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EFFECT OF VITAMIN E SUPPLEMENTATION ON THE PRODUCTIVE PERFORMANCE OF RAHMANI SHEEP

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SUMMARY

The present study was conducted during the period from (September 2012 to April 2013) at the experimental farm station, belongs to Anim. Prod. Dept., Fac. of Agric., Al-Azhar Univ. Thirty pregnant Rahmani ewes with an avg. 33.7 kg LBW and 3 years old age were used to investigate the effect of vitamin E daily supplementation to pregnant ewes at late gestation and early lactation on the productive performance of treated ewes and their offsprings. Experimental animals were randomly assigned (28 days prepartum) to three nutritional groups; the 1st one served as a control (nil vitamin E supplement). The 2nd and 3rd groups were daily and individually administrated 400 IU of α-tocopherol acetate (vitamin E), 28 days prepartum (T_1) and for 28 days pre and 28 days postpartum (T_2). Experimental animals were offered their daily requirements during pregnancy and early lactation according to NRC recommendations (1985). Results obtained showed that; supplementing pregnant ewes with vitamin E didn't lead to any positive influences on improving their daily milk yield or milk chemical composition, although there were significant differences among different experimental groups in daily milk yield. Ewes of T_2 recorded higher ($p<0.05$) daily milk yield (417 g /h/d) in compare with (348 g /h/d) for the control ewes group and (292 g /h/d) for T_1 ewes, respectively. Vitamin E supplementation to pregnant and lactating ewes didn't lead to significant differences in most of daily milk yield and chemical composition traits. Although, there were significant differences among different ewes groups in fat and SNF percentages in favor of the two supplemented ewes groups. Vitamin E supplementation to pregnant and lactating ewes didn't improve productive performance of both the two supplemented ewes groups and their progenies. Ewes of T_1 group weaned more ($p<0.05$) kg of lambs, but without significant difference with those of the control group. Ewes of T_2 weaned lower ($p<0.05$) kg lambs. Ewes of T_2 and the control group one indicated more efficient feed utilization in compare with T_1 group. Vitamin E supplementation didn't improve ($p<0.05$) lambs productive performance. Although, there were significant differences among different lambs groups in lambs avg. weaning weight, daily gain and lambs feed conversion ratio. Lambs born to T_2 ewes consumed ($p<0.05$) higher milk intake (417 g/h/d), but lower feed conversion ratio (3.06 kg MI/kg gain), while lambs born to T_1 ewes consumed lower milk (292 g/h/d), but with an improved FC ratio (1.75 kg MI /kg gain). Lambs born to the control ewes group consumed (348 g/h/d), but with more efficient FC ratio (2.20 kg milk intake / kg gain) in comparison with the corresponding lambs born to T_2 ewes groups. Lambs born to T_1 supplemented ewes recorded higher ($p<0.05$) avg. weaning weight (13.73 kg/h) and faster daily weight gain (179 g/h/d), without significant difference with lambs born to the control ewes group (165 g/h/d), while lambs born to T_2 supplemented ewes indicated lower weaning weight (11.40 kg /h) and slower daily weight gain (141 g/h/d).

***Keywords**: Vitamin E, Rahmani sheep and productive performance.*

INTRODUCTION

Vitamin E is used to refer to a group of fat-soluble compounds that include both tocopherols and tocotrienols. Vitamin E is a feed additive authorized without a time limit under council directive for its use in all species as a nutritional additive; no maximum total levels of vitamin E in feeds are established in the Europian Union. Dietary vitamin E requirements for sheep are not clearly defined. The NRC (1985) recommends 10 to 70 IU of vitamin E/kg diet, which appears too based on levels to prevent white muscle disease. Kelleher (1991) concluded, after reviewing vitamin E studies both in human and animals, that vitamin E requirements was based on lymphocyte proliferation or, more generally, on immune function than an indicators to muscle degeneration. Nockels (1986) suggested that vitamin E at 6 to 20 times the NRC-recommended concentrations would improve the immune response of animals. Vitamin E as a dietary essential fat-soluble vitamin can enhance animal performance when provided in amounts above minimal requirements. Claims attributed to super nutritional provision of vitamin E vary from preventing cancer and cataracts in humans, to enhancing fertility in rats, improving immunity in swine, and preventing mastitis in dairy cows. The biological effects of vitamin E are predominantly seen in the prevention of resorption of fetuses, testicular degeneration, muscle dystrophy, anemia and encephalomalacia, the classical signs of vitamin E deficiency in animals. The influence of vitamin E on the immune system has also become an important issue (Politis *et al*., 1995 and 1996). Feeding during prepartum period is most important as it affects the reproductive performance of dairy animals. In order to resume normal fertility after parturition, adequate balance of protein, energy, trace minerals and antioxidant vitamins must be maintained even during dry period.

The aim of the present study was to investigate the effect of dietary supplemental vitamin E with sheep pre and post-partum on ewe's milk yield and composition and in turn its impact on lambs performance.

