

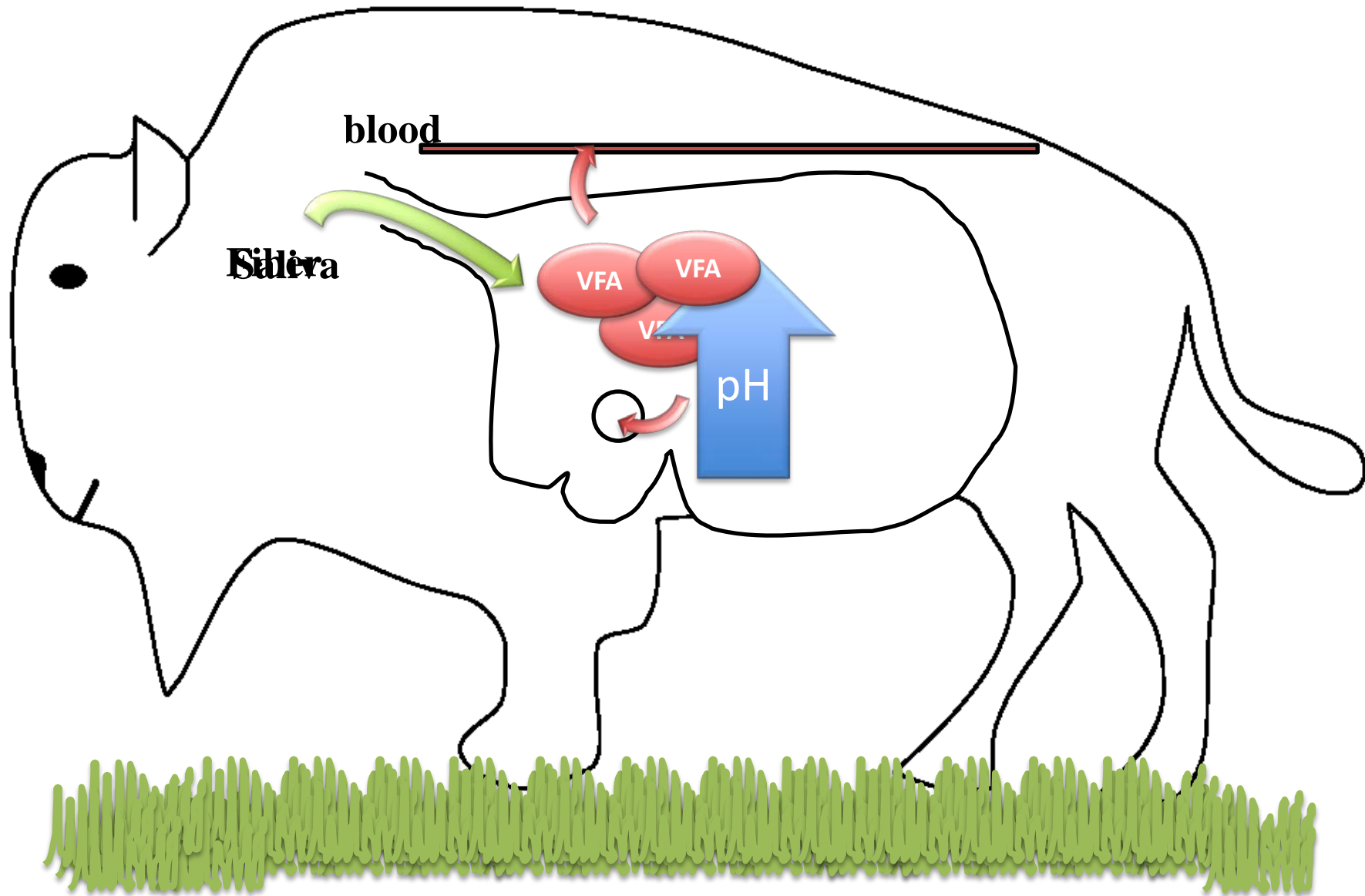


# Effect of backgrounding and finishing diets on growth and rumen health in Bison and Beef Cattle

*M.E. Walpole, P. Górka, M. Woodbury, L.L. Guan, T. Mutsvangwa and G.B. Penner*

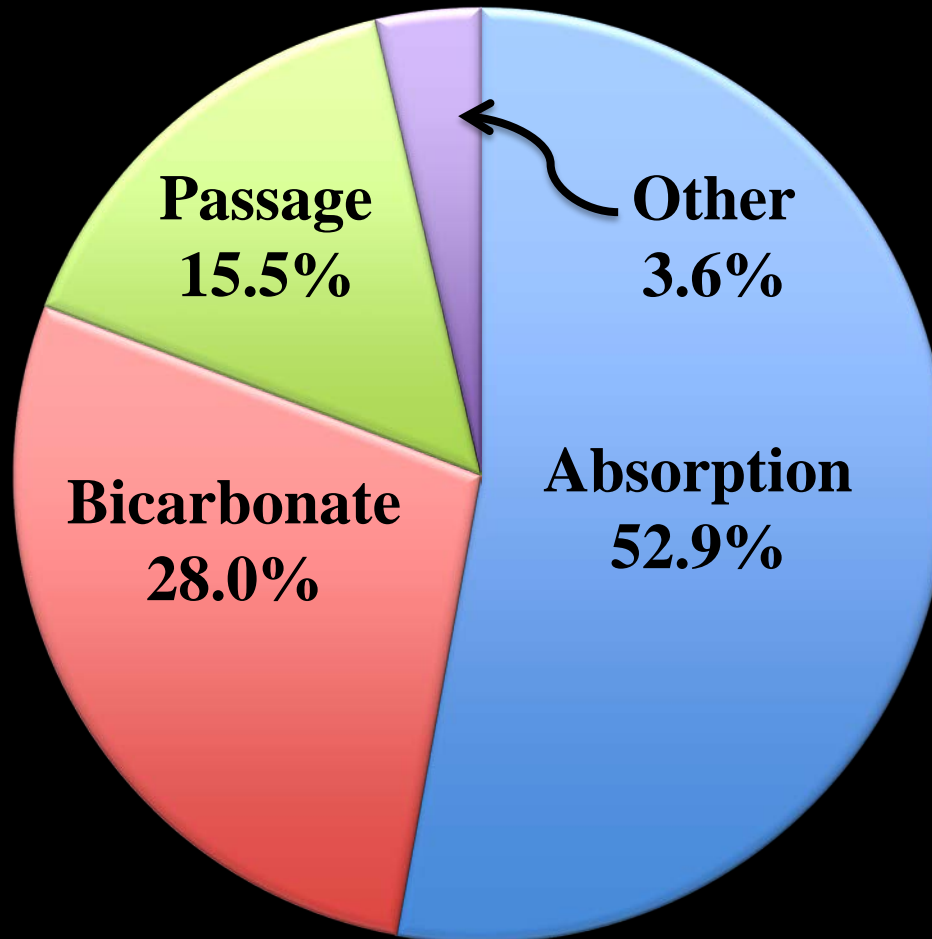


# Feed Digestion

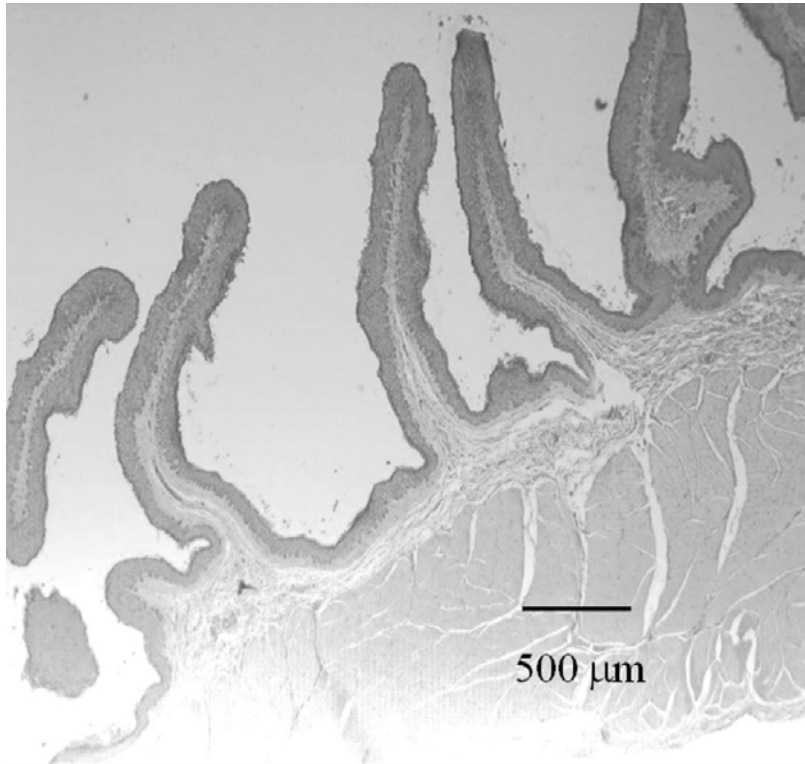


