

## **SOME REPRODUCTIVE PERFORMANCE OF MALE LAMBS AND FEEDING VALUES OF RATIONS AS AFFECTED BY SUPPLEMENTATION OF DIFFERENT SELENIUM SOURCES**

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### **SUMMARY**

The aim of this study was to evaluate some reproductive performance of male lambs, digestibility coefficients and feeding values of rations as affected by supplementation of different selenium (Se) sources. Twenty-four healthy Sohagi male lambs (7-8 month old and  $24.47 \pm 0.15$  kg body weight) were randomly assigned into four dietary treatment groups (6 animals each). The experiment was extended for 25-weeks after two weeks as adaptation period. Basal diet was formulated to meet the nutritional requirements according to the NRC (1985) except Se. Lambs in the first group were fed a basal diet as a control (T0) without supplement whereas lambs in groups T1, T2, and T3 were fed the basal diet supplemented with 0.1 mg/kg DM sodium selenite, vitamin E and selenium and selenized yeast (Se-yeast T3), respectively. Three rams from each group (average body weight  $44.21 \pm 4.90$  kg) of feeding trial were placed in metabolic cages to perform four digestibility coefficients trials to evaluate the digestibility and feeding values of the experimental rations. Five-day preliminary period was followed by a collection period of ten days with quantitative collection of the feces. Blood samples from three animals in each group were collected before offering feed and water throughout the experimental period at 0, 1, 2, 3, 4 and 5 months of the experimental period. Results showed that ration supplemented with selenized yeast (T3) had a higher DM, OM, CP, EE and NFE digestibility coefficients than the other three treatments and the differences mostly were significant in most nutrients between T3 and each of T1 and control (T0) group. Generally, digestibility coefficients of DM were 66.66%, 68.94%, 70.31%, and 71.98% for control (T0), T1, T2 and T3, respectively. Also the values of TDN and DCP were behaved similar trend among dietary treatments as well as the digestion coefficients of all nutrients. The present results illustrated that testes weight recorded higher values in T3, T2, T1 compared to control group (T0), but the differences among treatments were not significant. In addition, the concentrations of selenium in testes were significantly ( $P < 0.01$ ) higher in T3, followed by T2 and T1, while the lowest value was recorded in the control group (T0), with significant difference between each other. Also, results illustrated that values of testes circumference, testes volume and testosterone concentration at the beginning of experiment showed no significant differences among treatments, while at 1, 2, 3, 4 and 5 months of experimental period T3 group recorded higher ( $p < 0.01$ ) or values of three mentioned testes parameters compared with T2, T1 and control (T0) treatments. Generally, T3 and T2 recorded higher and significantly values in comparison with T1 and control group (T0). Also, data showed that both diameter of testes and plasma testosterone concentration increased with advancing of age. In addition, values of plasma thyroid hormones concentrations recorded significantly ( $p < 0.01$ ) higher values as a results of supplementation of different sources of selenium compared to control group. Moreover, concentration of both hormones in T3 selenized yeast (Se-yeast) and T2 (vitamin E and selenium) showed significantly ( $p < 0.01$ ) higher activity of both thyroid hormones in comparison with T1 (sodium selenite) and control (T0) groups. Also, both hormones concentrations increased with advancing age. It can be concluded that supplementation of selenium in the ration of sheep especially in the form of selenized yeast (Se-yeast) led to an improvement in nutritive value of rations and reproductive performance through the favorable effects on weight, testes diameters and testosterone concentration as well as the thyroid hormones concentrations in blood of male lambs.

**Keywords:** *Selenium sources, digestibility reproductive performance, growing lambs*

## **INTRODUCTION**

Animals that mainly consume home produced roughage and easily can suffer from Se deficiency if they are not supplemented in an appropriate way. Se deficiency induces oxidative stress and reduced fertility, which was associated with higher level lipids peroxidation. Sanchez-Gutierrez et al., (2008) reported that Se deficiency reduced the number and differentiation of germ cell. In addition, Marin-Guzman et al., (2000) reported that Se is important during testicular development. The improvement in reproductive performance of treated rams with vitamin E and selenium was revealed previously through published data by (Balicka-Ramsisz et al., 2006). There are relationship between live body weight and the weight of both testes and also testes volume and testes circumference. Kassab (2007) and Zanouny (2011) reported that significantly correlation coefficient between live body weight and the previous parameters.

