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EFFECT OF DIETARY ROUGHAGE SOURCES ON INTAKE, *IN-SITU* DEGRADABILITY, *IN-VIVO* DIGESTIBILITY, PRODUCTIVE PERFORMANCE AND CARCASS TRAITS OF GROWING OSSIMI MALE LAMBS.

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ABSTRACT

Thirty two Ossimi male lambs; four months age and 24± 0.35 kg initial live body weights were randomly allotted to four experimental rations. Experimental rations were formulated to contain 40% different fiber sources, i.e. sugar cane bagasses (SCB) ground corn cobs (Ccb) and ground peanut hulls (PnH) in cube form. A fattening trail was conducted for 140 days to study the impact of dietary fiber source on lambs fattening performance. A metabolism and nitrogen balance (NB) trail were carried out at the end of the study. Ruminal parameters and In-situ degradability trails were also conducted to estimated ruminal NH_3-N, TVFA concentration and ration disappearance. Four animals from each group were slaughtered by the end of the study to evaluate the effect of dietary fiber source on carcass characteristics and edible offal organ mass.

Results obtained revealed higher ($P<0.05$) digestibility coefficient values in most of dietary nutrients in favor of Ccb ration, followed by SCB. Higher ($P<0.05$) nutritive value and NB were also recorded for both of the two rations (67.57, TDN and 8.73% DCP and 16.37gm DCP/h/d; 64.84, 7.33 % and 14.62 gm DCP/h/d for both rations, respectively. Lower ($P<0.05$) digestibility coefficient values, nutritive values and NB were shown by both of PnH and the control rations and without significant difference between the later two rations. In the contrary, higher ($P>0.05$) NH_3-N release was shown by both of PnH ration and the control group at 3hrs after feeding, but with lower ($P<0.05$) TVFA's concentration with either Ccb or SCB rations. Higher ($P<0.05$) DM, OM and CP disappearance was achieved by both of Ccb and SCB in comparison with both of PnH and the control ration during different incubation periods. Degradation kinetic and effective degradability (ED) of DM were not affected due to dietary fiber sources. However, higher ($P<0.05$) ED of OM was detected by the control ration with intermediate values for both Ccb and SCB, while highest ($P<0.05$) soluble fraction of CP was shown by Ccb ration. Highest ($P<0.0$) daily feed intake was shown for both the control and SCB in different feed terms. Higher ($P>0.05$) daily gain and feed utilization were achieved by both Ccb and PnH lambs and being more economically. However, highest ($P<0.0$) dressing percentage was achieved by SCB lambs. Insignificant effect of dietary fiber source on different offal organs weight was indicating constant weight relative to both of hot carcass and live body weight of slaughtered animals. It could by concluded that dietary fiber source must be in consideration when formulating fattening lambs ration, lower fiber levels and more palatable source must be considered at such younger ages.

Keywords: *peanut hulls, sugar cane bagasse, ground corn cobs, degradability, digestibility and fattening lambs.*

INTRODUCTION

Feeding is the most important cost item for livestock production which represents about 70% of the total production costs (Borhami and Yacout 2001). Inclusion of roughage in high concentrate diets is proper in ruminant rations, as it reduces feeding costs of the available nutritional feedstuff and improved its economic value (Talha, 2001).

Shortage in animal feeds has been found to have a negative impact on the development of animal production in Egypt. Shortage has been estimated to be about 6 million tons in term of concentrate feed (F. A. O. 2006). In order to minimize this gap, crop residues and other agricultural by-products may have a non-conventional approach for solving such problem. Utilization of such by-products can not only by used in favor of solving feed shortage problem, but also as a method to prevent environmental pollution.(Zaza, 2004). Roughages are necessary for normal rumen function, because they help to maintain normal rumen fermentation (Stock *et al.*, 1990 and Woodford *et al.*, 1986). The ratio between roughage to concentrate (R:C) represents one of the major dietary factors influencing feed intake, which is reflected on rumen digesta kinetics and consequently rumen environment, which is the resultant picture to feed utilization by ruminants (Gabr, 2000 and Mehrez *et. al.*, 2001). Moreover, utilization of diets by ruminants seems to be markedly affected by (R: C) ratio, type of roughage and type of concentrate being fed which had it's reflect on animal performance and health (Owens *et al.*, 1987 and Gabr, 2000). The main target of the present study was to investigate the effect of dietary roughage sources on performance, rumen fermentation and carcass characteristics of Ossimi male lambs.

