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RESPONSE OF ZARAIBI GOAT BUCKS TO RATIONS CONTAINING DIFFERENT RATIOS OF SESBANIA HAY AS A NEW AND HIGH SOURCE OF PROTEIN

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ABSTRACT

A digestibility trial carried out on 12 adult Zaraibi bucks divided into 4 groups each of 3 animals. The tested rations were 40% Sesbania sesban hay (SSH)+ 60% concentrate feed mixture (CFM) (G_1),50%SSH + 50% CFM (G2), 60% SSH+ 40% CFM (G3) and 80% SSH + 20% CFM (G4). The results indicate that CP content in both SSH and CFM were nearly similar (15.03 and 14.91%, respectively). The daily water consumption was higher by increasing SSH in the rations. Rumen PH values and ammonia-N tended to be higher with increasing the level of Sesbania hay and the differences were significant at 4 hours post feeding . On the contrary, rumen total VFA's concentrations at 4, 6 and 8 hours post feeding were significantly affected by tested rations and the highest values were recorded with G1 at all hours.

Concerning blood profile, the obtained data indicated that most tested blood parameters were not significantly ($P<0.05$) affected by the tested rations. Unless that, increasing SSH in goats rations had significant higher serum urea-N and calcium, while serum glucose and phosphorus were lower. The increase of SSH until 60% (in G3) were not significantly different digestion coefficients of all nutrients as well as feeding values (TDN and DCP). In addition, DCP not significantly affected by increasing SSH in the rations until 80%level.

Key words: Zaraibi bucks - Sesbania sesban hay- roughage: concentrate ratio - digestion coefficients - feeding values

INTRODUCTION

In Egypt, there is a wide gap between the available feedstuffs and requirements of farm animals. Many research workers showed that roughage: concentrate ratio had important effects on digestion, feeding values, rumen fermentation and blood profile and consequently the general performance of animals (El-Bedawy, 1985, El-Badawi, 1994, Abelhamid *et al.* 1999, Mehrez *et al.*, 2001, Serment *et al.* 2011 and Contalapiedra-Hijar *et al.*, 2014). Goats characterize by its ability to consume more roughage in their diets (Louca *et al.*, 1982, Abd El-Baki *et al.*, 1995 and Ahmed 2003). On the other hand, Soliman *et al.* (1997) and El-Kholany (2004) reported that the value of CP digestibility and DCP were higher with Seshamia sesban (forage or silage) rations compared with Teosinte or whole corn plants. Recent studies indicated that Sesbania sesban in different forms (forage, silage or seeds) had positive effects on farm animal's performance as reported by Ahmed *et al.* (2009), Ibrahim *et al.* (2012) and El-Kholany *et al.* (2016), respectively Literature on using Sesbania sesban as hay in feeding Zaraibi goats is scarce. Therefore, the present study planned to evaluate Sesbania sesban hay (SSH) at different levels in rations of adult Zaraibi bucks.

MATERIALS AND METHODS

The present study conducted at El-Serw Experimental Research Station, Animal Production Research Institute, Agriculture Research Center and Animal Production Department, Faculty of Agricultural, Domietta University. Four digestibility trials conducted on 12 adult Zaraibi bucks of about 56.0 kg body weight (BW) and 3 years old. Animals divided into 4 equal groups (3 each), and kept

individually in digestibility cages to determine daily feed intake, water consumption, rumen parameters, blood profile, digestion coefficients and feeding values of the tested rations. The digestibility trial lasted for 35 days, 28 days (4 weeks) as preliminary period for adaptation on the tested rations, followed by 7 days as collection period. During the last day of digestion trial, rumen liquor and blood samples taken from all animals.

The rations offered twice daily at 8 am and 5 pm. Water was available all the day. Zaraibi bucks offered maintenance requirements according to NRC (1981) allowance of goats. The CFM consisted of 25% un-decorticated cottonseed meal, 45% yellow corn, 23% wheat bran, 3.5% molasses, 2% limestone, 1% common salt and 0.5% minerals mixture. Sesbania sesban collected from ridge and canals around El-Serw Experimatal Farm. It directly chopped into 2-3 cm pieces. The Sesbania sesban hay made by sun drying.

