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The Effects of *Artemisia Dracunculus*' Powders Different Levels on Blood Parameters and Internal Organs Weight Broiler Chickens

Z. Hosseinzadeh *[1], P. Farhoomand [2]

[1]M.Sc. Student, Department of Animal Science, Faculty of Agriculture, University of Urmia, Iran
[2]Professor, Department of Animal Science, Faculty of Agriculture, University of Urmia, Iran

ABSTRACT

This study was designed to investigate the effects of different levels of Tarragon powder on performance, carcass characteristics of broiler chickens. Two hundred Ross 308 male broiler chickens were randomly allocated into four treatments and five replicates per treatment. At each replicate ten birds were used. Experimental diets were set on the basis of corn-soy-wheat and Ross 308 broiler chickens nutritional requirements tables by the use of UFFDA ration formulation software for each of the (1-21 days) and (22-42 days) period. Treatments were: base diet (Control), base diet + 0.125% of Tarragon powder (group A), base diet + 0.25% of Tarragon powder (group B), base diet + 0.5% of Tarragon powder (group C). The consumption of experimentally different rations (dietaries) had no statistically significant effect on the relative weight of heart, liver, spleen, bursa, cook able carcasses and abdominal fat of different treatments in the whole process of husbandry ($P>0.05$). Testing rations in terms of Calcium, Phosphorus, Glucose, Cholesterol, Triglycerides, VLDL, LDL and HDL plasma didn't create any significant difference between different treatments statistically ($P>0.05$). We concluded that adding *Artemisia dracunculus* powder 0.25 percentage broilers rations with increased levels of HDL, glucose and reduced levels of plasma LDL increased non- significantly carcass compared with other treatments. And also the level of 0/5 percent *Artemisia dracunculus* powder has caused non- significant reducing of the weight of liver and carcass cook abdominal fat of broilers chickens.

Key words: Blood Parameters, Female Broiler chicken, Tarragon Powder, Internal Organs

INTRODUCTION

The World Health Organization estimates that approximately 80 % of the people rely on traditional medicine for their primary health care. Most of these therapies are based on the use of plant extracts or their active components (Craig, 1999). Antibiotics used as growth promoters have been forbidden in the European Union, because they could lead to resistance against pathogens and residues in tissues. In this view, aromatic plants and essential oils extracted from these plants became interesting due to their anti-microbial effects and the stimulating effects on animal digestive systems (Cabuk et al., 2003). Aromatic plants have been used traditionally in the therapy of some diseases for a long time in the world. In different herbs, a wide variety of active phytochemicals, including the flavonoids, terpeniods, ligans,

