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Original Article

Effects of Dietary Furazolidone on the Performance of Broiler Chicks under Sudan Conditions

[1]Howieda D. Ahmed, [2]Khalid M. Elamin and [3]Khadiga A. Abdel Ati

[1] Department of Animal Nutrition, Ministry of Animal Resources, Khartoum
[2]Department of Animal Breeding, Faculty of Animal Production, University of Gezira, Sudan
[3] Department of Animal Nutrition, Faculty of Animal Production, University of Khartoum, Sudan

*Corresponding author's email: khalid1130@yahoo.com

ABSTRACT

The present study was conducted to assess the effects of Furazolidone incorporation in broiler feeds under Sudan Conditions. A total of 144 one-day old non sexed chicks of Lohmann breed were used. Experimental chicks were distributed randomly into 4 treatments, each with three replicates (36 birds/treatment and 12 birds/pen as replicate).Four diets were formulated to be isocaloric and isonitrogenous, supplemented with graded levels of furazolidone (0,100, 200, 300 mg/kg feed). Traits studied were feed intake (weight gain), body weight and feed conversion ratio. Results revealed that body weight, weight gain, feed consumption and feed conversion ratio were not significantly at ($P \leq 0.05$) affected by different levels of Furazolidone. Final body weights at slaughter age (7 weeks) was in the range of 1592±45.9- 1706±45.9 g. Weekly weight gain was highest in the fifth week (322-391 g/ day). Average weekly feed intake increased with the advance in age and it approach 100 g in the seventh week of age. Total feed conversion ratio was in the range of 2.24±0.05-2.34±0.05.It is concluded that Furazolidone has neither positive nor negative effects on the performance of broiler chicks. It is suggested that this drug can be used in poultry farms were the hygienic and managerial conditions were poor.

Key words: growth promoter, Feed intake, feed conversion ratio

INTRODUCTION

Poultry industry played important role in alleviating animal protein deficiency in the last two decades throughout the world via increased availably of poultry eggs and meat (Pervez et al., 2011). Mumtaz et al. (2000) reported that although man obtained many foods from sea and lands but he have a preference for animal products (meat, milk, egg and fish). Antibiotics and anti-stress are commonly used in poultry (broiler and market of turkey rations) production as feed additives as growth stimulators (Ensminger, 1985). Antibiotics are chemical compounds that are produced by many microorganisms and have the ability to retard the growth or destroy other microbes (Goodman et al 1985). The production of low quality feed lead to many problems in broiler production resulting in poor performance and decreased benefits (Pervez et al., 2011). This could be attributed to many factors as lack of digestive enzymes, insufficient time for digestion, subclinical infections and inadequate processing of feed ingredients (Kemin, 1991). To reach a profitable balance among the cost of feed, broiler performance and product quality, certain feed additive are available in the market for the use in broiler feed (Pervez et al., 2011). These additives may be recommended for either their chemotherapeutic and prophylactic effects or for their growth promoting effects (Pervez et al., 2011).

Furazolidone is a relatively broad spectrum antibacterial drug is widely which used to treat certain bacterial and protozoal diseases in man and animals (Phlillips and Haily 1986, Brander et al 1982). This drug is a member of nitro-furan group that is known to be used as feed additive (bacteriostatic and growth promoter agent) to starter ration of turkey (Czarnecki, 1990).

The objectives of this study were to investigate the effects of furazolidone on the performance of the growing and finishing broilers and its effects on broilers blood chemistry.

MATERIALS AND METHODS

Study location

The experiment was conducted in the premises of the faculty of Animal Production, University of Khartoum. The experiment lasted for seven weeks during which the highest and lowest temperature and

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relative humidity were 35- 24° C and 50-32% respectively.

Experimental House

Birds were confined in open sided house, constructed from cemented brick walls, iron posts and the rest of the house was covered with fine wire netting. The house was divided into 12 pens each of a meter square dimension. A clean wood shaving was provided as bedding. Clean feeder and drinking devices were provided and adjusted according to the growth of the chicks.

Experimental diets

Isocaloric and isonitrogenous diet that met N.R.C. (National Researtch Council 1984) recommended levels of nutrients for broiler chicks as in table 1. This diet was formulated from locally available ingredients (sorghum, groundnut and sesame cake). Furazolidone was added at graded different levels (0, 100, 200 and 300mg/kg feed).

Management and data collection

Feed and water were supplied *ad libitum.* Continues light was provided naturally and artificially. Birds were weighed weekly and weight gain for each bird was calculated. Feed intake and feed conversion ratio were calculated weekly.

Experimental Design and Statistical analysis:

A complete randomized design was used and obtained data were subjected to statistical analysis according to analysis of variance a procedure outlined by Steel and Torie (1980). Duncan's multiple range tests was used to determine levels of significance between treatment means at 0.05 probability.

Table 1. Ingredient composition of the basal diet

Ingredient	Percent
Sorghum	64
Groundnut Meal	17
Sesame Meal	10
Wheat Bran	2
Concentrate[1]	5
Oyster Shell	1.5
Salt	0.25
Vitamins And Minerals[2]	0.25
Determined Analysis	
Dry Matter	95.05
Crude Protein	22.32
Ether Extract	3.00
Crude Fiber	5.48

The calculated nutrients of the basal diet were: crude protein 21.9%, crude fibre 4.45, ME (Kcal/kg) 3081, calcium 0.9,and phosphorus 0.9%. [1]Concentrate : CP 38%, C F 2%, Ca 12, P 7%. [2]Vitamins and minerals per mix Kg of feed : Ultra vit. Premix Vit A 8000 I.U., vit. D3 1400 I.U., Vit. E 2 I.U., Vit. K3 2 mg, Vit. B2 4 mg, Vit. B1 2 mg, Ca-d-pantothenic 5 mg, Nicotinamide 15 mg, choline chloride 100 mg, Vit. B12 5 mg, iorn 22 mg, manganes 33 mg, copper 2.2 mg, cobalt 0.5 mg, zinc 52mg, and iodine 1.1 mg.