Treatments contained four roughage (SSH) to concentrate (CFM) ratios (on dry matter basis): G1 (40:60), G2 (50:50), G3 (60:40) and G4 (80:20). The chemical composition of feed ingredients and calculated experimental rations presented in Table 1.

Rumen fluid samples took from bucks before feeding (0 time) and at 2, 4, 6 and 8 hrs post-feeding, during the last day of all digestibility trials, using stomach tube. The samples were filtered through 3 layers of gauze and directed to the determination of pH-value. Ammonia nitrogen (NH3-N) concentration measured according to Conway (1957) method, volatile fatty acids according to the technique described by Warner (1964) and microbial protein level by the method of Shultz and Shultz (1970).

Blood samples collected from the jugular vein once before feeding during the last day of digestion trial. The whole blood was immediately directed to hematological estimation, Another blood samples were centrifuged at 4000 rpm for 20 minutes. Part of the separated sera was directed to enzyme determination while the other part was stored frozen at -20^{o}C, until the biochemical analysis. Composite samples of feed took and dried at 60^{o}C for 48 hrs then grounded and stored in stopper bottles for chemical analysis. Proximate chemical analysis of the dietary ingredients and faces carried out according to A.O.A.C. (1995). Data statistically analyzed using SAS (2003).

Reference used for blood profile analysis:

Criteria	References
Hemoglobin (Hb)	Linne and Ringsrud (1992)
Red blood cells (RBC's)	Miller and Weller (1971)
White blood cells (WBC's)	Coles (1986)
Total protein	Doumas *et al.* (1981)
Albumin	Hill and Wells (1983)
Globulin	Coles (1986)
Creatinine	Ullmann (1976)
Urea-N	Freidman *et al.* (1980)
Glucose	Teuscher and Richterich (1971)
Cholesterol	Schettler and Nussel (1975)
Aspartate aminotransferase	Reitman and Frankel (1957)
Alanine aminotransferase	Reitman and Frankel (1957)
Calcium	Elveback (1970)
Phosphorus	Freidman et al.(1980)

RESULTS AND DISCUSSION

Chemical composition:

The chemical composition of feed ingredients and experimental rations presented in Table 1. The obtained data indicate that Sesbamia sesban hay (SSH) contained 15.03% CP, 2.65% EE, 46.05% NFE, 8.50% ash, 58.50% NDF, 37.39% ADF, 6.61% ADL, 21.11% hemicellulose and 30.78% cellulose. Similar results were reported by Soliman *et al.* (1997) who found that Sesbania sesban (as forage) contained 91.81% OM, 25.65% CF, 2.56% EE, 42.52% NFE, 8.19% ash on DM basis, while CP was higher than that obtained herein (21.09 vs. 15.03%). This decrease in CP content in the present study might be due to use of Sesbania sesban as hay. As for fiber fractions, El-kholany (2004) found that Sesbania sesban (as silage) contained 56.97% NDF, 36.0% ADF, 5.97% ADL, 20.97% hemicellulose and 30.03% cellulose.

Concerning the calculated chemical composition of tested rations, the data in Table 1 indicate that CF, NDF, ADF, ADL and cellulose were increased and both EE and NFE decreased with increasing Sesbania sesban hay (SSH) in the rations. Similar trend observed by El-kholany (2004).

The minerals analysis presented in Table 2 indicated that concentrations of Ca, K, Zn, Cu and Fe were higher and P, Mg, Na and Mn were less in SSH than CFM. Similar values for macro and microelements observed by Ahmed *et al.* (2017) on both mixture silage made from Sesbania sesban plus Kochia (1:1) and CFM as well. Finally, Soliman *et al.* (1997) found that Sesbania sesban (as forage) contained 1.27% Ca, 0.37% P, 0.36% Mg, 0.10% Na and 2.44% K.

