EFFICIENCY OF USING PEANUT (*ARACHIS HYPOGAEA L.*) VINE HAY IN RATIONS OF GROWING LAMBS

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ABSTRACT

Twenty-eight Rahmani male lambs aged about 6 months and weighing on average 26.25 ± 0.25 kg were divided into four similar groups (7 lambs each) to investigate effect of replacing berseem hay (BH) by peanut vine hay (PVH) with different concentrate levels on lambs performance in a feeding trial lasted 120 days. Animals were fed one of the following experimental rations: I- Berseem hay (BH) + barley with a level of 1.5% of live body weight (LBW), II- BH + barley 2 % of LBW, III-Peanut vine hay (PVH) + barley1.5 % of LBW, IV- PVH + barley 2 % of LBW. The animals in all groups were fed BH or PVH *ad-libitum* as roughage. At end of the feeding trial, twelve lambs were used in four digestibility trials (3 lambs each) to evaluate the previous rations by acid insoluble ash (AIA) technique. Rumen liquor and blood samples were collected at the last day of the digestion trials. Results indicated that, PVH had high contents of OM, EE, NFE, ADF, ADL, cellulose and GE, while it contained low CP, CF, ash and hemicellulose compared to BH. Rations containing PVH (R3&R4) showed higher ($p< 0.05$) EE digestibility than those containing BH (R1&R2). Digestibility of CF was decreased ($p< 0.05$), however OM, CP and NFE digestibilities were increased ($p< 0.05$), also the nutritive values (expressed as TDN, DCP and ME) were improved with increasing concentrate portion in the rations containing either BH or PVH. Concentration of ruminal VFA's was significantly higher ($p< 0.05$) for R2 &R4 than R1&R3. Moreover, NH_3-N concentration was increased ($p< 0.05$) for R2 compared to R3. No significant differences were observed in all blood constituents as affected by different experimental rations. Average daily gain (ADG) was 159.8, 175.0, 158.3 and 172.9 g / head /day for lambs fed R1, R2, R3 and R4, respectively. These data cleared that ADG was significantly higher ($p< 0.05$) for lambs fed R2&R4 than those fed R1&R3. Furthermore, lambs fed R2 &R4 were consumed more feed intake units (expressed as DM, TDN, ME and DCP) than those fed R1&R3. However, feed conversion efficiency (expressed as DM, TDN and DCP / kg gain) for lambs fed R1 &R3 was better than those fed R2 &R4. Feed cost decreased by 30.7 and 25.4 %, however economical efficiency was improved by 44.1 and 34.3 % for lambs fed R3 &R4 containing PVH compared to those fed R1 &R2 containing BH, respectively.

Keywords: *Peanut vine, digestibility, nutritive value, rumen and blood parameters, lambs, growth rate, and economical efficiency.*

INTRODUCTION

In Egypt, the animals are suffering from feed shortage particularly during the summer season. Shortage of both concentrates and their ingredients with their relatively high prices are the major problem in the animal production sector. These necessitate using of new sources of agricultural by-products (such as sugar beet tops, pea vine, sweet potato vine, peanut vine etc.) as animal feeds to minimize the feed cost and improve the economical efficiency. In a new reclaimed areas, peanut has been a main summer crop and represent up to 66% of the farm size in some districts (Ahmed et al., 1996). It was cultivated in about 161000 feddans as reported by CAPMS (1995). So, peanut will be promising crop in Egypt in reclaimed soil. A numerous amount about 135000 tons of peanut vine hay (PVH) is produced annually as by-products (AIEG, 1993). PVH had been demonstrated as good animal feed for calves (Ahmed and Pollot, 1979), sheep (Awadalla et al., 1997; Etman and Soliman, 1999; Mostafa et al., 1999;Talha, 2001; and Mahmoud et al., 2003), goats (Gelaye et al., 1990) and rabbits (Afifi, 1999).

