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RESPONSE OF OSSIMI LAMBS FED HIGH ENERGY CONCENTRATE FEED MIXTURE

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ABSTRACT: The present investigation was conducted to study the effect of feeding Ossimi growing lambs high energy concentrate feed mixture at 2, 2.5 and 3% rates of body weight on digestibility of nutrients and feeding value as well as their growth performance. Seventy five Ossimi lambs with an average initial weight of 31.96 Kg were assighned randomaly into three experimental groups representig the 3 feeding rates tested (2, 2.5 and 3% of live body weight of concentrate feed with ad - lib. intake of rice straw. The experiment lasted 105 days often start. Results revealed that feeding value in form of TDN and DCP increased with increasing feeding rate of concentrate and the highest ones ($p < 0.05$) were obtained by the 3% feeding rate. The highest ($p < 0.05$) digestibility coefficients for DM; OM; CP and NFE were recorded by the 3% feeding rate, however differences in CF; EE digestibility coefficient were insignificant. The applied feeding rates seemed to have insignificant influence on rumen liquor parameters (pH and TVFA's). The tested feeding rates revealed significant effects on serum total protein; albumin, however globuline and albumin to globuline ratio were not affected. Average daily gains improved significantly with each increase in feeding rate from 2 to 2.5 or 3% concentrated feed / Kg live body weight, while feed convertion parameters were not affected. Costs of feed per Kg. gain in weight increased with each increase in feeding rate and the economical efficiency showed the reverse trend.

INTRODUCTION

In Egypt, lambs are normally sold after weaning either to traders or directly to feedlots. Some farmers used to keep the newly weaned lambs in the rangelands as long as possible which causes overgrazing, consequently more degradation on rangelands. Feeding Fattening lambs on high energy concentrate diet was successfully applied on sheep in Middle East contries with

good growth performance (169 to 230 g/ h/ d)daily gain (Shehata, 1997; Marai et al, 1997 and Shalaby, 2000)

The objective of the present study was to transfer and evaluate this technique for lamb Fattening which could represent way to obtaine high growth rate in short time, consequently increase farm profitability.

MATERIALS AND METHODS

This study was carried out at Geziret Elsheer Experimental Station Kalubeia Governorate, which belongs to the Horticulture Services Unit, Ministry of Agriculture. The feeding trials were carried out to compare the effect of using different feeding rates from high energy concentrate feed mixture with rice straw on the performance of growing lambs. The feeding period lasted 105 days using 75 Ossimi lambs with an average age of 7 months and mean body weight of 31.96 kg. Animals were divided into three groups of similar live body weight. Each group was kept in a separate shaded pen and adapted for the tested rations for 15 days. Any health problem to experimental animals appeared was recorded and cured.

Concentrate feed mixture was offered to animals at a rate of 2, 2.5, 3% of animals live body weights for group 1,2 and 3 respectevily. It was adjusted every two weeks according to animalís live weight changes. Rice straw was offered ad libitum to animals. Premix salt blocks and water supply was available all over the day.

Animals were weighed before feeding at the beginning of the trial and every 15 days intervals during the experimental period. After 90 days from the beginning of feeding trials, three digestibility trails were carried out to evaluate nutrient digestibilities of the experimental rations. Three lambs were chosen randomly from each group. Animals were kept in metabolic cages for ten days before collecting samples. The collection period extended for six days. Amount of concentrated feed mixture (CFM) calculated according to animalís weight, was offered to animals in two portions at 8 Oíclock am,and 4 pm and rice straw were offered ad lib. The residue of rice straw were collected and weighed daily. Animals were allowed free access of water and Premix block. Blood samples were taken from 3 lambs from each group, at the end of digestibility trials from the Jugular vein before morning feeding with allowing blood to flow into clean dry tubes. The tubes were left to colt the blood under laboratory conditions, then the serum was

separate (handling) in a glass bottle. Serum samples were immediately frozen at - 20°C until analysis. Samples of rumen fluid were collected, using stomach tube from three lambs from each group at the end of digestibility trials. The samples were withdrawn just before offering morning diet and at 3 and 6 hours post morning feeding. Samples were filtered through a double layer of cheese - cloth and then pH values were recorded using pH meter. Few drops of saturated solution of mercuric chloride were used to stop microbial activity. Samples were frozen for TVFAís determination.

