

PRODUCTIVE PERFORMANCE OF GROWING LAMBS FED ON UNCONVENTIONAL DIETS BASED ON GROUND DATE PALME SEEDS

By

SOLIMAN, A.A.M; A.E., SULIMAN and A.H.A., MORSY

Animal Production Research Institute, Agriculture Research Center,

Dokki, Egypt.

SUMMARY

Twenty eight Frafra lambs of 6- months old and weighing 23.20 ± 1.56 Kg LBW were used. The aim of this study was to investigate the effect of partial substitution of yellow corn grain (YC) in the rations of growing lambs by ground date seeds (DS) at four levels: zero (control), 40, 60 and 100%. Lambs were allotted randomly into four treatment groups (7 lambs each). The feeding trial extended to 110 days, feed intake, digestibility coefficients, nutritive values, nitrogen utilization, daily gain, feed and economical efficiency were determined. Results indicated that apparent digestibility coefficients of CP, EE, CF and NFE of rations containing 40 and 60% DS ($P < 0.01$) increased with increasing DS levels. TDN, DCP, DE and ME of DS rations were higher ($P < 0.05$) compared to control ration. Daily DMI expressed as Kg/h/d or DM/kg $W^{0.75}$ was significantly ($P < 0.05$) higher in lambs fed rations containing different levels of DS compared to given control ration. Lambs received 60% DS recorded higher ($P < 0.01$) average daily gain (ADG) than those received control ration, the realized (ADG) were (178.18, 190.91 and 160) gm/day for 40, 60 and 100% DS, respectively, while lambs of control recorded (161.16)

gm/day. Ruminal pH values, NH₃-N and total VFA'S concentrations showed that, using date seeds in rations of sheep had no significant effect, after 3 or 6 hrs post feeding. No significant differences among the experimental treatments in serum total protein, albumin, globulin, creatinine, urea-N and glucose. Feed efficiency of lambs fed R2, R3 and R4 were markedly better than the control group. Economical efficiency were better with the DS 60% ration than other rations. It could be concluded that, replacing 60% of the yellow corn grain with ground date seeds in concentrate feed mixture resulted in superior nutrition, better daily gain and feed efficiency and economical efficiency, as compared to other groups could be recommended.

Key words: Date seeds, digestibility, complete ration, nutritive value, Sheep.

INTRODUCTION

In Egypt, there is a gape between animal feeding requirements and the available animal feeds. Moreover, yellow corn which is a feed ingredient in most animal rations is mainly imported and high expensive. The amount of date palm tree (*Phoenix dactylifera L.*) grown in Egypt averaged 11209539, which produced 1166182 ton date and 174927.3 ton seeds and increased the supply of agro-industrial by-products for feeding livestock (Ministry of Agriculture 2004). Date seeds (pits) are considered an important source of energy because they have a high content of energy (TDN, 73.19%), Al- Youssef et al., 1994. Such material was usually cheap and poorly utilized by animals because of their high cell wall content, which may be extensively lignified (11%). Some studies (Al-Kinani,1971and Rashid, 1976) have evaluated the feeding value of date seeds for sheep,

and Farhan and Jumah (1969), for steers, evaluate the feeding value of date seeds, and no studies have been reported the assess its replacement value or comparative feeding value in high primarily to its high energy growing, finishing rations for growing lambs.. Abou el-Nasr (1985) indicated that date seeds have an equal nutritive value to barley, but contained a little digestible protein. The main factor limiting the utilization of date seeds are low intake and digestibility. Date seeds had higher TDN value than oil extracted rice bran and contained relatively high percent of fat with a high coefficient of digestibility (El-Shazly *et al.*, 1983). These seeds contain high levels of energy and require processing, which makes it a very desirable by-product feed Blaxter (1967). However in summer season, the available feeds (mainly CFM and straws) cover only 39% and 22% of animal requirements from energy and protein, respectively (El-Serafy, 1991). Its use for small ruminants, especially for meat of goats and lambs, has not been fully explored.

The present study aimed to investigate the effect of substituting 40, 60%, or 100% of yellow corn grain in concentrate feed mixture by ground date seeds in growing Frafra lambs diets.

