Effects of supplemental selenium and α-tocopherol on hen performance and egg nutrients deposition

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Introduction

Nutrition of laying hen has direct influence on egg quality. Nutrients play important roles in animals and human health by activating harmful substances (Padh, 1991). Most important functions of selenium and α-tocopherol is their role as an antioxidant. Egg production of heat stress hens was increased with antioxidants supplementation. (Canan *et* al., 2007). Vitamin-enriched eggs are attractive as a means of providing consumers with nutrients that may be beneficial to health. Improvements in egg nutritional value may have direct positive implications for daily nutrient intake (Nys & Sauveur, 2004). However, requirement for selenium and α-tocoperol must be met through dietary supplementation. There is dearth of information on the effects of supplemental selenium and α-tocopherol on hen performance and egg nutrients deposition. Therefore, this study was aimed at evaluating the effects of supplemental selenium and α-tocopherol on hens performance and egg nutrients deposition.

Materials and methods

192 Point of lay, ISA Brown pullets were randomly allotted to 6 dietary treatments of α-tocopherol (20 and 40 mg/kg) and inorganic selenium (0.5, 1.0 and 1.6 mg/kg) each treatment was replicated 4 times with 8 birds per replicate. Number of birds and egg production was recorded daily to determine hen day egg production. Eggs were weighed to determine average egg weight.. Feed intake was recorded on a weekly basis and eggs were analysed at the end of the experiment for nutrient deposition. The experiment lasted 20 weeks.

Table 1: Performance of laying hens fed supplemental selenium and α-tocopherol

		HDEP (%)	Feed Intake (g)	Egg weight (g)
Control	0.00	40.80	90.46	53.28
Selenium (mg/kg)	0.5	36.98	96.88	57.77
	1.0	43.88	92.63	51.98
	1.5	35.60	94.04	50.93
α-tocopherol (mg/kg)	20	46.34	94.38	53.69

	40	42.99	98.67	58.72
	SEM	1.79	1.38	1.56

HDEP –Hen Day Egg Production, SEM-Standard error of mean.

Table 2: Effects of supplemental selenium and α-tocopherol on selenium and α-tocopherol deposition in egg

		Selenium (µg/100g)	α-tocopherol (mg/100g)
Control	0.0	13.33^{d}	1.51^{c}
Selenium (mg/kg)	0.5	14.00^{d}	2.06^{bc}
	1.0	16.00^{c}	2.16^{bc}
	1.5	26.00^{b}	2.61^{ab}
α-tocopherol (mg/kg)	20	27.33^{b}	2.86^{ab}
	40	28.00^{a}	3.38^{a}
	SEM	0.61	0.32

$^{a,b,\ c}$Means in the same column with different superscript are significantly different (P<0.05), SEM-Standard error of mean.

Results and discussion

Performance of laying hens fed diets supplemented with selenium and α-tocopherol is shown in Table 1. There were no significant difference (p>0.05) in all measured performance parameters. The effects of dietary supplement of selenium and α-tocopherol on selenium and α-tocopherol deposition in egg are shown in Table 2. Dietary treatment had significantly influence (p<0.05) on selenium and α-tocopherol deposition in the eggs. Higher selenium deposition (28.00) was recorded for hens on 40 mg/kg α-tocopherol while hens on 1.0 mg/kg selenium supplementation had lower value (16.00). *However*, α-tocopherol deposition was significantly higher (p<0.05) in eggs from *hens on 4*0 mg/kg α-tocopherol *(3.38) than control diet (1.51), 0.5 mg/kg selenium (2.06), 1.0 mg/kg selenium (2.16), 1.5 mg/kg selenium (2.61) and 2*0 mg/kg α-tocopherol *(2.86).* The improvement in egg deposition of selenium and α-tocopherol with dietary supplementation of these nutrients emphasized their synergistic roles in the synthesis and deposition of one another.

References

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