

EFFECT OF USING SOME FODDER PLANTS IN DIETS ON GOATS PERFORMANCE UNDER DESERT CONDITIONS OF SINAI

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SUMMARY

The present study included two parts : the first part was to evaluate three experimental rations consisted of 60% dried hays: clover(*Trifolium alexandrinum*) ; Pearl millet (*Pennisetum typhoides*) or *Kochia indica* plus 40% concentrate mixture where all offered according to energy maintenance requirements . Meanwhile, the second part was conducted to investigate the impact of the experimental rations on goats performance and their offspring. Metabolism trial was carried out before starting mating season using 12 adult Baladi goats, which randomly distributed into three groups (4in each) and groups fed for 30 days then trial lasted 15 days. Just after mating season, a feeding trial was conducted using 30 adult female Baladi goats aged 3-4 years randomly distributed into three groups (10in each) for eight months. Animals in the feeding trial were fed the same experimental rations according to body weight and physiological stage (pregnancy and lactation) at 125, 180 and 200 and 150% of energy and protein maintenance requirements of early, late pregnancy and early and late lactation period, respectively. Milk yield of goats was recorded during the lactation period. Data showed that dry matter (DM) intake from clover hay-ration (R1) exceeded by 24.5% and 42.8% than Pearl millet hay-ration (R2) and *Kochia indica* hay-ration (R3), respectively. The total digestible nutrients (TDN%) recorded the highest value ($p<0.05$) for R1 followed by R2 and R3 in descending order. In respect of digestible crude protein (DCP%), R1 recorded the highest value followed by R3 and R2. At the feeding trial conception rate of goats fed R1, R2 and R3 had similar values (80) while, the twinning rates of does were 1.25 : 1.00 and 1.50 respectively. Average daily gain of kids from birth to weaning recorded the highest value (100g./d.) for those fed R2 followed by R1 and R3. Milk yield of goats fed clover hay-ration (R1) recorded the highest value (735g./h/d) in the first week. Meanwhile, milk yield reached the peak (678g./h/d) at the third week for animals fed Pearl millet hay-ration (R2). On the other hand; goats fed *Kochia indica* hay-ration (R3) showed the peak of milk yield (654gm) in the second week. Liver and kidney functions showed no adverse effect with different dietary treatments for goats health.

It could be concluded that Pearl millet hay is a good quality roughage and it could be used instead of clover hay without any adverse effect on reproductive and productive performance of female goats and their kids in Southern Sinai Governorate. While, further studies are needed to improve the feeding quality of *Kochia indica* hay for better utilization of such fodder for feeding lactating goats.

Keywords: goats, Pearl millet, *Kochia indica*, nutritive value, milk production, liver and kidney function.

INTRODUCTION

Feed resources deficiency is considered one of the basic constraints facing the improve of animals productivity in arid and semi arid regions in Egypt. In southern Sinai as a semi arid region, animals mainly depend on the natural vegetation as a principal feed. The green biomass produced from the rangeland vegetation in this region, may not sustain the nutritional requirements of grazing animals. This is reflected upon their low productivity. To increase feed resources in such region, different approaches have been followed. including processing of less and non palatable summer forages which are naturally growing to improve both their quality and quantity (Khamis, 1988 and EL-Shear *et al.*,1991). Also, cultivation of some salt and drought tolerant shrubs such as *Atriplex spp.* and *Acacia Saligna* was recommended by Draz (1983).Two summer forages namely *Kochia indica* and Pearl millet as salt and drought tolerant plants were introduced in Sinai for their better palatability and feeding values (Fahmy, 2001 and Fahmy & Ibrahim, 2005). Therefore, the main objectives of the present study were to investigate the nutritive values of both *Kochia indica* and Pearl millet cultivated in salt affected lands and their impact on performance of lactating goats and their offspring.

MATERIALS AND METHODS

The present study was carried out at Ras Sudr Research Station, Desert

Research Center, Southern Sinai Governorate, Egypt.

