

EVALUATION OF THREE DIFFERENT TYPES OF ANTIBIOTICS IN SWINE STARTER DIETS

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The use of antibiotics in commercial swine feeds is a standard practice today. The appropriate use of certain antibiotics or drug combinations in pig diets is clearly beneficial for rate of weight gain and feed conversion. There are many commercial products in the market that claim an improvement in performance, that ranges from 5 to 30% in average daily gains and from 1.9 to 15% in feed efficiencies.

Some antibiotics and drug combinations are recommended just for starting and growing, and others only for growing and finishing. The variation in type of antibiotics used in these experiments as well as the wide differences in the results, usually confuse the producer. Who has to choose the one that produce the best biological and economical results in swine starter diets. For this reason the objective of the present study was to evaluate different antibiotics and drug combinations used in Costa Rica in swine starter diets.

A total of 480 crossbred pigs with an average weight of 6.5 kg were divided in four groups according to weight, (small, medium and large) in 24 pens of 20 pigs each. Four dietary treatments were evaluated A- Control (without antibiotics) B- Combination of Lincomycin and Spectinomycin C- Carbadox and D- Combination of Chlortetracycline, Sulfamethazine and Procaine Penicillin. The experiment lasted for 28 days, and feed and water were supplied *ad-libitum*.

A digestion trial was conducted by the indicator method. Chromium oxide was used as the indicator at a level of 0,25% of the basal diet. It was mechanically mixed into the diet and was self-fed to the pigs for the last fourteen days of the experiment. Grab feed and fecal samples were collected twice daily during the last 5 days of the trial. The chromium oxide analysis of the feed and feces were made by the method of Christian and Coup (1954). Protein and dry matter were analyzed according to A O A C (1970) methods.

Experimental diets contained 18% crude protein and 1.1% lysine. Corn was used as energy source and soybean meal as protein source. Vitamins and minerals were supplemented to meet NRC requirements and the antibiotics were added according to the manufacture recommendations.

Performance and digestibility data were subjected to analysis of variance, using a 4 x 3 x 2 factorial design.

There were no significant difference in average daily feed intake between treatments. Pigs fed the Carbadox diet consumed the greatest amount of feed (279 gr/day), while the control group had the lowest feed intake (261 gr/day). Feed intake for B and D treatments were 275 and 267 gr/day, respectively.

Daily gain was significantly affected by dietary treatment. Pigs fed the antibiotic diets gained weight significantly ($P < 0.05$) faster than pigs fed the control diet (108 gr/day). Growth response tended to maximize with the combination of Lincomycin plus Spectinomycin diet, followed by the Carbadox and the combination of Chlortetracycline + Sulfamethazine + Procaine Penicillin diet. Daily gains were 152, 145 and 129 gr/day, respectively.

The amount of feed required per unit of weight was significantly affected by dietary group. Feed efficiency was significantly poorer for pigs fed the control diet (2.49) than when compared to the efficiency of pigs fed the antibiotic diets. There were no significant differences in feed efficiency between antibiotic diets. However, pigs fed treatment B required less feed per kg of gain than the other two groups. Feed efficiency was 1.83, 1.91 and 2.20 for B, C and D treatments, respectively.

There were no significant differences in percentage of mortality between dietary treatments. Pigs fed the Carbadox diet, obtained the highest (5.18%) percentage of mortality, while the combination of Lincomycin plus Spectinomycin had the lowest mortality (2.96%). Percentage of mortality for the control and the combination of Chlortetracycline + Sulfamethazine + Procaine Penicillin groups was 3,7 and 4,44% respectively.

There were no significant differences between size of animals. However, the small pigs performed better than the medium and large pigs in the antibiotic treatments. Daily gains for the small, medium and large pigs were 144, 130 and 126 gr/day and feed efficiencies were 1,85, 2,17 and 2,31 respectively.

Percentage of mortality was lower for the big pigs, followed by the medium and small pigs. However, there were no significant differences between size groups.

Dry matter and crude protein digestibility was affected by dietary treatment. Pig fed the diet without antibiotics obtained the lowest ($P < 0.05$) dry matter and crude protein digestibility. No significant effect on digestibility parameters were found between pigs fed the diets with antibiotics.

Dry matter digestibility was 86,35, 91,32, 88,29 and 88,50% and the crude protein digestibility was 83,60, 88,25, 87,25 and 86,25 for A, B, C, and D treatments, respectively.

CONCLUSIONS

Based on the performance and digestibility data the combination of Lincomycin plus Spectinomycin was the antibiotic that produced the best results. The inclusion of antibiotics in starter diets produces an improvement in daily gain and feed conversion.

Selected references

A.O.A.C. Official Methods of Analysis 1970. Association of Official Agricultural Chemistry. Washington, D.C.; Christian, K. R. and M. R. Coup. 1954. J. Sci. Tech. 36:328