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The Effect of Anise and Rosemary on Broiler Performance

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Abstract: The present study was conducted to explore the usage of different level of Anise and Rosemary in broiler nutrition as a natural growth promotion. Different levels were added to a standard diet, to determine its effect on the daily feed intake, daily live weight and feed conversion ratio compared to a control group. Two hundred fifty day-old broilers (Arbor Acre) were divided into five equal groups as follows, Control group (no addition of Anise and Rosemary), Anise 0.5%, Anise 1%, Rosemary 0.5% and rosemary 1%. The experiment carried out in 42 days. The feed intake was significantly ($P < 0.05$) different between the groups. The highest was at Anise 1% group and the highest daily live weight gain observed in the same group Anise 1% (63.34g) followed by Anise 0.5% group (59.49g), Rosemary 1% group (59.30g), Rosemary 0.5% group (56.08g) and control group (50.99g). The results show that Anise 1% and Rosemary 1% could be considered as a potential growth promoter for poultry.

Key words: Anise, rosemary, broiler nutrition

Introductions

Plants (Specially herbs) have been used as food for medicinal purposes for centuries and some of them have played a significant role in maintaining human health and improving the quality of human life for thousands of years, (Osman *et al.*, 2005).

The World Health Organization estimated that 80% of the earth's inhabitants relies on tradition medicine for their primary health care needs and most of this therapy involves the use of plants extracts or their active components (Mehmet *et al.*, 2005). Those extracts are specifically for their antiseptic properties and beneficial effects on the digestion (Foster and Duke, 1999).

After the use of most antibiotic, growth promoters, as feed additives, have been banned by the European Union due to cross-resistance against pathogens and residues in tissues. Scientists have searched for alternatives to antibiotics. In this view, aromatic plants are becoming more important due to their antimicrobial effects and stimulating effects on animal digestive systems. (Osman *et al.*, 2005).

Aromatic plants have been used traditionally in the therapy of some diseases worldwide for a long time.

As an aromatic plants, anise (*Pimpinella anisum L.*), Cumin (*Cuminum cyminum*), Rosemary (*Rosemarinus officinalis*) is an annual herb in digeneous to Iran, India, Turkey, Egypt and many other warm regions in the world. As a medicinal plants, all of them have been used as stimulating effects of digestion and antiparasitic (Cabuk *et al.*, 2003) antibacterial (Singh *et al.*, 2002; Tabanca *et al.*, 2003), and antifungal (Soliman and Badea, 2002).

Materials and Methods

Two hundred fifty day-old broilers (Arbor Acres) were divided into five treatment group of 50 birds each and

randomly assigned to the five treatment diets. The experiment was carried out 42 days. Each treatment group was further Sub - divided into two replicates of 25 birds per replicate. The presence and levels of herbal plants (anise and rosemary) on performance diet the main factor test.

In the control group the birds were fed a standard diet (21.49% CP and 3188 Cal ME/kg) (Control group).

Two different levels of each anise and rosemary 0.5%, 1% were added to the standard diets to generate the other five treatment groups. Mixed carefully Vegetable oil was as a fat source. The diets were prepared isocaloric and isonitrogenous. The ingredient and chemical composition of the diets are presented in Table 1. The diets and water was provided *ad libitum*.

Twenty five broilers were kept into 10 pens (2.5 X 1.5m). A photoperiod of 24 h/d in 4 week and 16 h/d in 4-6 weeks was maintained. The body weights of the birds were measured at 1, 7, 14, 21, 28, 35 and 42 days of the experiment. Feed intake was recorded biweekly. Feed conversion ratio was calculated at the end of the 42 day experimental period.

There was no mortality in any group during the trial. Chemical compositions of feed ingredients (crude protein, metabolically energy were calculated according to the AOAC (1990).

Date collected was subjected to the analysis of variance, and significant differences were observed. Means were further subjected to statistical analysis.

The results were considered as significant when P values were less than 0.05.