Chemical analysis:

Dry matter (DM), crude fiber (CF), crude protein (CP), ether extract (EE) and ash of diets and feces were determined according to A.O.A.C. (1990) procedures. Nitrogen free extract (NFE) values of the samples were calculated by difference.

Estimation of serum total proteins was done colorimetrically (using kit from BioMerieux France) according to Patters (1968).

Determination of serum albumin was carried out colorimetrically (using a kit from BioMerieux France) according to the method of Drupt (1974). Estimation of globulin was calculated by subtracting from total protein, albumin concentration values of the same samples (El-Nouty et. al., 1984). TVFA's were determined by steam distillation method according to Warner (1964). The Statistical Analysis System (SAS) was used for data management and analysis (SAS, 1988). Data were summarized as means and proportion comparison between groups' means was done using analysis of variance for comparison between more than two groups.

RESULTS AND DISCUSSION

Chemical analysis of feeds used for experimental rations:

The chemical analysis of feeds and calculated rations used for experimental rations are presented in Table (1). Data indicated that the percentage of nutrient in the concentrate feed mixture (CFM) and rice straw (R S) are in the range obtained by many authers (Mehrez et al 2001; Salem et al 2001 and Etman et al 2001)

Resulte of calculated rations showed that as the CFM increased the Ash and CF contents redused. This may be due to the low contents of Ash and CF% in CFM (4.08, 4.22 respectevily) than rice straw (16.97, 33.92

respectevily). On the other hand, increase of CFM persentage in rations caused increase in OM, CP, EE and NFE (not significant). Similar observations were reported by El-Ayek et al (1991);Ead (1999); Etman and Soliman(1999)and Mehrez et al (2001).

Digestibility coefficients of the experimental rations:

The averages digestibility coefficients of the experimental rations are presented in Table (2). Data indicate that there were significant differences between groups. The digestibility coefficients of all nutrients for G3 (fed 3% CFM) were the highest followed by G2 (2.5%CFM) then G1 (2% CFM)exept EE which recorded the highest digestibility coefficient in G3 followed by G1 then the lowest one in G2. On the other hand, the feeding values of the different rations in terms of total digestible nutrients (TDN%) and digestible crude protein (DCP%),are presented in Table (2). The presented results revealed some differences between groups in TDN and DCP value. The best value belong to group 3 (70.47%) and (8.57%) for TDN & DCP value, respectevily, while there were no significant differences between G2 and G1in these traits. In general, it can be shown that increasing CFM percentage resulted in increasing TDN and DCP value. This may be due to a higher fermentation rate and better ruminal activity of the group fed at higher rate of concentrated feed (Fouad,2001 a).This result is in agreement with that reported by Mehrez et al (2001).

RUMEN LIQUOR:

Table (3) summarized the effect of experimental rations on rumen liquor pH and TVFA's concentrations. The results showed that there was insignificant differences between groups. Results show that the increase of the percentage of CFM caused slit decrease in pH value, and an increase TVFA's. The minimum pH value was observed at three hours post feeding and tended to increase again after 6 hours. These results agreed with those obtained by Abdel -Aziz et. al., (1993); Allen (1997); Meklad and Mohamed (2000) and Mehrez et. al. (2001). Lashien, et. al., (1995) who found that pH value of sheep rumen liquor was the highest shortly before the morning meal then declined to the minimum at 3-4 hours after feeding then began to rise again.

The change in TVFA's concentration in rumen liquor was showed in Table (3). TVFA's concentration of rumen liquor showed the minimum concentration before morning feeding and increase after 3 hours to the

maximum value, then again decreased after 6 hours, This is in agreement with the data of pH (in table 3) these trends agree also with the finding of Abdel-Kareem (1990); and El Ashry et. al. (2000), who found that TVFA's concentration in the rumen fluid was low before feeding and increased with time after feeding. Also results were observed by El-Ayek et. al. (1991); Hussein et. al. (1995) and Mehrez et. al. (2001), who found that the addition of CFM to tested roughages caused an increase in total VFA's concentration.

