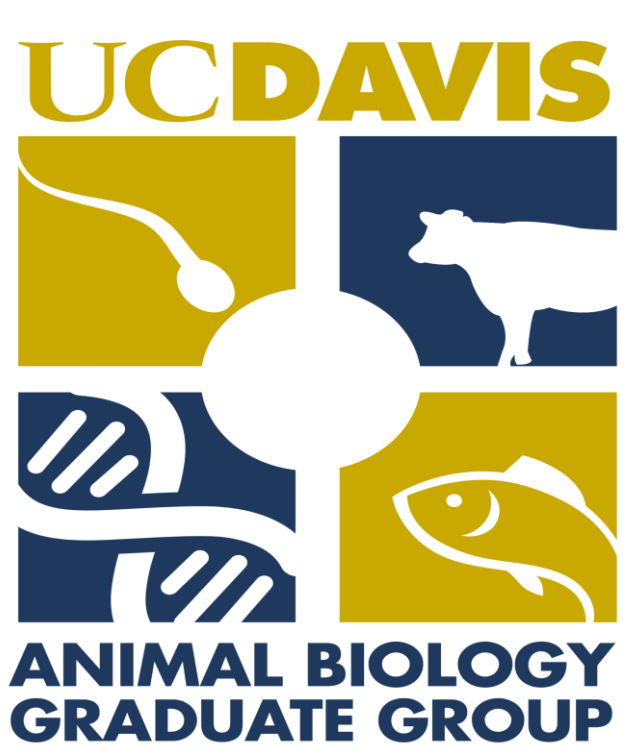




Effects of antibiotics on growth performance, diarrhea, bacterial translocation, and blood profiles in weanling pigs experimentally infected with a pathogenic *E. coli*

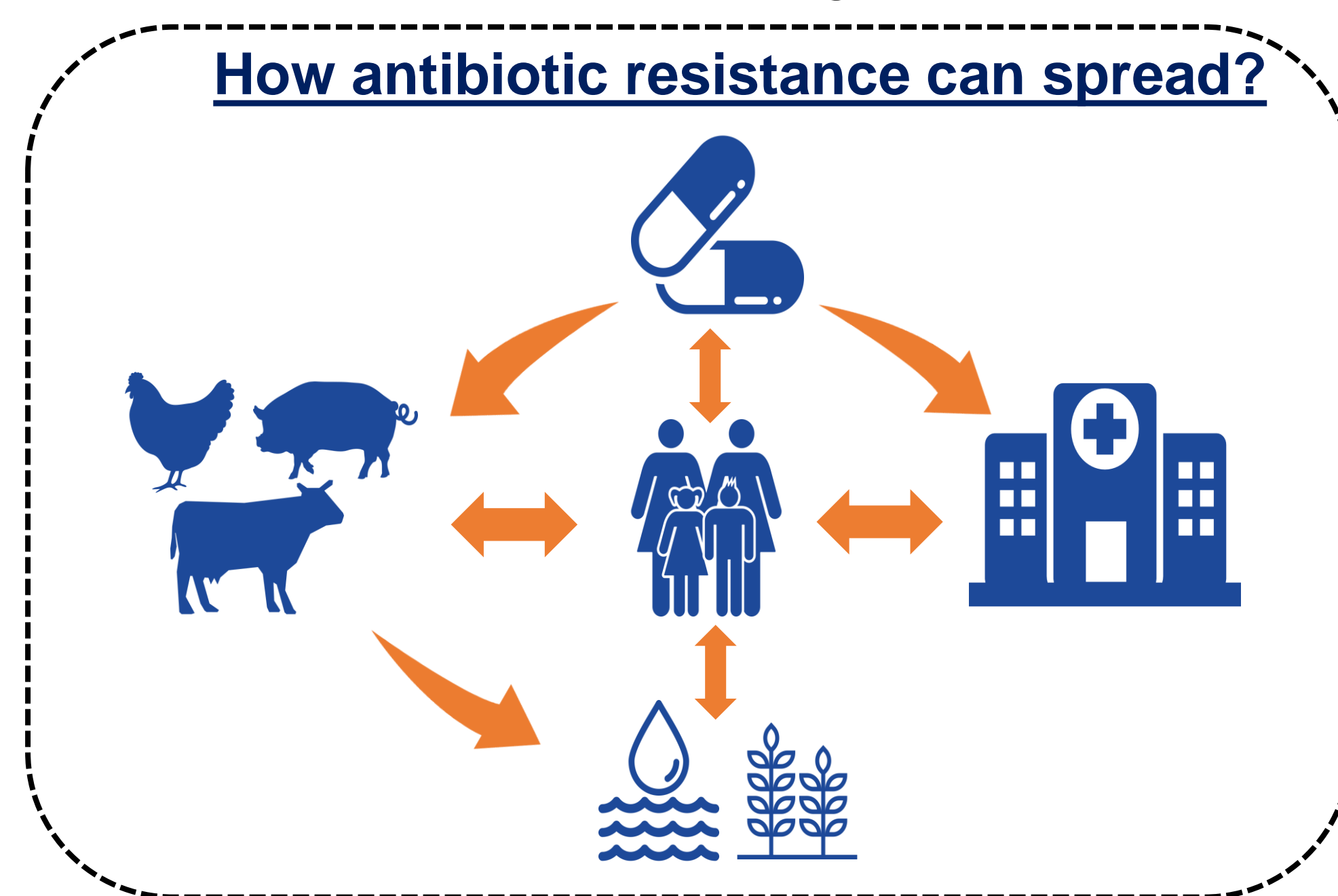


Kwangwook Kim¹, Yijie He¹, Cynthia Jinno¹, Seijoo Yang¹, Minho Song², Peng Ji¹, Yanhong Liu¹

