH-40G, T-40G and T-60G) and fed according to NRC (1981) allowances: BH-40G fed 40 berseem hay (BH) : 60 concentrate feed mixture (CFM), T-40G received 40 Teosinte : 60 CFM and T-60G nourished 60 Teosinte : 40 CFM.

The data indicated that the digestibility of most nutrients of T-40G was significantly higher compared with BH-40G and T-60G. Thus, the TD*9N and DCP values were significantly better with T-40G (69.06 and 10.25, respectively) than BH-40G (65.27 and 10.05, respectively). The lowest values ($P<0.05$) of TDN (61.40) and DCP (8.51) were recorded with T-60G. Daily body gain (DBG) was improved with BH-40G and T-40G by 10.93 and 18.79 %, respectively compared with T-60G. Moreover, the DBG was increased by 9.68 % in T-40G than BH-40G. The feed conversion efficiency based on DM was better with T-40G followed BH-40G and lastly T-60G. The same trend was observed with feed conversion based on TDN and recorded 10.20, 9.76 and 10.50 for BH-40G, T-40G and T-60G, respectively. Using Teosinte forage in goat rations reduced feed cost/kg body weight gain from 13.93 LE in BH-40G to 11.90 and 11.72 LE in T-40G and T-60G, respectively. Therefore, the economic efficiency was higher with T-40G (1.68) and T-60G (1.71) compared with BH-40G (1.43). The economic efficiency was improved with the two Teosinte rations (T-40G and T-60G) by 17.5 and 19.6%, respectively compared with BH-40G (BH ration). Accordingly, feeding Teosinte at 40% instead of clover hay + 60 CFM level has better impact on growing kids either for growth rate or feed conversion efficiency and economic values.

Keywords: Teosinte - Zaraibi goats - growth performance – roughage : concentrate ratio - feeding value - economic efficiency

INTRODUCTION

The shortage of animal feeds in Egypt is the main constraint for further increase of animal population. Moreover, areas cultivated with Berseem are diminishing due to the state trend to replace it with wheat. As green forage is not adequate during summer season, animals rely on supplementary feeding mainly with concentrates which increases feeding cost during that season. Some studies (Ahmed *et al.*, 2001 and Shehata *et al.*, 2001) indicated that Teosinte could be used as good quality forage for ruminant in summer and that feeding value and daily milk yield were significantly improved with increasing Teosinte in goat rations.

Teosinte (*Euchleana mexicana*) is closely related to maize in most alleometric characteristics. It has also the advantages of tillering and regeneration, as fodder crop, under irrigation condition (Lal *et al.*, 1980). Teosinte forage produced high dry matter yield (Singh *et al.*, 1988) but, with medium content of crude protein (Soliman *et al.*, 1997).

Several studies (Gado, 1992, Mehrez, 1992, Mehrez *et al.*, 2001 and Ahmed, 2003) indicated that roughage: concentrate ratio has important role on metabolic parameters and consequently the productive performance. Ahmed (1999) studied the effect of using berseem hay as roughage in rations differing in roughage: concentrate ratio and indicated positive effects for Teosinte on performance of dairy Zaraibi goats and their born kids. Literature on using Teosinte in rations differing in roughage: concentrate ratio is scarce especially with Zaraibi goats.

Therefore, the present study was directed to evaluate the effect of using Teosinte in two ratios of roughage to concentrate on performance of male growing Zaraibi goats.

MATERIALS AND METHODS

This study was carried out at El-Serw Experimental Station (Damietta Governorate), Animal Production Research Institute, Ministry of Agriculture.

Eighteen growing male Zaraibi goats, selected from El-Serw Station herd, with an average age of 5-6 months and 23.5 kg weight were used. The animals were divided into 3 equal groups (6 each) to test:

- 1- Effect of replacing berseem hay with Teosinte with ration contained 60% concentrate.
- 2- Effect of increasing Teosinte level in the ration to 60% with 40% concentrate supplement only.

The experimental rations were therefore formulated:

Ration 1: 40% Berseem hay (BH): 60% concentrate feed mixture, CFM (BH-40G).

Ration 2: 40% Teosinte : 60% CFM (T-40G).

Ration 3: 60% Teosinte: 40% CFM (T-60G).

The three animal groups were assigned at random to receive the three experimental rations.

