



# Sodium butyrate improves duodenal development even in calves with neonatal diarrhea

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# INTRODUCTION



## SODIUM BUTYRATE

DUODENAL  
DEVELOPMENT



CAN DIARRHEA HARM THIS?



# OBJECTIVE

Evaluate the duodenal development of Holstein calves who received sodium butyrate in their diet during the first 15 and 30d of life and to investigate if episodes of diarrhea can affect the benefits of butyrate



n-24



## 2 GROUPS BUTYRATE CONTROL

*WITH DIARRHEA  
WITHOUT DIARRHEA*

**EUTHANASIA**  
15 DAYS (n-12) or 30 DAYS (n-12)

## Evaluated:

### DUODENAL EXPRESSION

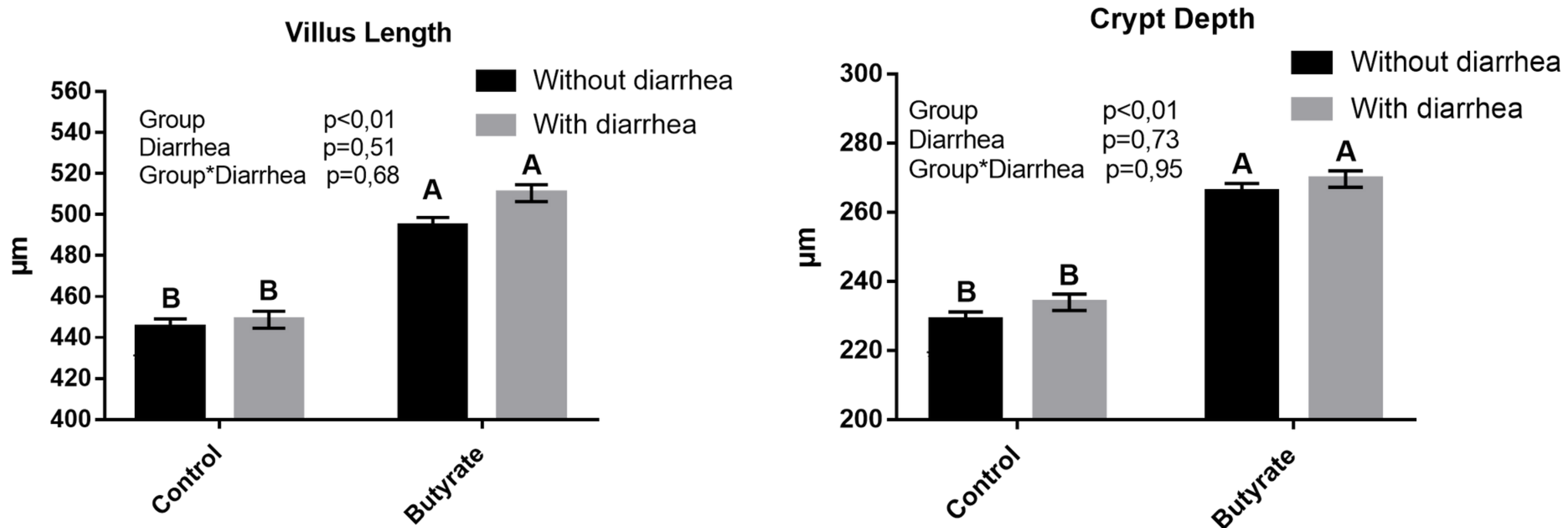
Lactase gene, marker of intestinal immaturity  
Glucagon gene-Like Peptide 2, related to tissue repair