# Removal of Acid from the Rumen

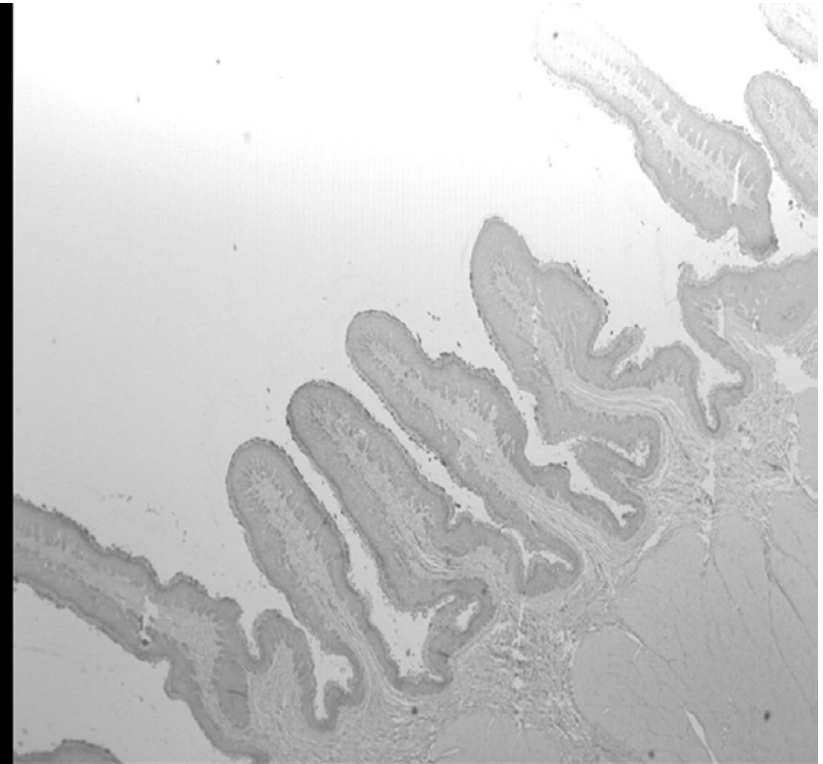
Acid removal from the rumen



# Rumen Adaptation

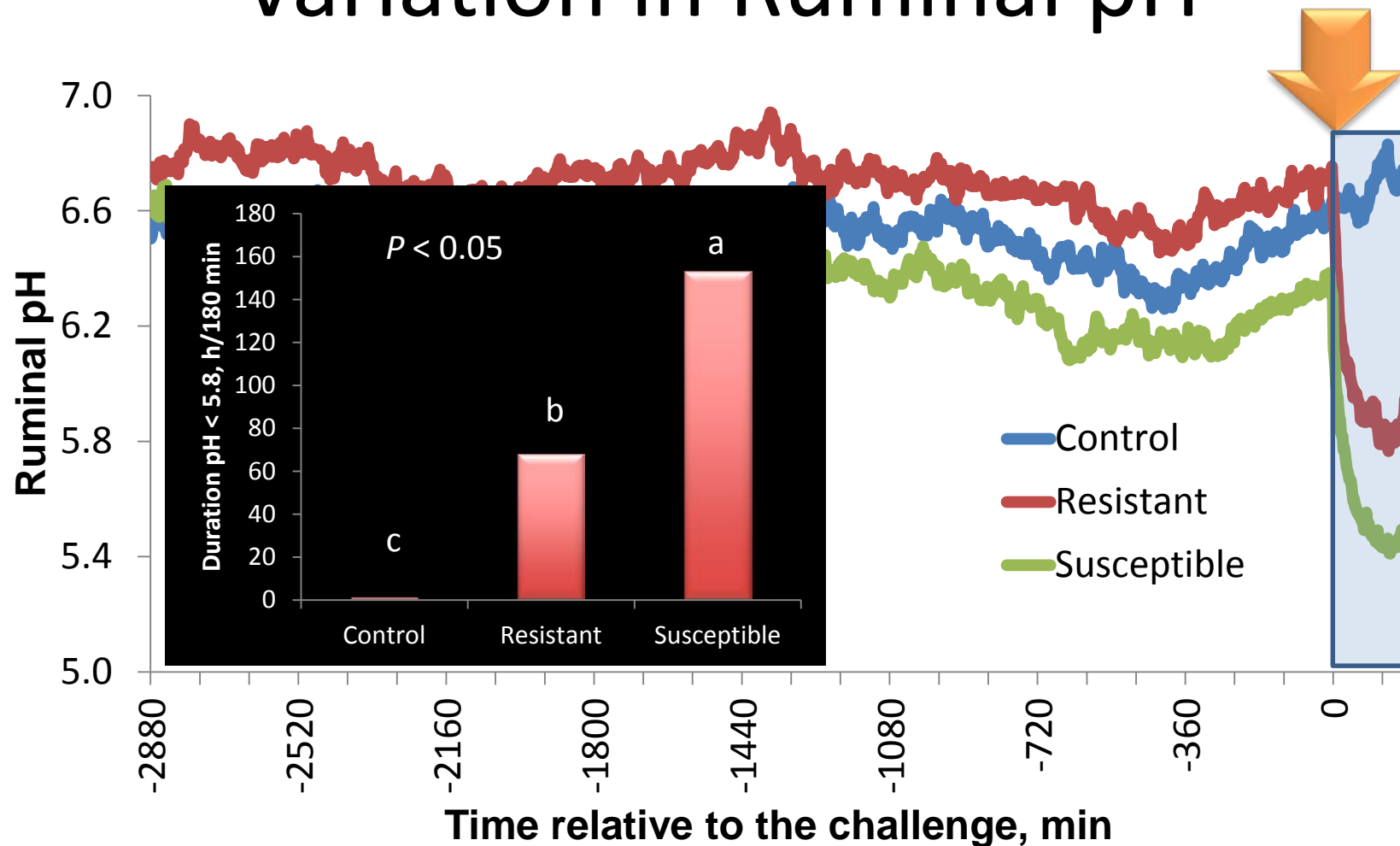


**Grain challenge**

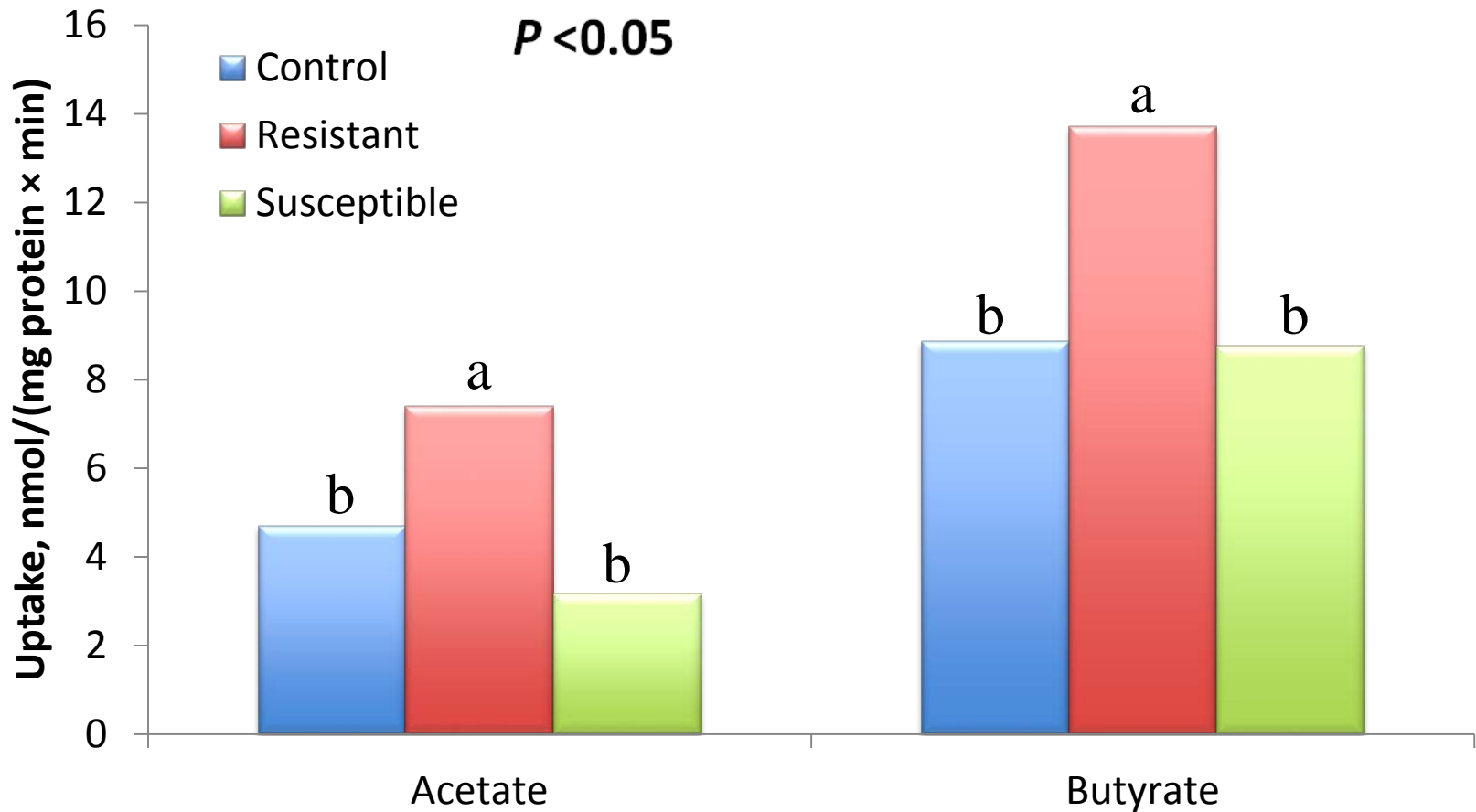


**Control**

# Variation in Ruminant pH



# Total SCFA uptake and ruminal pH



