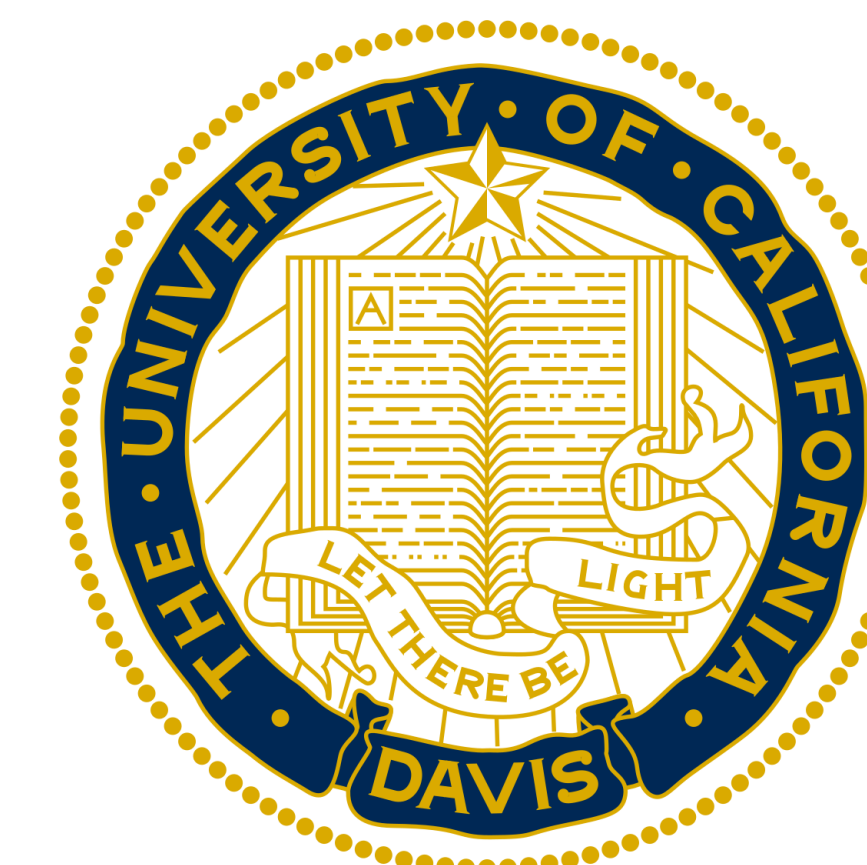


# Effects of *Bacillus spp.* probiotics on growth performance, diarrhea, and systemic immunity of weaned pigs experimentally infected with an enterotoxigenic *E. coli*

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May 2nd - 3rd, 2018

## Introduction

- Enterotoxigenic *E. coli* (ETEC) are the most common type of *E. coli* that cause diarrhea in post-weaning piglets.
- Supplementation of *Bacillus spp.* probiotics reduces incidence of diarrhea and improves growth performance of post-weaning pigs (Bhandari et al., 2008; Pan et al., 2017)
- Probiotics can affect the immune system by increasing local antibody levels, and blood immune cell populations (Schierack et al., 2007)

## Objective

- To investigate the effects of supplementation of *Bacillus spp.* probiotics on the growth performance, diarrhea frequency, and systemic immunity of weaned pigs experimentally infected with an enterotoxigenic F-18 *E. coli*