The concentration of Se in body tissues is depending on a number of factors such as the chemical forms, the length of time over which its consumed, the amount of Se provided by the diet, species of animal as well as the type of tissue. Pond et al., (1995) indicated that tissue concentration of Se influence by the amount and chemical forms of Se in the diet. In addition, Juniper et al., (2009) found that with the exception of kidney tissue, all other tissue showed increasing the concentration of Se as a result of supplement different sources of Se in the diet, which can be effect on the improvement in Se availability retention. Antunović et al., (2009 and 2014) concluded that Se inorganic form had a better bioavailability compared to the inorganic form. Marai et al., (2009) reported that supplementation selenium in the ration improved reproductive performance in sheep. Also, Mahmoud et al., (2013) concluded that injections of combination of Vit. E and Se during the breeding season improved the overall reproductive performance of Ossimi rams. In addition, Behne et al., (1996) indicated that testosterone concentration and function are affected by severe selenium deficiency and such element is necessary for testosterone synthesis. Generally, testosterone production increased in rams with more sexually active than rams of low sexual active or sexual inactive (Stellflug et al., 2004). Also, Matos and Thomas, (1991) reported close correlation between testes size and plasma LH, FSH and testosterone concentrations. There are variations in the references which studied the effects of selenium supplementation in the diet on thyroid hormones activity in blood. Some investigators showed that thyroid hormones secretion could be modified as a results of supplementation different Se sources in the diet of animals (Rock, et al., 2001, Shinde, et al., 2009, Soliman, et al., 2012, Alimohamady, et al., 2013, Antunović et al., 2014 and Kassab and Mohammed, 2014). They documented that selenium is essential for thyroid hormones secretion and selenoperoxidase protect the thyroid gland from peroxide produced during the synthesis of hormones. Contrarily, Kumar, et al., (2008 and 2009) and Mudgal, et al., (2008) indicated that no effect of supplementation of selenium in the diet on the amount of thyroid hormones secretion in blood. Few studied were carried out with sheep, which indicate the metabolic profile and thyroid hormones activity when fed with different selenium supplementation diets.

The aim of this study was to evaluate the reproductive performance of male lambs, digestibility coefficients, feeding values of ration and some blood parameters as affected by supplementation of different selenium (Se) sources.

## **MATERIALS AND METHODS**

This experiment was carried out at the Animal Production Experimental Farm, Faculty of Agriculture, Sohag University, Sohag. The climate is dry and subtropical condition.

### ***Experimental design .***

Twenty-four healthy Sohagi male lambs of about 7-8 month of age and an average body weight of  $24.47 \pm 0.15$  kg were randomly assigned into four dietary treatment groups (6 animals each). In a feeding trial that extended for 25-week preceded by two weeks as adaptation period. Basal diet was formulated to meet nutrient requirements according to the NRC (1985) except Se. The diet consists of 30% wheat straw and 70% concentrate feed mixture (CFM). Lambs in group 1 were fed the basal diet as a control (T0), whereas lambs in groups T1, T2, and T3 were fed the basal diet supplemented with 0.1 mg/kg DM from sodium selenite, vitamin E and selenium and selenized yeast (Se-yeast T3), respectively. The basal diet was formulated to be adequate in protein, energy, vitamins and minerals for this class of animals except for Se content.