MATERIALS AND METHODS

The present study was carried out at the Experimental Farm of the Faculty of Agriculture, AL-Azhar University and the laboratory of By-products Research Department, Animal Production Research Institute, Agriculture Research Center, Ministry of Agriculture. The main target of the study was to seek for a low cost diet for fattening Ossimi male lambs. Thirty-two Ossimi male lambs with an average initial body weight of 24± 0.35 kg were randomly assigned to four similar groups (each of 8). Each group of animals was allotted at random to receive one of the four experimental rations, since they were formulated to have different source of roughage being peanut hulls (PnH), sugar cane bagasse (SCB) and ground corn cobs (Ccb) and to maintain roughage: concentrate ratio to be 40:60, since in control ration (R1) it was consisted of 13.13% of each tested roughage, while in ration R2, R3 and R4 contained 40% of Ccb, SCB and PnH, respectively. The animals were adapted to the experimental rations for two weeks before the starting of the feeding trials. The rations were offered as *ad-lib* complete rations in pelleted form for 140 days. Animals were group fed at two times daily in equal portions at 08:00 a.m. and 05:00 p.m. Animals weight and feed consumption were recorded biweekly intervals; live body weight gain, feed efficiency and feed cost per 1kg live body weight gain were calculated. Drinking water was free choice available. Composition and chemical analysis of the experimental rations are presented in Tables (1 and 2)

At the end of feeding trials three animals were slaughtered from each group. Hot carcass, body offal's and internal organs were separately weighed. The measurements and classification of carcass were carried out according to Colomer *et al.* (1987), Abou-Ammo (1992) and Maharem (1996). Weight of meat; fat and bone of carcass were calculated according to Field *et al.* (1963) procedures.

Metabolism trials:

At the end of the feeding trials, digestion trials were conducted by chosen 12 animals (three in each treatment group) to evaluate the experimental rations. Samples of feeds, feces and feed refusal were analyzed according to A.O.A.C. (1990).

The digestibility trial lasted for one week to adapt the animals for the metabolic cages followed by one week as a collection period. Feed, feces and urine analyses were carried out according to the methods of A.O.A.C. (1990).

Table (1): Composition of the experimental rations.

Ingredients	(R1) Control	(R2) Ccb	(R3) SCB	(R4) PnH	Current price L.E/Ton
Yellow corn	45	45	45	45	970
Urea	2	2	2	2	800
Wheat bran	5	5	5	5	750
Molasses	5	5	5	5	900
Corn cobs	13.33	40	_		300
Sugarcane bagasses	13.33	_	40	_	300
Peanut hulls	13.34	_	_	40	300
Limestone	2	2	2	2	60
Sodium chloride	1	1	1	1	
Total	100	100	100	100	
Price L.E./Ton	656.2	656.2	656.2	656.2	

Table (2): Chemical analysis (%) of the experimental rations (on DM basis).

Item	R1	R2	R3	R4
DM%	89.64	90.41	90.32	89.93
OM%	91.12	93.73	92.04	89.53
CP%	11.71	13.52	12.56	11.65
CF%	21.23	17.32	21.03	25.44
EE%	2.47	3.51	3.50	3.42
NFE%	55.71	59.38	54.95	49.02
Ash%	8.88	6.27	7.96	10.47

