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PRODUCTIVE PERFORMANCE AND SEXUAL PUBERTY OF GROWING RAM LAMBS FED DIETS CONTAINING CONSERVED SUGAR BEET PULP

Youssef, Hafsa F. H.[1] ; Y. H. Hafez[1] and M. I. Bassiouni[2]

[1] Sheep and Goat Research Department, Animal Production Research Institute (APRI), Agricultural Research Center (ARC), Giza, Egypt.

[2] Animal Production Department, Faculty of Agriculture, Kafr Elsheikh University.

ABSTRACT

Twenty one growing crossbred ram lambs with average body weight of 19.67±0.42 kg and 4 months of age were divided into 3 similar groups (7 in each). All animals were fed diets consisted of 50% concentrate feed mixture (CFM) plus 50% berseem hay (BH) in the 1st group (control, G1) or plus 50% conserved mixture {sugar beet pulp (SBP) + BH, 1:1} in the 2nd group (G2) or plus 50% conserved mixture (SBP+BH, 2:1) in the 3rd group (G3). Results showed that CP and CF contents decreased but NFE content increased in diets of G2 and G3 than in G1. Lambs in G2 showed the highest (P<0.05) digestibility coefficients of all nutrients and TDN value, while, G1 showed the highest (P<0.05) DCP value. Lambs in G3 recorded the highest (P<0.05) DM intake. The TDN intake was higher (P<0.05) by G2 and G3 than G1. Lambs in G1 revealed the highest (P<0.05) DCP intake. The highest (P<0.05) ruminal pH value and NH_3-N concentration was recorded in G1, while, G2 showed the highest (P<0.05) ruminal TVFA's concentration. The highest (P<0.05) concentrations of total protein, albumin and T4, was found in blood plasma of G2, while G1 had the highest concentrations of globulin, T3, urea-N, AST and ALT. Glucose concentration was nearly similar in all groups. Lambs in G2 showed the heaviest (P<0.05) weight, the highest (P<0.05) total weight gain and average daily gain, followed by G3, while G1 had the lowest values (P<0.05) Amount of DM and DCP/ kg gain was higher (P<0.05) for G1than G2 and G3. Amount of TDN/kg gain was nearly similar in all groups. Economic feed efficiency was higher (P<0.05) for G2 and G3 than G1. Lambs in G2 revealed the earliest (P<0.05) age, the heaviest weight, the highest scrotal circumference and the highest testosterone concentration at age of puberty, followed by lambs in G3, while those in G1 had opposite trends. From these results it could be concluded that lambs fed diet containing conserved sugar beet pulp (50% sugar beet pulp + 50% berseem hay) showed the best results concerning feed intake, digestibility, nutritive value, rumen fermentation activity, growth rate, feed conversion, economic efficiency and earliest age at puberty

Keywords: Ram lambs, conserved sugar beet pulp, digestion, gain, puberty**.**

INTRODUCTION

In Egypt, the total planted area of sugar beet was about 440 thousand feddans produced about 2.5 million tons fresh sugar beet pulp (Agricultural Economics, 2012). Sugar beet pulp is a byproduct of the sugar beet industry. After the sugar is extracted from the beet, the remaining fraction is mechanically pressed to around 24% dry matter. The pulp can be fed fresh or ensiled, allowing it to be accessible year round (Park *et al*., 2001). Sugar beet pulp could be used as a satisfactory source of energy in

rations of lactating, growing and fattening ruminants (Haaksma, 1993; Mahmoud *et al*., 1998 and Mele *et al*., 1998).

Wet sugar beet pulp (WSBP) silages have a relatively high feedout value for livestock (Bell *et al*., 2001), which may be attributed to the highly digestible fiber fraction of WSBP (Tatlli *et al*., 2001). Introduction of 3% sugar beet pulp to replace 50% of the common concentrate mixture is recommended in rations of growing sheep and could provide a safe source of carbohydrates with longer time of passage rate and consequently better utilization of dietary energy (El-Badawi and El-Kady, 2006).