MATERIALS AND METHODS

The present study was carried out during the period from September, 2012 to April 2013 at the experimental farm station belongs to Animal Production Department, Faculty of Agric. Al-Azhar University, Nasr city, Cairo, Egypt. The effect of Vitamin E supplement to ewes during late pregnancy (28 days prepartum) and early lactation (28 days postpartum), and its influences on ewes daily milk yield and composition, besides ewes and lambs performance were determined.

Animals feeding and management:

Milk yield was recorded once weekly allover 8 weeks lactation period, starting from the third day post parturition. Lactating ewes were hand milked; while milk yield was recorded individually. A composite sample (10% of total daily milk yield) was immediately collected for further chemical analysis.
Thirty pregnant Rahmani ewes, with an average live body weight 37.7 kg and 3 years of age, were randomly assigned into three nutritional groups during late gestation (4 weeks prepartum). The first group served as a control (C) without Vitamin E supplement. The second group (T_1) was orally and daily administrated Vitamin E (1g of Rovimix E-40 %, 400 IU of α-tocopherol acetate; Roche Vitamins, Parsippany, NJ) in capsulated form during late gestation (28 days before the expected lambing date). The third group (T_2) was orally and individually administrated Vitamin E capsules for 28 days just before the expected lambing date and lasted for another 28 days postpartum (early lactation period). Experimental animals were housed in semi–opened pens, offered their daily requirements during pregnancy and lactation, according to NRC recommendations (1985). Concentrate feed mixture (14% CP and 60% TDN) in addition to green berseem (*Trifolium alexandrinum)* were offered to pregnant and lactating ewes in two equal meals at 09:00 and 15:00 hrs (Table 1), while fresh drinking water was freely available allover the day time. Different experimental groups were fasted weighed at the start of the study for two consecutive times and at biweekly intervals, thereafter until eight weeks after lambing. Ewes and lambs of each group were weighed at birth, while newborn lambs were ear tagged and births data were recorded.

Milk determination:

Lactating ewes of different experimental groups were daily hand milked 4 times after lambing (colostrum period) *i.e.* at 6, 24, 48 and 72 hrs, respectively, and at weekly intervals thereafter, until weaning. Louca *et al.,* (1974) provided lambs difference technique that was applied to determine ewes weekly milk yield. Representative weekly milk samples (10% of the total weekly yield) were collected to study ewe's milk chemical composition during 8 weeks collection period.

Experimental measurements:

Real changes in ewes live body weight of different experimental groups during late pregnancy, lambing and lactation; lambs daily gain from birth to weaning; ewes and lambs feed conversion ratio and ewes weekly milk yield during the rearing period (8 weeks lactation period) were routinely measured. Representative milk sample were performed to determine the milk chemical composition *i.e.* fat (Ling, 1956); total protein (Ling, 1963); total solids (A.O.A.C, 1990) and solids not fat (SNF) as the difference between total solids and fat content. Vitamin E (α-Tocopherol) concentrations (mg) in ewes rations (concentrate feed mix) and green berseem (*Trifolium alexandrinum*) were also assessed in the central laboratories of RCFF, Central Agric. Research laboratories, Ministry of Agric., Dokki, Giza). Chemical composition of concentrates and green fodder were analyzed to DM, OM, CP, CF, EE, NFE and ash contents according to A.O.A.C. (1990).

Statistical Analysis:

Data were statistically analyzed using GLM procedures using the statistical package software SAS version 9.1 (SAS Institute Inc., 2002, Cary, NC., USA). The data were analyzed by fitting effects of treatment (3 nutritional groups), effects of period (pre and postpartum) and the interaction between treatment and period. Differences between means were tested for significances using the LSD test, according to Duncan (1955) at the pre-set level of 5%.

RESULS AND DISCUSSION

Effect of vitamin E supplementation on the daily milk yield and its chemical composition:

Milk yield:

Data presented in Table (2) and Fig (1) showed the effect of Vit. E supplement on daily milk yield. There were significant differences among treated groups in daily milk yield. However, such results suggested that Vit. E supplementation did not have any significant effect on ewes milk yield when it added during the pre-partium, since the control group tended to yield higher (P<0.05) milk yield in compararison with T_1 (28 days pre-partum Vitamin E supplement).

On the other hand, there were significant differences among weeks of lactation on milk yield. Figures obtained pointed out to linear (P<0.05) decrease in ewes milk yield with the advance of season of lactation, while the peak of lactation curve lies between the 2^{nd} and 3^{rd} week of lactation *i.e.* 503 and 455 g/h/day. The lower (P<0.05) milk yield, *i.e.* 168 g/h/d, took place in the 8^{th} week of lactation, and represents as low as one third of the peak milk secretion.

