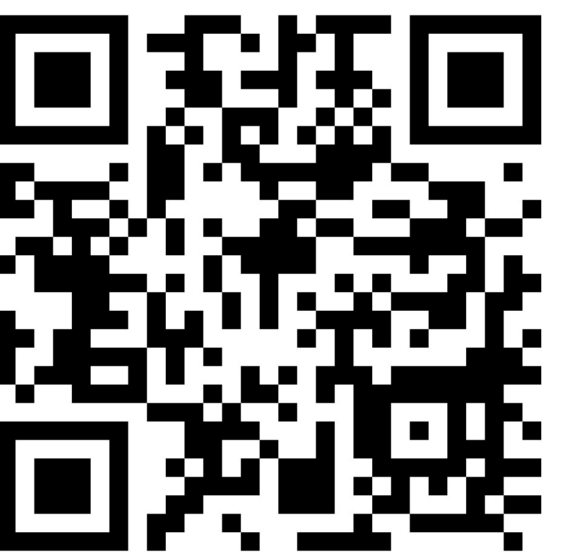




Effects of Non-Nutritive Sweeteners on the Morphology of the Small Intestine During the Weaning Period in Pigs

MICHIGAN STATE UNIVERSITY
Department of Animal Science
Presentation #104

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INTRODUCTION

- Weaning stress in pigs can escalate mortality rates up to 10%, worsened by their fragile digestive systems, leading to reduced nutrient absorption and increased susceptibility to diseases like diarrhea. (Kim et al., 2022).
- Due to restrictions on antibiotics, alternative nutritional approaches are being investigated, with limited research on non-nutritive sweeteners (Chen et al., 2020).
- Our data showed that non-nutritive sweeteners improved growth performance reduced diarrhea on weaned pigs (Jansen et al., 2024).

OBJECTIVE

To investigate the effects of non-nutritive sweeteners on the intestinal morphology of weaned pigs.

MATERIALS & METHODS

Experimental Design

- Randomized Complete Block Design (Blocks: Body weight & Sex)
- 168 weaning pigs (21-day old; 6.21 ± 0.45 kg)
- Intestinal sample collection: Day 14 & 28 post-weaning
- Measurements: Villi height, width, area, & crypt depth

Nursery basal diet (CON)

- CON + 150 mg/kg of Sucralose (SCL)
- CON + 30 mg/kg of Neotame (NEO)
- CON + 50 mg/kg of Carbadox (CBX)



