

# Evaluation of Salinomycin (Biocox®) effects on pig performance

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## ABSTRACT

The aim of the present studies was to evaluate the effects of salinomycin (Biocox®) on the piglet and growing-fattening pig performance. Forty-eight piglets and 40 growing pigs were used. Biocox® was included in the piglet feed at a level of 60 ppm and the observation period lasted for 35 days. In the feed for growing pigs Biocox® was included at 60 ppm during the first 14 days and at 30 ppm thereafter until the 71th day. The dietary antimicrobial supplements significantly improved the pig daily mean weight gain and feed conversion ratio.

KEY WORDS: salinomycin, piglets, growing-fattening pigs, performance

## INTRODUCTION

In animal production small dosages of antimicrobials in the feed have generally been recognized as good growth and health promotants (Cromwell, 1991). Salinomycin, a polyether antibiotic, has been shown to possess activity against Gram-positive bacteria and coccidial infestation (Miyazaki et al., 1974) and appears to alter the composition and/or the metabolism of gastrointestinal microflora in pig (Moore et al., 1986). Indeed, salinomycin has often been tested in pig as a feed additive (Lindemann et al., 1983; Moore et al., 1986; Kobayashi et al., 1989; Thacker et al., 1992). The aim of the present study was to evaluate the effects of salinomycin (Biocox®) on the young pig and the growing-finishing pig performance.

## MATERIAL AND METHODS

*Experiment 1*

Forty-eight weaned Large-White x Landrace x Piétrain castrated male piglets ( $7.9 \pm 0.88$  kg) were used. They were allocated into two equal groups (A and B), housed in cages in sub-groups of 3 animals each in an environmentally-controlled room and fed for 35 days a basal diet (group A) or this diet supplemented with 60 ppm of Biocox<sup>®</sup> (group B). The feed was distributed *ad libitum* in a mash form. The basal diet composition is presented in Table 1. The measured inclusion level of salinomycin was 68.1 ppm for diet B. Piglets were weighed individually at weekly intervals and cage feed intakes were recorded. Zootechnical performances were evaluated regularly during the observation period and the animals' health status was controlled daily.

*Experiment 2*

Forty Large-White x Landrace x Piétrain castrated male growing pigs ( $30.6 \pm 2.16$  kg) were used. The observation period lasted for 71 days. The animals were allocated into two equal groups (C and D), housed in floor-pen cages in sub-groups of 4 animals each in an environmentally-controlled room and fed for 14 days a basal diet (group C) or this diet supplemented with 60 ppm of Biocox<sup>®</sup> (group D). For the rest of the experiment the animals belonging to group C remained under the same dietary treatment whilst in group D the inclusion level of Biocox<sup>®</sup> was reduced to 30 ppm (D1). The basal diet composition is presented in Table 1. The observed feed inclusion levels (ppm) of the antimicrobial were 69.8 (D) and 33.3

TABLE I

Percentage composition of the basal diets, A and C

Ingredients	A <sup>1</sup>	C <sup>2</sup>
Maize	—	30
Wheat	44	20.4
Soyabean meal	25	21
Barley	21.7	5
Wheat bran	2	20
Soyabean oil	1	—
Minerals, vitamins and aa	5.3	3.6

<sup>1</sup> crude protein content = 20.9%; Lys = 1.13%, Met + Cys = 0.71%; Ca = 1.03%; P = 0.66%; estimated digestible energy = 3,520 kcal / kg

<sup>2</sup> crude protein content = 15%; Lys = 0.95%, Met + Cys = 0.61%; Ca = 0.93%; P = 0.64 %; estimated digestible energy = 3,215 kcal / kg.

(D1). The feed was distributed *ad libitum* in a mash form. Zootechnical performances were evaluated regularly during the 71 days of trial duration and the animals' health status was controlled daily.

## RESULTS

### Experiment 1

No symptoms of sub-clinical or clinical disease were observed during the experiment. In the present evaluation the performances of the control group were particularly high (Table 2). Nevertheless, the supplemented group had a significantly better daily mean gain (DMG) and feed conversion ratio (FCR) (Table 2). For the 35 days of observation these parameters were increased by 13 and decreased by 10 percentage units respectively.

TABLE 2  
Effects of salinomycin (Biocox<sup>®</sup>) dietary supplementation on the swine daily mean gain (DMG) (g) and feed conversion ratio (FCR) (kg/kg). A - basal diet, B - diet A supplemented with 60 ppm of Biocox<sup>®</sup>, C - basal diet, D/D1 - diet C supplemented respectively with 60 and 30 ppm of Biocox<sup>®</sup>

Parameters	Diets	
	A	B
Experiment 1		
DMG, g (D 0 to D 35)	415 ± 65 <sup>a</sup>	467 ± 50 <sup>b</sup>
FCR, kg/kg (D 0 to D 35)	1.84 ± 0.26 <sup>a</sup>	1.65 ± 0.17 <sup>b</sup>
Experiment 2		
	C	D/D1
DMG, g (D 0 to D 34)	934 ± 77 <sup>c</sup>	1013 ± 72 <sup>d</sup>
« (D 0 to D 71)	942 ± 62 <sup>a</sup>	995 ± 58 <sup>b</sup>
FCR, kg/kg (D 0 to D 34)	2.55 ± 0.20 <sup>a</sup>	2.39 ± 0.20 <sup>b</sup>
« (D 0 to D 71)	2.92 ± 0.20 <sup>a</sup>	2.78 ± 0.09 <sup>b</sup>

a, b, c - in the same row values with different superscript letters are statistically different:

a, b P < 0.05; c, d P < 0.01

### Experiment 2

The pig performances observed in this trial were also particularly good (Table 2). Biocox<sup>®</sup> significantly increased the DMG; the magnitude of the effect was slightly greater during the first half compared to the second half of the trial. The FCR of the supplemented animals was also significantly improved in both halves of the trial. No symptoms of sub-clinical or clinical disease were observed during the experiment in any of the animals.

## DISCUSSION

Nutritional responses of pigs to antibacterials in the diet are clearly sensitive to environmental influences (Rosen, 1995). The percentage improvements are virtually doubled in «field» tests *versus* those performed in research stations (Cromwell, 1991). However, the quantitative contributions to this differential of a wide range of very different variables still remain to be determined: «rigor» of the protocol application, level of performance, range of liveweight and duration of feeding, proportion of discontinuous feeding levels, stocking density, health status, etc.

In the present experiments the performance of the control groups were particularly high. Nevertheless, Biocox® dietary supplements significantly improved the piglet and the growing-fattening pig DMG and FCR under very well controlled environmental conditions.

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