Impact of Medium Chain Fatty Acids products and the replacement of commonly used antibiotics in Swine feed

M.G. Howard, A.B. Lerner, and C.K. Jones

Undergraduate Research, Kansas State University, Manhattan, Kansas

Introduction

- Carbadox and Zinc Oxide (ZnO) are two commonly used antibiotic feed additives in the swine industry today. They are used therapeutically to prevent diarrhea in post-weaning pigs and are known to enhance growth performance and feed efficiency.
- Feed additives such as carbadox and ZnO have adverse effects on human health and the environment as well. There is a response to search for alternative feed additives for disease protection and growth in the industry.
- Medium Chain Fatty Acids (MCFA) can become bactericidal, antiviral, and bacteriostatic because of their ability to bind to membrane proteins of viruses and bacteria and 'leak" contents. This makes MCFA a potential replacement for other feed aditives. There is, however, little research showing their efficacy in improvement of growth performance and disease prevention in swine diets.

Objective

- The objective of this study was to test the effect of common feed additives as antibiotics like ZnO and Carbadox compared to MCFAs on weanling pig growth performance.

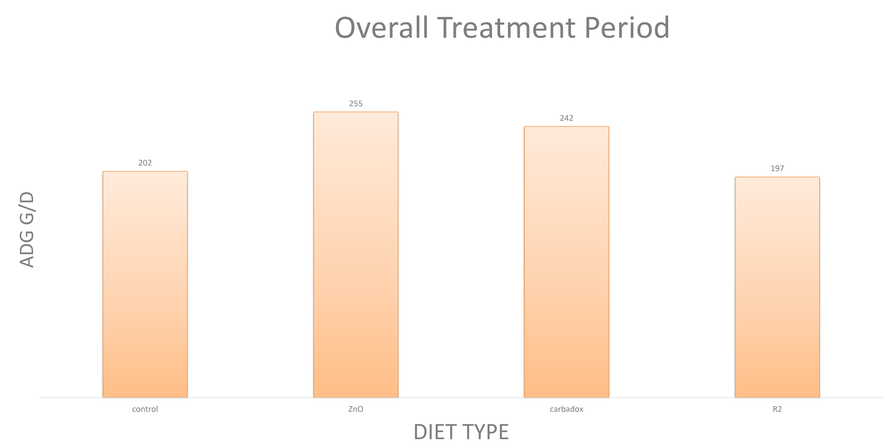
Materials & Methods

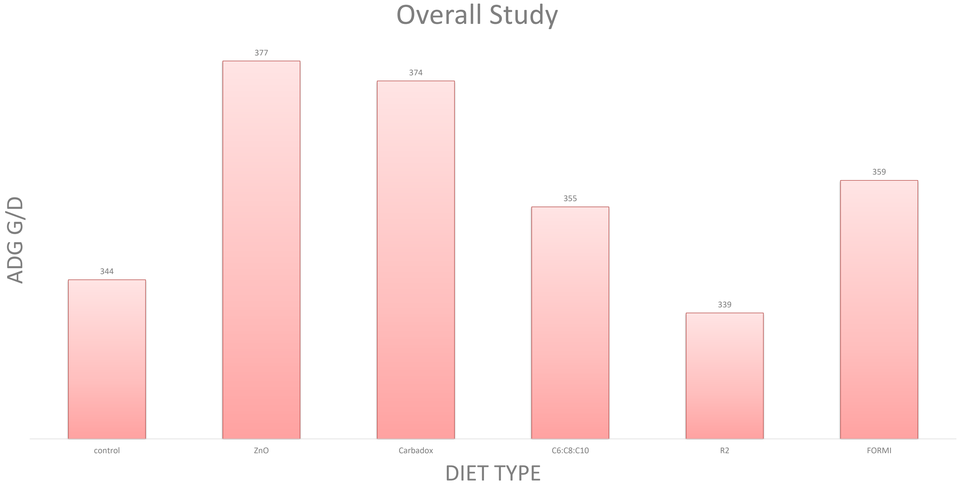
- A total of 360 pigs were used for a 35d growth experiment that were randomly assigned in a grouped completely randomized design.
- A total of 60 pens with approximately 6 pigs per pen were used. There were 10 pens per treatment with the pen as the experimental unit.
- Treatment diets were fed during the first two phases:
  - phase 1 (d0 to 7)
  - phase 2 (d7 to 21)
- A common diet was fed during phase 3 (d21 to 42).

- Pigs were weighed weekly as well as measurements of feed disappearance and fecal scores. Individual treatment diets included:
  1. Control
  2. 3,000 ppm ZnO in phase 1 and 1,500 ppm ZnO in phase 2
  3. 50 g/ton carbadox
  4. 1% blend of C6:C8:C10
  5. 1% Feed Energy R2 (Feed Energy Corp, Des Moines IA)
  6. 1% FORMI GML (ADDCON, Bitterfeld-Wolfen, Germany).

- Statistical analysis was conducted using SAS GLIMMIX for pig growth and a *P* value of *P*> 0.05.

Results





The overall treatment in d0 to 19 showed significantly greater (*P*<0.05) Average Daily Gain (ADG) for ZnO and Carbadox than the control and R2 diets. ZnO, carbadox and FORMI showed similar (*P*>0.05) Average Daily Feed Intake (ADFI) in overall treatment and likely accounted for increased ADG. Carbadox, C6:C8:C10, and FORMI showed similar ADG in overall treatment (*P*>0.05). Overall study (d0 to 35) showed ZnO diet ADG significantly higher than R2 (*P*<0.05). All other diets were similar (*P*>0.05).

Conclusions

- Pigs on ZnO and Carbadox showed growth improvement to those without treatment.
- Some MCFA diets show comparable growth to these leading diets, but more research is necessary to conclude its ability to be a leading competitor for the swine industry.

Acknowledgements

D

Special Thanks to Dr. Mark and Kim Young Undergraduate Research Fund and ADDCON