## Materials and Methods

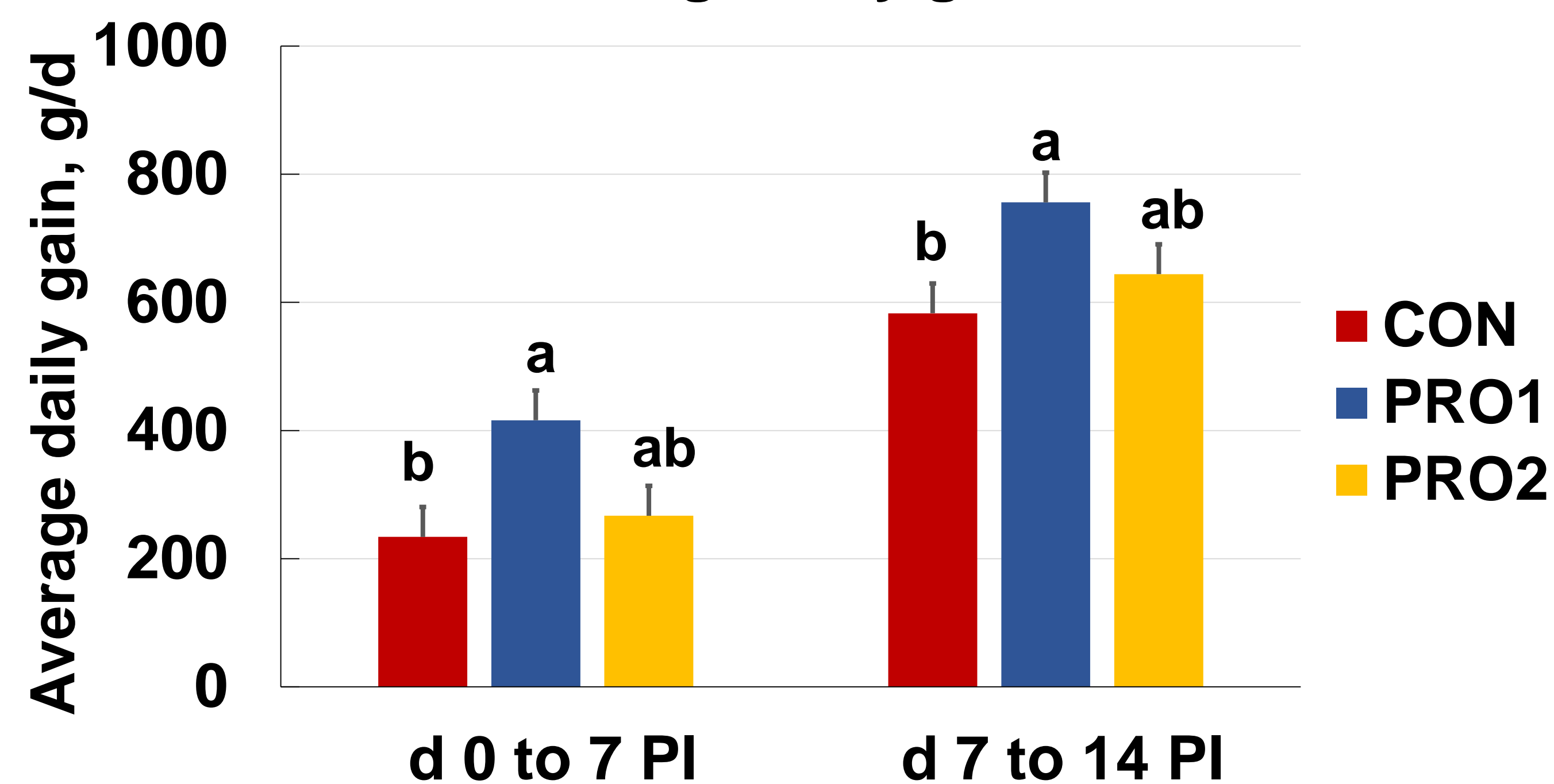
- Animals and facility
  - 36 weanling pigs (7.61 ± 0.40 kg)
  - Weaned at 21 d of age into 2 confinement nursery rooms
- F18 *E. coli* challenge
  - Enterotoxigenic F18 *E. coli* (LT, STb, SLT-2)
  - Oral inoculation, 10<sup>10</sup> cfu/dose with 3 doses
- Experimental design
  - Randomized Complete Block Design
  - Blocking factors: body weight x gender
- Dietary treatments: 12 pigs/treatment
  - Nursery basal diet (CON)
  - CON + 500 mg/kg *Bacillus spp.* strain 1 (PRO1)
  - CON + 500 mg/kg *Bacillus spp.* strain 2 (PRO2)
- Data collection
  - Growth performance: Body weight (BW), Average Daily Gain (ADG), Average Daily Feed intake (ADFI) and Feed to Gain ratio (F:G)
  - Blood sampling: d 0 before inoculation and d 3, 7, 14, and 21 post-inoculation (PI)

