Egyptian J. Anim. Prod.,45 Suppl. Issue, Dec. (2008):189-203

MILK PRODUCTION, FEED CONVERSION RATE AND REPRODUCTION OF ZARAIBI GOAT IN RESPONSE TO BACTERIAL FEED ADDITIVE DURING LATE PREGNANCY AND LACTATION

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SUMMARY

This work was carried out on Zaraibi does to investigate the effect of using commercial microbial supplement (Lacture) on milk production, feed conversion efficiency and some blood constituents as well as reproductive parameters such as still birth, litter size, kidding rate and kilograms of kids produced per doe per year in addition to performance of the offspring. Twenty one pregnant does were divided into three equal groups (G1, G2 and G3) and fed according to NRC allowances, where diets contained 0, 1 and 2g Lacture / head/ day, respectively.

The data indicated that daily milk yield during suckling period was increased (1.341 kg., 1.593 kg. and 1.669 kg.) with increasing the level of Lacture (0, 1 and 2 g/head/d) in the three groups G1, G2 and G3, respectively. Moreover, average milk yield during lactation period was improved by 7.06% and 13.79% in G2 and G3 groups, respectively, compared with the control, differences were found to be significant during either experimental periods. The effect of treatment was positive on milk composition, especially milk protein and lactose, however, no significant effects of Lacture were observed on milk quality. The feed utilization efficiency (based on DM and CP) was better in G2 and G3 groups (over 10%) compared with G1 group.

Litter size ranged from 1.86 to 2.14 with no-significant differences among treatments. Daily body gain of kids was significantly improved in G2 (105.2 g) and G3 groups (108.5 g) by 11.91% and 15.43%, respectively compared with that of G1 group (94.0 g).

The mortality rate of kids was 7.1% in G2 and 0.00 in G3 vs. 13.3% in the control group. Thus, output measured as kilograms of kids produced per doe per year improved significantly due to Lacture supplementation. Accordingly, the economic efficiency was higher due to using Lacture at levels 1 and 2 g/head/day compared with the control one (0 g).

Keywords: Zaraibi goats, Lacture yeast, milk production, kids performance, feed efficiency, mortality rate, kilograms produced per doe

INTRODUCTION

High milk yield and prolificacy (twining rate) of Zaraibi goat require attention while preparing their ration in terms of amino acids, enzymes, vitamins and other feed requirements which are important for does, especially during phases of reproductive stress such as late pregnancy and suckling..

Yeasts are known as rich sources of vitamins, enzymes, nutrients and other important cofactors that make them attractive as a basic nutrient (Dawson, 1992). Yeast products have been shown to modify rumen fermentation (Wiedmeier *et al.*, 1987 and Harrison *et al.*, 1988), to stimulate the number and growth of rumen bacteria (Dawson *et al.*, 1990 and Erasmus *et al.*, 1992) and to increase rate of feed digestion in the rumen environment which is reflected on the productive performance of farm animals (Higgibotham *et al.*, 1994, Besong *et al.*, 1996, Putnam *et al.*, 1997, El-Badawi *et al.*, 1998, El-Ashry *et al.*, 2002 and Abou'l Ella, 2007).

Addition of yeast culture, as growth promoter, to the diets resulted in increasing rumen pH, total bacteria and protozoa culture count, total volatile fatty acids, total N and microbial protein with decreasing ammonia-N concentration and improving digestion of cellulose and DM disappearance (Kumar *et al.*, 1994). Therefore, the use of yeast cultures as a dietary supplement for dairy animals for many years, is thought to; 1- improve rumen function and hence, milk production and feed efficiency by stimulating growth of rumen bacteria, particularly cellulotic species and 2- improve fiber digestibility (Harrison *et al.*, 1988). Thus, much attention has been focused recently on the use of supplemented yeast to improve animal performance. Allam *et al*. (2001), El-Ashry *et al.* (2001), Kholif and Khorshed (2006) and Abou'l Ella (2007) reported that addition of yeast in the diet of cows, buffaloes and sheep were beneficial in improving production of milk, 4% fat corrected milk (FCM), milk fat and milk composition. However, production responses to yeast supplementation vary with species, diet, yeast level or preparation type (laboratory or commercial) and production stage (Newbold *et al.*, 1995, Wohlt *et al.*, 1998 and El-Ashry *et al.*, 2001)

Increasing milk yield for lactating animals, especially Zaraibi goat, is an important factor for the production of robust kids at weaning. Therefore, the present study was carried out to investigate the effect of a commercial microbial supplement (Lacture) on milk yield, milk composition, some blood parameters in addition to the performance of offspring of lactating does.