At 6 weeks of age 5 birds were slaughtered. The birds were individually weighed to the nearest gram (after 12 hours of fasting), then slaughtered by cutting the throat and the jugular vein with a sharp knife near the first

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Table 1: Composition of standard diet, %

Feeds ingredients	1-42 d
Yellow corn	30.00
Wheat	32.50
Soybean meal (48% protein)	19.50
Protein concentrate (50% protein) ¹	10.00
Limestone	0.70
Salt	0.30
Oil	6.70
Vitamins & trace mineral premix ²	0.10
Methionine	0.10
Lysine	0.10
Total	100
Analysis	
Crude protein	21.49
Methionine + Cystine	0.33
Lysine	1.54
ME, cal/ kg	3188.00
Calorie protein ratio	1:148

¹Source: Provime Company, Jordin. Premix: (1%) provided the following (per kilogram of complete diets); 1400 IU vitamin A; 3000 IU Vitamin D₃; 50 mg Vitamin E; 4mg Vitamin K; 3mg Vitamin B₆; 6 mg vitamin B₁₂; 60 mg niacin; Edition 20 mg pantothenic acid; 0.20 mg folic acid; 150 mg choline; 4.8 mg Ca; 3.18 mg P; 100mg Mn; 50mg Fe, 80 mg Zn; 10 mg Cu; 0.25 mg Co; 1.5 mg 10 dine.

vertibrium. When complete bleeding was a achieved, the slaughter weight was recorded. The eviscerated weight was obtained after the removal of the head, neck, viscera, shanks, spleen, gizzard, liver, heart and the reproductive oranges.

Results and Discussion

The effect of different amounts of anise and rosemary on the daily live weight gain (g) is presented in Table 2. At the end of 6 week, daily live gains differed ($P < 0.05$) between treatments. The highest live weight gain was recorded in anise 1% group (92.64g), followed by rosemary group 1% (79.00g), rosemary group (77.86 g), anise group 0.5% (69.00g) and control group (66.43g) ($P < 0.05$). The daily live weight gains of birds fed the diets containing anise 0.5% and control were lower than those of the birds on the diet containing anise 1% ($P < 0.05$).

The effect of different amounts of anise and rosemary on the feed intake is presented in Table 3. From 1-6 weeks feed intake differed significantly between groups ($P < 0.05$). The improvement was observed in the anise 1% group and rosemary 1% group. This improvement may be due to the appetizing effect of active ingredient, (such as anethole and borneol) in anise and rosemary respectively (Cabuk *et al.*, 2003).

The effect of anise and rosemary on feed conversion ratio is presented in Table 4. From weeks 1 to 6, feed conversion ratios differed significantly between groups ($P < 0.05$).

The addition of anise 1% group and rosemary 1% to the diets improved feed conversion ratio compared to the

Table 2: The effect of diets varying in amounts of anise and rosemary on the daily live weight gain of broilers (g / bird /day) (n=50)

Wks	Control	Anise	Anise	Rosemary	Rosemary
		0.5%	1%	0.5%	ary 1%
1	16.22 ^d	17.96 ^{ab}	18.61 ^a	16.96 ^{cd}	17.32 ^{bc}
2	30.57 ^d	41.87 ^b	45.89 ^a	35.97 ^c	37.46 ^c
3	33.09 ^b	38.79 ^{ab}	32.80 ^b	36.56 ^{ab}	38.19 ^{ab}
4	70.79 ^a	104.90 ^a	100.93 ^{ab}	89.86 ^d	95.77 ^{cd}
5	88.86 ^a	76.14 ^b	89.14 ^a	79.29 ^{ab}	88.03 ^a
6	66.43 ^c	77.29 ^{bc}	92.64 ^a	77.86 ^c	79.00 ^b
0-6	50.99 ^d	59.49 ^b	63.34 ^d	56.08 ^e	59.30 ^b

$P < 0.05$, ^{abcde}Mean values with different superscript within a row differ significantly.