### DUODENAL MORPHOMETRY

Villous height and crypt depth



# RESULTS

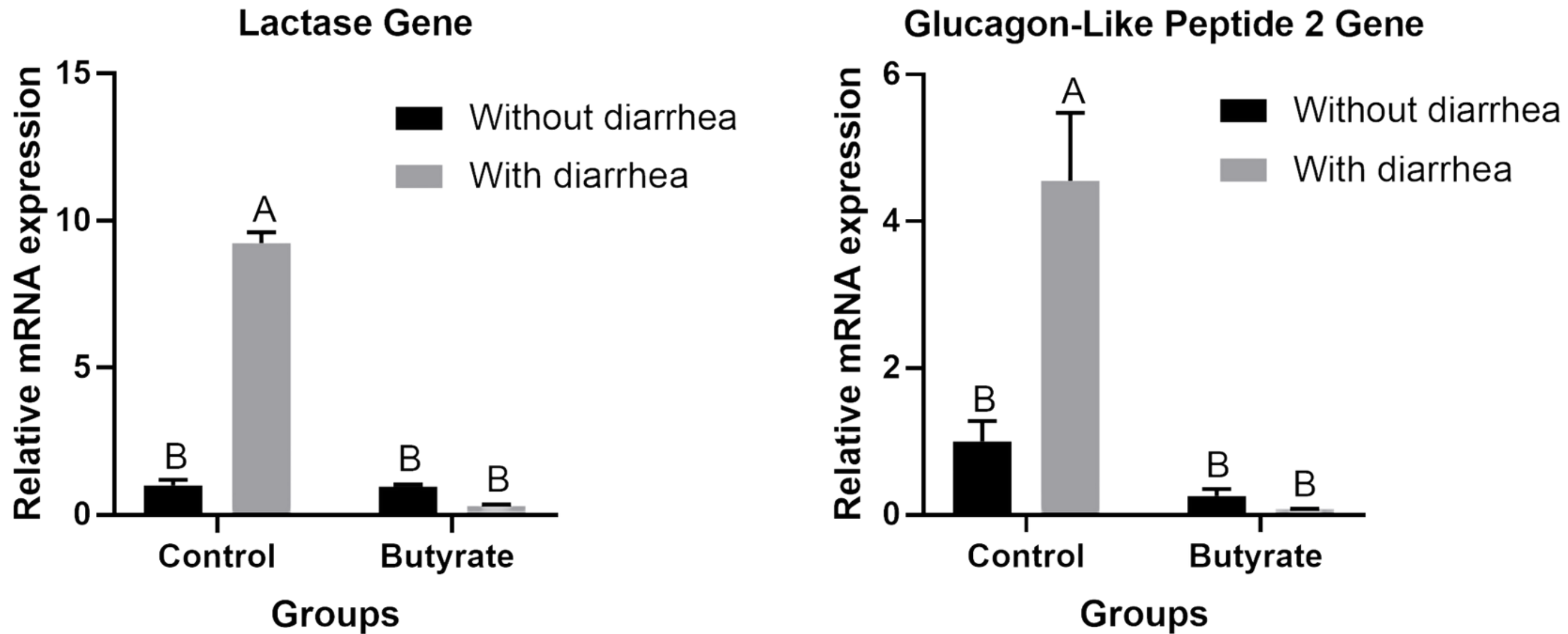


**Figure 1:** Villus length and duodenal crypt depth of Holstein calves supplemented or not with sodium butyrate and with or without diarrhea up to 30 days of age.





# RESULTS



**Figure 2:** Relative expression of lactase and glucagon-Like Peptide 2 gene in the duodenum of Holstein calves supplemented or not with sodium butyrate with or without diarrhea up to 30 days of age.

# Conclusion ...



Duodenal development attributed to butyrate occurred in the first 30 d of life and episodes of diarrhea during this period did not impair the effects of its supplementation



# LARGER STUDY

## ***SODIUM BUTYRATE SUPPLEMENTATION***

### **DIARRHEA**

MORBIDITY

(CG=50% vs. BG=30%)  $p=0.04$

RECURRENCE

(CG=60% vs. BG=26.67%)  $p=0.04$

### **ADG UP TO 60 DAYS OLD**

CG=0.516Kg vs. BG=0.555Kg

$p=0.09$

**HIGHEST DEVELOPMENT  
OF RUMINAL PAPILLAE**







# Acknowledg

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