Evaluating the efficacy of Medium Chain Fatty Acids as an Antibiotic Replacement for Zinc Oxide and Carbadox in Nursery Pig Diets

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Introduction

- Increased regulatory and consumer pressure on the agricultural industry to limit use of antibiotics in livestock species has forced industry professionals to look for alternative options for nursery pig diets.
- One of these alternatives is the use of Medium Chain Fatty Acids (MCFA).
- With limited research on the efficacy of MCFA diets, this study focused on assessing the ability of MCFAs to replace traditionally used Zinc Oxide (ZnO) and carbadox concentrations in weaned pig diets, while maintaining growth and feed intake.

Objective

- To evaluate the efficacy of MCFAs as an effective alternative for traditionally used antibiotics ZnO and carbadox.

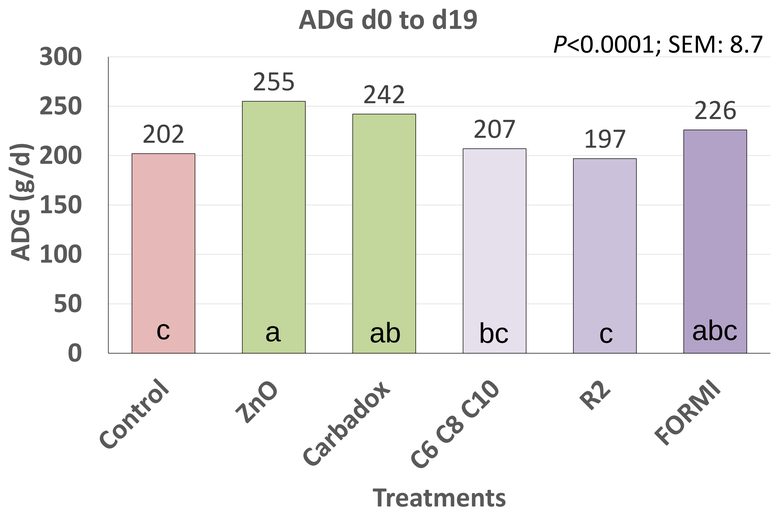
Experimental Design

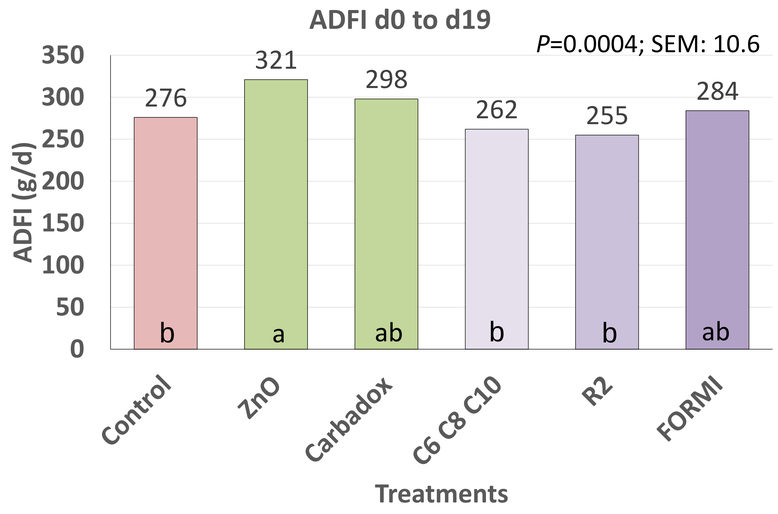
- 360 weaned pigs (DNA 200 x 400; 5.4±kg) were allotted to each experimental unit (pen) and placed on one of six treatment diets.
- Six pigs per pen were used to form total of 10 replicates per treatment in a completely randomized block design.
- Treatments were fed in 3 phases, with phase 1 being d0 to d7, phase 2 being d8 to d 19 and a common phase fed from d 20 to 35.
- Treatments were as follows:
  - **Treatment 1- Control**
  - **Treatment 2- Zinc Oxide**
  - **Treatment 3- 50g/ton carbadox**
  - **Treatment 4- 1% C6:C8:C10**
  - **Treatment 5- 1% Feed Energy R2 (Feed Energy Corp., Des Moines , IA)**
  - **Treatment 6- 1% FORMI GML (ADDCON, Bitterfeld-Wolfen, Germany)**

Materials and Methods

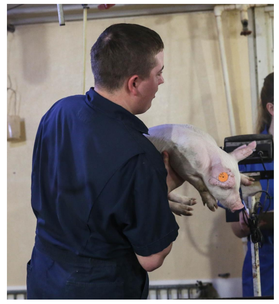
- Individual pig and feeder weights were collected on a weekly basis.
- All data was analyzed using the PROC GLIMMIX procedure of SAS (SAS Inst., Cary, NC).

Results





d0 to d35	Control	ZnO	Carbadox	C6:C8:C10	R2	FORMI	SEM	*P*=
ADG	344^{ab}	377^{a}	374^{ab}	355^{ab}	339^{b}	359^{ab}	8.5	0.0012
ADFI	492^{ab}	536^{a}	517^{a}	488^{ab}	463^{b}	494^{ab}	11.5	0.001
G:F	0.70	0.70	0.72	0.73	0.73	0.73	0.012	0.32



Conclusion

- Pigs that were fed ZnO and carbadox during phase 1 and 2 performed significantly better than those on control and R2 diets for treatment period (d0 to d19) ADG.
- For overall(d0 to D35) study, pigs fed ZnO performed significantly better than those fed R2, with all other diets being intermediate.
- Pigs fed the FORMI diet were not significantly different in their ADG or ADFI from Zno or Carbadox for the treatment (d0 to d19) or overall (d0 to d35) periods.
- G:F did not change significantly regardless of treatment.

Future Directions

- The results of this study warrant further research to be conducted on the effects of MCFA as a replacement for antibiotics in nursery pig diets.

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