



Engineered *Bacillus subtilis* regulates intestinal barrier in ETEC K88-infected piglets and modulates miR-1250-5p/NFκB pathway in IPEC-J2

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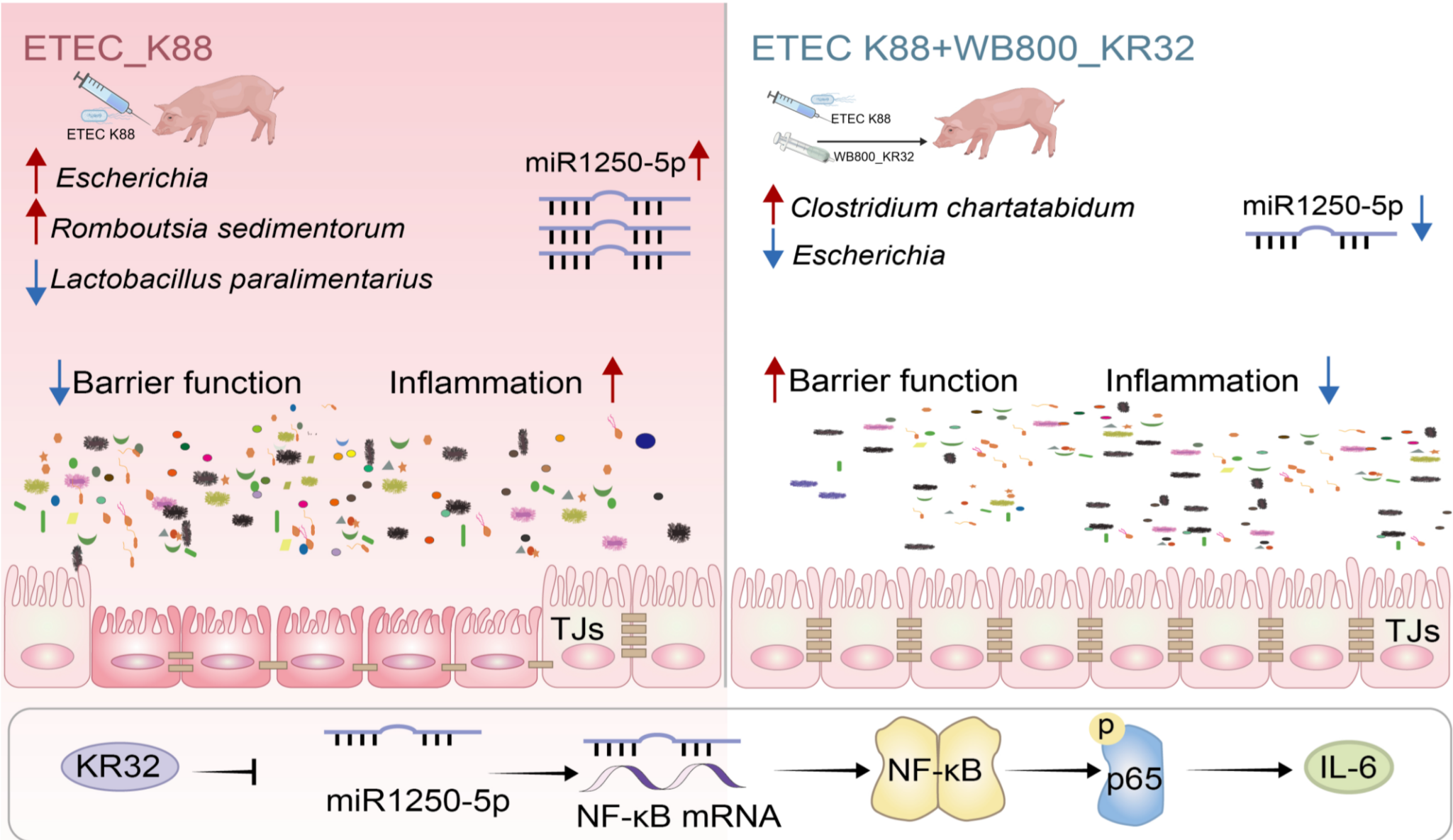
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Abstract



