



THE EFFECT OF A MIXTURE OF THYME AND PARSLEY IN THE DIET ON PERFORMANCE OF BROILER

Maysoon Rodhan Jaffer

Dept. of Public Health, College of Veterinary Medicine, University of Baghdad, Iraq

ABSTRACT

This study was conducted to explore the use of a mixture thyme and parsley in broiler nutrition as a natural growth promoter (NGP). Different levels of a mixture of thyme and parsley were added to standard diet to determine its effects on feed intake, live weight gain, feed conversion ratio, hematological and Serobiological changes in broiler. Two hundred day-old broiler chicks (Arber- Acres) were divided into four equal groups and treated as follows: No added NGP (control group), 0.4% , 0.8%, 1.2% of a mixture thyme and parsley were incorporated into the basal diet (group 2,3,4) respectively for five weeks. Results showed that chicks fed with 0.4%, 0.8%, 1.2% mixtures of thyme and parsley had significantly high ($P<0.05$) in body weight gain, feed intake and, feed conversion ratio compared with control group, which showed the lowest performance. Moreover, the chick fed with mixture of thyme and parsley had reduced serum cholesterol. In conclusion, a mixture of thyme and parsley could be considered as a potential natural growth promoter for poultry at the levels, 0.4%, 0.8%, and 1.2%

KEY WORDS: Thyme, Parsley, Performance, Serum cholesterol, Broilers.

INTRODUCTION

Feed additives are important materials that can improve the efficiency of feed utilization and animal performance (Gudev *et al.*, 2008). Some plants, containing various essential oils, have been used as natural alternative remedies by some researchers (Ceylon *et al.*, 2003). Some studies have indicated that various plant extracts can improve feed conversion ratio, increase carcass quality, decrease the market age of boiler and reduce their rearing cost (Jared *et al.*, 2009).

Mansoub (2011) suggested that herbals plants have stimulatory effects on pancreatic secretions such as digestive enzymes which help to digest and absorb more amino acids from digestive tract (Lee *et al.*, 2004). Herbal growth promoter has significant improvement of body weight, weight gain and feed conversion (Ghazalah and Ibrahim, 1996; Al-Kaissie, 2009). Parsley (*Petroselinum sativum*) which is belonging to the family Apiaceae is widely cultivated as an herb, a spice and vegetable (Peter, 2004). Parsley is a good source of antioxidants (especially luteolin), folic acid; Vitamin A. Proclaimed health benefits include anti-inflammatory properties and boosted immune system. This herb contains no cholesterol, Eugenol has been used in therapeutic to reduce blood sugar levels in diabetics. Fresh herb leaves are also rich in many essential vitamins such as pantothenic acid, riboflavin, niacin, pyridoxine and thiamin. These vitamins play a vital role in carbohydrate, fat and protein metabolism by acting as co-enzymes inside the human body (Richmond and Mackely, 2000). Thyme (*Thymus vulgaris* L) is a member of *Lamiaceae* family, with the major components of phenols, thymol (40%) and carvacrol (15%), also it can be used for several medicinal purpose, such as respiratory disease, antimicrobial, antinociceptive *etc.* (Mikaili *et al.*, 2010). In addition, these phenolic compounds exhibit considerable

antimicrobial and anti fungicidal activities (Basilico and Basilico, 1999). Furthermore, Allen *et al.*, (1998), Denil *et al.*, (2004) and cross *et al.* (2007) reported the beneficial effect of thyme in poultry production. Al-Kaissie (2009) found that the addition of thyme at different levels increase body weight, body weight gain and decrease feed conversion ratio in boiler.

MATERIALS & METHODS

This study was carried out at the poultry farm, Public Health Department, College of Veterinary Medicine, University of Baghdad. Two hundred day-old mixed sexed broiler chicks (Arbor-Acres) were used in this study. Chicks were weighed and the average of weight was recorded as day-old weight. They were assigned into 2 equal replicates of 25 for each. The chicks were housed in floor pens (1.25 *1.25 m). Starter diets containing 22.4 crude protein (CP) and 2850 Kcal/kg ME were offered *ad-libitum* from 1 to 21 days of age. Then a finisher diet contains 20.2% crude protein and 2900 Kcal/kg ME was offered *ad-libitum* from 22 to 35 days of age. All diets were formulated to cover the nutrient requirements of chicken (NRC, 1994). First group served as a control, while groups 2, 3 and 4 fed diet with, 0.4%, 0.8% and 1.2% mixture of thyme and parsley respectively. Standard management practices of commercial broiler production were applied. Chicks were vaccinated against Newcastle disease and Infectious bronchitis. Body weight was determined through the final experiment and feed intake was recorded for the corresponding periods. At the end of the experiment, three chicks from each replicate were randomly selected and weighted to obtain live body weight, then were slaughtered by a sharp knife for complete bleeding, and feathers were plucked. Head, viscera and shanks were removed. Carcass was left for one

hour to remove excess water and allowed for overnight in a refrigerator at $4\pm 2^{\circ}\text{C}$ then weighed. Dressing percentage was calculated without giblets (Heart, gizzard, liver and abdominal fat) and the weight of each part was calculated as percentage of the carcass weight. Blood sample were also taken from the brachial vein with a syringe. These sample were used for the determination of various hematological and some of serobiochemical parameters including Hb, RBCs, PCV%, WBC and heterophils/lymphocytes ratio. Cholesterol and uric acid also determined. Data were analyzed by using the General Linear Model procedure of SAS (2001) Duncan's multiple range test was used to detect the differences ($P<0.05$) among different group means (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