# Materials and Methods

- 23 yearling beef bulls and 23 2-yr old bison bulls were blocked by weight and randomly assigned to dietary treatment
  - Backgrounding ( $n = 16$ )
  - Finishing ( $n = 16$ )

Ingredient (%DM)	Backgrounding	Finishing
Barley Silage	45	10
Rolled Barley	45	80
Mineral Supplement	10	10

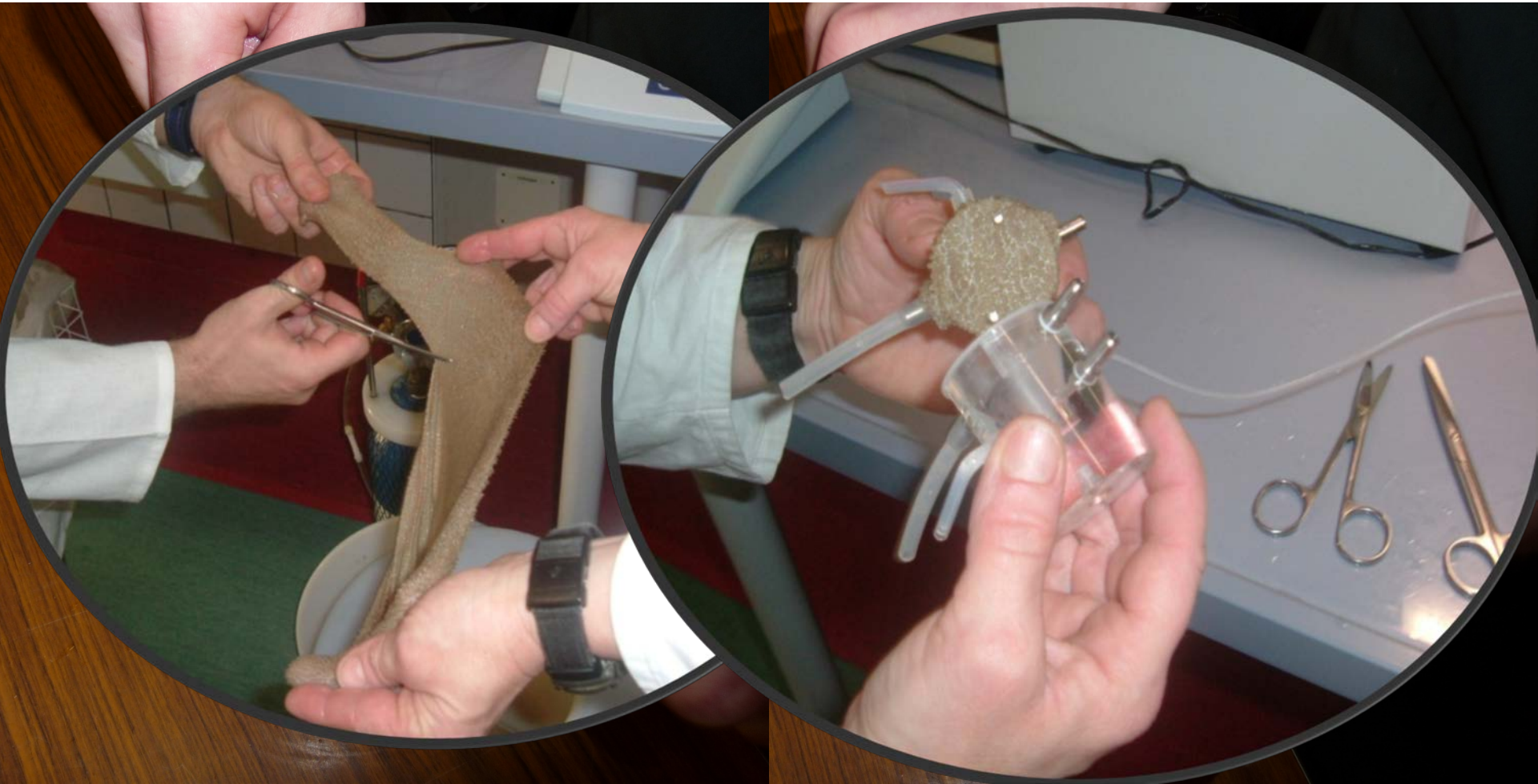


# Materials and Methods

- Animals were grouped 3hd/pen
- Blood was collected from each animal 1 day before slaughter.
- Two animals per pen were killed each week (one per day) at a local abattoir
- Rumen fluid was collected at slaughter for determination of ruminal SCFA concentration