Hays preparation:

Kochia indica and Pearl millet were cultivated at Ras Sudr farm for two seasons. Both plants were harvested and chopped (2-5 cm) to facilitate handling; decrease loss of the plant parts in addition to increase surface of such plants for enzymatic action and microflora then air-dried.

Metabolism trial:

Before starting the mating season, a metabolism trial was conducted using 12 adult Baladi female goats aged 3-4 years to evaluate the experimental rations. The trial was conducted during January-February, 2005. Animals were randomly distributed into 3 groups (4 in each). The initial live body weights were 21.6 ± 0.9 ; 21.3 ± 0.1 and 19.7 ± 0.1 kg for 1st; 2nd and 3rd groups, respectively. Animals fed the hays (clover ; Pearl millet and *Kochia indica*) and the concentrate mixture to cover 60% and 40% of their energy maintenance requirements according to Kearn (1982). The first group (R1) fed clover hay; the second group (R2) fed Pearl millet hay and the third group (R3) fed *Kochia indica* hay (R3). Animals were fed in groups for 30 days, and then fed individually in metabolism cages for 15 days (8 days as adaptation period followed by 7 days as collection period) in shaded pens to avoid water loss during collecting urine and feces. Total feces and urine excretion were recorded daily. Representative samples of feces about 5% of the total fresh feces weight were taken daily and few drops of Sulfuric acid were added to

avoid N-loss. At the end of collection period feces sample of each animal were mixed and ground. Urine was allowed to drain into bottles containing 5 ml of Sulfuric acid and a slight amount of thymol granules was added to prevent N- loss and fermentations. The volume of urine was recorded daily and a sample of urine represents 10% of total urine for each animal. Daily feed offered and refusals were weighed if any to estimate the actual feed intake (the real amount). Water was available free choice during the experiment. Water intake was calculated by sum total of drinking water; feed moisture and metabolic water. Samples of feed offered and refused; feces and urine were taken and stored during the collection period for proximate analysis.

Feeding trial:

After mating season, a feeding trial was carried out using 30 female Baladi goats aged 3-4 years for 8 month. Goats were randomly allocated to three groups (10 each). The initial live body weights were 19.2 ± 0.5 ; 19.9 ± 1.3 and 19.8 ± 2 kg for the 1st; 2nd and 3rd groups, respectively. The three groups were fed the same experimental rations, which used in the metabolism trial. Feeding requirements (maintenance and productive) of goats were calculated according to body weight and physiological states of does (pregnancy or lactation). The feed intake was measured individually during metabolism trial but in the feeding trial, daily feed offered and refusals were weighed for each animal group to estimate the actual feed intake. As result of animal refused bigger amounts of Pearl millet and Kochia hays compared to clover hays the actual proportion

between hays and concentrate was changed. Since both hays and concentrate were placed in separate trough for each animal groups, there is no difficult to determined its amounts. Drinking water was available all the day. Weight of kids was recorded at birth then every week up to weaning age. Milk yield was recorded weekly for all goats after parturition till the end of the first month then biweekly using hand milking. Milk samples taken from 4 animals of each group biweekly during lactation season (12 weeks) for chemical analysis. Kids were separated from their mothers 12 hours before milking to record Daily milk yield in the same day of sampling of milk. Then after, kids suckled the milk. Whereas samples of milk were biweekly taken from 4 animals of each group during lactating period (12 weeks) for chemical analysis. Blood samples were taken from 4 animals in each group during the different physiological stages (early and late pregnancy-early and late lactation).

Chemical analysis:

Proximate analysis of feeds and feces (DM%; CP%; CF%; EE% and Ash%) were conducted according to A.O.A.C.(1990). Nitrogen in urine was determined by micro - Kjeldahl methods of Chibnall *et al.* (1943). Fiber constituents [neutral detergent fiber (NDF), acid detergent fiber (ADF) and acid detergent lignin (ADL)] were determined according to Goering and Van Soest (1970). Hemicellulose and cellulose values were calculated by difference. Milk protein; total solids and ash were determined according to Ling (1963). Fat in milk was determined by using Gerber tube according to British Standard Institution (1951). Lactose was

calculated by difference. Liver functions were tested by determining : aspartate aminotransferase (AST) and alanine aminotransferase (ALT) in serum samples using calorimetric method of Schmidt and Schimdt (1963). Calcium in serum was determined by spectrophotometer (Gindler and King, 1972). Blood urea nitrogen (BUN) level was determined according to Patton and Croch (1977).

