Egyptian Journal of Sheep & Goat Sciences, Vol. 9 (1), P: 43- 57, 2014

PRODUCTIVE AND REPRODUCTIVE PERFORMANCE OF GOATS AS AFFECTED BY L-TYROSINE ADMINISTRATION

2- Productive performance and some blood metabolites during breeding period of Zaraibi does

A.A. ABU EL-ELLA[1]; E.S. EL-GOHARY1; T.M.M.ABDEL-KHALEK[1] and A.M.ABDEL-SAMEE[2]

[1] *Animal Production Research institute, Ministry of Agriculture, Dokki, Giza. Egypt*

[2] *Suez Canal University, Faculty of Environmental Agricultural Sciences, El-Arish, North Sinai, Egypt.*

Correspondent author email: Amghmd5922@yahoo.com

ABSTRACT

A total of 30 Zaraibi does aged 2-4 years and weighed 35-40 kg were used to define the influence of oral administration of L-tyrosine on milk yield and composition, some blood metabolites during breeding period in pregnant and non-pregnant doe as indicator for the physiological status of animals are also studied. Does were randomly assigned to three equal groups (10 each). The first group (G1): was kept as a control (without L-tyrosine treatment). The second (G2) and third (G3) groups were received orally two doses of L-tyrosine at levels 1.0 and 1.5gm / 10 kg live body weight, respectively. L-tyrosine was given as two doses, one single dose before one week from the beginning of breeding period and the other dose three days post kidding.

Results indicated that milk yield and 4% fat correct milk (FCM) of does treated with 1.5 g L-tyrosine (G3) were significantly ($P \leq 0.05$) higher than those of does treated with 1.0g L-tyrosine (G2) and control (G1) groups. Fat, protein and lactose percentages in milk from does treated with L-tyrosine groups were significantly ($P \leq 0.05$) higher as compared to the control group (G1).

L-tyrosine administration significantly ($P \leq 0.05$) increased blood albumin and glucose concentration compared to the control does. Meanwhile, blood globulin was decreased significantly due to L-tyrosine administration. The concentrations of urea-N and creatinine decreased as a result of L-tyrosine treatments compared to the untreated does.

Total protein, globulin and urea –N decreased ($P \leq 0.05$) till 8 days after mating where it increased gradually up to 18 days after mating and decreased again at the end breeding period. The effect of breeding period on albumin and A/G ratio were not significant. Values of glucose were significantly ($P \leq 0.05$) increased at 8 days after mating and then decrease ($P \leq 0.05$) in estrous period. While, obtained values of blood plasma creatinine were higher in estrous period as compared to other breeding period.

In pregnant does, there were significantly ($P \leq 0.05$) lower concentrations of total protein, urea, glucose, triglyceride, calcium and Phosphorus and significantly ($P \leq 0.05$) higher concentrations of total lipids and cholesterol in relation to non pregnant does. The changes of Plasma albumin, creatinine, AST, ALT, alkaline phosphates and zinc between pregnant and non pregnant does were not significant.

Key words: *Goats, L-tyrosine, Milk yield, Blood metabolites, breeding period*

INTRODUCTION

Proteins are the main constituents of animals body and are continuously needed in the feedstuffs. Actually, the amino acids contained in the proteins are required for a diversity of functions .They are primary constituents of structural and protective tissues such as skin, hint and bone matrix as well as of the soft tissues such as organs and muscles. Moreover, secretions such as milk, enzymes and hormones have additional amino acids requirements. Since body protein is in a steady state of flux with synthesis and degradation therefore, an adequate intake of protein is required (**Shaw and Anni, 2002**).

Many studies have shown that there is a close correlation between the level of some amino acids in the blood and reproductive performance at various stages of the production cycle in animals. Treatment by some amino acids, especially tyrosine at each of this stage led to improvement of reproductive and productive performance (**El-Amrawi, 2008**). Tyrosine is an aromatic amino acid derived from the essential amino acid phenylalanine by the action of phenylalanine hydroxidase enzyme. It is necessary for the synthesis of catecholamines (adrenaline, noradrenaline and dopamine), thyroxin and protein, in addition, to its important role in the citric acid cycle and building of melanin (**Harper *et al.*, 1980**).

Also, it was concluded by **Rae and Ingalls (1984)** that the availability of tyrosine can affect milk production in some circumstances. **Omima *et al*. (2001)** reported that milk production and milk composition in rabbit were significantly improved as a result of L-tyrosine supplementation in drinking water. **Yassin *et al*. (2011)** showed a significant increase in milk production as result of L-tyrosine oral administration in ewes. Also, **Gabr (2012)** found that the L-tyrosine treatment improved significantly daily milk production and milk composition in Friesian dairy cows.

Blood components during breeding period can be considered essential as an markers for reproductive performance of animals. Many researchers reported that serum levels of most blood components recorded significant differences during breeding period (**Marai *et al*., 2006 and Solouma *et al*., 2011).** Also, Blood components were affected by presence of protected protein in the diet (**Aly, 2005 and El-Reweny, 2006**).

Many investigators reported that serum levels of some blood component recorded significant differences between pregnant and non pregnant (**Antunovic *et al*. 2002; Balikci *et al*., 2007; Liesegang *et al*., 2007; Gluseppe *et al*., 2009 and Fazio *et al*., 2011;).**

The aim of this study was to determine the effects of L-tyrosine administration on milk yield, composition and some blood metabolites during breeding period of Zaraibi does (as indicator for the physiological status of animals) in addition to differences in some blood metabolites between pregnant and non-pregnant does as affected by L-tyrosine administration.

MATERIALS AND METHODS

This study was conducted in Faculty of Environmental Agricultural Sciences, El-Arish, North Sinai Governorate Suez Canal University. The present work aimed to define the effects of L-tyrosine administration on milk yield, composition in addition to differences of some blood metabolites during breeding period of Zaraibi does and some blood metabolites between pregnant and non-pregnant does are also studied.

A total number of 30 healthy Zaraibi does aged 2-4 years and of 35-40 kg body weight were used in the present experiment. The first group (G1) was served as a control, while the second (G2) and third (G3) groups were treated orally with two doses of L-tyrosine at levels of 1.0 and 1.5gm /10 kg live body weight, respectively, after being dissolving in 200 ml of water (El-Battawy, 2006), the first dose was administration one week before the beginning of breeding season and the other dose three days post kidding.

Animals were housed in semi open sheds under natural daylight conditions and fed allowances according to **NRC (1981)** recommendations for dairy goats. The does were allowed to drink clean fresh water freely. Vitamin and minerals block mixtures were available all the time to does.