Corresponding Author E-mail: zendegiroza@yahoo.com

sulfides, polyphenolics, carotenoids, coumarins, saponins, plantsterols and phthalides have been identified (Craig, 1999). Additionally, herbs have antimicrobial activity (Elgayyar et al., 2001; Singh et al., 2002) and other biological activities such as hypocholesterolemic (Craig, 1999) and stimulating effects on animal digestive systems (Jamroz et al., 2002). In Arabic language, Tarragon or Estragon is called "*Tarkhon*", and its scientific name is *Artemisia dracunculus L*, which belongs to Asteraecae family. For the first time, it has been seen in the southern parts of Russia and Siberia. Because of its active ingredients, such as trans-anethole, which is focused mainly in its oil extracts? Tarragon is used as a remedy for the treatment of stomach pains, anorexia and intestinal parasitic or bacterial infections. Its antibacterial properties have also been proved (Al-Attar, 2006). *Anethole* and *Estragole* combination are the most significant compounds found in the anise seed and fennel and tarragon (Romila, 2001; Soltan et al., 2008). Researcher's studies in laboratories showed that *Tarrlin* increases glucose uptake in cellules muscles and intracellular Kinases enzyme activity which is influenced by the activity of Insulin as a hormone (Wang et al., 2008). In addition, this enzyme stimulates the connection, glucagon-like peptide-1 (GLP-1)with the receptor strongly, therefore biological pathways dependent on insulin can be regulated well (Ribnicky et al., 2006). Besides that, *Tarrlin* further reduces Phosphoenol pyruvate carboxyl kinase (PEPCK) metabolism pathway by reducing the amount of required mRNA construction for the production of this enzyme, and by prohibiting the activity of tyrosine phosphatase-1B (PTP-1B) and aldose reductase type2 (ALR2) causes anti-hyperglycemia (Ribnicky et al., 2006; Logendra et al., 2006). Ayoughi et al. (2011), Sayyah et al., (2004) in their studies identified the quantities of Iranian tarragons' volatile oils as following ones: Anatole (51.72 percentage), Cis-Beta-Ocimene (8.32 percentage), methyleugenol (8.06 percentage), Limonene (4.94 percentage), Linalool (4.41 percentage). The composition of tarragon essential extract is Anatole which can be found in two forms of cis isomer and Anatole trans. In most of the studies, researchers have focused on the common intake forms of tarragon including liquid extract, alcoholic extract and essence forms in their studies which have been done in lab, and there is no study focusing on the use of this plant in its complete form or powdered form on the broilers. Regarding the effects of tarragon as an anti-hyperglycemia plant, the investigation of the current resources made it necessary to investigate the effects of different levels of tarragons' powdered form as well as choosing desired intake level of this plant on blood factors and internal organs weight and carcass abdominal fat of broilers chickens.

MATERIAL AND MTHODS

Two hundred Ross 308 male broiler chickens were randomly allocated into four treatments and five replicates per treatment. At each replicate ten birds were used. Experimental diets were set on the basis of corn-soy-wheat and Ross 308 broiler chickens nutritional requirements tables by the use of UFFDA ration formulation software for each of the (1-21 days) and (22-42 days) period. Treatments were: base diet (Control), base diet + 0.125% of Tarragon powder (group A), base diet + 0.25% of Tarragon powder (group B), base diet + 0.5% of Tarragon powder (group C).

Composition of the experimental diets (Table 1)

Feeds Ingredients (% of the diet)	(22-42 days)	(1-21 days)
corn	40/1	42/28
Soybean meal	28/24	37/30
Wheat	24/5	14
Dicalcium Phosphate	1/97	1/96
Limestone	0/95	1/0
L-Lysine	0/27	0/16
DL-Methionine	0/07	0/3
Mineral and Vitamin Premix *	0/5	0/5
Salt	0/3	0/3
Soybean oil	3/1	2/2
Sum	100	100
Nutritional composition (% of the diet)		
ME, KCal/kg	3000	2870
Crude protein	18/00	21/16
Crude fiber	3/45	3/88
Ca	0/88	0/92
P	0/41	0/43
NaCl	0/14	0/14
CLA	2/58	2/2
Lysine	1/14	1/28
Methionine	0/35	0/61
Methionine+Cystine	0/68	0/97

*Vitamin and Mineral Premix supplied per 1 kg: vitamin A, 1500 IU; cholecalciferol, 10 IU; vitamin E, 1 IU; vitamin B1, 1.5 mg ; vitamin B2, 4 mg; ; vitamin k3, 1 mg; vitamin B3, 5mg; vitamin B5, 20mg : vitamin B6, 2 mg : vitamin B9, 0/5 mg: vitaminB12, 0.01 5mg; biotin,0 .065 mg.Mn, 80 mg; Cu, 4 mg; Se, 0.1mg; cholinchlorideride 20 mg: I,0/5mg: co,0/1mg: se, 0/1 mg: ca ,1520 mg : antioxidant.100 mg.

**To prepare the experimental diets, the amount of 0/125, 0/25 and 0 /5 Percentage Tarragon without counting the fraction Percentage powder were added to the diets.

Preparation method of tarragon powder

To prepare the experimental rations, tarragon plant was purchased on October from vegetable market in Khoy. After cleaning and removing mud and weeds and also non usable parts of the plant, it was placed on the clean cloth, and dried under proper room temperature, shade. The dried samples were powdered at the mill powders, and were added to the experimental rations.