***In situ* degradability:**

Nylon bag technique was used to determine the disappearance of dry matter, organic matter and nitrogen contents in the rumen according to the method described by Barrio *et al.*, (1985). Three fistulated rams weighing an average 65 kg were used in these trials. Animals were fed the same rations which were incubated as a basal diet. Dacron cloth (100% Dacron polyester) with a mean pore size of 75 µm was used for construction of *In-situ* bags. Five gm of dried tested rations were ruminally incubated in the dried weighed bags (5 x 8 cm) for 6, 12, 24, 36, 48 and 72hrs bags were inserted in the rumen through the fistula with nylon cord. After removing the bags from the rumen they were washed gently with flowing strain of tap water until the rinse fluid was clear. Washing losses (W) were estimated by soaking two bags per sample in acidified warm water (39°C) with HCL at pH (6.5 average measure values of rumen pH before and 2hr after feeding) for 1 h followed by washing, and then bags were dried for 24hrs at 105°c, cooled in desiccators and weighed. Dry matter, organic matter and nitrogen were estimated according to the methods of A.O.A.C. (1990). The data were fitted to the model of Ørskov and McDonald, (1979) that, $P = a + b\ (1-e^{-ct})$ where, (P) presents the DM disappearing at time (t). The a, b and c are least squares estimated for soluble fraction (a), degradability fraction (b) and rate of degradation (c), which is the natural log of (e) at time (t). The effective degradability (ED) for dietary DM, OM and N was estimated from the equation of Ørskov *et. al.*, (1980) that, $ED = a + (bc/c + k)$ where, (k) is the outflow rate assumed to be 0.05/hr under the feeding condition of this experiments.

Rumen parameters:

Rumen fluids samples were taken from fistulated rams during *In-suite* trials at 0, 3, and 6 hours after feeding. Ruminal pH was determined by the HANNA-pH meter. Concentration of TVFA's and ammonia-N was determined according to Eadie *et al.*, (1967) and Conway (1978), respectively.

Statistical analyses:

Statistical analysis was carried out using SAS program (1988). Multiple Range Tests were used to compare the differences among individual means of different treatments (Duncan 1955.) Analysis of variance of repeated measurements and least square means were used to test the effect of time on ruminal fluid parameters.

RESULTS AND DISCUSSION

Results of degradability:

Data of in situ DM, OM and CP disappearance (%) for experimental mixed rations, at different incubation times are given in Table (3). The data obtained pointed out to gradual increasing, but insignificant of DM, OM and CP disappearance with increasing time of incubation. Washing loss (W) of DM, OM and CP were quite similar for all experimental rations with insignificant differences. Values of DM disappearance for experimental mixed rations were similar during the first 12 hrs of incubation. Regarding the effect of roughage sources on DM disappearance, it was shown higher insignificant disappearance for ration containing Ccb and SCB than control and PnH ones. The same trend was observed for OM and CP disappearance (%) for both the two rations in comparison with the control and PnH rations.

Estimates of ruminal degradation constants (a, b and c) fitted with rates of DM, OM and CP for experimental mixed rations are presented in (Table 4). Degradation kinetics of DM as a, b and c did not differ ($P<0.05$) among experimental rations; effective degradability (ED) was not also differ. The (a) constant, showed that the soluble fraction in OM was higher ($P<0.05$) for experimental rations containing Ccb and ScB, although no log time was detected for the experimental diets. The (b) constant, represented that the ruminally degradable fraction, was insignificantly higher for rations containing

Ccb and SCB than control and that contained PnH. Higher (P<0.05) ED of OM was found for control diet, while it had intermediate values for Ccb and SCB containing rations. The lower ED of OM was noticed for PnH containing diet; this could be due to the higher CF content of PnH and the less soluble fraction (a). Higher (P<0.05) soluble fraction (a) of CP was obtained for Ccb containing diet as it had more CP content (13.52%). Wantanabe *et. al.*, (1993) found that starch degradation of corn was higher supplements of fast degradable N sources (urea or casein) than with the slower degradable N source of gluten meal.