***Digestibility and feeding values of the experimental rations.***

At the end of the feeding trial, three rams from each group (average body weight  $44.21 \pm 4.90$  kg ) were placed in metabolic cages for digestibility trial. The amount of the daily ration was offered to each animal twice daily and fresh water was available along the day. Five-day preliminary period followed by a collection period of ten days in which daily feces was collected and weighed for each animal. During the collection period of the digestibility trials , the amounts of refused feed were measured daily for each ram for precisely estimate the feed input. Representative samples of feed and feces were taken for proximate analysis according to the method of A.O.A.C. (2000) for dry matter, ash, ether extract, crude fiber and crude protein. Digestion coefficients of all feed nutrients, total digestible nutrients (TDN) and digestible crude protein (DCP) were calculated.

***Blood analysis***

Blood samples from three animals in each group were collected before offering morning feed and water via jugular venipuncture at 8.0 a.m. into 10 ml heparinized tubes at 0, 1, 2, 3, 4 and 5 months of the experimental period . Plasma blood samples were then separated by centrifugation blood samples at 3000 rpm for 15 minutes. Testosterone hormone concentration was determined in plasma by the method of Jaffe and Behrman (1974) who performed the assessment of total testosterone concentration using Coat- A- count I<sup>125</sup>. Radioimmunoassay (RIA) kits purchased from diagnostic product corporation, Los Angeles, California, 90045,USA was used. Triiodothyronine and thyroxin concentrations were determined by Radioimmunoassay procedures according to Chopra et al., (1971) and Irvin and Standeven, (1968) by using kits purchased from diagnostic corporation, United States (U. S. A)

At the end of the experimental period three animals were chosen randomly from each group to be slaughtered. Immediately after slaughtering weight of both testes were recorded and a snap of testes was collected and frozen until determination the concentration of Se in testes according to Norheim and Haugen (1986).

***Testes measurements***

Testes circumference and testes volume of each lambs were recorded at the beginning of experiment and then at monthly intervals to the end of experimental period. Testes diameter was measured by flexible cloth tape at the point of maximum circumference of the paired testes. Testes volume was evaluated from the volume of water that replaced as described by Salhab et al.,(2001).

***Statistical Analysis:***

The results were statistically analyzed using the General Linear Model (SAS, 2008) by using complete randomized design. Different parameters were performed by methods of analysis of variance. All statements of significant difference are based on the 0.05 or 0.01 probability levels. Significant differences among treatments, within the experiment were analyzed using L.S.D (Petersen, 1985).

$$Y_{ij} = \mu + T_i + E_{ij}$$

Where,

$Y_{ij}$ = Experimental observation.  $\mu$  = The overall mean.

$T_i$  = The effect of dietary treatment,  $i$ = T0 , T1, T2, and T3

$E_{ij}$ = The errors related to individual observation.

## **RESULTS AND DISCUSSION**

***Nutrient digestibility coefficients***

The effect of different Se sources on digestibility coefficients of nutrients and feeding values of the experimental rations are presented in Table (1). Data showed that ration supplemented with Se-yeast (T3) had higher DM, OM, CP and EE digestibility coefficients than the other three treatments. However, the differences were significantly only between T3 and both T1 and control groups. Slightly increases in CF digestibility with all tested rations (T1, T2 and T3) in comparison with control one (T0), while NFE digestibility was significant higher for all tested rations than control one. Mostly organic Se supplements (T2&T3) had improved significantly the digestion coefficients of most nutrients of the rations in