Daily milk yield for each doe was measured individually twice/day (every 12h) by suckling kids, once every two weeks starting from the seventh day of parturition and throughout the following 12 weeks. The quantity of milk produced was estimated by using suckling till weaning. The kids were separated from their dams at 16.00 pm. prior to the day of measurement. Kids were weighed immediately before and after suckling and hand milking of the residual milk in the udder. The differences between the kids weights recorded before and after each suckling were add together with residual milk denoting. The differences in the weight of kids before and after suckling were added to give daily intake of suckling kids. Milk intake plus milk removed by hand milking represented daily milk yield. Milk samples were collected at the same time of milk yield recording and kept at -20° C for analysis. Butter fat, protein and lactose were determined according to **A.O.A.C. (1990).**

Blood samples (5 ml) were collected randomly from 5 animals in each group of does at morning from jugular vein puncture using heparinized vacutainer tubes. Blood samples were collected before treatments, during the estrous (mating) and at 4, 8, 18 and 30 days after mating and every two days weekly up to the end of the experimental period. Blood plasma were obtained and stored at -20^0C until analysis for aspartate amino transferase (AST), alanine amino transferase (ALT) enzyme activities according to **Reitman and Frankel (1957)**, glucose, cholesterol, urea (**Henry, 1965),** creatinine (**Bartels, 1971),** total protein and albumin (**Doumas and Biggs, 1972a & b**) using commercial colorimetric kits. Globulin was calculated by subtraction concentration of albumin from that of total protein then albumin / globulin ratio (A/G ratio) was also estimated. Commercial kits were used for calorimetric determination of serum alkaline-phosphates triglycerides, total lipids. Concentration of Zinc, calcium and phosphorus in serum were determined by the absorption spectrophotometer **(Kaneko, 1989).**

Data were statistically analyzed using analysis of variance procedure described by **SPSS (1999)** and significant differences among treatments were tested by Duncan's Multiple Range Test **(Duncan, 1955).**

RESULTS AND DISCUSSION

1.Milk yield and composition:

Many factors can affect milk yield including breed of goats, number of suckling kids, feeding level and parity of does (**Latif *et al*, 1988**).

Average milk yield of suckling period (week 1 to week 12) are shown in Table (1). Milk yield gram/head/day; was increased gradually to reach the peak from second to fourth after parturition (highest at the fourth week) where it began to declined markedly till end of the suckling period (12^{th}wk). Differences among suckling periods were significant (P<0.05). These results are in correspondence with the results obtained by **Hoon, *et al*. (2002)** and **Talha *et al*, (2005).**

As shown in Table (2), milk yield and 4% fat corrected milk (FCM) of G3 group were significantly (P≤0.05) higher than those of G2 and control (G1) groups. This indicates that L-tyrosine treatment had a positive reflection (P≤0.05) on the yields of fat, protein and lactose. Fat, protein and lactose percentages from does treated with L-tyrosine groups were significantly (P≤0.05) higher as compared to the control group (G1) (Table 2). The present results are in agreement with **Rae and Ingalls (1984**); **Omima *et al*., (2001); Yassin *et al.*, (2011) and Gabr (2012)** who reported an increase in milk production in response to tyrosine treatment. This is mostly attributed to the increase in blood supply **(Mepham, 1982)** and the energy intake of mammary gland cells **(Wurtman, 1982**), in addition to its effect on increasing growth hormone via its effect on brain catecholamine's **(Martin, 1980)**. This explanation is also supported by the previous findings of **Peel *et al*. (1981)** who found that administration of exogenous growth hormone increased milk production. Moreover, the significant increase in milk yield as a result of L-tyrosine administration may be due to increasing in body weight and body condition score of does and or due to increase of prolactin level. The observed increase in milk protein yield in treated groups may be attributed to elevation in the supply of tyrosine to the mammary gland, to from milk protein **(Mepham, 1982 and Gabr, 2012).**

***2. Blood plasma metabolites in Zaraibi does as affected by L-tyrosine*:**

2.1- Protein fractions:

Data of total protein, albumin, globulin and A/G ratio concentrations in does blood during breeding period are presented in Table (3).

Table (1): Average of daily milk yield (g/h/d) of Zaraibi does during first 12 weeks of lactation as affected by L- tyrosine administration.

Periods	**Treatments**			
Milk yield, g/h/d	**Control (G1)**	**G2 (1.0 gm)**	**G3 (1.5 gm)**	**Overall mean**
First week	1023.81 ± 82.34	1045.10 ± 58.05	1113.83 ± 71.98	1060.91 [c] ± 70.79
2 weeks	1714.29 ± 116.36	1833.33 ± 115.86	1937.55 ± 128.52	1828.39 [a] ± 120.25
4 weeks	1789.00 ± 126.60	1869.05 ± 157.00	2112.38 ± 177.28	1923.48 [a] ± 153.63
6 weeks	1364.69 ± 106.02	1354.76 ± 95.00	1442.27 ± 82.84	1387.24 [b] ± 94.62
8 weeks	984.62 ± 68.88	968.58 ± 58.75	950.95 ± 49.86	968.05 [c] ± 59.16
10 weeks	970.05 ± 70.52	942.86 ± 58.00	925.85 ± 63.32	946.25 [c] ± 63.95
12 weeks	958.14 ± 61.29	919.05 ± 61.90	869.05 ± 67.07	915.41 [c] ± 73.42
Overall mean	1257.62 [B] ± 75.14	1276.10 [B] ± 86.37	1335.98 [A] ± 91.55	

[.a,b and c]: values in the same column bearing different superscripts significantly differed (P<0.05)
[A, B,]: values in the same row bearing different superscripts significantly differed (P<0.05).

Table (2): Daily milk yield, 4% fat corrected milk (FCM) and milk composition of Zaraibi does as affected by L-tyrosine administration.

Items	**Treatments**		
	Control	**G2 (1.0 gm)**	**G3 (1.5 gm)**
Average. daily milk yield (G/d)			
Actual milk yield	1257.62 [b] ± 75.14	1276.10[b] ± 86.37	1335.98 [a] ± 91.55
4% fat correct milk	1268.94[b]	1398.61 [b]	1512.33 [a]
Component yields (g/h/d)			
Fat	51.06 [b] ± 5.84	59.21 [a] ± 6.58	65.20 [a] ± 7.47
Protein	41.38[b] ± 4.19	46.83 [a] ± 5.69	49.97 [a] ± 7.75
Lactose	55.33 [b] ± 7.11	61.25 [a] ± 7.86	66.26 [a] ± 7.85
Milk composition (%)			
Fat	4.06 [b] ± 0.12	4.64 [ab] ± 0.19	4.88 [a] ± 0.20
Protein	3.29 [b] ± 0.09	3.67 [a] ± 0.09	3.74 [a] ± 0.08
Lactose	4.40 [b] ± 0.09	4.80 [a] ± 0.07	4.96 [a] ± 0.13

[a, b,]: values in the same row bearing different superscripts significantly differed (P<0.05)

L-tyrosine administration significantly ($P \leq 0.05$) increased blood total protein, albumin and A/G ratio. Meanwhile, blood globulin was decreased significantly as affected by L-tyrosine treatment. The present results were in agreement with those of **Aly (2005)** and **El- Shabrawy (2006)** where they reported that values of serum total protein, albumin were increased ($P \leq 0.01$) when goats fed protected protein in the diet. The current results also could be related to beneficial effect of L-tyrosine on increasing protein digestibility through protease enzyme effect and alteration of amino acid profile of digesta resulting in increasing microbial protein synthesis as reported by **Abdel-Khalek *et al.*, (2000)**. The significant increase in blood albumin suggested normal status of liver function, since liver is the main organ of albumin synthesis. The obtained results are in accordance with those reported by **El-Shaer (2003)** and **Mahrous and Abou-Ammou (2005)** for sheep and **Kholif (2001)** and **Abu-El-Ella and Kommonna (2013)** for goats. The increase of albumin in response to L-tyrosine administration may be associated with nitrogen absorption (**Talha *et al*., 2009**). Also, albumin acts as a significant mobile protein store for amino acids (**Abu-El-Ella and Kommonna, 2013).** It is important to note that the values of A/G ratio were higher than 1.0 which indicates that animals did not suffer from any health

Table (3): Blood protein fractions of Zaraibi does during breeding period as affected by L-tyrosine administration.

