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Effects of Orego-Stim® on Broiler Chick Performance and Some Blood Parameters

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Abstract: The aim of this experiment was to determine the effect of Orego-Stim® on broiler chick performance and some blood parameters. This research was carried out on the base floor using 120 male Ross PM3 7 days old hybrid chicks. In the 1st week of the research, the chicks were fed with starter diet, then 120 chicks were divided into four groups. Each group has consisted of three replications and each replication contained 10 chicks. Water and feed were given to the chicks as *ad-libitum*. Orego-Stim® (0, 300, 500 and 700 ppm) were added into four diets. Body Weight (BW), Body Weight Gain (BWG), Feed Intake (FI), Feed Conversion Ratio (FCR) and death rates were determined in a group level weekly. At the end of experiment, Carcass Yield (CY) and Liver Weigth (LW), Gizzard Weigth (GW), Heart Weigth (HW) and Abdominal Fat (AF) weight were determined cutting all the animals in each group. Orego-Stim® had no significant ($p>0.05$) effect on BW, BWG and mortality of broiler chicks at all experiment periods whereas Orego-Stim® had significant effect on FI and FCR in the current study. On the other hand, Orego-Stim® had no ($p>0.05$) effect on CY, AF, LW, GW and HW.

Key words: Orego-Stim®, *Origanum vulgare* sp. *hirtum*, broiler, feed intake, feed conversion ratio, performance

INTRODUCTION

After the prohibition of the use of antibiotics as growth promoters considerable effort has been devoted to essential oils which are the products which obtained from natural and aromatic plants by steam distillation. Some essantial oils obtained from different sources were used in broiler diets to determine the effect on growth perormance, digestibility and digestive systems (Hernandez *et al*., 2004; Alcicek *et al*., 2004; Lee *et al*., 2004; Mitsch *et al*., 2004). Several researchers swhowed that the supplementation of some essantial oils increased the live weight (Denli *et al*., 2004) and improved feed conversion ratio (Lee *et al*., 2003; Botsoglou *et al*., 2004; Halle *et al*., 2004; Cross *et al*., 2007).

It was suggested that Orego-Stim® is commercilay available product and 100% natural feed additive/flavour used globally in livestock diets to improve the overall performance and returns. Orego-Stim® onsists of essantial oils such as 81.89% carvacrol, 5.1% χ-terpinen, 3.76% Cymen and 2.42% thymol.

The aim of this experiment was to determine the effect of Orego-Stim® on broiler chick performance and some blood parameters.

MATERIALS AND METHODS

This research was carried out on the base floor using 120 male Ross PM3 7 days old hybrid chicks. In the first week of the research, the chicks were fed with starter, then, 120 chicks were divided into 4 groups. Each group consisted of 3 replications and each replication contained 10 chicks. Water and feed were given to the chicks as *ad-libitum*. Orego-Stim® (0, 300, 500 and 700 ppm) were added into four diets. Orego-Stim® were obtained from Polimed in Istanbul, Turkey.

Orego-Stim® was excracted from *Origanum vulgare* sp. *hirtum* plants by steam distilation and consists of 81.89% carvacrol, 5.1% χ-terpinen, 3.76% Cymen and 2.42% thymol. The diet presented in Table 1 was given to broiler chicks from 2nd week to 3rd week. The diet presented in Table 2 was given to broiler chicks from 4th-6th week.

The BW, BWG, FI, FCR and mortality were determined in a group level weekly. At the end of experiment, CY and LW, GW, HW and AF were determined cutting all the animals in each group. The CY was obtained from the ratio of carcass weight to live weight after cutting the animal and taking out its abdominal fats. After cleaning liver, gizzard and the fats on heart of all animals in each group, LW, GW and HW were determined. Abdominal fat of the animals in each group has been determined taking out stomach, gizzard, heart, reproductive channels, bursa fabricus and the fats that have accumulated around intestine of the chicks. Cold carcass weights of the animals were determined after the animals had been waited in +4°C and for 24 h in the end of experiment.

