PRODUCTIVE PERFORMANCE AND EGG QUALITY TRAITS OF LAYING HENS FED ON DIETS TREATED WITH NANO-SELENIUM UNDER HOT DESERT CONDITIONS

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ABSTRACT: The objective of this investigation was to study the productive performance of laying hens fed on diets treated with Nano-Selenium at various levels under hot desert conditions. One hundred and fifty 21-weeks-old purpose breeding hens of ISA White strain were distributed randomly into five treatments groups of 30 females. Each group was divided into 3 replicate (10 hens of each) the 1st group was fed a basal diet without additives (control). The 2nd, 3rd, and 4th groups were fed the same basal diet supplemented with 0.1, 0.2 and 0.30 mg Nano-Se/kg diet. The 5th group was fed the same basal diet supplemented with 0.3 mg organic-Se/ kg diet (selenomethionine), respectively. Feed and water were provided *ad-libitum* throughout the experimental period (21–34 weeks of age). Artificial light was used beside the normal day light to provide 16 hour/ day photo period. The results showed that egg number, egg weight, egg mass, and feed conversion ratio (FCR) were significantly (P≤0.05) improved by nano-se supplementation compared with hens fed the control diet. The best improvement in feed conversion noticed with birds which received 0.3 mg/ kg diet nano-se. Body weight did not induce any significant differences among treatments. Showed the shell thickness, Egg width, Y Width, and YH had significantly increased (P≤0.05) by supplementation of source Se compared the control. On the other hand, shell weight and shell % insignificantly differences in the hen's supplementation of source se compared the control. Also, albumen weight, albumen height, and yolk weight, egg index and egg weight were insignificantly differences in the hens as compared to the control.

In conclusion, under hot desert conditions, hens fed nano-selenium at a level of 0.2 mg nano-se/ kg diet might alleviate the drastic effect of heat stress and it's positively reflected on productive performance, and egg quality, economical efficiency and relative economical efficiency.

Key words: Nano-Selenium; Egg Production; Egg Quality; Laying Hens.

INTRODUCTION

Selenium is an essential trace element that has a large number of biological functions in poultry. Selenium is sometimes supplemented in broiler diets in its inorganic form (sodium selenite). However, this salt is very toxic and needs to be more soluble in its ionic form in order to increase its absorption in gastrointestinal tract. In addition, the electric charges of this ionic form may interact with other diet components (minerals, proteins and carbohydrates), rendering them partially unavailable to animals (Saad *et al.,* 2013). Many researches study the various effects of using selenomethionine as organic selenium source in broiler or layer diets and most of them reported positive effects Mahmoud and Edens, (2003) and

El-Sheikh and Ahmed (2006). Selenomethionine is the most appropriate form of se for use in animal nutritional supplements because of their excellent bioavailability and lower toxicity among various forms of se (Utterback *et al.*, 2005). However, selenium deficiency in poultry causes oxidative diathesis, pancreatic dystrophy and nutritional muscle dystrophy of the gizzard, heart and skeletal muscle. Additionally, insufficient immunity, lowering of production ability, lowers fertility and laying capacity. Also, decreased feathering of chickens and increased embryonic mortality may occur due to selenium deficiency (Cantor *and* Scott 1974).

With the recent development of nanotechnology, nano-selenium (nano-se) has attracted widespread attention because nanometer particulates exhibit novel characteristics such as a large surface area, high surface activity, high catalytic efficiency, strong adsorbing ability and low toxicity and it has been reported that nano-se possesses comparable efficiency to selenite and se-methyl seleno cysteine in up regulating seleno enzymes but with dramatically decreased toxicity (Zhang *et al.,* 2008). The different physiological effects of nano-se and sodium selenite were probably related to the different absorption process and metabolic pathways (Mohapatra *et al*., 2014[a and b]). It has been reported that nanoparticle show new characteristics of transport, uptake and exhibit higher absorption efficiencies (Liao *et al.*, 2010). They suggested that the superior performance of nano particles may be attributed to their smaller particle size and larger surface area, increased mucosal permeability, improved intestinal absorption and tissue depositions. The transport efficiencies of selenomethionine and nano-se were higher than that of sodium selenite ($p \leq 0.05$). The highest uptake efficiency ($p \leq 0.05$) was observed in cells treated with nano-se and significant difference was also observed between the cells incubated with sodium selenite and selenomethionine (Wang and Fu, 2012). Glutathione peroxidase (GSH-Px®) has antioxidative action and contributes to the oxidative defense by catalyzing the reduction of hydrogen peroxide and lipid peroxides to less harmful hydroxides (Arthur, 2000). The activity level of this enzyme in the liver or plasma is indicative of the se supply to the organism moreover antioxidant protection levels are affected by dietary se status (Wang and Xu, 2008).

