

EFFECT OF INJECTING DIFFERENT LEVELS OF VITAMIN E AND SELENIUM IN SOME PHYSIOLOGICAL CHARACTERISTICS OF BLOOD AND MILK YIELD AND COMPOSITIONS IN AWASSI EWES

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ABSTRACT

This study was conducted in Beibocket area (8Km north of Mosul city) using 15 Awassi ewes, with average weight of 35.63kg . and 2-4years of age. Ewes were divided into three equal groups (5 animal per each). Three groups their, feed relied fully on grazing. 1st group was control ,the 2nd group was injected subcutaneously with 4.5mg of vitamin E and 90 µg sodium selenite/ewes and the 3rd group was injected subcutaneously with 9mg of Vitamin E and 180 µg sodium selenite/ewes once for per 10 days. The Results showed that injection with vitamin E and sodium selenite had a significant effect ($P<0.05$) on red blood cells ,body weight, daily milk yield, solid non-fat and final body weight, daily body weight and Total body weight. There were no significant effect on milk composition of fat, protein, lactose, packed cell volume (PCV).white blood cell (WBC). Hemoglobin concentration glucose, triglyceride, total protein, Albumin, Globulin in serum blood as a compared with control group.

Key word : Awassi ewes, Blood Physical Characters, Milk Yield, Selenium ,Vitamin E.

تأثير حقن مستويات مختلفة من فيتامين E والسيلينيوم في بعض الصفات الفسلجية للدم وإنتاج الحليب ومكوناته في النعاج العواسية

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الخلاصة

اجريت الدراسة في منطقة بابيوقت (8 كم شمال مدينة الموصل) استخدم 15 راس من النعاج العواسية (5 راس/مجموعة) وتراوحت اعمارها (2- 4 سنة) ومتوسط اوزانها 35.63كغم اعتمدت تغذيتها على الرعي بشكل اساس وقسمت الحيوانات الى ثلاثة مجاميع وكانت المجموعة الاولى مجموعة (السيطرة)، والمجموعة الثانية تم حقنها ب 4.5ملغم فيتامين E و90 مايكروغرام سيلينيوم الصوديوم ، والمجموعة الثالثة تم حقنها 9ملغم فيتامين E و180 مايكروغرام سيلينيوم الصوديوم تحت الجلد مرة كل 10 ايام .اظهرت النتائج وجود تأثير معنوي ($P<0.05$) للحقن بفيتامين E والسيلينيوم بمستويين في (عدد كريات الدم الحمر، إنتاج الحليب، المواد الصلبة الغير دهنية، الوزن النهائي، الزيادة الوزنية الكلية، الزيادة الوزنية اليومية).ولم يظهر أي تأثير معنوي على مكونات الحليب ، دهن ، وبروتين و اللاكتوز وحجم كريات الدم وكريات الدم البيض وهيموكلوبين الدم و الكلوكوز والكليسيريدات الثلاثية والبروتين الكلي والالبومين والكلوبولين مقارنة مع مجموعة السيطرة.

كلمات مفتاحية : النعاج العواسية ، الصفات الفسلجية للدم، إنتاج الحليب، السيلينيوم، فيتامين E.

INTRODUCTION

Sheep occupies an important role in human nutrition and ewes take the most important parts as they provide milk as food in addition to meat, These ewes need constant provision of vitamins and nutrients as they are part one of the components of these products and help the animal to conduct vital activities inside the body. Vitamin E and selenium are lost through milk, faeces, and urine Al-hasany and Alhety (1). Vitamin E is a lip soluble vitamin Halliwell and Gutteridge (2). Selenium is very important in function and vitality of the cells and its importance revealed day after day. This ingredient works in a wonderful system with vitamin E as it increases the Vitamin E sedimentation and benefit of the body Faiz and Hatem(3). It has an anti-oxidant role, congenital malformations, and genetic Mutations, and it improves the health of the animal by raising its blood level Ramirez,et al., (4) and Abood et al (5) noted that the deficiency of vitamin E and

selenium in the sheep leads to the fall of wool and improvement of body functions, and to the occurrence of the clinical mastitis in the ewes Abed and Gharbi (6). Injection of ewes during the last period of pregnancy and during the lactation period with vitamin E led to a significant rise in the number of white blood cells Soliman (7). Reduced the concentration of triglycerides in serum ewes Mardalena (8). Increase milk production in buffalo compared with animals that have not been injected with vitamin E and Selenium Qureshi (9). In the case of grazing cattle, which are mainly nourished, they may be exposed to the lack of these elements and to the need for a greater demand for nursing in regular fields with a balanced diet and continuous dietary supplements of vitamins and minerals. Therefore, this study was designed to determine the effect of subcutaneous injections with vitamin E and selenium on the blood parameters and milk production and its composition and body weight in the ewes.