Statistical analysis:

Data obtained in this study was statistically analyzed (SAS, 1988) as one-way analysis of variance using the following model $Y_{ij} = U + X_i + E_{ij}$ where U =overall mean ; X_i =type of ration; E_{ij} =error. Duncan multiple range test (Duncan,1955) was used to examine the differences among means wherever possible.

RESULTS AND DISCUSSION

Chemical composition and fiber constituents of feed ingredients and experimental rations:

Ash content of *Kochia indica* hay and Pearl millet hay were 41% and 34.4% higher than those of clover hay (Table 1). While clover hay contained more crude protein than that of *Kochia indica* hay and Pearl millet hay by about 36.9%and 235% respectively. Crude fiber (CF) content of Pearl millet was the lowest (21.3%) followed by those of *Kochia indica* (27.8%) and clover hay (33.2%). Nitrogen free extract (NFE) content of Pearl millet recorded the highest value (56.6%) followed by *Kochia indica* (43.1%) then clover hay

(37.4%). Results of chemical composition of fodder plants are nearly comparable to those recorded by Bhatia and Patnayak (1977); Tag El-Din et al. (1991); Nour (1995); Fahmy and Fayed (2000) and Fahmy (2001) except crude protein. Higher values of crude protein in the present study than obtained by Fahmy and Fayed (2000) may be due to the difference in stage of growth and frequency of cutting.

Ration 4 which contained Pearl millet hay showed the highest contents of NFE (52.1%) and hemicellulose (37.1%) and the lowest contents of crude protein (CP) ;crude fiber (CF) and acid detergent lignin (ADL) compared to rations 1 and 3. On the other side, ration 3 which contained *Kochia indica* hay attained the highest contents of ash, ADL and moderate contents of CP and CF compared to R1 or R2.

Feed intake; nutrient digestibilities and nutritive values of experimental rations:

Dry matter intake from clover hay-ration was 42.5% more than of *Kochia indica* hay-ration (Table 2). The lower intake from *Kochia indica* hay in R3 may be due to its higher ash content compared to clover hay (17.2 vs12.2%).

Crude fiber digestibility of the experimental rations was significantly varied ($p < 0.05$) among animal groups. The lowest value was recorded in R3 .This may be due to the higher ADL content of *Kochia indica* hay compared to clover hay as shown in Table (1). Goats fed clover hay-ration (R1) was able to digest more CP than those fed

Table (1): Chemical composition and fiber constituents of feed ingredients and experimental rations.

Item	Chemical composition (% DM basis)											
	Proximate analysis						Fiber fraction					
	DM	OM	CP	CF	EE	NFE	Ash	NDF	ADF	ADL	Hemi	Cellu.
CH	90	87.8	15.2	33.2	1.98	37.42	12.2	63.1	41.2	7.5	21.9	33.7
PMH	88	83.6	4.53	21.3	1.15	56.62	16.4	60.9	38.25	7.1	22.65	31.15
CH	91	82.8	11.1	27.8	0.82	43.08	17.2	59.5	39.3	10.9	20.2	28.4
CFM	91	85.6	17.0	14.5	6.1	48.00	14.4	63.1	12.3	3.65	50.8	8.65
Ration 1	90.4	86.9	15.9	25.6	3.7	41.7	13.1	63.1	29.5	5.93	33.6	23.5
Ration 2	89.5	84.6	10.1	17.8	4.1	52.6	15.4	62.0	24.9	5.3	37.1	19.6
Ration 3	91.1	84.1	13.9	21.6	3.3	45.2	16.0	61.0	26.7	6.6	34.3	20.1

CH = Clover hay, PMH = Pearl millet hay, CH = *Kochia indica* hay

Ration 1 =60%clover hay +40%CFM

Ration 2 =60%Pearl millet +40%CFM =60%*Kochia indica* hay +40%CFM Ration 3

CFM: Concentrate feed mixture (consisted of 25% cotton seed cake, 30% corn, 35% wheat bran, 3% rice bran, 3% molasses, 1% urea, 2% limestone and 1% common salt.

