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EFFECT OF DIETARY ENERGY LEVELS ON PRODUCTIVE AND REPRODUCTIVE PERFORMANCE OF BUFFALO COWS.

H. El-Matarawy[1] and M. A. Sarhan[2]

1- *Animal Production Research Institute, Agricultural Research Center, Ministry of Agriculture, Egypt.*
2- *Department of Animal Production, Institute of Efficient Productivity, Zagazig University, Egypt.*

ABSTRACT:

The present study was designed to investigate the effect of three energy levels on the performance of Egyptian buffaloes. Eighteen pregnant buffalo cows six years old in the 3rd season of lactation and weighing on the average 561.06 ± 20.96 kg (at the last three months of pregnancy) were divided randomly into three similar groups. The experimental rations were isonitrogenous with three levels of energy (100, 80 and 120% TDN). The first group served as control and animals were fed ration (R1) containing CFM 45.22%, yellow corn 27.82% and berseem hay 26.96%. The second group was fed ration (R2) containing CFM 45.73%, yellow corn 25.12% and berseem hay. The third group was fed ration (R3) containing CFM 41.84%, yellow corn 31.59% and berseem hay 26.57%. Digestibility trial was conducted at the end of the experiment using three animals from each group.

The results showed that:

Buffaloes fed 80% dietary energy level recorded lower digestibility values of DM, OM, CP, CF, EE and NFE than those fed 100 and 120 % levels. The nutritive values as TDN or DCP for all groups were quite similar. Animal fed 120 % dietary energy level recorded heavier calf birth weight than those fed 100 and 80 % energy levels with no significant differences. Animals fed 120 % energy level recorded lower (P < 0.01) time lapsed to placenta expulsion (h), interval from calving to uterine horns symmetry and cervical closure (days), as well as number of cervices per conception than those fed 100 and 80 % energy levels. Interval from calving to complete uterine involution, to the first estrus and calving intervals (days) for animals fed 120 % energy level were significantly (P < 0.01) shorter than that fed 80 and 100% energy levels. Buffaloes fed 120 % energy level conceived 26.2 and 62.17 days earlier than those fed 80 % and 100% energy level, respectively. The differences in days open were significant (P < 0.01). Milk yield and fat, protein, lactose, total solids, solid not fat and ash as a percent for buffaloes fed 120 % energy level were significantly higher (P < 0.01) than those fed100 and 80% dietary energy levels. The animals received 120 % dietary energy level recorded highest (P < 0.01) progesterone (ng/ml) and 17-estradiol (pg/ml) than those fed 100 and 80% energy levels. Progesterone concentration increased slightly up to 15 days postpartum and

decreased at 20 days then it increased up to 35 days postpartum. However, 17-estradiol concentration (pg/ml) behaved in an opposite trend,

Key words: Buffaloes, reproductive, digestibility, progesterone 17-estradiol, energy.

INTROPDUCTION

Buffaloes are the most important farm animals in Egypt. They contribute about 65 % of total milk yield in Egypt. (Marghany *et al*., 2001). Average total milk yield ranged between 1404 and 1836 kg per head in lactating season (302 days) with average fat content was about 7 % and the production life of the lactating buffaloes was estimated to be 5 lactation seasons (Nigm, 1996).

Many factors have been shown to affect fertility in pre and post-partum of dairy buffaloes and dairy cattle, including delayed onset of ovarian cyclicity, bacterial complications of uterine involution, circulating progesterone level in already cyclic cows and quality of oocytes. Energy balance appears to be the most important factor, but the complex interactions of all these factors must be considered and controlled in order to improve the understanding and to develop new strategies to enhance fertility of dairy buffaloes and cows (Huszenicza *et al*., 2004).

Nutrition is the major factor affecting the physiological and metabolic status of animals. Many experiments had been carried out to study the effect of energy and protein levels on milk yield and composition. There is general agreement that an increase in energy intake of dairy cows within certain limits, increase milk yield, solids not fat (SNF) and to a lesser extent lactose and decrease milk fat (Gordon and Forbes, 1970). Birth weight of calves is significantly increased when their dams are maintained on high level of feeding during late pregnancy (Bellows and Short, 1987 and Bayoumi, 1995). Increasing energy and protein levels in the diet to 115% improved the body condition and increased body fat within the range considered optimal for this breed. No adverse effect on the reproductive parameters were observed, except for age at first calving which had a favourable effect on the dairy performance over the first 100 days of lactation (Bilik *et al*., 2004).

