

**Effect of different levels of vitamin E in some semen Biochemical
Parameters in Awassi rams**

Zeaid Amad Hamid Taqi Zeny

Department of Animal Resources - Faculty of Agriculture - University of Kufa –
Republic of Iraq

Abstract

The ram seminal plasma is a complex fluid, which serves as a carrier for the spermatozoa on their journey into the male testes, and make role as nutrition and source of energy.

The objective of this study was to investigate the enzyme activities in seminal plasma. Aspartate Amino transferees (AST), Alanine Amino transferees (ALT), and fructose in seminal plasma from twelve mature Awassi rams 14-16 month of age. Rams divided to three group 1st group (T1) served as a control, Second and third group(T2, T3) were given vitamin E at a level of 200 and 300 IU/Week respectively. The Overall mean activity of (AST:ALT)in T1,T2,T3 were (8.60 $\pm$ 1.49, 6.71 $\pm$ 1.48, 5.57 $\pm$ 1.59: 5.96 $\pm$ 1.06, 6.50 $\pm$ 1.57, 2.91 $\pm$ 0.77)UE/ML³and fructose (3.80 $\pm$ 0.49, 4.17 $\pm$ 0.85, 3.33 $\pm$ 0.57)Mm/Lat temperatures ranging from 10-16⁰C.where the impact of vitamin E in (AST,ALT) groups (9.20 $\pm$ 2.0, 8.96 $\pm$ 2.16 , 7.43 $\pm$ 1.06: 5.52 $\pm$ 1.67, 2.69 $\pm$ 0.28, 5.24 $\pm$ 0.79)and fructose (2.67 $\pm$ 0.21, 3.43 $\pm$ 0.55 , 4.54 $\pm$ 0.75).

Keywords: vitamin E, semen Biochemical character, Awassi ramsAST,ALT, Fructose.

Introduction:

Awassi is one of the dual-purpose, fat-tailed sheep breeds which can be accepted as a sheep-milk resource in south-west Asia (Iraq, Jordan, Palestine, Lebanon and Turkey). It also exists in Europe, Australia, New Zealand, and China. The breed is well adapted to harsh conditions and capable of producing and reproducing under these circumstances (5).

Vitamin E (Vit E) important nutrients that can affect several biological processes including spermatogenesis and semen quality (10 and 17), and reproduction (9).

Seminal plasma which is a complex mixtures created from tests can effect sperm morphology, mortality, acrosome reaction and fertility.(12 and 14).In addition, environmental circumstances are also effect in sexual performance and semen

quality in rams such ambient temperature, humidity, thermal radiation and air speed(3 and 16).

AST,ALT enzymes and fructose are essential for metabolic processes which provide energy for survival, motility and fertility of spermatozoa. Previous studies are generally related to the comparisons of seminal plasma composition between males of different fertility or the isolation and characterization of specific seminal proteins that could influence sperm cap citation and fertilization. However, the correlation between specific seminal proteins and semen characteristics in crossbred rams with differing fertility has not hitherto been well studied(1).

The major aim of this study is to provide valuable information on effect of vitamin E in Biochemical Parameters (ALT,AST and fructose

concentrations) in semen of Iraqi awassi rams to improve semen quality and raise the sexual efficiency in local animals and increase fertility and use this information as guidelines or indicators for the management strategies for ewes under the farming conditions for selecting and improving the performance of domestic animals depending on this indicators.

Material and methods

The experiment was conducted from 2/1/2015 to 28/2/2015 in Iraq, the cold weather and air temperature hovered between 10-16°C in the shade (Source: U.S. National Climatic Data Center, Asheville, N.C)(4) on a farm located in the Ruminant Research station / Abu – Graib / Department of animal

Resources /Public Authority for Agricultural Research/ Ministry of Agriculture. Twelve adult Iraqi Awassi rams 14-16 month of age were kept in semi open sheep pens. The daily hours devoted to out door feeding - related activity supplement with hay and some barley were randomly assigned to three groups. Rams in the 1st group(T1) served as a control. Second and third group(T2, T3) were given vitamin E at a level of 200 and 300 IU/Week respectively. Semen was collected using an artificial vagina once each 15 days through a period, Then we measured the chemical qualities of semen plasma enzyme (ALT and AST) and the concentration of fructose in the following manner. The proportion of fructose was measured in semen plasma using the spectral analysis method described

by the company Aracomex, and supports the principle of this analysis is that the fructose pink color when heated with resorcinol and the presence of hydrochloric acid can be measured in the manner and extent of spectral 546nm (6). Estimate the concentration of enzyme Glutamic Oxalate Transaminase: Saucepan (ALT) in plasma semen as instructed by the company bioassay system America, which he described by Bergmeyer *et al*(2) The concentration of (ALT) was estimated in the plasma of semen as instructed by the company and the Canadian described by Ishiguro *et al*(8).

