

# Effects of replacing antimicrobials with medium chain fatty acids in nursery pig diets

G.E. Luebcke, A.B. Lerner, and C.K. Jones

Department of Animal Sciences and Industry, Kansas State University, Manhattan

## Introduction

- Carbadox is an antimicrobial commonly used in U.S. swine diets due to its bactericidal properties that improve growth and feed efficiency. Concern has arisen over its potential for antimicrobial resistance. Furthermore, carbadox residues in pork carcasses have proven to be carcinogenic.
- Zinc Oxide (ZnO) has been preventatively used to combat *E. coli* associated diarrhea, while improving growth, feed efficiency, and mortality. However, excess Zn is excreted in manure and can cause environmental pollution. Bacteria have also been shown to adapt to ZnO in the gut.
- Given these concerns, it has become paramount to find products that can serve as a suitable alternative to carbadox and/or ZnO. Medium chain fatty acids (MCFA) have been suggested due to their potential bactericidal and antiviral effects, and ability to improve growth, feed efficiency and mortality in swine. However, there is currently little data available on its efficacy in nursery swine diets.

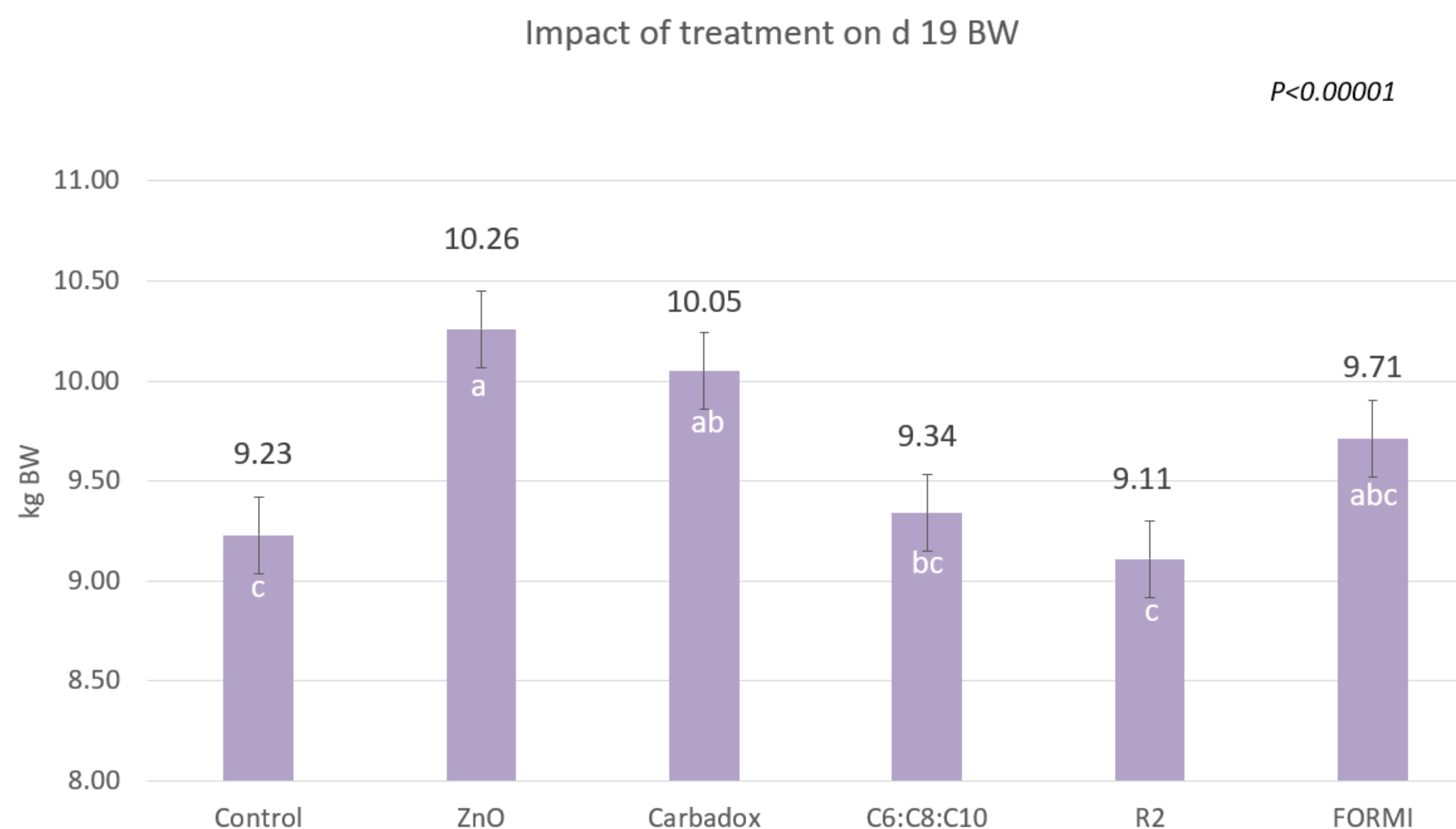
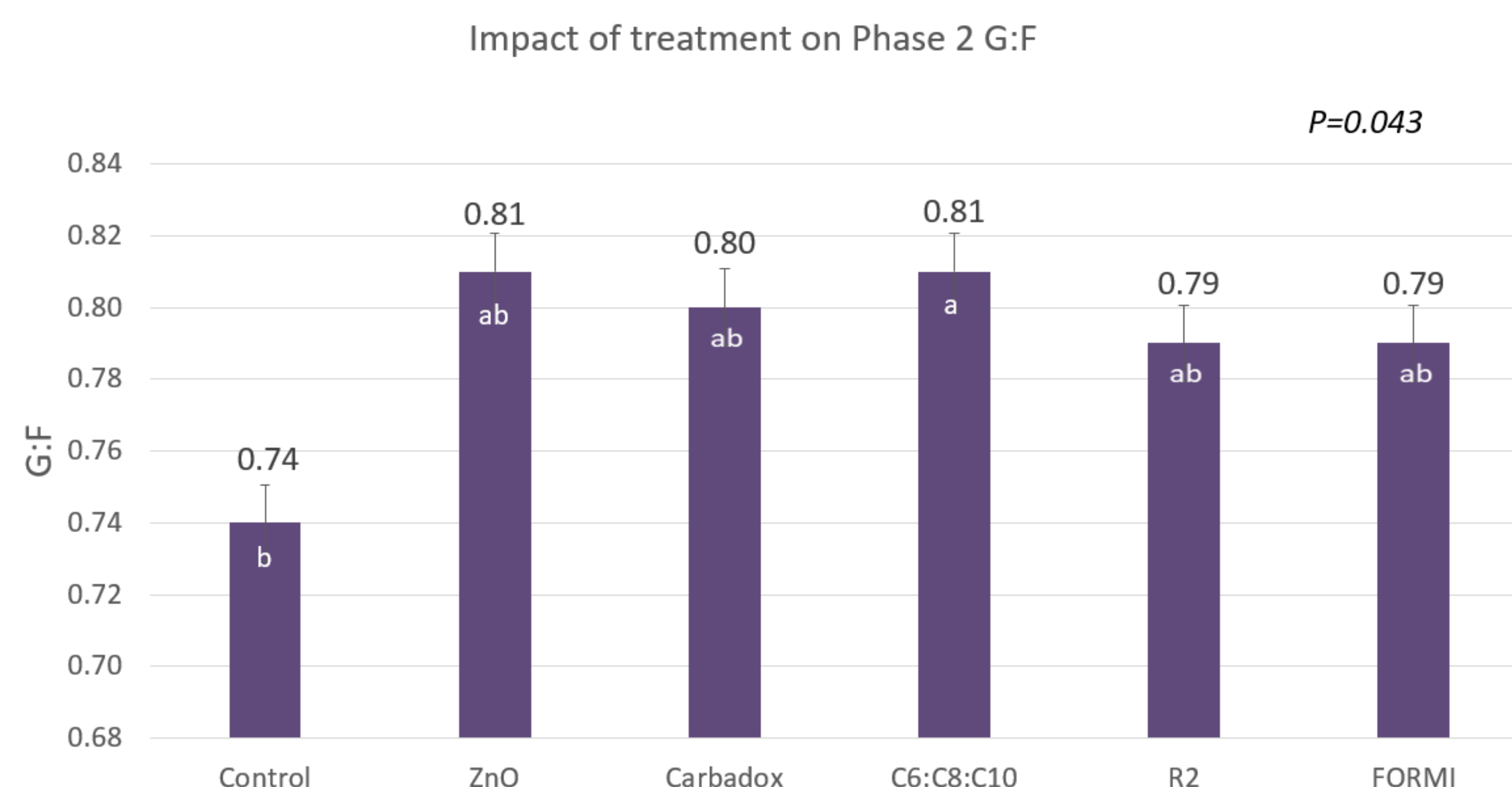
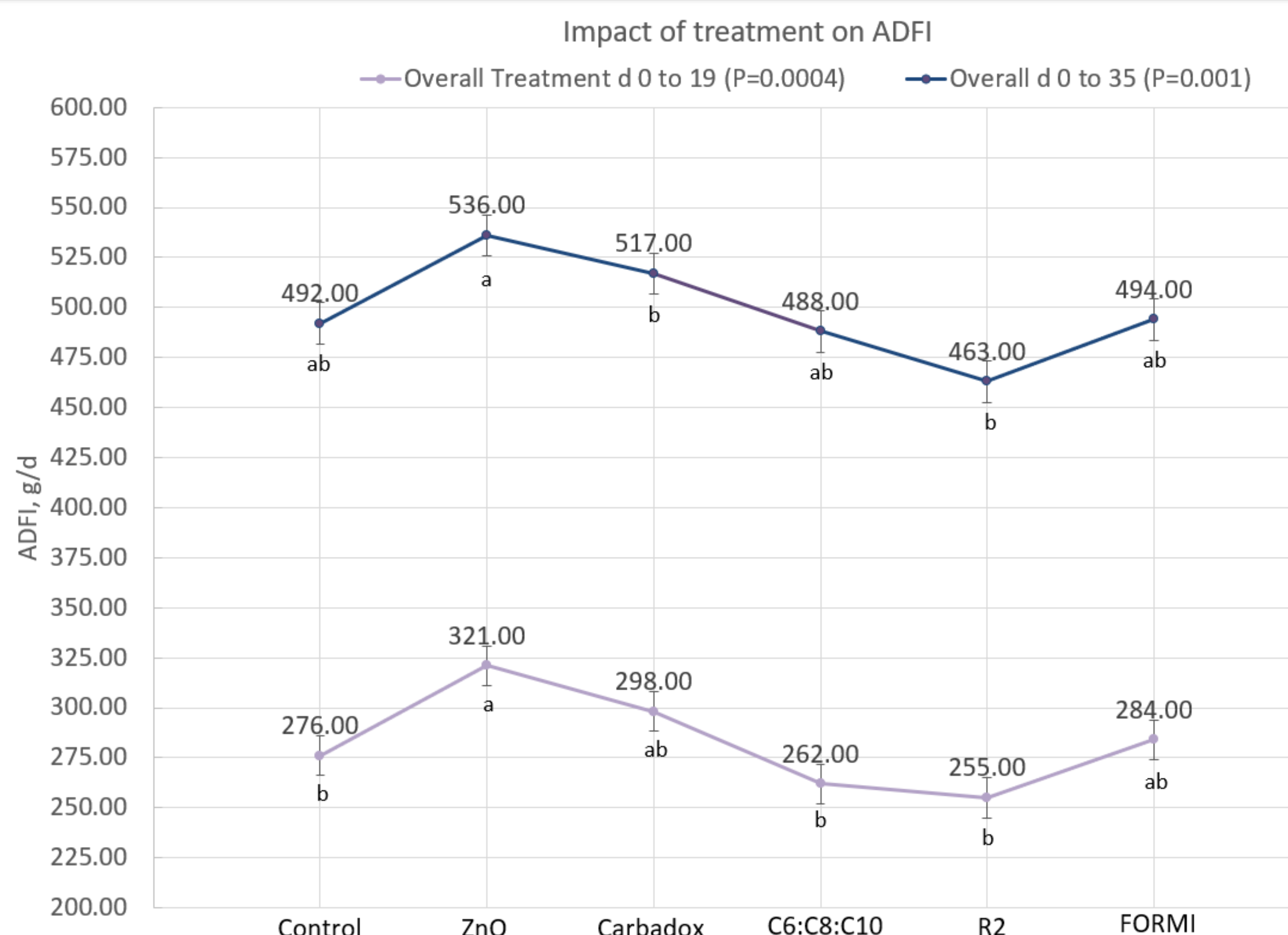
## Objective