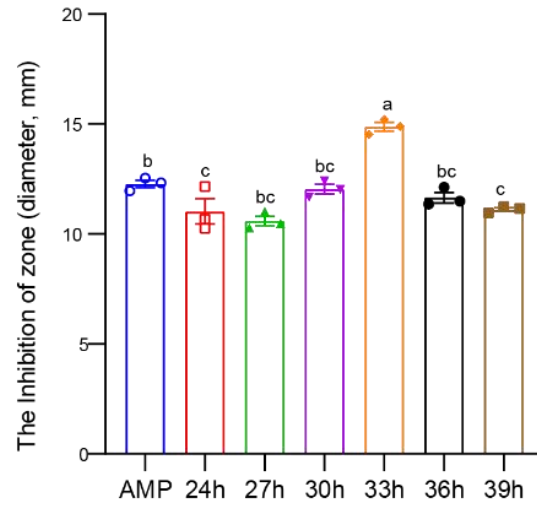


Bioactivity and yield of engineered strain WB800_KR32

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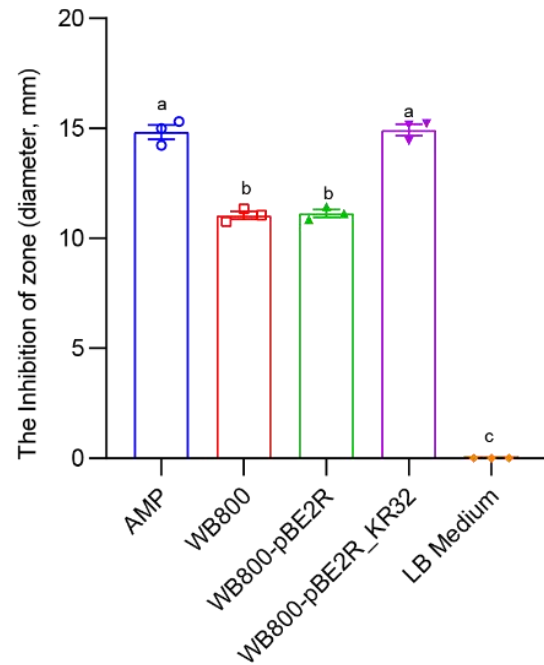
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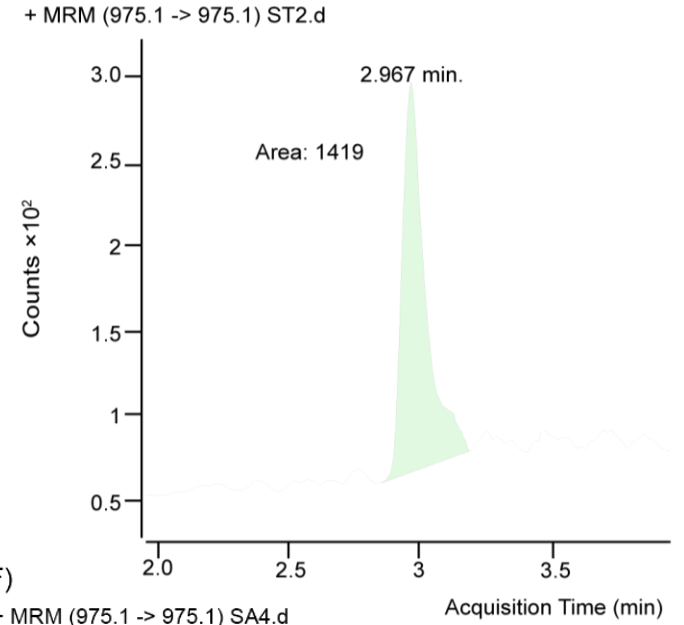
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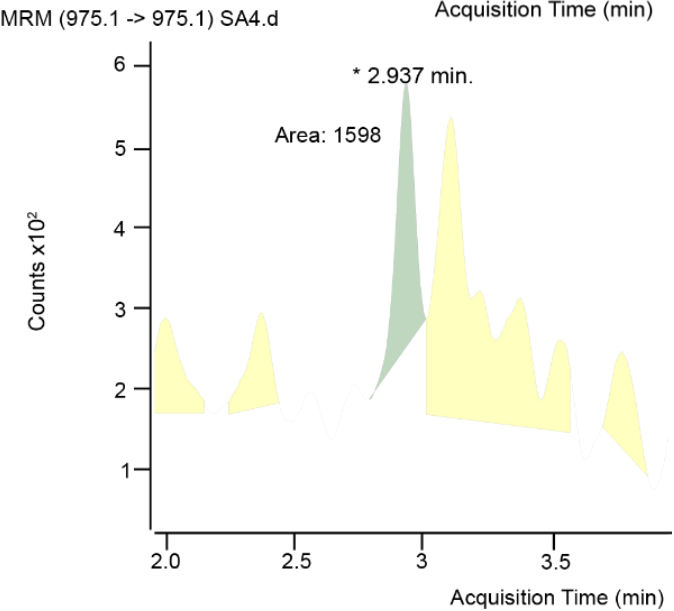
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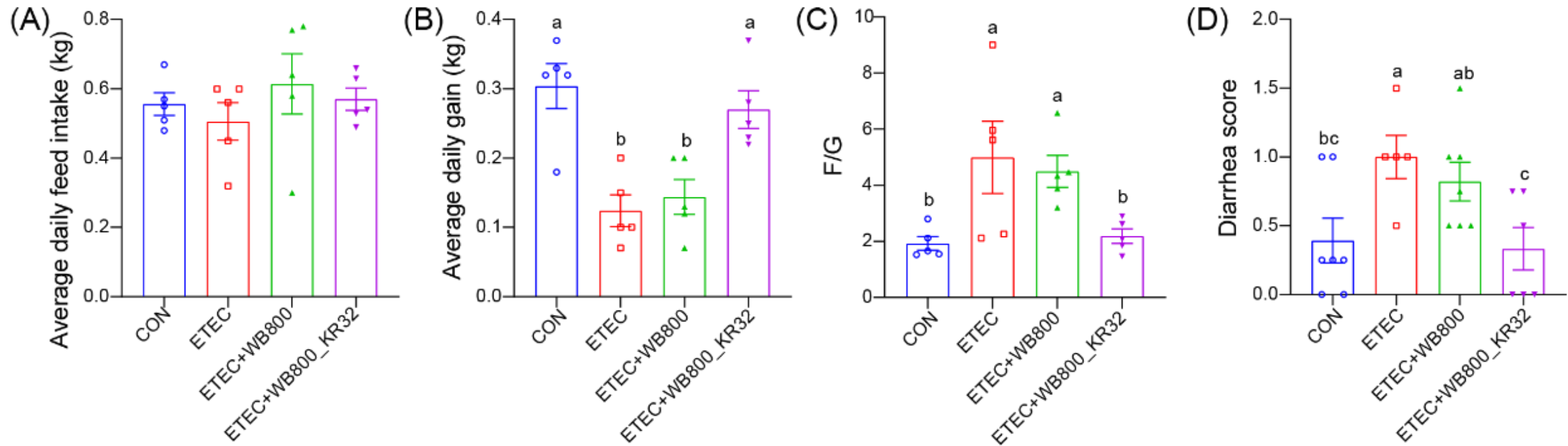
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(F)

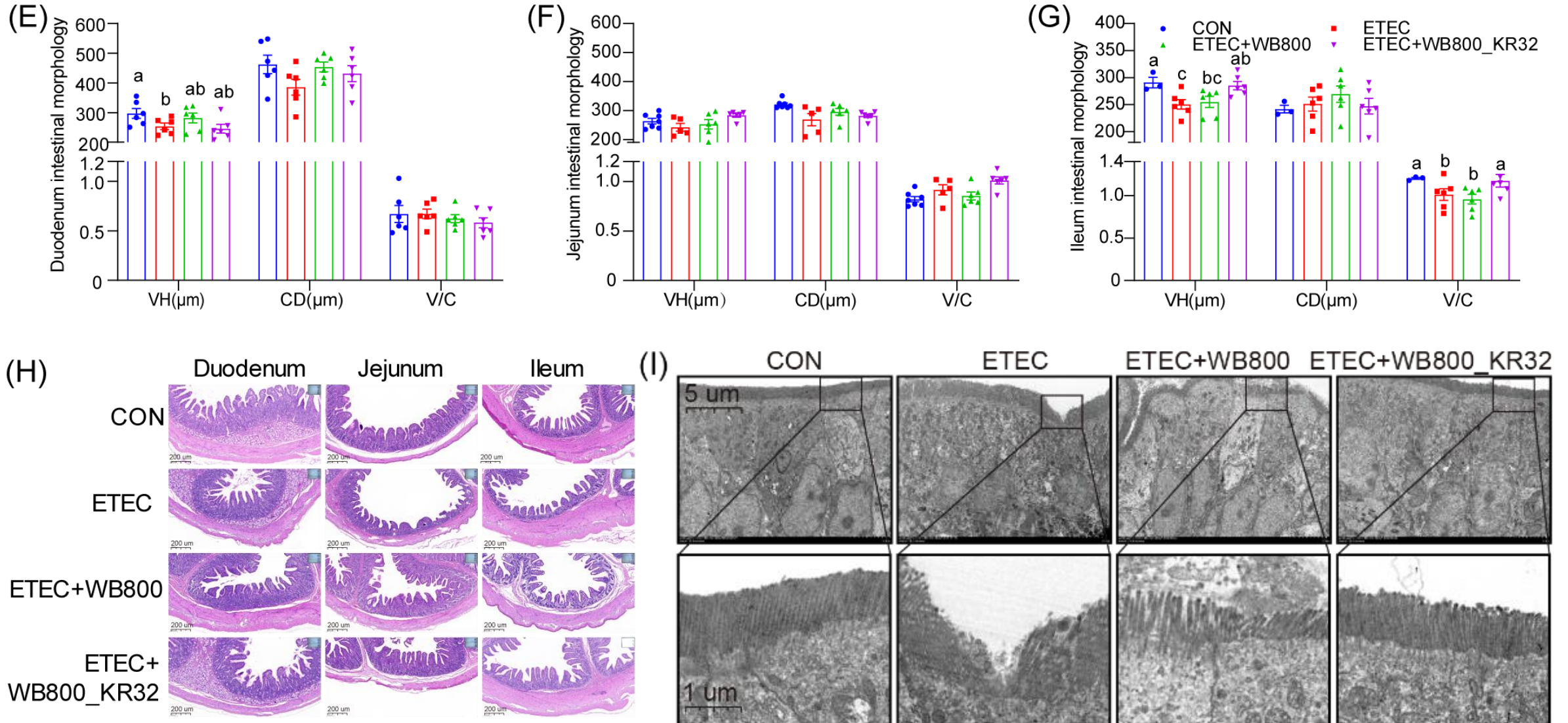


Effects of WB800_KR32 on growth performance and diarrhea scores in ETEC-infected piglets