Milk chemical composition:

Results obtained in Table (3) and Fig. (2, 3 and 4) pointed out to significant differences among treated groups in milk chemical composition in both fat and solids not fat (SNF) percentages. T_1 and T_2 yielded more (P<0.05) fat and SNF percentages without significant difference between both of them, 7.58 and 6.77% fat and 11.87and 11.96 % SNF, respectively. The higher insignificant fat percentage of T_1 might be related to the lower (P<0.05) milk yield of such group (292 g/h/d). There was a significant relationship between daily milk yield and fat percentage (r = -0.56). It was also obviously detected, that both of the control group and T_2 (those having higher P<0.05 milk yield), *i.e.* 348 and 417 g/h/day, respectively, tended to have almost similar insignificant fat percentages *i.e.* 6.76 and 6.77% fat percentages, respectively. On the other hand, both of T_1 and T_2 indicated higher (P<0.05) SNF (11.78 and 11.96%, respectively) in comparison with the control group. This result might be related to the insignificant differences detected in fat percentages for these supplemented groups. As for different milk elements, the chemical composition did not lead to any significant differences among treatments. Milk protein percentages ranged between 5.13 for the control to 5.52% for T_1; lactose percentages ranged between 4.34 and 5.55%, respectively; total solids (TS) ranged between 17.25 for the control to 19.31% for T_1, while ash contents pointed out to nearly constant values, ranged between 1.01 for the control to 1.10% for T_2, respectively. On the light of milk data chemical composition, it was concluded that dietary supplementation of pregnant and lactating ewes with vitamin E did not result in any significant impact on ewes milk chemical composition, since statistical differences for both of fat and SNF percentages are being mainly referred to significant variations in ewes daily milk secretion and the negative relationship between milk yield and fat percentage. Numerous scientific reports pointed out to insignificant effect of Vitamin E supplementation to lactating animals on milk chemical composition. According to Politis and Kwai-Hang (1988) and Pauselli *et al.* (2004), the only positive effect of dietary Vitamin E or/and Se supplementation on all milk chemical characteristics was mainly correlated to mammary glands health. The role of mammary health on milk quality, particularly its effect on somatic cells count, being of great value, since it is mainly interferes with cheese making properties and other better technological characteristics. Chiofalo *et al.* (1998) observed a significant decrease in somatic cells count in ewe milk treated with 200 IU /h/d of Vitamin E due to the better status of the mammary glands.

Effect of vitamin E supplementation on ewes' performance:

Results obtained in Table (4) and Figs. (5 and 6) revealed the effect of daily oral administration of vitamin E on ewes performance during late pregnancy and early lactation. It was obviously observed that vitamin E supplementation did not have any significant effect on most of animal performance traits, however it was shown that animals in T_1 and T_2 tended to maintain positive, but non-significant, live body weight after 8 weeks of lactation. On the contrary, ewes in the control group tended to lose insignificant live body weight. This result might not be attributed to a significant stress brought on ewes body condition, due to higher ($p<0.05$) milk secretion, since T_2 ewes yielded more significant amounts (417 g/h/d) in compare with the corresponding non supplemented control ewes (348 g/h/d). In contrast, the control group yielded significantly higher ($p<0.05$) milk in compare with the corresponding supplemented T_1 group (292 g/h/d). Results concerning, the average birth and weaned weight did not lead to any significant effect of vitamin E supplement on both traits, since the control ewes group tended to deliver insignificantly normal lambs (3.37 kg /ewe) in comparison with both of T_1 and T_2 groups. On the contrary, The control ewes weaned heavier significant ($P<0.05$) lambs, in comparison with T_2 group and without significant difference with T_1 group. Similar results were reported by Kott *et al.* (1998) who showed that lambs born to ewes supplemented with vitamin E had similar BW at birth and at 30 and 120 days postpartum compared to control ewes (without supplementation).

As for feed conversion ratio, results obtained (Table 4) indicated a significant differeces ($P<0.05$) among treated groups. T_2 group showed an efficient feed conversion ratio (4.14 kg dry matter intake (DMI) /kg milk yield) in comparison with both of the control and T_1 groups, respectively, *i.e.* 5.11 and 5.86 kg DMI /kg milk secretion. However, such results might lead to attribute such significant improvement ($P<0.05$) in feed conversion ratio of T_2 group to the significant milk secretion of such group, rather than to any other interacted factors. It was clearly noticed a higher ($P<0.05$) FC ratio in ewes control group (5.11 kg DMI /kg milk secretion) in comparison with lower ($P<0.05$) feed efficiency of T_1. These results were previously confirmed by former findings, since vitamin E supplementation to both the two treated group did not result in any improvement in daily milk yield or milk chemical composition, respectively (Tables 2 and 3).