Statistical analysis

Data analysis was performed using SPSS software program(15) All values were expressed as Mean $\pm$

standard error of mean(S.E.M.).

Spearman's correlation coefficient test was applied to examine the correlation between seminal plasma protein fractions with months and vitamin of these men. Differences were considered to be statistically significant at $P < 0.05$ under a linear model: $Y_{ij} = M + t_i + p_j + e_{ijk}$

Where

M=over all mean

Ti= Effect of temperature (10-16 °C)

Pj= Effect of vitamin (control, 200ID, 300ID).

Eijk: Random error

Results and discussion

The results of semen quality parameters of 12 Awassi rams are summarized in Table 1

Enzymes ALT, AST and Fructose were significantly increase between treatments.

(Table 1) Effect temperate and vitamin E in AST,ALTand

Fructose in seminal plasma.

Factors Affecting	AST UE/ML ³	ALT UE/ML ³	Fructose Mm/L
Temperature			
T1	8.60 $\pm$ 1.49A	5.96 $\pm$ 1.06A	3.80 $\pm$ 0.49A
T2	6.71 $\pm$ 1.48A	6.50 $\pm$ 1.57A	4.17 $\pm$ 0.85A
T3	5.57 $\pm$ 1.59A	2.91 $\pm$ 0.77B	3.33 $\pm$ 0.57A
M	6.96 $\pm$ 1.51	5.12 $\pm$ 1.11	3.77 $\pm$ 0.61
Vitamin E			
T1	9.20 $\pm$ 2.0A	5.52 $\pm$ 1.67B	2.67 $\pm$ 0.21A
T2	8.96 $\pm$ 2.16 A	2.69 $\pm$ 0.28A	3.43 $\pm$ 0.55 B
T3	7.43 $\pm$ 1.06A	5.24 $\pm$ 0.79B	4.54 $\pm$ 0.75 B
M	8.44 $\pm$ 1.01	4.48 $\pm$ 0.79	3.55 $\pm$ 0.48

Averages bearing different letters within the same column means that there were significant differences (p<_0.05).

Temperature does not have a significant effect on the enzyme AST and low temperature did not show any changes(16)conscious values and this result consistent with his findings by Sharma *et al*(14).

This resembles his findings in (11) did not get an increase in the concentration of fructose in different temperatures.

The impact of vitamin E on the enzyme AST was not significant, enzyme ALT and fructose was

increased significantly in Treatment 2 and 3 (Table 1) showed the level of second and third group as surpassed the two treatment for the first, second. The impact of vitamin E on fructose has moved in moral and overtook the second and third treatment to the control treatment. This may be due to the role of vitamin E as a single antioxidant factors (17) which could prevent from free radical and increase fructose (decrease free radical led to increase fructose), and reduces cold-induced oxidative stress (13). Vitamin E in the second treatment reduced of oxidative stress because supportive to combat liver damage (18)

Reference

1. Asadpour, R .2012. Relationship between Mineral Composition of Seminal

Plasma and Semen Quality in Various Ram Breeds. *Acta Scientiae Veterinariae*, 40: 10-27.

2. Bergmeyer, H. U.; P. Scheibe and Wahlefeld A.W.1978. Optimization of methods for aspartate- aminotransferase and alanine aminotransferase. *Clin. Chem.*, 24: 58-73.
3. Dobson, H. and R. F. Smith.2000. What is stress and how does it affect reproduction. *J. Reprod. Fert(Animal Reproduction Science)*, 60:743-752.
4. FAOSTAT.2012. Air condition. <http://www.faostat.fao.org/site/573/>.
5. FAOSTAT: Online: <http://faostat.fao.org/>. FAOSTAT© FAO Statistics

- Division 2007, Accessed: 23 August 2007.
6. Foreman, D., L. Gaylor; E. Evans and Trella, C. 1973. A modification of the Roe procedure for the determination of fructose in tissues with increased specificity. *Anat. Biochem*, 56 : 584 - 590..
 7. Ishiguro ,M; K. Takio and M.Suzuki.1991.Complete amino acid sequence of human liver cytosolic alanine aminotransferase (GPT) determined by a combination of conventional and mass spectral methods .*Biochemistry*, 30:10451-10457.
 8. Koyuncu, M., and H., Yerlikaya. 2007. Effect of selenium–vitamin E injections of ewes on reproduction and growth of their lambs. *S. Afr. J. Anim. Sci.*, 37:233-236.
 9. Marin-Guzman, J.;D.C. Mahan; Y. K. Chung; J. L. Pate and Pope, W. F.1997. Effects of dietary selenium and vitamin E on Boar performance and tissue response, semen quality and subsequent fertilization rates in mature gilts. *J. Anim. Sci.*, 75:2994-3003.
 10. Matsuoka,T.; H. Imai.; S. Asakoma,; H. Kohno, and H. Fukul, .2006.Changes of fructose concentrations in seminal plasma and glucose and testosterone concentrations in seminal plasma and glucose and testosterone concentrations in