Blood components	Breeding period (days)	Treatments			Overall mean
		G1 (Control)	G2 (1.0gm)	G3 (1.5gm)	
Total protein (g/dl)	Pre estrous period	9.86 ± 0.83	8.19 ± 0.80	10. 17± 0.78	9.41^{a} ± 0.80
	Estrous period (at mating)	7.09 ± 0.93	6.61 ± 0.92	10.36 ± 0.66	8.02^{b} ± 0.84
	4 days after mating	7.96 ± 0.91	7.31 ± 0.43	8.43 ± 0.59	7.90^{b} ± 0.64
	8 days after mating	7.95 ± 0.82	6.93 ± 0.59	7.99 ± 0.67	7.62^{b} ± 0.69
	18 days after mating	8.65 ± 0.92	8.51 ± 0.67	9.38 ± 0.89	8.85^{ab} ± 0.83
	30 days after mating	8.78 ± 0.23	8.32 ± 0.49	8.64 ± 0.78	8.58^{ab} ± 0.50
	Overall mean	8.38^{AB} ± 0.77	7.65^{B} ± 0.65	9.16^{A} ±0.73	
Albumin (g/dl)	Pre estrous period	4.67 ± 0.36	4.96 ± 0.60	4.50 ± 0.19	4.71^{a} ± 0.38
	Estrous period (at mating)	3.71 ± 0.53	4.58 ± 0.55	4.79 ± 0.33	4.36^{a} ±0.47
	4 days after mating	3.76 ± 0.32	5.07 ± 0.57	5.38 ± 0.46	4.74^{a} ± 0.45
	8 days after mating	3.21 ± 0.56	3.63 ± 0. 54	5.06 ± 0.43	3.97^{a} ± 0.51
	18 days after mating	3.35 ± 0.27	4.82 ± 0.28	5.92 ± 0.42	4.70^{a} ± 0.32
	30 days after mating	4.27 ± 0.25	4.89 ± 0.27	4.47 ± 0.24	4.54^{a} ± 0.31
	Overall mean	3.84^{B} ± 0.33	4.66^{A} ± 0.47	4.85^{A}±0.35	
Globulin (g/dl)	Pre estrous period	5.19 ± 0.59	3.23 ± 0.53	5.67 ± 0.80	4.70^{a} ± 0.64
	Estrous period (at mating)	3.38 ± 0.81	2.04 ± 0.40	5.57 ± 0.86	3.66^{ab} ±0.69
	4 days after mating	4.20 ± 0.87	2.24 ± 0.39	3.05 ± 0.67	3.16^{b} ± 0.64
	8 days after mating	4.74 ± 0.98	3.30 ± 0.73	2.93 ± 0.87	3.66^{ab} ± 0.86
	18 days after mating	5.30 ± 1.07	3.69 ± 0.61	3.46 ± 0.66	4.15^{ab} ± 0.78
	30 days after mating	4.51 ± 0.35	3.43 ± 0.66	4.17 ± 0.68	4.04^{ab} ± 0.56
	Overall mean	4.55^{A} ± 0.78	2.99^{B} ± 0.55	4.14^{A}±0.76	
A/G ratio	Pre estrous period	0.90 ± 0.13	1.54 ± 0.37	0.79 ± 0.14	1.08^{a} ± 0.21
	Estrous period (at mating)	1.10 ± 0.61	2.24 ± 0.79	0.86 ± 0.20	1.40^{a} ± 0.53
	4 days after mating	0.90 ± 0.13	2.26 ± 0.56	1.76 ± 0.64	1.64^{a} ± 0.44
	8 days after mating	0.68 ± 0.35	1.10 ± 0.42	1.73 ± 0.62	1.17^{a} ± 0.46
	18 days after mating	0.63 ± 0.10	1.31 ± 0.27	1.71 ± 0.49	1.22^{a} ± 0.29
	30 days after mating	0.95 ± 0.15	1.43 ± 0.25	1.07 ± 0.29	1.15^{a} ± 0.23
	Overall mean	0.86^{B} ± 0.25	1.65^{A} ± 0.44	1.32^{AB} ±0.40	

A, B: values in the same row bearing different superscripts significantly differed (P<0.05).

problem that might affect the performance of experimental animals as reported by **EL-Sayed *et al*. (2002).**

As presented in Table (3), regarding the effect of breeding period on protein fraction in the blood plasma, it clearly appears that values of total protein and globulin decreased ($P \leq 0.05$) till 8 days after mating then increased gradually up to 18 days after mating where it decreased again at the end of breeding period. Meanwhile, higher values of blood plasma albumin concentration and A/G ratio were obtained at 4 days after mating (Table 3). However, plasma total protein and its fraction concentrations were decreased at the end of breeding period. These findings are in agreement with those reported by **Abdel-Rahman *et al.* (2012)** on Suffolk X Ossimi ewes, **Mousa *et al.* (2012)** on Rahmani ewes and **Abu El-Ella and Kommonna (2013)** on Damascus does. **Abdel-Hafez (2002)** also reported that the pre-partum decrease in blood protein fractions might be attributed to the increase in fetus weight and an increase of protein breakdown required for gluconeogenesis. On the other hand, **Antunovic *et al.* (2002)** reported that the maternal serum protein concentration decrease due to an increased foetal growth, and especially the utilization of amino acids from maternal circulation for protein synthesis in foetal muscle. Also, **El-Sherif and Assed (2001)** found that the serum globulin concentration was decreased in early pregnancy. **Abdel-Ghani *et al*. (2003)** reported that the globulin concentration was decreased during pregnancy in buffaloes. Regardless of treatment, data in Table (3) indicated that the different breeding intervals had no significant effect on the concentrate of albumin and A/G ratio. Similar results were reported by **Marai *et al*. (2006)** and **Solouma *et al*. (2011)** who found that there were no significant difference in the concentration of the albumin and A/G ratio at pre-estrus, at estrus and 21 days after mating.