Materials and Methods: This research was carried out at Fatthalla-Basha fattening farm in Mallawi. A feeding trial for 110 days was carried out on thirty Frafra lambs of 6 months old and weighing 23.20 ± 1.56 Kg LBW. Animals were divided into 4 groups (7 lambs each). The experimental groups allotted randomly into four rations as shown in (Table 1): control

(R1): not containing ground date seeds, while R2, R3 and R4 included 40, 60 and 100% ground date seeds (DS), respectively, instead of Yellow corn grain (YCG). The experimental rations were fed according to NRC (1985). Daily feed allowances were offered in group feeding at 8.00 a.m. and 4.00 p.m. in two equal portions. Feeds refused (if any) were daily collected and recorded. Offered amounts of feed mixtures were biweekly adjusted according to body weight change. Drinking water was freely available at all times. At the end of the feeding trails four digestibility trials were carried out; three animals chosen randomly from each group to be subjected to digestibility and nitrogen balance trial for 14 successive days, where 7 days were a preliminary period and 7 days for faces and urine collection. At the end of each trial, samples of rumen liquor were withdrawn from each animal by a stomach tube at 0, 3 and 6 hrs after feeding. Collected samples of rumen liquor were immediately determined for pH, NH₃ - N, concentration, while VFA'S samples were stored at (-20°C) until determined.

Blood samples were collected from jugular vein from each group (4 animals each) once at the end of the digestibility trial. Blood samples were centrifuged at 4000 rpm for 20 minutes. Serum was separated and stored at (-20°C) till the biochemical analysis. Commercial kits were used for all colorimetric determinations.

Chemical analysis:

Feeds: Proximate chemical analysis of feeds, ingredients, faces and urine were done according to A.O.A.C. (1990), while digestible energy (DE)

and metabolizable energy (ME) MJ/kg DM of the tested rations were calculated according to (MAAF, 1975) equations.

Rumen liquor: Ruminal fluid samples were taken using stomach tube before and post-feeding (0, 3 and 6 hrs) at the end of feeding trials. The samples were filtered through 3 layers of cloth cheese and directed to the determination of pH value (Hanna instruments Hi 3424 micro-computer pH meter) immediately. Ammonia-N concentration was determined according to Conway (1957) method, while, total VFA'S concentration were measured according to Warner (1964).

Blood Serum Metabolites: Serum total proteins (TP) were determined according to Henry 1964, albumin according to Dumas and Blggs 1972, urea according to Patton and Grouch (1977), Creatinine according to Bartels (1971), cholesterol according to Watson (1960) and triglycerides according to Bucolo and David (1973).

Statistical analysis: The data for all traits were statistically analyzed according to Snedecor and Cochran, 1980 in one way analysis of variance design using general linear model (GLM) procedure by computer program of SAS (1995) as the model:

$$X_{ij} = \mu + A_i + e_{ij}$$

Where: X_{ij} = represents observation, μ = overall mean,

A_i = effect of treatments (rations) and e_{ij} = experimental error (common error).

RESULTS AND DISCUSSION

Chemical composition: Data in Table (2) show that, replacement of date seeds in growing lambs diets increased CF, EE content of rations sequence energy content and also, Ash content. This was mainly due to the high CF (2.61 vs. 13.86%), EE (1.33 vs. 2.91%) and Ash (1.62 vs. 4.06%) contents of date seeds and yellow corn grain, respectively. In this respect, the high energy value of date seeds was due to primarily to its high carbohydrate content (67-70%) and it was also higher in cell wall (NDF and ADF (75 & 57%) and cellulose (39-41%) **Salem and Hegazy (1971)**. Since date seeds were relatively in being a high fiber and potentially high energy feedstuffs, result commonly are included in rations for growing lambs. Also, **Al-Youssef et al., 1994**, mention that date seeds had a high content of energy (TDN, 73.19%).

Digestibility Coefficients and Feeding Values: Apparent digestibility coefficients of CP, EE, CF and NFE of rations containing 40 and 60% DS instead of yellow corn ($P<0.01$) increased with increasing DS levels, while OM digestibility coefficients of control ration was lower ($P<0.01$) than other experimental rations. However DM digestibility did not differ significantly among all tested rations (Table3).

Opposite results were reported in lambs by **Awadalla et al., (2002)** who pointed that, addition of DS resulted in linear decreases in apparent digest-

ibility coefficients of all nutrients significantly. **Sabbah *et al.* (1997)** found a decrease in nutrients digestibility of rations fed to lactating cows in which DS substituted YC at 100% level (20% of the concentrate feed mixture). **Sayeda *et al.* (1999)** also found insignificantly lower CP and CF digestibility when the rations of Friesian calves included DS as a substitution of YC at 50% level.