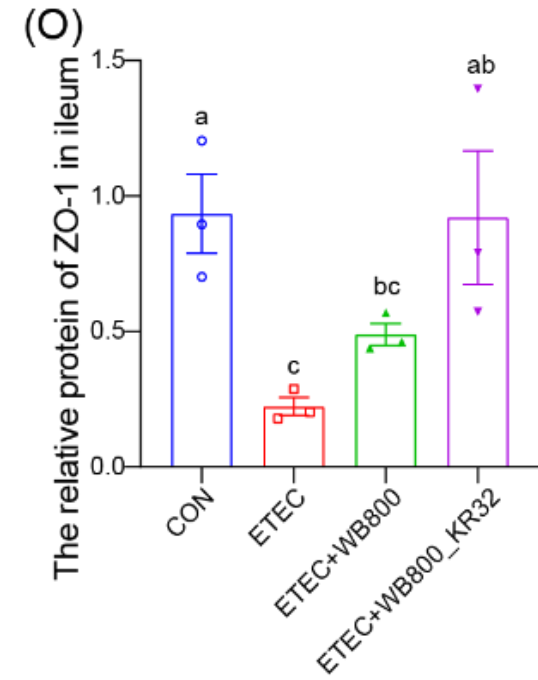
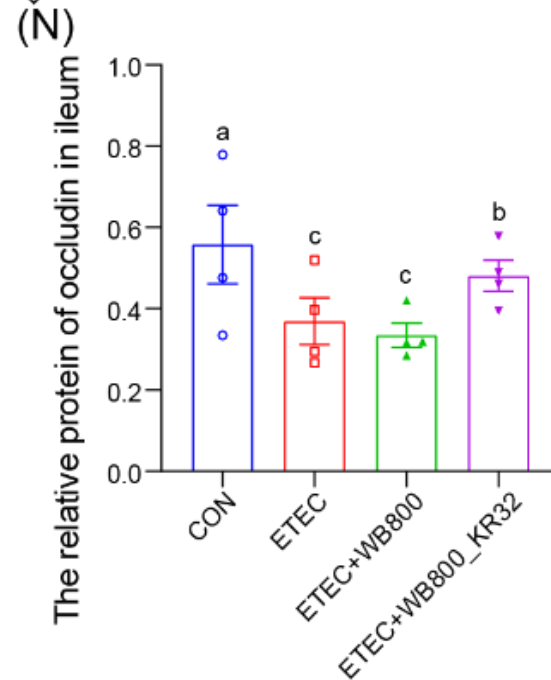
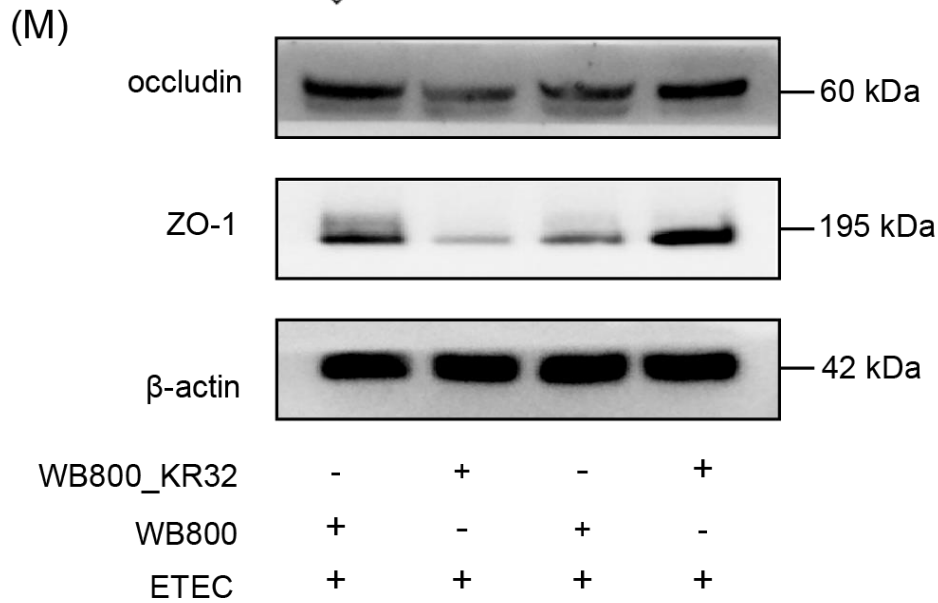
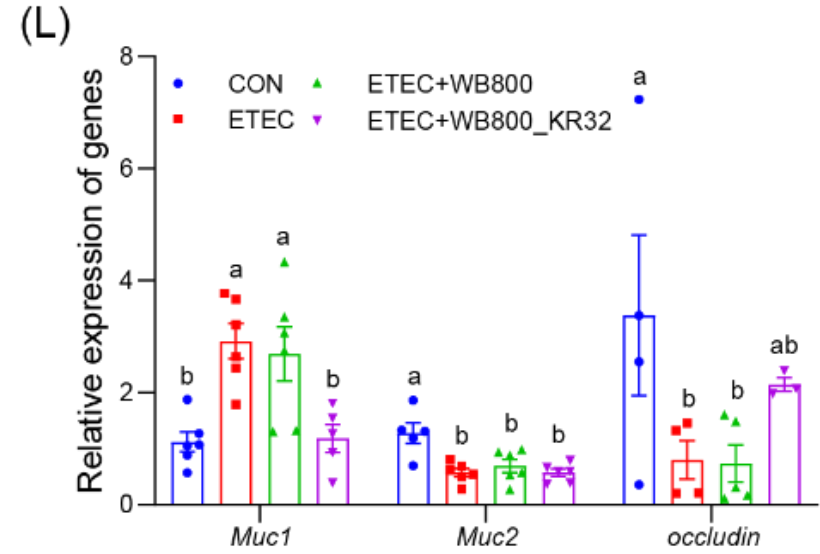
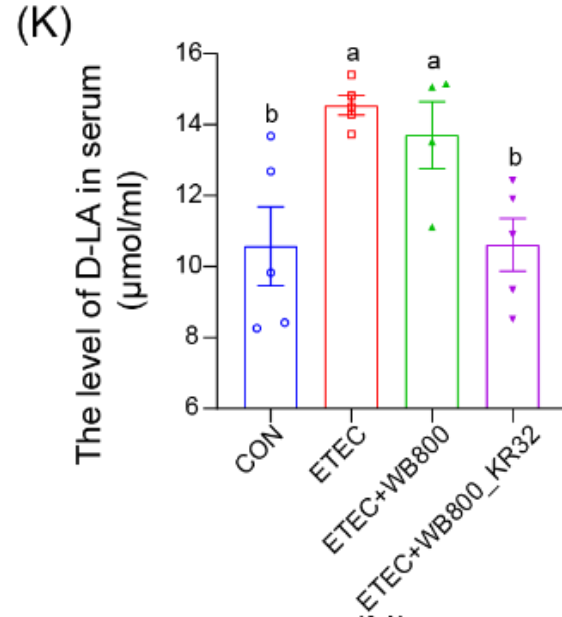
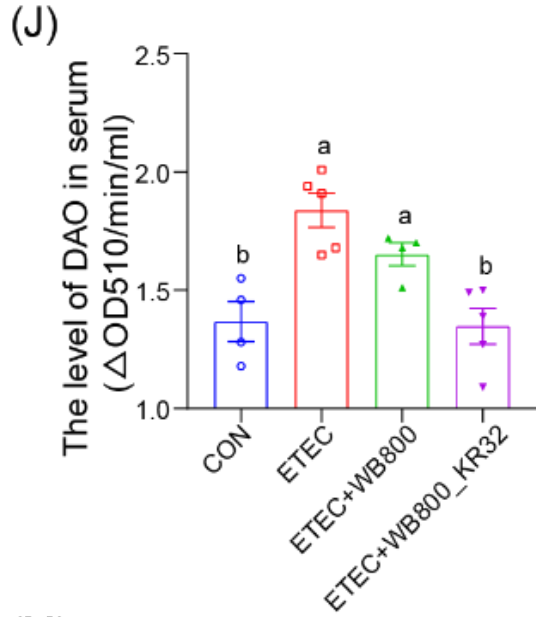