In sugar beet pulp supplementation to forage feeding, as in the usual practice, the highly digestible fiber supplied by sugar beet pulp may have some effects on the degradation of forage fiber in the rumen. However, the feeding readily fermentable fiber and pectin in sugar beet pulp (Tanaka *et al*., 1993; Sadoya *et al*., 1995) might cause the change in rumen pH, which then might influence the activity of rumen microbes involved in the fiber degradation of forages (Obara *et al*., 1991).

The objective of this study was to investigate the effect of feeding different proportions of sugar beet pulp and berseem hay in silages on nutrients digestibility, rumen activity, growth rate, economic efficiency and sexual behavior of growing lambs.

MATERIALS AND METHODS

The current study was conducted at Sakha Animal Production Research Station, Kafr El-Sheikh Province, belonged to Animal Production Research Institute, Agricultural Research Center in cooperation with Animal production Department, Faculty of Agriculture, Kafr El-Sheikh University.

Animals:

Total of twenty one growing crossbred ram lambs with average body weight of 19.67±0.42 kg and 4 months of age were divided according to body weight into 3 similar experimental groups (7 in each) fed three experimental diets. Animals were housed under a semi-roofed yard and kept under the same managerial conditions.

Feeding system:

Lambs in the 1st group (G1) were fed a diet consisted of 50% concentrate feed mixture (CFM) and 50% berseem hay (BH) and considered as a control group. Lambs in the 2nd group (G2) were fed 50% CFM plus 50% of conserved mixture 1:1 of fresh sugar beet tops (SBP) and BH. However, those in the 3rd group (G3) were fed 50% CFM plus 50% of conserved mixture 2:1 of SBP and BH, respectively.

All lambs were fed their allowances to cover the recommended requirements according to NRC (1985) for growing lambs and adjusted every two weeks according to body weight changes. The CFM was offered two times daily at 8 a.m. and 4 p.m., while roughages (BH or/and SBP) were offered once daily at 11 a.m. All lambs were kept under the routine veterinary supervision through the whole feeding period of 240 days. Lambs were allowed to drink water three times a day at 7 a.m., 1 p.m. and 7 p.m.

Ensiling process:

Fresh sugar beet pulps were ensiled between feed toughs with added 50% BH for G2) or 25% BH for G3. About 30 cm layer of rice straw spread on the ground as bed to absorb seepage and to prevent contamination with earth. The silage materials were compressed by heavy drum filled with sand, then covered with plastic sheet, hard pressed with 30 cm of soil layer and ensiled for eight weeks.

Experimental procedures:

During the feeding period, body weight of lambs and feed intake were biweekly recorded individually for each experimental group. Lambs were weighed in the morning before drinking and feeding. Then, body gain, feed conversion and economic feed efficiency were calculated

Feed conversion was calculated as the amounts of DM, TDN and DCP (kg) required per kg live body weight gain. Economic efficiency expressed as the daily feed cost, price of daily weight gain, feed cost per kg gain and the ratio between price of daily weight gain and daily feed cost.

Digestibility trials:

Three digestibility trials were conducted simultaneously on 3 animals from each group after 4 months from the beginning of the experimental period to determine nutrients digestibility coefficients and nutritive values of the experimental diets using acid insoluble ash (AIA) as a natural marker according to Van Keulen and Young (1977). Faeces samples were taken from the rectum of each lamb twice daily at 12 hours interval during the collection period for 5 days. Representative samples of tested feedstuffs and faeces were taken at the beginning, middle and end of collection period to analyze according to AOAC (1990).