Therefore, the objective of this investigation was to study productive performance and egg quality of laying hens fed on diets treated with at various levels nano-selenium under hot desert conditions.

MATERIALS AND METHODS

The present study was conducted in the Poultry Research Farm, Al Sarhan Farm located at Bir AL Abed in North Sinai, Egypt. The experiment started on June 2017 up to August 2017. Laboratory work was carried out in the laboratories compound of Desert Research Center.

Experimental design

One completely randomized design was carried out to study effects of dietary supplementation of nano selenium (0.1, 0.2, and 0.3 mg/ kg diet) and organic selenium (0.3 mg/ kg diet) on the productive and physiological performance of ISA strain layers under hot desert conditions in Egypt. A total number of 150 ISA white strain layers (21-weeks old and body weight of 1252.8 g ± 9.3) were randomly divided into five equal experimental groups (30 layers/ group). Each group was randomly divided into 3 equal replicates (10 hens of each). The 1st group (Tr_1), hens fed basal diet without additives (control). The 2nd, 3rd and 4th groups (Tr_2, Tr_3 and Tr_4) layers fed the same basal diet supplemented with 0.1, 0.2 and 0.3 mg nano selenium/ kg diet, respectively. The 5th group (Tr_5), fed the basal diet, supplemented with 0.3 mg organic selenium/ kg diet.

Preparation and characterization of selenium nano particles:

Selenium nano particles were prepared by the reduction of selenium with diluted aqueous solutions containing Na_2SO_3. Sodium selenosulphate solution was prepared by refluxing a mixture of selenium and Na_2SO_3 in double distilled water at 70-80 °C for about 7-8 hours (Gorer and Hodes, 1994). An aqueous polyvinyl alcohol (PVA) stock solution, 1 % by weight, was prepared and used as stabilizing agent. The formation of orange-red colored selenium nano particle solution was observed in less than one minute upon mixing the PVA with Sodium selenosulphate. It is important to use stabilizer, during the preparation of metal nano-particle, to avoid nano-particles agglomeration (Bai *et al.*, 2007).

Characterization:

Characterization of nano particles is important to understand and control nano particles synthesis and applications. SeNPs were assessed by UV-V spectroscopy (Figure 1). The determination of SeNPs concentration of the present study was 17800 ppm/ liter using Flam Atomic absorption spectrometry (Agilent Technologies 200 Series AA).

Management and feeding:

ISA white strain layer hens (21 weeks old) were kept under the same managerial and hygienic conditions. Layer hens were healthy and examined against diseases and treated with antibiotics and vaccine.

Layer hens until 34 weeks of age (end of experiment) were housed in wire cages, supplied with clean fresh water and fed *ad-libitum*. The experiment's basal diet was formulated to meat the nutrient measurments for the ISA strain. The composition and calculated analysis of the experimental basal diet are presented in Table (1).

At the age of 18 weeks the natural day length was artificially increased from 14 h to 16 h/ day in peak of egg production (30 weeks) and then it maintained constant until the end of experiment (34 weeks).

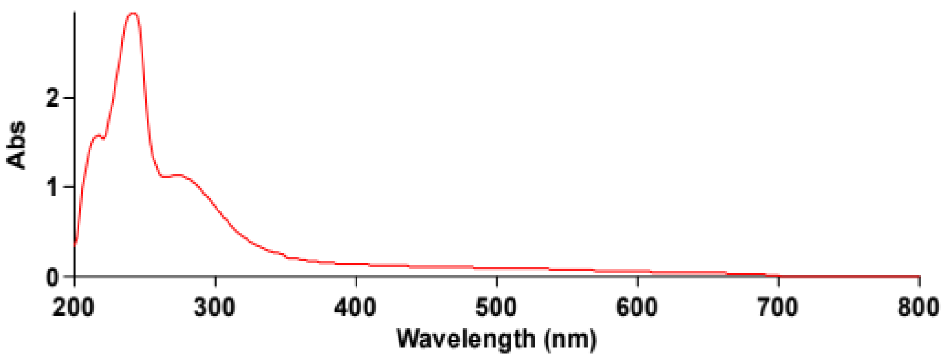

Figure 1: UV-V spectroscopy of nano selenium.