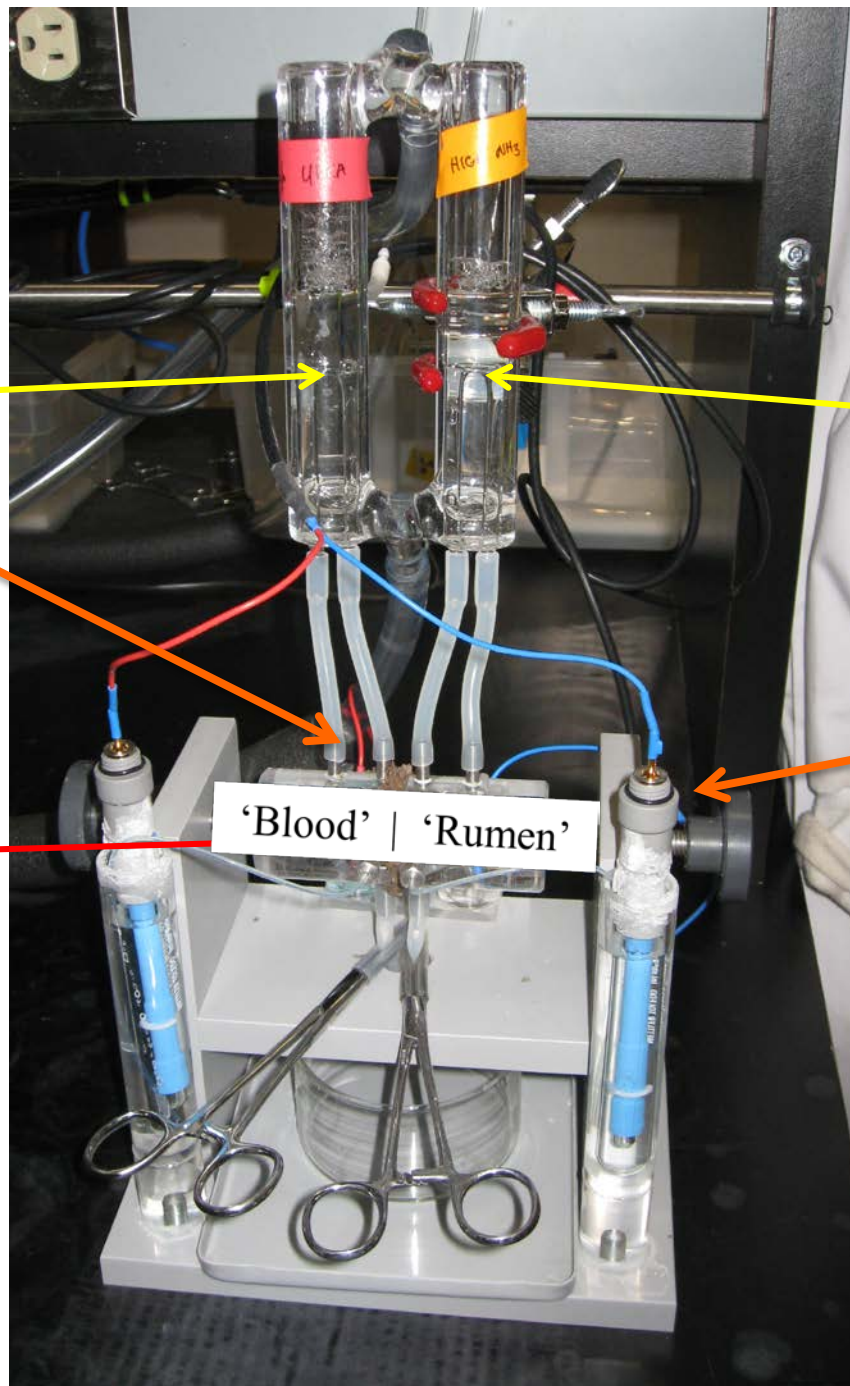
# Materials and Methods



Serosal buffer  
(Blood)

Current electrodes

Tissue



Mucosal buffer  
(Rumen Fluid)