Rumen liquor samples:

During digestibility trials, rumen liquor samples were collected after 4 months from the beginning of the experiment from lambs at 3 hours after the morning feeding using a stomach tube and filtered through double layers of cheese cloth. Ruminal pH value was determined directly using Orian 680 digital pH meter, then samples were stored in dry clean glass bottles with added 2 drops of mercuric chloride and kept in deep freezer (-20 ^{o}C) for chemical analyses. Concentration of total volatile fatty acids (VFA's) was determined in rumen liquor samples by the steam distillation method (Warner, 1964) using markham micro-distillation apparatus. The concentration of NH_3-N was determined using saturated solution of magnesium oxide distillation according to AOAC (1990).

Blood samples:

Blood samples were withdraws from the jugular vein of three lambs in each group using sterile needle into clean dry heparinzed tubes and centrifuged at 4000 r.p.m. for 15 minutes to obtain plasma which was stoted at -20 ^{o}C till analysis. In blood plasma, concentration of glucose, total proteins, albumin, urea-N, triiodothyronine (T3) and thyroxin (T4) as well as activity of asprtate (AST) and alanine (ALT) transaminases were determined calorimetrically using spectrophotometer and commercial diagnostic kits (Test-combination, Pasteur lap.). However, globuline concentration was determined by subtraction albumin fro total proteins concentration

Puberty detection:

Ram lambs in all groups were subjected to observation to detect changes in sexual behavior, during the period from 3 months of age till the onset of puberty (first successful ejaculate with motile sperm). Five ewes were subjected to estrous synchronization by the hormonal treatment to ensure the availability of two ewes at least in oestrus at each time of libido test.

Age, weight, scrotal circumference and testosterone concentration were determined at different puberty stages, including 1st mounting, mounting with erection (1st penile protrusion) and puberty.

Statistical analysis:

Data were subjected to statistical analysis using general linear models (GLM) procedures adapted by SPSS for Windows (2008) with one-way ANOVA. Duncan test within program SPSS was done to determine the level of significance between the means (Duncan, 1955).

RESULTS AND DISCUSSION

Chemical composition:

Chemical composition of feedstuffs and the experimental diets is shown in Table (1). Fresh sugar beet pulp (SBP) had lower CP content and higher NFE content compared with berseem hay (BH). So, CP content decreased but NFE content increased with increasing SBP and decreasing BH levels in the conserved mixture as presented in G2 and G3. The composition of experimental diets revealed that CP and CF contents decreased but NFE content increased in diets contained both conserved mixtures (G2 and G3) than that of control diet containing BH (G1).

The chemical composition of SBP is nearly similar to that obtained by Klebaniuk and Matras (1999).

Digestibility coefficients and nutritive values:

Digestibility coefficients and nutritive values of experimental diets are presented in Table (2). Lambs in G2 showed significantly ($P<0.05$) the highest digestibility coefficients of all nutrients, followed by lambs in G3 (for DM, OM, CP and EE) and in G1 (for CF and NFE). Meanwhile, G1 showed significantly ($P<0.05$) the lowest digestibilities of DM, OM, CP and EE and G3 had the lowest digestibilities of CF and NFE.

Concerning the nutritive values of different experimental diets, dietary inclusion of both conserved mixtures significantly ($P<0.05$) increased TDN in G2 and G3 as compared to BH (control, G1), but increasing SBP conserved mixture in diet of G3 showed significant reduction in TDN than in diet of G2. However, dietary inclusion of SBP conserved mixture significantly ($P<0.05$) decreased DCP in G2 and G3, respectively as compared to BH (G1). These results confirmed with the higher NFE content of SBP and higher CP content of BH (Table 1).

The obtained results agreed with those obtained by El-Badawi and El-Kady (2006) reported that dietary nutritive value expressed in terms of TDN was higher for the 50% SBP mixture than control.

Table (1): Chemical composition of feedstuffs and experimental diets.