¹University of California, Davis, CA, ²Chungnam National University, Daejeon, Republic of Korea

INTRODUCTION

- Antibiotics have been widely used as a growth promoter and to treat the diarrheal disease caused by enterotoxigenic *Escherichia coli* (*E. coli*), which are the most dominant type of pathogenic *E. coli* in both humans and livestock.
- Antibiotic resistance is one of the biggest health concerns that lead to tremendous economical losses and increased mortality of both humans and livestock (WHO, 2018).
- Subinhibitory antibiotics concentration enhanced bacterial selection for antibiotic resistance genes (Davies et al., 2006).



OBJECTIVE

- Investigate the effects of antibiotics growth promoters (AGP) on growth performance, diarrhea, fecal β -hemolytic coliforms, bacterial translocation, and blood parameters of weanling pigs experimentally infected with F18 *E. coli*.

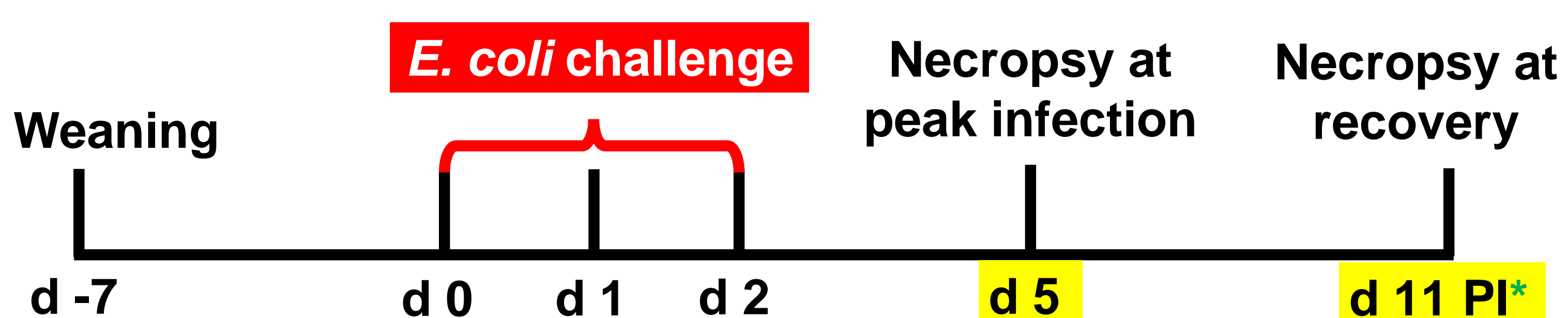
MATERIALS & METHODS

Experimental design & treatments

- Animals: 34 weanling pigs (6.88 \pm 1.03 kg BW)
- Experimental design: Randomized complete block design
- Housing: Individually housed in disease containment rooms
- Treatment: 3 treatments (11-12 pigs/treatment)
 - ✓ Control (CON)
 - ✓ Low dose AGP (carbadox), CON + 0.5 mg/kg AGP
 - ✓ High dose AGP (carbadox), CON + 50 mg/kg AGP

Sampling and data collection

- Pathogenic F18 *E. coli* challenge (LT, STb, SLT-2); oral inoculation, 10^{10} cfu/dose with 3 doses