Table (1): Ingredients and chemical analysis of the control basal diet:

Ingredients	Basal diet	Calculated values [3]:	
Yellow corn (8.8%)	58.02	Crude protein, %	18.02
Soybean meal (44%)	29.34	ME, Kcal/ kg diet	2797
Vegetable oil	2.17	C/P ratio	155.2
Di-calcium phosphate	1.32	Lysine, %	0.80
Limestone, ground	8.39	Methionine, %	0.41
Vit. and Min. Mix. [1]	0.30	Met.+ Cysteine, %	0.66
DL- methionine [2]	0.15	Calcium, %	3.46
Salt	0.31	Av. Phosphorus, %	0.42
Total	100		

[1]Vitamins and minerals premix provided per kilogram of the diet: Vit. A, 1200 IU; Vit. D_3, 2500 IU; Vit E, 10 mg; Vit. K, 3 mg; Vit. B_1, 1 mg; Vit. B_2, 4 mg; Pantothenic acid, 10 mg; Nicotinic acid, 20 mg; Folic acid, 1 mg; Biotin, 0.05 mg; Niacin, 40 mg; Vit. B_6, 3 mg; Vit. B_{12}, 0.02 mg; Choline chloride, 500 mg; Mn., 62 mg; Fe., 30 mg; Zn., 56 mg; I., 1 mg; [2]DL- methionine: 98 % feed grade (contained 98 % methionine). [3]Calculated according to NRC (1994).

Investigated measurements:

Temperature-humidity index:

Indoor (ambient temperature and relative humidity index were recorded during the experimental period (Table 2). Temperature Humidity Index (THI) calculated according to Marai *et al.* (2001). They reported that THI= db°C – [(0.31 – 0.31 × RH) × (db°C – 14.4)]. Where, db°C = dry bulb temperature in centigrade, The THI values were classified as absence of heat stress (≤27.8), moderate heat stress (27.8-28.8), severe heat stress (28.9-29.9) and very severe heat stress (≥30.0).

Productive performance

Body weight was recorded at initial body weight (21 weeks) and at final body weight (34 weeks). Egg number and egg weight were daily recorded for 90 days (egg production period). Egg mass was calculated by multiplying average egg weight by egg number. Feed and water intake were recorded. Feed conversion ratio was calculated as follows: feed conversion ratio=total feed intake/ total egg mass.

Egg quality

Thirty eggs were randomly collected from each treatment (180 eggs) to measure egg quality traits according to Stino *et al*. (1982) and El –Wardany *et al*. (1994). These traits included that: Egg shape index = egg width/egg length×100 using Vernier Caliper for measurements. Egg shell weight was recorded by digital balance to nearest 0.1 gram. Shell (%) = shell weight / egg weight × 100. Egg shell thickness measured with membrane in mm (average of the broad, narrow ends and equator areas of egg). Yolk weight was recorded by digital balance to nearest 0.1 gram. Yolk (%) = yolk weight / egg weight × 100. Yolk index calculated as yolk height / yolk diameter × 100. Albumen weight was calculated by subtracting yolk and shell weight from total egg weight. Albumen (%) = albumen weight / egg weight × 100. Yolk / Albumen ratio = yolk weight / albumen weight × 100.

Economical efficiency:

Economic efficiency for egg production was calculated from the input–output analysis (Heady and Jensen, 1954) according to the price of the experimental diets and egg produced. Values of economic efficiency were calculated as the net revenue per unit of total costs (Soliman and Abdo, 2005).

Chemical analysis:

At 34 weeks of age, three eggs from each treatment group were randomly taken for chemical analysis, and then samples were oven dried at 105 °C, then ground and stored to chemical analysis. The determination of moisture, crude protein, ether extract and crude fiber in eggs were carried out according to the Official Methods (AOAC, 2003).

Statistical analysis

Data was analyzed on one way classification basis by the least square analysis of variance using the General Linear Model Procedure (SAS, 2004). The model was as follows:

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

Y_{ij}= Any observations of i^{th} hen within j^{th} treatment

μ = Overall mean

T_i = Effect of i^{th} treatment, (i: 1-5)

e_{ij} = Random error.

All statements of significance are based a probability of less than 0.05. Significant differences among means were tested using Duncan multiple range test (Duncan, 1955).

