

The Ability of Medium Chain Fatty acids (MCFA) to Replace Zinc Oxide (ZnO) and Common Antimicrobials in Nursery Pig Diets



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Introduction

- ZnO and antimicrobials, such as carbadox, maximize pig growth performance, however, there is rising consumer pressure to decrease their use in nursery pig diets.
- ZnO is an environmental pollutant and carbadox residues are carcinogenic
- Studies have shown that MCFA may be able to replace the use of ZnO and carbadox due to their antiviral, bactericidal, and bacteriostatic effects.
- MCFA are known to improve growth, feed efficiency, and mortality. Consumers are requesting further research.

Objective

- To evaluate the use of Medium Chain Fatty Acids in Nursery Pig diets to determine if they can effectively replace ZnO and common antimicrobials in Nursery Pig Diets.

Materials and Methods

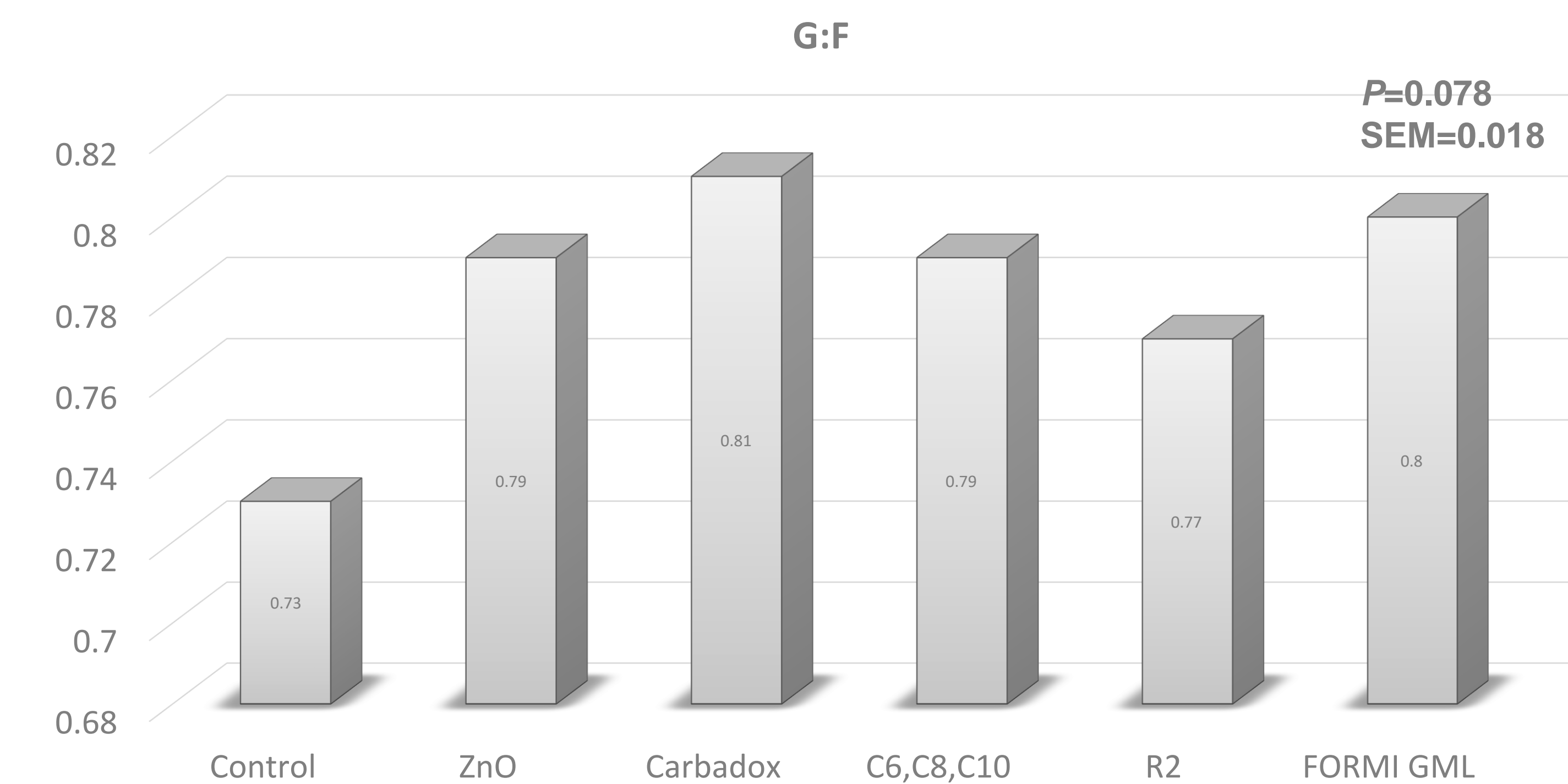
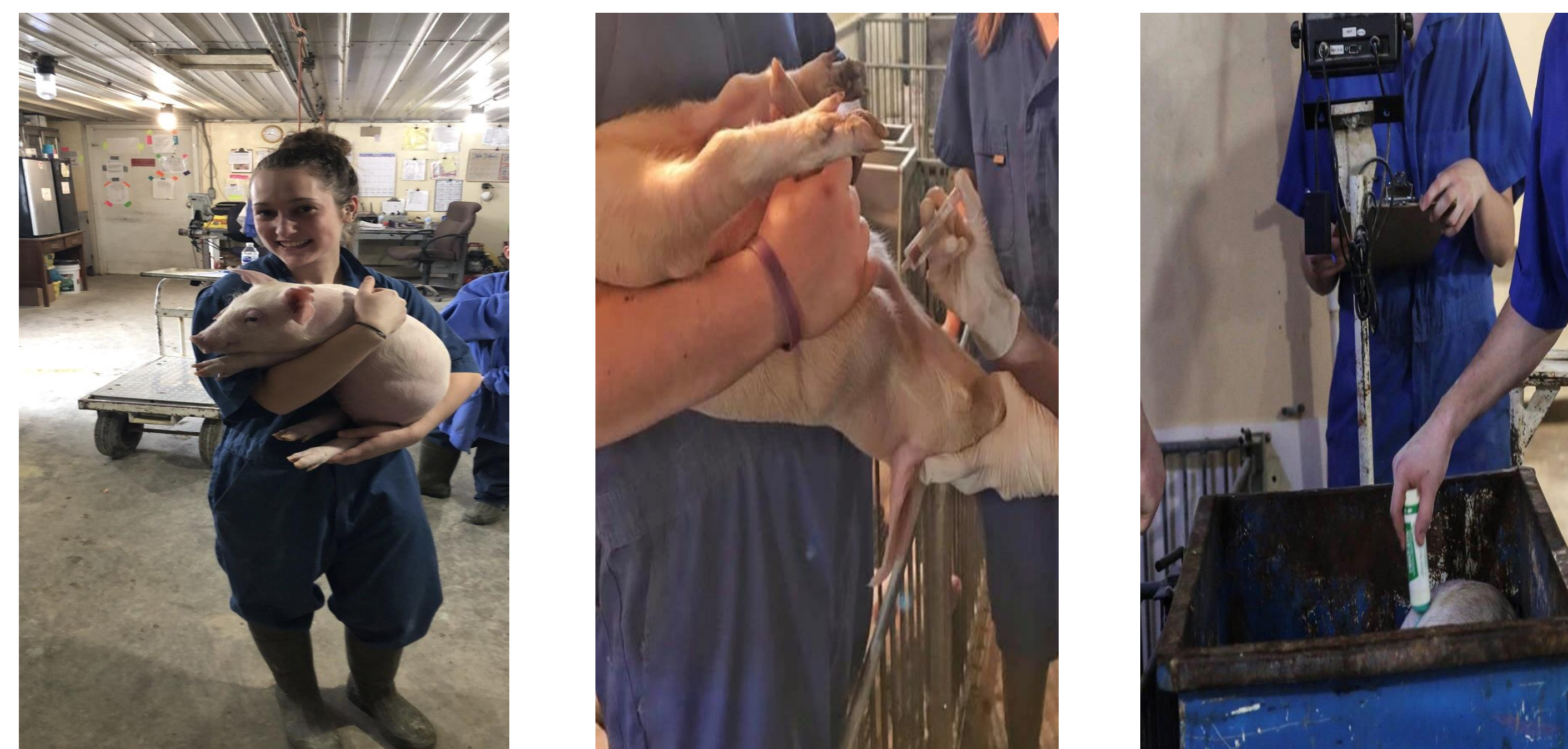
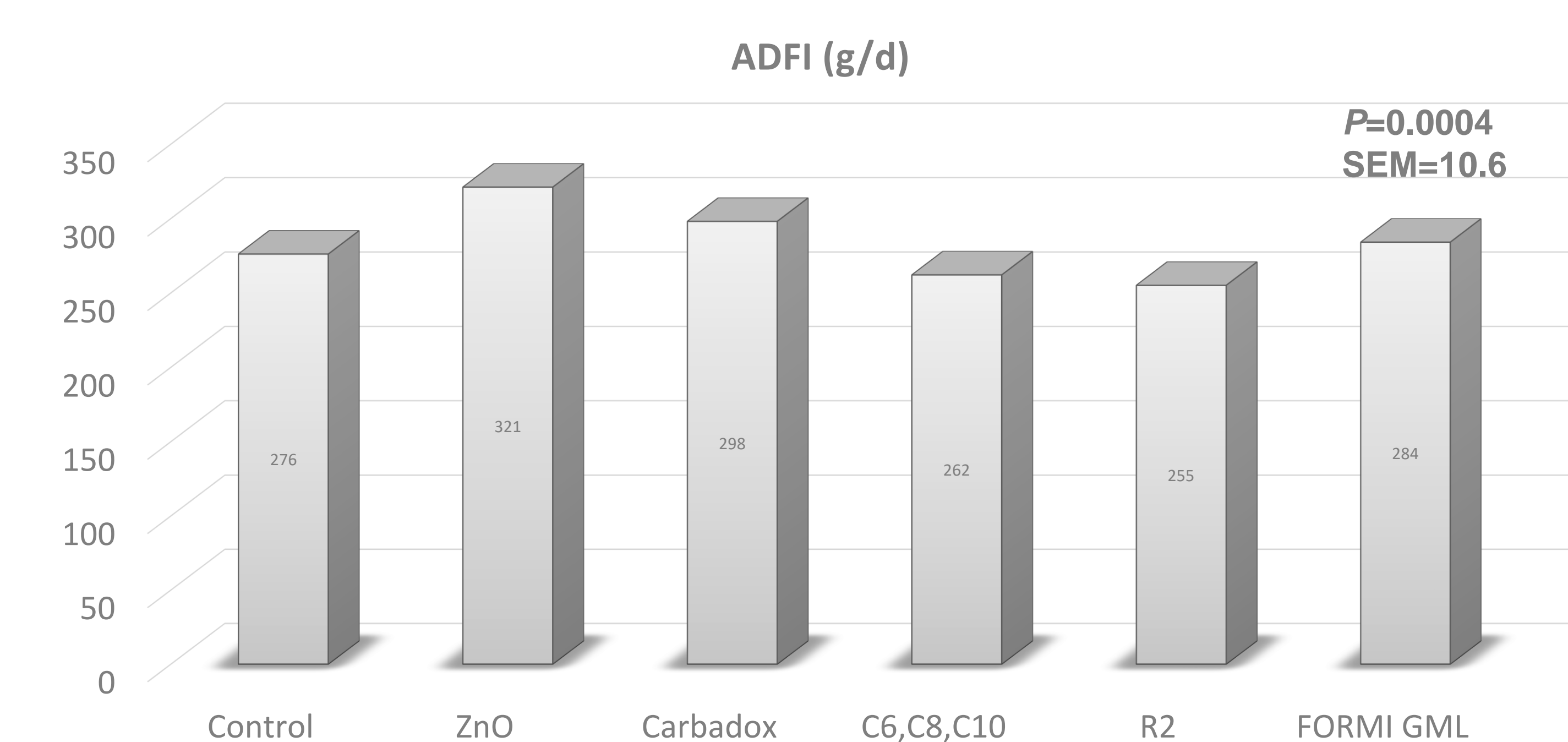
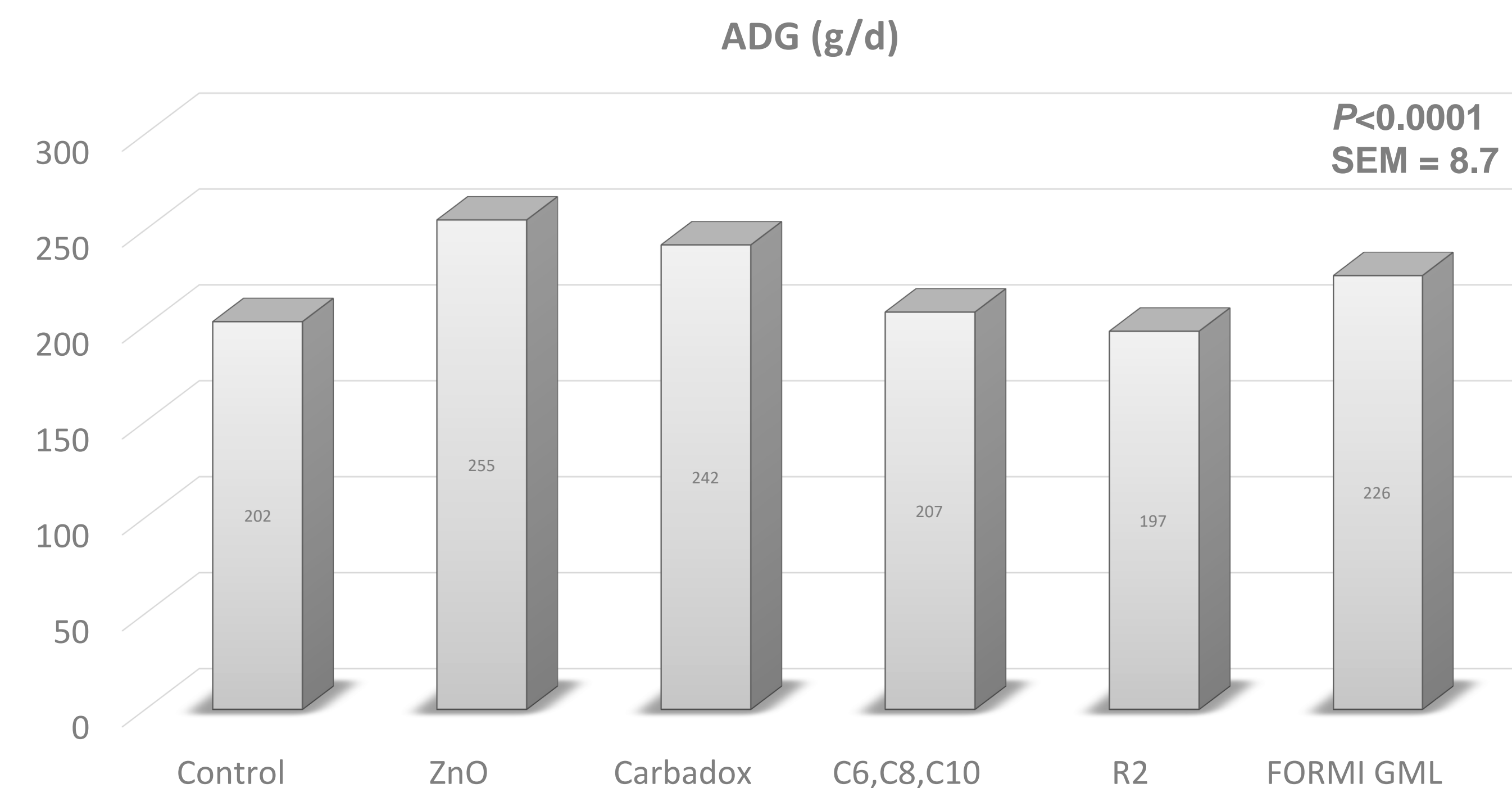
- **Materials:** 360 weanling pigs (21d) were randomly allotted to one of 60 pens (6 pigs per pen and 10 pens per treatment) and one of 6 dietary treatments
- **Experimental Unit:** Pen
- **Dietary Treatments:**
 1. Negative control
 2. Carbadox (50g/ton)
 3. ZnO (3,000 ppm in phase 1 and 1,500 ppm in phase 2)
 4. 1% C6:C8:C10 (MCFA blend)
