

# Removal of Sub-Therapeutic Antibiotics from Nursery Pigs Diets: Influence on Behavior, Performance and Physiology

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### Summary and Implications

The objective of this study was to determine the effects on pig behavior, performance and physiology of removing sub-therapeutic antibiotics from diets provided to nursery pigs. Including additional fat instead of the traditional antibiotics made the feed more palatable therefore; the treatment group (without antibiotic rations) visited the feeder more quickly and had an improved Feed-to-Gain ratio (F: G) than the control (pigs provided antibiotics) pigs. This study determined that when using high health status pigs, sub-therapeutic antibiotics may be omitted from the diets.

### Introduction

The use of sub-therapeutic antibiotics in nursery pig feed rations is a widely used practice in the U.S. However, this practice has been limited in other countries throughout the world and its use is being debated in the U.S. The objective of this research was to determine whether sub-therapeutic antibiotics can be removed from the nursery diet without detrimentally affecting the behavior, performance and physiology of the pigs.

### Materials and Methods

Crossbred nursery pigs (n = 224; 17 to 20 d of age) were assigned to pens (4 pigs / pen) in a completely randomized design arrangement of dietary treatments. The dietary treatments consisted of a control group (with antibiotics in ration; carbadox and tiamulin/CTC at approved levels) and a treatment group (without antibiotics

in ration with additional dietary fat [choice white grease] supplemented at a level 50 % more than the control diet). All pigs received 0.36 m<sup>2</sup>/ pig (2 gilts / 2 barrows per pen) and were housed on slatted plastic flooring. Pigs were provided *ad libitum* access to feed in plastic feeders (1.2 m long x .25 m wide x .10 m deep), and water from a nipple waterer during three dietary phases from 6 to 23 kg body weight. Lighting regimes were 9:15 h of a L:D cycle. Behavior acquisition was collected on 60 % of all pens, which was recorded continuously for a 24 h period once feed was placed in the feeders on the first day and then once dietary phases changed. The time (s) required for all pigs in a pen to initially visit the feeder was recorded. A pig was considered to be eating when its head was above the feeder for at least 5 consecutive s. Blood samples were collected from each piglet twice during the 6 wk trial via the jugular vein to evaluate the health of the animals. A Porcine Reproductive Respiratory Syndrome (PRRS) enzyme-linked immunosorbent assay (ELISA) was conducted on 40 % of the blood samples from the pigs. Individual pig weights were collected on day of arrival, each day that diets changed, and at the end of the trial. Respiration rates and rectal temperatures were recorded weekly on one barrow and gilt per pen. SAS Proc Mixed was used to analyze fixed and random effects model.

### Results and Discussion

Treatment pigs visited the feeder more quickly ( $P = 0.004$ ) than control pigs ( $575 \pm 210$  vs.  $1454 \pm 210$  s). Treatment pigs grew faster ( $0.44$  vs.  $0.37 \pm 0.01$  kg / d;  $P < 0.01$ ) and had improved F: G compared to control pigs ( $1.48$  vs.  $1.66 \pm 0.04$  kg/d;  $P = 0.015$ ). There were no treatment differences for total nursery feed intake ( $P > 0.05$ ). There were no treatment differences ( $P > 0.05$ ) in respiration rate or rectal temperature. In conclusion, increasing fat content by 50 % in nursery pig diets may allow removal of feed grade sub-therapeutic antibiotics without adversely affecting behavior, physiology or performance when fed to pigs whose health status is not compromised.