Teosinte was cultivated in salt-affected soil in El-Serw Agriculture Research Station. It was harvested 60 days after plantation. The used CFM contained, undecorticated cottonseed meal (25.0 %), yellow maize (38 %), wheat bran (25.0 %), soybean meal (5.0 %), molasses (3.0 %), limestone (2.5 %), common salt (1.0 %) and minerals (0.5 %). The chemical analysis of the dietary ingredients is shown in Table (1). Feed allowances were calculated according to NRC (1981).

The animals were weighed at the beginning then biweekly. Zaraibi males were fed for 3 weeks as a transitional period on the experimental rations before the start of the experimental work. The feeding experiment lasted 4 months (120 days). In addition, three digestibility trials (3 animals in each) were conducted after the end of feeding trials, to evaluate the experimental rations. Water was available all time. The rations were offered

twice daily at 8 am and 3 pm. Proximate chemical analysis of the feeds and feces was carried out according to A.O.A.C. (1995).

Table 1. Chemical analysis of feed ingredients and Tested diets.

Item	Composition, % DM basis						
	DM	OM	CF	CP	EE	NFE	ASH
Concentrate feed mixture, CFM	90.30	94.15	15.65	14.70	3.35	60.45	5.85
Teosinte, TS	25.05	89.97	25.89	10.31	1.87	51.90	10.03
Berseem hay, BH	88.93	88.10	28.93	11.22	2.09	45.86	11.90
Experimental diets:							
BH-40G	90.22	91.00	21.16	13.37	3.05	53.42	9.00
T-40G	65.22	91.61	19.97	13.20	2.92	55.52	8.39
T-60G	51.89	90.89	21.97	12.35	2.61	53.96	3.11

Rumen fluid samples were taken from 3 animals of each experimental group using stomach tube before feeding (0 time) and at 3 and 6 hrs post-feeding at the end of growing period. The samples were filtered through 3 layers of gauze and immediately subjected to the determination of pH value by pH meter. Ammonia nitrogen (NH₃-N) concentration was measured according to the method of Conway (1957), whereas total volatile fatty acids (VFA's) determined according to the technique described by Warner (1964).

Blood samples were collected from the jugular vein once before feeding (3 animals in each) at the end of growing period. Hematological analysis was directly applied on whole blood samples. Another samples were centrifuged at 4000 rpm for 20 min. Part of the separated serum was directed to enzymes activity determination, while the other part was stored frozen at -20 C° till the biochemical analysis. Commercial kits were used for all colorimetric biochemical determination.

Economic efficiency was calculated as total output/total input according to the local prices (where 1 ton of BH cost 500 LE, CFM cost 1000 LE and 1 ton Teosinte forage cost 100 LE while 1kg live body weight of male Zaraibi goats sold for 20 LE).

Data were statistically analyzed by the least squares methods described by the Likelihood program of SAS (1994). Differences among means were determined by Duncan's New Multiple Range Test (Duncan, 1955).

RESULTS AND DISCUSSION

Towards testing possible changes due to replacing hay with Teosinte, data of the digestibility trials, presented in Table (2), showed that the digestibility of most nutrients (DM, OM, CP, EE and NFE) were significantly higher with T-40G compared with BH-40G. The CF digestibility was higher also but insignificantly. The nutritive values, measured as TDN or DCP were significantly higher with T-40G (69.06 and 10.25, respectively) compared with BH-40G (65.27 and 10.05, respectively). Similar results were observed by Mehrez *et al.* (2001) and Ahmed (2003) with Rahmani lambs and Zaraibi kids. The improvement in digestibility of all nutrients and nutritive values in T-40G than BH-40G may be due to the good effect of introducing

Teosinte fresh as forage on some fermentation and metabolic parameters as will be reported in Tables (6) and (7).

Table 2. Digestibility and feeding values of male Zaraibi goats as affected by the experimental rations.

Items	Groups		
	BH-40G	T-40G	T-60G
Digestion coefficient % :			
DM	65.28 ± 1.24 ^b	69.13 ± 1.10 ^a	62.23 ± 1.33 ^c
OM	68.49 ± 0.79 ^b	72.24 ± 1.05 ^a	65.02 ± 1.27 ^c
CF	60.19 ± 0.63 ^a	62.65 ± 0.89 ^a	55.76 ± 0.30 ^b
CP	75.13 ± 0.31 ^b	77.66 ± 0.46 ^a	68.94 ± 1.20 ^c
EE	77.14 ± 0.337 ^b	79.18 ± 0.42 ^a	71.39 ± 0.96 ^c
NFE	69.62 ± 1.08 ^b	74.03 ± 1.48 ^a	67.54 ± 1.03 ^b
Nutritive value%			
TDN	65.27 ± 0.74 ^b	69.06 ± 0.98 ^a	61.40 ± 1.16 ^c
DCP	10.05 ± 0.05 ^b	10.25 ± 0.06 ^a	8.51 ± 0.15 ^c

Means in the some row with different superscripts differ significantly at (P < 0.05).