MATERIALS AND METHODS

This study was conducted at El-Serw Experimental Research Station belongs to Animal Production Research Institute, Agricultural Research Center, Ministry of Agriculture, Egypt.

Twenty one Zaraibi does at the last 2 months of pregnancy, of 50.4 kg average live body weight, were allotted into three groups, 7 does each. Animals were weighed at the beginning of the experiment and biweekly thereafter. Zaraibi does received three feeding treatments in group feeding. Zaraibi does in groups G1, G2 and G3 received a daily feed supplement of 0g., 1g. and 2g. Lacture /head, respectively. Feed additive (Lacture) was mixed with approximately 10g of ground concentrate and spread daily as powder over the concentrate feed mixture as reported by Chiquette *et al.* (1993).

Amounts of concentrate and roughage fed were based on Feed Allowance of NRC (1981). The concentrate feed mixture (CFM) and roughage (berseem hay and bean straw) were offered at 50:50 ratio. The CFM was consisted of 26% undecorticated cottonseed meal, 38% yellow corn, 20% wheat bran, 7% rice bran, 5% molasses, 2.5% limestone, 1% common salt and 0.5% mineral mixture. Samples of feed were analyzed according to the procedures of A.O.A.C (1988). The chemical composition of feed stuffs consumed by Zaraibi does is shown in Table (1). Water was available all times. Diets were offered twice daily at 8.00 am and 3.00 pm.

Table 1. Chemical composition of feed stuffs consumed by dairy Zaraibi goat

Feed	DM	Chemical composition					
		OM	CF	CP	EE	NFE	Ash
Concentrate feed mixture	91.3	93.2	16.3	14.9	3.3	58.7	6.8
Berseem hay	88.5	87.50	30.3	11.2	2.3	43.7	12.5
Bean straw	88.9	86.5	38.0	5.3	1.3	41.8	13.5

DM: Dry matter, OM: Organic matter; CF: Crude fiber; CP: Crude protein; EE: Ether extract and NFE: Nitrogen free extract.

Milk yield was recorded daily for each doe. Representative milk samples (about 0.5% of total milk produced) were taken monthly for each doe at both milkings. Samples were composed and analyzed for chemical composition of total solids, fat, protein and ash as well as pH and acidity (Ling, 1963), while lactose content was assessed as described by Baranett and Abdel-Tawab (1957).

Changes of live body weight were recorded individually for the does and their born kids every two weeks. Litter size (fetus/doe), kidding rate (litter size x100) were calculated. Economic efficiency was also calculated, as total output/ total input according to the local prices at the year 2008 (where 1 ton of BH costs 500 LE, 1 ton of BS costs 250 LE, 1 ton of CFM costs 1000 LE, and yeast Lacture cost L.E. 20 per kg, while selling prices of 1 kg live body weight of kid was 19 LE and 1kg goat's milk was 3.25 LE).
LE).

Blood samples were collected through the jugular vein just before feeding (0 time) once at the end of the experiment from 5 does of each group. Whole blood was immediately used for hematological estimation. Another blood sample was centrifuged at 4000 rpm for 20 minutes, separated serum were used for enzymes determination, while the remained part was frozen at -20 ^{0}C until other biochemical analyses. Commercial kits were used for all blood measures, except globulin which was calculated by differences.

Data were statistically analyzed by the least squares method described by Likelihood program of SAS (1994). Differences among means were determined by Duncan's New Multiple Range Test (Duncan, 1955).

RESULTS AND DISCUSSION

Average daily feed intake during pregnancy, suckling and lactation periods) are presented in Table (2). The daily feed intake was not affected by the experimental treatments, whereas the major differences was noticed during suckling (1697 g/h, 1783 g/h and 1842 g/h) and lactation periods (1467 g DM, 1486 g DM and 1555 g DM) for groups G1 , G2 and G3, respectively. Similar results were observed by Swarts *et al.* (1994), Soder and Holden (1999), El- Ashry *et al.* (2001) and Kholif and Khorshed (2006). However, Wohlt *et al.* (1991), Erasmus *et al.* (1992), Olson *et al.* (1994), Yousef *et al.* (1996) and Putnam *et al.* (1997) reported a significant improvement in dry matter intake when yeast culture was given to lactating animals. Also, Abou'l Ella (2007) found that total dry matter intake was significantly higher with addition of dried yeast to lactating ewe's rations. The enhanced intake is most likely referred to improvement of the rate of breakdown of feed stuffs in the rumen (Abou'l Ella, 2007).