RESULTS AND DISCUSSION

Productive Performance

Results in Table (3) showed that supplementation of nano-se (Tr2 and Tr3) and organic-se (Tr4) had insignificantly increased final body weight and body weight change as compared to the hens in control group. Similar findings were also reported by Zhou and Wang, (2011); Cai *et al*., (2012) they reported no significant effect of supplementation nano-se (0.2, 0.3 and 0.5 mg/ kg diet) or organic-se on body weight of broilers chicks.

Table (2): Indoor ambient temperature (AT), relative humidity (RH) and temperature-humidity index (THI) during experimental period:

Month	Min AT (ºC)	Max AT (ºC)	Min RH (%)	Max RH (%)	Min THI	Max THI
June	26.93±0.27	32.86±0.21	41.30±1.08	71.20±0.85	25.81±0.25	29.50±0.17
July	25.48±0.27	32.61±0.20	37.90±1.06	72.16±0.84	24.53±0.25	29.10±0.17
Aug	27.64±0.27	33.64±0.20	43.41±1.06	71.51±0.84	26.46±0.25	30.26±0.17
Overall	26.68±0.18	33.04±0.12	40.86±0.65	71.63±0.48	25.60±0.16	29.62±0.11

Table (3). Body weight and body weight change of laying hens as affected by organic and nano selenium supplementation.

Traits	C	Tr_1	Tr_2	Tr_3	Tr_4	±SE
IBW (g)	1253.75	1253.70	1252.20	1252.00	1252.50	21.27
FBW (g)	1448.43	1443.03	1475.29	1477.42	1459.37	13.52
BWC (g)	194.68	189.32	223.08	225.42	206.87	23.94

C = control (hens fed 0.3 mg inorganic selenium/ kg diet; Tr_1 =hens fed 0.1 mg nano selenium/ kg diet; Tr_2 =hens fed 0.2 mg nano selenium/ kg diet; Tr_3= hens fed 0.3 mg nano selenium/ kg diet; Tr_4 =hens fed 0.3 mg organic selenium/ kg diet. ±S.E, standard error; IBW = initial body weight, FBW = final body weight, BWC = body weight change.

Data presented in Table (4) showed that there was a significant (P≤0.05) increase in the value of egg weight of the hen's received diet supplemented with 0.3 mg of nano-se (Tr_3) as compared to the control group. The higher egg weight was observed with hens received 0.3 mg nano-se/ kg diet (Tr_3) by 4.1 % as compared to the hens in control group. Likewise, egg number and egg mass were significantly (P≤0.05) increased in the hens of Tr_3 (0.3 mg nano-se/ kg diet) and Tr_2 (0.2 mg nano-se/ kg diet) groups, followed by hens when compared to the control group and other dietary treatment groups.The higher egg mass was observed with hens received diet containing 0.3 mg nano-se/ kg diet value by 19.5 % as compared to the hens in control group. The effect of selenium supplementation on feed conversion of hens is presented in Table (4). It can be noticed that feed conversion ratio of hens was significantly improved by selenium supplementation at 0.2 and 0.3 mg/ kg diet. The finest improvement in feed conversion was noticed with hens which received diet containing 0.3 mg nano-se/ kg diet. It can be noted that feed intake of hens was significantly improved by selenium supplementation at 0.2 mg/ kg diet. These results agree with the results of Fu-xiang *et al.*, (2008); Selim *et al.*, (2015). They reported improvement FCR of broiler chicks when fed containing supplemental se sources using organic or nano-se (0.15, 0.2, 0.3, 0.4 and 0.5 mg/ kg diet). The improvement for productive performance may be attributed to selenium supplementation, where se is an important auxiliary factor for the key enzyme of 5-deiodinase (Nadia et al., 2015; Rizk et al., 2017).

Egg quality

The results in Table (5) showed the shell thickness and yolk color had significantly (P≤0.05) increased by supplementation of se source as compared the control group. Shell thickness had significantly (P≤0.05) increased by 24.5, 21.6, 19.0 and 16.8 % for Tr_1, Tr_2, Tr_3 and Tr_4 groups, respectively as compared to the hens of control group. These results agree with the results of Sara *et al*., (2008); Maysa *et al.*, (2009) they showed that shell thickness was significantly increased in Sel-Plex™ treated groups compared to the control group. However, Gjorgovska *et al*., (2012) reported that percentage of yolk, albumin and shell egg were not affected by different levels or sources of selenium. On the other hand, shell weight and shell % insignificantly differences in the hen's supplementation of source se compared the control. Also, albumen weight, albumen height, and yolk weight, egg index and egg weight were insignificantly differences in the hens of Tr_1, Tr_2, Tr_3 and Tr_4 as compared to the control. These results agree with the results of Gjorgovska *et al*., (2012) they reported that percentage of yolk, albumin and shell egg were not affected by different levels or sources of Selenium. On the other hand, Maysa *et al.,* (2009) and Rizk *et al.,* (2017) evaluated the 1st egg weight significantly increased for groups fed diet of nano and organic-se values by (12.5 %, and 8.6 %) than those of the control. They also showed improve in egg yolk index was significantly increased for hens fed sel-plex supplementation compared with those in control group.

