



Effects of oligosaccharide-based polymer on blood profiles in weanling pigs experimentally infected with a pathogenic *E. coli*



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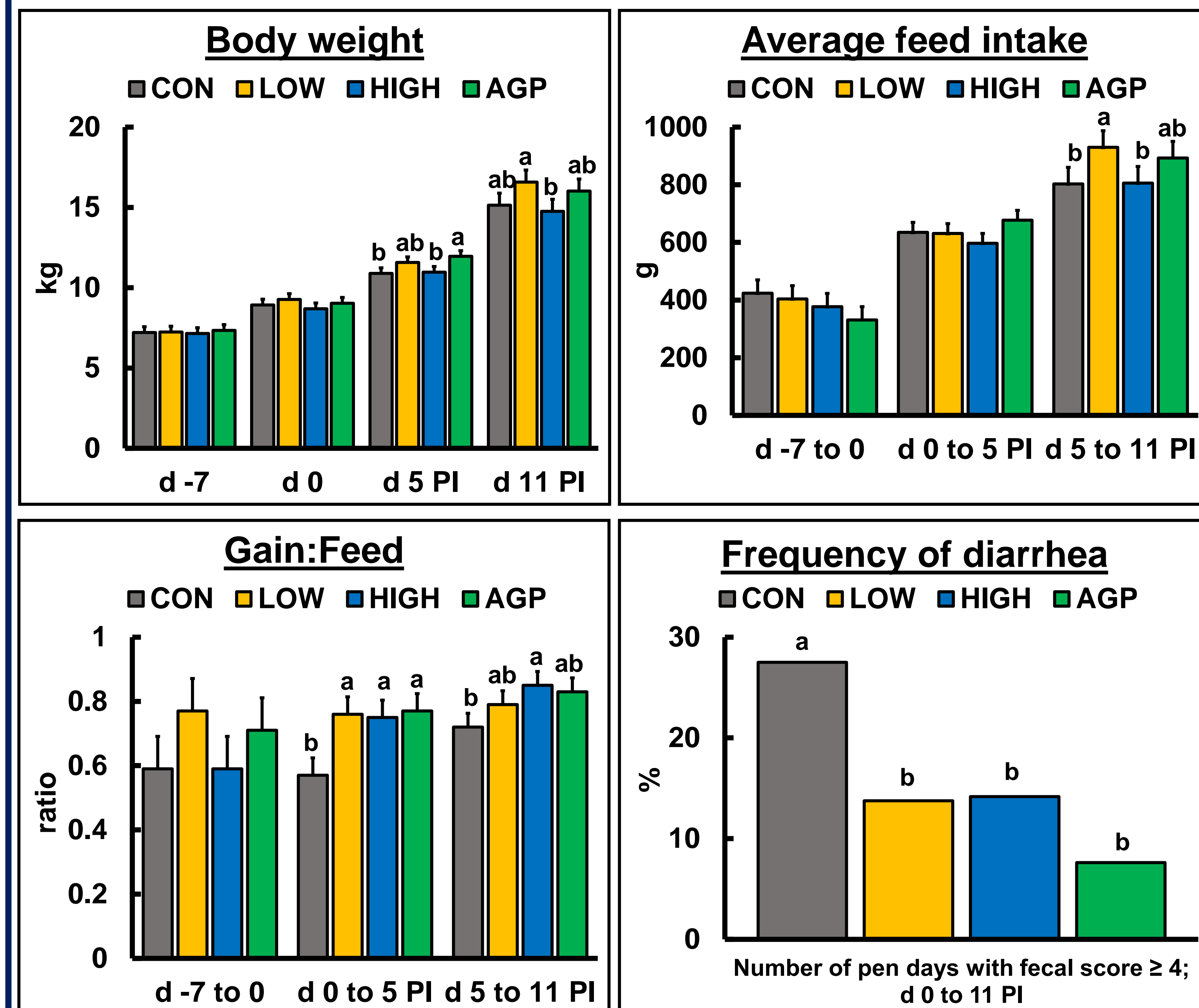
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Background

- Enterotoxigenic *E. coli* (ETEC) strains expressing F4 or F18 fimbriae are a major cause of post-weaning diarrhea in nursery pigs (Nagy and Fekete, 2005)
- Blood group A antigen oligosaccharides could enhance binding affinity of *E. coli* (Coddens et al., 2009)
- The grafting of blood group A antigen oligosaccharides on a carrier may enhance disease resistance of pigs against *E. coli* F18 infection by inhibiting bacterial attachment