MATERIALS AND METHODS

This study was conducted in Beibocket area (8Km north of Mosul city) for the period 25-3-2018 __ 25-6-2018 using 15 Awassi ewes, with average 35.63kg . and 2-4years of age. Ewes were divided into three equal groups (5 animal/each).feeding of animals have relied mainly. Group I was control group, subcutaneously the second group was injected with vitamin E and selenium (4.5 mg vitamin E and 90 µg sodium cylinate) subcutaneously and the third group was 9 mg vitamin E and 180 µg sodium cylinate once every ten days for a experimental period. The Blood samples were withdrawn from the jugular vein (10 ml/animal) and the sample was divided into two sections. Section I (3 ml), the blood samples were placed in the specimen (EDTA) and then the size of the packed blood cells (PCV), the number of erythrocytes, (RBC) and the blood

Hemoglobin (Hb) were estimated according to Aldaraj (10). The second section of blood samples (7ml) was placed in glass tubes free from anticoagulant and the serum was separated using the centrifuge and at the speed of (3000 cycle per minute) and for 15 minutes and preserved under the grade-20 m and the biochemical standards of blood serum were estimated using several measurement (kit) and suction by the French company Biolabo and by using the optical spectrum device to read the color change of the allele, the concentration of hemoglobin has been calculated using the equation to which it refers Burtis and Ashwood (11). Putting the herd under a health and prevention program that includes all the procedures that ensure the health of the animals during the duration of the experiment. The weights of the sheep were measured before the start of the experiment and then weighed once a month during the trial period.

The measurement of milk production was started after 15 days of birth following the method of manual milking, as the births were isolated from their mothers evening the sheepdog was the next morning, 12 hours after the birth isolation and multiplied the amount of milk 2x for the production of Milk ICAR (12), and the ingredients of milk was measured by Device Eko-Milk Analyzer where the percentage of protein and fat and the solids of the ratio of lactose.

All the data collected were analyzed to complete random design (CRD),
RESULTS AND DISCUSSION

The results revealed that there were significant effects ($P < 0.05$) of subcutaneous injections with vitamin E and selenium on certain blood parameters, production and composition of milk and body weights of the Awassi ewes. Table (1) shows the existence of significant effect ($P < 0.05$) of subcutaneous injections with vitamin E and selenium on the number of red blood cells, which increased significantly in the second and third treatment groups, reaching 15.14×10^6 , 16.72×10^6 respectively as compared with the control group (12.16×10^6). This increase was probably due to the role of Vitamin E by preventing the oxidation of unsaturated fatty acids such as linoleic in erythrocytes Bast et al., (15). It also acts to

according the statistical program SAS (13). Duncan's multiple range test (1955) method (14) at 5% level was used for significant differences amount means of the treatments. The following mathematical model was fitted for all traits:

$$Y_{ijk} = \mu + T_i + e_{ijk},$$

μ = the overall mean

T_i = The effect of the treatment, as a 1 (control), 2 (second) and 3 (third).

e_{ijk} = the random error effect.

protect it from oxidative destruction Abood (16) where the red blood cell fragility is higher in the sheep that have been exposed to vitamin E deficiency developed in the diet. Table (1) shows the no significant effect of subcutaneous injection on the packed blood cells (PCV) and the concentration of hemoglobin (Hb) Although there is an mathematics increase for the two injection groups as compared to the control group. The absence of the no significant effect may be due to the lower dose that was used during the experiment. This result was contrary of researchers Aljudi (17), who found that there was a decrease in the concentration of Hb and PCV in the blood of the sheep after provided with vitamin E in the feed blocks for four weeks.

Table (1) : Effect of injecting of vitamin E and selenium on some physiological characteristics of blood in Awassi ewes. (as appeared in the table \pm S.E).

Characteristics groups	Packed cell volume%	Red blood cells $\times 10^6$	White blood cells $\times 10^3$	Hemoglobin concentration (g/100ml)
control	0.59 \pm 24.70	0.70 \pm 12.16 b	0.77 \pm 8.42	0.23 \pm 7.41
second 4.5 mg vitamin E and 90 μ g SE	0.47 \pm 25.00	0.90 \pm 15.14 a	0.66 \pm 8.67	0.12 \pm 7.50
third 9 mg vitamin E and 180 μ g SE	0.52 \pm 26.50	0.05 \pm 16.72 a	0.67 \pm 9.72	0.51 \pm 7.95

*Means in each column with small letters are differs significantly.

Table (2) shows that there is no significant effect ($P<0.05$) of subcutaneous injections with vitamin E and selenium on some parameters blood. This result is consistent with Almalah (18), who have not found any significant effect on the biochemical blood parameter to addition

vitamin E and selenium to Awase ewes. And it was in a contrary with EL-Shahat and Abdel Monem (19), who noted the high concentration of protein and albumin blood serum in the group of Egyptian sheep that have been fed vitamin E and selenium as compared to the control group.

Table (2) : Effect of Injecting of vitamin E and Selenium on some biochemical characteristics of blood in Awassi ewes.(as appeared in the table \pm S.E).