Daily feed intake and water consumption:

Average dry matter (DM) intake by Zaraibi bucks presented in Table 3. The daily feed intake by Zaraibi bucks ranged from 538 to 541 g/h or 26.29 to 26.46 g/kg$w^{0.75}$. The values of feed intake in this study are less than those obtained by Shehata *et al.* (2001) on Zaraibi bucks (628.7 to 811.7 g/h or 39.50 to 50.09 g/kg$w^{0.75}$) and this attributed to the higher CP content in both SSH and CFM (15.03 and 14.91% , respectively).

The daily water consumption was higher by increasing SSH in the rations (Table 3). The values of water consumption (ml/kg $w^{0.82}$) were 88.25, 94.20, 101.36 and 110.56 for G1, G2, G3 and G4, respectively and the differences were significant. The increases were significant when related to live body weight and metabolic body size as well. The values of water consumption (ml/kg $w^{0.82}$) in this study are nearly similar to those obtained by Hassona *et al.* (1995) on growing goats (ranged from 98.20 to 116.0 ml/kg$w^{0.82}$) and Ahmed (1995) on Zaraibi goat bucks (ranged from 78.22 to 96.20 ml/kg $w^{0.82}$). Generally, the daily water consumption (m1/g DM intake) was higher (4.43, 4.75, 5.08 and 5.58) by increasing SSH (40, 50, 60 and 80%) in the rations (G1, G2, G3 and G4, respectively) and this increase might because the halophytic nature of Sesbania sesban as reported by Shehata *et al.* (2001) and Ibrahim *et al.* (2012) with Kochia and Sesbania sesban, respectively.

Rumen liquor parameters

Results in Table 4 indicate that differences in ruminal pH values among the four groups at 0, 2, 6 and 8 hrs post feeding were not significant. Whereas, pH values during 4 hr post feeding were higher (6.37, 6.42, 6.47 and 6.55) with increasing SSH in the rations (G1, G2, G3 and G4, respectively) and the differences were significant between G1 and G4. However, the obtained pH values at all hours are within the normal ranges (5.5 to 7.3) as recorded by Hungate (1966).

In the same time, ruminal ammonia-N concentration (Table 5) was greatly higher post-feeding than before feeding and the maximum values of NH3-N in rumen were observed at 4 hrs post feeding then decreased with all groups without noticeable differences among the tested experimental diets during most hours times. At 4 hrs post feeding, ruminal NH3- N concentration showed significant difference between G1 and G4 while G2 and G3 intermediated them. Similar results were observed by El-kholany (2004) and Chen et al . (2015).

Regarding to microbial protein, in general no significant results noticed by increasing SSH in the diets. However, G2

showed a trend of increase at all times while G3 and G4 had reduced values (Table 5).

So, the highest values of microbial protein (0.347, 0.547, 0.560, 0.553 and 0.540) and lowest values of ruminal ammonia-N concentrations (15.77, 20.96, 21.13, 20.40 and 19.93) were recorded with G2 at all times (0, 2, 4, 6 and 8 hrs, respectively). The same results recorded by El-kholany *et al.* (2013).

Data of ruminal total VFA's concentrations as well as proportions of individual VFA's % are presented in Table 6. Rumen total VFA's concentrations showed tendency to decrease with increasing SSH in the rations, but increases were significant only with G4 than the other three times at 4, 6 hrs while than G1 only at 8 hrs post feeding. Meanwhile, molar proportion of ruminal VFA's showed increasing acetate and decreasing propionate with increasing SSH in goats rations (not significant). Similar results observed by Chen *et al.* (2015) with rations differing in roughage / concentrate ratio (70:30, 60:40, 50:50 and 40:60). Generally, the highest value of total VFA's concentration was at 4 hrs post feeding which was reflected on the lowering of pH values at that time (Table 4), as reported by Shehata *et al.* (2006) and Ahmed *et al.* (2017) with Zaraibi goats. Finally, long-term feeding of high-concentrate diet causes a decrease in ruminal pH values due to the accumulation of volatile fatty acids and lactic acid (Chen et al . 2012).