Gelaye et al. (1990) reported that daily gain and feed utilization efficiency were better when the growing goats were fed PVH than those fed alfalfa hay. Morever, Etman and Soliman (1999) found that, best daily gain was recorded when the lambs were fed PVH with 2.5% concentrate feed mixture (CFM) from LBW comparing with those fed low concentrate levels (1, 1.5 and 2%). All explored good response in animal performance when inclusion PVH in sheep rations. Moreover, using PVH led to reduce feed cost compared to the other leguminous roughages. However, no significant differences in daily gain and feed conversion were observed among sheep fed either clover hay or alfalfa hay and those fed PVH as roughages with concentrate (Awadalla et al., 1997, Talha, 2001 and Mahmoud et al., 2003).

The objective of this work was to investigate the effect of replacing BH by PVH with different concentrate levels (1.5 or 2% barley grains from LBW) in rations of growing Rahmani lambs on digestibility, rumen fermentation, animal performance and feed utilization efficiency.

MATERIALS AND METHODS

The present study was carried out at the Experimental Farm of the Animal Production Department, Faculty of Agriculture, Kafr El-Sheikh, Tanta University. Peanut vine hay (PVH) was brought from the new reclaimed lands in Abu-Elmatamer, El-Behera governorate. It was dried on ground after harvesting the main crop (peanut pods) by sun drying.

When the moisture content reached to a suitable degree for storage (about 15%), hay was collected, then bailed and transferred to Faculty farm. As well as, berseem (*Trifolium alexanrinum*) hay was made from 3rd cut by the same previous method. Feeding trial was conducted using twenty-eight Rahmani male lambs weighing on average 26.25 ± 0.25 kg and aged about 6 months for 120 days as experimental period. Animals were housed in a semi-shaded open yard and were divided into four similar groups (7 lambs each). Animals were fed one of the following experimental rations: I-Berseem hay (BH) + barley with a level of 1.5% of live body weight (LBW), II- BH + barley 2 % of LBW, III -Peanut vine hay (PVH) + barley1.5 % of LBW, IV- PVH +barley 2 % of LBW. Animals were fed according to NRC (1985) requirements. Lambs in all groups were fed twice daily on two equal portions of cracked barley grains at 8 a.m. and 4 p.m., while the quantities of roughage (BH or PVH) were given *ad-libitum*. Fresh water and mineral blocks Salt (Biomix 112, Biochema, Cairo, Egypt) were available all the day. Each kg of Biomix 112 contain: S 6000 mg, Fe 3500 mg, Zn 3000 mg, Mn 3000 mg, Mg 1000 mg, Ca 800 mg, Se 6 mg, Molasses 500mg).

Animals were weighed before morning feeding on two consecutive days at beginning and end of the trial and once biweekly during the experimental period. At the end of feeding trial, twelve Rahmani lambs were used in carrying out four digestion trials (3 lambs each) to evaluate the previous rations by using acid insoluble ash (AIA) technique as a natural marker (Van keulen and Young, 1977). At the last day of digestibility trials rumen liquor samples were taken 3 hours after the morning feeding by a rubber stomach tube. Ruminal pH value was determined directly by using Beckman pH meter. While 1 ml concentrated mercuric chloride was added to the rest of sample to stop the microbial activity, filtered through a double layer of cheesecloth and stored in polyethylene bottles in freezer until analysis. Total volatile fatty acids (VFA`s) concentrations were estimated by using steam distillation method (Warner, 1964). Ammonia-N (NH_3-N) concentration was determined by using magnesium oxide (MgO) as described by AOAC (1990). Blood samples withdrawn at the same time of rumen liquor collection from the jugular vein into clean tubes. Ethylene diaminetera acetate (EDTA) was added as anticoagulant. Blood samples were centrifuged at 3500 r.p.m. for 15 minutes to obtain plasma which was stored at -20°C until analysis. Blood hemoglobin, total plasma proteins, albumin, urea, GOT, GPT and cholesterol concentrations were determined according to the methods recommended by Varley (1976).

The data were statistically analyzed using General Linear Models Procedure (one way ANOVA model) adapted by SPSS (1997). While appropriate means were separated using Duncans`s multiple range test (Duncan, 1955).