comparisons with that supplement by inorganic Se source (T1) control one (T0) . The differences between T2 and T3 or between T1 and T2 did not significant respecting all nutrients digestibility's Results reported by Del Razo-Rodriguez at al., (2013) ,Esterhuysen, (2012), Xun, at al., (2012), Shi et al.,(2011) and Wang et al., (2009) are agreement with the previous findings that the digestibility of nutrients and the utilization of supplemental Se were higher than those of control animals. Also, the digestibility of DM in T2 increased than T1 treatments. Similar results have been observed in cattle (Nicholson et al., 1991 and Ivancic and Weiss, 2001) and in sheep (White and Somers, 1977). In relation to the present results, Hidioglou et al.,(1968) found that supplementing selenium to sheep had been shown to increase the number of rumen bacteria and also to have some effect on rumen bacterial composition and this might result in improved microbial protein synthesis .Such favorable effect on rumen microbes due to in particular organic Se supplementation could be significantly affecting positively on nutrients, digestibility's of feed. The present results are in agreement with those found by Kholif and Khorshed (2006), who concluded that organic Se supplementation to the diets of buffaloes improved rumen activity, nutrients digestibility and milk production. Similar results were recorded by Kholif and Kholif (2008) who tested Selenium enriched yeast supplementation with the rations of lactating buffaloes. In addition Abdou, Ahlam (2011) supplementation selenium enriched yeast to the diets of goats had improved the nutrient digestibility's of DM ,OM, CP, EE, CF, NFE, NDF, ADL, hemicellulose and cellulose compared with control free from Se supplement. She was added that organic Se improved rumen fermentation and utilization and absorption of minerals and consequently improving goat kids performance. Finally with growing rabbits, Ali et al (2011) results revealed that nutrients digestibility (OM,CF and NFE) were significant improved by using diet supplemented with Selenium active dried yeast compared to control one .

**Table (1): Effect of different selenium sources on digestibility coefficient and feeding values of experimental rations.**

Item	Treatments			
	control	T1	T2	T3
Digestibility coefficient				
Dry matter	66.66 <sup>C</sup> ±0.56	68.94 <sup>BC</sup> ±0.52	70.31 <sup>AB</sup> ±1.02	71.98 <sup>A</sup> ±0.71
Organic matter	69.23 <sup>C</sup> ±0.86	70.65 <sup>BC</sup> ±0.45	72.81 <sup>AB</sup> ±1.28	74.97 <sup>A</sup> ±0.37
Crude protein	67.05 <sup>C</sup> ±0.24	67.59 <sup>BC</sup> ±1.63	70.75 <sup>AB</sup> ±0.40	72.31 <sup>A</sup> ±0.93
Ether extract	66.63 <sup>C</sup> ±1.09	67.87 <sup>BC</sup> ±1.15	70.07 <sup>AB</sup> ±1.39	72.13 <sup>A</sup> ±0.68
Crude fiber	54.82 ±1.52	56.16 ±0.56	56.87 ±1.07	57.74 ±0.44
Nitrogen free extract	73.81 <sup>B</sup> ±1.45	75.53 <sup>AB</sup> ±0.92	77.76 <sup>AB</sup> ±2.13	80.44 <sup>A</sup> ±0.28
Feeding values on DM				
Total digestible nutrients (TDN)	62.99 <sup>C</sup> ±0.73	64.27 <sup>BC</sup> ±0.39	66.24 <sup>AB</sup> ±1.10	68.20 <sup>A</sup> ±0.35
Digestible crude protein (DCP)	11.08 <sup>B</sup> ±0.04	11.17 <sup>B</sup> ±0.27	11.69 <sup>AB</sup> ±0.07	11.95 <sup>A</sup> ±0.15

Control (T0) = Without treatment, T1= Sodium selenite treatment, T2= Vitamin E and Selenium treatment. T3= Selenized yeast treatment.

Mean followed different superscript letter within the same row are significant different at  $p < 0.01$

#### **Feeding values of the experimental rations**

The nutritive values (TDN and DCP) of experimental rations are presented in Table (1). The highest values of TDN and DCP were recorded in T3, but values were insignificant increased than those of T2 and significant increased than those of T1 and control .The values of TDN and DCP in T1 did not differ significantly than control group. The improvement of TDN and DCP values in T3 may be due to enhancing of digestibility coefficients of CP, EE, CF and NFE in response to the organic selenium sources. The results obtained here are in agreement with the results reported by Abdou, Ahlam, (2011) who supplemented the diet of goat with 2.5 g/head/day of selenium enriched yeast. Also, the same results and conclusion had been recorded by Ali et al., (2011) with rabbits when supplement their diet with 14 g selenium treated yeast /100 Kg diet.

