Effects of medium chain fatty acids in place of zinc oxide and carbadox on nursery pig performance

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Introduction

- Feed-based antibiotics are used to improve nursery pig health and performance
- There are growing regulations and consumer pressure to limit the use of feed-based antibiotics in swine production
- Some commonly used antibiotics used in nursery pig diets are zinc oxide (ZnO) and carbadox
- These antibiotic agents are shown to have some disadvantages such as some antibiotic resistance, carcinogenic components and environmental concerns
- Medium chain fatty acids (MCFA) are thought to be a viable alternative to feed-based antibiotics, yet little information is available on their effectiveness

Objective

- Evaluate the effectiveness of some MCFA products on nursery pig growth performance in place of ZnO and carbadox

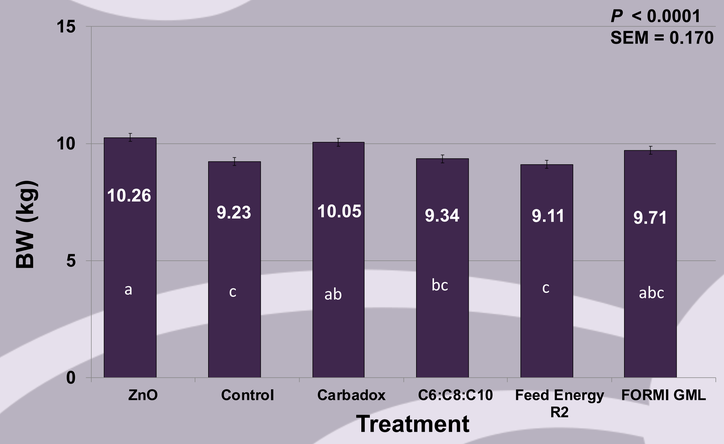
Materials & Methods

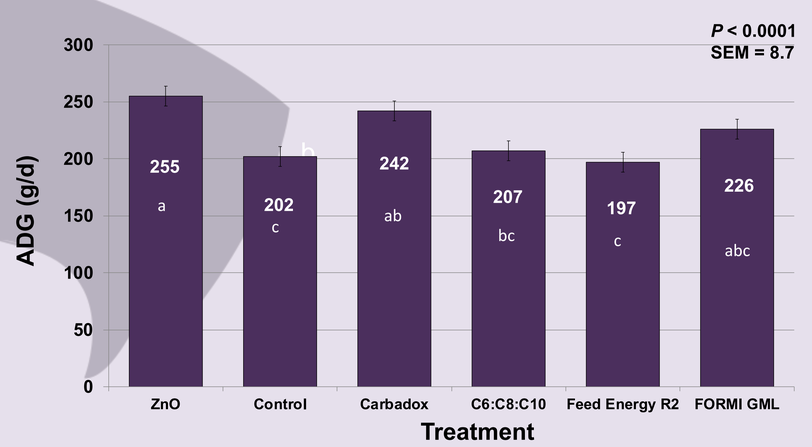
- 360 weanling pigs (DNA 200 X 400, 5.4 ± 0.07 kg BW)
- Fed for 35 d at the K-State Swine Research & Teaching Facility
- 6 pigs allotted to each pen, with 10 replicate pens per treatment
- Pigs placed in pens through a completely randomized design to be fed one of six dietary treatments
- Pigs were fed throughout three dietary phases, with treatment diets being fed from d 0 to d 19 (Phase 1 and Phase 2), and a common Phase 3 diet being fed from d 20 to d 35
- Pigs were weighed individually on a weekly basis to determine average daily gain (ADG)
- Feeders from each pen were weighed weekly to determine average daily feed intake (ADFI)
- Data was analyzed using the PROC GLIMMIX (SAS Version 9.4; Cary, NC)
- Data was considered significant if $P < 0.05$

Treatments

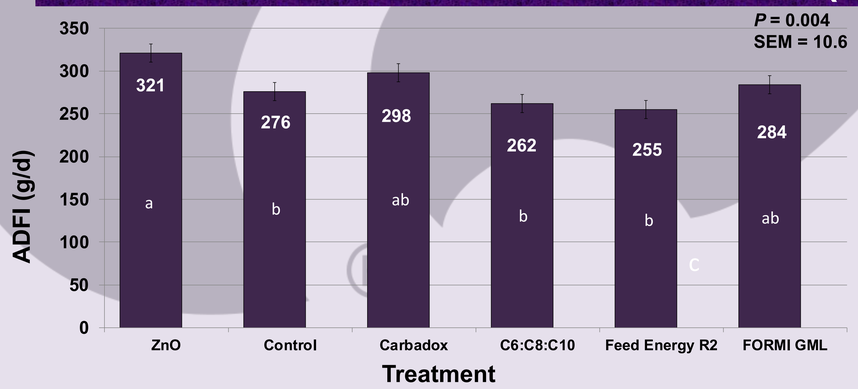
1. ZnO (1,500 ppm P1 & 3,000 ppm P2)
2. Control
3. 50 g/ton carbadox
4. 1% blend C6:C8:C10
5. 1% Feed Energy R2 (Feed Energy Corp; Des Moines
6. 1% FORMI GML (ADDCON, Bitterfeld-Wolfen, Germany)

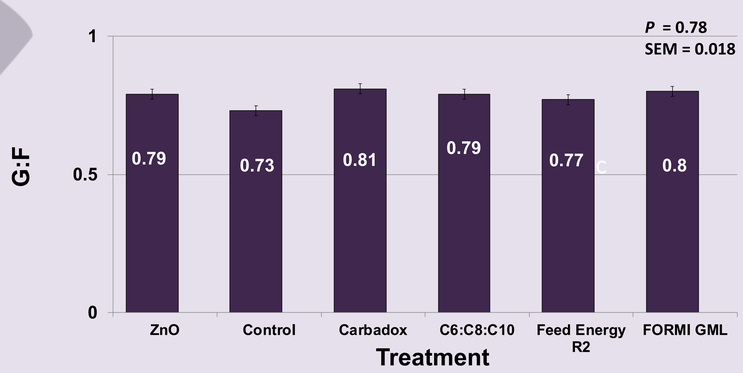
Treatment Period (d 0 to d 19) BW & ADG





Treatment Period (d 0 to d 19) ADFI & G:F





Conclusions

- From d 0 to 19, pigs fed ZnO or carbadox had improved ($P < 0.05$) ADG compared to those fed the control or R2, while other treatments were intermediate
- Pigs fed the C6:C8:C10 blend or FORMI GML had similar ($P > 0.05$) ADG as those fed carbadox, and these effects were driven by differences in ADFI ($P = 0.004$), as G:F differences were marginally significant ($P = 0.078$)
- Increased d 19 BW was observed for pigs fed ZnO and carbadox compared to the control, with other treatments being intermediate
- These results demonstrate that ZnO and carbadox are valuable additives to help maximize growth performance in the early stages of the nursery
- Additional research is warranted to continue evaluating the effectiveness of MCFA products and their ability to replace ZnO or feed-based antibiotics

Acknowledgements

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