Table 2. Average daily dry matter (DM) intake* by Zaraibi does during different experimental periods (gestation, suckling and lactation)

Item	Groups		
	G1	G2	G3
Daily DM intake (g/d) during gestation			
From CFM	794	815	805
From BH	396	405	409
From BS	398	413	415
Total DM intake	1588	1633	1629
DM intake, % of BW	2.97	2.95	3.01
Roughage/ concentrate ratio (R/C)	50:50	50:50	51:49
Daily DM intake (g/d) during suckling period			
From CFM	863	900	921
From BH	420	445	466
From BS	414	438	455
Total DM intake	1697	1783	1842
DM intake, % of BW	3.98	4.19	4.38
R/C ratio	49:51	50:50	50:50
Daily DM intake (g/h) during lactation period			
From CFM	728	750	800
From BH	360	363	375
From BS	379	373	380
Total DM intake	1467	1486	1555
DM intake, % of BW	3.58	3.53	3.69
R/C ratio	50:50	50:50	49:51

* Group feeding; CFM: Concentrate Feed Mixture; BH: Berseem hay; BS: Bean straw; DM: Dry matter; BW; Body weight.

Milk yield during suckling (early lactation) and lactation period are presented in Table (3). Daily milk yield reached the peak at the 4^{th} week of lactation in all groups (Figure 1). Milk yield during suckling period were significantly higher in G2 (143.1 kg/h or 1.593 kg/h/d) and G3 (148.7 kg/h or 1.650 kg /h/d) compared with that of the control group (125.4 kg/h or 1.401 kg /h/d). However, there was no significant response to increasing Lacture yeast level from 1g to 2 g.

During lactation period, the highest milk yield (95.79 kg/h or 1.064 kg /h/d) was recorded in G3, followed by G2 (90.21kg/h or 1.001 kg/h/d) while, the lowest value was detected in the control group (83.8 kg/h or 0.935 kg /h/d) and the differences among groups were significant. Daily milk yields were improved during lactation period (7.06% and 13.79 %) and suckling period (13.70% and 17.77%) in G2 and G3 groups, respectively compared with that in the control group. These results are in accordance with those reported by Wohlt *et al.* (1991), Erasmus *et al.* (1992), Piva *et al.* (1993), Yousef *et al.* (1996) and Putnam *et al.* (1997). Yields of milk were significantly improved by including yeast in the rations (El-Ashry *et al.*, 2001). They reported that the higher milk yield of those animals fed yeasts supplemented ration might be attributed to its positive effect on digestibility of organic matter and its nutrients. Moreover, results probably attributed to the higher blood serum glucose and albumin concentrations of animals fed yeasts supplemented ration (Table 5) as it led to an increase in milk lactose synthesis and consequently increased milk production (Kholif and Khorshed, 2006 and Kholif and Kholif, 2008).

Table 3. Milk production of dairy Zaraibi does fed the experimental rations during suckling and lactation period

Item	Groups		
	G1	**G2**	**G3**
Suckling period:			
Daily milk yield (kg/h/d)	1.40^{b} ±0.05	1.59^{a} ±0.04	1.65^{a} ±0.05
Total milk yield (kg/h)	125.4^{b} ±4.05	143.1^{a} ±3.80	148.7^{a} ±4.55
Milk composition			
Fat, %	3.34±0.07	3.43±0.06	3.48± 0.04
Protein, %	2.97^{b} ±0.02	3.19^{a} ±0.02	3.21^{a} ±0.02
Lactose, %	4.62^{b} ±0.01	4.79^{a} ±0.00	4.87^{a} ±0.02
Total Solids, %	11.65±0.08	12.14±0.07	12.20±0.05
Solids non fat (SNF), %	8.30±0.02	8.71±0.02	8.81±0.03
Ash, %	0.72±0.01	0.73±0.00	0.73±0.00
Somatic cell count's (SCC)× 10^{3}	546±19	539±21	516±17
pH value	6.63±0.01	6.65±0.01	6.66±0.00
Acidity, %	0.163±0.001	0.165±0.001	0.167±0.001
Lactation period:			
Daily milk yield (kg/h/d)	0.93^{b} ±0.04	1.00^{ab} ±0.03	1.06^{a} ±0.02
Total milk yield (kg/h)	83.80^{b} ±3.81	90.21^{ab} ±2.57	95.79^{a} ±2.11
Milk composition			
Fat, %	4.05±0.05	4.18±0.06	4.23±0.05
Protein, %	3.00^{b} ±0.02	3.21^{a} ±0.02	3.24^{a} ±0.02
Lactose, %	4.63±0.02	4.81±0.03	4.89±0.03
Total Solids, %	12.41±0.11	12.95±0.06	13.01±0.05
SNF, %	8.36±0.08	8.77±0.01	8.87±0.02
Ash, %	0.73±0.01	0.75±0.01	0.74±0.01
Somatic cell count's (SCC)× 10^{3}	425±16	411±29	407±25
pH value	6.64±0.01	6.67±0.01	6.68±0.01
Acidity %	0.16±0.001	0.16±0.001	0.16±0.001