Calf birth weight, placenta weight and fetus liquid weight increased with increasing feeding level from 100 to 120% dietary energy levels (Kirrella, 1984; Houghton *et al*., 1990 and Bayoumi , 1995). Shorter days open for buffaloes fed 120 % energy level of Ghoneim allowances (1967) during prepartum period than those fed 100 % energy level. Milk yield increased with increasing energy level (Sharma *et al*., 1993; Aaes *et al*., 1994; Bayoumi, 1995; Mcdonald *et al*., 1995 and Ekinci and Broderick, 1997 and El-Ashry *et al*., 2003). The present study was designed to investigate the effect of energy levels on the reproductive performance and digestibility of nutrients Egyptian buffaloes.

MATERIAL AND METHODS

This study was conducted at El-Gemiza Experimental Station belonging to Animal Production Research Institute, Agriculture Research Center, Ministry of Agriculture, Egypt, during the period from April 2002 up to June 2003.

Eighteen pregnant buffaloes six years old in the 3rd season of lactation and weighing on the average 561.06 ± 20.96 kg (at the last three months of pregnancy) were divided randomly into three similar groups (six animal each). The experimental animals were kept under semi-open shaded pens. The experimental rations were isonitrogenous with three levels of energy (100, 80 and 120% TDN according to Kearl, 1982). The experimental rations consisted of concentrate feed mixture (CFM) and yellow corn (as concentrate source) and berseem hay and rice straw (as roughage source). Concentrate: roughage ratio was about 1: 1. The first group served as control and animals were fed ration (R1) containing CFM 5.20 kg (45.22%), yellow corn3.2 kg (27.82%) and berseem hay 3.10 kg (26.96%). The second group was fed ration (R2) containing CFM 4.55 kg (45.73%), yellow corn 2.50 kg (25.12%) and berseem hay 2.90 kg (29.15 %). The third group was fed ration (R3) containing CFM 5.59 kg (41.84%), yellow corn 4.22 kg (31.59%) and berseem hay3.55 kg (26.57%). Ingredients, chemical composition of the experimental rations and chemical composition of the feedstuffs are shown in Tables 1 and 2. The experimental rations were formulated to cover maintenance and production allowance according to Kreal (1982). The rations were offered twice daily at 7.0 a.m. and 4.0 p.m. In addition water was offered three times daily during summer season and twice during winter season. Animals were weighted at the beginning of the experiment to the nearest kg, while weight of dams and newborn calves were recorded immediately after calving. Uterine and ovarian palpation per rectum to determine the uterine involution was performed weekly from the first week after parturition until mating. The first observed estrus and number of services per conception were recorded for each buffalo. Number of days open was calculated for buffaloes that were actually diagnosed pregnant. Buffaloes were hand milked twice daily at 7.0 a.m. and 4.0 p.m. and daily milk yield of each animal was recorded from 50 days postpartum up to 150 days postpartum period. Representative samples of milk (morning and evening samples) were mixed by ratio of 1% weight of milk yield and analyzed biweekly for fat, lactose, protein, total solids and ash with using Milkoscan apparatus.

Digestibility trial was conducted at the end of the experiment by using three animals in each experimental group. A grab sample method was applied using acid insoluble ash (AIA) technique as internal marker according to Van Keulen and Young (1977). Fecal grab samples were collected for four successive days from each animal. Chemical composition of the different ingredients, experimental rations and feces samples were analyzed according to A. O.A. C. (1995) procedures.

Table 1. Chemical composition of experimental rations with different levels of energy by buffalo cows.

Items	Rations 1	Rations 2	Rations 3
DM	87.89	86.25	88.65
OM	89.12	87.25	90.56
CP	12.55	12.49	12.64
CF	18.87	20.17	16.71
EE	2.11	1.86	2.31
NFE	55.59	51.73	58.9
ASH	13.75	13.75	9.44

- The ingredients of concentrate feed mixture (CFM) were undecorticeted cotton seed meal 36%, yellow 25%, rice bran 5% wheat bran 28 %, limestone 2%, salt 1% and molasses 3%.

Table 2. Chemical composition of feedstuffs as DM basis used in the experimental rations for buffalo cows.