2.2- Glucose:

Data of glucose, concentrations (mg/dl) in plasma of does during breeding period are presented in Table (4).Values of glucose, 8 days after mating were significantly ($P \leq 0.05$) higher, meanwhile of estrous period were significantly ($P \leq 0.05$) lower. High values of blood plasma glucose concentration obtained in L-tyrosine treatments compared to the control does. The present results are in accordance with those obtained by **Abdel-Ghani *et al*. (2011)** and **Solouma *et al*. (2011).** The increase of glucose levels in blood may be related to the rapid rate of hydrolysis and absorption of the dietary carbohydrates in alimentary tract (**Abdel-Rahman *et al,* 2012).** This findings may be related to the effect of amino acid through activity of amylase that lead to increasing carbohydrates metabolism as a result of higher thyroid hormones secretion (**Abdel-Ghani *et al*., 2011)** Additionally, the increase in blood glucose could be a response to thyroid hormones and may also be attributed to the increased carbohydrates metabolism (**Harper *et al*., 1980**). Thyroid hormones are known to increase gluconeogensis and /or plasma glucose concentration in blood (**Cole *et al.*, 1994**).

2.3- Urea and creatinine

Blood plasma urea-N and creatinine concentrations in treatments groups (regardless of breeding period) recorded are shown in (Table 4). It can be observed that the concentrations of urea-N decreased as a result of L-tyrosine treatments compared to those of untreated (control). These differences may be due to the reduction of ammonia concentration released through the microbial fermentation in rumen of lambs fed protected protein. Subsequently, decreasing the observed ammonia via the ruminal wall, which converted to urea in liver, resulted in a lower level of urea in the blood of sheep fed protected protein (**El-Ayek *et al*., 1999**). In addition, **El-Shabrawy (2004)** found that the effect of protected protein method led to significant (P<0.01) reductions in urea-N concentration as a result of heat or formaldehyde treated diets in comparison with untreated one. Lower concentration in plasma urea-N of does in response to L- tyrosine administration could be considered as indicator of better nitrogen metabolism and utilization of protein. These results are also in agreement with those reported by **Abdel-Ghani *et al*., (2011).**

Table (4): Blood plasma glucose, urea-N and creatinine of Zaraibi does during breeding period as affected by L-tyrosine adminstration.

Blood components	Breeding period (days)	Treatments			Overall mean
		G1 (Control)	G2 (1.0gm)	G3 (1.5gm)	
Glucose (mg/dl)	Pre estrous period	31.16 ± 9.52	24.77 ± 3.56	36.01± 8.76	30.65^{b} ± 7.28
	Estrous period (at mating)	30.77 ± 4.94	15.37 ± 3.24	31.95±11.70	26.03^{b} ± 6.63
	4 days after mating	24.31 ± 5.17	39.84 ± 9.82	24.35± 5.50	29.50^{b} ± 6.83
	8 days after mating	27.10 ± 7.11	47.88 ± 14.20	40.41±12.77	38.46^{a} ±11.36
	18 days after mating	27.63 ± 12.46	45.74 ± 11.77	31.51± 5.91	34.96^{ab} ±10.05
	30 days after mating	20.64 ± 3.96	39.03 ± 10.63	44.33±14.59	34.67^{ab} ± 9.73
	Overall mean	26.93^{B} ± 7.19	35.44^{A} ± 8.87	34.76^{A} ±9.87	
Urea (mg/dl)	Pre estrous period	90.16 ± 6.91	87.38 ± 7.34	72.59 ± 7.34	83.38^{a} ± 7.28
	Estrous period (at mating)	91.77± 5.87	62.84 ± 8.26	58.61 ± 8.15	71.07^{b} ± 6.63
	4 days after mating	74.73± 5.25	70.56 ± 8.07	64.81 ± 3.82	70.03^{b} ± 6.83
	8 days after mating	70.78±5.95	70.46 ± 7.24	61.38 ± 5.24	67.54^{b} ±11.36
	18 days after mating	83.11± 7.87	76.62 ± 8.13	75.42 ± 5.97	78.38^{ab} ±10.05
	30 days after mating	76.59± 6.93	77.84 ± 2.04	73.69 ± 4.38	76.04$^{a\ b}$ ± 9.73
	Overall mean	81.19^{A} ± 6.46	74.28^{AB}± 6.85	67.75^{B} ± 5.82	
Creatinine (mg/dl)	Pre estrous period	0.89 ± 0.29	0.79 ± 0.07	0.52 ± 0.04	0.73^{a} ± 0.13
	Estrous period (at mating)	0.95 ± 0.32	0.54 ± 0.08	0.73 ± 0.10	0.74^{a} ± 0.17
	4 days after mating	0.85 ± 0.10	0.47 ± 0.04	0.48 ± 0.04	0.59^{b} ± 0.06
	8 days after mating	0.74 ± 0.12	0.58 ± 0.09	0.60 ± 0.04	0.64^{ab} ± 0.08
	18 days after mating	0.75 ± 0.07	0.72 ± 0.15	0.53 ± 0.09	0.67^{ab} ± 0.10
	30 days after mating	1.02 ± 0.27	0.60 ± 0.07	0.52 ± 0.06	0.71^{a} ± 0.13
	Overall mean	0.87^{A} ± 0.20	0.61^{B} ± 0.08	0.56^{B}± 0.06	

^{A},^{B}: values in the same row bearing different superscripts significantly differed (P<0.05).
$^{a, b,}$: values in the same column bearing different superscripts significantly differed (P<0.05).

Regarding the effect of breeding period on urea –N concentration in the blood plasma, it clearly appears that values of urea –N decreased (P ≤ 0.05) till 8 days after mating where it increased gradually till 18 days after mating and decreased again at the end breeding period.

Creatinine is considered as the major metabolite produced from protein catabolism. Lower creatinine concentrations in plasma of does treated with L-tyrosine (Table 4) may be due to higher utilization of dietary protein in does of L-tyrosine administration as compared to the control. These results are agreement with those of **Solouma *et al*. (2011)** reported that creatinine concentrations decreased in the serum of ewes fed protected protein as compared to the control. Generally plasma creatinine level is a useful indicator of glomerular filtration in the kidney.

Meanwhile, higher (P ≤ 0.05) values of blood plasma creatinine were obtained in estrous period as compared the other breeding period (Table 4). Moreover, plasma creatinine concentrations were increased ($P \leq 0.05$) at the end of breeding period. The present results are in agreement with results by **Marai *et al*. (2006)** who found the creatinine concentration showed significantly higher values at estrous in comparison with the other breeding period and in disagreement with the results by **Solouma *et al*. (2011)** who reported that the effect of breeding period on urea-N and creatinine concentrations were not significant. The quantity of creatinine formed each day depends on the total body content of creatine, which in turn depends on dietary intake, rate of synthesis of creatine, and muscle mass (**Gluseppe *et al*., 2009**).