Table (2): Feed intake, nutrients digestibilities and nutritive values of the experimental rations.

Item	R1	R2	R3	± SE
Live body weight, kg	21.6	21.3	19.7	0.39
Dry matter intake, (g./h/d)				
Hays (H)	392 ^a	315 ^{ab}	274 ^b	19.81
Concentrate (C)	270	266	246	3.26
Total	662	581	520	22.3
Nutrient digestibilities %				
DM	68.3	65.0	64.0	1.15
CP	85.7 ^a	58.0 ^b	71.0 ^{ab}	4.4
CF	65.6 ^a	57.8 ^{ab}	53.0 ^b	2.14
EE	62.5	57.0	61.0	2.18
NFE	67.3	71.0	68.0	1.41
OM	69.4	66.8	65.0	1.08
Nutritive value %				
TDN	62.2 ^a	58.0 ^{ab}	56.0 ^b	1.15
DCP	12.70 ^a	6.03 ^c	9.48 ^b	.93

Means having superscripts within the same row are significantly differed ($p < 0.05$).

Pearl millet hay-ration (R2). This may be due to that R1 contained more CP (15.2%) than that R2 (4.53%). The high crude protein content may had a positive effect on crude protein digestibilities. These results are similar to those obtained by Abd El -Rahman (2003). In contrast, no significant differences were detected among animal groups in other nutrients digestibilities. Nutritive values of rations as total digestible nutrients (TDN %), recorded the highest value for R1 followed by R2 and R3. Also, the control ration (R1) showed the highest DCP content. This may be due to its higher CP content as well as higher CP digestibility when compared with the other rations. In the present study, the nutritive values as TDN% and DCP% of *Kochia indica* ration (60%roughage +40% concentrate) were 56%and 9.48% respectively. Tag EL-Din *et al.* (1991) studied the utilization of *Kochia indica* in complete rations (45% roughage : 55% concentrate) instead of clover hay throughout metabolism trial using adult Rahmany rams and found that TDN and DCP values were 65.3% and 13.1% versus 67.3% and 12.7% for clover hay ration or *Kochia indica* ration respectively.

Nitrogen and water retention:

Nitrogen intake; excretion and retention were significantly ($p<0.05$) differed due to different rations (Table 3). Goats fed clover hay-ration accomplished the highest nitrogen intake (16.4 g./h/d) resulting to the higher dry matter intake as well as its higher crude protein content (15.2%). In contrast, the lowest nitrogen intake (9.51g./h/d) was recorded for animals fed Pearl millet hay-ration. Total

nitrogen excretion followed the same trend of nitrogen intake and recorded the highest value for animals consumed clover hay-ration ,but animals fed R2 or R3 excreted similar nitrogen values in both feces and urine (total nitrogen excretion). The obtained results are in harmony with the findings of Tag El-Din *et al.* (1991) and Fahmy & Ibrahim (2005). Total water intake (drinking water + feed moisture + metabolic water) ; water excreted in both feces and urine and water retention were significantly ($p<0.05$) affected by type of ration. Animals consumed clover hay ration showed the highest amount of total water intake as it exceeded by about 23.7 and 17.1 % than those fed Pearl millet hay and *Kochia indica* hay rations. Water excretion in both feces and urine followed the previous trend. Insensible water loss recorded the highest value for goats fed control ration (R1) but the lowest value was attained for those fed *kochia indica* ration (R3). Animals retained water in their bodies in order to utilize for getting rid thermal stress through respiration and sweat. Therefore, animals fed R1or R2 retained more water ($p<0.05$) than those fed R3, they were more adapted for thermoregulation in the desert.