- blood plasma in rams over the course of year. Journal of Reproduction and Development, 52:6-16.
11. Manafi, M. 2011. Artificial Insemination in Farm Animals. Janeza Trdine, 9-51000 Rijeka, Croatia.
12. Mahmood, S.1.;G .Yamada; G .Niiyama; M. Kawanaka; K .Togawa; M .Sho; Ito; T .Sasagawa; M. Okita; H. Nakamura and Yodoi, J.2003.Effect of vitamin E on serum aminotransferase and thioredoxin levels in patients with viral hepatitis C. Free Radic. Res., 7:781- 785.
13. Pilch, B. and M. Mann.2006. Large-scale and high-confidence proteomic analysis of human seminal plasma.Genome Biology, 4:5-12.
14. Sharma, S.; K. Narendra; N. K. Sharma; S. Sinha and Sharma, S.2013. Assessment of transaminases and effect of freezing rates on their leakage into seminal plasma of bucks. Journal of Animal Science, 1: 18-22.
15. SPSS.2008. Statistical package of social science, version 16.users guide for statistical, Chicago. USA.
16. Webster, A. J.1983. Environmental stress and the physiology, performance and health of ruminants. Journal of Animal Science, 57:1584-1593.
17. Yousef, M. I ;G. A. Abdallah; K. I. Kamel. 2003. Effect of ascorbic acid and vitamin E

supplementation on semen
quality and biochemical
parameters of male rabbits.
Anim. Reprod. Sci. 76:99-
111.

18. Venditti, P ; D. i. Stefano and
D. I. Meo.2009.Vitamin E
reduces cold-induced
oxidative stress in rat skeletal
muscle decreasing
mitochondrial H_2O_2
release and tissue
susceptibility to oxidants.
Redox Rep.,4:75-167.

**تأثير مستويات مختلفة من E في الصفات الكيماوية للسائل المنوي في الكباش العواسي
فيتامين**

زيد عماد حميد تقي زيني

قسم الثروة الحيوانية -كلية الزراعة – جامعة الكوفة – جمهورية العراق

المستخلص

تعد البلازما المنوية للكبش سائلاً معقداً حيث يساعد الحيامن في رحلتها داخل الجهاز التناسلي الذكري ويعمل على تغذيتها وتوفير مصدر الطاقة اللازمة لها.

وموضوع هذه الدراسة يتمحور حول فعالية إنزيمات بلازما السائل المنوي (AST, ALT) وسكر Fructose للكبش العواسي العراقية بعمر (14-16 شهراً) تحت ظروف التربية في النظام شبه المكثف وبدرجة حرارة 16-10⁰ م.

تم تقسيم الكبش لثلاثة مجاميع الاولى سيطرة والثانية اعطيت فيتامين E200 وحدة دولية اسبوعيا والثالثة اعطيت فيتامين E300 وحدة دولية اسبوعيا تم قياس مستوى الانزيمات حيث كان قياس الانزيمات في المجاميع الثلاثة T2,T1 (AST, ALT) 2.91 ± 0.77 ، 6.50 ± 1.57 ، 5.96 ± 1.06 ، 5.57 ± 1.59 ، 6.71 ± 1.48 ، 8.60 ± 1.49 (T1,T2 T3,UE/ML³) والفركتوز 4.17 ± 0.49 ، 3.8 ± 0.49 ، 3.33 ± 0.57 ، 0.85 ± 0.05 في درجات حرارة تراوحت بين 16-10⁰ م

وكان تأثير فيتامين E في مجاميع (AST,ALT) 2.00 ± 9.20 ، 2.16 ± 8.96 ، 1.06 ± 7.43 ، 1.67 ± 5.52 ، 0.28 ± 2.96 ، 0.79 ± 5.24) والفركتوز 0.21 ± 2.67 ، 0.55 ± 3.43 ، 0.75 ± 4.54 .

الكلمات المفتاحية : فيتامين E ,Fructose ,AST ,ALT ,البلازما المنوية, الكبش العواسية العراقية.