3. Some blood metabolites between pregnant and non pregnant does as result of L-tyrosine administration:

3.1- Protein metabolism:

Data of total protein, albumin, urea and creatinine concentrations in plasma of pregnant and non pregnant does are presented in Table (5). Lower concentrations ($P \leq 0.05$) of total protein and urea and higher non significant concentrations of albumin and creatinine as compared to non pregnant does were observed as a result of L-tyrosine administration (Table 5) . Decreased plasma total protein in pregnant does may be due to an increased foetal growth and especially the utilization of amino acids from the maternal circulation for protein synthesis in the foetal muscles (**Antunovic *et al*. 2002**). The present results are in agreement with the results obtained by **Brzostowski *et al* (1996)** who showed decreased protein concentration during gestation period. These results disagrees with the results reported by **El-Sherif and Assad (2001) and Meziane (2001)** who reported a significant increase of total protein in pregnant ewes. The lowest urea and highest creatinine values of pregnant does might reflect a difference in protein metabolism associated with the presence of the foetus. In addition, changes in plasma creatinine and urea concentrations might be explained if muscle mass increased secondary to decreased muscle catabolism during pregnancy (**Fazio *et al*., 2011)**. While, **El-Sherif and Assad (2001)** in Barki ewes stated that urea level started to rise during 10^{th} week of pregnancy. So, the increase in serum creatinine levels could be attributed to the development of the foetal musculature, which is well documented in ewes (**Roubies *et al.*, 2006**).

3.2- Energetic metabolism:

Data of total lipid, glucose and cholesterol concentrations in plasma of does pregnant and non pregnant as a result of L-tyrosine administration presented in Table (5). In blood of pregnant does significant ($P \leq 0.05$) increase in concentrations of total lipids and cholesterol and significantly ($P \leq 0.05$) lower concentrations of glucose were observed as compared to non pregnant does. The increase of plasma total lipids in pregnant does could be ascribed to the higher levels of free fatty acids (FFA) in pregnant than non-pregnant does, caused by increased level of cortisol due to the stress induced by pregnancy. These results are in agreement with the result reported by **Gluseppe *et al*., (2009**). The increased sensitivity of ewes to epinephrine hormone, leads to the increase in serum FFA concentrations in late gestation (**Revell *et al*. 2000**). In addition, **Schlumbohm *et al*. (1997)** reported that the elevated level of total lipids in late gestation compared to *dioestrus* is probably due to the reduced insulin-mediated inhibition of lipolysis observed in late pregnancy.

Significant decrease of plasma glucose in pregnant does as compared to non pregnant may be to associated with fetus development and mobilization of maternal glucose to fetal blood circulation (**Jacob and Vadodaria, 2001 and Antunovic *et al*., 2011**). These results are in agreement with those reported by **Wells *et al*. (1999)** who suggested that the decrease in serum concentration of glucose with the progression of pregnancy might be due to the increased demand for fetal growth. Moreover**, Waziri *et al.* (2010)** concluded that glucose has lower values in pregnant ewes compared with empty ones. However, **Firat and Ozpinar (1996)** did not mention any significant differences in blood glucose during pregnancy; this observation is supported also by **Radostits *et al*.** (2000) who reported lower values than those reported by **Shetaewi and Daghash (1994).**

Significant increase of plasma cholesterol concentrations in pregnant does as compared to non pregnant. These results are in agreement with **Balikci *et al* (2007)** who reported gradual increase ($P \leq 0.05$) of cholesterol levels during pregnancy compared with values obtained in non pregnant. **Al-Dewachi (1999)** pointed a high cholesterol level in pregnant ewes compared to empty ones. In addition**, Waziri *et al.* (2010)** attributed that the increase of plasma cholesterol in pregnant does to the physiological alteration of endocrine function. Furthermore the significant increase of cholesterol observed in the present study could also be a factor contributing to inhibiting glucose synthesis or, could be responsible for enhancing glucose uptake by the body cells. **Tanaka *et al*., (2007)** observed that no significant difference in serum cholesterol has been reported between pregnant ewes and empty ones**.**

3.3- Hepatic functionality:

Significant decreased concentrations of plasma triglyceride are found in this study in pregnant does as compared to non pregnant (Table 5). These results are in agreement with the results reported by **Gluseppe *et al*., (2009**) in ewes. The significant decrease in serum triglyceride could be explained as the effect of increased lipolysis which is hormonally regulated and not an expression of energy deficiency. The adipose tissue metabolism is strictly related to insulin, which stimulate lipogenesis in pregnant ewes (**Schlumbohm *et al*., 1997**). These results are in disagreement with **Antunovic *et al*. (2011) and Deghnouche *et al*. (2013)** who reported that the highest concentrations of triglyceride in the blood of the ewes during pregnancy comparing to the non-pregnant ewes and can be explained as a consequence of heavier transport of the lipoproteins or energy deficiency in a meal. The changes of Plasma AST, ALT and ALP between pregnant and non pregnant does were not significant. This indicate that during pregnancy, the liver (AST and ALT) was not clinically affected. These results are in agreement with the reported by **Waziri *et al.* (2010).**

3.4- Mineral metabolism:

Blood plasma of calcium, phosphorus and Zinc in pregnant and non pregnant does are presented in Table (5). Mineral substances join the structures of important enzymes and proteins. In blood of pregnant does were lower ($P \leq 0.05$) levels of calcium and Phosphorus but non significantly higher level of zinc as compared to non pregnant does were found. The significant ($P \leq 0.05$) decrease of Plasma calcium levels in pregnant as compared to non pregnant does are in agreement with the reported by **Liesegang *et al*. (2007).** These results may be related to the flux of calcium to the fetus or into milk resulting in significant decrease in serum calcium in goats and sheep (**Liesegang *et al*., 2007**). Some authors found that calcium levels increased (**Waziri *et al.* (2010)** during pregnancy**.** Also, the requirements of calcium for pregnancy are higher than those of maintenance, which increases the quantity of calcium required of tissue level and thereby increase calcium absorption from the gastro-intestinal tract of goats. In addition, the passage of calcium across the placenta is unidirectional; back transfer of this element is very limited, so, the mobilization from bone and the increased absorption from the gastrointestinal tract are required to re-establish homeostasis. Also it is true that the requirement of calcium and phosphorus depends also on the physiological status and on the animal's productivity (**Brezezinska and Krawczyk, 2009**).

As shown in Table (5), a significant ($P \leq 0.05$) decrease of Plasma Phosphorus levels in pregnant as compared to non pregnant does (Table 5). These results are in agreement with the result reported by **Antunovic *et al*. (2011)** and **Pinar *et al*. (2009).** Phosphorus is known as a component of phospholipids, which are important in lipid transport and skeleton and dent formation (**Krajnicakova *et al*., 2003**). Although, some researchers reported that no significant differences were observed at the phosphorus levels at different stages (**Krajnicakova *et al*., 2003).** Other researchers informed that Phosphorus level during pregnancy significant increase in does and ewes (**Ozyurtlu *et al*., 2007).**

Table (5) Changes of some blood metabolites between pregnant and non pregnant as a result of L-tyrosine administration.

