

USE OF THE HERBAL METHIONINE AS AN ALTERNATIVE TO SYNTHETIC METHIONINE (DL-METHIONINE) TO IMPROVEMENT THE PERFORMANCE AND FEED COST ECONOMICALLY FOR THE LAYER (ISA BROWN)

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Abstract

One hundred and eight layers (ISA Brown Iraq) at old 28 weeks were randomly distributed into 6 nutritional treatments. Each treatment included 9 replicates (cages in battery system with dimensions 40x45x48 cm per cage). The feed and water were ad libitum and the birds supplied with 17 h light daily. The treatment were, T1 : was basic diet without adding industrial or herbal methionine (control), T2 : basic diet + (100% DL-Met) to complete the needs, T3 : basic diet + (75% DL-Met + 25% Herbal Met) to complete the needs, T4 : basic diet + basic diet + (50% DL-Met + 50% Herbal Met) to complete the needs, T5 : basic diet + (25% DL-Met + 75% Herbal Met) to complete the needs and T6 : basic diet + (100% Herbal Met) to complete the needs. No significant differences among the treatment birds for the egg production as % H.D, egg mass, feed intake, feed conversation ratio, protein intake and protein conversation ratio, while the birds of T3,T4 and T5 best than the birds of the T1, T2 and T6. Replacing the completing the requirement of methionine (%100) with the Herbal Methionine (T6) caused the lowest cost of feed to produced one kilogram of egg and the value of this trait were (0.505, 0.507, 0.474, 0.491, 0.475, 0.469 dollars) for the treatments respectively.

Keywords : DL-Met, Herbal-Met, layer, diet, egg production

Introduction

Herbal feed additives are currently in use for poultry diets to improve egg and egg quality (Gragasin et al., 2014; Igbasan et al., 2012). Adding methionine as essential amino acids in layers diets was due to their lack in cereal grains and vegetable meal as soybean meal (Lesson and Summers, 2001). Methionine may act as lipotropic agent through its role as amino acid in increasing the biological role in the acting as methyl donor and involvement in choline, betaine, folic acid and vitamin B12 metabolism (Chattopadhyay et al., 2006; Chen et al., 1993) and precursor for cystine and important source for dietary sulfur (organic source) and synthesis important substances for the live body including epinephrine, choline and creatine (Bender, 1975). The risk to use synthetic methionine and the high cost of synthetic methionine (Ahmed and Abbas, 2015). Herbal Methionine is phyto additive containing herbal ingredients that mimic the activity of methionine .The aim of this study was conducted to determine the effects of herbal methionine versus DLmethionine on the layer performance and quality of the egg.

Materials and Methods

The present experiment was conducted in an semi closed poultry house at the poultry farm of agriculture college-University of Kirkuk. One hundred and eight 28 week ISA Brown layers were procured from a commercial company. The layers were randomly assigned to 6 dietary treatments, each was replicated 9 times (9 cages at battery system) and each cage (replicate) contained 2 birds. Diet1 was the control (basic diet) with out supplementation methionine, Diet2 was basic diet supplemented 100% with DL-methionine to complete the needs, Diet3 was basic diet supplement 75% DL-methionine +25%Herbal methionine to complete the needs, Diet4 was basic diet supplement 50% with DL-methionine +50% with Herbal methionine to complete the needs.Diet5 was basic diet supplemented with 25% DL-methionine + 75% Herbal methionine and diet6 supplemented with 100% Herbal methionine. Experimental diets were iso-caloric, iso-nitrogenous and formulated according to ISA BROWN guide (2010),to be fed during experimental period 60 days (Table 1). Data on performance for layers were recorded at weekly .The feed cost per kg of egg produced as the following equation: Feed cost (dollars)/kg of egg produced = feed conversion ratio× price (dollars) for kg feed (AL-Nuaimy and AL-Hadeedy, 2018). The experiment was arranged in a completely randomized design. Statistical analyzed by using the General Linear Model procedure of SAS institute (2005). The Duncan's Multiple Range Test at 5% probability (Duncan, 1955).