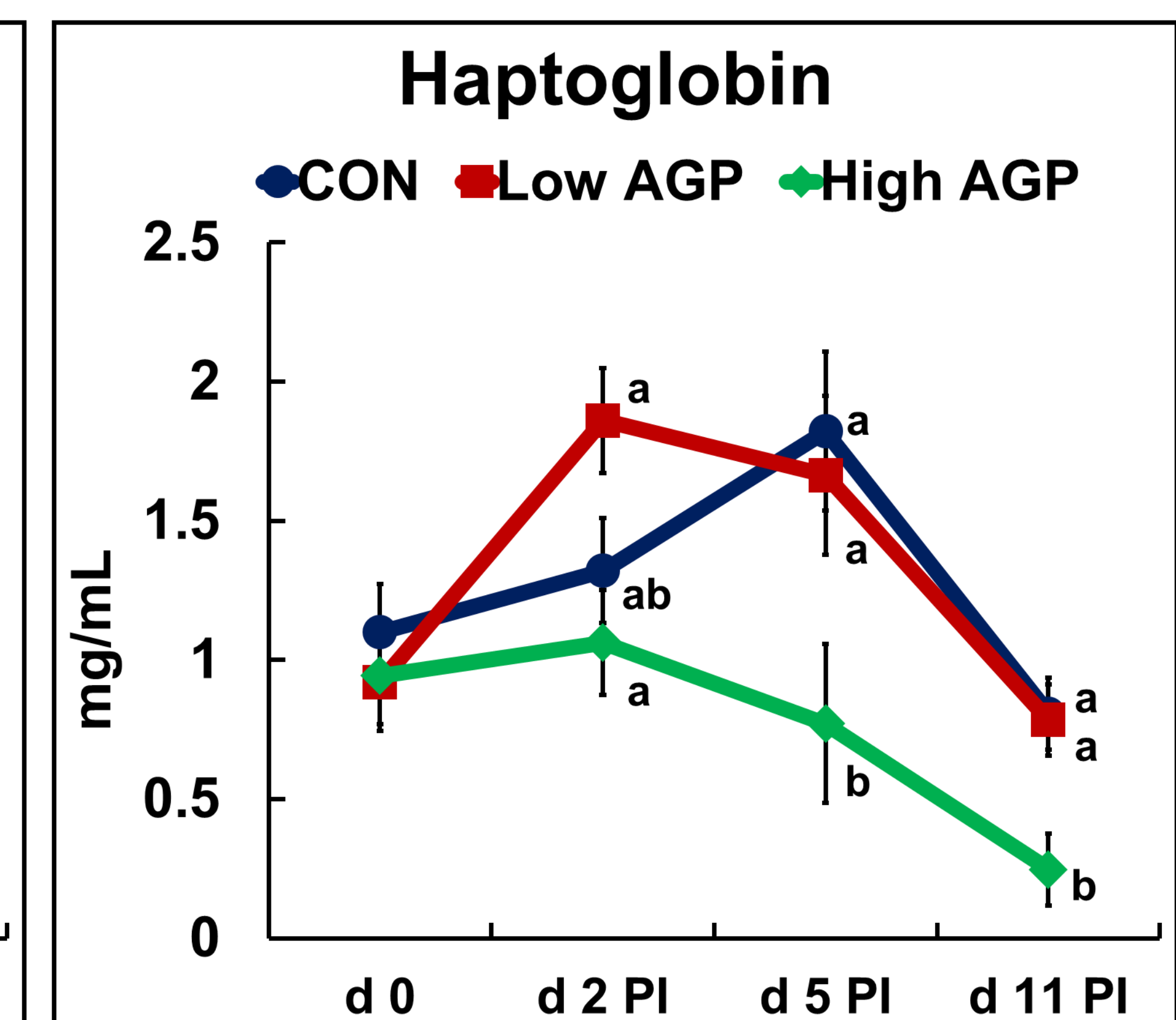
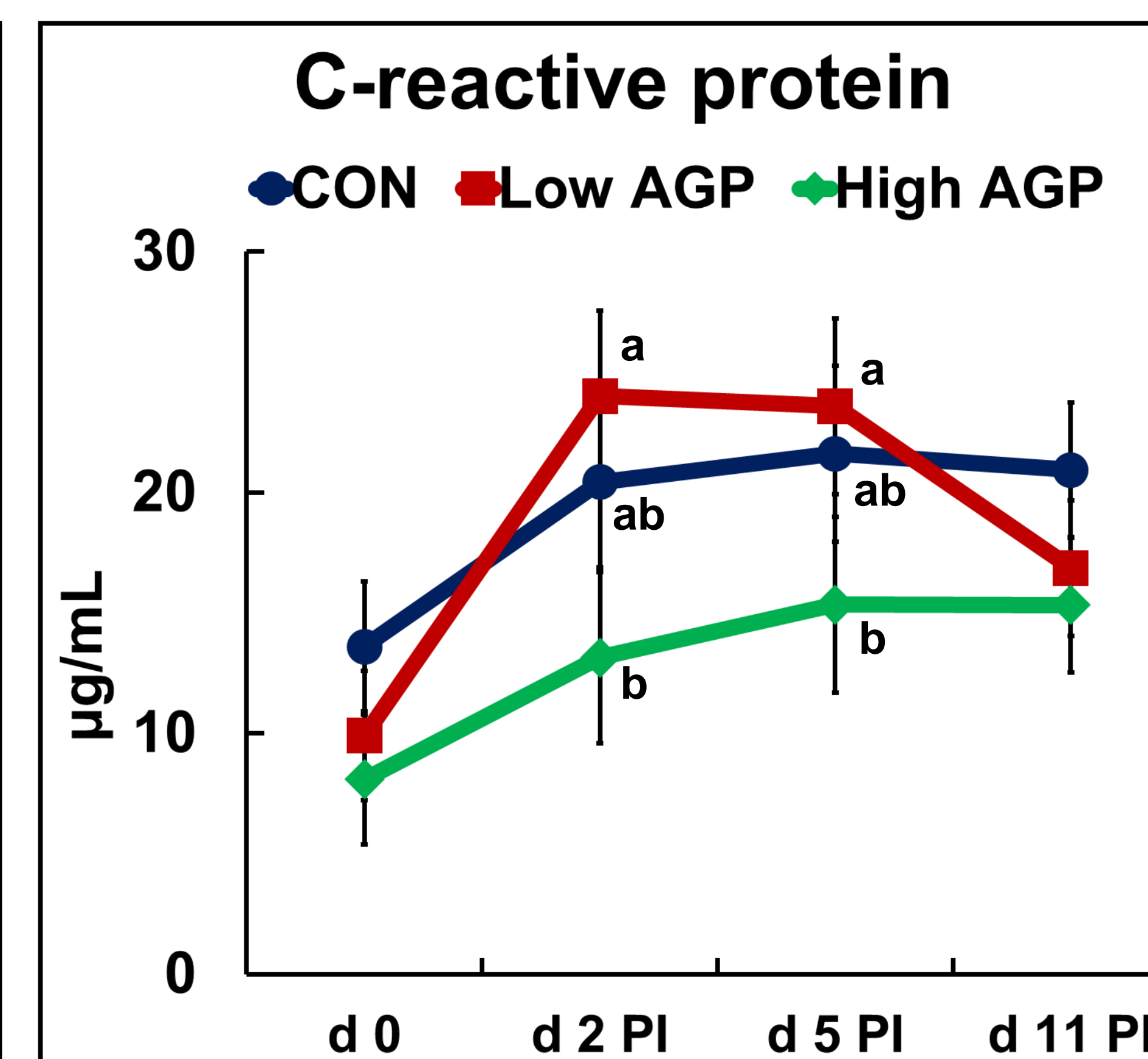
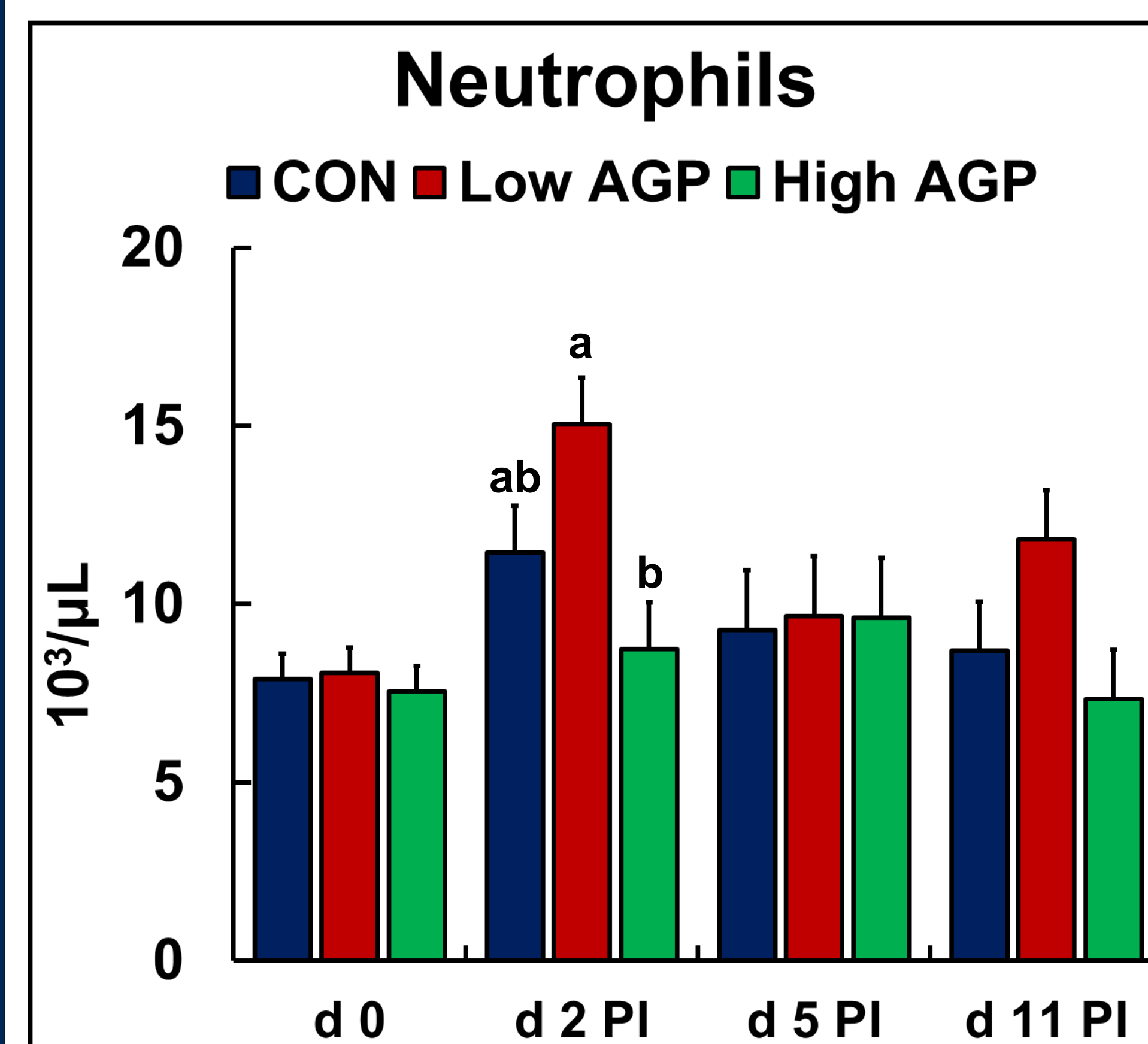
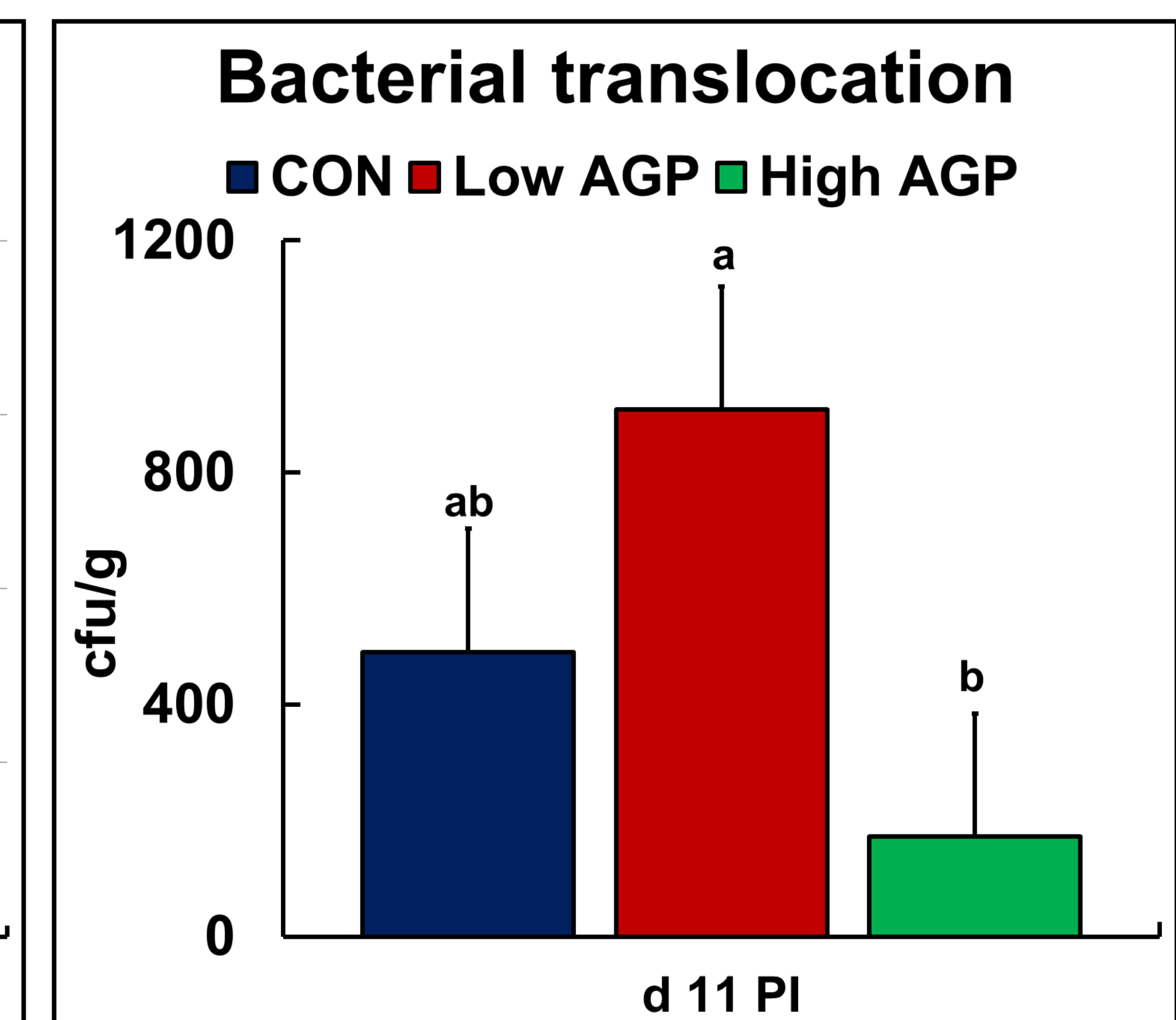
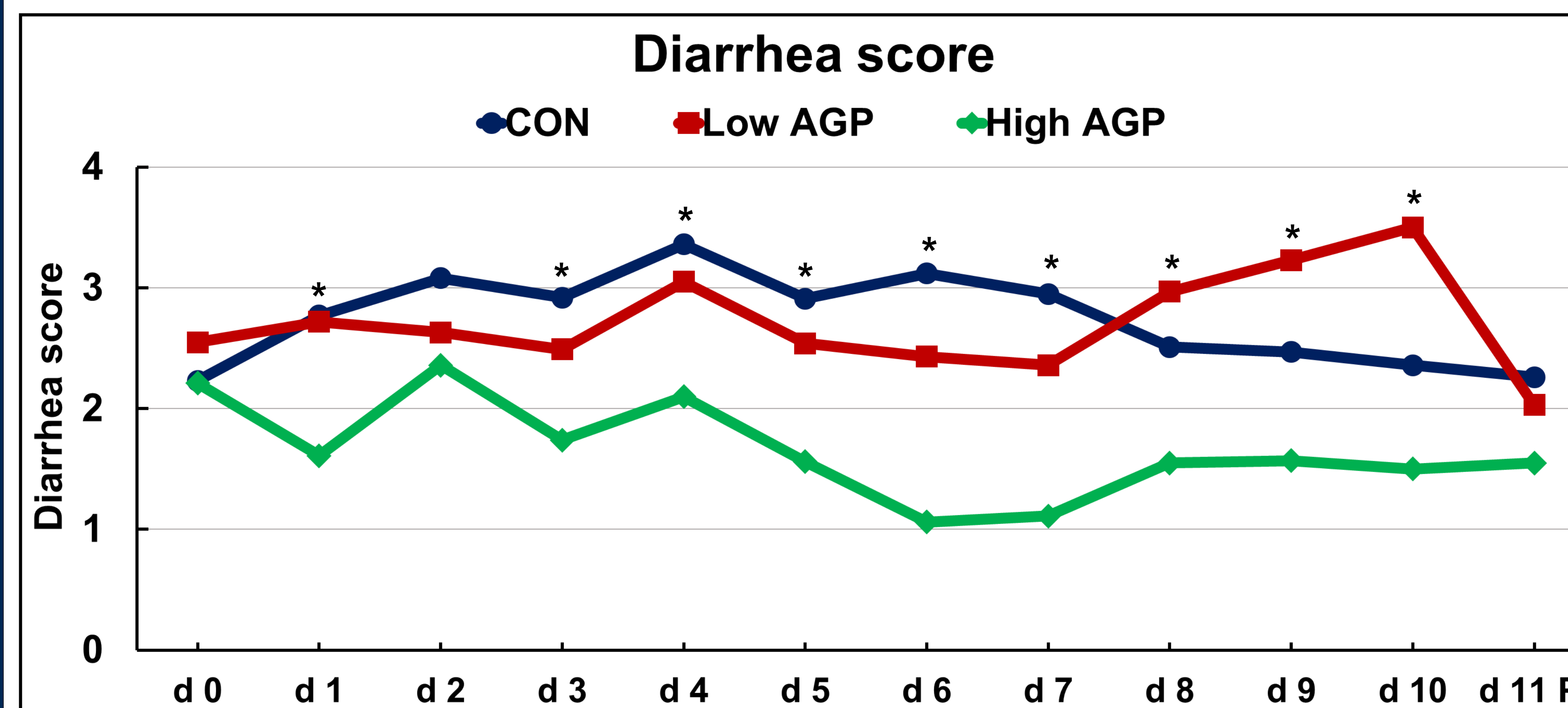
