



Effects of Tarragon Powders' Different Levels (*Artemisia Dracunculus*) on general Performance and Anetometric Properties of Digestive System of male Broiler chickens

Zahra Hosseinzadeh *¹ and Gholamali Moghaddam²

¹ MSc Student, Department of Animal Science, Faculty of Agriculture, University of Urmia, Urmia, Iran

² Professors, Department of Animal Science, Faculty of Agriculture, University of Tabriz, Tabriz, Iran.

ABSTRACT

This study was designed to investigate the effects of different levels of Tarragon powder on general performance and Anetometric' properties of digestive system of male broiler chickens. 200 one-day-old Ross 308 male broiler chickens in a completely randomized design with 4 treatments and 5 replicates per treatment and 10 birds in each replicate 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. Treatments were: base diet (control), base diet + 0.125% of Tarragon powder, base diet + 0.25% of Tarragon powder, base diet + 0.5% of Tarragon powder. The results of experiment showed that experimental dietaries caused no significant difference between the Feed Intake of different treatments statistically ($P>0.05$). The consumption of experimental rations decreased body weight significantly in 0.5% Tarragon treatment when compared with control treatment in 1- 42 days old ($P<0.05$). The consumption of experimental rations caused statistically significant increase of 0.5 %Tarragon powder treatment's conversion ratio when compared with control treatment and 0.125 % Tarragon powder treatment in 1- 42 days old ($P<0.01$). The results of the experiment showed that the consumption of experimental rations didn't have any effect on the relative weight of digestive system's accessories significantly (gizzard, Bursa, stomach and Pancreas) and weight and length of digestive parts' (Duodenum, Jejunum, Ileum, Secum, Rectum, and whole small intestine) in different treatments in the whole process of raising in 1 to 42 days old ($P>0.05$). It seems that adding *Artemisia dracunculus* (Tarragon) powder 0. 5 % level has had negative effect on the performance of broiler chickens in the whole process of husbandry, but in comparison with its effect on digestive parts' weight and length, it has had no significant effect on them.

Key words: Digestive System, male Broiler chicken, Tarragon Powder.

INTRODUCTION

Antibiotics have been used in poultry feed for improving growth performance, preventing some specific pathogenic microorganism and increasing some useful microorganism in intestinal micro flora over the years. However, antibiotics used as growth promoters in animal feeds have been banned recently due to potential development of antibiotic resistant human pathogenic bacteria. Nowadays, the possibility of using new natural alternative additives instead of antibiotics in animal diets is being researched. One such alternative is plant extracts. Plant extracts contain many active components, including essential oils,

which boast a wide range of pharmacological activities (Lewis *et al.*, 2003). Herbal remedies, spices, and their extracts have wide utilizations in traditional medicine for their medicinal impacts. These combinations also play an important role in human diet in the form of spices and preservatives. There have been lots of studies focusing on the widespread effects of photobiotic, including antimicrobial, antifungal, growth stimulator as well as immune system stimulator, in animal diets (Tipu *et al.*, 2006).

In Arabic language, Tarragon or Estragon is called “*Tarkhon*”, and its scientific name is *Artemisia dracuncululus L*, which belongs to *Asteraeaceae* family. Tarragon is a species of perennial herb that grows to around 0.3 to 1 feet in height. It has long, narrow green leaves. Today, there are two varieties of this plant: *Russian* and *French*. French Tarragon’s leaves are more lanceolate and bitter than Russian one (Oblskiy *et al.*, 2011). Ayoughi *et al.*, (2011), Sayyah *et al.*, (2004) in their studies identified the quantities of Iranian tarragons’ volatile oils as following ones: Anetole (51.72 %), Cis-Beta-Ocimene (8.32 %), methyleugenol (8.06 %), Limonene (4.94 %), Linalool (4.41 %). *Anethole* and *Estragole* are the most significant compounds found in the anise seed and fennel and tarragon that is focused mainly in their oil extracts (Romila, 2001; Soltan *et al.*, 2008). Volatile extracts found in Tarragone have lots of merits, such as antifungal, antitumor (Meepagala *et al.*, 2002). It is helpful in treating stomach problems, anorexia and digestive parasites and their antimicrobial properties have been proved too (Al-Attar, 2006). Tarragon has anti *Helicobacter pylori* effects on the stomach. It increases gastric juice and bile in the upper parts of the digestive system, and accordingly enhances feed digestion, so in this way it makes the ground smooth for digesting proteins and dietary fats in digestive system. By stimulating circular movements in the stomach, Tarragone facilitates diet movement in all parts of digestive system (Oblskiy *et al.*, 2011). 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 Few studies does not exist on the use of this herb in powder form on broilers chickens. Regarding the effects of tarragon as a plant useful, 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 general performance and Anetometric’ properties of digestive system of male broiler chickens.

