



Effect of ENTEROSURE® on piglet performance under natural *E. coli* challenge during the nursery period in commercial conditions

Introduction

Post-weaning diarrhea is a very common, significant, and costly intestinal health issue for swine producers. *Escherichia coli* and other pathogenic organisms opportunistically flourish in the GI tract of piglets, especially during stress events associated with nursery and grow-finish. ENTEROSURE® is a multi-strain product containing *Bacillus licheniformis* 12G- 3 (G3), *Bacillus subtilis* FxA (FxA), and *Bacillus subtilis* PB6 (PB6). *In vitro* studies have shown that ENTEROSURE inhibits the growth of virulent *E. coli* strains found in commercial production. Thus, this study was conducted to evaluate the *in vivo* effects of ENTEROSURE on mortality and average daily gain (ADG) when administered to nursery pigs with natural enteric challenges in a commercial research facility.

Experimental Model

The 35-day study was conducted on a Midwest swine nursery site that had a history of enteric disease challenges (including *E. coli* F18). A total of 2,016 female and male pigs were randomly assigned to a Control or an ENTEROSURE (1 lb./ton) diet for the 35-day nursery study (18 pens/treatment; approximately 56 pigs/pen). There were two rooms, with 18 pens in each room and 2 pull pens in each room. In addition to treatment assignment, pigs were also visually categorized by size as small, medium, and large, with average body weight (BW) of 11.8, 13.8, and 16.3 lb./pig, respectively. There were 4 placement events where pigs were radio-frequency identification (RFID) tagged, weighed, and randomly allotted into pens. *E. coli* disease pressure was confirmed, and performance metrics were collected.

Results

The ENTEROSURE group showed a 4% improvement ($P<0.05$) in ADG (Figure 1) that resulted in a total weight gain of 4% more ($P<0.05$) over the Control group during a period of 35 days. When analyzed by pig size, ENTEROSURE improved ($P\leq 0.07$) the ADG of small and medium pigs by 8% compared to Control pigs. Between large pigs, the ADG in ENTEROSURE seems 2% larger than that in Control pigs, but it was not detected as a significant difference (Figure 2). The same ENTEROSURE effect was observed on the overall weight gain per pig. Overall mortality in the study was 6.71% and was only slightly decreased by use of ENTEROSURE.

Key Conclusion:

- The inclusion of ENTEROSURE in nursery feeds improved ($P<0.05$) ADG by 4% in piglets exposed to natural enteric challenge with *E. coli* F18. This growth effect was significantly larger (8%, $P\leq 0.07$) in the small and medium size pigs.

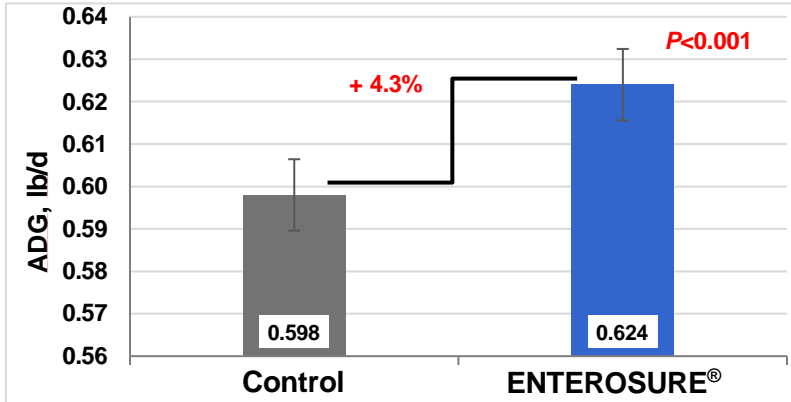


Figure 1: Average Daily Gain per pig for Control and ENTEROSURE® treatment groups in natural enteric challenge conditions.

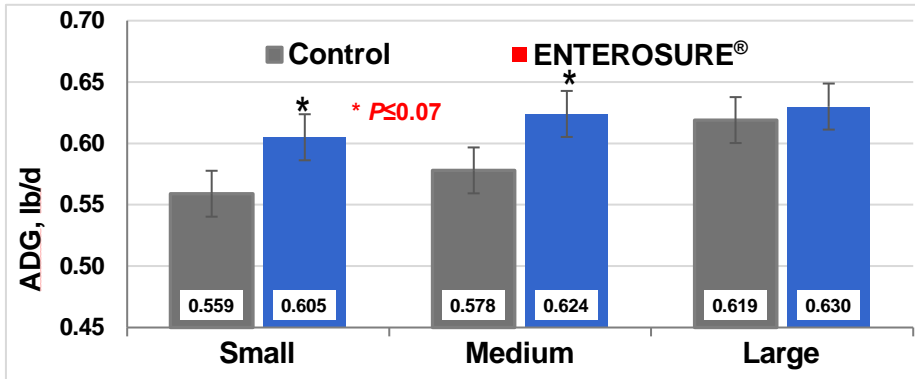


Figure 2: Average Daily Gain per pig by initial body size category for Control and ENTEROSURE® treatment groups in natural enteric challenge conditions.

Piglets' average BW at placement: Small (11.8 lb./pig), Medium (13.8 lb./pig), and Large (16.3 lb./pig)

References

- TD-22-7944: To assess the inhibitory effects of ENTEROSURE on the growth of selected bacteria
- TD-23-9244: Assessing the inhibitory effects of ENTEROSURE on current and pathogenic field swine *E. coli* isolates
- TD-23-9253: Effect of ENTEROSURE on piglet performance and mortality under natural *E. coli* challenge during the nursery period in commercial conditions