RESULTS AND DISCUSSION

1.Chemical composition

Peanut vine hay had higher OM, EE, NFE, NDF, ADF, ADL, cellulose and GE contents, while it contained lower CP, CF, ash and hemicellulose than BH (Table 1). Chemical composition of PVH &BH was within the range reported by many authors (Awadalla et al., 1997; Etman and Soliman, 1999; Mostafa et al., 1999; Saleh et al., 2000 and Talha, 2001). However, Mahmoud et al (2003) found that PVH had higher contents of CP (15%), NFE (53.35%) and hemicllulose (14.92%), while it was contained lower CF (21.94%), ash (7.75%), NDF (47.19%), ADF (32.27%), cellulose (26.45%) and ADL (5.82%) than values were reported in the present study. Chemical composition of crop residues is depending on many factors such as, age of plant, type of soil, fertilizers, system of crop harvesting and others.

Table 1: Chemical composition of the feed ingredients and calculated experimental rations.used in feeding Rahmani lambs.

Ingredients	DM, %	DM composition, %					
		OM	CP	CF	EE	NFE	Ash
Barley grains	92.15	96.85	12.50	6.86	1.89	75.60	3.15
Berssem hay	89.25	86.55	14.75	32.35	2.25	37.20	13.45
Peanut vine hay	90.12	89.40	13.60	30.14	3.05	42.61	10.60
Experimental rations (calculated)*							
R1	90.45	90.78	13.83	21.88	2.10	52.97	9.22
R2	90.61	91.64	13.64	19.72	2.07	56.21	8.36
R3	90.98	92.49	13.15	20.50	2.56	56.28	7.51
R4	91.09	93.10	13.05	18.63	2.47	58.95	6.90
Fiber fractions, %**							
Ingredients	NDF	ADF	ADL	Hemicell.	Cellulose	GE***	
Barley grains	30.15	8.75	1.25	21.40	7.50	4.31	
Berssem hay	53.25	41.12	7.40	12.13	33.72	3.93	
Peanut vine hay	57.84	50.07	9.93	7.77	40.14	4.07	

*R1- Berseem hay +1.5% Barley of LBW. R2- Berseem hay +2% Barley of LBW
R3-Peanut vine hay +1.5% barely of LBW. R4-Peanut vine hay +2% barely of LBW
**Hemicellulose = NDF-ADF & Cellulose = ADF-AD
***GE (Mcal/kg DM) = CP x 5.65+CF x 4.15+EE x 9.40+NFEx 4.15 (Blaxter, 1968).

2. Digestibility and nutritive values

Results of digestibility and nutritive values of the different experimental rations are shown in Table (2). No significant differences were observed among the different experimental rations in DM digestibility. These results are in agreement with those reported by Mostafa et al (1999) when Barki lambs were fed PVH or alfalfa hay *ad libitum* with 1.5 % CFM from LBW. Digestibility of EE for rations containing PVH (R3&R4) were significantly higher ($p< 0.05$) than those containing BH (R1&R2). This may be due to PVH had higher EE content than BH. These results are in accordance with those found by Mahmoud et al (2003) when they fed Barki lambs on PVH or alfalfa hay with 2 % barley from LBW.

Table 2: Average of digestibility and nutritive values of the different experimental rations used in feeding Rahmani lambs.

Items	Experimental rations				SEM*
	R1	R2	R3	R4	
Digestibility, %					
DM	72.31	74.61	71.70	73.76	0.50
OM	72.48^{c}	75.48^{a}	72.88^{bc}	75.08^{a}	0.50
CP	71.42^{b}	74.53^{a}	70.88^{b}	73.59^{a}	0.60
CF	59.92^{a}	57.15^{b}	60.90^{a}	56.43^{b}	0.66
EE	69.69^{c}	72.20^{c}	74.93^{b}	78.50^{a}	1.04
NFE	78.06^{b}	82.26^{a}	77.61^{b}	81.16^{a}	0.69
Nutritive value, %					
TDN	67.63^{c}	71.04^{ab}	69.80^{bc}	72.32^{a}	0.60
DCP	9.88^{ab}	10.17^{a}	9.32^{c}	9.61^{bc}	0.11
ME, Mcal/ kg DM**	2.43^{b}	2.56^{ab}	2.51^{ab}	2.60^{a}	0.03

^{a,b,c} means in the same row with different superscripts differ significantly at ($p<0.05$).
*SEM: Standard error of mean.
** ME, Mcal / kg DM = (TDN x3.6) /100 (Ranjhan, 1980) and (Church and Pond1982).