Concerning daily feed intake, the animals consumed approximately similar quantity of DM intake as shown in Table (3). The highest value of DM intake (841 g/h or 74.03 g/kgw^{0.75}) was recorded with T-40G during the 1st period. However, , the daily feed intake as g/h or % of BW or g/kgw^{0.75} for growing goats of either concentrate or roughage was not affected by the tested rations during the 2nd period. Similar results were observed by Ahmed (2003) and Shehata *et al.* (2003) on small ruminant (kids and lambs) fed on ration differing in roughage: concentrate ratio.

Table 3. Dry matter intake by male Zaraibi goats*.

Items	Groups		
	BH-40G	T-40G	T-60G
Daily feed intake (g/h) during the 1st period (1-60 days)			
Concentrate	498.8	507	323.5
Roughage	329.0	334	475.5
Total DM intake, g/d	827.8	841	799.0
DM intake, % BW	3.25	3.29	3.19
DM intake, g/kg w ^{0.75}	72.93	74.03	71.34
Roughage concentrate (R/C) ratio	40:60	40:60	60:40
Daily feed intake(g/h) during the 2nd period (61-120 days)			
Concentrate	576	574.3	376.5
Roughage	376	385.7	558.5
Total DM intake ,g/d	952	960.0	935.0
DM intake, %BW	3.29	3.28	3.33
DM intake, g/kgw ^{0.75}	76.40	76.25	76.64
R/C ratio	39:61	40:60	60:40
Average daily feed intake (g/h) during the whole period (1-120 days)			
Concentrate	537.4	540.6	350
Roughage	352.5	359.9	517
Total DM intake, g/d	889.9	900.5	867
DM intake, %BW	3.28	3.29	3.28
DM intake, g/kgw ^{0.75}	74.91	75.36	74.29
R/C ratio	40:60	40:60	60:40

* Group feeding

In the contrary, Abdelhamid *et al.* (1999a) observed clear effects to roughage: concentrate ratio on daily DM intake in dairy Zaraibi goats during the two reproductive stress phases (gestation and weaning period).

Performance of the male growing Zaraibi goats in relation to different feeding schemes are presented in Table (4). The obtained results revealed that replacing hay with Teosinte during the first period maintained the same growth rate of kids with slight favor for feeding Teosinte. The DBG values were 61.12 and 65.27 g/h for BH-40G and T-40G as shown in Table (4). The same trend was observed during the 2nd period. During the whole period (1-120 day), final body weight was higher with T-40G (31.08 Kg) compared with BH-40G (30.5 kg) but insignificantly. Daily body gain was improved with BH-40G and T-40G by 10.93 and 18.79 %, respectively compared with T-60G and the improvement in production performance is likely attributed the positive effect of decreasing roughage: concentrate ratio (40:60) in BH-40 and T-40G on digestibility and feeding value and consequently the productive performance as reported by Abdelhamid *et al.* (1999b) and Ahmed (2003).

Table 4. Growth performance during the two different growth periods of male Zaraibi as affected by different roughages.

Items	Groups		
	BH-40G	T-40G	T-60G
First period (60 days)			
Initial LBW(kg)	23.67 ± 0.95	23.58 ± 0.69	23.42 ± 0.61
Final LBW (kg)	27.33 ± 0.87	27.50 ± 0.76	26.67 ± 0.59
Total gain (kg)	3.67 ± 0.17 ^{ab}	3.92 ± 0.20 ^a	3.25 ± 0.21 ^b
Daily body gain (g)	61.12 ± 2.79 ^{ab}	65.27 ± 3.35 ^a	54.17 ± 3.57 ^b
Second period (60 days)			
Initial LBW (kg)	27.33 ± 0.87	27.50 ± 0.76	26.67 ± 0.59
Final LBW (kg)	30.50 ± 0.92	31.08 ± 0.93	29.50 ± 0.70
Total gain (kg)	3.17 ± 0.11 ^{ab}	3.58 ± 0.20 ^a	2.83 ± 0.17 ^b
Daily body gain(g)	52.77 ± 1.75 ^{ab}	59.73 ± 3.35 ^a	47.2 ± 2.77 ^b
Whole period (120 days)			
Initial LBW (kg)	23.67 ± 0.95	23.58 ± 0.69	23.42 ± 0.61
Final LBW (kg)	30.50 ± 0.92	31.08 ± 0.93	29.50 ± 0.70
Total gain (kg)	6.83 ± 0.17 ^a	7.50 ± 0.29 ^a	6.08 ± 0.20 ^b
Daily body gain (g)	56.92 ± 1.35 ^a	62.43 ± 2.40 ^a	50.70 ± 1.69 ^b