Means in the same row with different superscripts differ significantly at $P< 0.05$

In lactating ewes, Abou'l Ella (2007) stated that the relative improvement in milk production as a result of using yeast in sheep ration could be attributed to the fact that yeast may act as a source of B-vitamins, which may occasionally be beneficial, in addition to that the flow of microbial protein from the rumen will increase with addition of yeast to the diet.

Milk protein content was higher in G2 and G3 than G1. This result is in accordance with those reported on lactating animals fed diets supplemented with yeast culture (Kumar *et al.*, 1992, Yousef *et al.*, 1996, Putnam *et al.*, 1997 and El-

Ashry *et al.*, 2001). Skorko-Sajko *et al.* (1993) reported that the increased flow of lysine and methionine observed by Erasmus (1991) might help to explain the increase in milk and milk protein yield. In addition, the increase in milk protein yield by yeast culture supplementation may be due to stimulation of rumen microbes, that cause alteration in microbial protein synthesis and increased protein passage then protein yield (El- Ashry *et al.*, 2001).

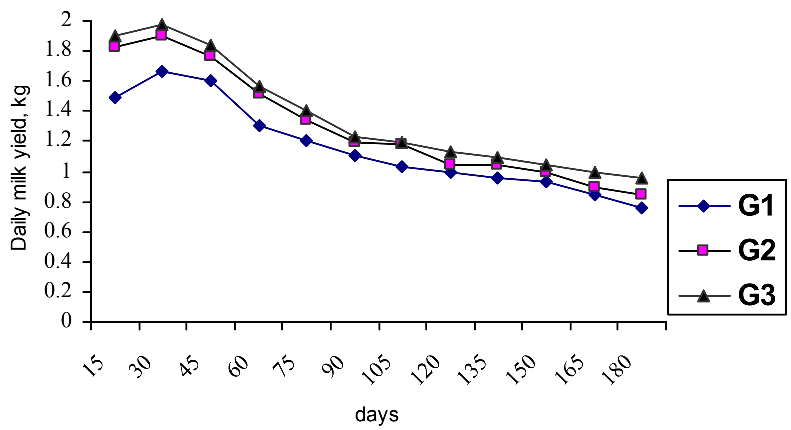

Figure 1. Effect of the experimental treatments on daily milk yield of Zaraibi goat

Milk fat content in G2 and G3 groups were insignificantly higher by 3.89% and 2.69 % than those in G1. That is in accordance with those reported by Soder and Holden (1999) and El-Ashry *et al*. (2001). However, Abd-El-Ghani *et al.* (1995) and Yousef *et al.* (1996) found that lactating animals fed yeast culture had significant increase in milk fat content. In lactating ewes, Abou'l Ella (2007) observed that milk fat percentage was 7.12% to 7.30% higher as a result of using yeast, thus milk fat yield was significantly higher from 46.3 g/h/d to 52.6 g/h/d with the same addition.

Milk lactose content was higher ($P < 0.05$) in G2 and G3 compared with G1 group as shown in Table (3). Similar results were observed by El- Ashry *et al.* (2001) and Abou'l Ella (2007) on lactating buffaloes and ewe's. In another study, milk lactose content was higher as a result of addition of selenized yeast and this may be attributed to the positive effect of treatment on the metabolic process in the mammary gland which led to increase milk lactose synthesis (Kholif and Khorshed, 2006).