Significant increased were observed in estimated TDN and DCP values of 40 and 60% DS rations compared to the control diet which are mainly attributed to the increase in digestibility of CP and other nutrients since all rations were iso- nitrogenous. Differences in TDN and DCP values between the control ration ($P < 0.01$) and those of the 40, 60 and 100% DS rations were 7.75, 8.43 and 1.46% for TDN and 14.09, 2.59 and 5.86% for DCP, respectively. The observed increase in digestibilities of the most nutrients for all the by-products diet may be attributed to its high EE content (2.91%) compared to with EE content of yellow corn (1.33%). (**Phillips *et al.*, 1995**) concluded that increasing diet fat content encouraged digestibility coefficients of all nutrients especially CP and CF by growing lambs. Also, the observed progress in digestibilities of most nutrients for the DS diets may be due to its slight higher CF content (16.98%) when compared with the control one which contained (13.05%) as explained by **Khattab *et al.*, (1999)**. These results were agreement with finding of **Abou el-Naser and El-Kerdawy (2003)** mention that, feeding the growing lambs on a diet all its components from agro-industrial by-products (35% ground date seeds) increased significantly digestibility coefficients of DM, CP, EE and

EE compared with those fed the commercial diet. While digestibility of CF was significantly ($P<0.01$) decreased.

On the contrary **El-Sayed (1994)** found a decreased in DCP when replaced half of the concentrate mixture in a control ration of sheep by DS. Also, **Sabbah et al. (1997)** mention that substitution of YC in lactating cows diets with DS at 100% level (20% of the concentrate mixture) decreased TDN and DCP values of the diets. In addition, **Sayeda et al. (1999)** found a slight decrease in TDN of Friesian calves due to substitution of YC by DS at 50% level, while they found a significant decrease in DCP when the level of substitution was 100% (20% of the CFM).

Results in Table (3) showed that, TDN, DCP, DE and ME of DS rations were higher ($P<0.05$) values than control ration, the superiority of these records probably due to high nitrogen free extract digestibility (NFED) of these rations more than control ration. Similar results were obtained by **Eid (1998)** and **Abou el-Nasr and El-Kerdawy (2003)**, they reported that, lambs fed agro-industrial wastes (included 35% DS) recorded higher values of TDN or DCP compared with control group.

Feed intake: Data presented in (Table 4) illustrated that, average daily DM intake expressed as kg/h/d or g DM/kg $W^{0.75}$ was significantly ($P<0.05$) higher with lambs fed control ration than those offered other tested rations. Data obtained in (Table 3) illustrated that, lambs fed control ration consumed more than full fat seeds feed as DM, TDN and DCP. In this respect

Daily gain and Feed Efficiency: Performance of the growing lambs is presented in (Table 4). These results indicated that, lambs fed diet containing 40 and 60% date seeds (DS) were heavier ($P<0.01$) by 3.91 and 8.95% over those fed control diet, respectively. On the other hand, lambs fed ration containing 100% DS showed a slightly lower final weights 0.39% relative to those received 0% DS diet (control). Lambs received 60% DS ration recorded higher ($P<0.05$) average daily gain (ADG) than those received 40 and 100% DS rations or control (Table 4). Values were (178.18, 190.91 and 160.00) vs. (161.16) gm/day for 40, 60, 100% DS and control, respectively. In this respect, **Abou El-Nasr (1985)** and **Abd El-Rahman *et al* (2003)** mentioned that lambs fed diets containing olive pulp and ground date palm had higher values of average daily gains than control. On the contrary **Sayeda *et al.*, (1999)** found a slight insignificant decrease in ADG of Friesian calves due to replacing half or all the corn of the concentrate mixture by DS. Also, **Awadalla *et al.* (2002)** found that lambs fed the control ration were heavier ($P<0.05$) by 9 and 11.9% over those fed the rations containing date seeds with 7.5 and 15%, respectively. Same trends were observed for total weight gain, daily gain. In this respect, **Sabbah *et al* (1997)** found no significant differences in the intake of concentrate feed mixture intake of cows due to replacing half of the corn by ground DS. Also, **Sayeda *et al.* (1999)** found no significant differences in the intake of concentrate in Friesian calves due to substitution of corn with DS. Similar findings were also reported with sheep fed 41% DS replacing concentrate mixture (**Mohamed and Salman, 1985**). Concerning feed effi-

ciency as DM and TDN/kg gain, lambs fed ration containing 60% DS markedly performed better than those fed the other rations (Table 4). Feed costs per kg gain, feed efficiency and economical efficiency was better with the R2, R3 and R4 rations than control ration (Table4). In accordance with the present results, **Abou El-Nasr (1985) and Abd El-Rahman et al (2003)** mentioned that feed and economical efficiency were improved by using unconventional by-products in sheep rations. Also, **Sayeda et al., (1999)** reported a slight increase in DM conversion of Friesian calves due to replacing half or all the corn of the concentrate mixture by DS. In the contrary, **Awadalla et al. (2002)** mention that feed conversion of the control lambs followed by those fed on 10 or 20% DS rations, respectively.