Digestibility of OM, CP and NFE were significantly increased ($p< 0.05$) with increasing concentrate level in R2&R4 compared to R1&R3. These results are in agreement with those reported by Colucci et al (1989) with sheep and cows; Hanafy (1998) with steers; Etman and Soliman (1999) and Talha (2001) with sheep, when they used alfalfa hay or BH or PVH with different concentrate levels. On the other hand, CF digestibility was decreased ($p< 0.05$) with increasing concentrate proportion in R2&R4 compared to R1&R3, this may attributed to the increase of soluble carbohydrate which has adversely effect on

rumen environment and reduce fiber digestion in the rumen (Schneider et al., 1985 and Talha, 1996).

Total digestible nutrients (TDN) were ranged from 67.63 % for R1 to 72.32 % for R4. No significant differences in TDN values were found neither between R1&R3 (low concentrate level) nor between R2&R4 (high concentrate level). However, DCP values were ranged from 9.32 % for R3 to 10.17 % for R2. No significant differences were observed neither between R1&R2 (containing BH) nor between R3&R4 (containing PVH). Increasing DCP values in rations containing BH may be attributed to higher CP content and its digestibility in these rations than those contained PVH. Increasing concentrate proportion was accompanied by an increase of CP digestibility. These findings are in accordance with those showed by Colucci et al (1989); Hanafy (1998) and Etman and Soliman (1999). ME values were ranged between 2.43 and 2.60 Mcal /kg DM. Generally, most of digestibility coefficients and nutritive values were improved with increasing concentrate level in rations containing BH or PVH. Improving nutritive values might be attributed to increase most nutrient contents and their digestibilities by increasing concentrate proportion in these rations. These results are in agreement with those reported by many authors (Etman et al, 1988; Etman and Soliman, 1999 and Talha, 2001). Mahmoud et al (2003) indicated that, no significant differences were observed in TDN, DCP and ME values among the different lamb rations containing groundnut vine hay or alfalfa hay with 2% barley from LBW. Meanwhile, Awadalla et al (1997) showed an increase in TDN value by increasing groundnut vine hay with CFM in lamb rations.

3. Rumen fermentation parameters

Data of rumen fermentation parameters (Table 3) indicated that, no significant differences were observed in ruminal pH values among the experimental rations. Hoover (1986) and Soliman et al (1997) stated that cellulolytic bacteria are very sensitive to ruminal pH (less than 6) which seriously inhibits their growth. Concentration of VFA s was significantly higher ($p< 0.05$) for R2 &R4 than those for R1&R3. Increasing VFA` s concentration in the rations containing high concentrate level was associated with increase efficiency of energy utilization by lambs. These results are in agreement with those reported by Baraghit et al (1999); Mehany (1999); Saleh et al (2000) and Saleh (2001). Total VFA can supply the animal host with 50 and 85 % of utilizable basal metabolic rate and ME, respectively. Absorption of VFA` s is depend on the ruminal pH and length of chain of presented acids (Church, 1988 and Borhami et al, 1999). Ammonia-N concentration increased ($p< 0.05$) for R2 compared to R3, while no significant differences were observed among the other

rations. Decrease of NH_3-N concentration in R1 &R3 may be due to increase crude fiber content in these rations comparing with the other rations (see Table 1). Otherwise, higher NH_3-N concentration in R2&R4 may be related to its higher CP intake and its digestibility in these rations than other rations. These results are in harmony with those reported by Crickenberger et al (1979) and Mehany (1999). Mehrez (1992) indicated that, the optimal NH_3-N concentration for maximum rate of fermentation in the rumen was associated with the dietary type and level of fermented energy in the rumen. Lower ruminal NH_3-N concentration may indicate best utilization of NH_3-N by rumen microbes (Saxena et al., 1971).