Item	DM %	Composition of DM (%)					
		OM	CP	CF	EE	NFE	Ash
Feedstuffs:							
CFM	91.01	91.48	15.52	8.37	2.46	65.13	8.52
BH	93.89	86.11	14.33	20.25	2.73	48.80	13.89
SBP	25.08	94.08	7.87	18.34	2.11	65.76	5.92
1st conversed mixture (G2)	56.94	84.27	9.81	17.30	2.24	54.92	15.73
2nd conversed mixture (G3)	41.28	85.21	7.94	16.79	1.97	58.51	14.79
Experimental diets:							
G1	90.57	88.62	14.37	14.97	2.40	56.88	11.38
G2	73.53	88.15	12.60	12.59	2.22	60.74	11.85
G3	64.53	89.26	12.40	11.57	2.50	62.79	10.79

Table (2): Digestibility coefficients (%) and nutritive values (%) of the experimental diets.

Item	G1	G2	G3
Digestibility coefficient (%):			
DM	70.06 ± 0.01^{c}	71.85 ± 0.06^{a}	71.07 ± 0.12^{b}
OM	70.95 ± 0.03^{c}	73.95 ± 0.04^{a}	71.30 ± 0.14^{b}
CP	75.00 ± 0.09^{c}	79.41 ± 0.08^{a}	77.42 ± 0.76^{b}
EE	56.00 ± 0.16^{c}	61.79 ± 0.08^{a}	60.71 ± 0.05^{b}
CF	72.50 ± 0.16^{b}	73.33 ± 0.06^{a}	70.00 ± 0.24^{c}
NFE	73.79 ± 0.10^{b}	74.87 ± 0.52^{a}	72.24 ± 0.03^{c}
Nutritive value (%):			
TDN	65.06 ± 0.004^{c}	67.25 ± 0.010^{a}	65.85 ± 0.008^{b}
DCP	10.77 ± 0.010^{a}	10.05 ± 0.012^{b}	9.53 ± 0.009^{c}

a, b, c: Means in the same row with different superscripts are significantly different (P<0.05).

Feed intake:

Results in Table (3) showed that G3 recorded significantly (P<0.05) the highest DM intake, followed by G2, while G1 had the lowest DM intake. The TDN intake by G2 and G3 was significantly higher (P<0.05) than that of G1. However, G1 showed significantly (P<0.05) the highest DCP intake, followed by G2, while G3 had the lowest DCP intake.

Table (3): Effect of dietary treatment on average daily feed intake by lambs.

Item	G1	G2	G3
Intake (g DM/d/h)			
CFM	960	960	960
BH	991	-	-
1st conversed mixture	-	1690	-
2nd conversed mixture	-	-	2425
Total intake	1951	2650	3385
Total DM intake	1804 ± 1.96^{c}	1836 ± 1.09^{b}	1876 ± 2.12^{a}
TDN	1174 ± 1.11^{b}	1235 ± 1.45^{a}	1235 ± 1.57^{a}
DCP	194 ± 0.34^{a}	185 ± 0.44^{b}	179 ± 0.53^{c}

a, b, c: Means in the same row with different superscripts are significantly different (P<0.05).

Rumen activity:

Parameters of rumen activity in Table (4) showed that G1 revealed significantly (P<0.05) the highest pH value followed by G3, while G2 had the lowest value. The G1 revealed significantly (P<0.05) the highest ruminal NH_3-N concentration, followed by G2, while G3 had the lowest concentration. Moreover, G2 showed significantly (P<0.05) the highest ruminal TVFA's concentration, followed by G3, while G1 had the lowest concentration.

These results agreed with those obtained by Rouzbehan *et al.* (1996), who reported that ruminal ammonia concentration reduced and TVFA's concentration increased during feeding sheep diets supplemented with SBP. Also, Salman *et al.* (2008) found that ruminal TVFA's concentration was significantly higher for goats fed SBP rations than the control group.

Table (4): Effect of dietary treatment on rumen activity of lambs.

