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Influence of Malvasilvestris and great burdock on performance, carcass quality and blood parameters in male broiler chickens

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ABSTRACT

The research was conducted to examine the effects of supplementation of Malvasilvestris and great burdock on performance and serum composition of male broiler chickens. A total of 240 male broiler chickens were divided into 4 groups and 3 repetitions with 20 chickens each. The results showed that the highest amount of daily feed intake and body weight gain were observed in the group 3 but the best result for FCR was in G4. The highest percent of liver was observed in experimental group 2, the highest percent of breast and lowest percent of abdominal fat were in experimental groups 3 and 4. Also the serum total cholesterol, Triglycerides and LDL concentration were significantly reduced in groups of 4 compared to the control group ($P < 0.05$). But the level of HDL and glucose did not significantly change between groups.

Keywords: Malvasilvestris and great burdock Broilers, Carcass, Performance.

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. Unfortunately, over use of these products ended up with a lot of problems both for animals and costumers, for example, bacterial resistance to antimicrobial agents [1-2]. Because of this problem, there have been made some restricted rules about the usage of these antibiotics, like ban and low use of them [3]. Nowadays, there are a lot of concerns to finding non-synthetic alternatives for antibiotics among the scientists. The positive effect of herbal plants on broilers have been reported by many studies. Their antibacterial potential, hypocholesterolemic effects, growth promoting and availability are the most beneficial part of herbs, which have drawn the scientists attention themselves [4]. Approximately 80% of domestic animals have been fed synthetic compounds for the purpose of either medication or growth promotion [5]. There are a large number of feed additives available for inclusion in animal and poultry diets to improve their performance. However, the use of chemical products especially (hormones and antibiotics), may cause unfavorable side effects. Moreover, there is evidence

indicating that these products could be considered as pollutants for human and threaten the health on the long-run. Attempts to use the natural materials such as medicinal plants could be widely accepted as feed additives to improve the efficiency of feed utilization and productive performance [6].

Specific effects of the essential oils on chicken performance have not received much attention because poultry may not acutely respond to flavor when compared to pigs [7], although there is an evidence that flavors could affect feed intake negligibly in chicken [8]. Present experiment was planned to study the effects of *Malva sylvestris* and great burdock performance, carcass quality and blood biochemical parameters of broilers.

MATERIALS AND METHODS

A total of 240 male broiler chickens were divided into 4 groups and 3 repetitions with 20 chickens each. G1, First group as control group did not receive any herbal plant extract, G2, 200 ppm of *malva sylvestris* extract, G3, 200 ppm great burdock extract, G4, 200 of ppm both *malva sylvestris* and great extract. During days 0-42, unbound water and dietary was in poultries' access. Dietary and chick weight were going on weekly. Feed consumed was recorded daily, the uneaten discarded, and feed conversion ratio (FCR) was calculated (total feed : total gain).

Table 1. Ingredients and chemical analyses composition of the starter and grower diets

Ingredients	starter(%)	grower(%)
Maize	54.73	325
Soybean meal	36.92	300
Soybean oil	3.4	40
Fish meal	2.1	--
Limestone	1	--
Oyster shell	--	12
Dicalcium phosphate	1.2	15
Vitamin-mineral mix ²	0.25	5
dl-methionine	0.201	
Sodium chloride	0.202	
Vitamin E (mg/kg)	--	100
Zn	--	50
Analyzed chemical composition (%)		
Dry matter	89.9	89.3
Crude protein	22.3	21.6
Fat	6.24	6.9
Fiber	3.1	3.6
Ash	6.7	5.0
Calcium	0.82	0.81
Phosphorus	0.54	0.55
Selenium (mg/kg)	0.53	0.58
ME by calculation (MJ/kg)	12.78	12.91

¹ starter diet fed to birds from 0 to 21 days. ² 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.

