Hayvancılık Araştırma Dergisi (2004) 14, 1-2: 27-30

EFFECT OF SALINOMYCIN ON BROILER PERFORMANCE

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Salinomycin'in broiler performansına etkisi

ÖZET

Bu çalışmada, broyler performansı üzerine yeme salinomycin katılmasının etkisi değerlendirilmiştir. Yeme 6 farklı düzeyde salinomycin katılmıştır (sırasıyla; 0, 1, 3, 5, 7 ve 9 ppm). Deneme 49 gün sürmüştür. Yeme katılan salinomycin düzeyin artmasıyla canlı ağırlık, yem tüketimi, canlı ağırlık artışı ve yemden yararlanmada azalma saptanmıştır. En yüksek canlı ağırlık (1972.25 g), boyun ağırlığı (90,9 g) ve ve iyi yemden yararlanma (1.59) değerleri 1 ppm salinomycin grubundan elde edilmiştir. En iyi yaşama gücü (% 96) ise 3 ppm salinomycin grubunda gözlenmiştir ($P<0.05$). En yüksek yolunmuş ağırlık (1629,1 g) ile, karkas (1316,9 g), but (399,09 g), kanat (150,0 g), göğüs (440.0 g) ve sırt (300,7 g) ağırlıkları kontrol grubundan elde edilmiştir. En yüksek abdominal yağ, (36,8 g) 7 ppm salinomycin grubunda bulunmuştur ($P<0.05$). Koksidiyozu önleme dışında salinomycin'in broyler yemlerine 1 ppm'den fazla katılmaması uygun görülmüştür.

ANAHTAR KELİMELER: Salinomycin, broyler performansı

SUMMARY

In this study, effects of salinomycin on broiler performance were evaluated. Six levels of salinomycin added to feed were tested (0, 1, 3, 5, 7 or 9 ppm respectively) for 49 days. Increasing the level resulted in a decrease in body weight, feed intake, weight gain and feed efficiency. The highest body and neck weight (1972.5 and 90.9g), and the best feed efficiency (1.59) were obtained with 1 ppm salinomycin ($P<0.05$). The best viability rate (96%) was obtained with 3 ppm salinomycin ($P<0.05$). The highest plucked, carcass, tight, wing, breast and back weight of the group were 1629.1 g, 1316.9 g, 399.0 g, 150.0 g, 440.0 g and 300.7 g, respectively. The highest abdominal fat weight (36.8 g) observed with 7 ppm salinomycin used group ($P<0.05$). Salinomycin musn't have used more than 1 ppm into the broiler fed.

KEY WORDS**:** Salinomycin, broiler performance

INTRODUCTION

It has been observed that salinomycin used for animal health caused live weight increases in ruminants (Bolat et al. 1995). This observation led some producers to add salinomycin in their broiler's feed.

Salinomycin is widely used to control coccidiosis. Harms and Buresh (1987) reviewed additional work indicating that monensin decreased body weight of broilers; they also reported that salinomycin depressed body weight of broilers. The amount of depression was dependent upon the level of salinomycin in the feed and the energy content of the feed.

There are various studies on adding salinomycin into fed (Dost and Raether 1986, Ferratto et al. 1988, Harms et al. 1989, Izat et al. 1991). The tolerance limits of salinoycin as a coccidiostat were reported as 120 and 80 ppm for Waren-Isabrown chicks and Lohmann selected Leghorn chicks respectively. The mentioned two breeds ingested 1.09 to 4.50 and 1.25 to 5.87 mg/kg body weight of salinomycin/day when 30-120 ppm dosage was applied (Dost and Raethar 1986).

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In the Ferratto et al., (1988)'s studies, weight gain, feed intake, feed conversion and mortality in broiler chicks were measured over 28 days to compare the effect of adding monensin (100 mg/kg), salinomycin (60 mg/kg), lasalocid (90 mg/kg), arprinocid (60 mg/kg), halofuginone (3 mg/kg) and nicarnazin (125 mg/kg) with the performance on non-medicated control feed. Arprinocid gave the best results, differing from halofuginone only with regard to weight gain, and from halofuginone as well as from nicarbazin with regard to feed conversion. Weight gain, and feed conversion figures were not impaired by the use of monensin, lasalosid, salinomycin and arprinocid. When compared with the non-medicated control feed, feed conversion was impaired by the use of nicarazin and halofuginone. In another study (Harms et al. 1989), five levels of each coccidiostat were fed and increasing the levels of coccidiostat resulted in a decrease in body weight and feed intake. Monensin gave a greater depression at the level suggested by the manufacturer for prevention of coccidiosis (121 ppm) than did salinomycin (66 ppm). On the other hand, broilers were grown to 42 days of age on diets supplemented with salinomycin (60 mg/kg), monensin (99 mg/kg) or halofuginone (3 mg/kg) and continued on unmedicated diets to 49 days of age. There were no significant differences among anticocidals in final body weight, feed conversion, or mortality rates. (Izat et al.1991). However, in another study in which salinomycin was given 60 ppm for 4 weeks poission symptom recession of water and feed intake and body weight were observed (Mazurkiewicz et al.1989).