Blood component	Non pregnant	Pregnant
Protein metabolism		
Total protein (g/dl)	8.64 [a] ± 0.85	7.97 [b] ± 0.10
Albumin (g/dl)	4.36 [a] ± 0.34	4.58 [a] ± 0.21
Urea (mg/dl)	76.59 [a] ± 7.56	70.64 [b] ± 0.91
Creatinine (mg/dl)	0.65 [a] ± 0.04	0.72 [a] ± 0.18
Energetic metabolism		
Total lipids (g/dl)	387.45 [b] ± 44.94	410.56 [a] ± 39.08
Glucose (mg/dl)	39.37 [a] ± 4.22	24.21 [b] ± 3.45
Cholesterol (g/dl)	37.34 [b] ± 5.21	60.38 [a] ± 6.48
Hepatic functionality		
AST (U/L)	21.09 [a] ± 4.56	20.11 [a] ± 3.28
ALT (U/L)	39.07 [a] ± 0.73	38.78 [a] ± 1.06
Triglyceride (g/dl)	75.93 [a] ± 6.13	56.94 [b] ± 9.00
Alkaline phosphates (mg/dl)	0.48 [a] ± 0.04	0.44 [a] ± 0.01
Mineral metabolism		
Calcium (Ug/dl)	26.55 [a] ± 3.30	22.25 [b] ± 4.53
Phosphorus (Ug/dl)	7.45 [a] ± 0.73	6.87 [b] ± 0.09
Zinc (Ug/dl)	106.45 [a] ± 12.64	99.67 [a] ± 18.33

[a,b]: values in the same row bearing different superscripts significantly differed ($P<0.05$).

CONCLUSIONS

From the present results it can be concluded that the does received oral dose of L-tyrosine at levels of 1.0 or 1.5 gm / 10 kg body weight at different time of breeding periods led to changes in most plasma metabolites, which could be considered as indicator for the physiological status of animal and improve of milk yield and composition first 12 weeks of lactation.

REFERENCES

Abdel-Ghani, A.A.; G.M.A. Solouma; A.K.I. Abd Elmoty; A.Y. Kassab and E. B. Soliman (2011). Productive performance and blood metabolites as affected by protected protein in sheep. J. of Anim. Sci. 1: 24-32.

Abdel-Ghani, L.; Singh, C. and Singha, S. P. S. (2003). Effect of advanced pregnancy and early lactation on the changes in protein profile of plasma in Murrah Buffaloes. Indian. J. Anim. Sci., 73: 1031 – 1032.

Abdel-Hafez, M. A. M. (2002). Studies on reproductive performance in sheep. Ph. D. Thesis, Fac. Agric. Zagazig Univ. Egypt.

Abdel-Khalek, A.F.; A.F. Mehrez and F.A. Omer (2000). Effect of yeast culture (Lacto-Sacc) on rumen activity, blood constituents and growth of suckling Friesian calves. Proc. Conf. Anim. Prod. In the 21th Century, Sakha, 18-20 April 2000: 201-210.

Abdel-Rahman, H; G.A. Baraghit; A.A. Abu El-Ella; S.S. Omar; Faten F. Abo Ammo and O.F. Komonna (2012). Physiological responses of sheep to diet supplementation with yeast culture. Egypt J. of Sheep & Goats Sciences, Vol 7 (1): 27-38.

Abu El-Ella, A.A. and O.F. Kommonna (2013). Reproductive performance and blood constituents of Damascus goats as affected by yeast culture supplementation. Egyptian J. of Sheep and Goats Sci.8:171-178.

Al-Dewachi OS. (1999). Some biochemical constituents in the blood serum of pregnant Awassi ewes. Iraqi. J. Vet. Sci. 12:275–279.

Aly, M.T.A. (2005). Effect of rumen-protected amino acids supplementation to the diets on dairy animals performance. Ph.D Thesis. Faculty of Agriculture, Ain Shama University, Cairo.

Antunovic, Z.; **D Sencic.; M. Šperanda and B. Liker** (**2002).**Influence of the season and the reproductive status of ewes on blood parameters. Small Ruminant Research, 45: 39-44.

Antunovic, Z.; J. Novoseleci; H. Sauerwnin; M. Speranda; M. Vegar and V. Pavic (2011). Blood metabolic profile and some of hormones concentration in ewes during different physiological status. Bulgarian Journal of Agricultural Science, 17 (5) : 687-695.

A.O.A.C.(1990). Association of Official Analytical Chemists. Official Methods Analysis 15^{th} ed. Washington DC, USA.

Balikci, E.; A. Yildiz and F. Gurdogan (2007). Blood metabolite concentrations during pregnancy and post-partum in Akkaraman ewes. Small Rum. Res. 67, 247-251.

Bartels, H. (1971). Colorimetric determination of creatinine. Chem. Acta, 32: 81.

Brezezinska, M. and M. Krawczyk (2009). Changes of the mineral profile of Serum of goats in various physiological states. Journal of Elementology.14, 649–656.

B**rzostowski H; S.Milewski; A.Wasilewska and Z. Tanski (1996).** The influence of the reproductive cycle on levels of some metabolism indices in ewes. Arch. Vet. Polonic. 35:53–62.

Cole, N.A.; R.H. Gallavan; S.L. Rodiguez and C.W. Purdy (1994). Influence triiodothyronine injection on calf immune response to an infection bovine rhinotracheitis virus challenge and nitrogen balance of lamb. J. Anim. Sci. 72:1263.

Deghnouche, K.; M. Tlidjane; T.Meziane and A. Touabti (2013). Influence of physiological stage and parity on energy, nitrogen and mineral metabolism parameters in the Ouled Djellal sheep in the Algerian Southeast arid area. African J. Agric. Res. 8 (18):1920-1924.

Doumas, B.T. **and Biggs, H.G. (1972a).** The colorimetric determination of total protein in serum or plasma. Standard Methods of Clinical Chemistry. Vol 7. Academic Press, New York.

Doumas, B.T. **and Biggs, H.G. (1972b).** The colorimetric determination of albumin in serum or plasma. Standard Methods of Clinical Chemistry. Vol 7. Academic Press. New York.

Duncan, D. B. (1955). Multiple range and multiple F-test. Biometrics, 11: 1- 42.

El-Amrawi, G.A. (2008). Effect of Theriogon in concentration of testosterone in buffalo-bulls. 16^{th} international Congress on Animal Reproduction (ICAR) 12-16 Juli Budapest. Hungura.

El-Ayek,Y.; A.Z. Mehrez; S.A. El-Ayouty; and H.M. El-Shabrawy (1999). Influence of source of protein and protection methods on the performance of lactation Friesian cows. J. Agric. Sci. Mansoura Univ., 24: 3891.

El-Battawy, K.A. (2006). Reproductive and endocrine characteristics of delayed pubertal ewe-lambs after melatonin and L-tyrosine administration. Reproductive in Domestic Animals, 41(1): 1-4.

El-Reweny, A.M.S. (2006). Effect of protected protein on productive and reproductive performance in sheep. Ph. D Thesis. Faculty of Agriculture, Tanta University, Tanta.

El-Sayed, H. M.; El-Ashry, M. A.; Metwelly; H.M., Fadel, M. and M.M. Khorshed (2002). Effect of chemical and biological treatments of some crop-residues on their nutritive value:3-Digestion coefficient, rumen and blood serum parameters of goats. J. Nutrition and Feeds, 5(1): 55-69.