The total solids, SNF, ash, pH and acidity showed similar trends to that of fat content with no significant differences among groups. These results are in accordance with those obtained by Erasmus *et al.* (1992), Piva *et al.* (1993), Soder and Holden (1999), El-Ashry *et al.* (2001) and Kholif and Khorshed (2006). Abou'l Ella (2007) observed that total solids yield was significantly improved from 131.6 g/h/d to 147.1 g/h/d as a result of using yeast in lactating ewe's ration, whereas total solids percentage was not affected by the treatment.

Data in Table (3) showed that there were no significant differences in somatic cells count (SCC) among different treatments during the suckling and lactation periods. This suggests that addition of Lacture yeast to the rations did not have negative effects on goat's general health given the association of SCC with microbial infection in animals. That seems to be consistent with Pernthaner *et al.* (1991) and Shehata *et al.* (2004).

Data of feed utilization efficiency of the experimental goat are summarized in Table (4). The obtained results indicated that feed conversion calculated as dry matter intake and crude protein intake/milk yield were better in G2 and G3 groups compared with the control (G1), being 10.49% and 11.11%, higher than the control, respectively, based on CP. The positive effect (based on DM and CP) was observed also by El-Ashry *et al.* (2002). Kholif and Khorshed (2006) reported that feed efficiency was significantly better with animals fed yeast supplemented rations followed by selenized yeast supplemented ration and then the control. In sheep, Abou'l Ella (2007) observed that feed efficiency calculated as fat corrected milk (FCM)/dry matter intake was 11.52% higher in lactating ewes fed yeast supplemented rations compared with the control.

Table 4. Feed utilization efficiency by Zaraibi does as affected by the experimental treatments

Item	Groups		
	G1	G2	G3
No. of does	7	7	7
Av. body weight, kg	41.21	42.31	42.11
Metabolic body size, $W^{0.75}$	16.26	16.59	16.53
Av. feed intake during milk production period (suckling and lactation)			
From CFM, g/h/d	796	825	861
From BH, g/h/d	390	404	421
From BS, g/h/d	397	406	418
Total DM intake g/h/d	1583	1635	1700
DM intake, g/kg $W^{0.75}$	97.0	99.0	103.0
DM intake, % BW	3.80	3.90	4.04
R/C ratio	50:50	50:50	49:51
CP intake, g/h/d	184	189	197
Av. daily milk yield, g/h/d	1161^{b}±41	1297^{a}±25	1358^{a}±32
Feed utilization efficiency:			
kg DM/kg milk	1.39	1.26	1.24
kg CP/ kg milk	0.162	0.145	0.144

Means in the same row with different superscripts differ significantly at $P< 0.05$.
CFM: Concentrate Feed Mixture; BH: Berseem hay; BS: Bean straw; DM: Dry matter; BW; Body weight; R/C: Roughage to concentrate ratio.

The data in Table (5) indicated that yeast supplemented groups had significantly higher hemoglobin (Hb), red blood cells (RBC's), mean cell hemoglobin concentration (MCHC), serum glucose and albumin than the control. The same trend was observed also on serum protein, globulin, urea-N and cholesterol. Similar results were observed by Yousef *et al.* (1996) and Kholif and Khorshed (2006) on lactating animals. El- Ashry *et al.* (2001) reported that serum total protein, albumin, urea-N, glucose and cholesterol content were significantly higher as a result of using some yeast types in dairy animals rations. In lactating ewes, concentration of plasma total protein, albumin, globulin and urea were higher with yeast supplemented groups where differences were significant for serum albumin only. The obtained results in Table (5) indicated that serum transaminases (AST and ALT) activities were not significantly affected by the treatments. Also, serum alkaline phosphatase (ALP) activity recorded the highest value (105.11 u/l) in G1 and the lowest value (97.39 u/l) in G3 group. However, El-Ashry *et al.* (2001) reported that transaminases (AST and ALT) activities in blood serum were unchanged by adding dietary yeast culture, but serum ALP activity was significantly lower with using some yeast types in the diets. The present blood parameters of supplemented treated groups may indicate the beneficial effect of the supplements on doe's metabolism.