Table (3): The disappearance (%) of DM, OM and CP of mixed rations containing different roughage sources:

Item	Incubation time (hr)						
	W	6hr	12hr	24hr	36hr	48hr	72hr
Dry matter disappearance(%)							
R1	5.44	15.39	20.22	27.19	38.95	52.69	53.36
R 2	6.08	17.21	22.62	30.41	43.57	56.54	57.36
R 3	5.97	16.89	22.19	29.83	42.75	55.47	56.16
R 4	5.36	15.18	19.94	26.81	38.42	51.99	52.64
±SE	٠,٦٤	١,٨٢	٢,٧٢	٣,٥٣	٤,٦٥	٤,٦١	٤,٦٧
Organic matter disappearance(%)							
R 1	5.88	16.62	21.84	29.36	42.07	56.90	57.63
R 2	7.00	19.80	26.01	34.97	50.11	65.03	65.76
R 3	7.04	19.93	26.18	35.21	50.45	65.46	66.27
R 4	5.90	16.70	21.94	29.49	44.64	58.38	59.10
±SE	٠,٧٣	٢,٠٦	٣,٠٨	٣,٩٩	٥,٠٣	٥,٢٨	٥,٣١
Crude protein disappearance(%)							
R 1	5.87	16.60	21.81	29.92	42.02	56.83	57.57
R 2	8.05	22.77	29.92	40.22	57.63	64.78	67.29
R 3	6.98	19.74	25.94	34.88	49.98	64.85	62.32
R 4	5.89	16.67	21.91	29.46	44.58	58.30	59.03
±SE	٠,٧٦	٢,١٥	٣,٢١	٤,١٧	٤,٤٣	٢,٨٤	٢,٨٩

a, b and c: Mean in the same column with different superscripts are significantly different (P<0.05).

The faster degradable CP in Ccb containing diet was achieved with higher rate of NH_3-N production, which resulted in lower NH_3-N concentration in the rumen and the more concentration of VFA compared with the other rations. No significant differences of (b) fractions among all experimental rations were detected except that contained ScB. However, these were reflected on the higher (P<0.05) ED of CP for that ration. This was followed by Ccb containing ration, as it had the more soluble fraction (a) in the rumen. So, in some roughages source seem to influence different parameters of degradation kinetics, especially degradation of OM and CP in the rumen.

Digestibility and nutritive values:

Results in Table (5) indicated that ration contained corn cobs (R2) had almost higher (P<0.05) digestibility coefficient for most nutrients, except for NFE followed by R3 containing sugar can bagasse. In contrary, peanut hull ration showed the lowest (P<0.05) digestibility values, except NFE (80.69%).

Increase digestion coefficient of crude fiber in ration containing Ccb mainly could be related to lower fiber percentage (17% CF) than that of PnH (25% CF) , Table (2). The lower (P<0.05) digestibility of CF and relatively of CP of such ration could be explained by the high contents of lignin in peanut hulls as reported by Waldo and Jorgensen (1981), West *et. al.*, (1998) and Hill (2002).

Table (4): Effect of roughage sources on degradable kinetics values and effective degradability of tested rations.

Items	a	b	c	ED
DM				
R 1	6.31±1.27	66.06±5.83	0.02±0.00	72.37±4.62
R 2	7.32±1.26	65.49±5.54	0.02±0.00	72.81±6.17
R 3	7.15±1.26	63.99±5.48	0.02±0.00	71.14±6.15
R 4	6.21±1.24	65.31±5.83	0.02±0.00	71.52±4.62
OM				
R 1	6.81±1.36	71.40±6.23	0.02±0.00	78.21±4.91
R 2	8.36±1.46	74.88±6.14	0.02±0.00	83.25±6.89
R 3	8.44±1.48	75.51±6.47	0.02±0.00	83.95±7.26
R 4	5.98±1.64	72.26±7.89	0.02±0.00	78.23±6.52
CP				
R 1	6.80±1.36	71.36±6.29	0.02±0.00	78.16±4.99
R 2	10.03±2.00	71.32±7.69	0.02±0.00	81.35±6.01
R 3	8.19±1.36	68.18±1.57	0.03±0.00	76.37±0.55
R 4	5.97±1.64	72.16±7.89	0.02±0.00	78.14±6.51

Digestibility coefficient values were reflected consequently on the feeding values of different tested rations in terms of TDN and DCP where rations containing Ccb and SCB showed the higher (P<0.05) nutritive values (67.57, 8.73 and 64.84, 7.33%, respectively) with significant differences. Both of the control and PnH rations showed quite similar TDN and DCP values in that significant difference. It is generally accepted that the energy available for rumen activity and microbial yield is largely dependent on the rate of carbohydrate digestion in the rumen (Hoover *et. al.*, 1986). All lambs showed positive nitrogen balance (NB); especially Ccb ration which showed the higher (P<0.05) NB (16.37 g/h/d), followed by (14.62 g/h/d) for lambs fed SCB containing ration. Other rations showed lower (P<0.05) NB. These could be related to the more nitrogen excreted through the feces and urine compared to other rations (R2 and R3). However, these resulted in more N utilization by lambs fed such rations, as they recorded higher (P<0.05) NB as percentage of either NI or ND compared with the other two ones.