El- Shabrawy, H.M. (2006). Performance of goats fed protected protein during gestation and lactation. Egyptian Journal of Sheep, Goats and Desert animals Sciences, 1, 213-232.

El- Shabrawy, H.M.; A.Z. Mehrez; and E.I. Shehata (2004). Evaluation of alfalfa hay and silage in complete diets for lactating goats. Egyptian J. Anim. Prod. (Suppl. Issue)41:181.

El-Shaer, E. K. H. I. (2003). Nutritional studies in ruminants. "Effect of yeast culture supplementation and concentrate: roughage ratio on performance of growing lambs." Ph. D. Thesis, Fac. Agric., Mansoura Univ.

EL-Sherif M.M.A.and F. Assad (2001). Changes in some blood constituents of Barki ewes during pregnancy and lactation under semi arid conditions. Small Ruminant Research 40, 269-277.

Fazio E.; P. Medica; E. Galvano; C.Cravana and A.Ferlazzo (2011). Changes of cortisol and some biochemical patterns of pregnant and barren jennies (*Equus asinus*). Veterinarski Arhiv 81, (5), 563-574, 2011.

Firat A. and A. Ozpinar (1996). The study of changes in some blood parameters (glucose, urea, bilirubin, AST) during and after pregnancy in association with nutritional conditions and litter size in ewes. Tr. J.Vet. Anim. Sci. 20:387–393.

Gabr, Sh.A. **(2012)**. Reproductive performance and milk yield of friesian dairy cows affected by L-tyrosine treatment during early postpartum period. Life Sci. J. 9: 4486- 4489.

Gluseppe, P.; C. Giovanni; G. Claudia; G. Fortunata; C.R. Sebastiano; Z. Alessandro and P. Pietro (2009). Selected biochemical serum parameters in ewes during pregnancy, post-parturition, lactation and dry period. Animal Science Papers and Reports. 27 (4): 321-330.

Harper, H.A.; V.W. Rodwell; and P.H. Mayes (1980). *Review of Physical Chemistry***,** 17th Edition, Longer Medical Publication, Los Altos, 34, 511.

Henry, R.J. (1965). ***Clinical chemistry. Principles and Technics*****, P: 293.**

Hoon, J.H.; M.J. Herselman; M. Heedern and A.P.Pretorius (2002). The effect of bypass protein supplementation on the reproductive performance of Merino sheep on eastern mixed karoo veld. Gadi. Agric. Za. 14: 1-7.

Jacob, N. and V. P. Vadodaria (2001). Levels of glucose and cortisol in blood of Patanwadi ewes around parturition. *Ind. Vet. J.*, **78:** 890-892.

Kaneko, J.J.(1989). Clinical Biochemistry of Domestic Animals. Academic Press Inc. London

Kholif, S. M. M. (2001). Effect of biological treatments of low quality roughage on milk yield and composition.Ph.D. Thesis, Fac. Agric., Ain-Shams Univ. Egypt.

Krajnicakova, M.; N.S. Kovae; M.Kostecky; I.Valocky; I.Maraeek; I. Sutiakova and L. Lenhardt (2003). Selected clinico-biochemical parameters in the puerperal period of goats. Bull. Vet. Res. Inst. Pulawy, 47:177-182.

Latif, M.G.A; G.A. Hassan; F. El-Nouty and B.S. Zaki (1988). Milk yield and composition of Barki and Rahmani ewes in summer and winter lactations. Alex. J. Agric. Res. 33:95-106.

Liesegang, A.; **J.Risteli and M. Wanner (2007).** Bone metabolism of milk goats and sheep during 2nd pregnancy and lactation in comparison to first lactation. Physiol. Anim. Nutr. 91:217-225.

Mahrous, A. A. and Abou Ammou, F. F. (2005). Effect of biological treatments for rice straw on the productive performance of sheep. Egyptian J. Nutr. Feeds, 8 (1) Special Issue : 529 – 540.

Marai, I.F.M.; A.A. El-Darawany; E.I. Abou-Fandoud and M.A.M. Abdel-Hafez (2006). Serum blood components during pre-oestrus, oestrus and pregnancy phases in Egyptian Suffolk ewes as affected by heat stress under conditions of Egypt. Egyptian J. Sheep, Goats and Desert Animals Sci.1:47.

Martin, J. B. (1980). Functions of central nervous system neurotransmitters in regulation of growth hormone secretion. Fed. Proc. 39:2902.

Mepham, T. B. (1982). Amino acid utilization by lactating mammary gland. J. Dairy Sci. 65:287.

Meziane T (2001). Contribution à l'étude de l'effet de la salinité de l'eau de boisson et d'un régime à base de paille chez les brebis de race Ouled Djellal dans les hauts plateaux sétifiens. Thèse Doctorat (Constantine), P. 162.

Mousa, Kh. M.; O. M. El-Malky; O.F.Komonna, and S. E. Rashwan (2012). Effect of some yeast and minerals on the productive and reproductive performance in ruminants**.** J. of American Sci. 8 (2): 291-303.

N.R.C.(1981). Nutrient Requirements of goats. National Academy of Science. National Research Council, Washington, DC, U.S.A.

Omima, M.K.; R.I. El-Sheshtawy and H.A. Sebra (2001). Effect of L-tyrosine and bovi C3 supplementation, sire breed and superovulation on some reproductive performance of Egyptian rabbit. J. Egypt Vet. Med. Assoc. 61 (6): 207-216.

Ozyurtlu, N.; S.Y. Gurgoze; S. Bademkran; A.Simsek; and R. Celik (2007). Investigation of some biochemical parameters and mineral levels in pre and post-partum period of Awassi ewes. Firat Univ. J. Health Sci., 21 (1): 33-36.

Peel, C. J., D. E. Bauman, R. C. Gorewit, and C.J. Sniffen (1981). Effect of exogenous growth hormone on lactational performance in yielding dairy cows. J. Nutr. 111:1662.

Pinar, T.; D. Semiha and C. Ebubekir (2009). Changes of some macro minerals and biochemical parameters in female healthy Siirt hair goats before and after parturition. J. of Anim. and Vet. Advances, 8 (3): 530-533.

Rae R. C. and J. R. Ingalls (1984). Lactational response of dairy cow to oral administration of Ltyrosine. J. Dairy Sci., 68: 1430-1438.

Radostits OM.; CC. Gay; DC. Blood and KW. Hinchcliff (2000). Veterinary Medicine, 9th ed. Harcourt Publishers Ltd., London, pp. 1417–1420.

Reitman, S. and Frankel, S. (1957). Colormetric GOT and GPT transminases determination. Amer. J. Clin. Path., 28: 57.

Revell, D.K.; S.F.Main; B.H.Breier; Y.H.Cottom; M.Hennies and S.N.Mccutcheon (2000). Metabolic responses to mid-pregnancy shearing that are associated with a selective increasein the birth weight of twin lambs. Domestic Animal Endocrinology 18, 409-412.

