

## INTRODUCTION

### Post-weaning diarrhea

- Commonly caused by enterotoxigenic *E. coli*
- Often leads to weight loss and possibly death
- Economical losses

### *Bacillus subtilis*

- Potential alternatives to antibiotics
- Gram positive, aerobic bacteria
- Dietary supplementation of *B. subtilis* affected weaned pigs challenged with F18 *E. coli* (Kim et al., 2019)
  - Improved growth rate
  - Reduced leaky gut
  - Enhanced gut barrier function
- Supplementation of *B. subtilis* alters fecal microbiome of weaned pigs challenged with pathogenic *E. coli* (Jinno et al., 2020)
  - Fecal microbiome altered differently between antibiotics and *B. subtilis* supplementation

## MATERIALS & METHODS

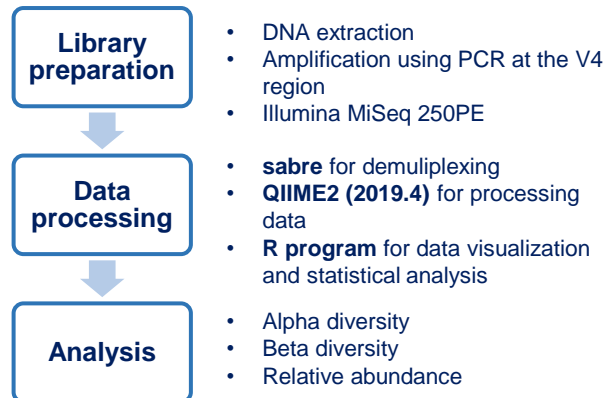
### Animal experiment

- 48 weaned pigs (~6.17 kg)
- Design: RCBD with BW x gender as blocking factors

Treatment (12 pigs per treatment)		
Sham	NC	Negative control
F18 <i>E. coli</i> challenge	PC	Positive control
	AGP	50 mg/kg carbadox
	DFM	500 mg/kg <i>B. subtilis</i>

- Pigs were housed individually and had access to feed and water *ad libitum* for 28 days
- After 7 days adaptation period, pigs were orally inoculated with 3 mL F18 *E. coli* ( $10^{10}$  CFU/dose) for 3 consecutive days from d 0 post-inoculation (PI)
- Pigs were euthanized d 21 PI
  - Fecal samples and digesta from jejunum, ileum, and colon were collected

### 16S rRNA analysis

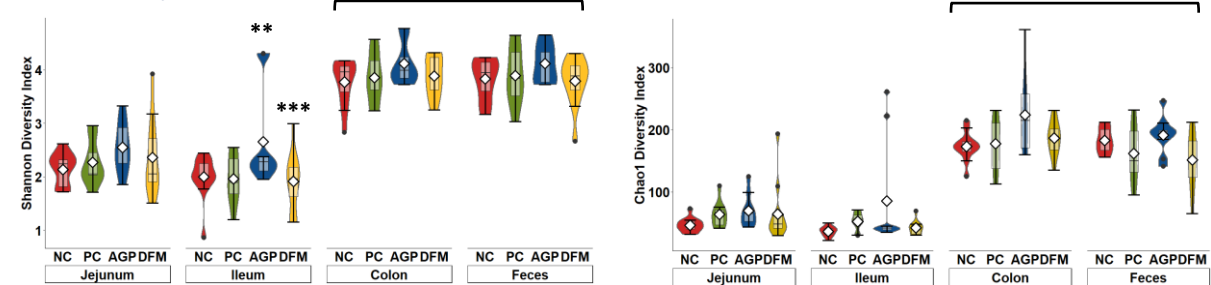


### Statistical analysis

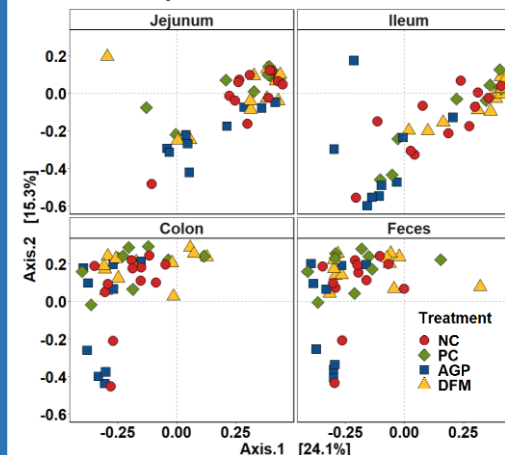
- Alpha diversity and taxonomic analysis were analyzed with Kruskal-Wallis and Conover test using agricolae package in R.

## RESULTS

### Alpha diversity

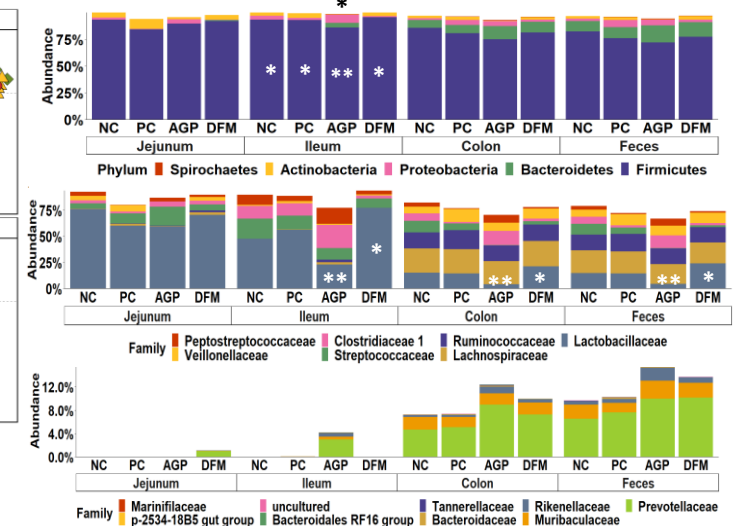


### Beta diversity



Sampling mean: 14,345  
 Total number of taxa: 3,430

### Relative abundance



## CONCLUSION

- Supplementation of *B. subtilis* and carbadox modified intestinal microbiota of weaned pigs challenged with F18 *E. coli* differently from each other
- Further study should investigate the gut microbiome of weaned pigs challenged with F18 *E. coli* supplemented with *B. subtilis* using metagenomic sequencing

## REFERENCES

1. Kim, K., Y. He, X. Xiong, A. Ehrlich, X. Li, H. Raybould, E. R. Atwill, E. A. Maga, J. Jørgensen, and Y. Liu. 2019. Dietary supplementation of *Bacillus subtilis* influenced intestinal health of weaned pigs experimentally infected with a pathogenic *E. coli*. *J. Anim. Sci. Biotechnol.* 10:52-63.
2. Jinno, C., K. Kim, M. Song, P. Ji, E. Maga, and Y. Liu. 2019. Supplementation of *Bacillus subtilis* modified fecal microbiota of weaning pigs experimentally infected with a pathogenic *E. coli*. *J. Anim. Sci.* 97(Suppl\_2):81

## OBJECTIVE

To observe the effects of supplementing *Bacillus subtilis* on intestinal microbiota of weaned pigs experimentally infected with F-18 *E. coli*.