**Testes weight and concentration of selenium in testes.**

Data in Table (2) illustrated that testes weight in T3, T2 and T1 recorded higher values in treatment groups compared to control treatment, but the differences among treatments were not significant. Higher value of testes weight in T3 may be due to increasing live body weight in this treatment than the other treatments that in advance owing to increasing TDN and DCP in this treatment than other treatments. This increasing in live body weight led to heavier weight of different organs in animal including testes .

**Table (2) Effect of different sources of selenium on weight and selenium concentrations of testes.**

Item	Treatments				±SE
	Control	T1	T2	T3	
Testes weight (kg)	0.202	0.220	0.233	0.295	0.03
Selenium testes concentration (mg/kg)	0.0140 <sup>D</sup>	0.161 <sup>C</sup>	0.365 <sup>B</sup>	0.391 <sup>A</sup>	0.005

*Control (T0) = Without treatment, T1=Sodium selenite treatment, T2= Vitamin E and selenium treatment, T3= Selenized yeast treatment,*

*Mean followed different superscript letter within the same row are significant different at P<0.01*

Also, the present results illustrated that Se concentration in testis recorded higher (P<0.01) values in T3 followed by T2 and T1, while the lowest value recorded in control group. The present results are in agreement with those detected by Juniper, et al., (2009) who indicated that Se concentrations generally in all tissues increased as a results of supplementation different Se sources in the diet and also the concentration of selenium in the consumed diets. Investigations on the chemical nature of Seleno-compounds of plant origin demonstrated the presence of several selno compound, e.g. selenomethionine, selenocysteine, selenite, selenocystathione, Se-methylselenocysteine and others (Aspila, 1991). So, these forms of Se and other factors like levels of Se intake and protein, Se absorption, animal class and age, minerals status etc. All these factors largely affecting on Se concentrations in body tissues. Regarding the discriminatory effectiveness of organic Se, Khirwar and Arora, (1977) found that much less selenium's is excreted into milk after the dose of selenite than after adose of selenomethionine or feeding natural selenium containing feeds

**Testes circumference and testes volume**

Results, concerning the effect of different Se sources on the testes circumference and testes volume are presented in Table(3). The data illustrated that values at the beginning showed no significant differences, while after 1,2,3,4 and 5 months of the experimental period the differences among dietary treatments were significant (P<0.01).

The present results indicated that T3 recorded higher (p<0.01) values of both diameters compared with T2 , T1 and control groups. These results may be due to the supplementation selenized yeast (Se-yeast) in T3 that led to the increases of live body weight and both testes diameters as a results of improving TDN and DCP in T3 compared to T2, T1 and control treatments (T0 ). Bayoumi, (1999) and Kassab, (2007) found significant relationship between body weight and testicular diameters in calves and in sheep. In addition, in the present study, testes circumference and volume of ram lambs increased gradually with advancing age and these changing greatly be due to the increase in body weight with advancing age. These results are agreement with those reported by Salem (1997), Kassab (2007) and Zanouny, (2011). They observed that testicular measurements in ram lambs increased gradually with advancing of age until reaching puberty. In addition, Salhab et al., (2001) added that the age and live body weight of Awassi ram lambs were positively affecting on testicular volume. The same results were obtained by Hamdon, (2005) in choise and farafra sheep.

**Plasma testosterone concentrations**

The values of testosterone concentrations (ng/ml) at the beginning showed insignificant differences among treatments, while after one, 2, 3, 4 and 5 months of the experimental period there were significant (P<0.01) differences (Table,4). The testosterone concentrations in the groups supplemented with selenized yeast (Se-yeast T3 and vitamin E and selenium (T2) were higher than that in the group supplemented with sodium selenite (T1) and control group (T0) . These results may be due to organic selenium source in T3 and T2 led to increase in the nutritive values of rations as TDN and DCP.