Voltage electrodes

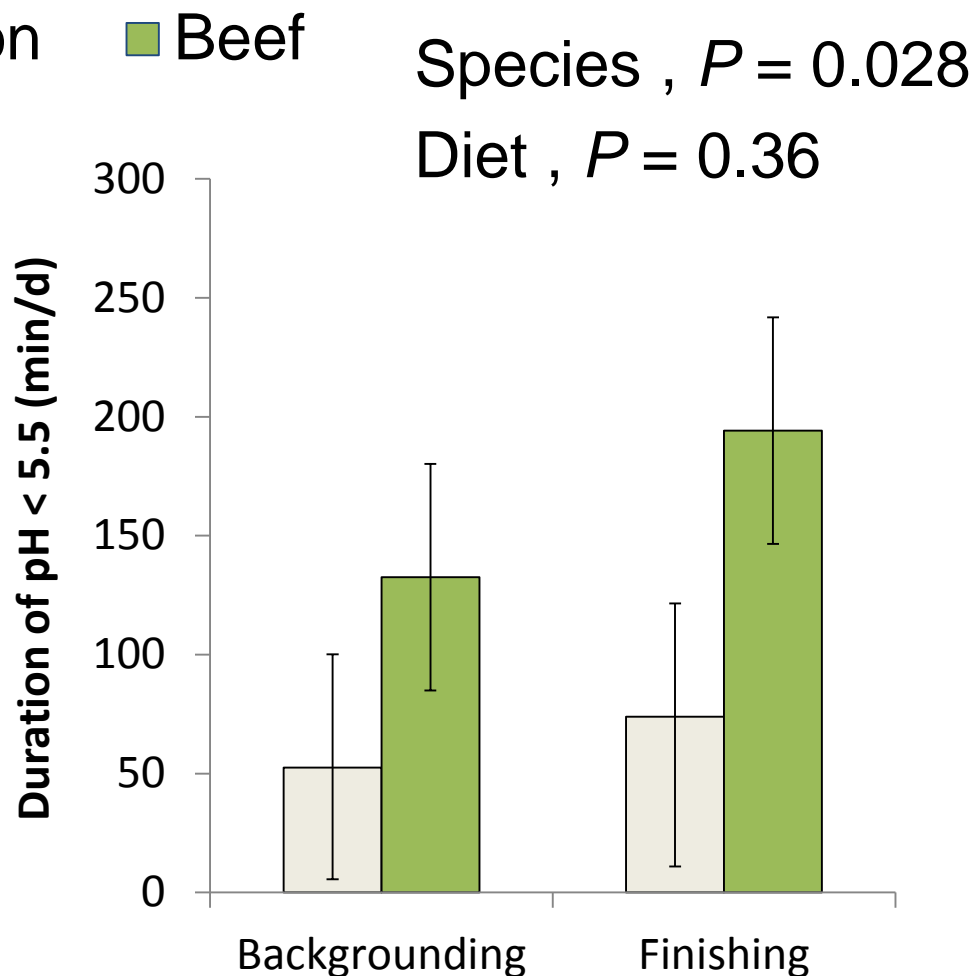
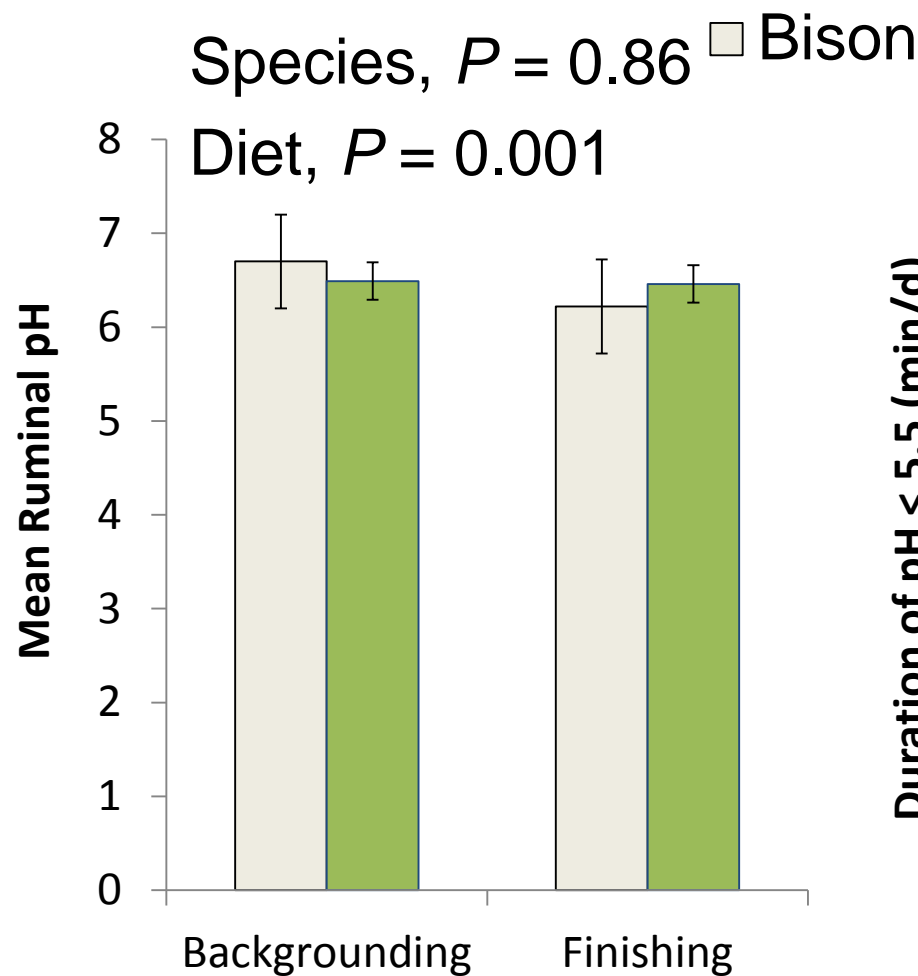


# Statistics

- Proc Mixed of SAS (9.3)
  - Species, Diet, Block, Treatment and order of kill were Fixed
  - Tissue Replicate as Random
- Regression analysis performed using Proc Reg of SAS (9.3)
- Significance at  $P \leq 0.05$ ; trends at  $0.05 < P < 0.10$