Table 5. Blood profile of Zaraibi does as affected by the experimental treatments

Items	Groups		
	G1	G2	G3
Hemoglobin , g/dl	11.53^{b}±0.29	13.37^{a}±0.34	13.75^{a}±0.43
Hematocrit , %	32.27±0.89	34.40±0.70	35.00±1.04
Red blood cells x 10^6/ul	12.70^{b}±0.42	14.40^{a}±0.45	14.90^{a}±0.32
Mean cell hemoglobin concentration , %	35.70^{b}±0.37	38.90^{ab}±0.20	39.30^{a}±0.18
Glucose, mg/dl	65.33^{b}±0.88	70.00^{a}±0.58	71.67^{a}±0.88
Total protein, g/dl	6.87±0.29	7.25±0.29	7.43±0.52
Albumin, g/dl	3.50^{b}±0.15	3.83^{a}±0.15	3.87^{a}±0.09
Globulin, g/dl	3.37±0.15	3.42±0.16	3.57±0.43
Urea- N, mg/dl	15.53±0.43	17.13±0.52	17.43±0.46
AST, u /l	69.00±2.65	70.33±1.76	73.00±2.08
ALT, u/l	13.57±0.77	12.60±0.78	15.03±0.94
ALP, u/l	105.00±4.58	103..3±3.71	98.00±3.21
Cholesterol, mg/dl	110.00±2.52	115.3±5.17	117.0±6.43

Means in the same row with different superscripts differ significantly at $P < 0.05$.
AST: Glutamic oxalacetic transaminase; ALT: Glutamic Pyrovic transaminase; ALP: Alkaline Phosphatase; CP: Crude protein

Table (6) presented changes in live body weight (LBW). The mean initial LBW (at 3 months of pregnancy) were approximately equal in all groups ranged from 49.5 kg. to 51.0 kg. The LBW of does increased to the maximum before parturition and recorded the highest values (ranged from 57.7 kg in G1 to 59.9 kg in G2) then sharply decreased (post- parturition) to the minimum at day 90th (weaning) in all groups. Thereafter, it tended to increase again (but very slowly) in all groups during the lactation period. The same trend was observed by Shehata *et al.* (2007 a). Devendra (1979) recorded a decline in body weight of high milk yielding goat during the first month post-parturition. Moreover, Ahmed (1999) found that dairy Zaraibi goat fed 100% NRC had decreased LBW from 13% to 22% at day 60th post-parturition. Concerning the effect of the treatment, the obtained results indicated that LBW was not significantly affected as a result of using Lacture at level of 1g/head (G2) and 2 g/head (G3) as shown in Table (6). However, the highest values of LBW at the end of pregnancy (59.90 kg) and at mating (42.5kg) was recorded with G2, but the lowest values were recorded with G1 (57.7 kg and 41.0 kg, respectively). Body weights during weaning were 40.1, 41.5 and 41.7 for G1, G2 and G3, respectively. Generally, body weights at day 180 post kidding (mating) were 94.25%, 95.72% and 96.12% higher than the weight at kidding, respectively. These data indicated some positive effects of the treatment on live body weight of Zaraibi does especially during the reproduction stress-phases (late pregnancy and suckling).

Table 6. Live body weight of Zaraibi does during late pregnancy, suckling and lactation periods

Days	Groups		
	G1	G2	G3
Initial weight (at 90 days of pregnancy)	49.5±0. 2	51.0±0.3	50.2±0.2
At 120 days of pregnancy	52.9±0.4	54.5±0.2	53.6±0.3
At 150 days of pregnancy	57.7±0.3	59.9±0.2	58.8±0.3
Weight at kidding	43.5±0.2	44.4±0.4	43.8±0.2
Weight at 30 days post kidding	41.7±0.3	42.5±0.2	42.0±0.4
Weight at 60 days post kidding	40.5±0.4	41.7±0.3	41.9±0.2
Weight at 90 days post kidding (weaning)	40.1±0.1	41.5±0.2	41.7±0.4
Weight at 120 days post kidding	40.3±0.4	41.5±0.3	41.8±0.3
Weight at 150 days post kidding	41.4±0.3	42.3±0.2	42.5±0.1
Weight at 180 days post kidding (mating)	41.0±0.1	42.5±0.2	42.1±0.4
Weight at 180 days as % of weight at kidding, %	94.3	95.7	96.1

The productive and reproductive performance of does fed the experimental diets is summarized in Table (7). The obtained results indicated that treatment by the two levels of Lacture yeast (G2 and G3) had no adverse effect on Zaraibi does performance during late pregnancy. No abortion and still birth cases were happened in all groups. Litter size ranged from 1.86 to 2.14 without marked differences among treatments. Moreover, kidding rate were 214, 200 and 186 for groups G1, G2 and G3, respectively. However, litter size was found to be ranged from 2.31 to 2.47 in Zaraibi goat (Shehata, 2007b).