## Materials and Methods (Cont.)

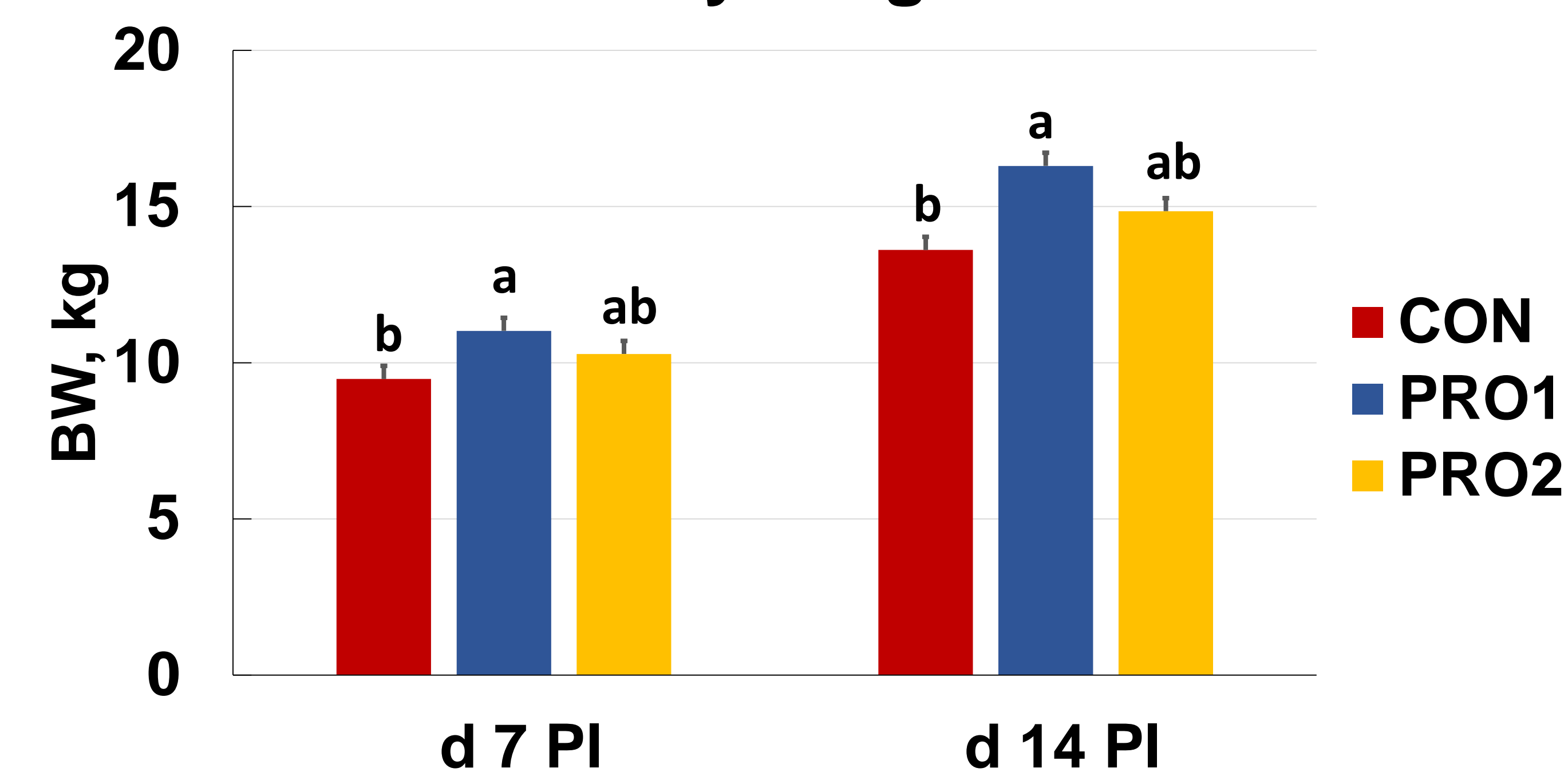
- Complete Blood Count: Total and differential blood cell counts
- Daily diarrhea score: ranging from 1 to 5 (1, normal feces and 5, watery diarrhea)
- Data analysis
  - PROC MIXED of SAS (SAS Institute Inc., Cary, NC)
  - Individual pig used as the experimental unit
  - Diet as the main effect and block as random effect