# Results – Ruminant pH

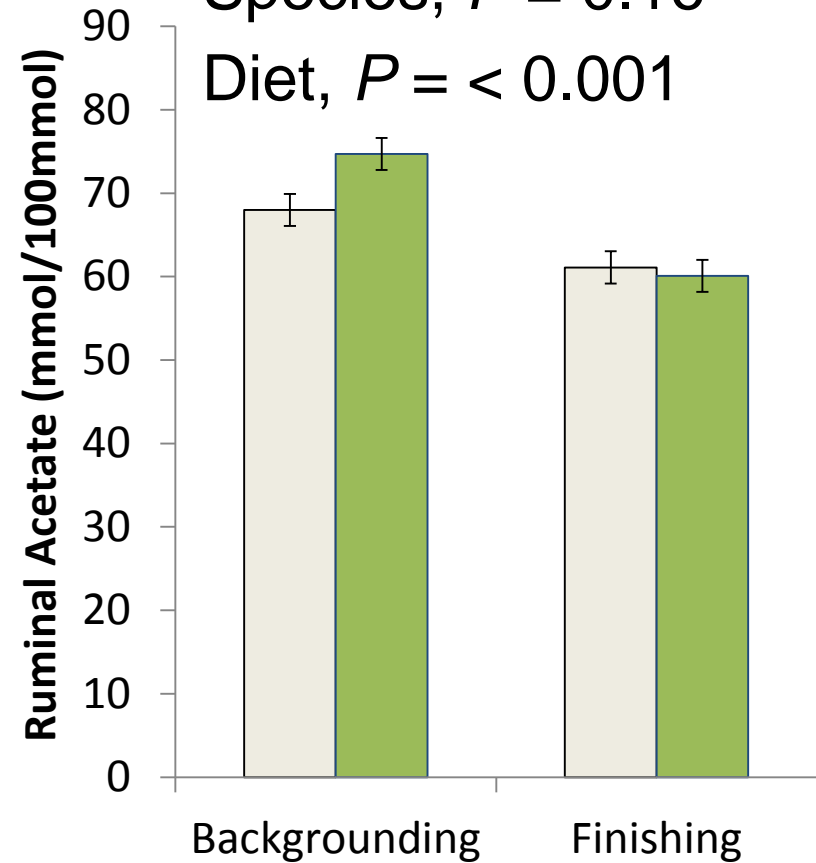


# Results – Short Chain Fatty Acids

□ Bison    ■ Beef

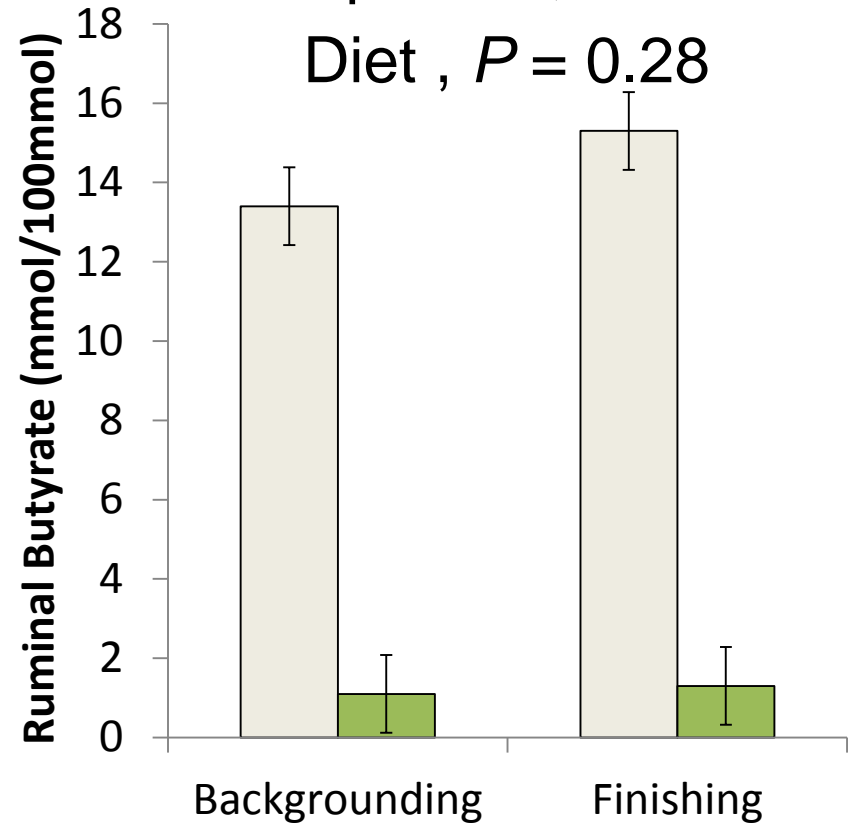
Species,  $P = 0.16$

Diet,  $P = < 0.001$



Species,  $P < 0.001$

Diet,  $P = 0.28$

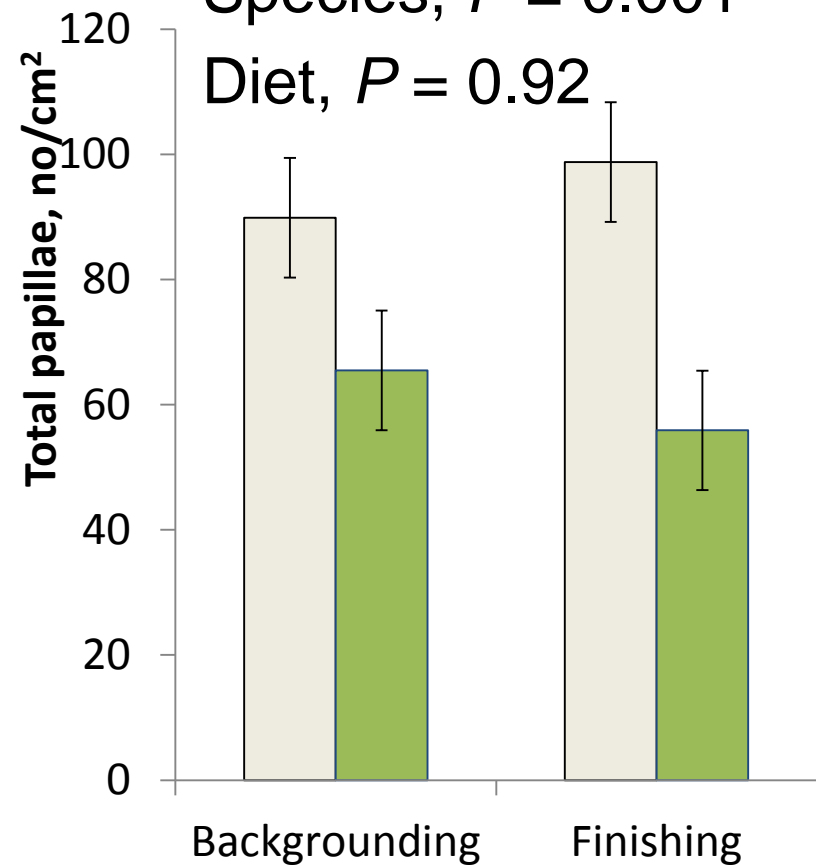


# Results – Rumen Papillae

□ Bison    ■ Beef