Effects of WB800_KR32 on intestinal morphology in ETEC-infected piglets



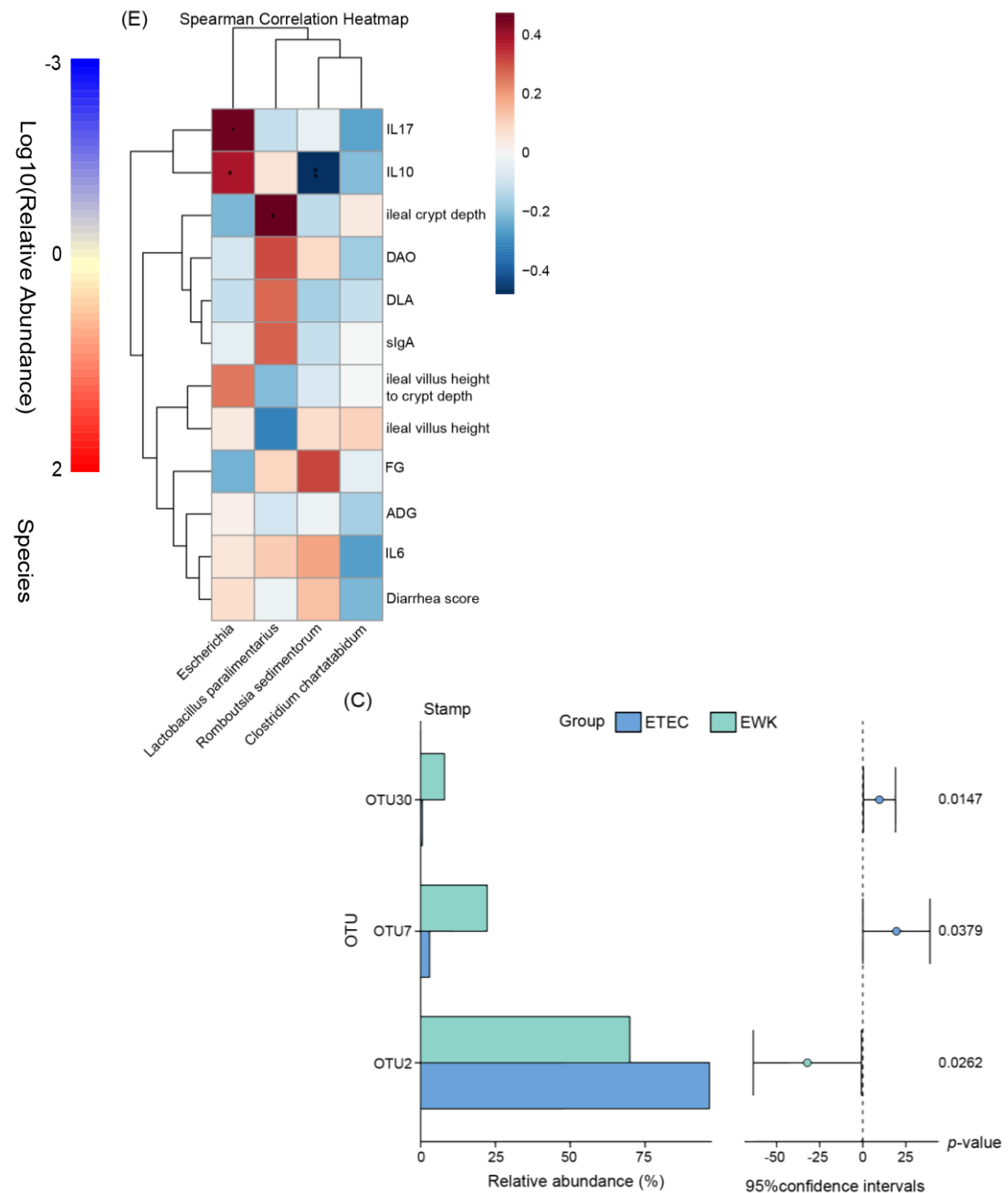
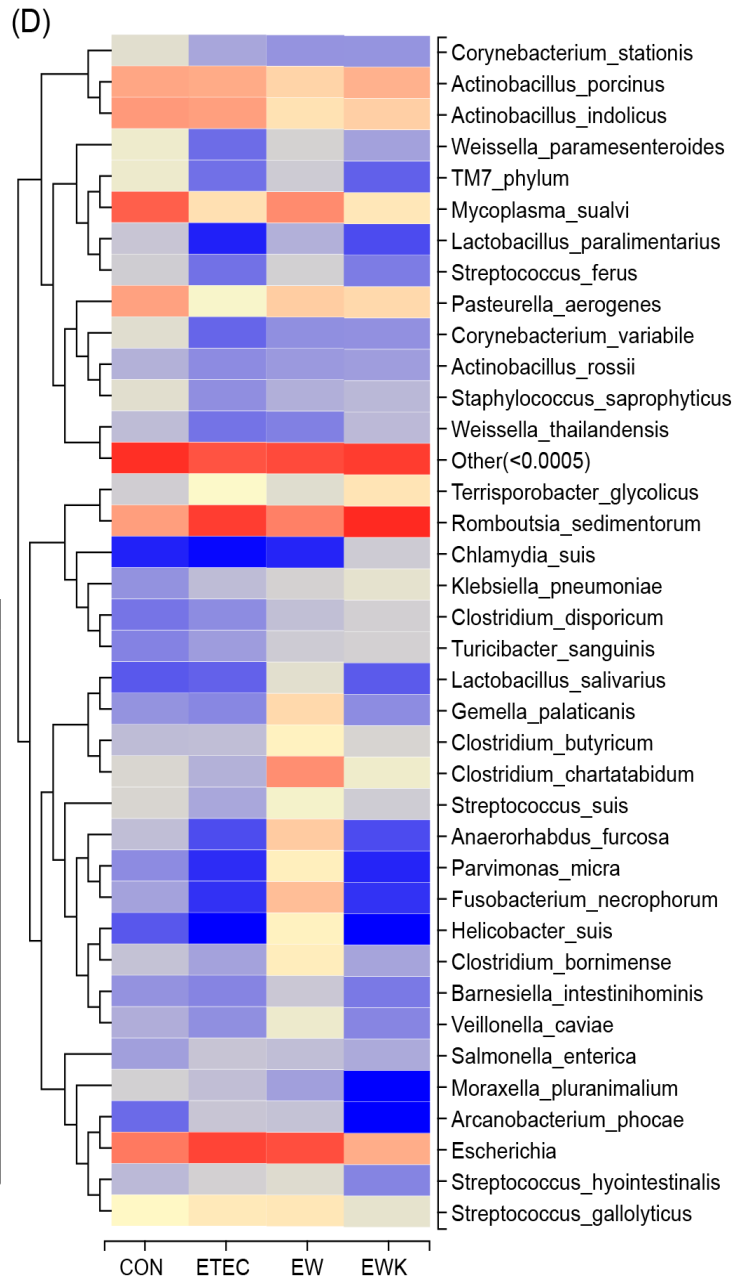
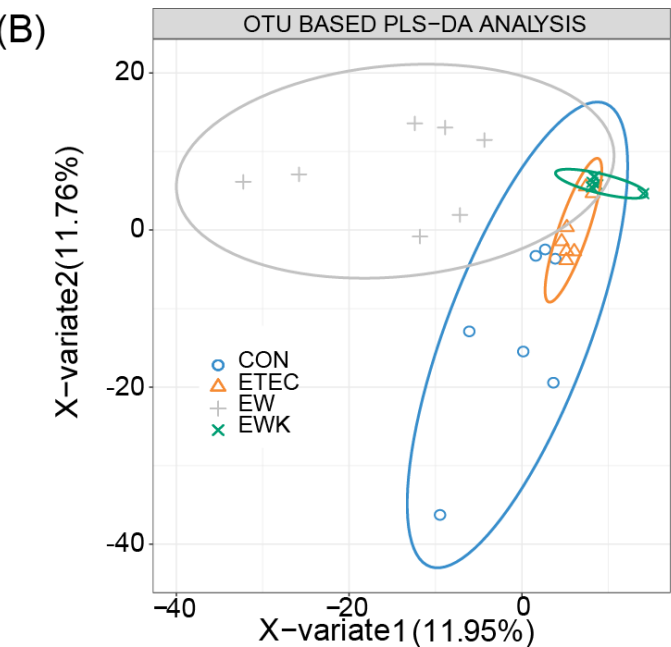
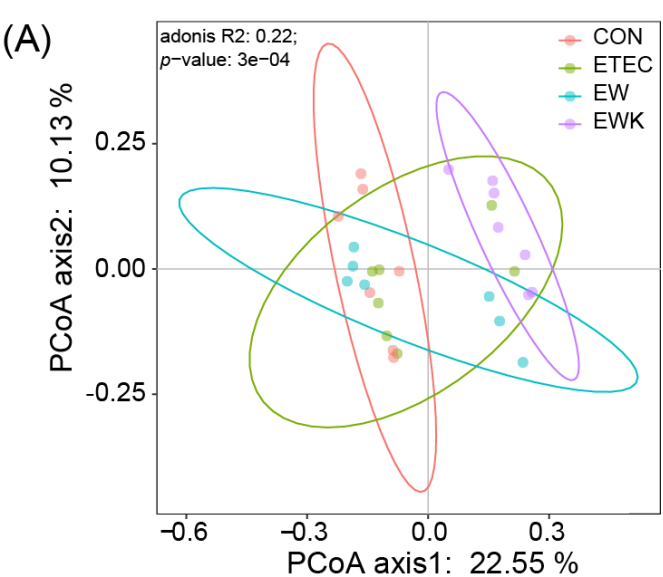