Daily water consumption of lambs increased significantly ($P<0.05$) with the increase in DS level in the rations. Moreover, water intake expressed as L/kg W^{0.75} followed similar trend. Also, drinking water (L/kg DMI) increased significantly ($P<0.05$) as the level of DS increased in the rations. In accordance with the present results, **Awadalla et al. (2002)** on sheep.

Ruminal Parameters: Data of rumen parameters are presented in table (5). Ruminal pH values, NH₃-N and total VFA'S concentrations showed that, using date seeds in rations of sheep had no significant effect, after 3 or 6 hrs post feeding. In this respect, **Sabbah et al., (1997)** pointed that, ruminal pH, TVFA'S concentration were not affected by replacing 10% or 20% date seeds instead of yellow corn grain. Moreover, increasing date seeds level in the ration from 10 to 20% did not affect ruminal pH value. The pH

value found to be above six which might indicate that there were no deleterious effect on the digestion of the roughage since rumen pH below six was found to inhibit the activity of cellulolytic bacteria (Hungate, 1966 and Mehrez *et al.*, 1983). Abd el-Rahman *et al.* (2003) mention that, values of NH₃-N concentrations of lambs fed rations containing agro-industrial by-products (35% olive pulp, 35% ground date seeds or 35% radicell) were not significant between treatments at post feeding.

Nitrogen Utilization: Data in table (6) indicated that, no significant differences among the experimental treatments in the daily nitrogen intake of lambs fed different levels of DS. %apparent N utilization (NB/NI X100) was currently lower ($P < 0.05$) for the control ration and the ration containing 100% DS (R4) than for other rations, while rations containing 40 and 60% DS (R2 and R3) were recorded the higher values which can be attributed mainly to higher fecal N. Similar N retention values were recorded for the same two rations (R2 and R3). Therefore, it is suggested that lambs can utilize N of the rations containing 40 and 60 and 100% DS more efficiently by 17.3, 19.6 and 4.5% than control ration, respectively. Protein of rations could be more efficiently utilized either with 60 or 40% DS than 100% DS or control rations. In this respect, Yousef and Fayed, 2001 and Abou el-Nasr and El-Kerdawy (2003) came to the same conclusion with lambs and goats fed the organic wastes feed mixture. On the contrary, Awadalla *et al.*, (2002) found that lambs can utilize N of the control ration more efficiently by 11.9 and 11.2% than N of rations included 10 or 20% DS, respectively.

Table 1: Feed composition of the experimental rations (% DM basis)

Ingredients	Experimental rations			
	CR	40%	60%	100%
	R1	R2	R3	R4
Yellow corn grain	35	21	14	00
Date palm stone	---	14	21	35
Uncorticated cottonseed meal	30	30	30	30
Wheat bran	15	15	15	15
Rice bran	12	12	12	12
Molasses	5	5	5	5
Lime stone	2	2	2	2
Common salt	1	1	1	1
Total ingredients	100	100	100	100

Table (2): Calculated nutrients composition and gross energy (GE*) of the main ingredients and the experimental rations.

Item	DM%	Nutrients% (DM basis)						GE, MJ/kg DM
		OM	CP	CF	EE	NFE	Ash	
Yellow corn	87.09	98.38	8.14	2.61	1.33	84.68	1.62	1.787
Date stone	91.02	95.94	7.82	13.86	2.91	67.29	4.06	1.752
Ration 1	93.57	91.86	16.12	13.05	3.35	59.34	7.43	1.802
Ration 2	89.26	91.64	16.07	14.62	4.04	56.90	8.36	1.815
Ration 3	89.53	91.30	16.05	15.41	4.15	55.69	8.70	1.813
Ration 4	90.09	91.18	16.01	16.98	4.37	53.82	8.82	1.818

*GE, MJ/kg DM = 0.0226 CP + 0.0407 EE + 0.0192 CF + 0.0177 NFE (MAFF, 1975).

*GE: Calculated according to MAFF (1975), using the following equation: GE, MJ/kg DM = 0.0226 CP + 0.0407 EE + 0.0192 CF + 0.0177 NFE

Table 3: Digestion coefficients and nutritive values of the experimental rations, by sheep.