The obtained results indicated that average birth weight was higher (2.60 kg/h/d and 2.65 kg/h/d vs. 2.35 kg/h/d) with increasing level of Lacture yeast (G2 and G3 vs. G1, respectively). Also, the levels of Lacture (1 g/h/d and 2 g/h/d) had positive effects on weaning weight (12.07 kg/h/d and 12.42 kg/h/d vs. 10.75 kg/h/d for G2 and G3 vs. G1, respectively). That was reflected on daily body gain (DBG), being 105.2 g/h/d and 108.5 g/h/d for G2 and G3 compared with 94.0 g/h/d for G1. The improvements in DBG, by treatments G2 and G3 were 11.91% and 15.43%, respectively compared with G1 where differences were significant. Similar results were observed by El-Ashry *et al.* (2002) and Hanafy (2008). In other study on lactating ewes, Abou'l Ella (2007) found that average daily body gain of lambs were significantly higher (182 g/h/d) with using dry yeast in ewes rations compared with the control (162 g/h/d). This increase in daily gain of offspring may be due to the higher milk yield and its content from total solids, total protein and fat. The mortality rate of born kids was decreased (13.3%, 7.1% and 0.00%) with the increasing of Lacture yeast level in groups G1, G2 and G3, respectively. Accordingly, output measured as kilograms kids produced per doe per year improved significantly due to the treatment by Lacture as number of kilograms at weaning were 19.90, 22.50 and 23.20g for G1, G2 and G3, respectively. Generally, increasing milk yield for lactating ewes by the treatment represents an important factor for the production of robust lambs at weaning. In addition, it also have been effective in reducing incidence of scouring and mortality and stimulated live weight gain for offspring (Umberger *et al.*, 1989 and Abou'l Ella, 2007).

Table 7. Effect of the experimental treatments on the productive and reproductive performance of dairy Zaraibi does

Items	Groups		
	G1	G2	G3
No of does	7	7	7
Born kids	15	14	13
Still birth kids, No.	-	-	-
Alive kids at 0 day	15	14	13
Alive kids at 90 days	13	13	13
Litter size	2.14	2.0	1.86
Kidding rate, %	214	200	186
Average birth weight, kg	$2.35^{b}\pm0.05$	$2.00^{a}60\pm0.08$	$2.65^{a}\pm0.10$
Average weaning weight, kg	$10.75^{b}\pm0.18$	$12.^{a}07\pm0.14$	$12.42^{a}\pm0.20$
Total body gain, kg	$8.40^{b}\pm0.33$	$9.47^{a}\pm0.45$	$9.77^{a}\pm0.48$
Average daily body gain, g	$94.00^{b}\pm0.17$	$105.20^{a}\pm0.25$	$108.50^{a}\pm0.24$
Kilogram kids born /doe	5.04±0.51	5.21±0.55	4.93±0.55
Kilogram kids weaned/doe	$19.90^{b}\pm2.71$	$22.50^{a}\pm2.94$	$23.20^{a}\pm3.08$
Mortality of kids, No.	2	1	zero
Mortality of kids, %	13.30	7.10	0.00
Economic efficiency	2.25	2.42	2.48

Means in the same row with different superscripts differ significantly at P< 0.05

Economic efficiency (estimated for 8 months) = milk yield*3.25 + kg kids*19 / Feed cost/240 days.

Table 8. Effect of the experimental treatments on the performance of Zaraibi kids

Item		No	Birth weight, kg	No.	Weaning weight, kg
Sex	Male	29	2.61±0.06	27	11.71±0.21
	Female	13	2.35±0.06	12	11.67±0.22
Type of birth	Single	2	$2.75^{A}\pm0.25$	2	$12.25^{A}\pm0.75$
	Twins	28	$2.61^{A}\pm0.06$	26	$11.93^{A}\pm0.19$
	Triplets	9	$2.31^{B}\pm0.09$	8	$11.75^{AB}\pm0.26$
	Quadratic	3	$2.25^{B}\pm0.14$	3	$10.92^{B}\pm0.08$

Means in the same column with different superscripts differ significantly at (P< 0.05)

G1: 0 g Lacture/head/day; G2: 1 g Lacture/head/day; G3: 2 g Lacture/head/day

CONCLUSION

It could be concluded that microbial supplement of Lacture to Zaraibi doe's rations during late pregnancy and lactation periods had a positive role in improving milk yield and its composition, especially milk protein and lactose, without any adverse effect on milk quality or general health. This improvement was reflected on born kids performance and production of robust kids at weaning and consequently reducing mortality rate for born kids. Accordingly, output measured as kilograms kids produced per doe per year was improved significantly due to the treatment. This had a good economic return on the herd of Zaraibi goats.