Item	G1	G2	G3
pH value	5.81±0.01^{a}	5.28±0.02^{c}	5.61±0.01^{b}
NH_3-N (mg/100 ml)	24.38±0.01^{a}	23.96±0.01^{b}	23.46±0.01^{c}
TVFA's (mg/100 ml)	16.46±0.04^{c}	18.82±0.02^{a}	17.70±0.01^{b}

a, b, c: Means in the same row with different superscripts are significantly different (P<0.05).

Blood parameters:

Blood plasma parameters in Table (5) revealed significant (P<0.05) effect of dietary treatment on concentrations of total proteins (TP), albumin (AL), globulin (GL), urea-N, T3 and T4 as well as activity of AST and ALT. Concentration of TP, AL and T4 was significantly (P<0.05) the highest in blood plasma of lambs in G2.

Table (5): Effect of dietary treatment on blood parameters of lambs.

Item	G1	G2	G3
Blood biochemicals:			
Total proteins (g/dl)	7.38±0.01	7.76±0.01^{a}	7.19±0.01^{c}
Albumin (g/dl)	4.12±0.02^{c}	4.53±0.02^{a}	4.19±0.01^{b}
Globulin (g/dl)	3.26±0.01^{a}	3.23±0.02^{a}	3.00±0.01^{b}
Glucose(mg/dl)	54.15±0.02	55.90±0.01	54.15±0.24
Urea-N (mg/dl)	39.7±0.11^{a}	34.5±0.13^{c}	38.2±0.16^{b}
Enzyme activity (IU/l):			
AST	33.3±0.25^{a}	32.7±0.09^{b}	32.9±0.04^{ab}
ALT	16.51±0.01^{a}	15.30±0.09^{c}	15.72±0.01^{b}
Hormonal concentration (ng/dl):			
T3 (ng/dl)	160.4±0.09^{a}	145.5±0.09^{c}	155.3±0.09^{b}
T4 (µg/dl)	5.56±0.01^{c}	6.79±0.04^{a}	5.73±0.02^{b}

a, b, c: Means in the same row with different superscripts are significantly different (P<0.05).

Concentration of GL, T3 and urea-N as well as activity of AST and ALT was significantly (P<0.05) the highest in blood plasma of lambs in G1. However, glucose concentration was nearly similar for the different groups.

In accordance with the obtained results, Enaeme *et al.* (1990) observed no typical pattern in plasma concentration of glucose, while plasma urea concentration increased with feeding growing fattening bulls on SBP

diet. Also, Belibasakis *et al*. (1996) reported that feeding dairy cows on SBP increased concentration of TP, AL and urea.

Growth performance:

Growth performance parameters of lambs fed experimental diets are presented in Table (6). Lambs in G2 showed significantly (P<0.05) the heaviest final body weight and the highest total weight gain and average daily gain, followed by those in G3, while the control lambs (G1) had the lowest values. Results indicated that average daily gain of lambs in G2 and G3 increased by 10.05 and 4.76% than that of G1, respectively. These results confirmed with higher TDN value (Table 2) and TVFA's concentration (Table 4) for G2. In agreement with the present results, Ali *et al*. (2000) found the addition of SBP to sheep rations caused an increase in body weight gain. Also, El-Badawi and El-Kady (2006) found that inclusion of SBP at 50% of the common CFM increased average daily gain of lambs.

Feed conversion expressed as the amounts of DM, TDN and DCP per kg gain presented in Table (6) showed that the amount of DM/kg gain was significantly (P<0.05) higher for G1 and G3 than that of G2.

The amount of DCP/kg gain was significantly (P<0.05) higher in G1 than in G2 and G3. However, the amount of TDN/kg gain was nearly similar for all groups.

Table (6): Effect of dietary treatment on growth performance of lambs.