Increasing TDN and DCP in T3 and T2 as a results of organic selenium source improve live body weight and consequently the tests weight was increased (Table2).Organic selenium is more efficient in increasing plasma selenium content and selenium-supplemented animals a mountain plasma selenium level longer when depleted, that affected on the vital role of Se on the metabolic processes in general and generated of hormones in specific ( Aspila, 1991). In addition the multi-functional metabolic processes of Se is including GSH—Px that being the most important compound containing seleno cysteine which have a very important role in Se metabolism. Kaur and Bansal, (2004) demonstrated that the levels of testosterone, FSH and LH were significantly reduced during Se deficiency. Generally, testosterone production increases in rams with more sexually active than rams of low sexually active or sexually inactive (Bearden and Fuquay, 1997 and Stellflug et al., 2004). The significant increases of testosterone in treated rams are inconsistent with results of Marin-Guzman et al., (2000)

**Table ( 3 ): Effect of different seleniumsources on the testes circumference (cm) and testes volume (ml) in Lambs .**

Item	Testes circumference				± SE
	Control T0	T1	T2	T3	
At the beginning	12.55	12.47	12.67	12.69	0.05
One month	14.39 <sup>D</sup>	16.10 <sup>C</sup>	17.65 <sup>B</sup>	18.89 <sup>A</sup>	0.07
2 months	20.89 <sup>D</sup>	22.59 <sup>C</sup>	22.55 <sup>B</sup>	24.00 <sup>A</sup>	0.21
3 months	22.52 <sup>D</sup>	23.07 <sup>C</sup>	24.03 <sup>B</sup>	24.77 <sup>A</sup>	0.10
4 months	24.15 <sup>D</sup>	25.39 <sup>C</sup>	25.26 <sup>B</sup>	27.03 <sup>A</sup>	0.13
5 months	26.07 <sup>D</sup>	26.84 <sup>C</sup>	28.18 <sup>B</sup>	29.36 <sup>A</sup>	0.19
			Testes volume		
At the beginning	51.67	50.67	49.67	52.33	1.04
One month	71.67 <sup>D</sup>	91.00 <sup>C</sup>	99.67 <sup>B</sup>	114.00 <sup>A</sup>	1.51
2 months	128.33 <sup>D</sup>	133.00 <sup>C</sup>	140.67 <sup>B</sup>	166.33 <sup>A</sup>	3.94
3 months	153.33 <sup>D</sup>	167.67 <sup>C</sup>	183.67 <sup>B</sup>	197.67 <sup>A</sup>	1.31
4 months	172.33 <sup>D</sup>	188.33 <sup>C</sup>	215.33 <sup>B</sup>	249.00 <sup>A</sup>	2.74
5 months	191.00 <sup>D</sup>	208.00 <sup>C</sup>	244.67 <sup>B</sup>	282.33 <sup>A</sup>	2.20

*Control (T0) = Without treatment, T1=Sodium selenite treatment, T2= Vitamin E and selenium treatment. T3= Selenized yeast treatment,*

*Mean followed different superscript letter within the same row are significant different at P<0.01*

**Table (4). Effect of different selenium sources on plasma concentration (ng/ml) of testosterone in lambs**

Item	Treatments				±SE
	Control	T1	T2	T3	
At the beginning	0.65	0.67	0.66	0.68	0.01
One month	0.71 <sup>C</sup>	0.81 <sup>B</sup>	0.89 <sup>A</sup>	0.90 <sup>A</sup>	0.02
2 months	0.97 <sup>C</sup>	1.02 <sup>B</sup>	1.05 <sup>A</sup>	1.06 <sup>A</sup>	0.05
3 months	1.11 <sup>C</sup>	1.25 <sup>B</sup>	1.31 <sup>A</sup>	1.34 <sup>A</sup>	0.03
4 months	1.41 <sup>C</sup>	1.58 <sup>B</sup>	1.68 <sup>A</sup>	1.71 <sup>A</sup>	0.05
5 months	1.73 <sup>C</sup>	1.98 <sup>B</sup>	2.09 <sup>A</sup>	2.12 <sup>A</sup>	0.04

*Control (T0) = Without treatment, T1=Sodium selenite treatment, T2= Vitamin E and selenium treatment. T3= Selenized yeasttreatment.*

*Mean followed different superscript letter within the same row are significant different at P<0.01*



by Rock et al. (2001), Antunović et al., (2009 and 2014), El- Shahat and Abdel Monem (2011), Soliman et al. (2012), Alimohamady, et al., (2013) and Kassab and Mohammed, (2014) in sheep.