Table 3: Rumen fermentation parameters of Rahmani lambs fed the different experimental rations.

Items	Experimental rations				SEM
	R1	R2	R3	R4	
pH	6.81	6.45	6.83	6.38	0.09
VFA`s, meq/100ml	11.24^{c}	13.64^{ab}	11.73^{bc}	14.29^{a}	0.47
NH_3-N, mg/100ml	20.29^{ab}	22.25^{a}	19.65^{b}	21.42^{ab}	0.44

^{a,b,c} means in the same row with different superscripts differ significantly at ($p<0.05$).

4. Blood constituents

No significant differences were observed among the experimental rations in all measured blood constituents (Table 4). Furthermore, these values are within the normal level of sheep blood as reported by many authors (Reece (1991; Yousef et al., 1998 and Saleh et al., 2001), who found that sheep blood is contain 8-10 g % hemoglobin, 6-9 g % total plasma proteins, 8-38 g % urea, 3.5-4.7 % albumin, 153-200 mg % total lipids, 22-30 IU/L GOT, 12.4-16.2 IU/L GPT. Blood constituents may be affected by the dietary components, feeding level, animal strains, method applied for blood determination and others.

Table 4: Average values of some blood constituents of Rahmani lambs fed the different experimental rations.

Items	Experimental rations				SEM
	R1	R2	R3	R4	
Total proteins, g%	7.69	7.97	7.44	7.84	0.28
Albumin, g%	3.75	3.67	3.73	3.66	0.14
Urea, mg %	20.93	21.43	19.97	20.35	0.49
Hemoglobin, g%	12.38	12.17	12.46	12.54	0.18
GOT, IU/L	35.48	35.53	36.03	35.58	0.16
GPT, IU/L	17.56	17.80	18.36	18.58	0.20
Cholesterol, mg %	182.82	183.28	184.74	185.22	0.86

5- Growth performance and feed conversion

Growth performance and feed conversion data are presented in Table (5). Average of daily gain (ADG) was 159.8, 175.0,158.3 and 172.9 g / head /day for lambs fed R1, R2, R3 and R4, respectively. These results showed that ADG of lambs fed R2&R4 were significantly higher ($p< 0.05$) than those fed R1&R3.This might be due to higher DM intake and feed units intake (expressed as TDN, ME and DCP).

Table 5: Average values of feed intake, daily gain, feed conversion and economical efficiency of Rahmani lambs fed different rations.

Item	Experimental rations				SEM
	R1	R2	R3	R4	
Animals No.	7	7	7	7	-
Experimental period, day	120	120	120	120	-
Initial body wt.(IBW, kg)	26.33	26.17	26.00	26.50	0.25
Final body wt.(FBW, kg)	45.50	47.17	45.00	47.25	0.47
Total gain, kg	19.17^{b}	21.00^{a}	19.00^{b}	20.75^{a}	0.28
Daily gain, g	159.8^{b}	175.0^{a}	158.3^{b}	172.9^{a}	2.00
DM intake, kg /head /day					
From BH	0.714	0.678	-	-	-
From PVH	-	-	0.703	0.676	-
From barley grains	0.498	0.663	0.498	0.663	-
Total DM intake, kg/head/day	1.212	1.341	1.201	1.339	-
Roughage ratio, %	58.91	50.56	58.53	50.49	-
TDN intake, kg /head /day	0.820	0.953	0.838	0.968	-
ME intake, Mcal / head /day	2.96	3.43	3.01	3.48	-
DCP intake, kg /head /day	0.120	0.136	0.112	0.129	-
Feed conversion efficiency , kg / kg gain					
DM	7.58	7.66	7.59	7.74	-
TDN	5.13	5.45	5.29	5.60	-
DCP	0.751	0.777	0.708	0.746	-
Feed cost, LE /head /day	1.02	1.18	0.70	0.87	-
Feed cost, LE / kg gain	6.38	6.74	4.42	5.03	-
Economical efficiency *	2.35	2.23	3.39	2.98	-

[a,b] means in the same row with different superscripts differ significantly at ($p<0.05$).
The price list of one ton of barley grains, BH and PVH were 1000, 600 and 200 LE., respectively and price of one kg LBW was 15 LE (based on year 2004 prices).
* Economical efficiency = price of one kg LBW, LE / feed cost (LE / kg gain).