1 Diet mixing



2 Allotment



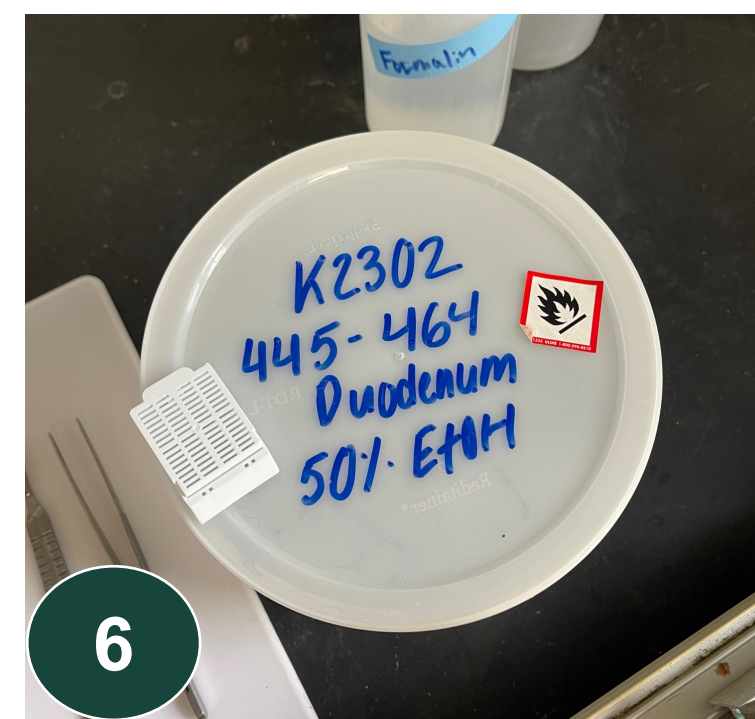
3 168 weaned pigs



4 Sample collection & Processing



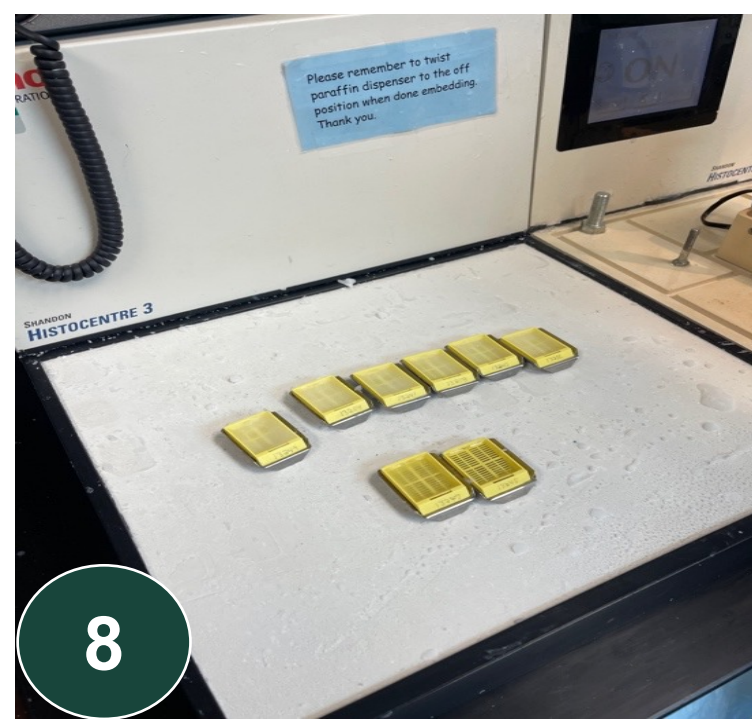
5 Sample collection & Processing



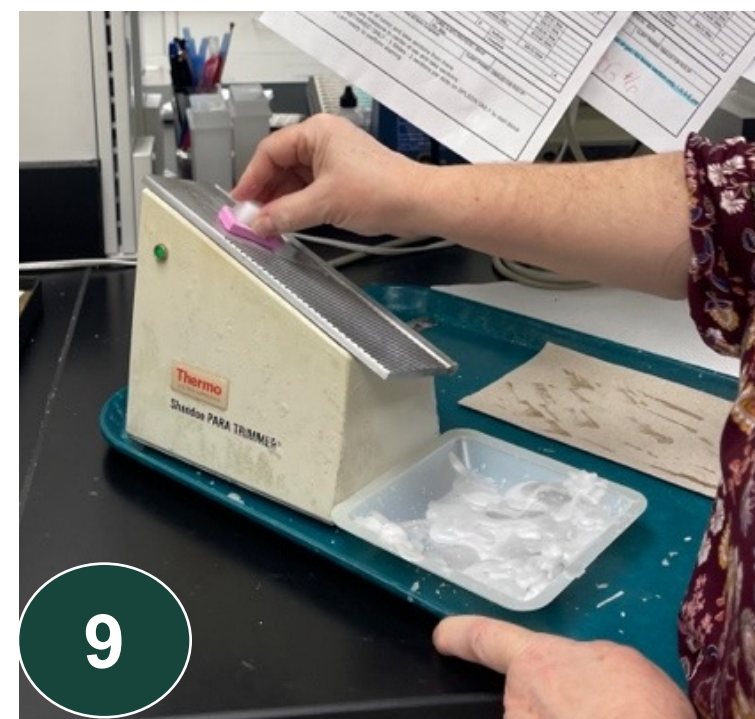
6 Stored in EtOH



7 Tissues were embedded in paraffin