Effect of vitamin E supplementation to pregnant and lactating ewes on the performance of their offsprings:

Results obtained in Table (5) and Fig (7) indicated insignificant differences among treated groups in birth weight (kg). However, lambs of T_1 and T_2 had relatively insignificant heavier birth weight. Results might lead to assume insignificant effect of vitamin E supplement to their dams on birth weight. Results obtained referred to significant differences among treated groups in weaning weight, total lambs gain and their average daily gain. However, lambs born to control and T_1 ewes groups indicated heavier ($P<0.05$) weaning weight and lamb's total weight gain, and faster daily gain in comparison with T_2 supplemented ewes, respectively. Figures obtained were 12.58 kg, 9.22 kg and 165 g/h/d for the control lambs and 13.73 kg, 10.03 kg and 179 g/h/d for T_1 and 11.40 kg, 7.92 kg and 141 g/h/d for T_3, respectively. Such results might lead to confirm the previous observation, concerning the insignificant role of vitamin E supplemented to different experimental ewes groups on the performance of their offsprings, since T_2 indicated lower ($P<0.05$) growth performance values. However, matching the daily milk intake with the corresponding lambs daily gain, might lead to favor lambs birth weight rather than lambs daily milk intake as the most important factor controlling the performance of newborn lamb. Lambs born to T_1 showed insignificant heavier births, higher weaning weight and faster gain, but lower ($P<0.05$) daily milk intake (292 g/h/d) in comparison with T_2, which showed lower growth performance, but higher ($p<0.05$) milk intake (417 g/h/d), respectively. On the contrary, lambs born to control ewes indicated a lower insignificant birth weight, higher insignificant weaning weight and daily gain, with higher milk intake (348 g/h/d) in comparison with T_1, however, they showed higher growth performance, but lower than that corresponding to T_1 group (lower $P<0.05$ milk intake /lamb/d).

Results of feed conversion (FC) for different lambs groups during early lactation indicated significant differences among treated groups. Feed conversion in terms of average daily milk intake and lambs daily gain, indicated significant differences among different lambs groups. Group T_1 was favored as the most efficient group in converting milk to growth (175 g milk intake/100 gm daily gain) and without significant difference with the control group. This might be attributed to the faster daily gain of T_1 lambs groups, irrespective of their lower ($P<0.05$) milk intake that due to their insignificant higher birth weight. The control lambs group indicated higher ($P<0.05$) FC ratio in comparison with T_2, and without significant difference with T_1, regardless of their higher ($P<0.05$) milk intake, *i.e.* (more than that of T_1). Such result might lead to favor and confirm our previous observation regarding the positive significant effects of lamb's birth weight on their performance, thereafter. The better FC ratio of an animal was assumed to be controlled by both of daily milk intake and/or lambs heavier weight and faster daily gain. As shown previously that lambs born to the control ewes showed lower insignificant birth weight, but higher available ($P<0.05$) daily milk intake in compare with the corresponding lambs born to T_1 ewes. On the other hand, lambs born to T_1 ewes indicated heavier birth weight and faster daily gain, but lower ($P<0.05$) milk intake.

General discussion and recommendation:

Results obtained in Tables (2, 3, 4 and 5), concluded the insignificant effects of vitamin E supplementation on most of the productive performance traits, hence leading to insignificant differences among treated groups. The matter which might lead to conclude that the daily feed requirements provided to different experimental groups satisfied animals daily needs of vitamin E.

Chemical analysis of concentrate feed mixture and available green berseem (Table 1) as daily feed allowances for different experimental groups seemed to fulfill animals daily vitamin E requirements and were higher than the daily requirements recommended by NRC (1985), *i.e.* 10 -70 IU/ kg diet. Hence, providing experimental ewes under the study with an excessive dose of vitamin E (400 IU/h/d) as α-tochopherol acetate was assumed to be useless and of no necessity. The NRC (1985) recommended that ewes of body weight heavier than those used in our study (Targhee breed) should receive 28 IU daily; therefor vitamin E supplemented ewes groups (T_1 and T_2) received approximately 14 times of vitamin E more than that recommended by NRC (1985). However, there was insignificant impact of such supplement on either ewes or their offsprings performance. Such observation might lead to assume, possibly limited restriction of vitamin E absorption when given orally to experimental ewes groups. Another explanation for lack of significanct among experimental groups due to vitamin E supplement to pregnant ewes was that reported by Yang *et al.* (2002) who claimed that there was a possible interaction between dietary β carotene derived from green fodder (green berseem in our study) and α-tochopherol (vitamin E). Hence, high concentrations of vitamin E supplementation may interfere with the absorption of β carotene, and as β carotene and α-tochopherol are bound to lipoproteins when transported in the blood, they may compete with each other for the binding sites on the lipoprotein molecules. Such hypothesis might explain to somehow, the negative response of supplemented ewes groups and their offsprings to vitamin E oral supplementation. According to Pellett *et al.* (1994), the intake of one fat-soluble vitamin can interfere with the uptake or utilization of other fat-soluble vitamins.

On the light of the present results, it was concluded that natural feed resources provided to local ewes are sufficient enough to meet the daily requirements of vitamin E and there was no necessity to an additional supply of such vitamin under the lower productive performance of local breeds when green fodder or grazing system is available..