Preliminary data

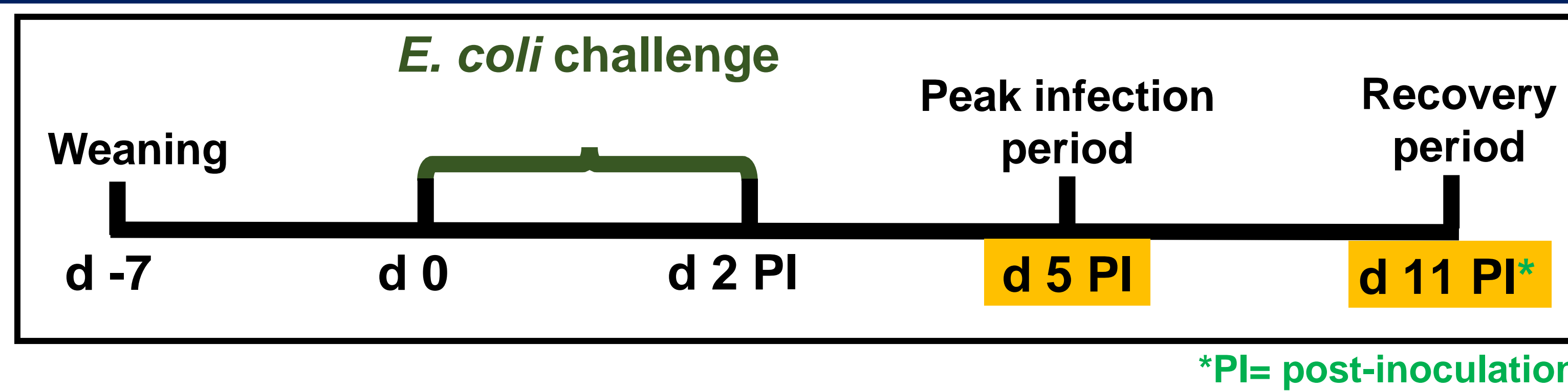
Supplementation of oligosaccharide-based polymer enhanced feed efficiency and reduced diarrhea of weaned pigs infected with *E. coli* F18 infection



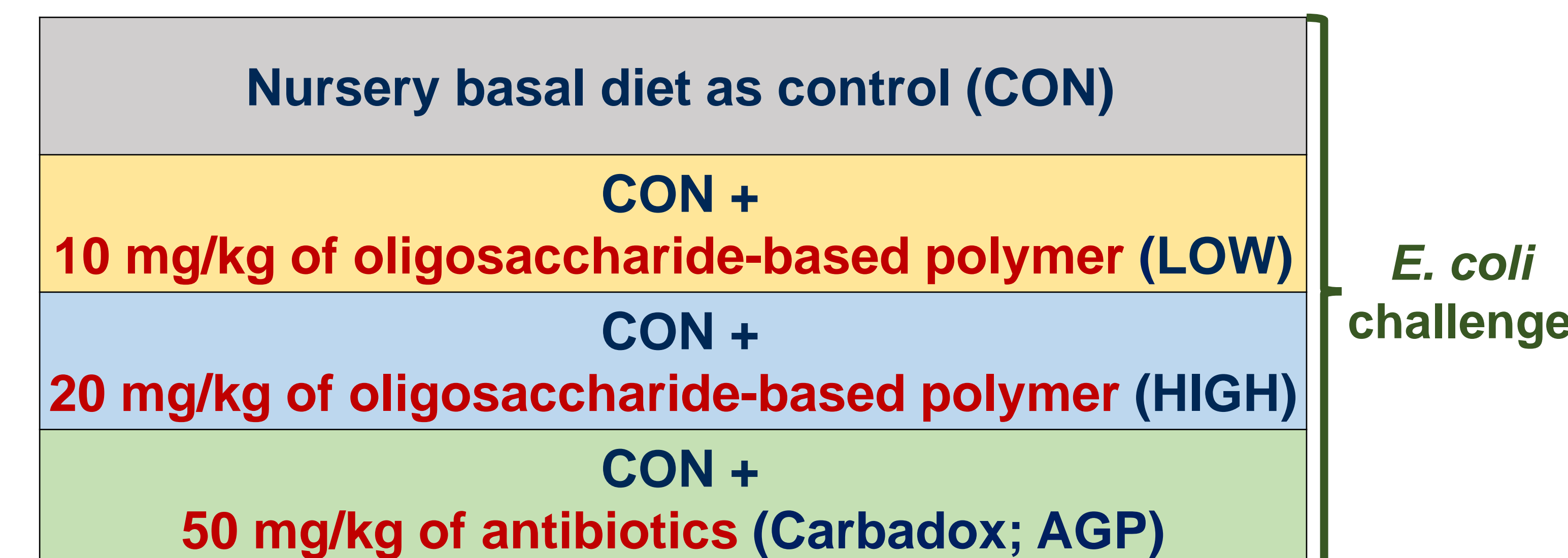
Objective

To investigate dietary supplementation of oligosaccharide-based polymer on blood profiles of weaned pigs experimentally infected with a pathogenic *E. coli* F18