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Table 1: Ingredients and chemical composition of the experimental diets (as fed basis) used from from 2nd-3rd week for broiler chicks

Ingredients (kg/1000 kg)	Diets I	II	III	IV
Maize	408	407.7	407.5	407.3
Soyabean meal	292	292	292	292
Full fat soyabean meal	190	190	190	190
Fish meal	42	42	42	42
Vegetable oil	35	35	35	35
Orego -Stim	0	0.3	0.5	0.7
Ground limestone	12	12	12	12
Dicalcium phosphate	11	11	11	11
DL-Methionine	2.5	2.5	2.5	2.5
L-Lysine	1.5	1.5	1.5	1.5
Sodium chloride	2.5	2.5	2.5	2.5
Vitamin + Mineral premix[1]	2.5	2.5	2.5	2.5
Anticoccidial	1	1	1	1
Total	1000	1000	1000	1000
Composition (analysed)				%
Dry matter				94.2
Crude protein				23.8
Ether extract				10.25
Crude fibre				3.18
Crude ash				6.98
Composition (calculated)				
Total calcium				0.996
Total phosphorus				0.65
Methionine				0.69
Lysine				1.64
Metabolisable energy (Kcal kg^{-1})				3100

Table 2: Ingredients and chemical composition of the experimental diets (as fed basis) used from from 4th-6th week for broiler chicks

Ingredients (kg/1000 kg)	Diets I	II	III	IV
Maize	404	403.7	403.5	403.3
Soyabean meal	304	304	304	304
Full fat soyabean meal	180	180	180	180
Fish meal	30	30	30	30
Vegetable oil	46	46	46	46
Orego -Stim	0	0.3	0.5	0.7
Ground limestone	16	16	16	16
Dicalcium phosphate	12	12	12	12
DL-Methionine	1	1	1	1
L-Lysine	1	1	1	1
Sodium chloride	2.5	2.5	2.5	2.5
Vitamin + Mineral premix[2]	2.5	2.5	2.5	2.5
Anticoccidial	1	1	1	1
Total	1000	1000	1000	1000
Composition (analysed)				(%)
Dry matter				94.0
Crude protein				20.7
Ether extract				11.30
Crude fibre				3.8
Crude ash				6.70
Composition (calculated) (g kg^{-1})				
Total calcium				1.13
Total phosphorus				0.62
Methionine				0.52
Lysine				1.55
Metabolisable energy (Kcal kg^{-1})				3200

Orego-Stim: Consists of 81.89% carvacrol, 5.1% χ-terpinen, 3.76% Cymen and 2.42% thymol; [1] Vitamin premix (/kg diet): Vitamin A-12000 IU; vitamin D_3-1500 IU; vitamin E-30 mg; vitamin K -3 mg; vitamin B_1 -3 mg; vitamin B_2 -6 mg; vitamin B_6 -5 mg; vitamin B_{12} -0.03 mg; nicotin amid -40 mg; calcium-D-pantothenate -10 mg; folic acid -0.75 mg; D-biotin -0.075 mg; choline chloride 375 mg; antioxidant -10 mg Mineral premix (mg kg^{-1} diet): Mn -80; Fe -80; Zn -60; Cu -8; I -0.5; Co -0.2; Se -0.15

High Density Lipoprotein Cholesterol (HDL-C) was determined as mg/dL by using Crescent Diagnostics Cholesterol test kit in blood serum taking from each animal in each treatment group. Measurement of blood serum triglyceride and total cholesterol were spectrofotometricly determined using commercial kits (Teco Diagnostic, California, USA).

Statistical analysis: One-way Analysis of Variance (ANOVA) was carried out to compare BW, BWG, FI, FCR, LW, GW, HW and mortality using General Linear Model of Statistica for Windows. Significance between individual means was identified using the Duncan multiple range test. Mean differences were considered significant at $p<0.05$.

RESULTS AND DISCUSSION

The effects of Orego-Stim on BW, BWG, FI, FCR and mortality of broiler chicks were given in Table 3. As can be shown from Table 3 Orego-Stim® had no significant ($p>0.05$) effect on BW, BWG and mortality of broiler chicks at all experiment periods whereas Orego-Stim® had significant effect on FI and FCR. The reduction in FI may be attributed to phenolic compounds in Orego-Stim. However there is no available information about the effect of Orego-Stim® on BW, BWG, FI, FCR and mortality of broiler chicks in the literature to compare the results obtained in the current experiment. However, Alcicek *et al.* (2004) showed that the supplementation of a mixture of herbal essantial oils improved the body weight gain, feed conversion ratio and carcass yield of broilers when compared with organic acids and probiotics treatments.