## Results

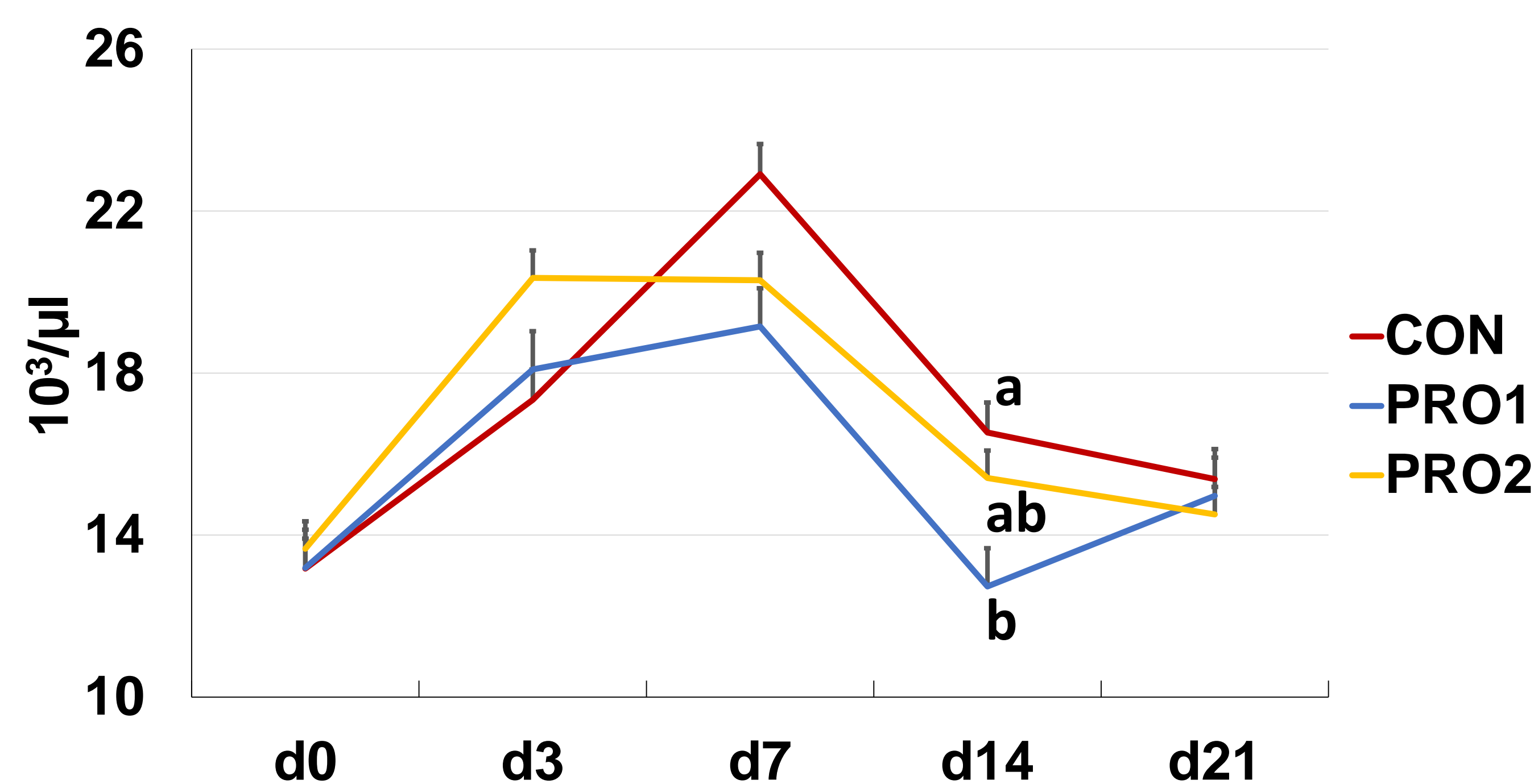
Average daily gain



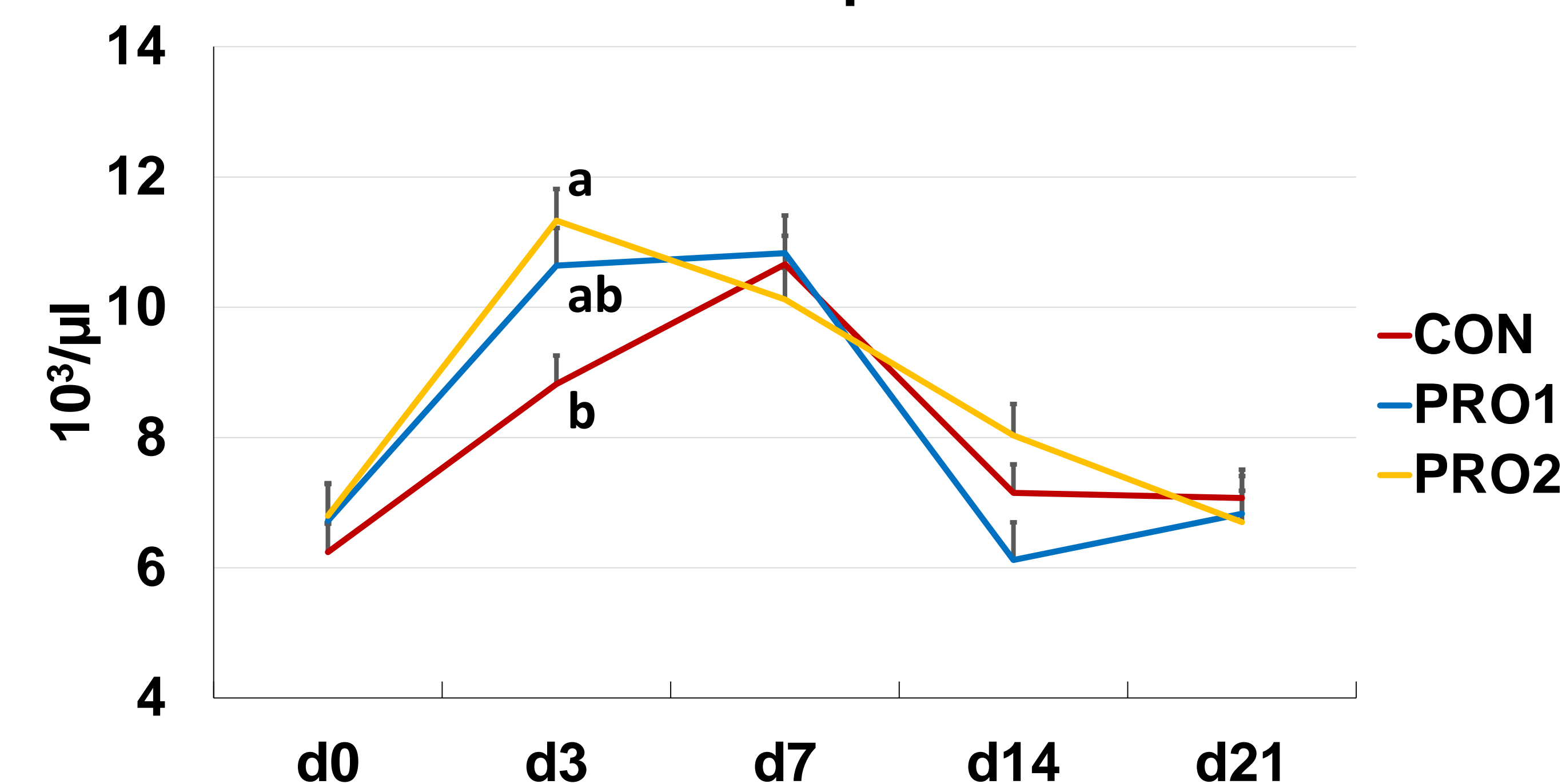