This research was conducted to determine the effects of adding various levels of salinomycin on broiler performance.

MATERIAL and METHODS

In this investigation, 150 male Ross PM3 chicks were divided into control (0 ppm) and 5 salinomycin groups (1,3,5,7,9 ppm respectively). The density was 15 birds/m^2.

The lightening regimen was 24 L for the first two days and then 23 L : 1 D until slaughter. The duration of experiment was 7 weeks. The broilers were stunned by low electrical shock before slaughter.

A commercial type corn-soybean meal basal diet was used (Table 1). The starter and finisher diets were calculated to contain 20.09 % protein and 3002.54 kcal ME/kg diet and 19.99 % protein, 3108.31 kcal ME/kg respectively. While control group was fed with basal diet, salinomycin groups were fed with basal diet containing 1,3,5,7 or 9 ppm of salinomycin.

Chicks were not sexed and randomly distributed into 6 pens. Day old broiler chicks were wing banded for identication and weighted to determine live weight by a balance sensitive to 1g every week until slaughter. Diets and water were provided *ad libitum* throughout the experimental period. Feed consumptions and live weights were measured to calculate feed efficiency.

The data were analysed by ANOVA (SAS, 1985). Significant differences among treatment means were determined by Duncan's multiple range tests.

RESULTS

The addition of increasing amount of salinomycin to diet resulted in a decrease in body weight, viability, feed intake and feed efficiency (Table 2) (P<0.05).

A level of 7 and 9 ppm for salinomycin resulted in significant decreases in body weight (P<0.05). The best result of live weight was obtained from 1ppm salinomycin (P<0.05).

The best viability (96 %) was obtained from 3ppm salinomycin group (P<0.05). Viability increased in 3 ppm group, but decreased in 5 ppm group.

Feed intake decreased as the level of salinomycin increased in the diet (Table 2). The best mean feed intake per capita of the last week (157.46 g) was obtained from control group and the lowest (92.29 g) was obtained from 7 ppm salinomycin group (P<0.05).

Feed efficiency of birds given diet containing 1 ppm salinomycin (1.59) was better than 9 ppm (2.50) group (Table 2) (P<0.05).

Parts of broilers carcass at the end of the trial were examined as well (Table 3).

The addition of increasing amount of salinomycin to diet resulted in a decrease in plucked, carcass, leg, wing, breast and bag weights (Table 3) (P0<0.05), but the highest (36.8 g) and the lowest (28.8 g) abdominal fat weight were obtained from level of 7 ppm of salinomycin and from level of 9 ppm of salinomycin, respectively (P<0.05). On the other hand, the highest (90.9 g) and the lowest (57.7 g) neck weights were obtained from level of 1ppm of salinomycin and from level of 7 ppm of salinomycin, respectively (P<0.05).

DISCUSSION

In this research, generally, body weight, viability, adding of salinomycin in feed declined feed intake and feed efficiency. Various researches obtained similar results (Ferratto et al.1987, Ferratto et al.1988, Laczay et al.1989, Hoshino et al.1992, Bolat et al.1995, Chappel and Babcock 1979). On the other hand, Wheelhouse et al., (1995) added salinomycin (60 ppm) and lasalocid (125 ppm) into feed with low protein and obtained negative effect for body weight.

Viability increased in 3 ppm group, but decreased in 5 ppm group, whereas, no significant differences were determined among salinomycin group and control group for liveability in Lu and Tsai (1988)'s studies.