Item	Experimental rations				± SE
	R1 (CR)	R2 (40%)	R3 (60%)	R4 (100%)	
<u>Digestion coefficients (%)</u>					
DM	63.37 ^a	63.59 ^a	64.67 ^a	64.14 ^a	1.96 NS
OM	63.02 ^b	64.55 ^a	65.61 ^a	61.48 ^a	1.89**
CP	55.02 ^b	62.97 ^a	64.51 ^a	58.66 ^c	1.06**
CF	64.52 ^c	67.78 ^b	69.77 ^a	60.28 ^d	1.11**
EE	61.51 ^a	56.50 ^b	57.03 ^b	51.56 ^c	1.04**
NFE	63.77 ^a	66.26 ^a	68.90 ^a	63.54 ^a	1.63**
<u>Nutritive values:</u>					
TDN%	59.76 ^a	64.39 ^a	64.86 ^a	58.89 ^b	2.23*
DE (MJ/kg DM)*	1197.38	1226.45	1246.59	1168.12	
ME (MJ/kg DM)**	981.85	1005.69	1022.20	913.92	
DGP%	8.87 ^c	10.12 ^a	10.35 ^a	9.39 ^b	0.69**

*DE and **ME, calculated according to MAFF (1975) using equations being DE (MJ/kg DM) =

Digestible organic matter (DOM X 19) & ME (MJ/kg DM) = DE X 0.82.

a, b, c and d Means with different superscripts on the same row are different at (P<0.05).

Productive performance of...

Table 4: Performance of growing lambs fed different levels of whole full fat seeds in complete rations.

Item	Experimental rations				± SE
	R1 (CR)	R2 (40%)	R3 (60%)	R4 (100%)	
No. of Animals	6	6	6	6	—
Duration of trail (days)	110	110	110	110	—
Av. Initial weight (kg) Av. Final live wt. Kg	23.20 ^a 40.910 ^d	22.91 ^a 42.51 ^b	23.57 ^a 44.57 ^a	23.15 ^a 40.75 ^c	2.12 NS 2.02 *
Av. Daily Gain (g)	161.20 ^c	178.18 ^b	190.91 ^a	160.00 ^c	2.47 **
Feed consumption:					
Av Daily DM intake (g)	1350 ^b	1400 ^{ab}	1387 ^{ab}	1360 ^{ab}	5.02 **
Av. Daily DM intake, g/kg w ^{0.75} /h/d)	86.48 ^a	84.08 ^b	80.41 ^c	84.31 ^b	2.32 **
TDN (kg)	0.806 ^b	0.901 ^a	0.898 ^a	0.801 ^b	3.11 **
DCP (g)	119 ^c	142 ^a	144 ^a	127 ^b	2.17 **
Water intake, L/h/d	2.821 ^b	3.164 ^{ab}	3.219 ^{ab}	3.778 ^a	0.24 *
Water intake, L/kg w ^{0.75}	0.18 ^b	0.19 ^b	0.19 ^b	0.23 ^a	0.14 *
Water intake L / kg DMI	2.09 ^d	2.26 ^c	2.32 ^b	2.78 ^a	0.23 *
Feed Efficiency:					
Kg DM/Kg gain	8.39 ^a	7.86 ^b	7.30 ^b	8.50 ^a	0.57 *
Kg TDN/Kg gain	5.01 ^a	5.06 ^a	4.71 ^b	5.01 ^a	0.43 *
Kg DCP/Kg gain	0.74 ^a	0.79 ^a	0.75 ^a	0.79 ^a	0.03 NS
Feed cost/kg gain	1.085 ^a	0.967 ^b	0.928 ^b	0.850 ^d	0.14 *
Daily revenue	2.737 ^b	3.029 ^a	3.233 ^a	2.720 ^b	1.18 *
Economic efficiency	1.52 ^c	2.13 ^b	2.48 ^a	2.20 ^b	0.25 *

a, b, c and d means with different superscripts on the same row are different at (P<0.05) and (P<0.01), respectively.

*Based on free market prices of feed ingredients 2006, the cost of experimental rations was estimated as the total prices of ingredients used in the concentrate feed mixture, yellow corn grain, ground date seed and wheat straw, being, 980, 800, 300 and 300 L.E., respectively and the price of one kg body weight on selling, 17.0 L.E.

*Economic efficiency $Y = [(A-B)/B]$, where A = selling cost of obtain gain, and B = feeding cost of this gain.