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إستجابة الماعز الزرايبى أثناء فترتى الحمل المتأخر وإنتاج اللبن لبعض الإضافات البكتيرية في غذائها

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هذا العمل البحثي أجرى على الماعز الزرايبى لدراسة تأثير استخدام أحد الإضافات البكتيرية (اللاكتشر) بمستويات مختلفة على إنتاج اللبن وتركيبه وجودته, وكفاءة تحويل الغذاء إلى لبن, وبعض قياسات الدم والحالة التناسلية (مثل الولادات النافقة، والتوأمية، معدل المواليد، عدد الكيلوجرامات المفطومة لكل أم)، بالإضافة إلى تأثيره على اداء الجداء الرضيعة، وقد تم استخدام عدد ٢١ عنزة زرايبى في الشهر الرابع من الحمل وقسمت لثلاثة مجموعات هى مج١ ، مج٢ ،مج٣، وغذيت طبقا لمقررات NRC مع إضافة ثلاثة مستويات من الخميرة هى صفر ، ١ ،٢ جم لكل رأس يوميا للمجموعات الثلاثة على التوالى.

وقد أظهرت النتائج ارتفاع محصول اللبن اليومى أثناء فترة الرضاعة (١.٤٠١ ، ١.٥٩٣، ١.٦٥٠ كجم) مع زيادة مستوى المعاملة (صفر، ١، ٢ جم/ رأس/ يوميا) في المجموعات الثلاثة (مج١، مج٢ ، مج٣ على التوالى)، وارتفاع إنتاج اللبن أثناء فترة الحليب بنسبة ٧.٠٦ ، ١٣.٧٩% مع مج٢ ، مج٣ مقارنة بـ مج١، وكانت الاختلافات معنوية أثناء فترتى التجربة.

معظم مكونات اللبن تأثرت إيجابيا من المعاملة في مج٢ ، مج٣، خاصة بروتين ولاكتوز اللبن، هذا بالإضافة إلى أن جودة اللبن لم تختلف معنويا بين المعاملات.

كفاءة تحويل الغذاء إلى لبن كانت افضل بأكثر من ١٠% سواء كانت محسوبة على أساس المادة الجافة أو البروتين المأكول، وهذا يوضح أن المعاملة توفر أكثر من ١٠% من البروتين المأكول، مما يعتبر تأثيراً جيداً للمعاملة.

التوأمية تقاربت بين المجموعات وتراوحت بين ١.٨٦ و ٢.١٤ ، مع ملاحظة عدم حدوث ولادات نافقة في المجموعات الثلاثة، أما المواليد فقد ارتفع معدلات نموها معنويا من ٩٤جم في مج١ إلى ١٠٥.٢ و ١٠٨.٥ في مج٢ ، مج٣ على التوالى، محققة معدل تحسين قدره ١١.٩١% ، ١٥.٤٣% في مج٢ ، مج٣ مقارنة بـ مج١ ، أما نسبة النفوق فقد انخفضت إلى صفر في مج٣ مقابل ١٣.٣% في مج١ ،٧.١ % في مج٢.

عدد الكيلوجرامات المفطومة لكل أم كانت أفضل وبدرجة معنوية في مج٢(٢٢.٥٠جم) ، مج٣ (٢٣.٢٠جم) مقارنة بالكنترول (١٩.٩٠جم)، مما إنعكس على تحسين الكفاءة الاقتصادية لكل من مج٢ ، مج٣ مقارنة بـ مج١.

نوضح هذه الدراسة أن استخدام الإضافة البكتيرية (اللاكتشر) في علائق الماعز الزرايبى أثناء الفترة الأخيرة من الحمل وفترة إنتاج اللبن له تأثير إيجابي على إنتاج اللبن وتركيبه بدون أى تأثير عكسى على جودة اللبن أوالتمثيل الغذائى فى الحيوان، وقد انعكس هذا على تحسين اداء الولادات ، وانخفاض نفوقها، وبالتالى تحسين واضح في إنتاجية الأمهات متمثلا في عدد الكيلوجرامات المفطومة لكل أم سنويا ، مما يحقق منفعة إقتصادية في قطعان الماعز الزرايبى.