Table (4). Productive performance of laying hens as affected by organic and nano selenium supplementation.

Traits	C	Tr_1	Tr_2	Tr_3	Tr_4	±SE
EW (g)	54.91^{b}	55.66^{ab}	56.66^{ab}	57.16^{a}	55.41^{ab}	0.65
EN	57.08^{d}	59.66^{c}	64.75^{a}	65.58^{a}	62.41^{b}	0.77
EM (g)	3136.66^{c}	3321.83^{b}	3666.00^{a}	3748.58^{a}	3460.33^{b}	59.13
DFI (g)	108.44^{a}	103.31^{b}	104.40^{b}	105.94^{ab}	106.68^{ab}	1.23
TFI (g)	9759.75^{a}	9298.50^{b}	9396.00^{b}	9534.75^{ab}	9601.50^{ab}	111.29
FC	3.126^{a}	2.811^{b}	2.569^{c}	2.545^{c}	2.782^{b}	0.05

C = control (hens fed 0.3 mg inorganic selenium/ kg diet; Tr_1 =hens fed 0.1 mg nano selenium/ kg diet; Tr_2 =hens fed 0.2 mg nano selenium/ kg diet; Tr_3 =hens fed 0.3 mg nano selenium/ kg diet; Tr_4 =hens fed 0.3 mg organic selenium/ kg diet. ±S.E, standard error; EW = egg weight, EN = egg number, DFI = daily feed intake, TFI = total feed intake, EM = egg mass, FC = feed conversion. $^{a, b, c}$ Means bearing different superscripts within the same row are significantly different (P≤0.05).

Table (5): Egg quality parameters of laying hens as affected by organic and nano selenium supplementation.

Traits	C	Tr_1	Tr_2	Tr_3	Tr_4	±SE
Egg weight (g)	54.65	53.97	55.99	55.11	57.17	1.22
Egg shape index	73.56	73.14	73.02	73.96	74.40	111.29
Yolk index	43.52	44.35	43.06	44.01	45.34	1.32
Albumen height	6.97	7.09	6.55	7.20	7.50	0.45
Yolk weight (g)	12.92	12.81	13.71	12.90	13.34	0.63
Yolk (%)	23.75	23.67	24.55	23.30	23.43	1.06
Yolk color	6.00^{b}	6.84^{ab}	7.00^{ab}	7.76^{a}	6.23^{b}	0.45
Albumen weight (g)	34.43	34.00	34.87	34.88	36.13	1.11
Albumen (%)	63.85	62.95	62.20	63.28	63.09	1.11
Shell (%)	13.38	13.37	13.23	13.41	13.45	0.49
Shell thickness (×0.01 mm)	0.416^{b}	0.495^{a}	0.506^{a}	0.518^{a}	0.486^{a}	0.01

C = control (hens fed 0.3 mg inorganic selenium/ kg diet; Tr_1 = hens fed 0.1 mg nano selenium/ kg diet; Tr_2 =hens fed 0.2 mg nano selenium/ kg diet; Tr_3 = hens fed 0.3 mg nano selenium/ kg diet; Tr_4 = hens fed 0.3 mg organic selenium / kg diet. ±SE = standard error. $^{a, b, c}$ Means bearing different superscripts within the same row are significantly different (P≤0.05).

Economical efficiency:

Results concerning economical efficiency evaluation of nano-se and organic-se incorporation in ISA white layer hens diets are shown in Table (6).

Generally, the results indicate that supplementation of nano-se and organic-se increases economical efficiency and relative economical efficiency. The best values were obtained with 0.2 mg nano-se/ kg diet.

The highest economical efficiency value (168.46 %) was observed with the diet containing 0.2 mg nano-se/ kg diet (T2), followed by (157.73 %) the diet containing 0.3 mg nano-se/ kg diet (T3) and lowest economical efficiency value (132.69 %) obtained with the control (C). The relative economical efficiency values followed the same trend being highest for (T2) and lowest in control (C).