Feedstuffs	Nutrient %as DM						
	DM	OM	CP	CF	EE	NFE	Ash
CFM	87.27	94.62	17.56	9.17	1.19	66.70	5.35
Yellow corn	89.17	98.44	9.05	2.39	2.88	84.12	1.57
Berseem hay	92.96	87.44	13.93	27.32	0.48	45.71	12.56

Blood samples were collected at five days interval after parturition until 35 days postpartum, via the jugular vein of buffaloes into glass tube and serum was separated by centrifugation at 3000 r.p.m for 10 minutes, then cooled and kept frozen at –20 ^{o}C until being assayed for concentration of serum progesterone and 17-estradiol. Direct radioimmiunoassy technique was performed for progesterone and 17-estradiol of representative samples. Kits of Diagnostic Products Corporation Los Angles U.S.A. with ready antibody coated tubes were used according to the procedure outlined by the manufacture.

Statistical analysis:

Data were statistically examined by analysis of variance (ANOVA) according to Snedecor and Cochran (1982) using SPSS system (1998). Conception rate was analysed by using χ^2 test. The differences among means were tested by using Duncan's New Multiple Range test, Duncan (1955).

RESULTS AND DISCUSSION

1. Nutrient digestibility:

Data in Table (3) clearly show that buffaloes fed 80% dietary energy levels recorded lower digestibility values of DM, OM, CP, CF, EE and NFE than those fed 100 and 120 % levels. The differences were significant ($P < 0.05$ or $P < 0.01$) for OM, EE and NFE digestibility and were not significant for DM, CP and CF digestibility. Also, data clearly indicate that animals fed 120 % dietary energy levels recorded higher digestibility values of DM, CP and NFE than those fed 100% levels. However, the nutritive values as TDN or DCP for all groups were similar and the differences were not significant. These results are in agreement with those reported by El-Ashry *et al*. (2003) who found that the animals fed 120 % dietary energy level recorded higher digestibility values of DM, OM, CP, CF, EE and NFE than those fed 100% level. Also, Kumar *et al*. (1981) and Etman (1985) reported that the increase of dietary energy levels improved the digestibility of all nutrients except CF digestibility with male buffaloes calves. While Hossain *et al*. (2003b) found that, OM and CF digestibility ($P < 0.05$) increased with increasing dietary energy levels for goats, but DM, CP, NFE and EE was similar for all dietary energy levels. Moreover, Hossain *et al*. (2003a) with sheep, reported that DM, OM, CF digestibility increased ($P < 0.05$) with increasing dietary energy level. However, CP, NFE and EE was similar for all dietary energy levels. In this respect, El-Banna (1995) reported that increasing levels of dietary energy increased the digestibility of DM, OM and CP while decreased CF digestibility for sheep, goats and camel.

2. Reproductive parameters:

Data in Table (4) clearly indicate that animal fed 120 % dietary energy level recorded higher average of birth weight of newly born calves than those claved to animals fed 100 and 80 % dietary energy levels with no significant differences.

The obtained results also, indicate that animals fed 120 % dietary energy level recorded lower ($P < 0.01$) time /lapsed to placenta expulsion (h) than those fed 100 and 80 % dietary energy levels. The interval from calving to uterine horns symmetry in animals fed 120 % dietary energy level was lower ($P < 0.01$) than those fed 100 and 80 % dietary energy levels. The interval from calving to complete uterine involution in animals fed 120 % dietary energy level was 15.67 days was being significantly ($P < 0.01$) shorter than that fed 80 and 100% dietary energy levels. Moreover, the uterine involution in animals fed 80 % dietary energy level showed longer days ($P < 0.01$) than those fed 100 % dietary energy level (control). Time to the cervical closure (days) was shorter ($P < 0.01$) for buffaloes fed 120 % dietary energy level than those fed 100 and 80 % dietary energy levels. Buffaloes fed 120 % dietary energy level also showed significantly shorter ($P < 0.01$) interval from calving up to the first estrus compared to the other groups fed 100 % and 80 % dietary energy levels.

Table 3. Nutrient digestibilities and nutritive values of the experimental rations fed by buffalo cows.