The effect of a mixture thyme and parsley on the growth performance (body weight gain, feed intake and feed conversion ratio) of broiler chicks is presented in table (1). Results showed that chicks fed a mixture of thyme and parsley had significantly higher values ($P<0.05$) for all treatments compared with control group. Moreover, higher level of a mixture showed better results than low level. Results revealed an improved body weight gain, feed intake and feed conversion ratio, which may be attributed

to active materials (thyme and carracrol, luteolin, Eugenol) in these plants which are considered as digestion stimulating factors, in addition to their antioxidant, antimicrobial activity against bacteria found in the intestine (Cabuk *et al.*, 2003). In the utilization of feed, results showed an enhanced growth. There is an evidence to suggest that herbs, spices and various plant extracts have appetite and digestion stimulating properties and antimicrobial effects (Kamel, 2001). The present study showed that groups fed with a mixture of thyme and parsley had significantly lower cholesterol and H/L ratio, compared with the control group ($P<0.05$). These observations are in consistent with results published by some authors (Panda *et al.*, 2000; Kannan *et al.*, 2005; Gudev *et al.*, 2008; Paryad and Mohmoudi, 2008).

Unfortunately, reports on the value of used a mixture of these plants in poultry nutrition is scarce. This study showed that the supplementation of different levels from thyme and parsley in diets significantly improved the live weight gain and feed conversion ratio during a growing period of 5 weeks, in addition to decreasing serum cholesterol level and H/L ratio in mixture. The mixture of thyme and parsley could be considered as a potential growth promoter for poultry due to its digestive stimulating and antimicrobial effect.

TABLE 1: The effect of adding different levels of a mixture of thyme (*Thymus vulgaris* L) and Parsley (*Petroselinum saliva*) to the diet on broiler performance for 5 weeks

Parameters	Diets			
	T ₁ Control	T ₂ (0.4%)	T ₃ (0.8%)	T ₄ (1.2%)
Average body weight (g)	1616.65 \pm 38.20 ^b	1731.32 \pm 41.73 ^a	1235.43 \pm 43.5 ^a	1787.54 \pm 36.8 ^a
Average body weight gain (g)	1575.87 \pm 39.42 ^b	1690.43 \pm 42.35 ^a	1795.76 \pm 41.8 ^a	1764.65 \pm 38.4 ^a
Total feed consumption (g/bird/day)	3039.75 \pm 0.10 ^b	3008.2 \pm 0.95 ^a	3122.34 \pm 2.1 ^a	3020.53 \pm 1.95 ^a
Feed conversion ratio (g.feed/g.gain)	1.93 \pm 0.03 ^a	1.78 \pm 0.02 ^b	1.74 \pm 0.02 ^b	1.73 \pm 0.01 ^b
Mortality rate (%)	1.8 ^b	3.1 ^c	2.4 ^c	9.5 ^a
Dressing percent (%) without edible parts	67.92 \pm 2.72 ^b	71.39 \pm 1.8 ^a	73.42 \pm 1.3 ^a	72.23 \pm 1.9 ^a

Means with different subscripts letters in the same row are significantly different ($P<0.05$).

TABLE 2 Hematological and Serobiochemical changes in chicks fed a mixture of thyme and parsley for 5 weeks.

Parameters	Diets			
	T ₁ Control	T ₂ (0.4%)	T ₃ (0.8%)	T ₄ (1.2%)
HB (g/dL)	9.2 \pm 0.27	8.8 \pm 0.32	8.6 \pm 0.24	7.4 \pm 0.09
RBC _s ($10^6/\text{mm}^3$)	3.4 \pm 0.31 ^a	3.3 \pm 0.02 ^a	2.7 \pm 0.2 ^b	2.1 \pm 0.07 ^b
PCV (%)	33.7 \pm 0.41 ^a	30.6 \pm 0.30 ^b	29.8 \pm 0.40 ^{bc}	27.9 \pm 0.35 ^c
H/L ratio	21.8 \pm 0.15 ^a	20.2 \pm 0.20 ^a	19.3 \pm 0.31 ^b	18.9 \pm 0.04 ^b
Serobiochemical	0.29 \pm 0.01 ^a	0.28 \pm 0.02 ^{ab}	0.27 \pm 0.03 ^b	0.27 \pm 0.04 ^b
Cholesterol (mg/dL)	3.2 \pm 0.3 ^a	143.2 \pm 3.8 ^b	142.6 \pm 3.7 ^b	142.2 \pm 3.9 ^b
Uric acid (mg/dL)		3.3 \pm 0.2 ^a	2.9 \pm 0.3 ^a	4.3 \pm 0.7 ^a

Means with different subscripts letters in the same row are significantly different ($P<0.05$).

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