Table 1 : Composition of the basal diets and treatments

Ingredients (%)	T1	T2	T3	T4	T5	T6
Corn	26.74	26.55	26.55	26.55	26.55	26.55
Wheat	37	37	37	37	37	37
Soybean meal(%47)	18.3	18.3	18.3	18.3	18.3	18.3
Barley	3	3	3	3	3	3
Sunflower oil	3.2	3.2	3.2	3.2	3.2	3.2
Salt	0.17	0.17	0.17	0.17	0.17	0.17
Limestone	9.13	9.13	9.13	9.13	9.13	9.13
Di-calcium phosphate	2.22	2.22	2.22	2.22	2.22	2.22

Choline chloride(%60)	0.1	0.1	0.1	0.1	0.1	0.1
vitamins and minerals	0.1	0.1	0.1	0.1	0.1	0.1
DL-Lysine	0.04	0.04	0.04	0.04	0.04	0.04
DL-methionine		0.19	0.14	0.09	0.05	
HM-methionine			0.05	0.09	0.14	0.19
Total	100	100	100	100	100	100
Calculated composition						
ME, kcal/kg	2861.36	2854.9	2854.9	2854.9	2854.9	2854.9
CP %	16.30	16.28	16.28	16.28	16.28	16.28
Met %	0.24	0.43	0.38	0.33	0.29	0.24
Lys %	0.75	0.75	0.75	0.75	0.75	0.75
Calcium %	4.00	4.00	4.00	4.00	4.00	4.00
Available Phosphorus %	0.39	0.39	0.39	0.39	0.39	0.39

Results and Discussion

Table (2) report some productive parameters of experimental treatments, The birds of T3 were better than T1 (control) about 6.39% and 4.44% for egg production and mass respectively and this improvement due to supplemented Herbal methionine plus DL-methionine, The active compounds in the Herbal-methionine are which cause enhancement in the digestion, absorption, availability of nutrients and energy production with protein synthesis. In general adding Herbal methionine with DL-methionine enhanced egg production and egg size immunity and act as antioxidant (Kumari *et al.*, 2012; Kaur *et al.*, 2013; Nanda *et*

al., 2018) Herbal methionine used 100% instead of DLmethionine to complete the needs (T6), the birds for this treatments consumed lest feed, protein and methionine by comparing with the control birds (T1), On the other hand the ability of the feed, protein and methionine to egg were better for T6 birds than T1 birds. Data presented at Table (4) showed the report the feed cost for producing one Kilogram of egg. The lowest cost feed as dollars was for the birds of T6 by recording about 0,469 dollar feed cost / one Kilogram of egg, While this value was 0.505 dollars for control (T1) birds.

Table 2 : The effect of herbal methionine substitution as a substitute for DL- methionine on egg production performance rate (1-60 days) for laying hens ISA BROWN (adjusted ± standard error).

		5	,			
	T1	T2	T3	T4	T5	T6
Egg production %H.D	5.14±81.1	5.53±79.07	3.87±87.50	5.14±84.53	4.29±86.29	1.57±84.72
Egg weight g	1.62±69.30	0.87±67.08	1.20±69.58	1.08±69.65	0.95±68.33	1.11±64.75
	а	ab	а	А	А	В
Egg mass G	3.88±62.41	3.92 ± 59.34	2.92±66.85	4.15±65.02	3.54±65.16	1.48±62.04
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The different letters within the same row indicate a significant difference between the transaction rates on the probability level 5%

Table 3 : The effect of herbal methionine substitution as a substitute for DL- methionine on feed intake, FCR, protein, methionine (1–60 days) for laying hens ISA BROWN (adjusted ± standard error)

	T1	T2	Т3	T4	T5	T6
Feed intake	3.93±105.11	5.34±98.26	3.94±106.65	3.60±105.35	4.89±105.46	2.94±97.85
FCR	0.13±1.80	0.12±1.77	0.04±1.66	0.14±1.73	0.05 ± 1.68	0.06±1.67
Protein intake	0.64±17.13	0.87±16.00	0.64±17.37	0.58±17.15	0.79±17.17	0.48±15.93
PCR	0.02±0.29	0.02±0.28	0.00±0.27	0.02±0.28	0.00±0.27	0.01±0.27
Methionine intake	9.61±257.21	23.21±426.79	15.14±409.91	12.05±352.25	14.41±310.42	7.20±239.11
	D	а	а	В	с	d
MCR	0.25±3.32	0.47±5.78	0.18 ± 4.08 ab	0.39±4.49	0.13±3.79	0.13±3.03
	D	а	0.10±4.96 ab	bc	dc	d

The different letters within the same row indicate a significant difference between the transaction rates on the probability level 5%

Table 4 : The effect of herbal methionine substitution as a substitute for DL- methionine economic return (1–60 days) for laying hens ISA BROWN

	T1	T2	Т3	T4	T5	T6
The price of one ton of feed \$	281.96	287.50	286.00	284.50	283.31	281.81
One Kg price \$	0.281	0.287	0.286	0.284	0.283	0.281
feed conversion ratio (g feed / g egg mass)	1.80	1.77	1.66	1.73	1.68	1.67
The cost of feeding to produce one Kg of eggs \$	0.505	0.507	0.474	0.491	0.475	0.469

I relied on the prices of fodder materials on the international website for trading grains, grains and fodder materials via the internet

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