Traits	Energy levels			Sig.
	100%	80%	120	
Animal weight kg	563.33±42.03	562.0±36.21	557.83±37.42	NS
Animal weight $W^{0.75}$	115.33±6.49	115.19±5.65	114.61±5.88	NS
Digestion coefficient (%)				
DM	65.83±2.80	59.38±2.88	66.89±0.89	NS
OM	73.50±2.23 [a]	63.35±1.36[b]	68.95±1.20 [ab]	**
CP	71.23±2.15	66.23±1.31	71.98±1.91	NS
CF	56.02±2.65	57.61±1.94	53.90±1.71	NS
EE	73.15±1.52 [a]	66.06±2.14 [b]	72.65±1.50 [a]	*
NFE	69.69±1.16 [a]	60.48±0.83 [b]	70.49±0.47 [a]	**
Nutritive values %:				
TDN	59.84±2.89	55.69±1.58	59.24±1.66	NS
DCP	8.87±0.29	8.31±0.16	8.99±2.24	NS
Nutritive values as:				
TDN/head /kg/day	0.11±0.005	0.10±0.003	0.11±0.003	NS
TDN/head /($W^{0.75}$)kg /day	0.52±0.03	0.48±0.01	0.52±0.01	NS
DCP / head /kg/day	0.015±0.0005	0.015±0.0003	0.016±0.0004	NS
DCP/head ($W^{0.75}$)kg /day	0.08±0.003	0.07±0.001	0.08±0.003	NS

Means in the same row with different letter differ significantly (P < 0.05).
* = P < 0. 05 , ** = P < 0.01 and N.S. = Not significant.

The present results showed that buffaloes fed 120 % dietary energy level conceived 26.2and 62.17 days fed 100% and fed 80 % dietary energy level, respectively. The differences in this respect were significant (P < 0.01). Also, the present data show that the number of services per conception for animals fed 120 % dietary energy level (1.17) was insignificantly lower than the control group (1.5.) and those fed 80 % dietary energy level (2.00).) Conception rate of buffaloes fed on 100, 80 and 120 % energy levels was 50%, 0.0 % and 100% within the last 60days after calving. The remainder 50% of the buffalo cows of the first group conceived from 60 to 90 days after calving versus 33% in the second group. The remaining 67% of buffalo cows fed 80% energy level conceived after 90 days (from 90 to 120 days). Gestation length and calving intervals (days) were significantly (P < 0.01) shorter for buffaloes fed 120 % dietary energy level than those fed 100 and 80 % dietary energy levels. These results are in agreement with those obtained by Hung *et al*. (1993), Youssef *et al*. (1998), El-Gaafarawy *et al*. (2003) and El-Ashry *et al*. (2003) who found that birth weight of calves didn't reflected by the level of nutrition, but rather maternal body weight during pregnancy. Khan *et al*. (2004) found that birth weight of calves in the low-energy group was lower (P<0.05) than that of calves in the high-energy group. Cows that were

Table 4: Effect of dietary energy levels on reproductive performance of buffalo cows, under Egyptian conditions.

Traits	Energy levels			Sig.
	100%	80%	120	
Number of animals	6	6	6	
Body weight of buffaloes (kg)	563.33±42.03	562.0±36.21	557.83±37.42	NS
Body weight of buffaloes ($W^{0.75}$)	115.33±6.49	115.19±5.65	114.61±5.88	NS
Calf weight at birth (kg)	36.00±0.73	36.67±1.84	36.83±1.40	NS
Time/lapsed to placenta expulsion (h)	7.50±0.50[a]	7.83±1.56[a]	4.08±0.51[b]	**
Uterine horns symmetry (days)	31.33±1.33[b]	37.67±1.09[a]	21.83±1.33[c]	**
Uterine involution (days)	22.83±0.54[b]	28.00±0.26[a]	15.67±0.33[c]	**
Cervical closure (days)	28.83±0.31[b]	35.50±0.43[a]	24.67±1.91[c]	**
First postpartum estrus (days)	42.83±0.91[b]	66.33±1.71[a]	36.00±0.26[c]	**
Service periods (days)	21.33±0.33	35.17±0.55	22.00±0.05	NS
Number of services per conception	1.50±0.22	2.00±0.37	1.17±0.17	NS
Days open (days)	55.50±4.48[b]	101.50±5.10[a]	39.33±3.34[c]	**
Gestation length (days)	316.50±0.67[a]	316.33±0.42[a]	313.50±0.96[b]	**
Calving interval (days)	370.00±4.95[a]	417.83±5.19[a]	356.17±3.88[b]	**