Factors and method to measure them:

Blood factors: at the end of 42 days old, five broilers chickens from every treatment which were slaughtered to measure different parts of carcasses and internal organs,. Blood was collected from their neck vein and was transformed to a tube containing anticoagulant for separating blood serum.

Serums were separated in the same day by centrifugation in 3000G for 10 minutes, and stored at – 30 ˚C until assayed for calcium, phosphorus, glucose, cholesterol, triglycerides, HDL, LDL, and VLDL, concentrations were analyzed by spectrophotometer methods using commercial kits (Unica 12, Japan).

Internal organs weight:

At the end of 42 days old, five broilers from every treatment (one broiler from every replication) were selected which were close in weight to the average weight of each pen. After marking and noting that specified treatment and replication's characteristics, they were weighted and then slaughtered. After slaughtering, abdominal fat, liver, heart, spleen, and bursa were weighted and their relative weight in comparison with their live body (body weight divided by live body weight multiplied by 100) calculated, and the data related to their relative weight were analyzed statistically after conversion ($\sqrt{x+0.5}$).

Statistical analysis:

Values concerning blood parameters and internal organs were compared by one-way analysis of variance (ANOVA) and *post hoc* Tukey-HSD test (SAS, 2003). Statistical significance was defined as $P<0.05$.

RESULTS AND DISSCOSION

Blood parameters:

Experimental rations in terms of the amount of calcium, phosphorus, glucose, cholesterol, triglycerides, VLDL, LDL, and HDL plasma didn't make significant difference between different treatments statistically ($P>0.05$). We concluded that the consumption of tarragon's powder on the level of 0.25 percent ration has caused non-significant increase ($P>0.05$) of glucose, VLDL, and HDL plasma and non-significant decrease of LDL plasma in comparison with control group. Herbal additives can affect the concentration of serum triglycerides by reducing hepatic fatty acid synthesis. On the other hand, herbal additives and other additives competence to affect the parameters are influenced by the interaction effects between ration constituents and active constituents of these compounds (Lee et al., 2003). In a study on the effect of anise seed's different levels on blood fat profile reported that different levels of anise seed (0.25, 0.5, 0.75, 1, 1.25. and 1.5 percentage) in ration had no effect on cholesterol, triglycerides LDL, VLDL, LDL plasma and HDL plasma ($P>0.05$), while plasma glucose concentration for the treatment of anise seed 0.5 percent was significantly low in comparison with control group ($P<0.05$) (Soltan et al., 2008). It has been reported that drenching ethanol extract which is taken from aerial and root parts of tarragon significantly decreases the level of blood glucose, cholesterol, triglycerides as well as the level of LDL plasma in comparison with the control group when comparing it with aqueous extract of tarragon (250 mg/kg body weight) in induced diabetic and hyperglycemia mice, while it increases the level of HDL significantly. The possible mechanism about the reducing performance of blood glucose by means of tarragon's ethanol extract is through increasing insulin secretion from pancreatic beta cells (LalSamyal

et al., 2011). When the level of blood glucose increases, as insulin secretes, the synthesizing pathway of fatty acids and triglycerides could be opened. Epinephrine and nor epinephrine trigger the release of fatty acids from adipose tissue stores, triacylglycerol lipase, which is known as hormone-sensitive lipase, catalyzes the first step of triglycerides' decomposition. Prior to having breakfast, the main stimulator of this enzyme in fatty tissues is not nor epinephrine released from the sympathetic nervous system. Mechanism of Tarragon's ant diabetic action is multifaceted, and this mechanism increases intake glucose in tissues, endogenous improves by strengthened insulin production, so it prevents from gluconeogenesis (Phosphatidyl inositol carboxykinase blocking) and provides cellular protection condition (Oblskiy et al., 2011). Anethole, is a monoterepene which is similar in formula to that of catecholamine's (adrenaline, noradrenalin dopamine) (Ayoughi et al., 2011). In this study, it is likely that the active compounds of tarragon in the powdered form as well as its effectiveness have been lost in the process of drying (Vienna, 2005).

