

PERFORMANCE OF BROILER CHICKENS FED DIETS CONTAINING NICARBAZIN, ROXARSONE AND BACITRACIN

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Story in Brief

A floor pen study was conducted to establish the efficacy of nicarbazin in combination with bacitracin and roxarsone. Addition of bacitracin to the diet of birds fed nicarbazin improved weight gain. Neither feed efficiency nor mortality was affected by the drug combinations. Males gained up to 21% more weight than females fed a similar diet, and showed a greater response to the nicarbazin-bacitracin combination.

(Key Words: Nicarbazin, Bacitracin, Roxarsone, Gain)

Introduction

Coccidiostats and other antibiotics are commonly used in poultry diets and are credited with increases in growth and feed efficiency. It is well known however, that certain anticoccidial agents will depress growth when used in the diet of healthy chicks (Damron et al., 1977). Conversely, one drug may augment the growth promoting properties of another when used at the correct concentration.

Nicarbazin is a coccidiostat which has not proved to be the drug of choice when broilers are exposed to heat stress (McDougald and McQuinston, 1980). This is because of the apparent interaction which exist between this drug and environmental temperature, resulting in increased mortality in nicarbazin fed heat stressed birds. The arsenical compound roxarsone, and the antibiotic bacitracin, have demonstrated no adverse effects when fed separately.

This present study was designed to evaluate the performance of nicarbazin under cool fall conditions when fed separately or in combination with roxarsone and bacitracin.

Materials and Methods

A floor pen house with twenty-four pens of 84 ft.² each was used in this experiment. The house was of conventional construction with a metal roof and had no insulation. Sixty day-old broiler chicks (30 males and 30 females) of a commercial strain, were randomly assigned to each pen. Each treatment was replicated six times throughout the house so as to provide equal environmental exposure.

Feed (Table 1) and water was supplied ad libitum throughout the experiment. Basal diet was formulated to meet or exceed nutrient requirements (Table 2) suggested by the National Research Council. Birds were fed a starter diet for the first 21 days and then placed on a finisher diet until day 41. For the last five days of the experiment

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Table 1. Experimental diets.

Ingredient	Starter (%)	Finisher (%)	Withdrawal (%)
Ground Corn	54.80	57.83	57.83
Soybean meal	38.00	35.00	35.00
Alfalfa meal	3.00	3.00	3.00
Dicalcium phos.	2.35	2.35	2.35
Calcium carbonate	.90	.90	.90
Salt	.40	.40	.40
Vitamin mix	.30	.30	.30
Trace minerals	.10	.10	.10
DL-Methionine	.15	0	0

Table 2. Calculated analysis of experimental diets.

Nutrient	Starter	Finisher	Withdrawal
ME (Kcal/Kg)	2729.68	2762.58	2762.58
Protein (%)	22.13	21.01	21.01
Fat (%)	2.44	2.54	2.54
Fiber (%)	4.70	4.55	4.55
Calcium (%)	1.06	1.05	1.05
Phos., Available(%)	.60	.60	.60
Sodium (%)	.18	.18	.18
Lysine (%)	1.27	1.19	1.19
Methionine (%)	.50	.40	.40
Met. + Cystine (%)	.81	.72	.72

birds were provided with a withdrawal diet from which the appropriate drugs had been removed. Supplemental heating was provided for the first 14 days, while lighting was supplied for the duration of the experiment.

The experimental regimens consisted of nicarbazin, bacitracin and roxarsone as outlined in (Table 3). Drug premixes were mixed with the starter and finisher diets to provide the required concentrations. Feed consumption was recorded throughout the experiment. At the end of the trial, body weights were recorded and feed efficiency and mortality calculated.

Results and Discussion

Body weight, feed efficiency, and percent mortality at forty-six days of age are presented in (Table 4). Addition of bacitracin to the diets of birds fed nicarbazin produced significantly greater ($P < .05$) gains than when nicarbazin was fed alone or in combination with roxarsone. The combination of nicarbazin, roxarsone and bacitracin did

Table 3. Experimental treatments.

Treatment No.	Nicarbazin (ppm)	Bacitracin (g/ton)	Roxarsone (ppm)
1	125	0	0
2	125	0	34.1
3	125	50	0
4	125	50	34.1

Table 4. Effects of different levels of bacitracin and roxarsone on birds fed nicarbazin (125 ppm).

Treatment No.	Body Weight (g)	Feed Efficiency	Mortality (%)
1	1702 ^b	2.36	1.1
2	1717 ^b	2.36	3.0
3	1761 ^a	2.38	3.0
4	1728 ^{ab}	2.32	4.1

^{ab}Means in columns with unlike superscripts differ ($P < .05$)

not improve on the weight achieved by nicarbazin alone. Neither feed efficiency nor percent mortality of nicarbazin-fed birds was impacted by the addition of bacitracin or roxarsone.

Examination of the body weights of the male and female birds independently (Table 5), revealed that males gained 19-21% more on individual treatments. The gain response to feed additions in both males and females was more pronounced in birds receiving nicarbazin and bacitracin only.

Nicarbazin is an effective drug against coccidia. The detrimental effects of this drug when used under heat stress conditions has been documented (Sammelwitz, 1965). It is important however, to consider the

Table 5. Body weights of male and female broiler chickens fed nicarbazin, bacitracin and roxarsone.

Treatment No.	Body Weight (g)	
	Males	Females
1	1847 ^b	1557
2	1873 ^b	1558
3	1932 ^a	1590
4	1872 ^b	1583

^{ab}Means in columns with unlike superscripts differ ($P < .05$)

many situations under which this drug can be used. This experiment was conducted during October and November when the mean daily temperature was approximately 70° F. The results indicate the addition of bacitracin and roxarsone to the diet of nicarbazine-fed broiler chickens is not detrimental to growth and performance under these climatic conditions. Furthermore, bacitracin at 50 grams/ton, improves the forty-six day weight of nicarbazine fed birds. Neither bacitracin nor roxarsone exacerbated the effects of nicarbazine with regards to mortality.

Literature Cited

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