Effects of WB800_KR32 on intestinal barrier function in ETEC-infected piglets

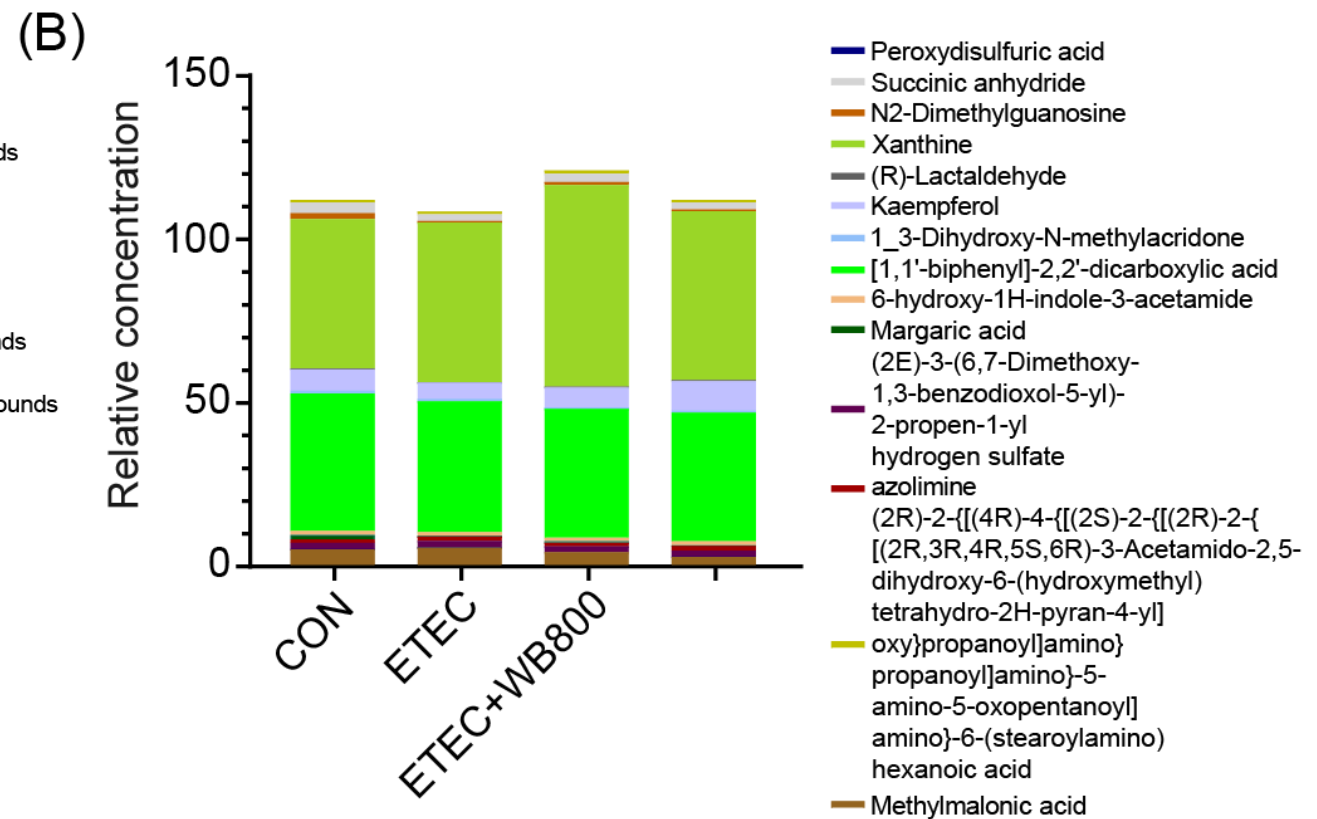
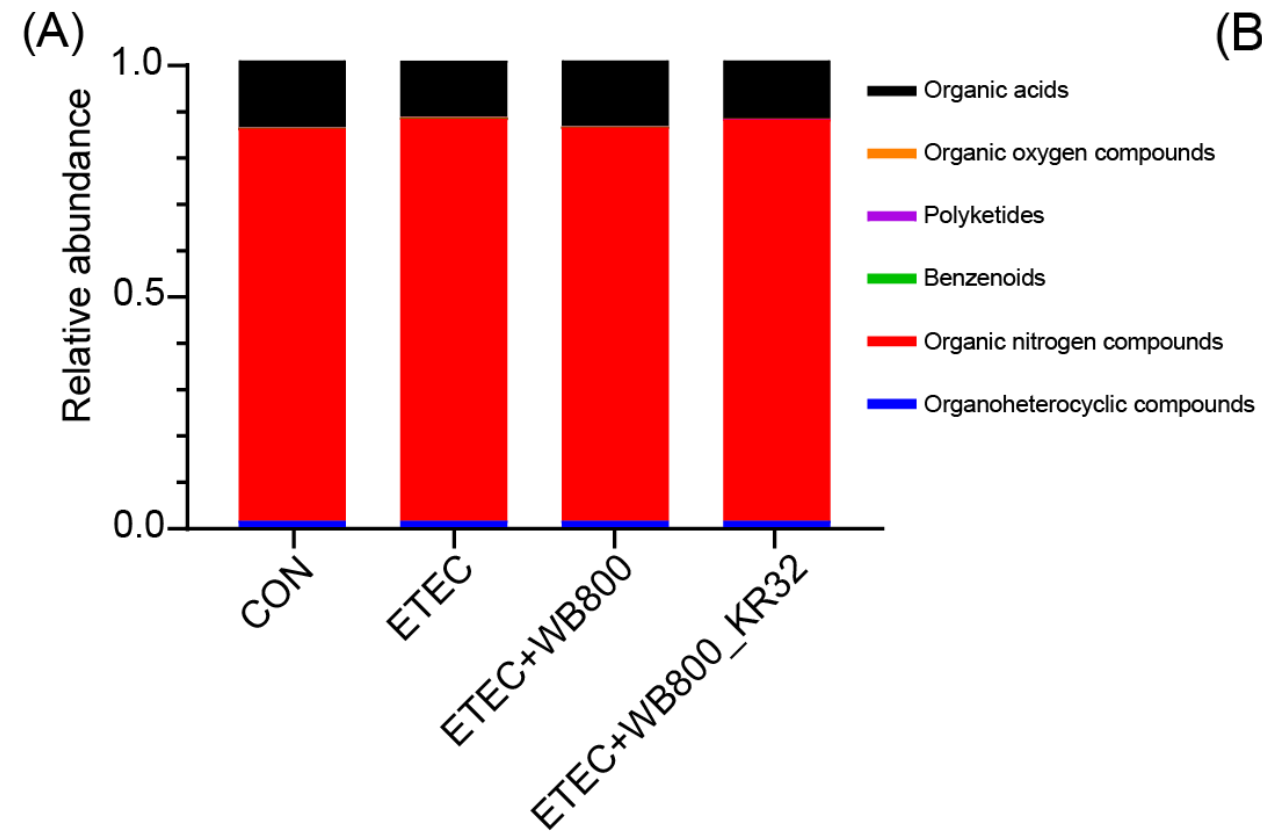