Likewise, the results obtained by Shinde et al., (2009) showed significantly higher activity of triiodothyronine in blood of buffalo calves that were fed with the addition of sodium selenite compared to those without add selenium. Previous study by Awadeh, et al., (1998) noticed that marked increase of triiodothyronine concentration in beef cows and calves as a results of higher intake of selenium. Contrarily, Kumar et al., (2008 and 2009) and Mudgal et al., (2008) did not observed any effect of supplementation 0.15- 0.30 mg selenium/kg DM on the amount of both thyroid hormones in lambs and male buffalo calves. Generally, the increasing in the secretion of thyroid hormones in T3, T2 and T1 may be due to 1- Increasing of carbohydrate, fat and protein metabolism, which was reflected in a positive effect on digestibility coefficient of carbohydrate, fat and protein 2- Also, the increasing of TDN and DCP intakes in T3, T2 and T1 groups. There was a positive relationship between energy or protein intakes and the concentrations of the thyroid hormones as reported by Ahmed, (2003), kassab, (2007) and Zounouy, (2011). Also, the present results showed that both triiodothyronine and thyroxin concentrations increased with advantaging of age over all dietary treatments. The present results are in agreement with the results reported by Kassab, (2007) and Zounouy,(2011). Generally, available data indicated that feed Se (organic forms) is takes up more efficiently by plasma and when cows are depleted plasma Se also remains higher in animals fed organic Se than in those fed inorganic Se.

## **CONCLUSION**

It could be concluded that supplementation of selenium in the ration of sheep specially in the form of selenized yeast (Se-yeast) led to an improvement the digestibility coefficient and feeding values of rations and reproductive performance through the favorable effects on testes weight, testes diameters and testosterone concentration and, as well as thyroid hormones concentrations in blood of male lambs. More detailed investigations including the identification of more and more chemical forms of seleno compounds in the course of metabolism should be conducted to confirm more confusions, recommendations biological functions of this very important element.

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## بعض الصفات التناسلية لذكور الحملان و القيمة الغذائية للعلائق المضاف إليها مصادر مختلفة من السيلينيوم

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الهدف من هذه الدراسة تقييم بعض الصفات التناسلية في الحملان ومعاملات الهضم و كذلك القيمة الغذائية للعلائق المضاف إليها مصادر مختلفة من السيلينيوم. أجريت هذه التجربة في مزرعة الإنتاج الحيواني البحثية التابعة لكلية الزراعة جامعة سوهاج- سوهاج. تم في هذه التجربة استخدام 24 حمل تتراوح اعمارهم من 7-8 شهور وكان متوسط أوزانهم  $24.47 \pm 0.15$  كجم تم تقسيم هذه الحيوانات عشوائيا إلى أربعة مجموعات متساوية 6 حملان في كل مجموعة. وقد استمرت هذه التجربة لمدة 25 أسبوعا لإضافة إلى أسبوعين قبل بدء التجربة للاقلمة. تم تركيب العليقة الأساسية لتغطية الاحتياجات الغذائية للحملان طبقا لمقررات NRC 1985 فيما عدا عنصر السيلينيوم. تم تغذية الحملان في المجموعة الأولى على العليقة الأساسية وبدون أى إضافات واستخدمت كاكنترول (T0) بينما تم تغذية الحملان في المجموعات T1 و T2 و T3 على العليقة الأساسية مضاف إليها 0.1 ملليجرام من السيلينيوم لكل كجم مادة الجافة في صورة سيلينيات الصوديوم و فيتامين E والسيلينيوم وخميرة السيلينيوم على الترتيب. تم اختيار ثلاثة كباش من كل مجموعة متوسط أوزانها  $44.21 \pm 4.90$  ووضعت في صناديق الهضم لاجراء 4 تجارب هضم لتقييم علائق التجربة من حيث القيم الهضمية و الغذائية. استمر الدور التمهيدى 5 ايام ثم 10 ايام كدور رئيسى لتجميع الروث من كل حيوان على حدى. وتم حساب مجموع المركبات الغذائية المهضومة (TDN) وكذلك البروتين الخام المهضوم (DCP). تم اخذ ثلاثة عينات من الدم من كل مجموعة صباحا قبل التغذية و تقديم الماء من الوريد الوداجى وذلك في الايام صفر، شهر 2، 3، 4، 5 شهور من بداية التجربة لتقدير بعض مكونات الدم.

