

ABSTRACT ([J. Anim. Sci Vol. 97, Suppl. S3](#)):

137 Effects of dietary supplementation with xylanase and probiotics on growth performance and gut health of newly weaned pigs.

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This study was to evaluate the supplemental effects of xylanase and probiotics on growth performance and gut health of newly weaned pigs. One hundred and forty-four pigs at 3 weeks of age with an initial body weight (BW) at 6.47 ± 0.03 kg were allotted (4 pigs per pen) to 3 dietary treatments based on a randomized complete block design with sex (gilts and barrow) and initial BW as blocks. The treatments were CON (no supplement), XYL (xylanase at 10,000 XU/kg, Xylamax, BRI, Durham, NC), and PRO (*Bacillus* spp. 6×10^9 CFU/kg plus xylanase 10,000 XU/kg, EnzaPro, BRI). All diets met the NRC (2012) requirements in 3 phases (P1 for 7 d, P2 for 14 d, and P3 for 14 d). The ADG, ADFI, and G/F were measured weekly. On d 21, 1 pig representing a median BW of each pen was euthanized to collect jejunal samples to measure the immune and oxidative stress status, microbiome, and histology. Data were analyzed using the MIXED procedure of SAS. Treatment was a fixed effect and blocks were random effects. There were no fixed effects among treatments on growth performance, immune and oxidative stress status, and histology. Use of xylanase increased ($P < 0.05$) the Chao1 index in jejunal mucosa of pigs (24.6 to 29.5). Relative abundance of the *Enterobacteriaceae* in jejunal mucosa tended to decrease ($P = 0.083$) with the use of xylanase (16.2 to 1.6%). The PRO increased ($P < 0.05$) the relative abundance of *Mitsuokella* compared with others treatments (0.9 vs. 4.8%). In conclusion, supplementation of xylanase or *Mitsuokella* can enhance the microbiome in jejunal mucosa by increasing the diversity and beneficial bacterial abundance, whereas by reducing pathogenic bacterial abundance without affecting the growth performance, histology, immune, and oxidative stress status.

Key Words: growth performance, gut health, microbiome, probiotics, xylanase