MATERIAL AND METHODS

200 one-day-old Ross 308 male broiler chickens in a completely randomized design with 4 treatments and 5 replicates per treatment and 10 birds in each replicate 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. Treatments were: base diet (control), base diet + 0.125% of Tarragon powder, base diet + 0.25% of Tarragon powder, base diet + 0.5% of Tarragon powder (Table 1).

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.

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.		

1-Factors and method to measure them:

1-1. The general performance in 1 -42 days old:

During this period all the birds had access to water and diet freely. Measurable attributes including body gain weight, feed intake, and feed conversion ratio were measured weekly.

1-2. Accessories weight and digestive system's different body parts:

At the end of period (42 days old) five broilers, which were close in weight to the average weight of each pen, were selected from every treatment (one broiler from every replication). After marking and noting that specified treatment and replication's properties, they were weighted and then slaughtered. Digestive system accessories' weight (gizzard, Bursa, stomach, and Pancreas) and digestive part's weight (Duodenum, Jejunum, and Ileum's weight, Secum, Rectum, and whole intestine's weight after defecating content) were measured. Their relative weight on the basis of live body weight (body weight divided by live body weight multiplied by 100) was calculated and the data related to their relative weight were analyzed statistically after conversion ($\sqrt{x} + 0.5$). The length of digestive systems' parts measures (cm) and the relative length of different parts of intestine on the basis of intestine's whole length were calculated. Statistical analysis of treatment's effects on the parameters under investigation was done completely randomly by means of statistical software, SAS, and generalized linear models (GLM) procedure. In case of the existence of any significance, the averages were compared by means of Toki test at %5 significance level in statistical software (SAS).

Results and discussion:

The results of experiment showed that experimental dietaries caused no significant difference between the Feed Intake of different treatments statistically ($P > 0.05$). The consumption of experimental rations decreased body weight significantly in 0.5% Tarragon treatment when compared with control treatment in 1- 42 days old ($P < 0.05$).

The consumption of experimental rations caused statistically significant increase of 0.5 %Tarragon powder treatment's conversion ratio when compared with control treatment and 0.125 % Tarragon powder treatment in 1- 42 days old ($P < 0.01$). Table2.

There has not been done any research on the applied treatments in the present study and their effect on the intestine properties. The findings showed that consumption of experimental rations statistically didn't have any significant effect on the relative weight of digestive system's accessories (gizzard, Bursa, stomach and Pancreas) and the weight and length of digestive parts' (Duodenum, Jejunum, Ileum, Secum, Rectum, and whole intestine) different treatments in the whole process of raising in 1- 42 days old ($P < 0.05$).Table3

Different results have been reported during the use of different herbal medicine derivations (powder, oil extract, hydraulic or organic extracts, and infusion) on the performance of poultry (Cross et al., 2007). These differences can be the result of diversity in effective combinations available in the mentioned derivations, physiological condition of the bird's body, and also high speed in transmitting digestive material in poultry's digestive system. Study on broiler chicks showed that adding *Anise* extract at 100 and 200 mg/ kg had no significant difference in performance parameters compared with control treatment, while the same extract at 400 mg/ kg diet improved average daily weight gain significantly (Ciftci et al., 2005). Cross et al., (2007) evaluated the positive effect of (*Achillea millefolium*) herb on broiler chicks' performance, while yarrow extract had no significant effect on performance. The difference between *Achillea millefolium* herb and extraction can be due to the *chemzolin terpen Sysco* structures that are

found in herb but can't be found in extract. Researchers have reported that increasing length of intestine can also improve absorption level in the intestine that can result in increased growth (Yusrizal et al., 2003). In the present investigation, broiler chickens fed with higher levels of powder Tarragone gained little weight when compared with other groups, and this led to the increase of feed conversion ratio of the birds. 0.5 % Tarragon powder can increase feed conversion ratio intake and decrease the performance of broiler chickens when compared with lower levels of powder Tarragon. It is possible that in the process of drying Tarragon, all its useful combination was destroyed (Vienna, 2005) and has lost its effectiveness.

CONCLUSION

It is suggested to consider the level lower than 0.5 % powder Tarragon in ration, and also to do some more comprehensive researches about using powder form of this plant in comparison with other intake forms of the plant in poultry feed.