Body weights



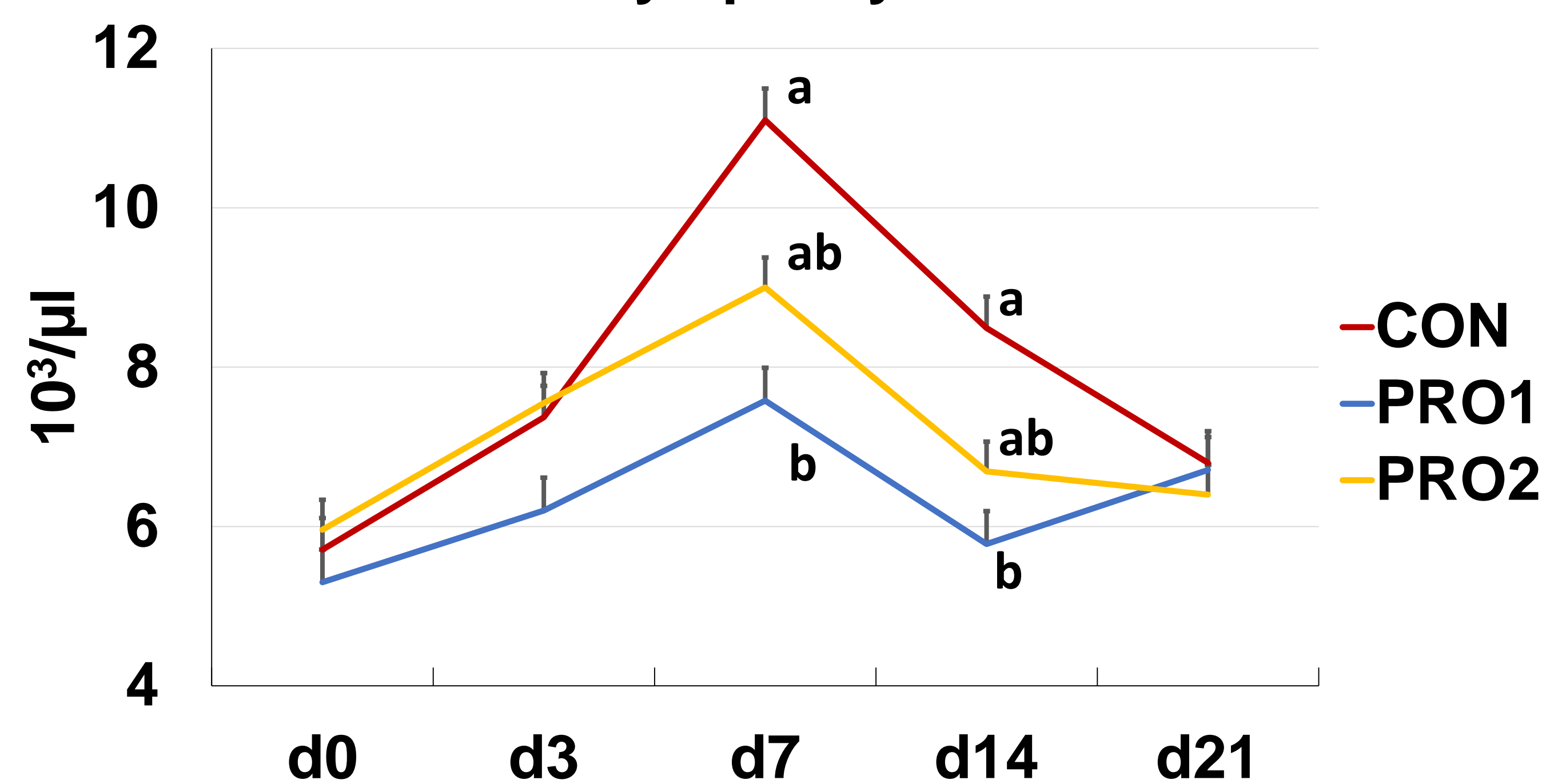
White Blood Cell



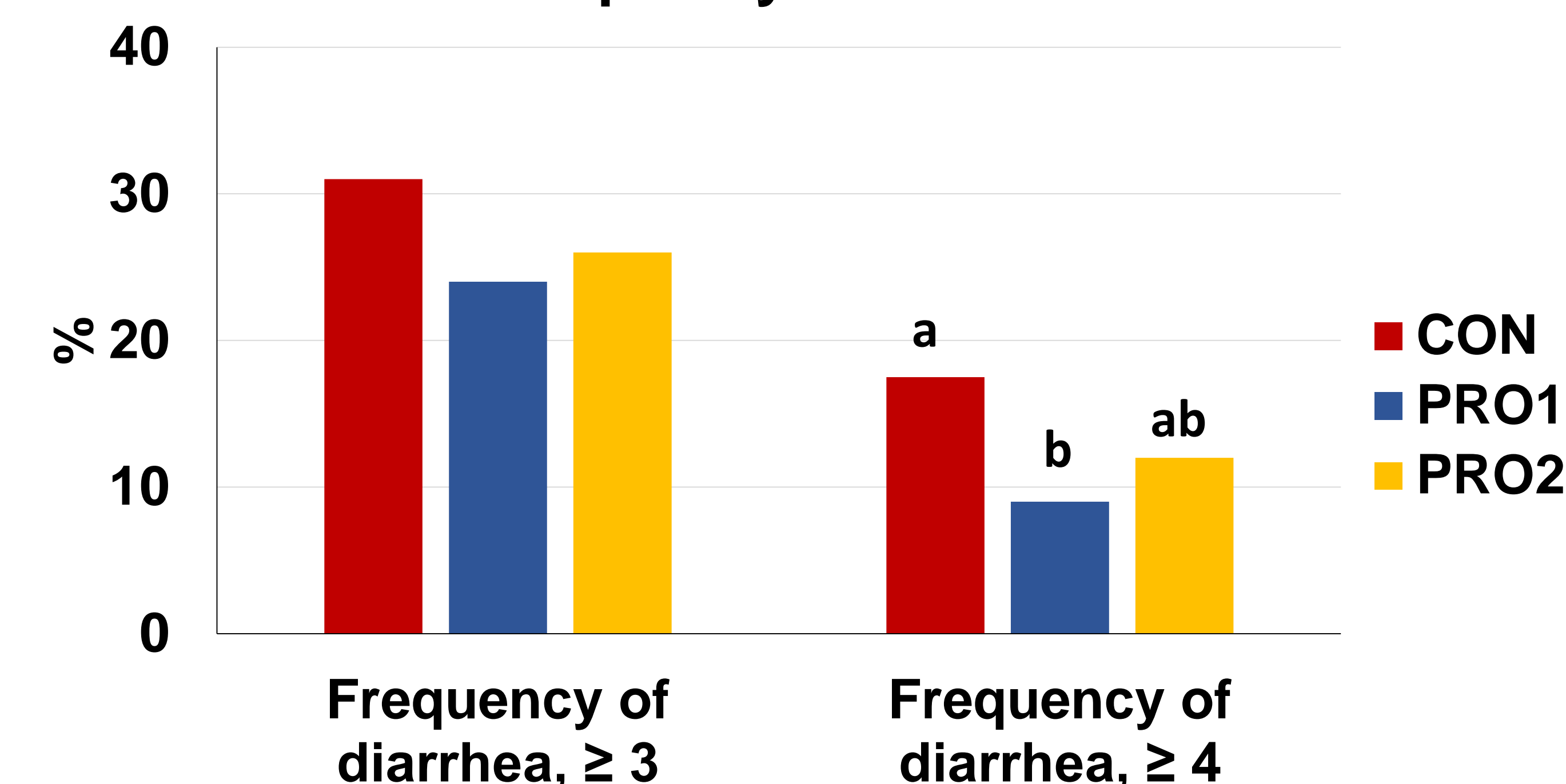
Neutrophil



Lymphocyte



Frequency of diarrhea



## Conclusions

- Compared to pigs without PRO1 supplementation, supplementation of PRO1 had
  - improved growth performance
  - enhanced disease resistance and reduced systemic inflammation