Ruminal Parameters:

The higher value of ruminal ammonia at 3hr after feeding (33.8 and 31.3 mg/100ml) and 6hr after feeding (29.1 and 26.6 mg/100ml) were recorded by lambs fed the control (R1) and PnH (R4) rations, respectively (Table 6).

Table (5): Digestibility coefficients, nutritive values and nitrogen utilization by lambs fed the experimental rations.

Item	R1	R2	R3	R4	±SE
Digestibility, %					
DM	59.94^{ab}	62.39^{a}	61.33^{a}	55.00^{b}	±1.48
OM	60.41^{b}	64.06^{a}	65.19^{a}	60.05^{b}	±1.40
CP	48.33^{c}	65.01^{a}	58.51^{b}	44.94^{c}	±1.34
CF	29.06^{c}	42.48^{a}	36.11^{b}	23.87^{d}	±2.25
EE	86.30^{b}	90.84^{a}	87.62^{b}	87.95^{b}	±1.88
NFE	75.72^{b}	71.69^{c}	76.91^{b}	80.69^{a}	±1.17
Nutritive values, %					
TDN	59.73^{c}	67.57^{a}	64.84^{b}	59.19^{c}	±1.01
DCP	5.59^{c}	8.73^{a}	7.33^{b}	5.85^{c}	±0.61
C/P ratio	10.68^{a}	7.74^{b}	8.84^{b}	10.11^{a}	±0.59
Utilization of dietary N (g/h/d)					
NI	27.04^{b}	31.70^{a}	27.70^{b}	28.66^{b}	±1.42
FN	13.97^{b}	11.09^{b}	11.49^{b}	15.78^{a}	±1.23
UN	2.89^{b}	4.24^{a}	1.59^{b}	4.66^{a}	±0.77
DN	13.07^{c}	20.61^{a}	16.21^{b}	12.88^{c}	±1.60
NB	10.18^{b}	16.37^{a}	14.62^{a}	8.22^{b}	±1.30
NB/NI, %	37.64^{b}	51.64^{a}	52.77^{a}	28.68^{c}	±2.82
NB/ND, %	77.88^{b}	79.42^{b}	90.19^{a}	63.81^{c}	±4.80

a, b and c Means in the same row not sharing the same superscripts are ($P<0.05$) different.

Table (6): Ruminal NH_3-N and TVFA's concentrations as effected by experimental rations fed to lambs.

Item	Time (hr)	R1	R2	R3	R4	±SE
NH3-N (mg/100ml)	0	17.5	14.0	15.0	17.5	±1.57
	3	33.8^{a}	21.8^{b}	24.5^{b}	31.3^{a}	±2.25
	6	29.1^{a}	16.3^{b}	18.6^{b}	26.6^{a}	±1.21
TVFA's (meq/100ml)	0	1.33^{b}	2.33^{a}	2.16^{b}	1.33^{b}	±0.22
	3	3.66^{b}	5.5^{a}	4.33^{b}	4.3^{b}	±0.81
	6	2.66	3.66	3.33	3.16	±0.60

a and b Means in the same row not sharing the same superscripts are ($P<0.05$) different.

These values were similar to those reported by Mehrez *et. al.* (2001), regarding the effect of roughage sources on ruminal NH_3-N concentration. Values of TVFA's concentration (meq/100ml) were higher ($P<0.05$) for lambs fed R2 than other tested rations. These results may be referred to the higher ($P<0.05$) TDN value of such ration (67.57%, Table3). The present results of rumen fermentation are supporting the assumption that the slower degradable rate of Ccb roughage might be the reason of the higher TVFA's at 3hr after feeding. On the other hand, the slower release of NH_3-N in the rumen for rations containing either Ccb or SCB might explain the higher N utilization of such rations.