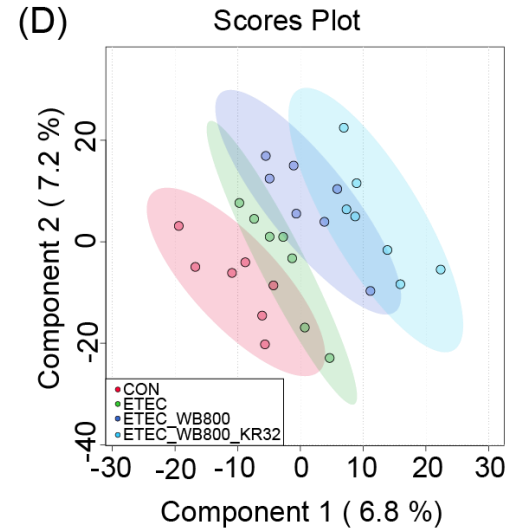
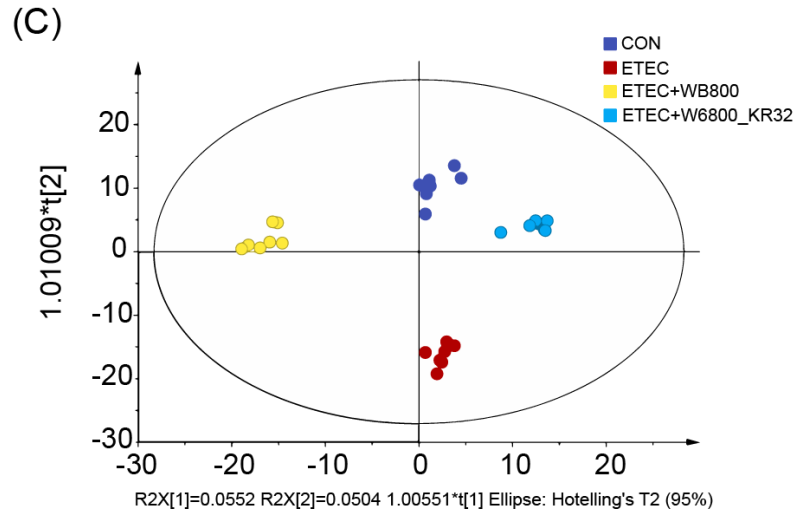
Impact of WB800_KR32 Engineered Bacteria on the Ileal Microbial Barrier



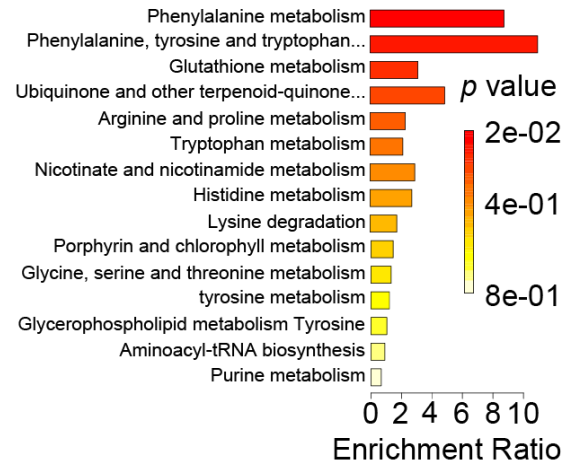
Effect of WB800_KR32 Engineered Bacteria on Serum Metabolites in ETEC K88-Infected Piglets



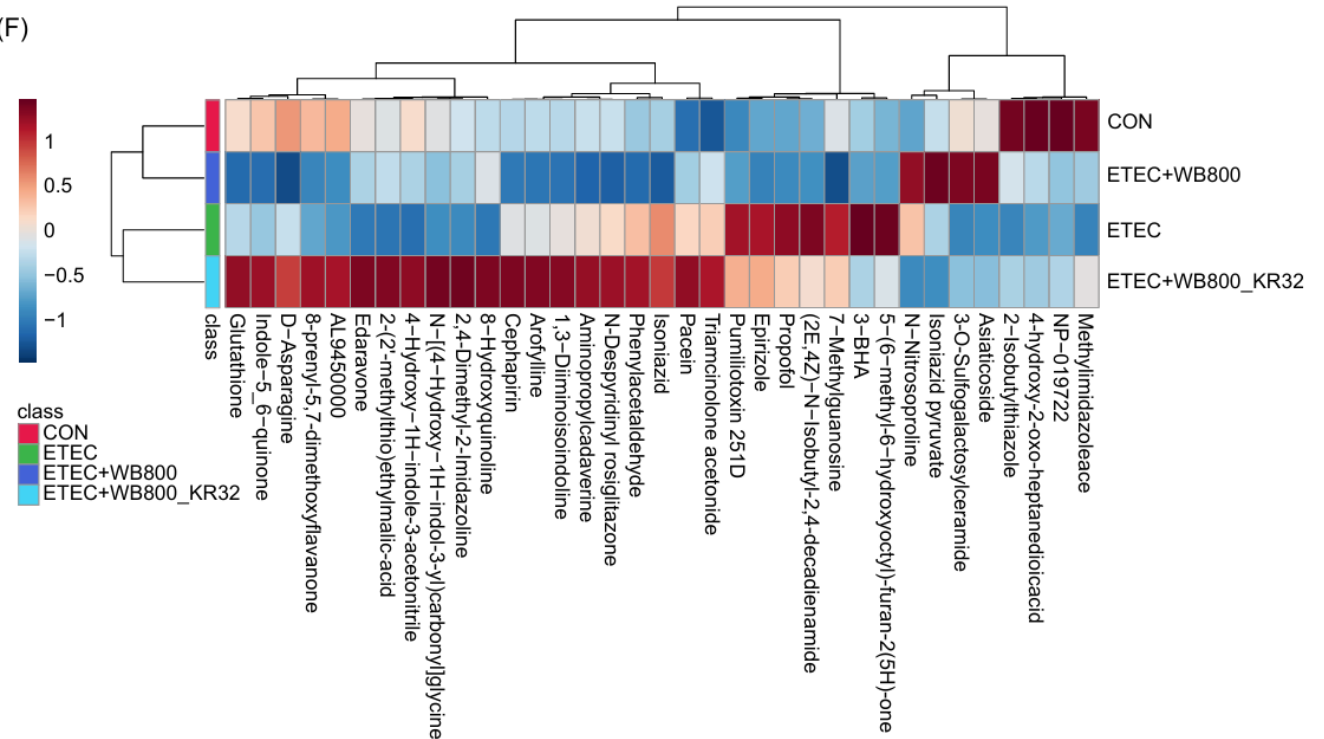
Effect of WB800_KR32 Engineered Bacteria on Serum Metabolites in ETEC K88-Infected Piglets