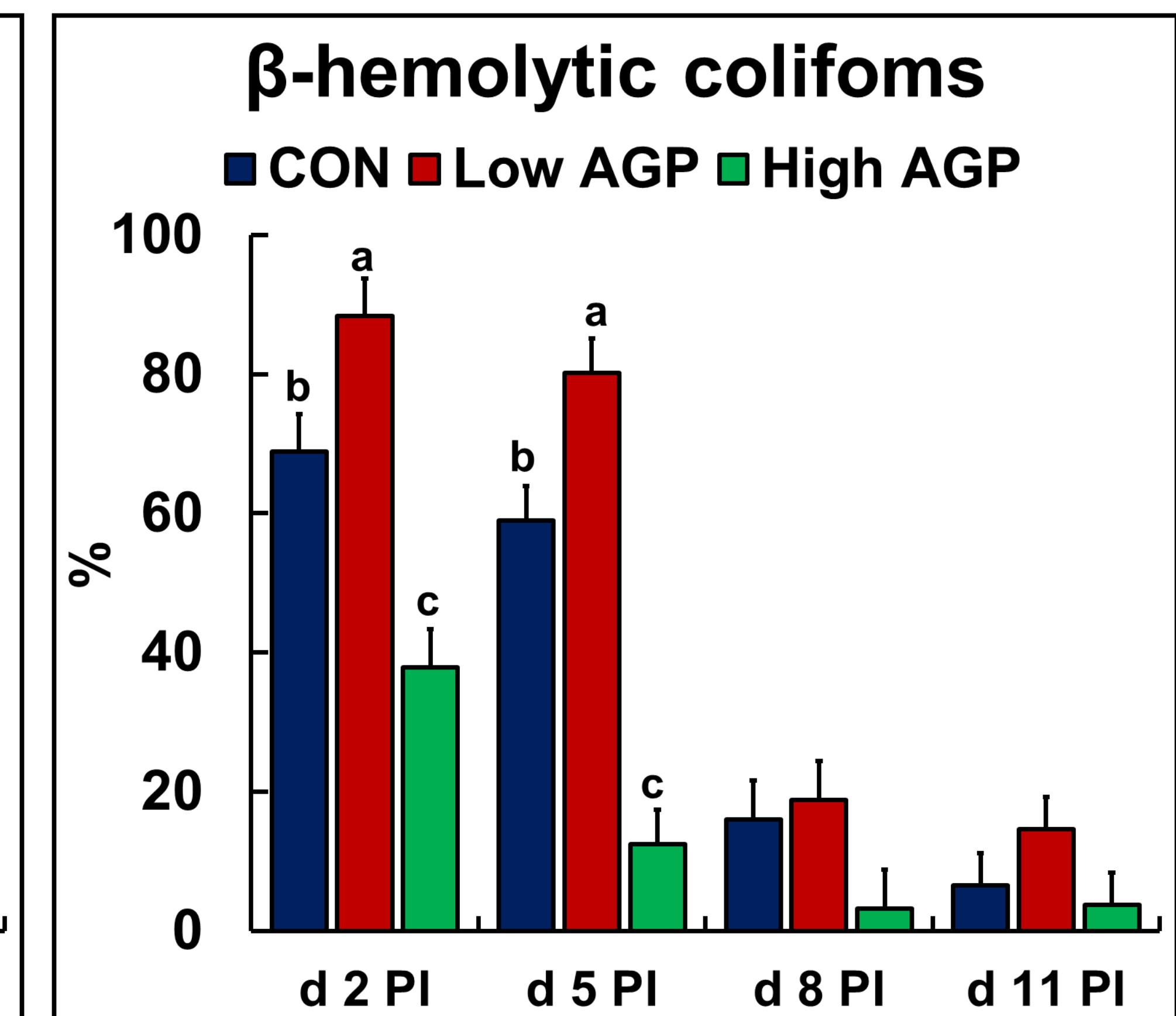
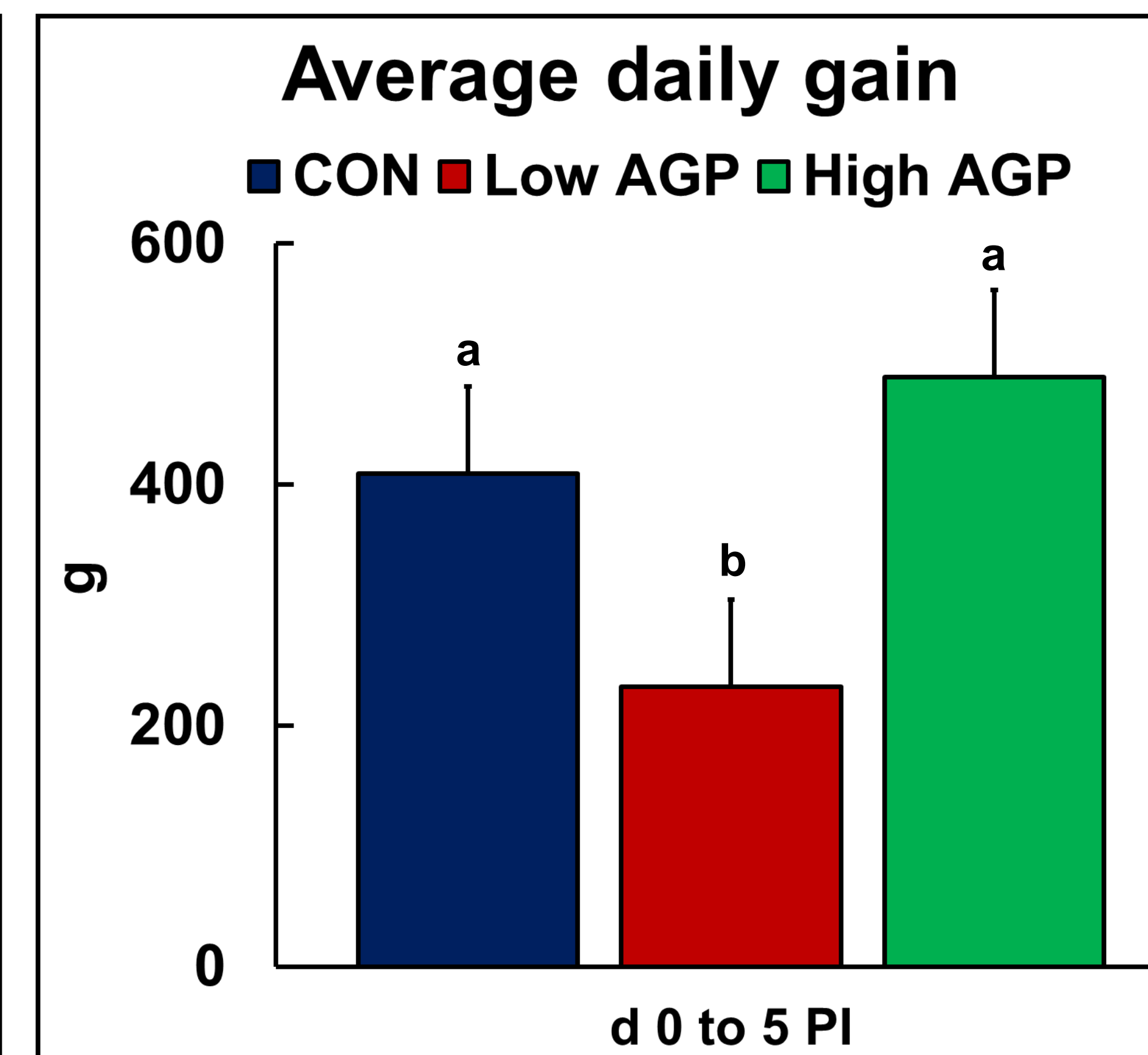
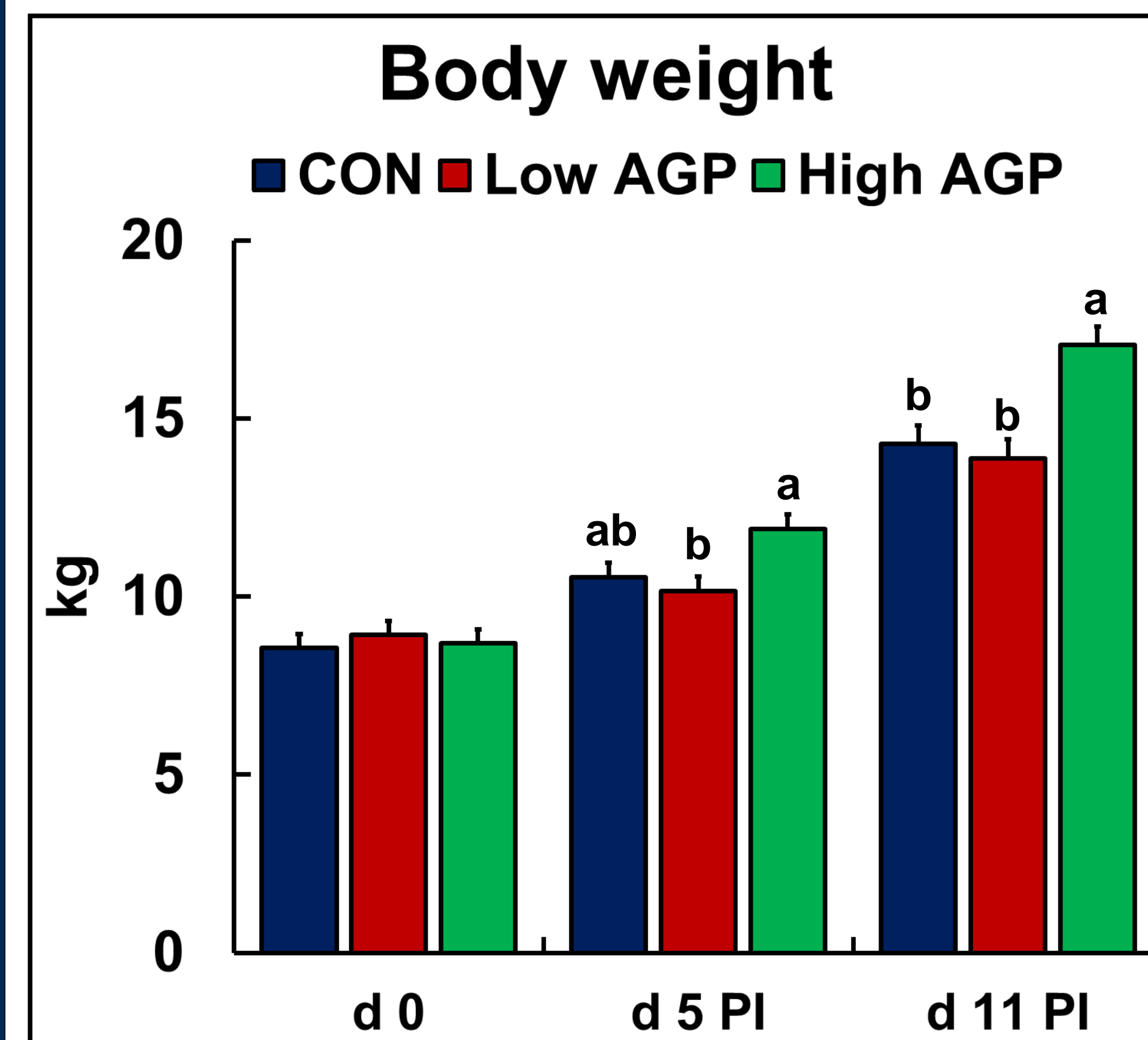


- Growth performance
- Daily diarrhea score (0 to 5 scale ;0= normal; 5= severe)
- Bacterial translocation in mesenteric lymph node
- β -hemolytic coliforms in feces
- Blood sample
 - ✓ Total and differential blood cell count
 - ✓ Serum inflammatory mediators

Statistical analysis

- All data were analyzed by ANOVA using the PROC MIXED of SAS. Significant difference at $P < 0.05$.

RESULTS



CONCLUSIONS

- Very low-dose antibiotic growth promoter supplementation exacerbated growth performance, diarrhea, and systemic inflammation of weaned pigs infected with a pathogenic *E. coli*.
- Nutritional intervention is required to avoid the adverse effects of removing antibiotics from humans and livestock.
- Exploring potential alternatives to antibiotics must be considered in both animal agriculture and human medicine.