Characteristics groups	Glucose ($\mu\text{g}/100\text{ml}$)	Triglyceride ($\mu\text{g}/100\text{ml}$)	Albumin ($\text{g}/100\text{ml}$)	Globulin ($\text{g}/100\text{ml}$)	total protein ($\text{g}/100\text{ml}$)
control	0.41 \pm 47.18	0.15 \pm 98.33	0.11 \pm 3.74	0.07 \pm 3.39	0.09 \pm 7.13
second 4.5 mg vitamin E and 90 μg SE	0.93 \pm 49.40	0.68 \pm 99.23	0.33 \pm 3.96	0.24 \pm 3.24	0.55 \pm 6.78
third 9 mg vitamin E and 180 μg SE	0.54 \pm 49.45	0.05 \pm 102.20	0.17 \pm 4.06	0.52 \pm 3.37	0.39 \pm 7.28

*Means in each column with small letters are differs significantly.

Table (3) indicates a significant effect ($P<0.05$) for subcutaneous injections with vitamin E and selenium on daily milk production, in the second treatment group (548.45) g/day followed by the third group (508,30) g/day compared to the control group (356, 21) g/day and Having significant effect ($P<0.05$) for injection on not fat solid substances where the superiotrey was on third group (12.18)% as compared with control group (11.37)%. Since the injection didn't effected the percentage of fat, protein and milk lactose. The result was compatible with Khrofa (20) in which significant high on daily milk production of Almriz goats were found in the two treated groups of vitamin

E and selenium compared with control group since provision of vitamin E and selenium leads to decrease of body's cells on milk with rate (50%), consequently, increasing milk yield Morgante et al., and Moeini et al., (21,22) also acting on improving of milk secreting cells of body in udder, since the selenium acts on protect the cell's membrane and improving their function Kyriakopoulos et al., (23). Therefore, It should be provided with vitamin E of diet that specified with milk yield because it prevent free radicals and peroxides that destructing the construction of the whole cell and causing of metabolism Salah et al., (24).

Table (3) : Effect of injecting of vitamin E and selenium on milk yield and compositions in Awassi ewes.(as appeared in the table \pm S.E)

Characteristics groups	Milk yield g/day	Milk fat%	Milk protein%	Milk lactose%	solid non-Fat %
control	0.02 \pm 345.21 b	0.26 \pm 5.34	0.07 \pm 4.26	0.11 \pm 6.25	0.19 \pm 11.37 b
second 4.5 mg vitamin E and 90 μ g SE	0.45 \pm 548 a	0.32 \pm 5.27	0.09 \pm 4.42	0.31 \pm 6.42	0.23 \pm 11.68 ab
third 9 mg vitamin E and 180 μ g SE	0.19 \pm 508.30 a	0.47 \pm 5.65	0.08 \pm 4.57	0.12 \pm 6.70	0.26 \pm 12.18 a

*Means in each Column with small letters are differs significantly.

Table (4) indicates significant effect ($P < 0.05$) of subcutaneous injection with vitamin E and selenium on the final weight of experimented ewes, The average weights in the second and third groups were 45.40 and 41.40 Kg for respectively as compared with control group , there was a significant difference in total body weight and daily weight in second and third treated groups with control group. This result agreed with what mentioned by Khrofa (20) who found significant effect in Mariz goats when provided with vitamin E and selenium, The significant effect of injection of vitamin E and selenium on ewes' weights may be due to the role with vitamin E that act to increase the appetite of animal which gradually leads to improve the animal weight and its act to

increase metabolism and construction of protein. Hatfield et al., and Zekri (25 , 26). As well as the rule of selenium that consider one of rare elements that is important for growth farm animal Weiss et al.,(27), and the role of vitamin E in metabolism, and maintenance of cells and vital tissues of body and longevity of age of cells, in addition to function of selenium in protecting vitamin E from oxidation and vitamin E on protecting vitamin A from oxidation. Those findings reveal that injection ewes with vitamin E and selenium improve the physical standards of blood and significant increase of milk production and increase of body's weights in comparing with ewes which were not injected with vitamin E and selenium.

Table (4) : Effect of injecting of vitamin e and selenium on body weight in awassi ewes.(as appeared in the table \pm S.E).

Characteristics groups	Initial B.W(kg)	Final B.W (kg)	Total gain B.W (kg)	B.W daily gain (kg)
Control	0.91 \pm 35.60	0.17 \pm 41.40 b	0.17 \pm 6.16 b	0.02 \pm 0.06 b
Second 4.5 mg vitamin E and 90 μ g SE	0.33 \pm 36.00	0.29 \pm 44.60 a	0.74 \pm 8.60 a	0.01 \pm 0.10 a
Third 9 mg vitamin E and 180 μ g SE	0.18 \pm 35.30	0.80 \pm 45.40 a	0.62 \pm 10.01 a	0.03 \pm 0.11 a

*Means in each column with capital letters are differs significantly

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