(E) Metabolite Sets Enrichment Overview

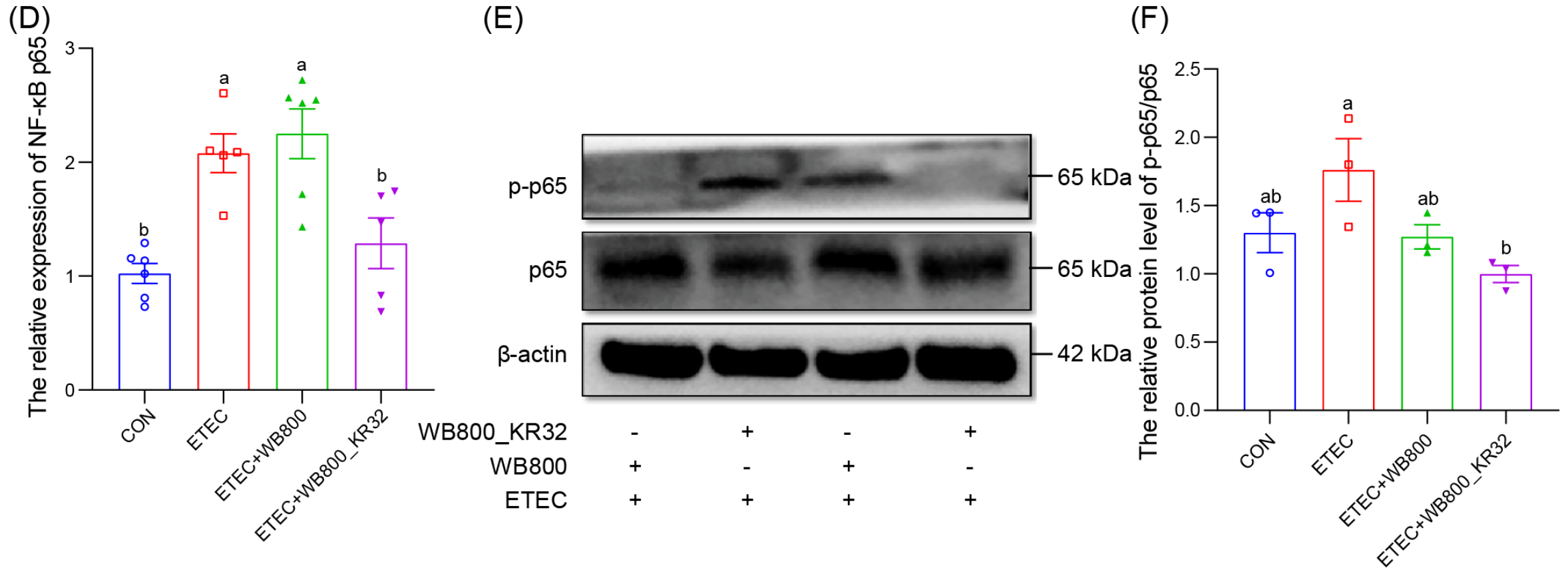


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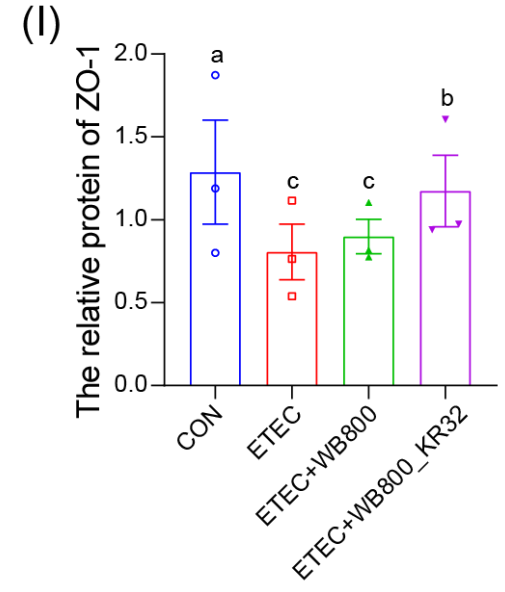
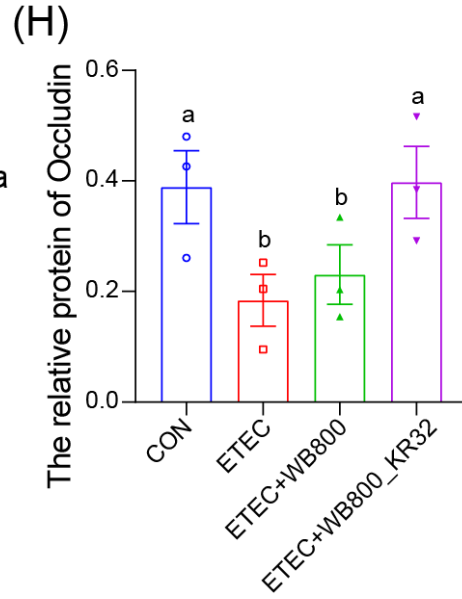
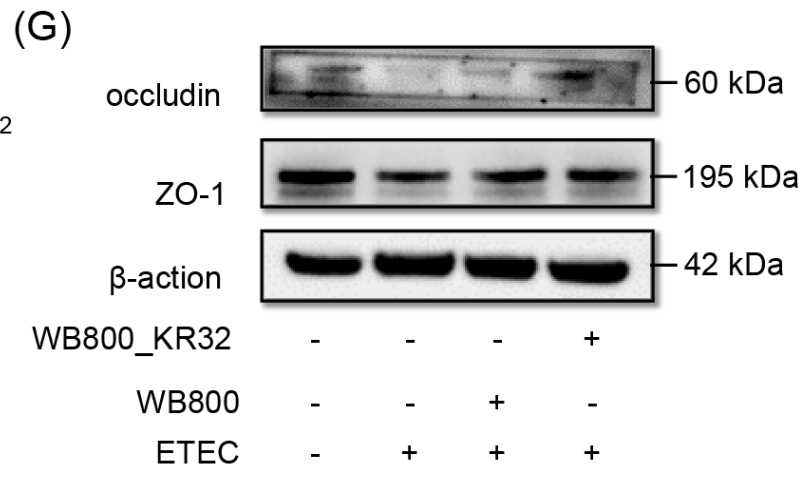
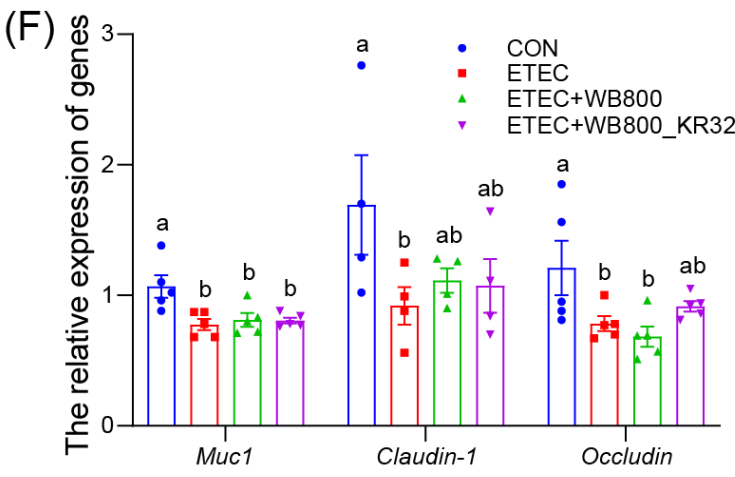
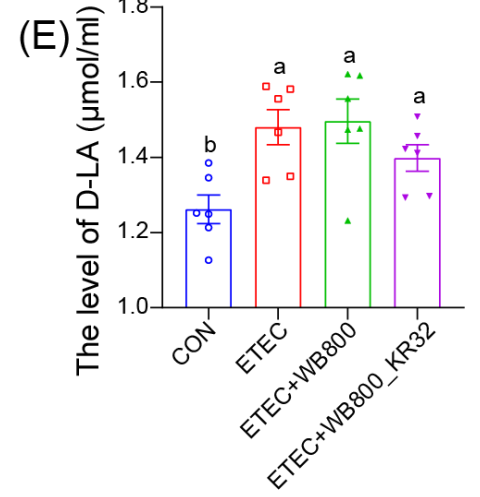
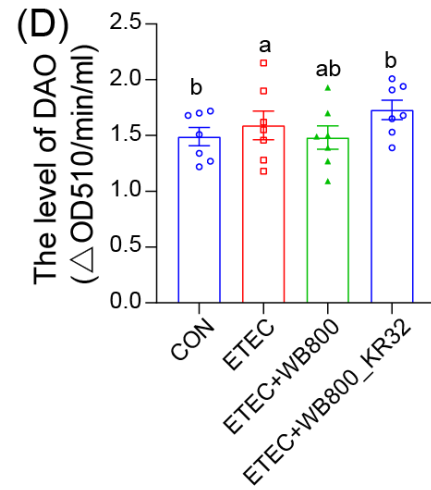
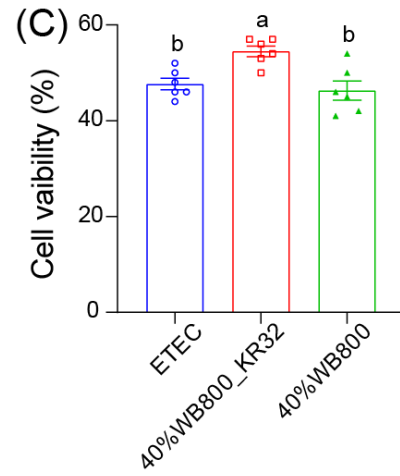
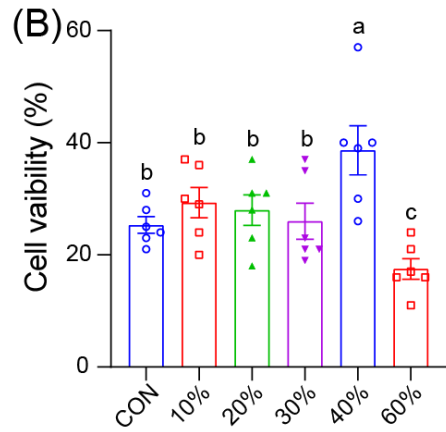
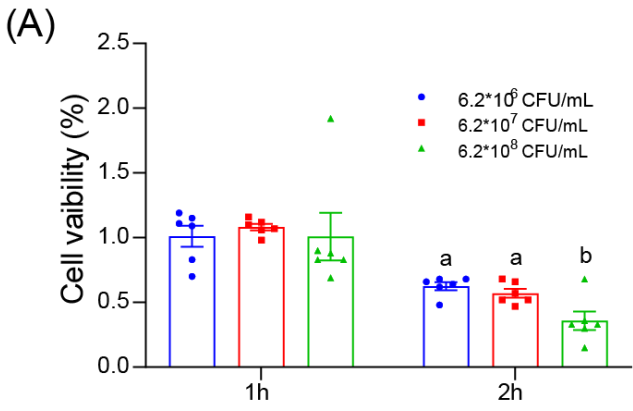