Means in the same row with different letter differ significantly ($P < 0.05$).
** = $P < 0.01$ and N.S. = Not significant.

on low pre-calving dietary energy level produced less milk during lactation than the cows in the high energy precalving group. No significant difference was noticed on reproductive parameters of cow. While, Kirrella (1984), Houghton *et al*.(1990) and Bayoumi (1995) reported that calf birth weight increased with increasing feeding level from 100 to 120 %. Also, Bayoumi (1995) and El-Ashry *et al*. (2003) obtained shorter days open for buffaloes fed120 % dietary energy level of Ghoneim allowances (1967) during postpartum period than those fed 100% dietary energy level. Mansour *et al*. (2000) showed that the level of dietary energy has a significant effect on the onset and duration of oestrus, ovarian activity and quality of embryos available for transfer and it increased the number of unovulatory ovarian follicles in goats. However, Abecia *et al*. (1997) found no effect of dietary energy level on pregnancy rate for Rasa Aragonesa ewes.

3. Milk yield and its composition:

Results obtained in Table (5) showed that milk yield and fat, protein, lactose, total solids, solid not fat and ash as percentage and daily yield (kg) for buffaloes fed 120

% dietary energy level was significantly higher ($P < 0.01$) than those recorded for buffaloes fed 100 and 80% dietary energy levels. This might be due to the increase in nutrients for 120 % dietary energy levels group (Table 3). These results are in good agreement with those reported by Sharma *et al*. (1993), Aaes *et al*. (1994), Bayoumi (1995), McDonald *et al*. (1995), Ekinci and Broderick (1997), Adogla-Bessa and Aganga (2000) and El-Ashry *et al*. (2003) who concluded that milk yield increased with increasing dietary energy level. Also, Broderieck (2003) showed an increasing dietary energy by reducing forage improved milk yield and efficiency in dairy cows. Lee-Meichu *et al*. (2003a and b) found that milk yields of the dairy goats fed on low and mid-dietary energy levels were higher ($P<0.05$) than those fed on a high dietary energy level. The milk composition, the percentage of milk protein, milk fat, the content of lactose, total solids and the urea nitrogen content in milk did not significantly differe among all the treatments. However, Al-Totanji and Lubbadeh (2000) found that milk production before weaning was significantly ($P<0.05$) higher for groups of goats fed intermediate and high energy rations than that for goats fed low energy ration during the prepartum period. Data of 7% FCM yield are in parallel with their corresponding values of milk yield. Similar results were obtained by El-Ashry *et al*. (2003). However, El-Serafy *et al*. (1984) observed higher 7% FCM yield was highest for lactating buffaloes received 80% of NRC (1978) energy allowances compared with those received 100 and 120 % dietary energy levels.

4. Serum progesterone and 17-estradiol concentration:

Data in Table (6) show that animals received 120 % dietary energy level recorded higher ($P < 0.01$) values of progesterone (ng/ml) and 17-estradiol (pg/ml) concentration than that the animals fed 100 or 80% dietary energy levels.

The present results show that progesterone concentration increased slightly up to 15 days postpartum and decreased at 20 days then increased up to 35 days postpartum. However, 17-estradiol concentration (pg/ml) behaved opposite trend, it decreased slightly from 5 days up to 15 days and increased at 20 days then decreased up to 35 days postpartum. No significant interactions were detected between the studied factors (dietary energy levels and postpartum period). This reveals that the effects of dietary energy levels on progesterone and 17-estradiol behaved in the same pattern during postpartum periods. Mansour *et al*. (2000) showed that the level of estradiol-17 beta was at a peak level on the day of oestrus. It then decreased to its lowest values on the day of embryo recovery.

It be concluded that buffaloes fed ration containing 120% dietary energy levels during the late pregnancy and during lactating period improved reproductive performance and digestibility of nutrients without any adverse effect on performance of buffaloes.

Table 5: Effect of dietary energy levels on milk yield and composition of buffalo cows, under Egyptian conditions.