Performance and economic efficiency:

Data derived from the feeding trials (Table 7) revealed that voluntary intake of rations was reflected on body weight changes of growing lambs. The maximum intake in term of DM and TDN were recorded by lambs fed R1 followed by R3 (1356.5 and 1220 DMI g/h/d) and (810.2 and 791.19 TDNI g/h/d), respectively. While the maximum daily intake in terms of DCP was recorded by lambs fed R2 followed by R3. The higher ($P<0.05$) DM, TDN and DCP intakes of the tested rations (Table 7) may be attributed to either higher ration palatability (R1) or/and ration nutritive value (Table 3). The lowest feed intake was noticed for lambs fed R4. These results indicated that PnH ration was less palatable than other sources of roughage. This finding is laying closely with the finding of Hill (2002).

Data showed insignificant higher daily gain for lambs fed Ccb and PnH rations. However differences were not significant with both of the control and SCB rations. The daily weight gains of growing lambs fed R2 and R4 were higher by about 12.65 and 11.45 %, respectively, in comparison with animals fed R1. The highest value of feed conversion as expressed as DM / kg gain was shown with ration contained Ccb, while the lowest value was shown with control one.

According to year of 2005 prices, the cost of dry matter consumed to produce one kg body weight gain was detected in favor of lambs fed R2. It was lower by about 28.27 % compared to 22.38% for R4, then R3 (13.75) to those fed the control ration. Data obtained favored in general CcB group as the most efficient and economic feed utilization group, due to its lower intake and its higher daily gain.

Table (7): Feed intake, daily gain, feed conversion and economical efficiency for lambs fed the experimental rations.

Item	R1	R2	R3	R4	±SE
Feed intake g/h/d					
DMI	1356.5^{a}	1096.9^{bc}	1220.0^{a}	1173.7^{b}	±33.80
TDNI	810.2^{a}	741.2^{b}	791.1^{b}	694.7^{c}	±20.11
DCPI	75.8^{b}	95.7^{a}	89.4^{a}	68.6^{c}	±2.14
Av. live body weight wt gain (kg)					
Initial body weight (kg)	24.46^{a}	24.80^{a}	24.05^{a}	24.70^{a}	±0.35
Final body weight (kg)	47.7^{a}	51.00^{a}	48.20^{a}	50.60^{a}	±1.68
Total B.W. gain (kg)	23.24^{a}	26.20^{a}	24.15^{a}	25.90^{a}	±1.40
Daily gain (g/h/d)	166.00^{a}	187.14^{a}	172.50^{a}	185.00^{a}	±20.11
Feed conversion kg intake / kg gain					
Kg DMI/kg gain	8.17	5.87	7.09	6.35	±2.36
Kg TDNI/ kg gain	4.88	3.96	4.60	3.76	±1.54
Kg DCPI/ kg gain	456.63	511.76	519.77	370.81	±184.9
Economical efficiency					
Feed cost/ kg gain	5.38	3.86	4.64	4.18	±1.35

a, b and c Means in the same row not sharing the same superscripts are ($P<0.05$) different.

Slaughter parameters:

Data presented in Table (8) indicated higher (P<0.05) dressing percentage for lambs fed Ccb and without significant differences with different tested rations. This result pointed out to negative relationship between fasted slaughter weight and carcass weight, since heavier lamb's weight Ccb group (47.67 kg) dressed 50.42% vs 48.63% for SCB group (43.33 kg) live body weight.

It was also noticeable the significant effect of roughage source on both of the hot carcass weight and the empty weight of the digestive system. However, the obtained data showed quite similar offal organ weights, irrespective of roughage source. This matter may indicate that offal organs weight may always have nearly constant weight relative to live and carcass weight, regardless of roughage source.

Empty weight of the digestive tract (TDT), on a wet tissue basis, increased (P<0.05) in lambs fed CCB containing ration, while other lambs fed the rest of experimental rations had quite similar TDT weight. This matter resulted in increased rumen, reticulum, omasum, heart, kidneys and lung weights, while abomasum and liver were heavier for lambs fed the control ration.