Item	G1	G2	G3
Growth parameters:			
Initial body weight (kg)	19.86±0.55	19.57±0.57	19.57±0.48
Final body weight(kg)	46.86±1.08^{b}	49.29±0.57^{a}	47.86±0.67^{ab}
Total weight gain(kg)	27.00±0.72^{b}	29.71±0.18^{a}	28.29±0.29^{ab}
Average daily gain (g/day)	112.50±3.02^{b}	123.81±0.77^{a}	117.86±1.19^{ab}
Feed conversion:			
Kg DM/kg gain	16.10±0.43^{a}	14.83±0.09^{b}	15.93±0.15^{a}
Kg TDN/kg gain	10.48±0.28	9.97±0.06	10.48±0.10
Kg DCP/kg gain	1.73±0.05^{a}	1.49±0.01^{b}	1.51±0.02^{b}
Economic evaluation:			
Daily feed cost (LE)	2.79±0.07	2.79±0.06	2.73±0.09
Price of daily gain (L.E.)	3.15±0.10^{b}	3.47±0.14^{a}	3.30±0.12^{ab}
Economic efficiency %	112.9±0.25^{b}	124.4±0.29^{a}	120.9±0.23^{a}

a, b, c: Means in the same row with different superscripts are significantly different (P<0.05).

Price of CFM, BH and SBP was 2020, 858 and 150 L.E./ton. Price of kg gain was 28 L.E.

These results agreed with those obtained by El-Badawi and El-Kady (2006), who found that feed conversion in terms of kg DM or TDN per kg gain was significantly (P<0.05) better for growing sheep fed 50% SBP. Data of economic efficiency (Table 6) revealed that in spite of the lower price of SBP than BH, average daily feed cost was nearly similar for all groups due to increasing the roughage intake with increasing the proportion of SBP. Lambs in G2 showed significantly (P<0.05) the highest price of daily gain followed by those in G3, while those in G1 had the lowest value. Therefore, economic feed efficiency was significantly (P<0.05) higher for G2 and G3 compared to G1 (control).

These results agreed with those obtained by Ali *et al*. (2000) who found the addition of sugar beet pulp to sheep rations decreased the feed cost for producing one kg of live body weight gain.

Sexual puberty of ram lambs:

According to sexual puberty stages, lambs in G2 showed significantly (P<0.05) the shortest ages and the heaviest weights at 1st stage (1st mounting), 2nd stage (mounting and 1st erection) and 3rd stage (mounting, erection and 1st ejaculation), indicating earliest age at puberty, followed by lambs in G3, while the control lambs showed the latest ages and the lightest weights at puberty (Table 7).

It is of interest to note that the earliest ages of lambs in G2 at different puberty stages was associated with the highest scrotal circumference and testosterone concentration, followed by lambs in G3, while those in G1 showed the lowest values (Table 7).

Table (7): Sexual behavior of ram lambs fed experimental diets.

Item	G1	G2	G3
1st mounting:			
Age (day)	208.86±0.67[a]	195.00±0.31[c]	200.00±0.44[b]
Body weight (kg)	28.20±0.09[c]	30.20±0.05[a]	28.90±0.10[b]
Scrotal circumference (cm)	23.51±0.10[b]	24.73±0.02[a]	24.07±0.85[ab]
Testosterone (ng/ml)	3.70±0.05[b]	4.40±0.05[a]	4.30±0.07[a]
1st mounting with erection:			
Age(day)	227.00±0.49[a]	224.14±0.91[b]	225.00±0.62[ab]
Body weight(kg)	32.40±0.18[b]	32.80±0.03[a]	32.50±0.03[ab]
Scrotal circumference (cm)	26.13±0.08[b]	26.96±0.04a	26.86±0.02[a]
Testosterone (ng/ml)	3.40±0.05[b]	3.61±0.04a	3.50±0.03[ab]
1st ejaculation (puberty):			
Age (day)	247±0.79[a]	240±1.09[b]	245±0.49[a]
Body weight(kg)	34.7±0.05[c]	35.7±0.08[a]	35.4±0.09[b]
♀Scrotal circumference (cm)	28.68±0.04[b]	28.99±0.02[a]	28.93±0.05[a]
Testosterone (ng/ml)	1.10±0.01[c]	1.31±0.01[a]	1.19±0.01[b]

a, b, c: Means in the same row with different superscripts are significantly different (P<0.05).