Blood profile

Data of hemato-biochemical parameters presented in Table 7. The results indicated that most tested blood parameters were no significantly ($P<0.05$) affected by the tested experimental rations.

Comparison of hematological parameters revealed small fluctuations among groups fed different rations in concentrations of Hb, RBC's, WBC's, total protein, albumin, creatinine and cholesterol. On the other hand, serum urea-N (Table 7) were significantly higher with G4 compared with the other three groups and this may be due to the high content of CP and high protein degradability of Sesbania as reported by Ibrahim *et al.* (2012) and Khalili and Varvikko (1992).

Both AST and ALT enzymes showed some fluctuations among groups and the highest values were recorded in G4 (22.0 and 47.0, respectively) while the lowest values were detected with G2 (19.67 and 44.0, respectively). The same results observed by Chen *et al.* (2015). Moreover, serum glucose were decreased with increasing SSH (75.67, 75.0, 73.33 and 70.0) in the rations (G1, G2, G3, G4, respectively). Serum calcium showed increasing trend (10.07, 10.23, 10.43 and 10.50) with increasing Sesbania sesban hay in the though significance appeared only between edges groups (G1 and G4) and this may be due to the high content of calcium 1.13 (Table 2) in SSH. The obtained values are within the normal range reported by Jain (1986) (for hematological parameters) and Kaneko (1989) (for biochemical parameters) for healthy goats.

On the contrary, phosphorus (inorganic) was noticed to be less ($P<0.05$) with G4 (5.33) compared to G1 (5.87). In this respect, Kaneko (1989) reported that the normal physiological range of blood phosphorus (Inorganic) ranged from 5.0 to 7.3 mg /dl.

Digestion coefficients

The obtained data in Table 8 showed significant differences among groups in nutrients levels. Meanwhile, the digestion coefficient of all nutrients tended to increase with increasing CFM ratio in the rations of Zaraibi bucks. Similar results were observed by Cantalapiedra- Hijar *et al.* (2014) who reported that high concentrate diets resulted in greater ($P<0.001$) nutrients digestibility by cannulated adult goats. The incorporation of concentrates into ruminant diets is intended to increase dietary energy, proteins, minerals, and vitamins and to optimize the efficiency of feed utilization (Morand-Fehr and Sauvant, 1987).

Feeding values

The obtained data in Table 9 indicate that values of total digestible nutrients (TDN) and digestible crude protein (DCP) reduced with increasing SSH in the rations and the differences were significant in TDN only. These

results related to the digestion coefficients as reported earlier in Table 8. A recent study (Ahmed *et al.*, 2017) indicated that feeding values as TDN were not significantly affected by increasing forage : concentrate rations for Zaraibi bucks.

Digested nutrients intake

Data in Table 9 indicate that digestibility coefficients of TDN and DCP were significantly less with G4 than other groups, which not differ in-between significantly. Both TDN and DCP intakes (g/h or g/kg $w^{0.75}$) showed slight decrease with increasing SSH in the rations which attributed to the decrease in digestibility of all nutrients and feeding values to these rations.

CONCLUSION

Sesbania sesban hay could replace berseem hay in summer feeding of ruminants (mainly goats), as 60 % of ration, without negative effects on digestion coefficients of all nutrients, TDN feeding values, and most studied metabolic parameters.

Further studies needed to evaluate the utilization of Sesbania hay by some other farm animals, during different physiological stages and for long time.

Table 1:Chemical analysis of consumed feed ingredients of CFM and Sesbania sesban hay and calculated composition of tested rations fed to Zaraibi bucks.