Table (6). Economical evaluation of laying hens as affected by organic and nano selenium supplementation.

Traits	C	Tr1	Tr2	Tr3	Tr4
Feed conversion	3.126	2.811	2.569	2.545	2.782
Cost of kg feed (L.E)	5.50	5.70	5.80	6.10	5.70
Feed cost of kg egg (L.E)	17.19	16.02	14.90	15.52	15.86
Selling price of one kg egg (L.E)	40.00	40.00	40.00	40.00	40.00
Net revenue (L.E)	22.81	23.98	25.10	24.48	24.14
Economic efficiency	132.69	149.69	168.46	157.73	152.21
Relative economic efficiency (%)	100.00	112.81	126.96	118.87	114.71

C = control (hens fed 0.3 mg inorganic selenium / kg diet; Tr1 =hens fed 0.1 mg nano selenium / kg diet; Tr2 =hens fed 0.2 mg nano selenium / kg diet; Tr3 =hens fed 0.3 mg nano selenium / kg diet; Tr4 =hens fed 0.3 mg organic selenium / kg diet. Economic efficiency = (Net revenue ÷ Total feed cost) x 100. Relative economic efficiency of control considered 100.

CONCLUSION

Under hot desert conditions, layer hens fed on nano-selenium at a level of 0.2 mg nano-se/ kg diet might alleviate the drastic effect of heat stress and it's positively reflected on productive performance, egg quality and economic efficiency.

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الأداء الإنتاجي وصفات جودة البيض للدجاج البياض المعامل بالنانو سيلينيوم تحت الظروف الصحراوية الحارة

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الملخص العربى

الهدف من هذا البحث هو دراسة الأداء الإنتاجي للدجاج البياض المعامل بالنانو سيلينيوم تحت ظروف الصحراوية الحارة. تم تربية مائة وخمسين (١٥٠) دجاجة من سلالة ايزا الابيض عند عمر ٢١ أسبوعً. تم توزيع الطيور عشوائياً الي خمس معاملات كل معاملة (٣٠ أنثى) وكل مجموعة ثلاث مكررات (١٠ انثى). تمت تغذية المعاملة الأولى (الكنترول) بنظام غذائي بالسيلينيوم غير العضوي (سيلينيت الصوديوم) يحتوي على ٠.٣ مجم سيلينيوم غير عضوي / كجم عليقة. تم تغذية المعاملات الثانية والثالثة والرابعة على Nano–Selenium بمستويات ٠.١ , ٠.٢ و ٠.٣ مجم نانو سيلينيوم/ كجم عليقة على التوالي. بينما غذيت المعاملة الخامسة على ٠.٣ مجم من السيلينيوم العضوي/ كجم عليقة (سيلينوميثيونين). تم توفير العلف والماء بصوره حره خلال فترة التجربة (٢١–٣٤ أسبوعًا من العمر). تم استخدام الضوء الاصطناعي بجانب ضوء النهار العادي لتوفير فترة ١٦ ساعة اضاءة/ يوم.

اوضحت هذه النتائج ان نسبة إنتاج البيض اليومي، وعدد البيض، ووزن البيضة، وكتلة البيض، ونسبة التحويل الغذائي (FCR) تحسنت معنويا ($P < 0.05$) بين المعاملات باستخدام النانو سيلينوم مقارنة مع طيور معاملة (الكنترول). أفضل تحسن في التحويل الغذائي لوحظ عند الطيور التي غذيت على ٠.٣ مجم/ كجم علف Nano–Se. لم يُحدِث في وزن الجسم أي فروق معنوية (P 0.05) بين المعاملات. أدت إضافة النانو سيلينيوم إلى تحسن سمك قشرةِ البيضة وعرض البيضة والصفار مقارنة بالكنترول، بينما لم يؤثر على كل من: (صفات وزن القشرة البيضة ونسبة القشرةِ وايضا وزن وارتفاع البياض ووزن الصفار ودليل شكل البيضة) لا توجد فروق معنوية بين المعاملات مقارنة بالكنترول.

التوصيات: في ظل الظروف الصحراوية الحارة ، قد يخفف الطيور الذي تتغذى على مادة النانو سيلينيوم بمستوى ٠.٢ ملجم نانو سيلينيوم / كجم عليقة من التأثير الشديد للإجهاد الحراري وينعكس إيجابيا على الأداء الإنتاجي وجودة البيض والكفاءة الاقتصادية والكفاءة النسبية.

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