Table (1) Chemical analysis of experimental feedstuffs and different rations

Items	DM	OM	CP	CF	EE	Ash	NFE
CFM	88.26	95.92	14.19	4.22	3.08	4.08	74.43
Rice straw	88.39	83.03	4.18	33.92	1.42	16.97	43.51
							Calculated
Ration 1	88.28	93.33	12.18	10.19	2.74	6.67	68.22
Ration 2	88.28	93.77	12.52	9.17	2.80	6.23	69.28
Ration 3	88.28	94.07	12.76	8.48	2.84	5.93	69.99

CFM CONSISTES OF: 80 % YELLOW CORN- 15 % SOYA BEEN CACKE – 3 % MOLASSES – 1.5 % LIME STOWEN – 0.5 % COMMON SALT (calculated TDN 77%).

C : R ratio " G1 = 1: 3.65 – G2 = 1 : 4.71 – G3 = 1 : 5.81

Table (2) Digestibility coefficient and feeding value for experimental rations

Items	DMD	OMD	CPD	CFD	EED	NFED	TDN	DCP
G1	63.42 b	66.90 b	63.59 b	52.31 a	72.83 a	69.43 b	64.94 b	7.75 b
G2	65.34 ab	68.89 ab	64.81 ab	52.74 a	72.02 a	71.63 ab	67.11 b	8.10 b
G3	68.13 a	72.09 a	67.17 a	53.75 a	74.48 a	75.11 a	70.47 a	8.57 a

a and b means in the same column with different letters are significant ($p < 0.05$)

Table (3) Effect of experimental rations on rumen liquor and blood serum parameters

Items	Rumen liquor								Blood Serum g / 100 ml			
	pH				TVFA's meq / 100 ml							
	0	3	6	Overall mean	0	3	6	Overall mean	T.P	AL	GL	AL/GL
G1	6.8	6.2	6.3	6.4 a	3.83	5.64	5.35	4.94 a	6.36 b	4.29 ab	2.07 a	2.07 a
G2	6.9	5.7	6.2	6.3 a	3.53	6.92	5.62	5.36 a	6.35 b	4.25 b	2.13 a	2.00 a
G3	6.6	5.8	5.9	6.1 a	4.38	6.89	6.66	5.98 a	6.70 a	4.50 a	2.20 a	2.05 a

a and b means in the same column with different letters are significant ($p < 0.05$)

Serum parameters:

Serum total protein is considered a reliable index reflecting health and performance of animals (O'Kelly, 1973). Average value of serum total proteins, albumin and globulin of experimental rations are showed in Table (3). Results indicated a significant differences ($p<0.05$) in serum total proteins and albumin while the differences was nonsignificant in serum globulin.

Serum parameters values of the present study are within the general ranges reported by Recce. (1991); Khorshed (1995), and El-Ashry et. al., (2000).and are in consistence with those obtained by Khattab et. al., (1982).

It is clear from Table (3) that there are slight increase (significant) in total protiens and albumin and insignificant differences in globulin and AL / GL ratio among the levels of CFM in diet.

Effect of rations on animal performance:

Data in table (4) indicated that the average daily live body weight gain throughout the feeding trial which extended for 105 days were 167.62, 198.48 and 236.86 grams for the animals in group 1,2 and 3 respectively. From these results, it could be noticed that the average daily live body weight gains increase with the increase ($p<0.05$) of CFM intake in the ration. This may be due to the higher CP digestibility and DCP value (Table 2) (Fouad, 2001 b).These results are in agreement with those observed by Etman and Soliman (1999), who reported that the increase of total intake of CFM improved growth. On the other hand, rice

Results of TDN and DCP conversion ratios of the groups fed on 2% CFM of live body weight reveled that both parameters were not significantly different compared to that of groups fed on higher rates which indicate that this group could utilize the diets as efficient as the groups of higher CFM feeding rates.