Materials and methods



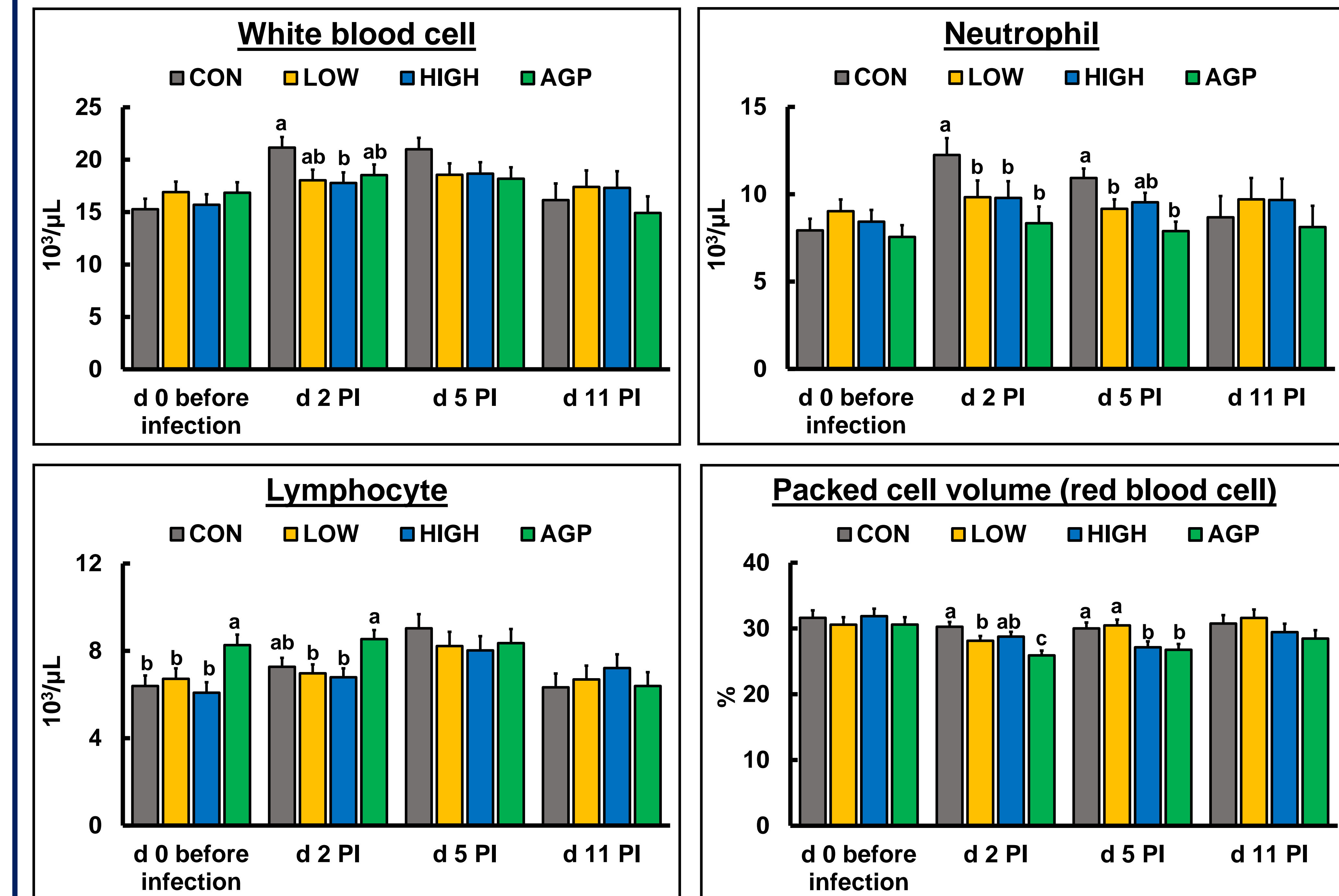
- Experimental design: RCBD (Blocks: BW x Sex)
- 48 weanling pigs (7.23 ± 1.11 kg, 21 d old)
- Treatments: 4 dietary treatments (12 pigs/treatment)
- E. coli* F18 inoculum: 10¹⁰ cfu/3 mL oral dose daily for 3 days



- Oligosaccharide-based polymer: Glycoconjugate composed of blood group A antigen oligosaccharides grafted on a carrier was designed and synthesized by Elicityl (France) in cooperation with Ghent University, and provided by Pancosma (Geneva, Switzerland)
- Blood samples were collected before *E. coli* inoculation (d 0), d 2, 5, and 11 post-inoculation (PI)
- Total and differential blood cell count were analyzed by CBC test
- All data were analyzed by ANOVA using the PROC MIXED of SAS with pig as the experimental unit

Results

White blood cell or red blood cell profiles of pigs challenged with *E. coli* F18 fed diets supplemented with oligosaccharide-based polymer or antibiotics



Conclusions

- Pigs fed antibiotics or oligosaccharide-based polymer supplements showed reduced systemic inflammation markers during peak infection period, whereas antibiotics had greater lymphocyte counts on d 0 before infection and d 2 PI
- Supplementation of oligosaccharide-based polymer may alleviate the systemic inflammation caused by *E. coli* F18 infection
- These observations support the effects of oligosaccharide-based polymer on enhanced feed efficiency reduced diarrhea severity of weaned pigs infected with *E. coli* F18

References

- Nagy B, Fekete PZ. Enterotoxigenic Escherichia coli in veterinary medicine. Int J Med Microbiol. 2005;295:443–454.
- Coddens A, Diswall M, Ångström J, Breimer ME, Goddeeris B, Cox E, et al. Recognition of blood group ABH type 1 determinants by the FedF adhesin of F18-fimbriated Escherichia coli. J Biol Chem. 2009;284:9713–26.