No significant differences were observed in growth rate either between rations containing high concentrate level (R2&R4) or between those containing low concentrate level (R1&R3) with either BH or PVH. These results take the same trend as those reported by Azamel (1997) and Talha (2001). Moreover, Etman and Soliman (1999) indicated that, growth rate was 129, 109, 91 and 56 g/day when Barki lambs were fed *ad lib.* PVH with CFM at levels of 2.5, 2, 1.5 and 1 % from LBW, respectively.

Lambs fed both R2 and R4 consumed more DM and feed units (expressed as TDN, ME and DCP) and resulted in higher growth rate than those fed R1&R3. The slightly decrease of DM intake with decreasing the concentrate proportion in the rations might be related to the physical constrains such as CF content which increased when more hay was fed (Lamas and Combs, 1991 and Hanafy, 1998). However, feed conversion efficiency (expressed as DM, TDN and DCP, kg / kg gain) for lambs fed R1 and R3 were better than those fed R2 and R4. Better DM and TDN efficiency may be due to higher metabolizable energy and more efficient utilization for growth (Blaxter, 1968).

Feed cost values were 6.38, 6.74, 4.42 and 5.03 LE. / Kg gain for lambs fed R1, R2, R3 and R4, respectively. The corresponding values of economical efficiency values were 2.35, 2.23, 3.39 and 2.98. These data indicated that, feed cost was decreased by 30.7 and 25.4 %, whereas economical efficiency was improved by 44.3 and 33.6 % for lambs fed R3 &R4 which containing PVH compared to those fed R1 &R2 which containing BH, respectively.

CONCLUSION

From the results obtained it could be concluded that, PVH can be used instead of BH in feeding the growing lambs as a sole source of roughage with different levels of concentrate. As well as, PVH is considered high quality roughage, cheap price and more palatable for growing lambs compared to the other agricultural by- products. Although using high concentrate level (2 % barley of LBW) with either BH or PVH gave higher growth rate, while using low concentrate level (1.5 % barley of LBW) with PVH gave a moderate growth rate with best economical efficiency and lower feed cost to produce one kg gain in Rahmani lambs.

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الملخص العربى

كفاءة استخدام دريس عرش الفول السودانى فى علائق الحملان النامية

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استخدم في هذه الدراسة ٢٨ حولى رحمانى نامى بمتوسط وزن ٢٦,٢٥ ± ٠,٢٥ كجم و عمر حوالى ٦ شهور لإجراء تجربة نمو لمدة ١٢٠ يوم. قسمت الحيوانات إلي أربع مجموعات متساوية بكل مجموعة ٧ حملان وزعت عشوائيا لتغذى علي إحدى العلائق الآتية:-

ع١- دريس البرسيم + شعير بمعدل ١,٥ ٪ من الوزن الحى

ع٢- دريس البرسيم + شعير بمعدل ٢ ٪ من الوزن الحى

ع٣- دريس عرش الفول السودانى+ شعير بمعدل١,٥ ٪ من الوزن الحى

ع٤- دريس عرش الفول السودانى + شعير بمعدل ٢ ٪ من الوزن الحى

غذيت الحملان فى كل المجموعات على الدريس حتى الشبع كمادة مالئة و فى نهاية تجربة النمو أجريت أربعة تجارب هضم باستخدام ١٢ حولى رحمانى بكل مجموعة ٣ حملان و ذلك لتقييم العلائق السابقة باستخدام طريقة AIA كما تم اخذ عينات من سائل الكرش و الدم فى اليوم الأخير من تجارب الهضم. وأوضحت الدراسة النتائج الآتية:-

١-ارتفعت نسبة كل من المادة العضوية و المستخلص الأثيرى و المستخلص الخالى من الآزوت والسليولوز و الطاقة الكلية (GE) NDF, ADF, ADL, بينما انخفضت نسبة كل من البروتين الخام والألياف الخام والهيميسليولوز فى دريس عرش الفول السودانى مقارنة بدريس البرسيم.