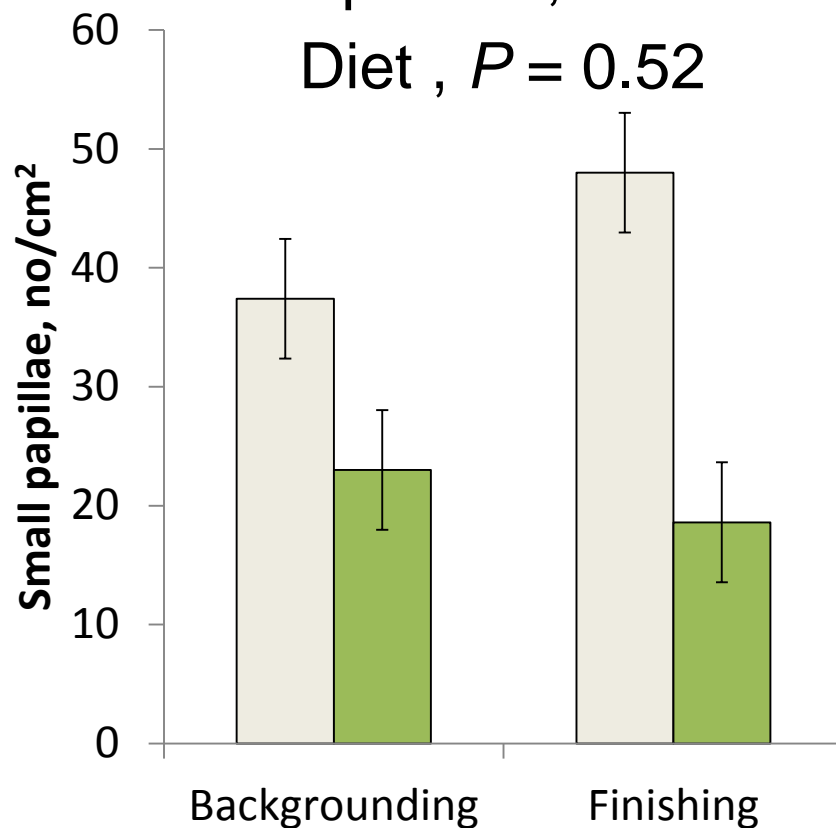
Species,  $P = 0.001$

Diet,  $P = 0.92$

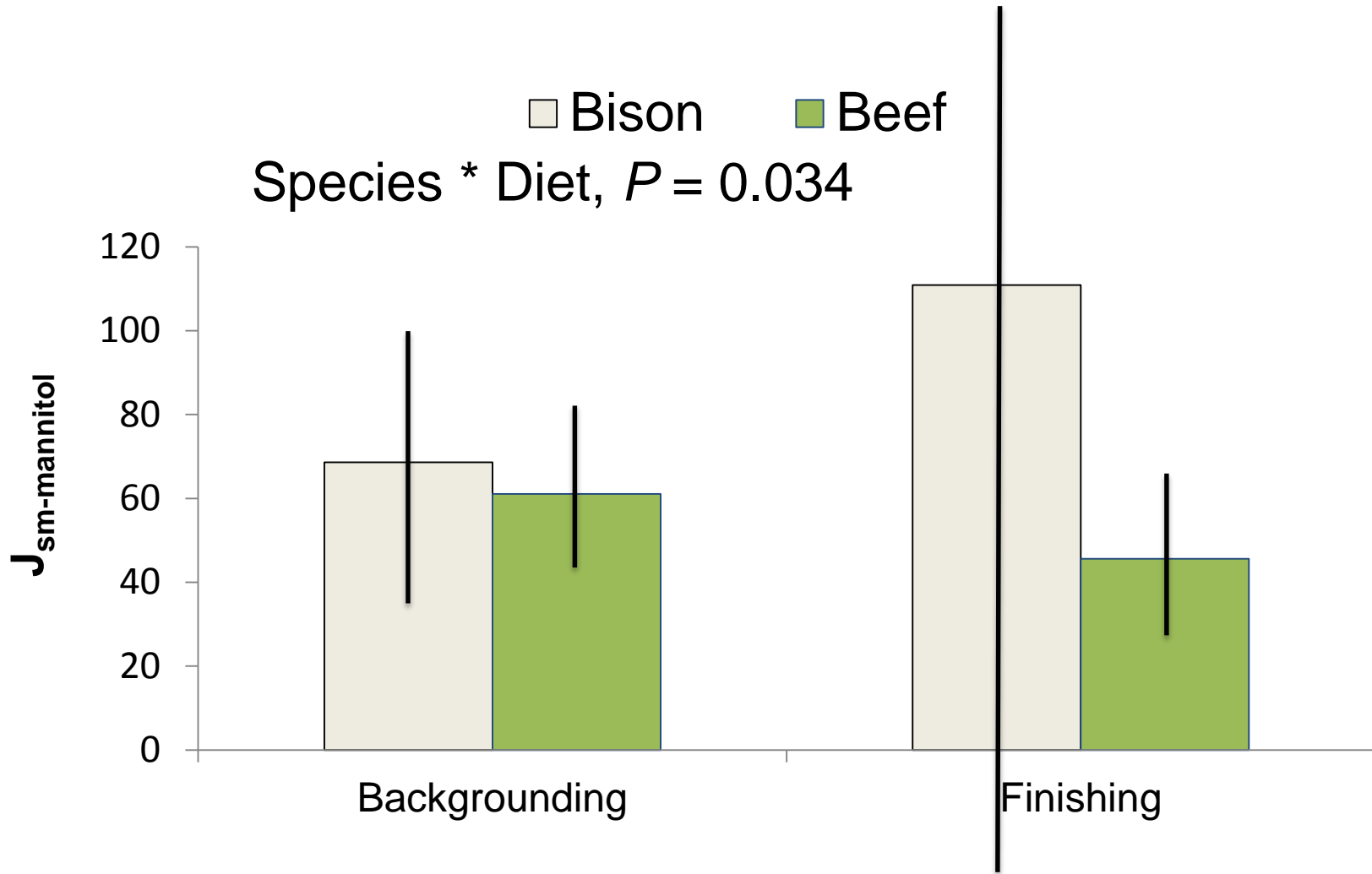


Species,  $P < 0.001$

Diet,  $P = 0.52$



# Results – Barrier Function









# Acknowledgements

- Funding agencies

**ALMA**  
Alberta Livestock  
and Meat Agency Ltd.



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- Team Rumen!