Table 1. The composition of basal diet

Ingredients (%)	Amount	
	Starter (0-3 Week)	Finisher (4-7 Week)
Yellow Corn	34.8	34.7
Wheat	26.7	30.7
Soybean Meal (46.88 % protein)	27.1	22.7
Fish meal	5.0	4.4
Salt	0.35	0.35
Mineral	0.175	0.175
Vitamin	0.175	0.175
Limestone	1.6	1.6
Vegetable oil	2.0	4.0
Dicalcium phosphate	1.2	1.2
Total	100.0	100.0
Protein	20.09	19.99
M.E. (kcal/kg)	3002.54	3108.31

Table 2. Performance of broilers in control an salinomycin groups

Treatment groups (level, ppm)	Body weight (g)	Viability (%)	Mean feed intake on the last week (g/day)	Feed efficiency
Control (0)	1965.20[a]	80[ab]	157.46 [a]	1.90 [ab]
Salinomycin (1)	1972.50[a]	88 [a]	116.19[b]	1.59 [a]
Salinomycin (3)	1736.00[ab]	96 [a]	134.38 [a]	2.17 [ab]
Salinomycin (5)	1915.27[a]	72 [b]	130.95 [a]	2.14 [ab]
Salinomycin (7)	1523.46[b]	92 [a]	92.29[b]	2.24 [b]
Salinomycin (9)	1440.26[b]	76 [b]	127.00[ab]	2.50[b]

B.W.: Body weight
a,b: Means within columns with no common superscripts are significantly (P<0.05)

Table 3. The weights of carcass parts (g)

Treatment Groups (level, ppm)	Plucked[1]	Carcass[2]	Leg	Wing	Breast	Bag	Ab. fat	Neck
Control (0)	1629.1[a]	1316.9 [a]	399.1 [a]	150.0 [a]	440.0 [a]	300.7 [a]	29.4[ab]	84.2[ab]
Salinomycin (1)	1514.5[a]	1254.5 [a]	374.0 [a]	146.8 [a]	406.4 [a]	285.0 [a]	30.5[a]	90.9[a]
Salinomycin (3)	1411.2[a]	1137.5 [a]	337.9 [a]	138.7 [a]	385.4 [a]	259.2 [a]	23.4[b]	75.9[ab]
Salinomycin (5)	1565.8[a]	1250.0 [a]	367.5 [a]	146.9 [a]	435.0 [a]	274.2 [a]	36.2[a]	73.1[ab]
Salinomycin (7)	1234.6[b]	1027.5[ab]	270.2[b]	120.5[b]	345.0[ab]	260.4 [a]	36.8[a]	57.7[b]
Salinomycin (9)	1188.6[b]	974.5[b]	288.0[ab]	123.2[b]	333.6[b]	215.5[b]	28.8[b]	62.3[b]

1: No eviscerated, 2: Without neck
Ab. Fat: Abdominal Fat
a,b: Means within columns with no common superscripts are significantly (P<0.05)

The best mean feed intake per capita of the last week was obtained from control group and the lowest were obtained from 7 ppm salinomycin group (P<0.05). In a study, Harms et al. (1989) used Cobb x Cobb chickens supplemented with the coccidiostassalinomycin 0, 44, 55, 66, 77 and 88 mg/kg and monensin 81, 101, 121, 141 and 161 mg/kg. In this research, increasing concentrations of coccidiostats decreased feed intake and body weights, indicating that appetite is a major factor in decreased performance. Feed efficiency of birds given diet containing 9 ppm salinomycin was lower than 1ppm group (P<0.05). Harms and Buresh (1987) added amounts of 66, 77 and 88 ppm salinomycin and obtained lower values than control group. While Chappel and Babcock (1979) used salinomycin monensin and lasalocid in their trial, Laczay et. al., (1989) used monensin, salinomycin and narasin. In both two trials the worst results of feed efficiency were obtained from salinomycin groups. But, Ferratto et al. (1989) used salinomycin as well as lasalocid and nicarbosin and the best results for feed efficiency were obtained from salinomycin group. In another study, 60 mg/kg of salinomycin and 100 mg/kg monensin were added into the feed, and better results were obtained from control group (Kiiskien and Anderson 1987). In a study of Lu and Tsai (1989), feed efficiency of salinomycin group was not different from control group.

We concluded that except precaution for coccidiosis, salinomycin mustn't have used more than 1 ppm into the broiler fed.

Energy losses in from metan gass during the protein sentesis in rumen. These loses are prevented by salinomycin and consequently lambs gain weigth. Because of the absence of rumen in poultry, similar affects are not observed.

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