Table 3: The effect of diets varying in amounts of anise and rosemary on the daily feed intake of broilers (g / bird /day) (n=6)

Wks	Control	Anise	Anise	Rosemary	Rosemary
		0.5%	1%	0.5%	1%
1	21.50 ^b	24.53 ^a	24.01 ^a	23.54 ^a	24.00 ^a
2	51.72 ^a	64.64 ^a	67.82 ^a	57.10 ^d	58.70 ^c
3	93.30 ^a	61.30 ^b	51.23 ^d	59.07 ^c	61.63 ^b
4	134.43 ^d	186.40 ^a	185.67 ^a	164.43 ^c	177.10 ^b
5	176.70 ^a	152.37 ^d	172.13 ^b	166.87 ^c	167.67 ^c
6	178.80 ^b	172.23 ^d	191.37 ^a	177.43 ^b	174.82 ^c
0-6	109.41 ^c	110.25 ^b	115.37 ^a	108.07 ^d	110.65 ^b

$P < 0.05$, ^{abcde}Mean values with different superscript within a row differ significantly

control group. This improvement was persistent with the anise 0.5% and rosemary 0.5% groups.

as shown, daily live weight gain and feed conversion ratio were increased statistically in anise 1% and rosemary 1% groups compared to the control. The differences among the groups may be due to active ingredient such as anethole in anise and borneol in rosemary. That was achieved anethole and borneol have digestive stimulating effects. (Cabuk *et al.*, 2003). Besides anethole and borneol affected pathogen microorganism in the digestive system and increased live weight gain and feed conversion.

Additionally, anise and rosemary have been used as an antiparasitic (Kim *et al.*, 2004; Cabuk *et al.*, 2003) and antipyretic (Feng and Lipton, 1987; Afifi *et al.*, 1994).

The improvement feed utilization in anise 1% and rosemary 1% in our study could be due to these positive effects of the active ingredient on the digestive system. The reduction in the performance in the case anise 0.5% and rosemary 0.5% group may be due to low active ingredient (anethole and borneol) in digestive system. Besides this active ingredient positively affected digestibility of nutrient and increase digestion of protein, cellulose and fat (Jamroz and Kamel, 2002), in addition to increase in the effects of pancreatic lipase and amylase (Ramakrishna *et al.*, 2003). The improved daily live weight gains and feed conversion ratio of birds fed the diets containing anise 1% and rosemary 1% in this study a greed with the results reported by other researchers. Osman *et al.* (2005) reported that addition of 200 ppm essential oil mix derived from Oregano, Clove and anise improved body weight and feed conversion ratio compared to control groups in broiler.

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Table 4: The effect of diets varying in amounts of anise and rosemary on the feed conversion ratio (g feed / g gain)

Wks	Control	Anise 0.5%	Anise 1%	Rosemary 0.5%	Rosemary 1%
1	1.33 ^{ab}	1.37 ^a	1.28 ^b	1.40 ^a	1.39 ^a
2	1.69 ^a	1.54 ^{bc}	1.47 ^c	1.59 ^b	1.56 ^{bc}
3	2.82 ^a	1.58 ^b	1.56 ^c	1.64 ^b	1.61 ^{bc}
4	1.90 ^a	1.78 ^b	1.84 ^b	1.82 ^{bc}	1.84 ^{bc}
5	1.99 ^b	2.00 ^b	1.93 ^b	2.11 ^a	1.90 ^c
6	2.68 ^a	2.23 ^b	2.21 ^b	2.28 ^b	2.21 ^b
0-6	2.15 ^a	1.85 ^b	1.82 ^{bc}	1.81 ^c	1.86 ^b

P<0.05, ^{abc}Mean values with different superscript within a row differ significantly

Similarly, Ather (2000) reported that broiler performance was improved when using a poly herbal premix which contained five herbs. In these studies anise and rosemary have been reported to improve body weight, feed intake and feed conversion ratio.

But unfortunately, reports on the value of anise and rosemary in poultry nutrition are limited. This study showed that the supplementation of anise 1% and rosemary 1% in broiler diets significantly improves the daily live weight gain and feed conversion ratio during a growing period of 6 week. These may be considered as a potential growth promoter for poultry due to digestive stimulating effect, and antimicrobial effect and positive effect on performance.

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