Reproductive and productive performance of goats:

Goats in each group recorded 80% conception rate (Table 4). The average twinning rate was 1.25; 1.00 and 1.50 for animals fed R1,R2 and R3, respectively.

Milk yield:

It was reached the peak (735g./h/d) at the first week by goats fed clover

Table (3): Nitrogen and water retention by goats fed the experimental rations.

Item	R1	R2	R3	± SE
Nitrogen intake, (g./h/d)	16.4 ^a	9.51 ^c	12.7 ^b	0.96
Total nitrogen excretion, (g./h/d)	14.73 ^a	9.75 ^b	9.72 ^b	0.84
Nitrogen retention, (g./h/d)	1.67 ^b	-0.24 ^c	2.98 ^a	0.44
Total water intake, (ml/h/d)	1818 ^a	1469 ^b	1552 ^{ab}	63.2
Total water excretion, (ml/h/d)	1025 ^a	714 ^b	881 ^{ab}	54.9
Water retention, (ml/h/d)	793 ^a	755 ^a	671 ^b	20.04

a,b Means having different superscripts within the same row are significantly differed (P<0.05).

Table (4): Reproductive and productive performance of goats as affected by type of rations.

Item	R1	R2	R3	± SE
A- Reproductive				
Does joined	10	10	10	
Does conceived	.8	8	8	
Conception rate	80	80	80	
Twining rate	1.25	1.00	1.50	
B- Productive				
- Total milk yield, (g./h/d)	470	478	490	6.3
-Milk composition%				
Total solid%	11.76	11.60	11.20	0.43
Fat%	3.86 ^b	4.22 ^a	3.74 ^b	0.09
Solid not fat%	7.87	8.38	7.46	0.37
Protein%	2.13	2.13	3.12	0.24
Ash%	0.74 ^b	0.79 ^{ab}	0.93 ^a	0.04
Lactose% (calculated)	4.03 ^a	4.35 ^a	3.42 ^b	0.16
-Kids				
Birth weight, kg	2.378 ^a	2.692 ^a	1.565 ^b	0.172
Weaning weight, kg	10.3 ^b	12.5 ^a	6.732 ^c	0.7
Average daily gain, g.	80.9 ^b	100 ^a	52.7 ^c	5.74

a,b,c Means having different superscripts within the same row are significantly differed (P<0.05).

hay-ration (R1), then it declined gradually till the end of lactation period (Fig 1). Similar findings were observed by Younan *et al.* (2005) for lactating goats fed agro-industrial by products with clover hay *ad lib*. While goats fed R2 and R3 reached the peak at the third week (678g./h/d) and the second week (654 g./h/d), respectively. It was noticed that the peak of lactation curves ranged between the first and the third week of lactation period. These results were agreed with those obtained by El Beddawy (1985); Ismail (1998); Kholif (2001) and Abdou (2003). No significant differences in milk yield were found among the three groups through out the whole lactation period.

Milk composition:

Goats fed Pearl millet hay (R2) showed the highest values of all milk components % except ash% (Table 4). In contrast the lowest values of all milk components % were attained for goats fed *Kochia indica* in R3 except ash%. Ahmed *et al.* (2001) reported that milk components were not significantly affected by increasing the level of *Kochia* in the ration. At the whole lactation period fat% and lactose% were significantly ($p<0.05$) higher for goats fed R2 than those fed R1 and R3. The depression in lactose percentage of milk for goats fed *Kochia indica* hay ration (R3) as result of the higher ash content compared to the other rations.

Birth and weaning weight of kids:

Data cleared that birth, weaning weights and average daily gain of kids were significantly ($p<0.05$) affected by type of ration (Table 4). Kids in the second group significantly surpassed the control ration in birth, weaning weights

and average daily gain by 13.2%; 21.3 and 23.6% respectively. This may be mainly due to that twinning rate in this group was single. On the other hand, goats fed *Kochia indica* ration attained the lowest birth weight, weaning weight and average daily gain of their kids. This decline in weight and gain of kids may be attributed to rejection of kids for some does milk due to its higher ash content in addition to lower feed consumption of their does from *Kochia indica* ration and their higher twinning rate(1.50).