Table 5: Effect of the experimental rations on some ruminal parameters of lambs

Item	Experimental rations				± SE
	R1 (CR)	R2 (40%)	R3 (60%)	R4 (100%)	
PH					—
0 hr *	6.80 ^a	6.73 ^a	6.72 ^a	6.65 ^a	—
3	5.63 ^b	5.60 ^b	5.65 ^b	5.67 ^b	—
6	6.54 ^a	6.56 ^a	6.60 ^a	6.58 ^a	—
NH3 - N (mg/100)					
0 hr *	16.33 ^a	16.31 ^a	16.40 ^a	1637 ^a	
3	24.8 ^a	25.46 ^a	25.20 ^a	23.27 ^a	
6	25.0 ^b	24.46 ^b	24.80 ^b	24.53 ^b	
Total VFA'S (Meq/100 ml)					
0 hr *	8.53 ^c	8.45 ^c	8.47 ^c	8.08 ^c	
3	10.51 ^b	10.38 ^b	10.19 ^b	9.18 ^b	
6	9.38 ^a	9.561 ^a	9.74 ^a	8.23 ^a	

+ a, b and c Means with different superscripts on the same column are different at (P<0.05).

* after feeding

Clinical Biochemistry: As shown in Table (7), no significant differences among the experimental treatments in serum total protein, albumin, globulin, creatinine, urea-N and glucose. In this respect, *Sabbah et al. (1997)* mention that, all blood serum constituents varied within narrow limits for all dietary treatments. Therefore, no significant differences were observed among animals fed the different levels of date seeds in values of total protein, albumin, globulin, urea, creatinine, and Glucose.

Table (6): Dietary nitrogen utilization of the experimental rations, by sheep (g/h/d).

Item	Experimental rations				± SE
	R1 (CR)	R2 (40%)	R3 (60%)	R4 (100%)	
N-balance					—
N. intake	34.82 ^a	35.99 ^a	35.62 ^a	34.84 ^a	1.32 NS
Fecal N.	13.86	12.84	12.71	12.97	
Urinary N.	11.11	10.93	9.08	11.57	
Retained N.	9.85	11.94	12.05	10.30	
Apparent N utilization ¹	28.29 ^c	33.18 ^a	33.83 ^a	29.56 ^b	1.03 **

^a, ^b and ^c Means with different superscripts on the same row are different at ($P < 0.05$).

¹ (N balance / N intake)

Table 7: Effect of the experimental rations on some blood serum parameters of lambs.

Item	Experimental rations				± SE
	R1 (CR)	R2 (40%)	R3 (60%)	R4 (100%)	
T. Protein (g/dl)	7.61 ^a	7.52 ^a	7.71 ^a	7.45 ^a	1.68 NS
Albumin (g/dl)	3.84 ^a	3.72 ^a	3.75 ^a	3.64 ^a	2.17 NS
Globulin (g/dl)	3.77 ^a	3.80 ^a	3.96 ^a	3.81 ^a	1.05 NS
Creatinine (g/dl)	1.35 ^a	1.13 ^a	1.24 ^a	1.16 ^a	1.06 NS
Urea-N (g/dl)	13.50 ^a	12.96 ^a	13.20 ^a	13.27 ^a	1.07 NS
Glucose (mg/dl)	62.48 ^a	63.06 ^a	63.08 ^a	62.57 ^a	2.04 NS

^a, ^b and ^c Means with different superscripts on the same row are different at ($P < 0.05$).

It could be concluded that, replacing 60% of the yellow corn grain with ground date seeds in concentrate feed mixture resulted in superior nutrition, better daily gain and feed efficiency and economical efficiency, as compared with other groups could be recommended.

REFERENCES

- Abd el-Rahman, G. A.; H.M., Abou el-Nasr; M.S., Ayyat; Afaf M. Fayed and M.S., Nassar (2003):** Utilization of some agro-industrial by-products in fattening lambs on the Natural ranges in the south of valley. *Egyptian J. Nutrition and feeds*. 6 (Special Issue): 851-865.
- Abou-el-Nasr, H.M. (1985):** A study on the possibility of using desert agricultural by-Products in feeding livestock. Ph. D. Thesis, Fac. Of Agric., Cairo Univ., Egypt.
- Abou-el-Nasr, H.M. and D.M.A, El-Kerdawy (2003):** Effects of complete replacement of The common feed mixture by agro-industrial by-products on performance of growing lambs under desert conditions of Egypt. *Egyptian J. Nutrition and Feeds*. Special issue (6): 803-810.
- Al-Kanany, L.M. (1974):** Study of different propor of date stones in the rariion for fattening Awassi lambs. M.Sc. Thesis, University of Baghdad.
- Al-Yousef, Y.M.; F.N., Al-Mulhim; G.A. El-Hag and G.A.Gasim (1994):** Apparent digestibility of discarded dates and date Pits together with other agricultural by-Products. *Annals Agric. Sci., Ain Shams Univ., Cairo*, 39:655.
- A.O.A.C. (1990):** Association of Official Analytical Chemists of Official Methods of Analysis, 15th ed., Washington, D.C.
- Awadalla, I.M.; Y.A. Maareck; M.I. Mohamed and M.S. Farghaly (2002):**Response to Partial replacement of yellow corn in Rahmani lambs rations with ground date Seeds on growth rate, digestion coefficients, rumen fermentation and carcass Traits. *Egypt. J. Nutrition and Feeds*. 5 (2): 139 - 154.
- Bartels, H. (1971):**Colorimetric determination of creatinine. *Clin. Chem. Acta*, 32: 81.
- Blaxter, K.L. (1967):** The energy metabolism of ruminants. London: Hutchinson.
- Bucolo, G. and M. David (1973):** Determination of triglycerides. *Clin. Chim.*, 19: 476.
- Conway, E.J. (1957):** Micro-diffusion analysis and volumetric error. 4th Edition Grosyby