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Table (1). Chemical composition of feedstuffs.

Items	DM	OM	CP	CF	EE	Ash	NFE	Vitamin E mg/100 ml
Pelleted CFM	90.4	84.3	13.4	14.2	3.9	15.7	52.8	6.04
Berseem	11.6	84.5	19.3	25.4	2.9	15.5	36.9	2.71

Table (2). Effect of vitamin E supplementation on ewes daily milk yield.

Items	Time of measuring	Experimental rations			Overall mean
		Cont. (1)	T1(2)	T2(3)	
Milk yield (g) / h	1st week	408	326	634	456^{AB}±48.31
	2nd week	464	332	714	503^{A}±47.73
	3rd week	468	368	528	455^{AB}±41.56
	4th week	402	332	428	387^{BC}±33.22
	5th week	304	312	340	319^{CD}±12.72
	6th week	312	300	296	303^{D}±10.12
	7th week	244	208	228	227^{E}±9.69
	8th week	180	156	168	168^{E}±5.09
	Overall mean	348^{b}±22.61	292^{c}±7.43	417^{a}±15.34	

a,b,c,d and e small letters; means with different superscripts in the same row and capital letters in the same column indicated significant differences at (p< 0.05).

1. *Nil vitamin E supplement*
2. *400 IU oral vitamin E supplement /h/d (28 d prepartum)*
3. *400 IU oral vitamin E supplement /h/d (28 d pre-and 28 d postpartum)*

Table (3). Chemical composition % of ewe's milk as affected by dietary treatments (Means±SE).

Composition %	Control	T_1	
Avgerage milk yield /head/day, g	348^{b}±22.61	292^{c}±7.43	417^{a}±15.34
Milk chemical composition, %			
Fat	6.76^{b}±0.81	7.58^{a}±0.62	6.77^{ab}±0.37
protein	5.13±0.50	5.52±0.59	5.32±0.37
Lactose	4.34±0.74	5.16±0.35	5.55±0.43
Total solids	17.25±0.65	19.31±0.91	18.73±0.53
Solids not-fat	11.74^{b}±0.19	11.78^{a}±0.39	11.96^{a}±0.25
ash	1.01±0.02	1.04±0.03	1.10±0.08

a and b; means with different superscripts in the same row are significantly different at (P<0.05).

Table (4). Effect of vitamin E supplementation to pregnant and lactating ewes on animals productive performance.

Observations	Treatments		
	Cont. (1)	T1(2)	T2(3)
Total No. of ewes	11	10	12
Total No. of lambs born alive	12	9	12
Avg. IBW of ewes (4) kg	38±1.67	38±1.61	38±1.42
Avg. ewes LBW at lambing kg (A)	34±1.35	34±1.67	36±1.84
Avg. ewes LBW (8 wks) lactation kg (B)	33±1.73	34±1.52	37±1.78
Changes in ewes LBW (kg)±(B-A)	-1±1.08	0±0.93	1±0.45
Total lambs birth wt. /group (kg)	40.40	33.30	45.28
Avg. kg of lambs born /ewe lambing	3.37±0.14	3.70±0.13	3.48±0.21
Kg lambs weaned / group	151.00	123.60	136.80
Avg. lambs weaned / ewe lambing (kg)	12.58±0.53^{ab}	13.73±0.91^{a}	11.40±0.52^{b}
DMI /h/d (kg):			
CFM*	1.3		
Green berseem	0.4		
Total DMI /h/d (kg)	1.7		
Total milk yield /group (8wks) kg	214.37^{b}	163.40^{c}	280.22^{a}
Avg. daily milk yield /h/d (gm)	348^{b}±22.61	292^{c}±7.43	417^{a}±15.34
Ewes feed conversion ratio (kg)			
DMI /h/d / Avg. daily MY**/h (Kg)	5.11^{b} ±0.32	5.86^{a} ±0.14	4.14^{c} ±0.15

a,b and c, means with different small letters in the same row indicated significant differences at (p< 0.05).
(1) Nil vitamin E supplement
(2) 400 IU oral vitamin E supplement /h/d (28 d prepartum)
(3) 400 IU oral vitamin E supplement /h/d (28 d pre-and 28 d postpartum)
(4) IBW = initial live body weight (kg).
** CFM = concentrate feed mix (14 % CP & 60 % TDN)*
*** MY = milk yield (kg)*

Table (5). Effect of Vitamin E supplementation to Rahmani ewes on the performance of the offsprings.