REFERENCES

- Al-Attar, A. M. 2006. Comparative physiological study on the effect of rosemary, tarragon and bay leaves extract on serum lipid profile of quail, *Coturnix coturnix*. Saudi. J. Biol. Sci. 13: 91- 98.
- Cross, D.E., R.M. Mcdevitt, K. Hillman, and T. Acamovic. 2007. The effect of herbs and their associated essential oils on performance, dietary digestibility and gut microflora in chickens from 7 to 28 days of age. Br. Poult. Sci. 48: 496-506.
- Ciftci, M., T. Güler, B. Dalkiliç, and N. Ertas. 2005. The effect of anise oil (*Pimpinella anisum* L.) on broiler performance. Int. J. Poult. Sci. 4: 851-855.
- Ayoughi .F., M. A. Sahari, H. Naghdibadi. 2011. Chemical compositions of Essential oils of *Artemisia dracunculus* L. and an Evaluation of their Antioxidative Effects Agricultural. Sci.Tech. 13:79-88.
- Tipu M. A., M. S. Akhtar, M. I. Anjum And M. L. Raja. 2006. New dimension of medicinal plants as animal feed. Pakistan Vet. J. 26: 144-148.
- Meepagala, K.M., Sturtz, G. and Wedge, D.A., 2002. Antifungal constituent of the essential oil fraction of *Artemisia dracunculus* L. Var. *dracunculus*. Journal of Agricultural and food chemistry, 50:6989-6992.
- Oblskiy, D., Pischel, I., Feistel, B., Glotov, N., Heinrich, M. 2011. A Critical Review of Its Traditional Use, Chemical Composition, Pharmacology, and Safety. Journal of Agricultural and food chemistry, 17:45.
- Romila, R.M.A., 2001. Hacked By SOSO H. H Iraqi-Cracker. M.Sci. Thesis, Dept. of Biochemistry, University of Cairo Egypt.
- Vienna, Ch. F., and coworkers. 2005. Assessment of plants/herbs, plant / herb extracts and their naturally or synthetically produced components as "additives" for use in animal production. CFT/EFSA/FEEDAP.
- Yusrizal, and T. C. Chen. 2003. Effect of adding chicory fructans in feed on broiler growth performance, serum cholesterol and intestinal length. Int. J. Poult. Sci. 2:214-219.

Table2: Effect of dietary Tarragon Powder supplementation on performanse parameters of broiler chickens in different experimental groups.

Groups	Control	0/125%	0/25%	0/5%	SEM	P-value
feed consumption (g)						
(1-42) days old	4088.9	3951.00	3989.9	4487.4	86.08	0.09
weight gain(g)						
(1-42) days old	2030.40 ^a	1894.3 ^{ab}	9 ^{ab} / 1715	^b 1569	60/28	**0021/0
feed conversion ratio						
(1-42) days old	2.024 ^b	2.092 ^b	2.37 ^{ab}	2.89 ^a	0.11	**0.006
**Mean values with different letters at the same differ significantly at (p<0.01). *Mean values with different letters at the same differ significantly at (p<0.05).						

Table3: Effect of dietary Tarragon Powder supplementation on Anatometic Properties of Digestive System parameters of broiler chickens in different experimental groups.

Groups	Control	0/12 5%	0/25%	0/5%	SEM	P-value
length of Duodenum(% intestine length)	13.06	12.8 3	14.32	13.1 2	0.31	0.37
length of Jejunum(% intestine length)	58.32	56.4 7	58.06	58.3 0	0.64	0.6
length of Ileum(% intestine length)	9.2	9.3	9.1	8.2	0.39	0.68
length of Secum(% intestine length)	15.35	17.1 7	14.03	16.1 9	0.59	0.28
length of Rectum(% intestine length)	3.9	3.7	4.3	3.4	0.13	0.08
weight of Duodenum(% bady weight)	0.56	0.54	0.63	0.62	0.02	0.51
weight of Jejunum(% bady weight)	2.2	2.13	2.18	2.52	0.07	0.17
weight of Ileum(% bady weight)	0.31	0.31	0.32	0.31	0.01	0.96
weight of Secum(% bady weight)	0.36	0.38	0.30	0.40	0.01	0.05
weight of Rectum(% bady weight)	0.174	0.17 4	0.172	0.17 0	0.01	0.98
length of small intestine (% length of intestine)	80.62	79.0 8	81.6	80.3 2	0.59	0.55
Pancreas	0.24	0.22	0.22	0.25	0.35	0.01
stomach	0.35	0.37	0.38	0.37	0.91	0.02
Bursa	0.19	0.20	0.18	0.19	0.01	0.92
gizzard	1.65	1.78	1.64	1.80	0.04	0.27