Traits	Energy levels			Sig.
	100%	80%	120 %	
Milk production (yield/day)	8.17±0.49[b]	7.58±0.42[b]	9.58±0.35[a]	**
7% FCM yield (kg/day)[1]	8.26±0.46[b]	7.16±0.36[b]	10.05±0.45[a]	**
Fat %	7.13±0.20[a]	6.48±0.12[b]	7.45±0.11[a]	**
Fat yield (kg /day)	0.58±0.03[b]	0.49±0.02[b]	0.72±0.03[a]	**
Protein %	4.00±0.07[a]	3.60±0.15[b]	4.25±0.06[a]	**
Protein yield (kg /day)	0.33±0.02[b]	0.27±0.02[b]	0.41±0.02[a]	**
Lactose (%)	4.85±0.08[ab]	4.62±0.14[b]	5.03±0.03[a]	**
Lactose Yield (kg /day)	0.40±0.02[ab]	0.38±0.04[b]	0.48±0.02[a]	**
Total solid (%)	16.42±0.21[a]	15.30±0.16[b]	16.70±0.49[a]	**
Total solids yield (kg /day)	1.34±0.08[b]	1.16±0.07[b]	1.60±0.08[a]	**
Solid not fat (%)	9.28±0.09[ab]	8.78±0.24[b]	9.72±0.17[a]	**
Solid not fat yield (kg /day)	0.76±0.05[b]	0.67±0.05[b]	0.93±0.03[a]	**
Ash (%)	0.61±0.004	0.61±0.008	0.61±0.004	NS
Ash yield (kg /day)	0.05±0.003[b]	0.05±0.003[b]	0.06±0.002[a]	**

[1] 7% FCM was calculated as: 0.265 x milk fat (kg) +10.5 x fat yield , according to Raafat and Salah (1962).

Means in the same row with different letter differ significantly ($P < 0.05$).

** = $P < 0.01$

N.S . = Not significant.

Table 6: Effect of dietary energy levels and postpartum periods (days) on progesterone and 17-estradiol hormones of buffalo cows, under Egyptian conditions.

Items	Progesterone (ng/ml)	17- estradiol (pg/ml)
Effect of energy levels (A):		
100%	1.50±0.26^{b}	1.58±0.25^{b}
80 %	0.22^{b}±1.53	1.50±0.23^{b}
120%	2.05±0.27^{a}	1.90±0.29^{a}
Sig.	**	**
Effect of postpartum periods (B):		
5 days postpartum	0.69±0.08^{f}	3.96±0.17^{a}
10 days postpartum	1.12±0.14^{e}	1.89±0.13^{c}
15 days postpartum	1.87±0.17^{c}	0.63±0.09^{ef}
20 days postpartum	0.53±0.05^{f}	2.23±0.16^{b}
25 days postpartum	1.44±0.14^{d}	1.51±0.11^{d}
30 days postpartum	2.20±0.14^{b}	0.91±0.09^{e}
35 days postpartum	4.01±0.15^{a}	0.50±0.06^{f}
Sig.	**	**
Interaction:		
A x B	NS	NS

Means in the same column with different letter differ significantly (P < 0.05).
** = P < 0.01 and N.S. = Not significant.

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تأثير مستويات الطاقة علي مظاهر الأداء الإنتاجي والتناسلي في إناث الجاموس.

حمدي المطراوي دياب * - مختار عبدالعظيم أحمد سرحان**

*** معهد بحوث الإنتاج الحيواني – مركز البحوث الزراعية – وزارة الزراعة –مصر.**

**** قسم الإنتاج الحيواني معهد الكفاية الإنتاجية – جامعة الزقازيق – مصر.**

أجريت هذه الدراسة بهدف دراسة تأثير مستويات الطاقة المختلفة (١٠٠% ، ٨٠ % و١٢٠% TDN) علي مظاهر الأداء الإنتاجي والتناسلي في إناث الجاموس المصري. أستخدم في هذه التجربة ١٨ أنثى جاموس بمتوسط عمر ٦ سنوات وفي موسمها الإنتاجي الثالث وبمتوسط وزن ٥٦٢,٠ + ٢٠,٩٦ كيلوجرام وذلك خلال الثلاثة شهور الأخيرة من الحمل وقسمت عشوائيا إلي ثلاثة مجاميع متماثلة. وتم تغذيتها علي ثلاثة علائق تجريبية ذات مستويات طاقة مختلفة (١٠٠ %، ٨٠% ، ١٢٠% TDN). استخدمت المجموعة الأولي للمقارنة وغذيت علي عليقه تحتوي علي ٤٥,٢٢ % مخلوط علف مركز ، ٢٧,٨٢ % أذره صفراء ،٢٥,٩٦ % دريس برسيم. أما المجموعة الثانية غذيت علي عليقه تحتوي علي ٤٥,٧٣ % مخلوط علف مركز ، ٢٥,١٢% أذره صفراء ، ٢٩,١٥ % دريس برسيم. أما المجموعة الثالثة غذيت علي عليقه تحتوي علي٤١,٨٤ % مخلوط علف مركز ، ٣١,٥٩% أذره صفراء ، ٢٦,٥٦ % دريس برسيم. و غذيت الحيوانات في فترة الحليب (١٠٠ يوم) ابتداء من اليوم الـ ٥٠ بعد الولادة علي علائق حسب الوزن وكمية إنتاج اللبن طبقا لمقررات (Kearl, 1982). وأجريت تجربة هضم في نهاية التجربة باستخدام ٣ حيوانات في كل مجموعة