Observations	Treatments		
	Cont. (1)	T1(2)	T2(3)
No. of lambs born alive	12	9	12
Average lambs birth weight (kg)	3.37±0.14	3.70±0.13	3.48±0.21
Average lambs weaning weight (kg)	12.58^{ab}±0.53	13.73^{a}±0.91	11.40^{b}±0.52
Average lambs total gain (kg)	9.21^{ab}±0.46	10.03^{a}±0.85	7.92^{b}±0.44
Average lambs daily gain (gm)	165^{ab}±8.21	179^{a}±15.06	141^{b}±7.79
Average lambs daily milk intake/head (g)	348^{b}±22.61	292^{c}±7.43	417^{a}±15.34
Lambs feed conversion ratio (g)			
Daily MI(4) /Avg. lambs DG (g)	2.20^{b}±0.22	1.75^{b}±0.20	3.06^{a}±0.22

a and b, means with different small letter in the same row indicated significant differences at (p< 0.05).
1) Nil Vitamin E supplement
2) 400 IU oral Vitamin E supplement /h/d (28 d prepartum)
3) 400 IU oral Vitamin E supplement /h/d (28 d pre-and 28 d postpartum)
4) MI = daily milk intake /h (gm).

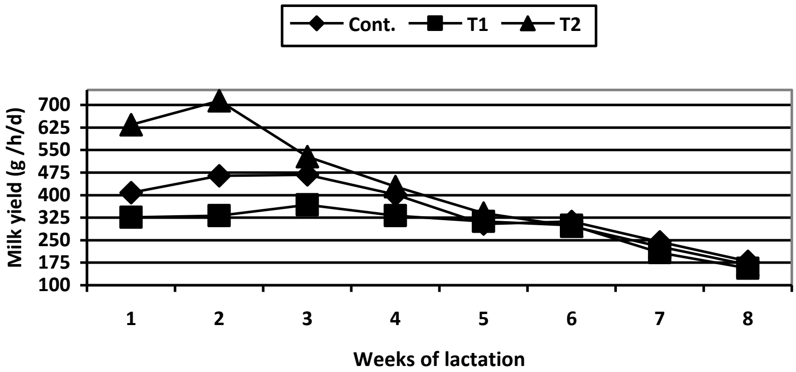

Fig. (1). Effect of vitamin E supplementation on ewes daily milk yield.

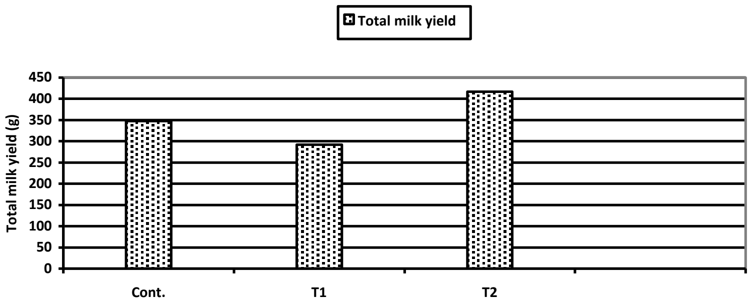

Fig. (2). Mean of ewes total milk yield as affected by dietary vitamin E supplement.

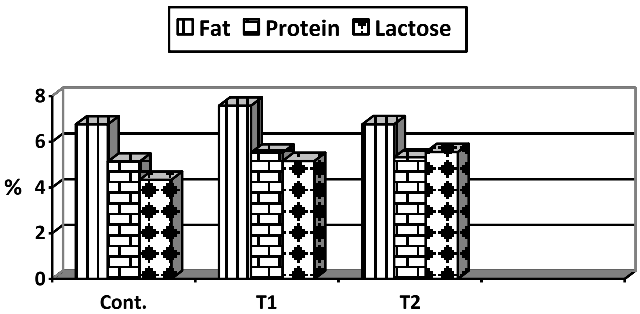

Fig. (3). Mean percentages of fat, protein and lactose content in ewes milk as affected by dietary vitamin E supplement.

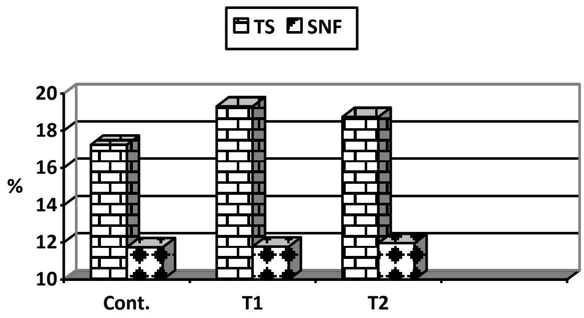

Fig. (4). Mean composition of total solids and solids not-fat % in ewes milk as affected by dietary vitamin E supplement.

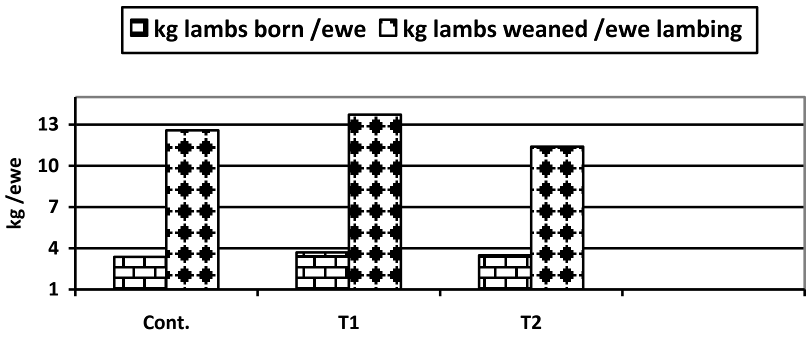

Fig. (5). Effect of vitamin E supplementation to Rahmani sheep on ewes productive performance.