Alcicek *et al.* (2004) also shown that the supplementation of a mixture of herbal essantial oils had no effect on the mortality of broiler chicks. As mentioned before, the supplementation of Orego-Stim® only improved FCR. The improvement in FCR can be atributed to increased digestion due to supplementation of Orego-Stim®.

It was determined that supplementation of some essential oil increased protein, cellulose and oil digestion (Jamroz and Kamel, 2002), the nutrients provides improvement in all digestive system and the digestive in ileum considerably (Hernandez *et al.*, 2004).

The effects of Orego-Stim® on CY, AF, LW, GW and HW were given in Table 4. As can be seen from Table 4, Orego-Stim® had no significant ($p>0.05$) effect on CY, AF, LW, GW and HW.

Table 3: The effects of Orego-Stim® on body weight, mortality of broiler chicks (n = 30)

	Diets			
Parameters	I	II	III	IV
In W	131.73±0.70a	131.83±0.39a	132.33±0.33a	131.67±0.67a
BW	2264.63±50.52a	2318.43±13.12a	2295.33±17.03a	2336.37±38.83a
BWG	2132.9±50.65a	2186.6±12.89a	2163.0±17.07a	2204.7±39.03a
FI	3732.9±0.03a	3654.4±0.02b	3594.1±0.02b	3602.5±0.01b
FCR	1.75±0.03a	1.67±0.01b	1.65±0.00b	1.63±0.03b
Mortality	0.97±0.03a	0.87±0.06a	0.90±0.06a	0.90±0.06a

[abc]:Row means with common superscript do not differe (p>0.05), In W: Initial Weigth (g) FBW: Final Body Weight (g), BWG: Body Weigth Gain (g), FI: Feed Intake (g), FCR: Feed Conversion Ratio (g feed g^{-1} gain)

Table 4: The effect of Orego-Stim® on carcass yield, abdominal fat, liver weight, gizard weigth and heart weigth of broiler chicks (n = 30)

	Diets			
Parameters (%)	I	II	III	IV
CY	75±2.3a	74±2.4a	74±2.0a	75±1.8a
AF	2.7±0.10a	2.6±0.12a	2.4±0.14a	2.4±0.11a
LW	2.6±0.09a	2.6±0.10a	2.5±0.09a	2.4±0.09a
GW	1.3±0.10a	1.2±0.08a	1.3±0.09a	1.2±0.07a
HW	0.6±0.02a	0.5±0.01a	0.5±0.02a	0.5±0.01a

[abc]: Row means with common superscript do not differe (p>0.05), CY: Carcass Yield (%), AF: Abdominal Fat (%) , LW: Liver Weight (%), GW (%): Gizard Weigth (%) HW: Heart Weigth (%)

Table 5: The effect of Orego-Stim® on total cholesterol, high density lipoprotein and triglyseride of broiler chicks (n = 30)

	Diets			
Parameters	I	II	III	IV
TC	127.18±4.12a	124.20±6.52a	125.65±6.79a	128.67±2.75a
HDL-C	107.45±5.95a	108.00±6.10a	106.55±7.10a	109.25±3.98a
TG	75.25±5.52a	80.15±3.20a	76.40±6.45a	77.55±4.90a

[abc]: Row means with common superscript do not differe (p>0.05), TC: Total Cholesterol (mg dL^{-1}), HDL: Chigh Density Lipoprotein (mg dL^{-1}), TG: Triglyseride (mg dL^{-1})

There is no available information about the effect of Orego-Stim® on CY, AF, LW and HW of broiler chicks in the literature to compare the results obtained in the current experiment. However, Alcicek *et al.* (2004) shown that the supplementation of a mixture of herbal essantial oil mixture improved the body carcass yield of broilers when compared with organic acids and probiotics treatments whereas supplementation of a mixture of herbal essantial oil mixture had no significant (p>0.05) effect on abdominal fat.

The effects of the Orego-Stim® extract on TC, HDL-C and TC were given in Table 5. As can be shown from Table 5 Orego-Stim® had no significant (p>0.05) effect on TC, HDL-C and TC.

CONCLUSION

The supplementation of Orego-Stim® to diets decreased feed intake and increased the feed conversion ratio without affecting the growth performance of brioler chicks. Therefore, Orego-Stim® can be used as a feed additives to improve feed conversion ratio. However, before large practical implication, Orego-Stim® should be tested.

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