اظهرت النتائج أنَّ العلائق المضاف إليها خميرة السيلينيوم T3 ادت الى زيادة في معاملات هضم كل من المادة الجافة ، المادة العضوية، البروتين الخام، مستخلص الاثير، والمستخلص الخالى من الازوت مقارنة بالمعاملات الاخرى. وكانت الفروق معنوية في معظم العناصر الغذائية بين T3 وكل من T1 و T0 المقارنه وكان معدل هضم المادة الجافة في المجاميع المختلفة  $66.66, 68.94, 70.31, 71.98\%$  في المعاملات الكنترول T0، T1، T2، T3 على التوالي. كما ان قيم كل من TDN و DCP. سلكت نفس اتجاه معاملات الهضم بين علائق التجربة الاربعه. وقد اظهرت النتائج ان وزن الخصية في المعاملة الثالثة (T3)، (T2)، (T1) أعلى من الكنترول وكانت الفروق بين المعاملات غير معنوية كما اظهرت النتائج أيضاً أنَّ تركيز عنصر السيلينيوم في الخصية في المعاملة الثالثة (T3) سجلَّ زيادة معنوية ( $P < 0.01$ ) وبلي ذلك المعاملة الثانية ثم الأولى بينما سجلت مجموعة الكنترول أقل قيمة وقد اظهرت النتائج أيضاً أنَّ محيط و حجم الخصية وكذلك تركيز هرمون التستستيرون في الدم عدم وجود فروق معنوية بين المعاملات في بداية التجربة و بينما ادت المعاملات المختلفة الى وجود فروق معنوية عند مستوى ( $P < 0.01$ ) او بين المعاملات وذلك بعد 1، 2، 3، 4، 5 شهور من بداية التجربة. وعموما سجلت النتائج أعلى قيم لمقاييس الخصية المختلفة وتركيز التستستيرون في المعاملة الثالثة والثانية مقارنة بالمعاملة الأولى والكنترول وكانت الفروق معنوية بين كل معاملة و الاخرى وكانت أقل القيم في مقاييس الخصية وتركيز التستستيرون في معاملة الكنترول. كما اظهرت النتائج ان كل من مقاييس الخصية وتركيز التستستيرون في الدم تزداد بتقدم العمر. و قد اوضحت النتائج أيضا ان قيم هرمونات الدرقية سجلت زيادة معنوية ( $P < 0.01$ ) في المجموعات الثالثة والثانية والأولى والتي اضيف إليها سيلينيوم عضوى او غير عضوى في العليقة بالمقارنة بالمعاملة الكنترول كما ان المعاملة الثانية والثالثة سجلت ايضا زيادة معنوية ( $P < 0.01$ ) بالمقارنة بالمعاملة الأولى او الكنترول كما اوضحت النتائج ايضا زيادة قيم هرمونات الدرقية مع التقدم في عمر الحملان .

نستنتج من هذه النتائج ان إضافة السيلينيوم الى علائق الأغنام خاصة في صورة خميرة السيلينيوم يؤدي إلى زيادة القيم الهضمية و الغذائية للعلائق بالإضافة الى تحسين الخصائص التناسلية في الحملان عن طريق تحسين مقاييس الخصية وتركيز هرمون التستستيرون وهرمونات الغده الدرقيه ذات العلاقه القويه بالتمثيل الغذائى بجسم الحيوان وقد انعكس ذلك على الاداء الانتاجى و التناسلى.