Means in the some row with different superscripts differ significantly at (P < 0.05).

The feed conversion efficiency based on DM, TDN and DCP by male growing Zaraibi goats are summarized in Table (5). Both feed efficiency with DM and TDN were better with utilized T-40G (14.42 and 9.76, respectively) than BH-40G (15.63 and 10.20). Similar results were observed by Ahmed (2003) with Zaraibi males fed ration differing in roughage : concentrate ratio. In this respect, Gado (1992) observed a positive effect on changes in body weight with decreasing forage: concentrate ratio. However, the feed conversion based on DCP was higher in BH-40G compared with T-40G. Generally, the feed conversation efficiency was better with forage compared with its hay (Ahmed *et al.*, 2009). With respect to feed cost and economical efficiency, it could be noticed that the animal fed BH-40G showed the highest feed coast and lowest economical efficiency. Replacing BH with Teosinte tended to lower feed coast and higher economical efficiency. Moreover,

increasing roughage ratio in ration (T-60G) lead to more decreasing in feed cost and increasing economical efficiency, as show in Table (5).

Table 5. Feed conversion rate and economic efficiency for male Zaraibi goats fed different experimental diets.

Items	Groups		
	BH-40G	T-40G	T-60G
Av. feed intake during feeding trial (from 1st to 4th month)			
From CFM, g/d	537.4	540.6	350.0
From roughages, g/d	352.5	359.9	517.0
Total DM intake, g/d	889.9	900.5	867.0
DM intake, g/kg ^{0.75}	74.91	75.36	74.29
DM intake, g/kg BW	3.28	3.29	3.28
Roughages %	39.61	39.97	59.63
TDN intake, g/d	580.8	621.9	532.3
TCP intake, g/d	89.43	92.30	73.78
Av, daily body gain, g	56.92	62.43	50.70
Feed conversion			
Kg DM/kg gain	15.63	14.42	17.10
Kg TDN/kg gain	10.20	9.76	10.50
Kg DCP/kg gain	1.57	1.47	1.46
Economical efficiency			
Cost of feed consumed (Eg Pound)	0.793	0.743	0.594
Price of weight gain (EgP)	1.14	1.25	1.01
Feed cost/kg gain (EgP)	13.93	11.90	11.72
Economical efficiency	1.43	1.68	1.71

Rumen parameters are presented in Table (6). The differences among the different groups were not significant in pH value before feeding (0 time) and at 3 and 6 hr post feeding. The same previous trial was observed with ammonia-N during 0 and 6 hrs after feeding, while after 3hr the concentration of ammonia-N with animals fed T-60G was significantly (P<0.05) lower than those the others. Rumen total VFA's concentration during the 6 hr post feeding was significantly higher with Teosinte forage T-40G (11.43 mEq/100ml rumen liquor) compared with BH-40G (10.7343 mEq/100ml rumen liquor).

Table 6. Rumen liquor parameters of male Zaraibi goats as affected by the experimental rations.

Items	Time after feeding (hr)	Groups		
		BH-40G	T-40G	T-60G
pH value	0	6.77 ± 0.09	6.90 ± 0.15	6.80 ± 0.21
	3	6.47 ± 0.09	6.40 ± 0.06	6.57 ± 0.09
	6	6.63 ± 0.09	6.60 ± 0.10	6.67 ± 0.09
Ammonia-N (mg/100 ml) rumen liquor	0	12.27 ± 0.77	11.87 ± 0.67	12.13 ± 0.37
	3	21.93 ± 0.35 ^a	21.40 ± 0.33 ^a	20.0 ± 0.23 ^b
	6	19.40 ± 0.31	19.80 ± 0.50	18.53 ± 0.24
Total volatile fatty acid (mEq/100 ml) rumen liquor	0	9.10 ± 0.32	8.93 ± 0.18	9.00 ± 0.20
	3	11.27 ± 0.26	11.70 ± 0.15	11.83 ± 0.09
	6	10.73 ± 0.15 ^b	11.43 ± 0.12 ^a	11.60 ± 0.12 ^a

Means in the some row with different superscripts differ significantly at (P < 0.05).