Cockwood and Son Lts. London.

- Doumas, B.T. and H.G. Bligg (1972):** Standard methods of chemical chemistry. Vol. 7 Academic Press, New York.
- Eid, E.Y. (1998):** Effects of organic wastes utilization in ruminant feeding on animal Performance under desert conditions. M. Sc., Thesis, Fac. Agric. Zagazig University.
- El-Serafy, A.M. (1991):** Efficiency of converting Egyptian clover to milk and meat Production in two methods of animal production in A.R.E. during years 1985 and 1990. 3rd Sci. Symp. On Animal, Poultry and Fish Nutrition, Sakha Kafr El-Sheikh, 26 ñ 28 Nov. pp 119 (In Arabic).
- El-Shazly, K. (1983):** Utilization of low quality roughages with special reference to developing countries. Proceeding of a workshop on applied Research. Alex. Egypt. 1-11 March.
- Farhan, S.M. and Jumah, H.F. (1969):** The use of date by-products for fattening calves. Iraqi J. agric. Sci. 4: 71.
- Henry, E.J. (1964):** Colorimetric Determination of Total Protein and Calcium. Clin. Chem. Principles and Techniques. Harper - Row, Newark, P. 182.
- Hungat, E.R. (1966):** The rumen and its microbes (Textbook). Academic Press, New York and London.
- Khattab, H.M.; H.M. El-Sayed; S.A. Abo El-Nor, M.Y. Saad and O.H. Abd El-Shaffy (1999):** Evaluation of Agro-industrial by-products mixture fed to goats. El-Arish 12-21 October. The 7th Scientific conference on animal nutrition (Ruminants, Poultry and Fish).
- MAAF (1975):** Ministry of Agriculture, Fisheries and Food Energy Allowances and Feeding System for Ruminants. Technical Bulletin, 99 London, H.M. 50.
- Mehrez, A.Z.; M.M., El-Shinnawy; M.A., El-Ashry and H. M. E., Ead (1983):** Assessment of The associative effect of roughages and concentrates. Diamond Jubilee of Amr. Soc. Anim. Sci. Pulman, Washington State Univ.
- Ministry of Agriculture (2004):** Ministry of Agriculture and Land Reclamation. Economic Affairs Sector.
- Mohamed, H.H. and A.D. Salman (1985):** Rice Hulls in ruminants feeding. 1-The Effect of feeding rice hulls and date stones on the performance of fattening Awassi lambs. J. Agric. Wastes Recourses 4: 195.
- N. R.C., National Research Council (1985):** Nutrient Requirements of Sheep National and Academy Press, 16th Edition. Washington. D.C.
- Patton, C. J. and S.R. Grouch (1977):** Colorimetric determination of urea. Anal. Chem. 49, 464 - 469.