Expressed as a percentage of empty body weight (EBW) (Table 8), TDT, reticulum, kidneys and lung weights increased as well for lambs fed ration contained CCB. While, omasum and liver weight relative to EBW increased (P<0.05) with TDN intake showed by lambs fed the control ration and those fed PnH containing ration. These changes in visceral organ mass in response to TDN intake are consistent with previous reports on sheep (Ferrell *et al.*, 1986; Rompala and Hoagland, 1987 and Burrin *et al.*, 1990) who showed that feed restriction retards organ growth or reduces organ weight when proceeded by higher level of alimentation. In contrast Johason *et al.*, (1987) found that constant TDN intake of rations containing 10, 45 and 95% chopped alfalfa had no effect on organ mass relative to EBW.

On the light of the present results, it could be concluded that roughage source affected (P<0.05) rations digestibility, nutritive value and DM intake. Consequently, dietary nitrogen utilization was also affected due to such dietary confound interaction effects of such factors. The final result out picture was of either negative or positive effects on ruminal fermentation activity, experimental rations degradability and consequently on the efficiency of feed utilization as well as animal health and performance. Incorporation of fibre sources in fattening rations to minimizing feeding costs, must took in consideration both of dietary fibre source and level to maintain higher daily gain and economic efficiency in fattened lambs.

Table (8): Effect of roughage sources on organ mass of lambs fed the experimental rations.

Item	R1	R2	R3	R4	±SE
Live body weight	42.67^{c}	47.67^{a}	43.33^{b}	38.33^{d}	±4.10
Empty body wt. (EBW) kg	35.50^{b}	37.70^{a}	34.74^{b}	30.11^{c}	±5.33
Hot carcass weight, kg	20.73^{ab}	24.20^{a}	21.07^{ab}	18.09^{b}	±2.75
Dressing percentage %	49.03^{a}	50.42^{a}	48.63^{ab}	47.20^{b}	±5.56
Full wt. of the digestive tract (kg)	7.17^{a}	9.97^{a}	8.59^{a}	8.22^{a}	±1.06
Empty weight of the digestive tract (kg)	2.63^{b}	3.49^{a}	2.73^{b}	2.56^{b}	±0.13
Rumen weight (kg)	0.73^{a}	0.76	0.70	0.74	±0.05
Reticulum wt. (kg)	0.14^{bc}	0.21^{ab}	0.22^{a}	0.13^{c}	±0.01
Omasum wt. (kg)	0.13^{a}	0.13^{a}	0.11^{a}	0.14^{a}	±0.01
Abomasum wt. (kg)	0.29^{a}	0.28^{a}	0.26^{a}	0.22^{a}	±0.02
Liver wt. (kg)	0.62^{a}	0.58^{a}	0.64^{a}	0.53^{a}	±0.23
Heart wt. (kg)	0.19^{a}	0.20^{a}	0.21^{a}	0.21^{a}	±0.08
Kidney wt. (kg)	0.22^{b}	0.34^{a}	0.25^{b}	0.21^{b}	±0.06
Lungs wt. (kg)	0.72^{a}	0.79^{a}	0.72^{a}	0.85^{a}	±0.21
Spleen wt. (kg)	0.08^{a}	0.08^{a}	0.09^{a}	0.08^{a}	±0.05
Organ mass as a percentage of empty body weight %					
Digestive tract	7.41^{b}	9.26^{a}	7.86^{b}	8.50^{b}	±1.96
Rumen	2.06	2.02	2.01	2.46	±0.63
Reticulum	0.39^{c}	0.56^{ab}	0.63^{a}	0.43^{c}	±0.32
Omasum	0.37^{b}	0.34^{b}	0.32^{b}	0.46^{a}	±12.33
Abomasum	0.82^{a}	0.74^{b}	0.75^{ab}	0.73^{b}	±0.63
Liver	1.75^{ab}	1.54^{c}	1.84^{a}	1.76^{ab}	±0.35
Heart	0.54^{b}	0.53^{b}	0.60^{b}	0.70^{a}	±0.11
Lungs	2.03	2.23	2.10	2.70	±0.55
Kidneys	0.62^{c}	0.90^{a}	0.72^{b}	0.70^{b}	±0.42
Spleen	0.23	0.21	0.26	0.27	±0.15

a, b, c and d Means in the same row not sharing the same superscripts are ($P<0.05$) different.

