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HYPO-CHOLESTEROLEMIC EFFECT OF HERBAL SUPPLEMENT ON SERUM & EGG YOLK CHOLESTEROL IN LAYER POULTRY EGG

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ABSTRACT

The herbal supplement containing natural source of hypocholesterolemic agent was examined for its effect on serum as well as egg cholesterol levels. One hundred and twenty healthy 40 weeks old layer birds were divided in four groups with three replicates of 10 birds each. Herbal supplement was fed to the experimental group-II, III and IV (AV/HLP/16) @ 1 kg, 1.5 kg and 2 kg per ton of basal diet respectively (*supplied by M/S Ayurvet Ltd., Baddi, India*) and Group-I was kept as control and fed on basal diet. The experiment was conducted for 12 weeks period from 40th week to 52nd week. However the feeding treatment of test product for Group-II, III and IV was given during the period from 40th week to 45th week (5weeks). Later on all the four groups were kept on similar basal diet till the end of trial. All four experimental groups have shown no significant difference in gain in weight, daily feed intake, egg production, FCR, egg weight, egg yolk weight, yolk index, haugh unit and yolk fat content. Significant results were observed in serum total cholesterol (145.78, 123.37, 104.82 and 116.31mg/dl), serum triglyceride (2004.22, 1799.56, 1684.56 and 1670.44 mg/dl), serum HDL cholesterol (97.45, 78.94, 79.65 and 77.69 mg/dl), serum LDL cholesterol (31.37, 24.03, 22.51 and 21.88 mg/dl), egg yolk cholesterol (15.95, 12.80, 12.38 and 12.42 mg/g), egg yolk HDL cholesterol (9.67, 7.94, 7.99 and 7.86 mg/g) and egg yolk LDL cholesterol (5.71, 4.50, 4.26 and 4.43 mg/g) for experimental Group-I, II, III and IV respectively. The experimental groups (II, III and IV) supplemented with

herbal hypocholesterolemic supplement have shown reduced serum and egg yolk cholesterol parameters.

Keywords: Hypocholesterolemic Effect, Serum, Cholesterol, Egg Yolk

INTRODUCTION

Even though it is well known that chicken eggs are highly nutritious and valuable food for human being day by day there is no increase in the egg consumption by the people because of high cholesterol content of eggs which causes heart disease and atherosclerosis. Clinical data strongly support the relationship between dietary cholesterol and CHD. The cholesterol is synthesized in body and also it is being produced by diet. In diet an egg has arguably a special place. It is rich and balanced source of essential amino and fatty acids as well some minerals and vitamins. On the other hand the egg is a good dietary source of cholesterol also, it is known that the average cholesterol content in eggs is about 250-300 mg (Daily intake should be limited below 300mg / person). One of the dietary recommendations in the prevention of coronary heart failure is to limit egg consumption because egg has shown to be the major source of dietary cholesterol and dietary cholesterol increases the serum total and LDL cholesterol concentration **[1, 2]**. These suggestions tend to have adverse effects in the eggs industry. Several studies showed that dietary cholesterol increases not only concentration of LDL cholesterol but also concentration of HDL cholesterol. Present research has been carried out to reduce the egg cholesterol level on nutritional basis by inclusion of herbal hypo-cholesterolemic agent to layer diet. AV/HLP/16 is an herbal formulation which controls the synthesis of cholesterol in laying hen either body synthesized or dietary cholesterol. The hypocholesterolemic action of the formulation in laying hen is directly linked to lowering of cholesterol levels of the eggs. Ingredients of AV/HLP/16 are known for their hypocholesterolemic effect.

MATERIALS AND METHODS

One hundred and twenty healthy 40 weeks old BV-300 layer birds with three replicates of 10 birds each were selected for the present study and reared for further 12 weeks study period. Herbal test product containing natural source of hypocholesterolemic agent was procured from M/s. Ayurvet Pvt. Ltd., Baddi (H.P.), India and fed to the experimental group-II, III and IV through feed at 1 kg, 1.5 kg and 2 kg per ton of basal diet respectively and Group-I was control and fed on basal diet. All the four groups were housed in separate battery cages

along with the replicates and all other managemental practises were similar to all experimental group. The experiment was conducted for 12 weeks period from 40th week to 52nd week. However the feeding treatment of test product for Group-II, III and IV was given during the period from 40th week to 45th week (5weeks). Later on all the four groups were kept on similar basal diet till the end of trial. Various production, serum and egg yolk parameters studied are depicted in table-I. The results were statistically analysed to draw the conclusions **[3]**.

RESULTS AND DISCUSSION

Biochemical Parameters

The addition of herbal hypocholesterolemic agent in the basal diet has proved effective with highly significant reduction in serum total cholesterol (20-22 %) **[4-7]**, serum triglyceride (10-17 %) (Jyh-Jye Wang, 2003), serum HDL (17-20 %) **[4-7]**, and LDL (22-31%) cholesterol **[5-7]**. Feeding of herbal hypocholesterolemic product has effectively reduced the serum parameters.

The addition of product has effectively reduced yolk total cholesterol (18-22 %) **[4-7]**, yolk HDL cholesterol (16-19 %) and yolk LDL cholesterol (21-25 %). However, it has no effect on total yolk fat content. The reduced cholesterol levels and its constituents in the serum has shown positive effect in depositing the same constituents in the egg yolk **(Table 1)**.

Feed Efficiency and Physical Parameters

No significant effect was observed in case of body weight gain, feed consumption, FCR (per dozen of egg), egg production, egg weight, egg yolk weight, egg yolk index and haugh unit **[4, 7]**. The addition of hypocholesterolemic agent has no adverse or no positive effect in case of these parameters.

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Table 1: Overall Performance of the Layer Birds During the Experimental Period

Parameters	Group I	Group II	Group III	Group IV
Initial Live Weight (gm)	1358.26	1340.13	1385.79	1378.54
Live Weight at 46th week (gm)	1411.36	1375.59	1396.56	1402.21
Average daily feed intake (gm)	109.17	108.38	108.51	108.81
Average Egg production	8.91	8.97	8.96	8.93
Average FCR (per dozen of egg)	1.47	1.45	1.45	1.46
Average Egg weight (gm)	56.09	55.92	56.70	56.29
Average Egg yolk weight (gm)	17.04	17.05	16.99	17.07
Average Yolk Index	0.43	0.44	0.43	0.43
Average Haugh Unit	74.18	74.66	74.91	74.46
Serum Total Cholesterol (mg/dl)	145.78a	123.37b	104.82c	116.31bc
Serum Triglyceride (mg/dl)	2004.22a	1799.56b	1684.56c	1670.44c
Serum HDL Cholesterol (mg/dl)	97.45a	78.94b	79.65b	77.69b
Serum LDL Cholesterol (mg/dl)	31.37a	24.03b	22.51b	21.88b
Egg Yolk Fat (%)	60.99	59.46	59.17	60.91
Egg Yolk Cholesterol (mg/g)	15.95a	12.80b	12.38b	12.42b
Egg Yolk HDL Cholesterol (mg/g)	9.67a	7.94b	7.99b	7.86b
Egg Yolk LDL Cholesterol (mg/g)	5.71a	4.50b	4.26b	4.43b

NOTE: Means with Different Superscripts Differ Significantly