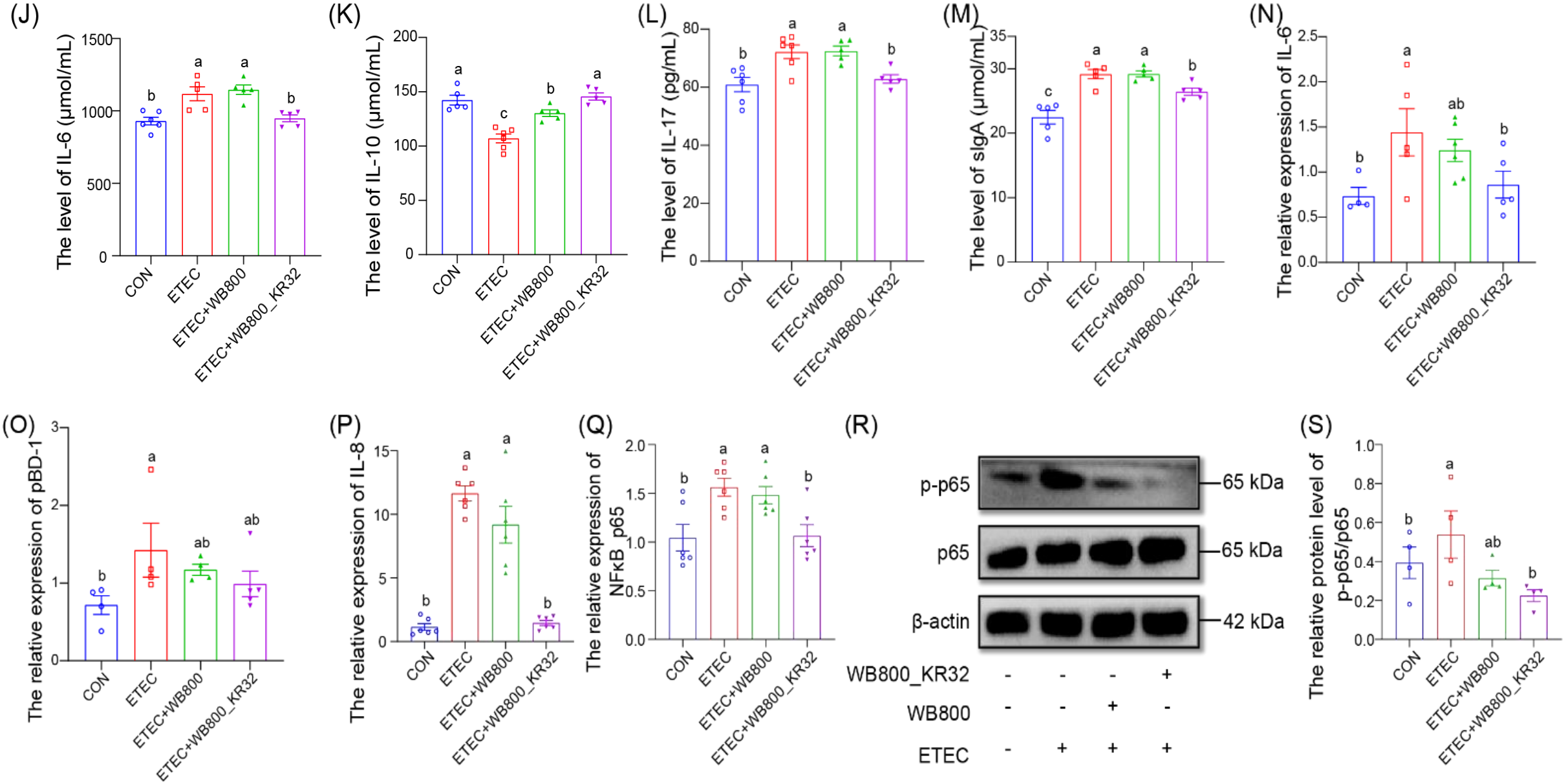
Effect of WB800_KR32 Engineered Bacteria on Ileal miRNAs



Establishment of ETEC Infection Conditions and WB800_KR32 Supernatant Treatment Conditions



Effect of WB800_KR32 Supernatant on the Immune Barrier of ETEC K88-Infected IPEC-J2 Cells





Conclusion

- Engineered WB800_KR32 demonstrated significant protective effects in both ETEC K88-infected piglets and porcine small intestinal epithelial cell models.
- It effectively modulates intestinal barrier function through the novel ssc-miR-1250-5p/NFκB/IL-6 signaling pathway, exhibiting markedly superior protective efficacy compared to the parental WB800 strain with only basic functions.
- This study provides novel research perspectives and application strategies for utilizing engineered probiotics to deliver antimicrobial therapies.

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