

EVALUATION OF NARASIN AND ROXARSONE AS GROWTH STIMULANTS IN HEAT STRESSED BROILERS

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Story in Brief

A trial was conducted to determine the response of heat stressed broiler chickens fed diets supplemented with narasin and roxarsone. Incorporation of either drugs into the diet did not significantly affect weight gain or feed utilization. The presence of both chemicals however, appeared to be beneficial in improving the survival of broiler chickens under the adverse heat stress conditions.

(Key words: Narasin, Roxarsone, Heat Stress, Broilers, Survival)

Introduction

Narasin, a polyether antibiotic, has been shown to be an effective anticoccidial agent when administered to poultry (Ruff et al., 1979). It has been determined that heat stressed birds excrete large amounts of potassium compared to their thermoneutral counterparts (Smith and Teeter, 1986). Narasin apparently transports monovalent ions such as Na⁺ and K⁺ and therefore may be expected to positively influence the growth of heat stressed birds. Roxarsone is an organic arsenical compound often used in broiler diets at up to 50 mg per kg alone or in combination with a number of antibiotics or coccidiostats. Its use in the diet of broilers reared under thermoneutral conditions has resulted in substantial saving by improving production. The efficacy of roxarsone in the field may be due to its anticoccidial activity, and therefore any such effect may be eliminated when birds are grown in batteries.

When birds are subjected to heat stress, a number of physiological changes take place. Management under these conditions must therefore reflect these changes and producers are constantly searching for new ways to improve performance. Response of battery-reared heat stressed birds could be an indicator of the growth-promoting aspects of ionophores or arsenicals under these conditions.

The purpose of this study was to evaluate the effect of narasin and roxarsone on the production performance of heat stressed broilers.

Materials and Methods

Chicks of a commercial broiler strain (Arbor Acre X Vantrass) were obtained from a local hatchery and reared under floor pen conditions for the first three weeks of life. At 4 weeks of age 288 male chicks were randomly assigned to three treatments within an environmental chamber.

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Ambient temperature in the chamber was allowed to fluctuate between 80 and 98°F over a 24-hour period in order to simulate a normal summer day.

Basal diet (Table 1) for the 21-day growth study was calculated to satisfy nutrient requirements suggested by the National Research Council. A quantity of basal diet sufficient to prepare all test diets was prepared and divided into aliquots. Each aliquot was then supplemented with the designated premix containing appropriate amounts of narasin (11.3% activity) or roxarsone (9.92% activity).

Experimental treatments consisted of narasin fed at 80 mg per kg of diet, roxarsone fed at 16.5 mg per kg of diet, and the basal diet with no additive. Feed and water consumption was monitored constantly. At the end of the 21-day trial, all birds were weighed and body weight gain, average feed consumption, feed efficiency and average water consumption calculated.

Results and Discussion

The addition of narasin and roxarsone to the diets of battery-reared broiler chickens subjected to heat stress did not impact live weight gain (Table 2). Feed utilization was not affected by drug supplementation.

Table 1. Composition of basal diet.

| Ingredient | % |
|-------------------|--------|
| Ground Corn | 56.8 |
| Soybean Meal | 36.0 |
| Fat | 3.0 |
| Dical. Phosphate | 2.35 |
| Calcium Carbonate | .90 |
| Salt | .50 |
| Vitamin Mix | .25 |
| Trace Mineral | .10 |
| DL-Methionine | .10 |
| Total | 100.00 |

Table 2. Body weight gain, feed consumption and feed efficiency of heat stressed birds fed narasin and roxarsone.

| | Gain (g/day) | Feed (g/day) | Gain Feed |
|-----------|-----------------|-----------------|--------------|
| Control | 35.2 | 102.1 | .35 |
| Narasin | 36.9 | 106.6 | .35 |
| Roxarsone | 36.1 | 102.1 | .35 |

Table 3. Water consumption and survival of heat stressed birds fed narasin and roxarsone.

| | Water Consumption (g/day) | Survival (%) |
|-----------|------------------------------|--------------------|
| Control | 254 ^b | 72.9 ^b |
| Narasin | 333 ^a | 81.1 ^{ab} |
| Roxarsone | 325 ^{ab} | 83.2 ^a |

^{ab}Means in columns with unlike superscripts differ ($P < .1$).

Results of this study demonstrate that the use of 80 mg per kg narasin or 16.5 mg/kg roxarsone has no adverse effect on body weight gain or feed efficiency of heat stressed broilers. The presence of both these chemicals appeared to be beneficial in improving the survival of broiler chickens under such adverse conditions.

Incorporation of narasin into the diet resulted in a significant ($P < .10$) increase in both consumption (Table 3). Examination of mortality figures indicates that the use of roxarsone enhanced ($P < .10$) the survival of these birds.

Literature Cited

- Ruff, M.D. et al., 1979. Anticoccidial activity of narasin in battery raised broiler chickens.
- Smith, M.O. and R.G. Teeter. 1986. High ambient temperature stress effects on acid-base balance and potassium requirements of broilers. Poultry Sci. 65(Suppl.1):194.