٢-ازداد معامل هضم المستخلص الاثيرى معنويا (على مستوى ٥ ٪) بالنسبة للعلائق ع٣، ع٤ المحتوية على دريس عرش الفول السودانى مقارنة بالعلائق المحتوية على دريس البرسيم (ع١، ع٢) كما ازداد معامل هضم كل من المادة العضوية والبروتين الخام والمستخلص الخالي من الآزوت بينما انخفض معامل هضم الألياف الخام معنويا (على مستوى ٥٪) فى العلائق ع ٢، ع٤ عن العلائق ع١، ع٣ أى بزيادة مستوى الشعير فى العلائق.

٣-ازدادت قيمة مجموع المركبات الغذائية المهضومة (TDN) بالنسبة للعليقة ع٤ مقارنة بالعلائق ع١، ع٣ كما ازدادت قيمة الطاقة القابلة للتمثيل(ME) معنويا (على مستوى ٥ ٪) بالنسبة للعليقة ع٤ أيضا عن العليقة ع١ بينما انخفضت قيمة البروتين الخام المهضوم (DCP) معنويا (على مستوى٥ ٪)

بالنسبة للعلائق ع٣، ع٤ عن العليقةع٢ وبصفة عامة تحسنت جميع القيم الغذائية(TDN, ME, DCP) بزيادة مستوى الشعير فى علائق الحملان.

٤-ازداد تركيز الأحماض الدهنية الطيارة الكلية (VFA`s) بالنسبة لكل من العلائق ع٢، ع٤ عن العلائق ع١، ع٣ كما ازداد تركيز نيتروجين الأمونيا (NH_3-N) معنويا (على مستوى ٥ ٪) بالنسبة للعليقة ع٢ عن العليقة ع٣ .

٥-لم يلاحظ أى اختلافات معنوية بين العلائق المختلفة بالنسبة لقياسات الدم وكانت جميع القياسات تقع فى حدود المستوى الطبيعى لدم الأغنام.

٦-ازداد معدل النمو اليومى معنويا (على مستوى ٥ ٪) كما ازدادت وحدات الغذاء المأكول يوميا من كل من المادة الجافة (DM) ومجموع المركبات الغذائية المهضومة (TDN) والطاقة القابلة للتمثيل (ME) والبروتين الخام المهضوم (DCP) بينما انخفضت الكفاءة التحويلية للغذاء بالنسبة للعلائق ع٢ ، ع٤ مقارنة بالعلائق ع١، ع٣.

٧-انخفضت تكلفة الغذاء (جنية / كجم نمو) بنسبة ٣٠,٧ & ٢٥,٤ ٪ بينما ازدادت الكفاءة الاقتصادية بنسبة ٤٤,٣ & ٣٣,٦ ٪ بالنسبة لمجا ميع الحملان المغذاة على العلائق ع٣، ع٤ المحتوية على دريس عرش الفول السودانى مقارنة بالعلائق ع١، ع٢ المحتوية على دريس البرسيم على التوالى.

مـــن نتائج هذه الدراسة يوصى بإستخدام دريس عرش الفول السودانى بـــدلا من دريس البرسيم كمادة مالئة جيدة و مستساغة مع مستويات مختلفة من المادة المركزة فى تغذية الحملان النامية. بالرغم من أن استخدام الشعير بمعدل ٢ ٪ من وزن الحيوان سواء مع دريس عرش الفول السودانى أو دريس البرسيم أعطى معدل نمو مرتفع لكن استخدام الشعير بمعدل ١,٥ ٪ من الوزن الحى مع دريس عرش الفول السودانى أعطى معدل نمو معقول مع ارتفاع كل من الكفاءة التحويلية للغذاء و الكفاءة الاقتصادية كما أدى إلى انخفاض تكلفة الغذاء بالنسبة لكل كيلو جرام نمو فى الحملان الرحمانى.