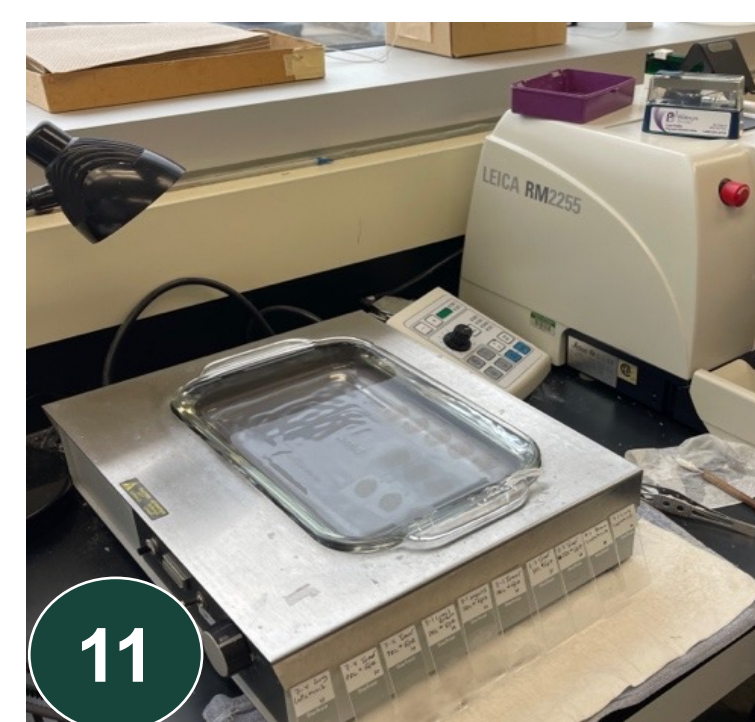
8 Tissues were embedded in paraffin



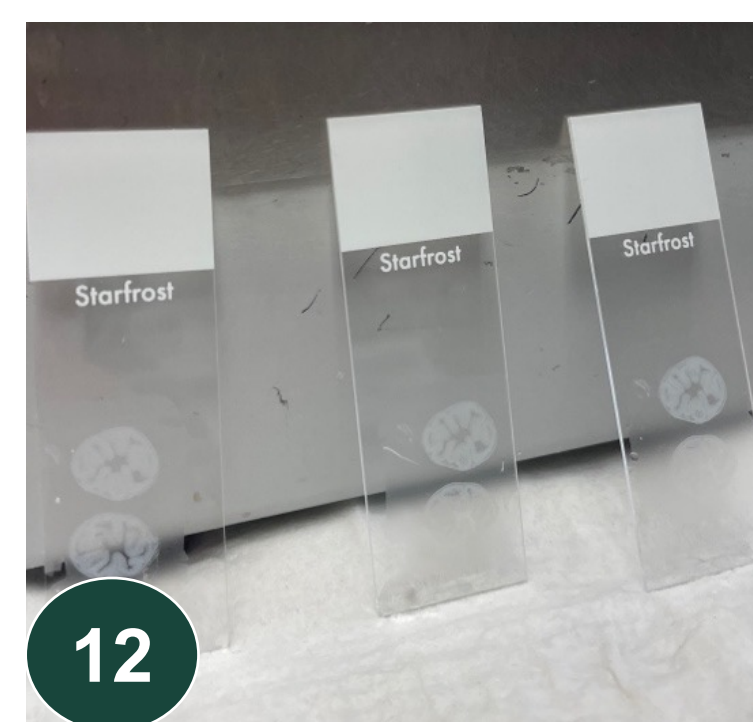
9 Fine-cutting & Ribbon-cutting



10 Fine-cutting & Ribbon-cutting



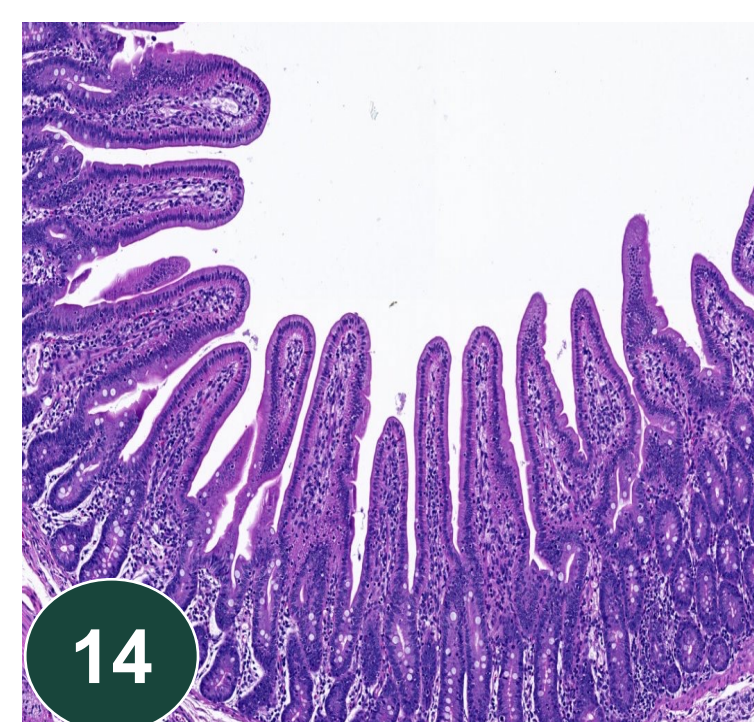
11 Mounted on a slide



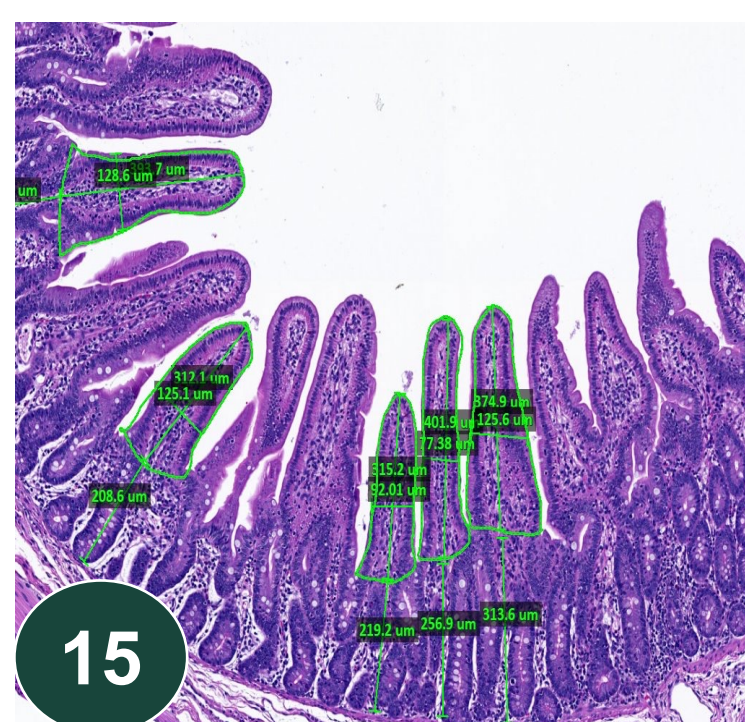
12 Mounted on a slide



13 Stained with H&E