- Philips, W.A.; G.W., Horn and M.E., Smith (1995):** Effect of protein supplementation on forage intake and nitrogen balance of lambs fed freshly harvested wheat forage. *J. Anim. Sci.*, 73: 2687-2693.
- Rashid (1976):** The effect of physical form and proportions of date stones in the diet on its Digestion and fermentation in the sheep rumen. M. Sc. Thesis, University of Baghdad.
- Salem, S.A. and S.M., Hegazy (1971):** Chemical composition of Egyptian dry dates. *J. Sc. Fd. Ag.*, 22, 632-3.
- Sabbah, M. Allam; M.A. Hanfay; I, A. Gomaa and A. M. Abdou (1997) :**Effect of Ammoniation on date seeds utilization in dairy rations. *Egyptian J. Nutrition and Feeds*, 1 (Special Issue): 201.
- SAS (1995):** SAS User's Guide: Statistical. SAS Inst. Inc., Cary, NC.
- Sayeda, M. Ahmed; Aziza M. Abdou and M.R. Hammed (1999):** Using date seeds in Fattening rations of Friesian calves. *Egypt. J. Nutr.and Feeds*, 2 (Special Issue): 179.
- Snedecor, G.W. and W.G.Cochran (1980) :**Statistical Methods .7th Ed. Allied Pacific, Bombay.
- Warner, A. C. I. (1964):** Production of volatile fatty acids in the rumen methods of Measurements. *Nutr. Abst. And Rev.* 34: 339.
- Watson, D. (1960):** A simple method for determination of serum cholesterol. *Clin. Chem. Acta.* 5: 637.
- Yossef, K.F. and A.M., Fayed, (2001):** Utilization of some organic wastes as feed Supplement for growing goats under desert conditions. *Egyptian J. Nutrition and Feeds* 4 (2): 91-99.

الاداء الإنتاجى للحملان الناحية المغذاة على علائق غير تقليدية تعتمد على نوى التمر المطحون

أحمد على محمد سليمان ، عبد الرحيم إدريس على سليمان ،
أحمد حسين مرسى

معهد بحوث الإنتاج الحيوانى - مركز البحوث الزراعية - الدقى - مصر

أستخدم فى هذه الراسة ٢٨ حمل فرافرة فى عمر ٦ شهور ومتوسط وزن حى ٢٣.٢٠ ± ١.٥٦ كجم الهدف الرئيسى من هذا البحث هو دراسة تأثير الإحلال الجزئى للأذرة الصفراء فى علائق الحملان النامية بمطحون نوى التمر بأربعة مستويات : صفر (كنترول) و ٢٠ و ٦٠ و ١٠٠٪ فسمت الحيوانات إلى أربعة مجموعات تجريبية (٧ حيوانات فى المجموعة) . وزعت المجموعات التجريبية على العلائق المختبرة عشوائياً . إمتدت تجربة التغذية إلى ١١٠ يوم حيث تضمنت تقدير كمية الغذاء المأكول ومعاملات الهضم والقيمة الغذائية وميزان الأوزن ومعدلات النمو والكفاءة الغذائية و الإقتصادية ووظائف الكبد والكلى للحيوانات وكان من النتائج المتحصل عليها من هذه الدراسة :

- زادت معاملات الهضم الضاهرى للبروتين والدهن الخمام والأليام الخام والمركبات الخالية من الأزرت والطاقة الممتلة للعلائق المحتوية على نوى التمر بدرجة معنوية (٥٪) مع الحملان التى غذيت على علائق تحتوى مستويات مختلفة من نوى التمر عن الحملان التى غذيت على عليقة المقارنة . سجلت الحملان التى غذيت على علائق تحتوى على (٦٠٪) نوى تمر مطحون متوسط زيادة وزنية عالية المعنوية (١٪) عن مجموعة المقارنة وكان متوسط النمو المحقق (١٨ ، ١٧٨ & و ٩١ ٪ و ١٩٠ و ١٦٠) جم /يوم للحيوانات التى تحتوى ٤٠ ، ٦٠ ، ١٠٠٪ على التوالي مطحون نوى التمر فى علائقها (١٦) ،

(١٦١) جم / اليوم بالنسبة لحيوانات عليقة الكنترول أوضحت قيم حموضة الكرش وتركيزات الأمونية نيتروجين والأحماض الدهنية الطيارة الكلية للحيوانات التى غذيت على نوى التمر المطحون أنه لم يكن هناك تأثير معنوى - بالنسبة للسيرم : لا توجد فروق معنوية بين المعاملات التجريبية فى محتواها من البروتين الكلى والألبيومين والجلوبيولين والكرياتنين واليوريا والجلوكوز .

كانت الكفاءة الغذائية محسوبة كمادة جافة ومركبات كلية مهضومة /كجم نمو فى حملان العليقة الثانية والثالثة والرابعة أفضل عن الحملان التى غذيت على عليقة الكنترول . كانت الكفاءة الإقتصادية بالنسبة للحملان التى تم إستبدال ٦٠ من الذرة فى علائقها بنوى التمر المطحون عن العلائق الأخرى .

من هذه الدراسة يمكن أن يوصى بإحلال ٦٠٪ من الذرة الصفراء بنوى التمر المطحون فى علائق الحملان النامية حيث تستطيع تحسين القيمة الغذائية والنمو اليومى الكفاءة الغذائية والإقتصادية .