It is worth noting, that younger age of lambs in G2 at the 1st and 3rd stage of puberty was associated with the highest ADG of ram lambs in G2. The increase in feed intake was associated with increase in testicular weight (Cupps, 1993).

In this respect, Walkden-Brown *et al.* (1994) suggested that testicular mass appears to be primarily dependent on changes in voluntary feed intake and growth of goats. Also, Perez-Clarig *et al.* (1998) concluded that improved nutrition accelerated the testicular growth and a transit increase occurred pulstile secretion of LH. Moreover, Miller *et al.* (1998) suggested that when nutritional status of male sheep was improved, insulin, amino acids and possibly glucose interacted to modulate GnRH secretion.

In accordance with the present results, Kumi-Diaka *et al.* (1985) found that at 6.4 months of age, scrotal circumference was 18.5 cm in intensively managed ram lambs. In the extensively managed animals, scrotal circumference decreased downward 15.2 cm at 7.8 months of age. Age of puberty of ram lambs under sub-tropical conditions was earlier (6.4 months)

and scrotal circumference was wider (18.5 cm) in intensively managed animals as compared to extensively managed animals (age at puberty and scrotal circumference were 7.8 months and 15.2 cm, respectively.

In Corriedule ram lambs, Castrillejo *et al.* (1995) found that onset of puberty attained earlier at 180-216 days of age with nearly similar scrotal circumference (23 cm) to that obtained in the present study. The present trend of increase in scrotal circumference at all stages of puberty was similar to that obtained by Ali and El-Saidy (2003) and El-Saidy *et al.* (2004), who found that at first ejaculation (puberty) ram lambs fed 50% dry sugar beet tops (DSBT) showed significantly wider scrotal circumference than that of ram lambs fed BH or 100% DSBT.

The present values of testosterone concentration in blood plasma of all groups at puberty are within the ranges reported by Schanbacher and Crouse (1980) in Suffolk ram lambs (0.8 and 3.4 ng/ml), but it was higher than values reported by El-Shamaa (2002) in Romanov crossbred ram lambs (1.45-2.70 ng/ml) and by El-Badawy (2003) in Finnish crossbred ram lambs (2.06-2.54 ng/ml. These differences may be attributed to wide variation in sheep breed, environmental conductions and feeding level.

From these results it could be concluded that lambs fed diet containing conserved sugar beet pulp mixture (50% sugar beet pulp + 50% berseem hay) showed the best results concerning feed intake, digestibility, rumen fermentation activity, growth rate, feed conversion, economic efficiency and earliest age at puberty.

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الأداء الإنتاجى والبلوغ الجنسى للحملان النامية المغذاة على علائق محتوية على تفل بنجر السكر المحفوظ

حافصه فهمي حسين يوسف[1] ، يوسف حسين حافظ [1]، محمد إبراهيم بسيوني[2]
1 قسم بحوث تربيه الأغنام والماعز – معهد بحوث الإنتاج الحيوانى – مركز البحوث الزراعيه – الجيزه- مصر.
2 قسم الإنتاج الحيواني – كلية الزراعه - جامعة كفر الشيخ.

استخدم فى هذه الدراسة 21 حمل نامى متوسط وزنها 19.67±0.42 كجم وعمر 4 شهور قسمت إلى ثلاثة مجموعات متماثلة (7 بكل منها). غذيت جميع الحيوانات على علائق تحتوى على 50% مخلوط علف مركز مع 50% دريس برسيم فى المجموعة الأولى (ج1) كمجموعة مقارنة أو مع 50% من مخلوط تفل البنجر المحفوظ المتكون من 50% تفل بنجر السكر + 50% دريس برسيم فى المجموعة الثانية (ج 2) أو مع 50% المخلوط الثاني الذي تكون من 75% تفل بنجر السكر + 25% دريس برسيم فى المجموعة الثالثة (ج3).