Some blood metabolites concentration of goats during pregnancy and lactation periods:

Blood urea nitrogen (BUN) not affected ($p>0.05$) by type of ration under all different physiological stages (pregnancy and lactation). It ranged from 45 mg/100ml to 60.3 mg/100ml (Table 5). These values were within the normal range as reported by (Younan *et al.*, 2005). Serum calcium levels were not significantly differed among animal groups during early pregnancy; early lactation and late lactation. These values were within the normal level in all physiological stages. Serum calcium concentrations of goats fed *Kochia indica* ration (R3) showed the lowest values in all physiological stages. This may be due to the presence of oxalate in *Kochia* which decrease calcium availability. The obtained data were in agreement with those reported by Ahmed *et al.* (2001).

Serum aspartate aminotransferase (AST) concentration was differed ($p<0.05$) among animal groups during late pregnancy; early lactation and late lactation. On the other hand, serum alanine aminotransferase (ALT)

Table (5): Some blood metabolites concentration for goats fed the experimental rations during pregnancy and lactation periods.

Item	R1	R2	R3	± SE
Early pregnancy				
Urea, mg/dl	54.3	51.7	60.3	1.71
Ca, mg/dl	13	16	12	0.88
AST, u/l	15	14	18.2	0.83
ALT, u/l	13.3	12.7	10.5	0.9
Late pregnancy				
Urea, mg/dl	51.6	40	56.7	3.35
Ca, mg/dl	16.7 ^b	20 ^a	10 ^c	1.53
AST, u/l	8.5 ^b	8.16 ^b	12.0 ^a	0.64
ALT, u/l	12.3 ^a	6.67 ^b	8.17 ^b	0.98
Early lactation				
Urea, mg/dl	47.3	49.7	52.7	1.32
Ca, mg/dl	10.3	13.7	8.33	1.19
AST, u/l	18 ^a	14.3 ^b	16.5 ^b	3.83
ALT, u/l	19 ^a	10 ^b	21.7 ^a	1.87
Late lactation				
Urea, mg/dl	54	50.7	45	2.56
Ca, mg/dl	12.3	15	10.3	0.88
AST, u/l	9 ^c	14.6 ^b	16.7 ^a	1.18
ALT, u/l	17.3	17.5	13.8	0.87

a,b,c Means having different superscripts within the same row are significantly differed ($p < 0.05$).

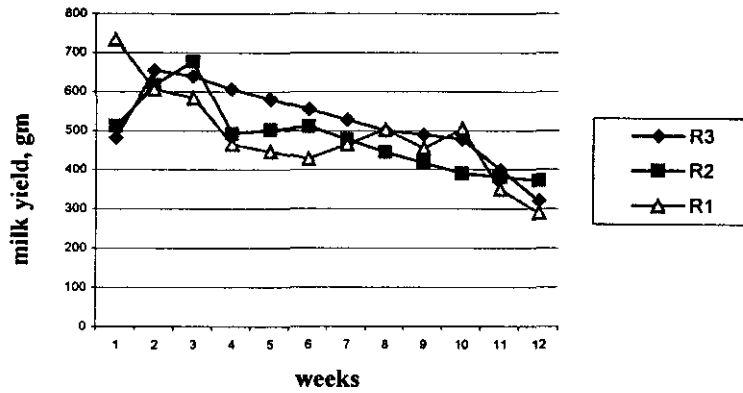


Fig (1): Effect of treatments on milk yield during lactation period

concentration was significantly ($p < 0.05$) varied during late pregnancy and early lactation. Both AST and ALT values were within the normal range. There was no significant effect for feeding the three experimental rations on liver function. The obtained results were in harmony with the finding of Abdou (2003).

It could be concluded that Pearl millet hay is good quality roughage and it could be used instead of clover hay without any adverse effect on reproductive and productive performance of female goats and their kids in Southern Sinai Governorate. While, further studies are needed to improve the feeding quality of *Kochia indica* hay for better utilization of such fodder for feeding lactating goats.