The superiority in total VFA's in T-40G is mostly attributed to the high content of NFE in Teosinte forage compared to berseem hay. Generally, ruminal total VFA's were higher with increasing Teosinte forage in goat rations (Ahmed *et al.*, 2001 and Shehata *et al.*, 2001).

Concerning blood profile, (Table 7) the obtained results revealed small fluctuations among groups fed different rations in concentrations of Hb, Hct, total protein, albumin, globulin, urea-N, creatinine, glucose, triglyceride, total lipids, cholesterol, AST, ALT and phosphorus. Also, serum calcium was significantly lower in BH-40G (9.93) compared with T-40G (10.47). This may be attributed to the good effect of Teosinte forage on metabolic parameters as reported by Ahmed *et al* (2009). Generally, the obtained values are within the normal ranges reported by Kaneko (1989) for healthy goats and in line with findings of Shehata *et al.* (2006) and Ahmed *et al.* (2009). Accordingly, it proved that replacing berseem hay with Teosinte keep the same performance with Zaraibi males rather than being some time in favor to Teosinte.

The next target was to evaluate the consequences of increasing Teosinte level in the ration from 40 to 60%, where results show that digestion coefficients of all nutrients contents (DM, OM, CF, CP, EE and NFE, Table 2) were decreased significantly by increasing Teosinte level.

The nutritive value as TDN and DCP were also significantly decreased by increasing Teosinte level (from 69.06 to 61.4 % and from 10.25 to 8.51%, respectively).

Table 7: Blood profile of male Zaraibi goats as affected by different experimental rations.

Items	Groups		
	BH-40G	T-40G	T-60G
Hemoglobin(Hb),g/dl	11.53 ± 0.52	12.03 ± 0.37	11.23 ± 0.48
Hematocrit ,%	35.33 ± 1.20	34.0 ± 1.0	35.83 ± 1.09
Red blood cells x10 ⁶ /ul	13.03 ± 0.42 ^{ab}	13.60 ± 0.32 ^a	12.07 ± 0.34 ^b
Mean cell hemoglobin concentration(MCHC),%	32.6 ± 0.53 ^b	35.37 ± 0.18 ^a	31.37 ± 0.87 ^b
Total protein, g/dl	6.7 ± 0.21	6.9 ± 0.25	6.5 ± 0.15
Albumin, g/dl	3.13 ± 0.19	3.13 ± 0.15	2.97 ± 0.15
Globulin, g/dl	3.57 ± 0.12	3.77 ± 0.15	3.53 ± 0.07
Urea-N, mg/dl	12.83 ± 0.73	13.80 ± 1.36	12.17 ± 1.42
Creatinine, mg/dl	1.53 ± 0.09	1.37 ± 0.12	1.43 ± 0.09
Glucose, mg/dl	68.33 ± 2.40	70.67 ± 2.60	67.33 ± 1.67
Triglyceride, mg/dl	78.33 ± 2.40	84.33 ± 2.19	80.0 ± 2.08
Total lipids, mg /dl	370 ± 19.0	353 ± 19.0	345 ± 13.0
Cholesterol, mg/dl	95.33 ± 3.28	89.67 ± 2.19	88.0 ± 3.61
AST, u/l	44.0 ± 3.51	41.33 ± 2.60	45.67 ± 2.96
ALT, u/l	13.17 ± 1.30	11.83 ± 1.09	13.50 ± 1.26
Calcium, mg/dl	9.93 ± 0.12 ^c	10.47 ± 0.03 ^b	10.87 ± 0.12 ^a
Phosphorus (inorganic), mg/dl	5.07 ± 0.23	5.27 ± 0.15	4.90±0.38

Means in the row with different superscripts differ significantly at (P < 0.05).

Daily body gain (Table 4) was significantly decreased by increasing Teosinte level, either during 1st period (65.3 to 54.2 g/h/d) or 2nd period (59.7 to 47.2 g/h/d) or the whole period (62.4 to 50.7 g/h/d).