RESULTS AND DISCUSSION

Tables 2, 3 and 4 revealed that graded addition of furazolidone in broiler feed did not significantly (at P 0.05) affected body weight, weight and on feed consumption at different ages in broilers. This may be due to good hygiene, proper management and small size of the flock used. The addition of furazolidone to feed seemed to be of less value in these conditions. However, if the drug is used in poultry farm (uncontrolled environment) where there is less hygiene, it may give different response in performance.

Table 2. Effects of Furazolidone on the growth of broiler chicks

Furazolidone (mg/kg feed)	Age Weeks							
	0	1	2	3	4	5	6	7
0	44.0[a]	92.0[a]	203.0[a]	450.0[a]	754.0[a]	1145.0[a]	1419.0[a]	1706.0[a]
100	44.0[a]	87.0[a]	215.0[a]	433.0[a]	748.0[a]	1051.0[a]	1359.0[a]	1612.0[a]
200	44.0[a]	86.0[a]	192.0[a]	420.0[a]	731.0[a]	1054.0[a]	1304.0[a]	1592.0[a]
300	43.0[a]	90.0[a]	212.0[a]	457.0[a]	787.0[a]	1126.0[a]	1411.0[a]	1705.0[a]
SE±	0.34	2.4	9.03	60.77	35.7	46.96	52.5	45.9

Table 3. Effects of Furazolidone on weekly weight gain (g/bird) of broiler chicks

Furazolidone (mg/kg feed)	Age Weeks						
	1	2	3	4	5	6	7
0	48.32[a]	114.70[a]	246.77[a]	303.48[a]	391.19[a]	247.34[a]	286.97[a]
100	43.39[a]	127.78[a]	218.53[a]	315.10[a]	322.12[a]	304.70[a]	253.77[a]
200	42.72[a]	106.07[a]	227.74[a]	310.30[a]	323.57[a]	250.82[a]	270.15[a]
300	47.55[a]	121.29[a]	245.90[a]	329.24[a]	339.13[a]	285.44[a]	293.38[a]
SE±	2.49	8.39	11.13	16.63	22.66	39.15	31.20

Table 4. Effects of Furazolidone on weekly feed intake (g/bird) of broiler chicks

Furazolidone (mg/kg feed)	Age Weeks						
	1	2	3	4	5	6	7
0	120.23[a]	226.93[a]	366.53[a]	560.77[a]	664.53[a]	830.37[a]	935.97[a]
100	110.33[a]	210.46[a]	361.20[a]	550.63[a]	648.33[a]	791.83[a]	853.77[a]
200	118.67[a]	208.20[a]	351.03[a]	379.80[a]	650.10[a]	781.70[a]	843.03[a]
300	104.14[a]	236.10[a]	379.80[a]	581.90[a]	704.77[a]	866.43[a]	944.07[a]
SE±	8.56	10.58	14.97	21.58	26.48	29.87	41.19

Means in the same column with the same letter are not significantly different at P 0.05; SE = Standard error of mea

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Table 5. Effects of dietary levels of Furazolidone on the performance of broiler chicks

Traits	Level of Furazolidone (mg/kg feed)				
	0	**100**	**200**	**300**	**SE±**
Total feed intake (g/bird)	3715.40	3527.60	3473.70	3814.20	111.12
Total weight gain (g/bird)	1662.50	1568.80	1548.10	1662.00	45.8
Total feed Conversion efficiency	2.24	2.25	2.25	2.34	0.05

Means in the same column with the same letter are not significantly different at P 0.05; SE = Standard error of means.

These results were in line with those reported by Moreover, Act et al. (1989) who found no significant effects on broiler growth due to the addition of furazolidone.

Body weight at the end of the first, third, fifth and seventh weeks were in the range of 86.0 – 92.0, 420.0- 457.7, 1051.0- 1145.0 and 1592.0- 1706.0 g respectively (Table 2). Final body weight is more or less similar to that obtained by El-Hussieny et al (2008) but lower than that reported by Olugbemi et al (2004) who reported 2550-2720 g.

Weight gain increased at increasing rate till the fourth and fifth weeks (303.48 – 391.19 g) when it reached the peak then began to drop down a little pit in the six and seventh weeks (247.34 – 304.7g) as in Table 3. Feed consumption increased gradually with the increase in age (from 104 -120 g in the first week to 935 – 953 g in the seventh week) as in Table 4.

Table 5 showed total feed intake, total weight gain and total feed conversion ratio. Results obtained in this study were 3473.70 – 3814.20, 1548.10-1662.50, and 2,24- 2,34 for the three traits respectively. Average Feed intake in a whole experimental period (five weeks) done by Khan et al (2011) was found to be 3178-3225 g. This intake is higher than feed intake for five weeks in this experiment (1883.64g). Total weight gain in this study was in accordance to El-Husseiny et al (2008) who found 1550-1604 but lower than that reported by Olugbemi et al (2004) who found 1680 - 1920g. While total feed intake and total feed conversion ratio were higher than results obtained by El-Hosseiny et al (2008) who reported 3003-3116 and 1.85-2.02 for the traits respectively but lower than results found by Olugbemi et al (2004).

CONCLUSION

It is concluded that Furazolidone has neither positive nor negative effects on the performance of broiler chicks. It is suggested that this drug can be used in poultry farms were the hygienic and managerial conditions were poor.

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