 5. 1% Feed Energy R2 (Feed Energy Crop, Des Moines, IA)
 6. 1% FORMI GML (ADDCON; Bitterfeld-Wolfen, Germany)
- **Treatments/Phases:** Dietary treatments were fed in 2 phases: phase 1 (d 0 to 7) and phase 2 (d 8 to 19). A common control diet was fed during phase 3 (d 20 to 35)
- **Response Criteria:** Individual pig weights and feeder weights were taken weekly to calculate ADG, ADFI and G:F. Fecal scores and blood parameters were taken on days 0 and 19.
- **Data Analysis:** Data was collected and analyzed using SAS GLIMMIX (SAS version 9.4, Cary, NC)

Results

Overall Body Weight (d 0 to d 35)

	ZnO	Control	50 g/ton Carbadox	1% C6, C8, C10	1% Feed Energy R2	1% FORMI GML	SEM	P =
BW, kg								
d 0	5.42	5.42	5.41	5.42	5.41	5.42	0.009	0.696
d 7	6.10 ^a	6.02 ^{ab}	6.13 ^a	5.79 ^b	5.82 ^{ab}	6.11 ^a	0.075	0.003
d 19	10.26 ^a	9.23 ^c	10.05 ^{ab}	9.34 ^{bc}	9.11 ^c	9.71 ^{abc}	0.170	< 0.0001
d 35	18.70	17.66	18.49	17.84	17.47	17.99	0.316	0.06

Overall Treatment Data (d 0 to d 19)



Conclusions

- Overall, there was no significant difference in body weight and G:F for pigs fed carbadox or ZnO versus those fed MCFA.
- Pigs fed diets containing ZnO and carbadox had higher ADG and ADFI than those that weren't fed ZnO and carbadox.
- Further research is recommended to evaluate the use of MCFA in nursery pig diets.

Acknowledgements

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