Feed DM intake was reduced (P < 0.05) from 900.5 to 867.0 g/h/d while when calculated in relation to body weight the reduction was modified;

being from 75.4 to 74.3 for DM intake as g/k.0.75, from 3.3 to 3.3 as g/kg BW. Meanwhile, intake as TDN or TCP was reduced.

Rumen liquor parameters (Table 6) were mostly not significantly changed except with ammonia-N concentration at 3 hours after feeding which showed slight reduction from 21.4 to 20.0 mg/100 ml rumen liquor.

Blood constituents analysis (Table 7) showed significant reduction in red blood cells count (13.6 to 12.07 x10⁶/ul) and in hemoglobin concentration (35.37 to 31.37 % while calcium level increased significantly (10.47 to 10.87 mg/dl).

Finally, the economic efficiency of feeding Zaraibi males on different experimental rations (Table 5) show reduction in feeding cost with Teosinte supplemented rations than BH fed ration. The best economic factors were calculated with 40% Teosinte level in the ration. Increasing Teosinte level from 40% to 60% though reduced cost of feed from 0.743 to 0.594 EgP it gave poorer estimate for cost of weight gain (11.9 to 11.72 EgP) and economic efficiency (1.68 vs. 1.71).

Accordingly, feeding Teosinte at 40% instead of clover hay + 60 CFM level has better impact on growing kids either for growth rate or feed conversion efficiency and economic values.

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الأداء الانتاجي لذكور الماعز الزرايبي المغذاه على الذره الريانه فى علائق مختلفه فى نسبه ماده الخشنه الى الخشنه.

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هذا العمل أجرى على ذكور الماعز الزرايبي لدراسة تأثير استخدام الذره الريانه فى علائق أختلفت فى نسبه ماده الخشنه والمركزه (٤٠:٦٠، ٤٠:٤٠، ٦٠:٤٠) على معدل النمو وكفاءة التحويل الغذائى وبعض قياسات الدم والكفاءة الأقتصاديه.

تم استخدام عدد ثمانية عشر ذكر ماعز زرايبي فى ثلاث مجموعات، غذيت على مقررات NRC لعام ١٩٨١ بنسبه ٤٠% دريس برسيم : ٦٠% علف مصنع (١)، ٤٠% أذره ريانه : ٦٠% علف مصنع (II)، ٦٠% أذره ريانه : ٤٠% علف مصنع (III) . وكانت أهم النتائج:-

- أرتفعت معنويا معظم معاملات الهضم للمجموعه الثانيه مقارنة بالمجموعه الأولى والثالثه وبالمثل حدث تحسين معنوى فى المركبات المهضومه الكليه والبروتين المهضوم مع المجموعه الثانيه مقارنة بالأولى والثالثه.

- حدث تحسن فى معدل النمو مع المجموعه الأولى والثانيه ١٠,٩٣، ١٨,٧٩ % مقارنة بالمجموعه الثالثه. وكان معدل النمو أيضا أفضل بمعدل ٩,٦٨ % مع المجموعه الثانيه مقارنة بالأولى.

- كفاءة التحويل الغذائى محسوبه على أساس ماده الجافه سجلت أفضل قيمه مع المجموعه الثانيه ثم الأولى فى حين سجلت المجموعه الأخيره القيمه الأسوأ. وأيضا كانت قيم كفاءة التحويل الغذائى للمجموعات الثالثه على التوالي ١٠,٢٠، ٩,٧٦، ١٠,٥٠ عندما حسبت على أساس المركبات المهضومه الكليه.

- أدى استخدام الذره الريانه فى علائق الماعز الى انخفاض تكلفه الغذاء لكل كيلو جرام زيادة وزنيه من ١٣,٩٣ جنيهه (فى المجموعه الأولى) الى ١١,٩٠ جنيهه (فى المجموعه الثانيه) و ١١,٧١ جنيهه (فى المجموعه الثالثه). وبناء على ذلك حدث تفوق واضح للكفاءه الأقتصاديه مع مجموعتى الذره الريانه بنسبه ١٧,٥، ١٩,٦ % على التوالي مقارنة بمجموعه دريس برسيم.

من هذه الدرسة يتضح انه يمكن استخدام الأذره الريانه بنجاح بدلا من دريس برسيم كماده خشنه ومكمله لعليقه ذكور الماعز الزرايبي بنسبه تصل الى ٤٠% من العليقه حيث ادى ذلك الى زيادة معدل النمو اليومى مع انخفاض فى تكاليف التغذيه وارتفاع الكفاءة الأقتصاديه.

قام بتحكيم البحث

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