Roubies, N.; N. Panousis; A. Fytianou; P. D. Katsoulos; N. Giadinis and H. Karatzias (2006). Effects of age and reproductive stage on certain serum biochemical parameters of chios sheep under greek rearing conditions. J. Vet. Med. A, **53**: 277-281.

Schlumbom C.; H. P. Sporleder; H. Gurtler and J. Harmeyer (1997). The influence of insulin on metabolism of glucose, free fatty acids and glycerol in normo- and hypocalcaemic ewes during different reproductive stages. Deutsche Tierarztliche Wochenschrift 104: 359-365.

Shaw and Anni, (2002). Basics of ruminants digestion: Echo Technical Network; appeared in EDN 76 July.

Shetaewi M. and HA. Daghash (1994). Effects of pregnancy and lactation on some biochemical components in the blood of Egyptian coarse-wool ewes. Inst. Vet. Med. J. 30:64–73.

Solouma, G.M.A.; A.K.I. Abd Elmoty; A.Y. Kassab; A.A. Abdel-Ghani and E.B. Soliman (2011). Change in serum blood components as affected by breeding period and protected protein. Egyptian J. Nutri. and Feed, 14: 31-38.

SPSS (1999). Statistical package for the social sciences, Release 10, SPSS Inc., Chicago, USA.

Talha, M.H.; A.A. Abu El-Ella and R.I. Moawd (2005). Effect of feeding diets containing different proportions from peanut vines hay on productive and reproductive performance of sheep. Egyptian J. Nutrition and Feeds 8 (1): 379-403.

Talha, M.H.; R.I. Moawd; A. A. Abu El-Ella and G.H. Zaza (2009). Effect of some feed additive on rearing calves from birth to weaning:1- Productive performance and some blood parameters. J. Agric. Sci. Mansoura Univ., 34: 2611-2631.

Tanaka Y.; H. Mori; A. Tazaki; S. Imai; J. Shiina ; A. Kusaba; T. Ozawa; T. Yoshida; N. Kimura; T. Hayashi; PR. Kenyon; H. Blair and T. Arai (2007). Plasma metabolite concentrations and hepatic enzyme activities in pregnant Romney ewes with restricted feeding. Res. Vet.Sci. 85:17–21.

Waziri, M.A.; A.Y. Ribadu and N. Sivachelvan (2010). Changes in the serum proteins, hematological and some serum biochemical profilesin the gestation period in the Sahel goats. Veterinarski Arhiv 80 (2): 215-224, 2010

Wells MY; CP. Decobecq; DM. Decouvelaere; C. Justice and P. Guttin (1999) Changes in clinical pathology parameters during gestation in the New Zealand white rabbit. Toxicol Pathol, (27):370–9

Wurtman, R. J. (1982). Nutrients that modifybrain function. Sci. Am., 246:50-59.

Yassin. M.; M.A. El-Barody; M.G.K. Gabr; Safaa, N. Abdel-Azeem; A.K.I. Abd Elmoty and A.A.Abd El-Hakeam. (2011). Post lambing productive and reproductive performance of Ossimi ewes as affected by theriogon oral administration during three sequence breeding seasons. Egyptian Nutri, and Foods 14 (3): 359-365.

الملخص العربى

الأداء الانتاجى والتناسلى للماعز المتأثرة بالمعاملة بـ L-tyrosine

2: الأداء الانتاجى وبعض قياسات الدم فى اناث الماعز الزرايبى

أمجد أحمد أبو العلا[1]، عماد صلاح الجوهرى[1] ،طارق محمد عبد الخالق[1] ، عبد الشافى محمد عبد السميع [2]

1- معهد بحوث الانتاج الحيوانى - مركز البحوث الزراعيه - وزارة الزراعه - مصر

2- - قسم الانتاج الحيوانى - كلية العلوم الزراعيه البيئية بالعريش - جامعة قناة السويس

استخدم فى هدة الدراسة 30 عنزه زرايبى بمتوسط عمر 2-4 سنوات ومتوسط الوزن 35-40 كجم ودلك لدراسة تأثيرتجريع ل- تيروزين على الأداء الانتاجى وبعض قياسات الدم . قسمت الحيوانات عشوائيا الى ثلاث مجموعات (10 بكل مجموعه) ، المجموعه الأولى هى الضابطه ، المجموعه الثانية تم تجريعها بـ 1جم ل- تيروزين لكل 10 كجم وزن حى، فى حين أن المجموعه الثالثه تم تجريعها بـ 1.5جم وذلك قبل أسبوع من بداية موسم التلقيح. وجرعة أخرى بعد ثلاث ايام من الولاده. أظهرت النتائج أن معاملة اناث الماعز الزرايبى بـ 1.5 جم لـ تيروزين / لكل رأس (مجموعه الثالثه) نتج عنه تحسن معنوى فى الانتاج اليومى من اللبن عن المجموعه الثانيه (1 جم لـ تيروزين لكل رأس) و المجموعه الأولى (الكنترول) . بالاضافة الى ذلك أدت المعامله بـالتيروزين الى زيادة معنويه فى نسبة وكمية كل من الدهن وبروتين والاكتوز فى اللبن مقارنة بمجموعة الكنترول.كما أظهرت النتائج ان المعاملة بالتيروزين ادى الى ارتفاع معنوى فى نركيز كلا من والألبيومين والجلوكوز وانخفاض معنوى فى تركيز كلا من الجلوبيولين واليوريا والكرياتنينين مقارنة بالكنترول.كذلك لوحظ انخفاض معنوى فى تركيز كلا من البروتين الكلى والجولوبيولين واليوريا فى اليوم الثامن بعد التلقيح وتزداد معنويا فى اليوم الثامن عشر بعد التلقيح. كذلك لوجظ ان نركيز الجلوكوز كان أعلى معنويا فى اليوم الثامن بعد التلقيح واقل معنويا اثناء الشياع. ينما واضجت النتائج المتحصل عليها ان تركيز الكرياتينين كان اعلى اثناء فترة الشياع مقارنته مع باقى الفترات. كذلك لاتوجد اختلافات معنويه فى تركيز الألبيومين ونسبة الألبيومين/ جولوبيولين بين الفترات. وقد أظهرت النتائج وجود اختلافات معنويه بين الاناث العشار والغير عشار فى بعض مكونات الدم حيث لوحظ زياده معنويه فى تركيزات كلا من الدهون الكليه والكوليسترول ينما ظهر انخفاض معنوى فى تركيزات كلا من البروتين الكلى واليوريا والجلوكوز والتراجليسريد والكالسيوم والفوسفور فى الاناث العشار مقارنته بالاناث الغير عشار. كذلك لاتوجد اختلافات معنويه فى مستويات كلا من الألبيومين و الكرياتنين AST , ALT والألكالين فوسفاتيز والزنك بين الاناث العشار والجلد .

من نتائج هذه الدراسه يتضح معاملة اناث الماعز بـ لـ - تيروزين عند مستوى 1.0 أو 1.5 جرام / لكل 10 كجم وزن جى ادى الى حدوث تغيرات فى مكونات الدم خلال فترة التزاوج وتحسن فى انتاج اللبن اليومى ومكوناته خلال فترة الفطام.