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تأثير مصادر الأعلاف الخشنة على المأكول و معدل التكسر في الكرش والمهضوم والأداء الأنتاجى وخصائص الذبيحة لذكور حملان الاوسيمى النامية.

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استخدم في هذة الدراسة ٣٢ حولي ذكر اوسيمي عمر اربع شهور وبمتوسط وزن ٢٤ كجم قسمت عشوائيا الى اربع مجاميع غذائية (٨ ذكور /مجموعة) .

وكانت العلائق المختبرة كما يلي:

العليقة الاولى (الكنترول) : تحتوي على ٤٥ % اذرة صفراء- ٢% يوريا- ٥ % ردة- ٥ %مولاس- ٢% حجر جيري – ١ % ملح طعام – ١٣,٣٣ % قوالح ذرة- ١٣,٣٣ % مصاصة قصب- ١٣,٣٣%قشر فول سوداني.

العليقة الثانية: : تحتوي على ٤٥ % اذرة صفراء- ٢% يوريا- ٥ % ردة- ٥ %مولاس- ٢% حجر جيري – ١ % ملح طعام – ٤٠ % قوالح ذرة.

العليقة الثالثة: : تحتوي على ٤٥ % اذرة صفراء- ٢% يوريا- ٥ % ردة- ٥ %مولاس- ٢% حجر جيري – ١ % ملح طعام – ٤٠ % مصاصة قصب.

العليقة الرابعة: : تحتوي على ٤٥ % اذرة صفراء- ٢% يوريا- ٥ % ردة- ٥ %مولاس- ٢% حجر جيري – ١ % ملح طعام – ٤٠ % قشر فول سوداني.

تم إجراء تجارب الهضم والتقييم الغذائي وكذلك تجارب تقدير تخمرات الكرش وتجارب النمو لقياس أداء الحملان النامية.

ويمكن تلخيص أهم النتائج المتحصل عليها فيما يلي:

١- أظهرت العليقة الثانية (المحتوية على قوالح الذرة) اعلى معاملات هضم للعناصر الغذائية المختلفة وبفروق معنوية عن باقى العلائق.
٢- أوضحت النتائج وجود فروق معنوية لقيمة المركبات الكلية المهضومة بين المجاميع حيث سجلت المجموعة الثانية اعلي قيمة بينما كان الانخفاض في المجموعة الرابعة التى تحتوى على قشرا لفول السوداني .
٣- أظهرت النتائج وجود فروق معنوية بين المجاميع بالنسبة للبروتين الخام المهضوم حيث سجلت المجموعة الثانية اعلي قيمة بينما كانت المجموعة الأولى اقل قيمة.
٤- فيما يتعلق بميزان الازوت أظهرت النتائج ان ميزان الازوت كان موجبا لجميع العلائق وسجلت المجموعة الثانية اعلى ميزان ازوت بينما سجلت المجموعة الرابعة اقل ميزان ازوت.
٥- أظهرت النتائج انة لاتوجد فروق معنوية بالنسبة لمعدل النمو اليومي الا ان المجموعة الثانية سجلت اعلى معدل نمو يومي والمجموعة الأولى اقل معدل نمو يومى.
٦- أظهرت النتائج عموما ان افضل مصادر العلائق الخشنة المختبرة هو قوالح الذرة حيث أدى هذا المكون الى ارتفاع معدل التحويل الغذائي لهذه المجموعة معنويا وكانت الاقل تكلفة والأكثر ربحية.

وتوصى الدراسة باستخدام قوالح الذرة الشامية كمصدر للأعلاف الخشنة مقارنة بمصاصة القصب وقشر الفول السوداني لما لها من تأثير على زيادة الأداء للحملان النامية وزيادة العائد المادي.