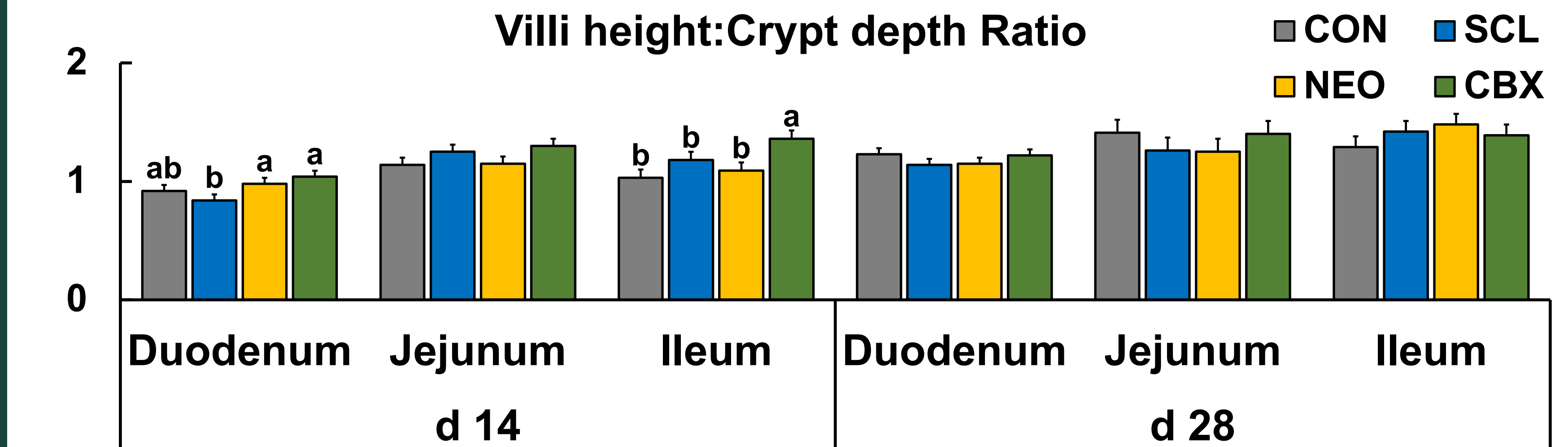
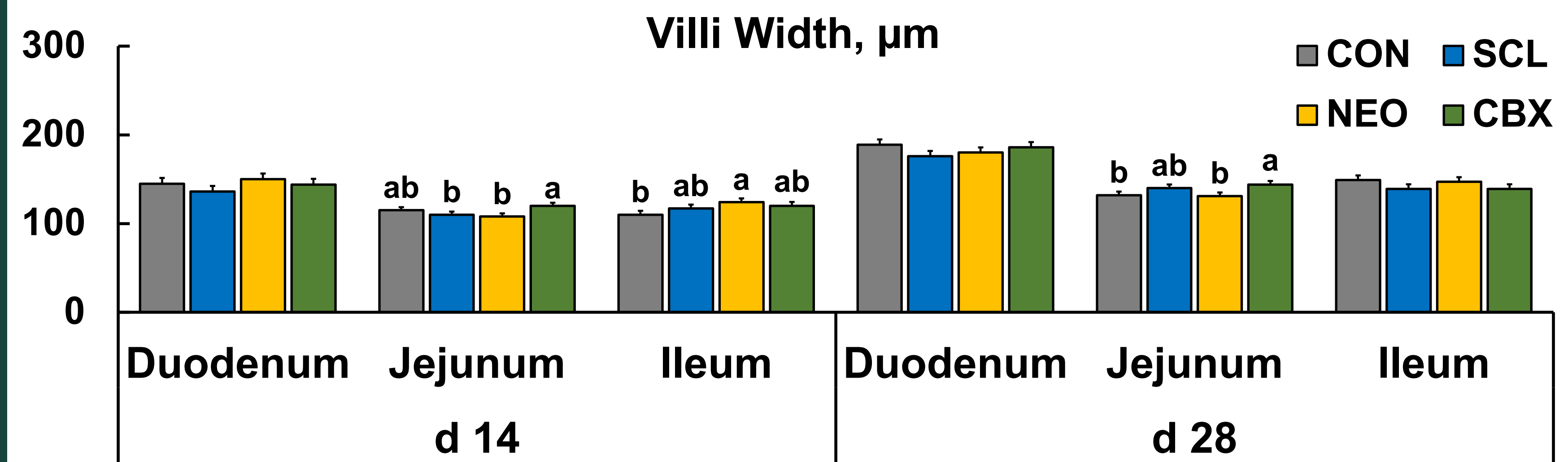
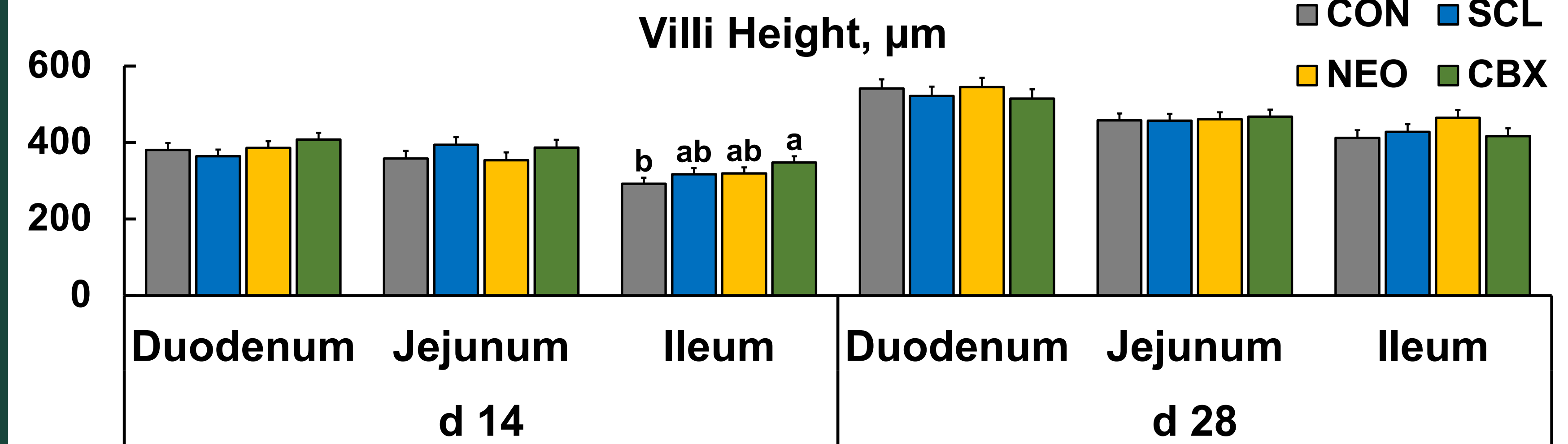


14 Scanned & Measured



15 Scanned & Measured

RESULTS



CONCLUSIONS

- Non-nutritive sweeteners and antibiotics have shown positive effects on the intestinal morphology of weaned pigs.
- The results support our previous findings, indicating that non-nutritive sweeteners improve growth performance and reduce diarrhea in pigs.
- Data supports the idea that non-nutritive sweeteners can serve as an antibiotic alternative on intestinal development in post-weaning pig.

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