Items	DM	Chemical analysis, DM basis						Fiber fractions, %				
		OM	CF	CP	EE	NFE	Ash	NDF	ADF	ADL	Hemi	Cellulose
Concentered feed mixture, CFM	90.53	92.0	17.50	14.91	3.31	56.28	8.0	42.70	22.15	5.50	20.55	16.65
Sesbania sesban hay, SSH	90.03	91.50	27.77	15.03	2.65	46.05	8.50	58.50	37.39	6.61	21.11	30.78
Calculated chemical composition of consumed rations												
40% SSH +60% CFM (G1)	90.33	91.80	21.61	14.96	3.05	52.18	8.20	49.02	28.25	5.94	20.77	22.30
50% SSH + 50% CFM (G2)	90.29	91.75	22.64	14.98	2.99	51.14	8.25	50.60	29.77	6.06	20.83	23.72
60% SSH + 40%CFM (G3)	90.23	91.70	23.66	14.98	2.91	50.15	8.30	52.18	31.29	6.17	20.89	25.13
80% SSH+ 20%CFM (G4)	90.13	91.60	25.72	15.0	2.78	48.10	8.40	55.34	34.34	6.39	21.0	27.95

Table 2 : Levels of some macro and microelements in the tested feed sources..

Items	Macro elements				Micro elements				
	Ca	P	Mg	Na	K	Zn	Mn	Cu	Fe
Concentrate feed mixture, CFM	0.67	0.81	0.41	0.50	0.65	25.0	59.0	3.5	60.5
Sesbania sesban hay, SSH	1.13	0.43	0.38	0.13	2.15	43.0	47.0	5.5	119.0

Table 3: Dry matter intake* and water consumption* of Zaraibi bucks fed the tested experimental diets.

Items	Groups				SE
	G_1	G_2	G_3	G_3	
No. of animals	3	3	3	3	-
Av. body weight, Kg	55.90	56.40	55.50	56.25	0.161
Metabolic body size , $W^{0.75}$	20.44	20.58	20.33	20.54	0.044
Metabolic body mass, $W^{0.82}$	27.09	27.29	26.94	27.23	0.063
Average daily feed intake:					
From SSH , g/h	217	270	323	430	3.150
From CFM, g/h	322	271	215	110	2.950
Total DM intake, g/h/d	539	541	538	540	0.337
DM intake, g/kg $W^{0.75}$	26.37	26.29	26.46	26.30	0.049
Roughage, %	40.26	49.91	60.04	79.63	-
Roughage : concentrate ratio	40:60	50:50	60:40	80:20	-
Average water consumption:					
L/head/day	2.39^{b}	2.57^{ab}	2.73^{ab}	3.01^{a}	0.089
ml/kg BW	42.77^{b}	45.58^{ab}	49.19^{ab}	53.52^{a}	1.620
ml/kg $W^{0.75}$	117^{b}	125^{ab}	134^{ab}	149^{a}	4.413
ml/kg $W^{0.82}$	88.25^{b}	94.20^{ab}	101.36^{ab}	110.56^{a}	3.332
ml/g DM intake	4.43^{b}	4.75^{ab}	5.08^{ab}	5.58^{a}	0.166

* Group feeding

Table 4: Effect of the tested experimental rations on rumen pH value of Zaraibi bucks.

Items	Hours	Groups				SE
		G_1	G_2	G_3	G_4	
PH values	0	6.97	7.05	7.07	7.10	0.039
	2	6.52	6.53	6.65	6.63	0.036
	4	6.37^{b}	6.42^{ab}	6.47^{ab}	6.55^{a}	0.027
	6	6.45	6.47	6.51	6.57	0.029
	8	6.62	6.62	6.67	6.68	0.030

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

Table 5: Effect of the experimental rations on rumen ammonia-N concentrations and microbial protein contents of Zaraibi bucks.

Items	Hours	Groups				SE
		G_1	G_2	G_3	G_4	
NH3-N (mg/ 100 ml)	0	16.01	15.77	16.53	15.93	0.230
	2	21.41	20.96	21.57	21.87	0.218
	4	21.51^{b}	21.13^{ab}	21.70^{ab}	22.32^{a}	0.157
	6	20.80	20.40	20.93	21.10	0.224
	8	20.07	19.93	20.13	20.27	0.180
Microbial protein (g/100 ml)	0	0.333	0.347	0.323	0.320	0.006
	2	0.533	0.547	0.533	0.520	0.008
	4	0.553	0.560	0.543	0.527	0.008
	6	0.533	0.553	0.530	0.520	0.007
	8	0.527	0.540	0.520	0.513	0.007

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

Table 6: Effect of the feeding treatments on ruminal total volatile fatty acids (VFA's) and fractions of VFA's.

