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Influence of different level of *polygermander* extraction Performance, Quality of Eggs and Blood parameters of Laying Hens

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ABSTRACT

This experiment was carried out to determine effect of dietary with deferent level of poly germanderon performance, egg quality, blood biochemical of laying hens. This study was carried out with 300of Hy- line (W36) hens in 4 treatment groups,3 repetitions and 25 hens for each group. The groups were F1) Control group, F2, F3, and F4 with 100, 150, and 200 ppm poly germander extract respectively. Dietary supplementation of various levels of poly germander extract caused significant changes on performance and egg quality. The highest level of food intakeand production percentwere seen in F4. Also the best result for Yolk weight and shell thickness was in groups 4. The serum total cholesterol and Triglycerides concentration were significantly reduced in groups of 4 and 5 compared to the control group (P<0.05). But the concentration of serum LDL, HDL and glucose were not significantly reduced in groups compared to the control group.

Key words: poly germander, Laying Hens, Blood parameters, Egg quality.

INTRODUCTION

There is an increasing trend in the prevalence level of disease, by industrialization of poultry science and breeding chickens in a large scale. To cope with this problem and improve the biological and nutritional characters of chickens, chemical compounds like antibiotic have been used highly in poultry industry [1]. Nowadays, food safety is seriously considered than previous time and many countries have tended to forbiddance antibiotics because of their side effects on both poultries and humans. Because of this problem in feeding farm animals the actual research is considered at finding natural feed that can replace antibiotics with natural occurring promoters to getting the production goal. [2-3].After many years, the long term side effects of these

products like microbial resistance and increase of the blood cholesterol level in the livestock lead to the ban of these commercial antibiotics[1,4].

There are a lot of reports indicating the positive effects of herbs like anti-coccidal , anti-oxidant, anti-fungi and etc. Some of medical effects of herbs are related to their secondary metabolites such as phenols, necessary oils, saponins and etc [5]. Herbs have been used for some disease since long time ago because of availability, easy usage, non side effects. Many herbs have a long history of use even prehistoric use, in preventing or treating human and animal diseases. Aromatic plants have been used traditionally in therapy of some diseases worldwide for a long time.Research on the use of herbal mixtures in poultry diets has produced inconsistent results [6]. Organic poultry is a relatively new expression in western countries which is going to expand in other countries. In this kind of poultry method, farmers do not use chemical compounds at all or in a very low level for sake of costumers, instead they use alternatives like organic acids, probiotics, and medicinal plants, and despite of higher prize of this method, these products have more fans in the costumers [7]. As one of the alternatives, herbal extracts are already being used as feed supplements to improve growth performance under intensive management systems [8]. Plant extracts and spices as single compounds or as mixed preparations can play a role in supporting both performance and health status of the animal [9-10].Approximately 80% of domestic animals have been fed synthetic compounds for the purpose of either medication or growth promotion [7].

In this experience, the effects were studied of adding different level of poly germanderon performance, quality of eggs, blood biochemical and immunity parameters of lying hens.

MATERIALS AND METHODS

This study was carried out with 300 of Hy- line (W36) hens in 4 treatment groups, 3 repetitions and 25 hens for each group. The groups were F1) Control group, F2, F3, and F4 with 100, 150, and 200 ppm *poly germander*extractrespectively. The hens were 60 to 70 weeks old and basal diet were based on corn – soybean meal considering the necessary nutrients were recommended by NCR (1994)(table 1).

Three hens were chosen from each group and inoculated from brachial vien by 0.1 ml (5 %). Heterophils to Lymphocytes ratio were determined and Globulin and Albumin proportion in blood were counted from blood samples which had been obtained from barchial vein of three randomly chosen chicks from each group in the 49th day of experiment.

Blood samples were obtained from barchial vein and centrifuged in order to getting serum, after 12 hours of fasting of experiment. Serums have been analyzed for glucose, Cholestrol, Low-density lipoprotein (LDL), High-density lipoprotein (HDL) and Triglyceride by ELISA set.

The amounts of intake food, egg production, egg mass and feed conversion were measured weekly. At the end of experiment, 5 eggs from each repetition were randomly chosen and weighted, and their mass was determined by sinking them into the water and salt soluble with different concentrations.

The shells were weighted by weighing machine which had 0.01g accuracy. The thickness of the shell was measured by micrometer with the accuracy of 0.001mm in the middle and 3 points of egg shell and the average was considered as the shell thickness. This process was taken on each 5 eggs and the averages of them were considered as the final result for each group. The strength of the shell was determined by the mg weight of shell to every cm of the surface of it.

Table 1- Ingredients and chemical analyses composition of groups

Ingredients (%)	%
Corn	53.65
Wheat	21.5
Soybean meal	17.15
Soybean oil	0
Limestone	0.2
Oyster shell	6.2
Dicalcium phosphate	0.5
Vitamin-mineral mix[1]	0.5
dl-methionine	0.1
Sodium chloride	0. 2
Nettle	--
Analyzed chemical composition (%)	
Dry matter	89.2
Crude protein	14.5
Fat	6.2
Fiber	3.6
Ash	6.1
Calcium	0.8
Phosphorus	0.5
ME by calculation (MJ/kg)	12.78