At the end of experiment, some analyses was done via SAS (Statistical Analyses Software) in the statistical level of 5% according to data gathered from dietary, weight improvement, average of FCR, weight of rearing period and carcass yield. At 42 days of age, four birds per replicate were randomly chosen, slaughtered and carcass percent to live weight and percent of carcass parts to

carcass weight were calculated. Blood samples were obtained from barchial vein and centrifuged in order to getting serum, after 12 hours of fasting in the 42th day of experiment.

RESULTS AND DISCUSSION

For the period of 0-42 days the effect of malvasilvestris and great burdock derived from extracts, body weight gain, feed intake and FCR are showed in table 2. The highest amount of daily feed intake and body weight gain were observed in the group 3. Also results showed that the best result for FCR was in G4. The carvacrol in these herbal planets have stimulatory effects on pancreatic secretions by increasing the secretions of digestive enzymes more amounts of nutrients like amino acids can be digested and absorbed from the digestive tract and thereby improve carcass traits [4]. There is a possibility of gathering these to antimicrobial herbs made a remarkable decrease in the amount of intestine microbial colony and this prevented from lysis of amino acids and they used in formation of proteinic tissues and increased the breast percentage [1]. Table 3 shows the effect of plants' extract and their different combinations on carcass and its parameters. The lowest percentage of abdominal fat and the highest percent of breast were in the G3 and G4. The effect of herbal planet on the broilers was studied by Al-Kassie, [10] who found their effect on the live weight gain and the improvement of the health of poultry, in addition to other performance traits, feed conversion ratio and feed intake. The present of antioxidants and phenolic substance in liquorice root may be the main cause of improvement in breast percent of broilers carcass. The presence of harmful bacterial populations in the gastrointestinal tract may cause breakdown of amino acids and thereby reduce their absorption as antimicrobial substances are present in liquorice root can reduce the harmful bacterial populations in the gastrointestinal tract and improve the levels of absorbed amino acids [1,11]. The mean values of serum constituents in broiler chicken fed different supplemented diets are shown in table 4. The serum total cholesterol, Triglycerides and LDL concentration were significantly reduced in group of 4 compared to the control group ($P < 0.05$). The concentration of serum HDL and were not significantly reduced in groups compared to the control groups.

Table 2: Effect of different level of Malvasilvestris and great burdock on performance of male broiler chickens

Treatments	G1	G2	G3	G4	SEM
Feed conversion ratio(g:g)	1.87 ^a	1.76 ^a	1.73 ^{ab}	1.70 ^{ab}	0.02
1-42d					
Feed intake (g/d)					
1- 42d	81.40 ^b	82.79 ^{ab}	82.92 ^{ab}	82.86 ^{ab}	1.39
Body weight gain (g)1-42d	45.16 ^b	45.42 ^{ab}	46.19 ^{ab}	46.07 ^{ab}	0.98

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

Table 3: Effect of different level of Malvasilvestris and great burdock on quality of male broiler chicken's carcass

Characters (%)	G1	G2	G3	G4	SEM
Abdominal Fat	3.92 ^a	3.90 ^a	3.30 ^{ab}	3.28 ^{ab}	0.01
Gizzard	2.41	2.42	2.39	2.89	0.03
Liver	3.51 ^a	3.81 ^{ab}	3.54 ^a	3.56 ^a	0.12
Breast	31.06 ^a	32.68 ^{ab}	32.86 ^{ab}	32.98 ^{ab}	1.11
Lap	27.88	27.96	28.01	28.13	1.02

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

Table 4. The effect of different levels of Malvasilvestris and great burdockon blood biochemical of hens

Blood Parameter	G1	G2	Treatments		SEM
			G3	G4	
Glucose (mg/dl)	175.29	175.01	174.98	175.11	3.19
Cholesterol (mg/dl)	136.11 ^a	134.16 ^{ab}	134.22 ^{ab}	134.02 ^{ab}	2.02
Triglyceride (mg/dl)	43.36 ^a	40.61 ^a	43.09 ^a	40.63 ^{ab}	1.02
LDL	35.01 ^a	34.97 ^a	33.85 ^a	33.79 ^b	1.26
HDL	85.11	85.02	84.98	84.86	1.64

Means with different subscripts in the same column differ significantly ($P < 0.05$)

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