وقد أظهرت النتائج مايلى:

1- ارتفاع محتوى البروتين والألياف وانخفاض محتوى المستخلص الخالى من الأزوت فى العلائق المحتوية على مخلوطى تفل بنجر السكر عن عليقة المقارنة المحتوية على دريس البرسيم (ج1)
2- أظهرت المجموعة الثانية أعلى معاملات هضم لجميع العناصر الغذائية وكذلك محتوى المركبات الكلية معنويا عند مستوى 5%، بينما كان أعلى محتوى للبروتين المهضوم فى المجموعة الأولى.
3- سجلت المجموعة الثالثة أعلى مأكول من المادة الجافة وكذلك ارتفع المأكول من المركبات الكلية المهضومة فى المجموعة الثانية والثالثة عن المجموعة الأولى، بينما كان أعلى مأكول من البروتين المهضوم فى المجموعة الأولى معنويا عند مستوى 5%.
4- حققت المجموعة الأولى أعلى قيمة لدرجة الحموضة وتركيز نيتروجين الأمونيا فى سائل الكرش، بينما وجد أعلى تركيز للأحماض الدهنية الطيارة الكلية فى المجموعة الثاني معنويا عند مستوى 5%.
5- أظهرت المجموعة الثانية أعلى تركيز لكل من البروتينات الكلية ،الألبيومين، T4 فى بلازما الدم، بينما حققت المجموعة الأولى أعلى تركيز لكل من الجلوبيولين، T3، نيتروجين اليوريا وأنزيمات وظائف الكبد معنويا عند مستوى 5%، بينما كان تركيز الجلوكوز متماثل تقريبا فى المجموعات المختلفة
6- أظهرت المجموعة الثانية أعلى وزن نهائى وزيادة كلية ويومية فى الوزن تلتها المجموعة الثالثة، بينما كانت أقل القيم فى المجموعة الأولى معنويا عند مستوى 5%.
7- أرتفعت كمية المادة الجافة والبروتين المهضوم اللازمة لإنتاج 1 كجم وزن حى فى المجموعة الأولى عنه فى المجموعتين الثانية والثالثة معنويا عند مستوى 5%، بينما كانت كمية المركبات الكلية المهضومة / 1 كجم وزن حى متماثلة تقريبا للمجموعات المختلفة0 كان متوسط تكلفة التغذية اليومية متماثل تقريبا فى المجموعات المختلفة0
8- أظهرت الحملان فى المجموعة الثانية معنويا عند مستوى 5% أعلى ثمن للزيادة اليومية فى الوزن كذلك كانت النسبة المئوية للكفاءة الاقتصادية مرتفعة معنويا فى المجموعتين الثانية والثالثة عن المجموعة الأولى0 سجلت حملان المجموعة الثانية أقل عمر وأعلى وزن للجسم، محيط كيس الصفن وتركيز هرمون التستستيرون عند البلوغ تلتها المجموعة الثالثة، بينما أظهرت المجموعة الأولى قيما معاكسه.

تستخلص من هذه الدراسة أن الحملان المغذاة على العليقة المحتوية على تفل بنجر السكرالمحفوظ و المحتوي علي 50% تفل بنجر سكر + 50% دريس برسيم أظهرت أفضل النتائج بخصوص الغذاء المأكول، معاملات الهضم، القيم الغذائيه ، نشاط تخمرات الكرش، معدل النمو، معدل التحويل الغذائى، الكفاءة الاقتصادية والبلوغ الجنسى.

قام بتحكيم البحث

أ.د / عبد الخالق السيد عبد الخالق	**كلية الزراعة – جامعة المنصورة**
أ.د / محمود محمد بنداري	**مركز البحوث الزراعية**