[1]*Provides per kilogram of diet: vitamin A, 9,000 IU; vitamin D3, 2,000, IU; vitamin E, 18 IU; vitamin B1, 1.8 mg; vitamin B2, 6.6 mg B2,; vitamin B3, 10 mg; vitamin B5, 30 mg; vitamin B6, 3.0 mg; vitamin B9, 1 mg; vitamin B12, 1.5 mg; vitamin K3, 2 mg; vitamin H2, 0.01 mg; folic acid, 0.21 mg; nicotinic acid, 0.65 mg; biotin, 0.14 mg; choline chloride, 500 mg; Fe, 50 mg; Mn, 100 mg; Cu, 10 mg; Zn, 85 mg; I, 1 mg; Se, 0.2 mg.*

RESULTS AND DISCUSSION

As shown in table 3 addition of different level of poly germander extract in laying hens diet has significant effect on performance.It has been proven thatthe highest level of food intake and production percent were seen in F4.Increase in the food intake and production percent in the treated groups with the poly germander extract could have been due to its antibacterial and antifungal effects which can lead to decrease in the amount harmful microbes of digestive system, improve their immunity and performance. This is possible that it is result of synergetic influence of effective substances in increasing antimicrobial activity. There is a possibility of gathering these to antimicrobial herbs made a remarkable decrease in the amount of intestine microbal colony and this prevented from lysisof amino acids and they used in formation of proteinic tissues and increased the breast percentage.Aromatic plants and essential oil extracted from these plants have been used as alternatives to antibiotics. For this reason, these plants are becoming more important due to their antimicrobial effects and the stimulating effect on animal digestive system[11].

Lee et al [1] found that the existence of harmful microbes in digestive system causes an increase in the lysis of protein and amino acids of nutrients, di-amination activity of proteins and amino acids and rapid decomposition of these molecules due to secretary substances from bacteria like urease. Considering this fact and antimicrobial activity of these herbs, the whole matter seems sensible.Chicory possibly promotes fat deposition along with live weight gain or since the increase in live weight gain is possibly by increased fat deposition. Increased abdominal fat in broilers fed by thyme leaves, is previously reported [12]. On the contrary, Yusrizal and chen[13] observed that dietary inclusion of chicory fructans in broiler feed had significantly decreased the abdominal fat pad size.

Table 3 shows the effect of poly germander extract on the quality of egg.The best result for Yolk weight and shell thickness was in groups 4.There were no significant differences in the other parameters. Considering that the most part of white is water, and this fact that most of herbs are bitter in taste, it can be concluded that this leads to more water consumption and increase in the eggs weight. Also there is another possibility of getting heavier of eggs, and it can be because of increase in the amount of ovosin protein. The medicinal plants can stimulate the secretion of digestive enzymes and by reducing the bacterial colony in digestive tracts, digestive system can improve and perform more efficient by increasing the ability of absorption of amino acids and mineral elements, and this can cause more formation of ovosin. Farkhoy, M. *et al.*[13] indicated that by depositing pigments of plants into the yolk, this makes them more colorful.

Table 2: The effect of different levels of poly germander extract on egg quality characters and performance of laying hens

Treatments	FCR	Intake food(gr)	Mass production(gr)	Production percent	Egg's weight(gr)
F1	^{a}2/80	^{a}10/08	37/78	^{a}54/28	60/42
F2	^{a}2/78	^{a}105/42	37/72	^{a}54/31	60/61
F3	^{ab}2/46	^{ab}106/32	38/10	^{a}54/29	60/82
F4	^{ab}2/50	^{ab}107/12	38/15	^{ab}55/92	61/02
SEM	0/12	3/86	2/08	1/61	2/32

$^{a-c}$Means with different subscripts in the same row differ significantly (P < 0.05)

Table 3: The effect of different level of poly germander extract on egg quality characters of laying hens

Treatment	Weight of Each mg of shell	Shell Thickness (mm)	Yolk weight (gr)	White weight (gr)	Shell weight (gr)	Yolk index (%)	Special weight (mg/cm2)
F1	84	^{a}0/331	^{a}19/68	37/10	^{a}5/32	^{a}41/72	1/30
F2	84	^{a}0/333	^{a}19/71	37/15	^{a}5/43	^{a}41/98	1/26
F3	85	^{a}0/349	^{ab}20/20	37/20	^{ab}6/09	^{a}41/92	1/30
F4	84	^{ab}0/367	^{ab}20/31	37/25	^{ab}6/19	^{ab}42/98	1/29
SEM	2	0/01	1/02	1/32	0/23	2/14	0/09

$^{a-c}$Means with different subscripts in the same row differ significantly (P < 0.05)

The use of different level of poly germander extract has significant effects onserum constituents in layinghens(table 5).The serum total cholesterol and Triglycerides concentration were significantly reduced in groups of 4 and 5 compared to the control group (P<0.05). But the

concentration of serum LDL, HDL and glucose were not significantly reduced in groups compared to the control group.

Table 4. The effect of different levels of poly germander extract on blood biochemical of hens

	Treatments				
Blood Parameter	F1	F2	F3	F4	SEM
Glucose (mg/dl)	175.01	175.62	175.17	175.26	1.98
Cholesterol (mg/dl)	134.11[a]	133.91 [a]	132.83[ab]	132.98[ab]	4.21
Triglyceride (mg/dl)	42.12[a]	42.01[a]	40.29[ab]	40.11[ab]	1.12
LDL	33.92	33.63	32.86	32.47	1.03
HDL	84.56	84.36	84.12	84.02	2.26

a-bMeans with different subscripts in the same column differ significantly (P < 0.05)

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