Items	Hours	Groups				SE
		G_1	G_2	G_3	G_4	
Total VFA: (m Eq/100 ml)	0	9.10	9.03	8.93	8.80	0.123
	2	11.07	10.90	10.80	10.53	0.114
	4	12.67^{a}	12.50^{a}	12.37^{a}	11.90^{b}	0.095
	6	11.73^{a}	11.60^{a}	11.53^{a}	11.0^{b}	0.093
	8	10.80^{a}	10.73^{ab}	10.67^{ab}	10.30^{b}	0.085
Rumen VFA's%:						
Acetic	4	45.97	46.57	47.03	48.0	0.381
Propionic		27.07	26.67	26.23	25.57	0.336
Butyric		19.00	18.40	18.57	18.53	0.232
Valeric		3.67	3.80	3.70	3.57	0.118
Isobutyric		2.67	2.77	2.63	2.57	0.134
Isovaleric		1.63	1.80	1.83	1.77	0.104

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

Table 7: Effect of feeding experimental rations on blood profile of Zaraibi bucks.

Items	Groups				SE
	G_1	G_2	G_3	G_4	
Hemoglobin (Hb),g/dl	10.80	11.03	10.87	10.63	0.178
Red blood cell (RBC's) X10^{6}/µl	12.83	12.97	12.70	12.43	0.271
White blood cell (WBC's) X10^{3} /µl	10.03	93.87	9.93	10.20	0.140
Total protein, g/dl	7.10	7.23	7.13	7.03	0.129
Albumin, g/dl	3.73	3.80	3.73	3.77	0.090
Globulin, g/dl	3.37	3.43	3.40	3.27	0.047
Creatinine, mg/dl	0.80	0.76	0.83	0.90	0.027
Urea-N, mg/dl	16.97 ^{b}	17.33^{b}	17.63^{b}	18.43^{a}	0.184
Glucose, mg/dl	75.67^{a}	75.0^{ab}	73.33^{ab}	70.00^{b}	0.933
Cholesterol, mg/dl	69.33	71.0	67.0	65.33	1.898
Aspartate aminotransferase (AST), µ/l	21.00	19.67	21.33	22.0	1.080
Alanine aminotrnsferase (ALT), µ/1	45.67	44.00	44.67	47.0	1.785
Calcium, mg/dl	10.07^{b}	10.23^{ab}	10.43^{a}	10.50^{a}	0.074
Phosphorus, mg/dl	5.90^{a}	5.57^{ab}	5.43^{ab}	5.33^{b}	0.089

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

Table 8: Digestion coefficients of Zaraibi bucks as affected by different experimental rations.

Digestion coefficients, %	Groups				SE
	G_1	G_2	G_3	G_4	
DM	65.92[a]	65.19 [a]	64.93[ab]	61.79[b]	0.639
OM	68.82 [a]	68.16 [a]	67.89 [a]	63.96 [b]	0.668
CF	62.39 [a]	61.63[ab]	61.21 [ab]	58.40 [b]	0.638
CP	75.59 [a]	75.42 [a]	75.31 [a]	72.28 [b]	0.568
EE	78.20 [a]	77.41 [a]	76.98 [a]	72.45 [b]	0.724
NFE	69.01 [a]	68.38 [a]	68.30 [a]	65.47 [b]	0.543

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

Table 9: Feeding values and intake of different tested rations consumed by Zaraibi bucks.