Table 2-The effect of different levels of zero (control),0 /125, 0/ 25and 0/5% of tarragon powder on the blood parameters of broiler chickens at 42 days of age (mg / dL).

Groups	VLDL	LDL	HDL	TG	Cholesterol	glucose	p	ca
Control	7/16[a]	60/52[a]	43/92[a]	35/80[a]	111/60[a]	204/80[a]	5/76[a]	9/96[a]
0/125%	8/08[a]	66/12[a]	45/00[a]	40/40[a]	119/20[a]	187/00[a]	5/28[a]	9/56[a]
0/25%	13/24[a]	56/56[a]	50/40[a]	66/20[a]	120/20[a]	214/00[a]	5/64[a]	9/56[a]
0/5%	6/80[a]	59/48[a]	40/32[a]	34/00[a]	106/60[a]	199/40[a]	5/82[a]	9/92[a]
SEM	1/06	2/19	2/01	5/31	3/41	4/04	0/14	0/21
P-value	0/10	0/50	0/37	0/10	0/47	0/10	0/53	0/86

Internal organs weight:

the consumption of experimentally different rations had no statistically significant effect on the relative weight of heart, liver, spleen, bursa, cook carcasses and abdominal fat of different treatments in the whole process of husbandry (1-42 days old)($p>0.05$). Utilizing tarragon powder at the levels of 0.125, 0.25, 0.5 percent ration causes non-significant reduction of abdominal fat percent in comparison with the control group, tarragon's powder at the level of 0.5 percentage ration reduces the abdominal fat more than other levels. The supplementation of tarragon powder at the levels of 0.125, 0.25, and 0.5 percentage ration makes non-significant reduction ($P>0.05$) of the percentage weight of liver in comparison with control group, tarragon's powder at the level of 0.5 percentage ration reduces the percentage weight of liver more than other levels. Compared with the control group, Tarragon's powder at the level of 0.25 percentage

ration causes non-significant increase (P>0.05) of carcass yield. Spices and extracts have Liptrap effects, and t some of the active components in spices could affect lipid metabolism predominantly, increase the use of fats, and decrease dispose tissue in abdominal area by displacing fatty acids (Cross et al., 2007). Soltan et al. (2008) studied the effect of different levels of anise seed on the carcass characteristics (abdominal fat percentage, liver, spleen, bursa, heart, carcass yield) and showed that different levels of anise seed (0.25, 0.5,0.75,1, 1.25, 5.1 percentage) in ration had no effect on carcass characteristics(abdominal fat percentage, liver, spleen, bursa, heart, carcass yield).Table3

Table3
The relative weight of internal organs and abdominal fat of broilers fed with three levels (control), 0/125, 0/25 and 0/5% of tarragon powder at 42 days of age. (Percentage of body weight).

Groups	Carcass	abdominal fat	bourse	spleen	liver	heart
Control	71/83[a]	1/66[a]	0/19[a]	0/10[a]	6/42[a]	0/57[a]
0/125%	70/33[a]	1/58[a]	0/20[a]	0/12[a]	2/14[a]	0/52[a]
0/25%	72/32[a]	1/46[a]	0/18[a]	0/11[a]	2/15[a]	0/46[a]
0/5%	71/53[a]	1/39[a]	0/19[a]	0/10[a]	2/04[a]	0/46[a]
SEM	0/39	0/09	0/01	0/00	1/02	0/02
P-value	0/344	0/79	0/926	0/18	0/31	0/07

CONCLOUSION

It can be concluded that compared with the control group, tarragon powder at the levels of 0.25 and 0.5 ration percentages has shown positive non-significant effects. Therefore, it is suggested to do some more and comprehensive research considering this herbal supplementation, its physiological effects, and its use as Synbiotic with other herbal supplements in poultry.

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