- To evaluate MCFA as a potential replacement for carbadox and ZnO in nursery swine diets.

## Materials and Methods

- 360 weanling pigs (DNA 200x400, BW 5.4±0.07 kg) were assigned in a completely randomized experiment with 6 pigs/pen and 10 replicates/treatment.
- Treatment groups included: negative control; 3000 ppm ZnO in phase 1 and 1500 ppm in phase 2; 50g/ton carbadox; 1% C6:C8:C10 blend; 1% Feed Energy R2 (Feed Energy Corp., Des Moines, IA); 1% FORMI GML (ADDCON, Bitterfeld-Wolfen, Germany).
- Diets were fed in phases: Treatment phase 1 from d 0 to 7, treatment phase 2 from d 8 to 19, and common phase 3 from d 20 to 35. Pigs and feeders were weighed weekly to calculate ADFI, G:F, and ADG.
- Data were analyzed using PROC GLIMMIX of SAS (SAS Institute, Cary, NC) with  $\alpha=0.05$ .

## Results



## Conclusions

- For the total treatment period (d 0 to 19), pigs fed ZnO or carbadox had greater ( $P<0.0001$ ) ADG than Control or R2 diets, with FORMI and C6:C8:C10 blend being intermediate.
- During Phase 1, ZnO and carbadox had greater ( $P<0.0001$ ) ADFI than C6:C8:C10 or R2 diets, while FORMI and control diets were intermediate. A palatability issue is the likely culprit for low intake of R2 diets.
- Differences in G:F during Phase 1 were not significant. During Phase 2, pigs fed C6:C8:C10 had greater ( $P=0.043$ ) G:F than those fed control diets, with other diets being intermediate. Overall (d 0 to 35) no significant impact ( $P=0.32$ ) was observed on G:F.
- These data suggest that ZnO and carbadox continue to improve nursery pig performance. Products such as FORMI GML and C6:C8:C10 show results similar to carbadox, while others display variable performance.
- Further research is warranted to evaluate the efficacy and inclusion rate of MCFA products to replace feed-grade antimicrobials.

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