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تأثير استخدام بعض النباتات العلفية في العلائق على أداء الماعز تحت الظروف الصحراوية في سيناء

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اشتملت هذه الدراسة علي جزئين : تضمن الجزء الأول التقييم الغذائي للعلائق المختبرة المكونة من ٦٠% مواد علف خشنة جافة (دريس برسيم، دريس دخن، دريس كوخيا) و ٤٠% مخلوط علف مركز على أساس الاحتياجات الحافظة من الطاقة، أما الجزء الثاني فتضمن دراسة تأثير هذه العلائق على الأداء الإنتاجي لأمهات الماعز البلدي ومولدها.

أجريت تجربة الهضم على ١٢ أنثى ماعز بلدى ناضجة قبل موسم التلقيح حيث وزعت الإناث عشوائيا في ٣ مجاميع (٤ حيوان / مجموعة) لمدة ٤٥ يوم. بعد موسم التلقيح أجريت تجربة التغذية على ٣٠ أنثى ماعز بلدى لمدة ٨ شهور حيث وزعت الإناث في ثلاث مجاميع (١٠ أنثى / مجموعة) وقدم لها نفس العلائق المذكورة في تجربة الهضم وقد حسبت كميات العلائق على أساس وزن الجسم والحالة الفسيولوجية للحيوان ، بحيث أعطيت الأمهات ١٢٥، ١٨٠، ٢٠٠، ١٥٠ % من احتياجاتها الحافظة من الطاقة والبروتين في فترات الحمل المبكر والمتأخر ومرحلة الحليب المبكرة و المتأخرة على التوالي ، وسجل إنتاج اللبن خلال فترة الحليب للمجاميع الثلاث ، وكانت أهم النتائج المتحصل عليها ما يلي :

* ارتفاع المادة الجافة المأكولة من دريس البرسيم في العليقة الأساسية ب ٢٤,٥ % ، ٤٢,٨ % عن عليقة دريس الدخن وعليقة دريس الكوخيا على التوالي

* سجلت العليقة الأولى القيمة الأعلى من حيث محتواها من المركبات المهضومة الكلية وبفارق معنوي تليها العليقة الثانية والثالثة في ترتيب تنازلي. فيما يخص البروتين الخام المهضوم سجلت العليقة الأولى أعلى قيمة و بفارق معنوي تلتها العليقة الثانية والثالثة على التوالي

* لم يتأثر معدل الحمل للإناث في المجاميع الثلاث بنوع العليقة بل أخذ نفس القيم (٨٠) بينما اختلفت قيم معدلات التوام وأعطت ١,٢٥ ، ١ ، ١,٥٠ لكل من المجموعة الأولى و الثانية و الثالثة على التوالي.

* سجلت مولدات المجموعة الثانية (المغذاة على عليقة دريس الدخن) أعلى زيادة يومية وصلت إلى ١٠٠ جرام تلتها المجموعة الأولى ثم الثالثة.

* وصل متوسط إنتاج اللبن إلى أعلى قيمة (٧٣٥ جرام/رأس / يوميا) في الأسبوع الأول للمجموعة الأولى المغذاة على عليقة دريس البرسيم بينما وصل أعلى قيمة (٦٧٨ جرام/رأس / يوميا) في الأسبوع الثالث للمجموعة الثانية (المغذاة على عليقة دريس الدخن) في حين سجلت المجموعة المغذاة على عليقة دريس الكوخيا أعلى إنتاج (٦٥٤ جرام /رأس/ يوميا) خلال الأسبوع الثاني من الحليب.

و بناء على ذلك يمكن التوصية بامكانية استخدام الدخن اللؤلؤى كمادة علف خشنة جيدة النوعية كبديل لدريس البرسيم المصرى في تغذية إناث الماعز بدون أى تأثير سلبي على استجاباتها التناسلية و الانتاجية في محافظة جنوب سيناء. كما يوصى بعمل مزيد من الدراسات على دريس الكوخيا انديكا لتحسين الاستفادة منه في تغذية الماعز الحلابة.