Items	Groups				SE
	G1	G2	G3	G4	
Feeding values, % :					
TDN	66.17[a]	65.43[a]	65.06[a]	61.89 [a]	0.587
DCP	11.31	11.30	11.28	10.84	0.084
Digested nutrients intake:					
TDN, g/h/d	357.0[a]	354.0 [a]	350.0[a]	334[b]	3.182
TDN, g/kgw$^{0.75}$	17.45[a]	17.20 [a]	17.21[a]	16.26[b]	0.152
DCP. g/h/d	60.96[ab]	61.13[a]	60.69[ab]	58.53[b]	0.447
DCP, g/kgw $^{0.75}$	2.98 [a]	2.97[a]	2.99[a]	2.85[b]	0.022

Means in the same row with different superscripts differ significantly at P< 0.05

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مدى استجابة ذكور الماعز الزرايبى للعلائق التى تحتوى نسب مختلفة من دريس السيسبان كغذاء جديد وغنى فى نسبة البروتين

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أجريت تجربة هضم على 12 ذكر ماعز زرايبى تامة النمو ، قسمت لأربع مجموعات كل من 3 حيوانات ، والعلائق هى: 40% دريس السيسبان+ 60% علف مركز (مج1) ، 50% دريس السيسبان+ 50% علف مركز(مج2) ، 60% دريس السيسبان + 40% علف مركز (مج3) وأخيراً 80% دريس السيسبان + 20% علف مركز (مج4) وذلك لتقدير معاملات الهضم والقيمة الغذائية للعلائق التجريبية، كما تم اخذ عينات سائل كرش وعينات دم لدراسة حالة الحيوان.

وكانت أهم النتائج ما يلى:

- محتوى البروتين الخام فى كل من دريس السيسبان والعلف المركز متساوى تقريبا (15,03، 14,91 على التوالى).
- حدث ارتفاع ملحوظ فى استهلاك المياه مع زيادة نسبة دريس السيسبان فى العلائق.
- فيما يتعلق بقياسات سائل الكرش فقد أظهرت النتائج زيادة فى تركيز الحموضة والأمونيا مع زيادة دريس السيسبان والاختلافات كانت معنوية عند الساعة الرابعة بعد الأكل فقط ، وعلى العكس انخفضت تدريجيا الأحماض الدهنية الطيارة الكلية عند كل الساعات (قبل وبعد التغذية) مع ارتفاع دريس السيسبان فى العلائق وكانت الاختلافات معنوية عند الساعات 4، 6، 8 بعد الأكل ، أيضا حدث ارتفاع للأسيتك وانخفاض للبروبيونيك مع زيادة دريس السيسبان (40، 50، 60، 80%) فى العلائق التجريبية المختبرة (مج1، مج2، مج3، مج4 على التوالى).
- أما قياسات الدم فقد لوحظ أن معظم قياسات الدم لم تتأثر معنويا بين العلائق التجريبية المختلفة، ومع ذلك فقد ارتفع كل من اليوريا والكالسيوم وانخفض الجلوكوز والفوسفور مع زيادة نسبة دريس السيسبان فى علائق ذكور الماعز الزرايبى.
- وأخيرا فيما يتعلق بمعاملات الهضم والقيمة الغذائية فقد أظهرت النتائج أن معاملات الهضم لكل العناصر الغذائية والقيمة الغذائية (سواء كانت مركبات مهضومة كلية أو بروتين مهضوم) لم تتأثر معنويا مع زيادة دريس السيسبان إلى 60% فى المجموعة الثالثة، بل إن البروتين المهضوم لم يتغير معنويا أيضا مع المجموعة الرابعة والتى تحتوى80% من دريس السيسبان وربما يعزى ذلك لارتفاع نسبة البروتين، وعليه يمكن استخدام دريس السيسبان كبديل جيد للأعلاف الصيفية مثل دريس البرسيم المرتفع السعر، مما يحقق وفرا فى تكلفة التغذية اللازمة للإنتاج بدون أى تأثير سلبى على حالة الحيوان، مع الأخذ فى الاعتبار أهمية إجراء دراسات مستقبلية على حيوانات المزرعة الأخرى أثناء مراحل فسيولوجية وإنتاجية مختلفة وعلى فترات أطول.

RESPONSE OF ZARAIBI GOAT BUCKS TO RATIONS CONTAINING DIFFERENT RATIOS OF SESBANIA HAY AS A NEW AND HIGH SOURCE OF PROTEIN