The results showed that the feed cost per kg weight gain was 6.17,6.48 and 6,55 L.E. for groups 1,2 and 3 respectively. Economical efficiency expressed as the ratio between the cost of feed consumed and the price of weight gain were 2.32, 2.20 and 2.18 for groups 1, 2 and 3, respectively. It could be noticed that, reduction in feed cost / Kg weight gain (L.E.) and increases in economical efficiency for group (1) than other groups.

Table (4) Effect of experimental rations on growth performance

Items	G1	G2	G3
No. of animal	25	25	25
Initial weight (Kg.)	31.96	31.96	31.96
Final weight (Kg)	49.56	52.80	56.83
Total gain (Kg)	17.60	20.84	24.87
No. of days	105	105	105
Daily gain (g)	167.62 c	198.48 b	236.86 a
DM intake (g/h/d)			
CFM	869.15	1087.48	1316.87
Rice straw	238.01	230.97	226.61
Total DM intake	1107.16	1318.45	1543.48
TDN intake	718.99	884.81	1087.69
DCP intake	85.80	106.79	132.28
Feed efficiency (Kg / Kg gain)			
DM	6.61 a	6.64 a	6.52 a
TDN	4.29 a	4.46 a	4.54 a
DCP	0.51 a	0.56 a	0.56 a
Cost Kg gain (L.E) +	6.17	6.48	6.55
Economical efficiency ++	2.32	2.20	2.18

a, b, and c means in the same column with different letters are significant ($p < 0.05$)

+ Based on the assumption that the price of one ton of CFM and Rice straw 717 and 65 L. E. respectively, the price of 1 Kg body weight gain was 10.00 L.E.

++ Economical efficiency (as a ratio between price of the weight gain and cost of feed consumed).

Conclusion:-

Accordingly, it is recommended under the prevailing market prices to use high energy concentrate feed mixture with a level of 2% of body weight to obtaind the best feed efficiency, best cost and best economical efficiency for growing and fattening lambs. On the other hands, we can decrease the fattening period by 16% or 29% when we increase the level of CFM to 2.5 or 3% respectevily.

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تغذية الحملان الاوسيمى على علف مركز عالى الطاقه

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تم فى هذه الدراسه استخدام ٧٥ حمل اوسيمى بمتوسط وزن ٣١,٩٦ كجم وتم تقسيمهم الى ثلاثة مجموعات متساويه وتم تغذيتهم على قش الارز لحد الشبع بينما كانت التغذيه على العلف المركزعالى الطاقة بنسبة ٢ ، ٢,٥ ، ٣ % من وزن الجسم للمجموعات ١ ، ٢ ، ٣ على الترتيب كما تم اجراء تجربة هضم فى منتصف تجربة النمو والتى استمرت لمدة ١٠٥ يوم باستخدام ثلاثة حيوانات من كل مجموعه وكذلك تم دراسة بعض القياسات على الدم وسائل الكرش وكانت اهم النتائج المتحصال عليها كما يلى :

١ ـ تزداد معاملات الهضم والقيم الغذائيه بزيادة نسبة العلف المركز.

٢ ـ زيادة الماده الجافه المأكولة بزيادة نسبة العلف المركز.

٣ ـ زيادة معدل النمو اليومى بزيادة نسبة العلف المركز.

٤ ـ كانت اقل تكلفة لانتاج كيلو النمو للمجموعه الاولى(٦,١٧ جنيه) كما كانت افضل كفاءة اقتصاديه (٢,٣٢ جنيه) لنفس المجموعه.

نستخلص من الدراسة انه يمكن تغذية الحملان الاوسيمى على ٢% من وزن الجسم علف مركز مع قش الارز لحد الشبع للحصول على افضل تكلفة اقتصاديه ، كما يمكن التغذية على ٢,٥ ، ٣ % من وزن الجسم لتقليل مدة التسمين بنسبة ١٦ ، ٢٩ % على الترتيب