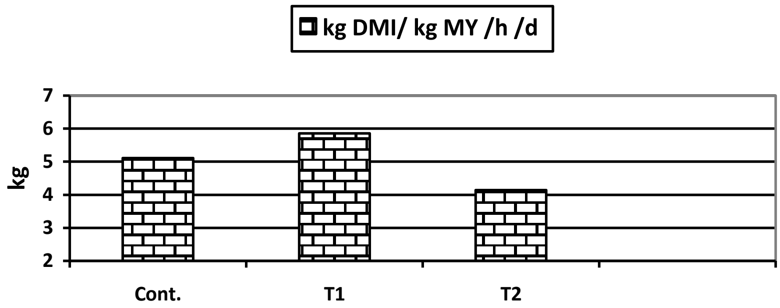

Fig. (6): Effect of vitamin E supplementation to Rahmani ewes on ewes feed conversion ratio.

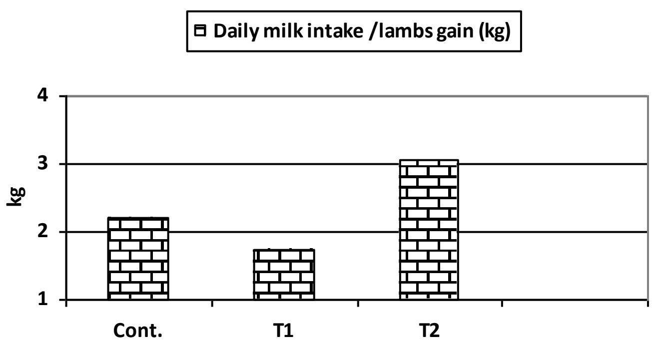

Fig. (7): Effect of vitamin E supplementation to Rahmani ewes on lambs feed conversion ratio.

تأثير إضافة فيتامين هـ على الكفاءة الإنتاجية لأغنام الرحماني.

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أجريت هذه الدراسة بمزرعة كلية الزراعة جامعة الازهر التابعة لقسم الانتاج الحيواني خلال الفترة من (سبتمبر 2012 – ابريل 2013). إستخدم في هذه الدراسة 30 نعجه رحماني بمتوسط وزن 37.7 كجم ومتوسط عمر 3 سنوات، بهدف تقييم تأثير استخدام فيتامين E على صورة (α-tochopherol acetate) وبمعدل 400 وحده دوليه للرأس/ يوميا خلال نهاية فترة الحمل (4اسابيع) أو نهاية موسم الحمل وأول موسم الحليب (8 اسابيع) على الكفاءة الإنتاجية للأمهات ونتاجها. تم تقسيم 30 نعجه رحماني في اخر فترة الحمل (4 اسابيع قبل موسم الولادة المتوقع) الى 3 مجاميع غذائية بمعدل 10 نعاج لكل مجموعه – حيث غذيت المجموعة الأولي على اساس احتياجاتها الغذائية القياسية في اخر الحمل وبدون اية اضافات غذائية واستخدمت (كمجموعه مقارنه) ، بينما تم تجريع النعاج الحوامل للمجموعة الثانية بكبسولات فيتامين E وبمعدل (400 وحده دوليه للراس / يوميا) ولمدة 4 اسابيع قبل ميعاد الولادة المنتظر (كمجموعة معاملة أولى)، بينما تم تجريع النعاج الحوامل لمجموعة المعاملة الثانية بكبسولات فيتامين E (400 وحده دوليه للراس / يوميا) لمدة 4 اسابيع قبل الولادة و 4اسابيع اخرى في بداية موسم الحليب واعتبرت (كمجموعة معامله ثانيه)، وحيث اظهرت النتائج المتحصل عليها مايلي:

- لم يؤد تدعيم النعاج بفيتامين E خلال فترة نهاية الحمل (المعاملة الأولى) أو نهاية الحمل و أول الحليب (المعاملة الثانية) الى أي تحسن معنوي في انتاجية النعاج من اللبن و لا في التركيب الكيماوي لمكونات اللبن، وان اظهرت الدراسة وجود اختلافات معنوية عموما في كمية اللبن المنتجة للراس / يوم و كذا في نسبة دهن اللبن و النسبة المئوية للجوامد الكلية بدون دهن (SNF)، الأمر الذي لا يمكن إعزاؤه - (حسبما تمت مناقشة ذلك في متن البحث) - لاستخدام الفيتامين في تدعيم المجاميع المعاملة (المجموعتين الثانية و الثالثة)، وعموما فقد كانت المعاملة الثانية (56 يوما دعما بالفيتامين) أعلى في إنتاجها اليومي من اللبن تلتها وبصورة معنوية مجموعة الكنترول، وكانت أقل المجاميع في انتاجها اليومي من اللبن نعاج المعاملة الاولى (28 يوما دعما بفيتامين E)، وحيث كانت كميات اللبن المتحصل عليها للرأس في اليوم 417 جم لنعاج المجموعة الثانية، 348 جم لنعاج مجموعة الكنترول وجاءت في النهاية إنتاجية نعاج المعاملة الاولى بـ 292 جم لبن/ للرأس/يوم.

- لم يؤد تدعيم الحيوانات المعاملة بالفيتامين وبمعدل 400 وحدة للراس/ يوم على مدى 28 يوما (معاملة أولى) أو 56 يوما (معاملة ثانية) الى تحسين كفاءة التحويل الغذائي معنويا و ان كانت هناك فروق معنويه في كفاءة تحويل الغذاء الى لبن يومي - (والتي لا يمكن اعزاءها أيضا لتدعيم النعاج بالفيتامين)- ، وحيث اظهرت النتائج وجود قيم متفاوتة معنويا، وكانت أكفأ المجاميع في معدلات التحويل الغذائي (المجموعة الثانية) المدعومة بالفيتامين لمدة 56 يوما تبعتها (مجموعة الكنترول)، وكانت أقلها كفاءة في تحويل الغذاء الى لبن هي نعاج المعاملة الاولى (28 يوما دعما بالفيتامين)، وكانت قيم التحويل الغذائي الى لبن 4.14 كجم مادة جافة مأكولة/ كجم لبن منتج (للمعاملة الثانية)، 5.11 لنعاج مجموعة (الكنترول) وكانت أقلها في كفاءتها الإنتاجية (نعاج المعاملة الأولى) 5.86 كجم مادة جافة مأكولة / كجم لبن منتج على الترتيب.

- أظهرت نعاج المعاملة الاولى أفضل أداء إنتاجي في كمية الحملان المفطومة بالكجم / أم والدة وبمعدل 13.73 كجم لحم مفطوم / للنعجة تلتها مجموعة الكنترول 12.58 كجم لحم مفطوم/ أم والدة وفى النهاية جاءت المعاملة الثانية وبمعدل 11.40 كجم حمل مفطوم / للنعجة وكانت الفروق بين المجاميع معنويه.

- لم يختلف الامر كثيرا بالنسبة للنتائج المتحصل عليها من نتاج الحيوانات المعاملة، حيث اظهرت النتائج وجود فروق معنوية بين الحملان المولودة في متوسط الوزن عند الفطام بالكجم ومعدلات النمو اليومية وكفاءة تحويل الغذاء الى نمو على صورة كجم لبن/كجم نمو.

وتشير النتائج المتحصل عليها عموما انه لم يكن لاستخدام فيتامين E كدعم غذائي للنعاج خلال الـ 4 أسابيع الأخيرة في نهاية فترة الحمل وقبل الولادة ولا لمدة 8 اسابيع (4أسابيع قبل الولادة، و4 أخرى أثناء اول الحليب) أي تأثيرات ايجابية معنويا على رفع الكفاءة الانتاجية لهذه النعاج ولا لنتاجها، وقد أعزي السبب في ذلك الى: وجود وفرة من الاحتياج اليومي من الفيتامين تمت تغطيته عن طريق المتوافر يوميا لحيوانات التجارب من البرسيم الاخضر والعلف المصنع، والذي كان كافيا وذلك نظرا لانخفاض الكفاءة الإنتاجية للسلالات المحلية، والتي ثبت بالتجربة أنها لا تحتاج لتدعيمها غذائيا بأية اضافات غذائية على صورة فيتامين E وحيث أن المتاح اليومي من خلال الاغذية القياسية المعطاة للنعاج اثناء فترة اخر الحمل ولمدة 8 أسابيع (4 قبل الولادة و 4 بعد الولادة و أول الحليب) كانت كافية جدا وواقعيا لتغطية الاحتياجات اليومية للنعاج من فيتامين E، وذلك كنتيجة للتغذية على مواد علف طازجة وغير مخزونة. وقد انتفت الحاجة الاساسية لاستخدام فيتامين E (كإضافة غذائية مضادة للتأكسد)، وحيث لم تثبت معاناة الحيوانات المعاملة من أية تأثيرات مرضية أو سلبية طوال فترة التجربة، مما يشير إلى عدم الحاجة لاستخدام فيتامين E كإضافة غذائية للنعاج الحوامل تحت ظروف الانتاج المتوسط أو المتدني، خاصة إذا كانت الحيوانات ذات صحة جيدة ولا تعانى من أية أعراض مرضيه.