وكانت أهم النتائج المتحصل عليها:

١ -سجلت المجموعة التي تغذت علي عليقه تحتوي ٨٠ % طاقة أقل قيم لمعاملات هضم كل من DM, OM, CF, EE and NFE عن المجموعتين التي تغذت علي عليقه تحتوي مستوي طاقة ١٠٠% و ١٢٠% بينما كانت الفروق بين المجموعات التجريبية في القيم الغذائية (TDN, DCP) غير معنوية.

٢ – سجلت الحيوانات التي تغذت علي عليقه تحتوي ١٢٠ % طاقة أعلي متوسط لوزن العجول عند الولادة مقارنة بالحيوانات التي تغذت علي عليقه تحتوي مستوي طاقة ١٠٠ % و ٨٠ %.

٣ -سجلت الحيوانات التي تغذت علي عليقه تحتوي ١٢٠ % طاقة أقل وقت لنزول المشيمة وأقل فترة زمنية لتماثل قرني الرحم واقل عدد من التلقيحات اللازمة للحمل مقارنة بالحيوانات التي تغذت علي عليقه تحتوي مستوي طاقة ١٠٠ % و ٨٠ %.

٤ -كانت الفترة من الولادة وعودة الرحم لوضعه الطبيعي والفترة بين الولادة وأول شياع ملحوظ والفترة بين ولادتين للحيوانات التي تغذت علي عليقه تحتوي ١٢٠% طاقة أقصر معنويا علي مستوي احتمال ٥% من الحيوانات التي تغذت علي عليقه تحتوي مستوي طاقة ١٠٠ % و ٨٠ %.

٥ – مجموعة الجاموس التي تغذت علي عليقه تحتوي ١٢٠ % طاقة حملت مبكرا بمعدل ٢٦,٢ و ٢٦,١٧ يوم عن مجموعة الجاموس التي تغذت علي عليقه تحتوي ١٠٠ % و٨٠% طاقة علي التوالي.

٦ -كان إنتاج اللبن والدهن والبروتين واللاكتوز والمواد الصلبة الكلية والمواد الصلبة الغير دهنية ككمية إنتاج يومي (كجم/يوم) وكنسبة مئوية للمجموعة التي تغذت علي عليقه تحتوي ١٢٠% طاقة أعلي معنويا علي مستوي احتمال ١% عن المجموعة التي تغذت علي عليقه تحتوي ١٠٠ % و٨٠% طاقة .

٧ – كان مستوي البروجسترون والأستروجين أعلي معنويا في سيرم دم الحيوانات التي تغذت علي عليقه تحتوي ١٢٠% طاقة مقارنة بالحيوانات التي تغذت علي عليقه تحتوي ١٠٠ % و٨٠% طاقة علي التوالي. وأزداد تركيز هرمون البروجسترون تدريجيا حتى ١٥ يوم بعد الولادة ثم نقص حتى ٢٠ يوم بعد الولادة ثم أرتفع تدريجيا مرة أخري حتى ٣٥ يوم من الولادة بينما كان مستوي تركيز الأستروجين علي العكس تماما من ذلك.

التوصيـة:

من هذه الدراسة ينصح بأنه يمكن أن تكون علائق الجاموس خلال الشهور الأخيرة من الحمل والجاموس الحلاب تحتوي علي طاقة ١٢٠% حيث أن هذه النسبة أعطت أفضل نتائج من ناحية القيم الغذائية وإنتاج اللبن بدون أي تأثيرات سلبية علي الأداء التناسلي والإنتاجي .