



WELFARE & NUTRITION

AWN-004

STUDY OF THE USE OF A BACTERIAL XYLANASE TO MODULATE THE MICROBIOTA AND THE GUT HOMEOSTASIS ON PIGLETS SUSCEPTIBLE TO ETEC

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Introduction

Exogenous enzymes favour the release of shorter polymers of the dietary fibre and could promote the development of a beneficial digestive microflora. The bacterial xylanase in weaning pig diet was tested for the impact on the intestinal microbiota and digestive homeostasis. Pigs genetically susceptible to enteropathogen *Escherichia coli* K88ac(ETEC) were used to not preclude the possibility of highlighting the response to xylanase on post-weaning diarrhoea and dis-microbiosis.

Material & Methods

32 ETEC-susceptible pigs, weaned at 25±1 days, were assigned to **CO** (corn/barley/wheat mash standard diet) or **XY** (CO plus 100 g/t xylanase Belfeed). Blood samples and faeces were taken after 14 and 28 days of treatment. At day 28 pigs were euthanized and sampled for jejunum tissue. Pigs were individually evaluated for a five-point faecal score every 7 days. Faecal bacteria 16S rRNA gene was sequenced using MiSeq Kit on a MiSeq-Illumina platform.

Results

Pigs had diffused diarrhoea. In each treatment group, 4 subjects died or were suppressed. The treatment did not change growth, faecal score and reactive oxygen metabolites in blood at the two time points. XY increased villus length in the jejunal mucosa (+ 15 %, p=0.066). The OTUs distribution was fairly homogeneous and Shannon and InvSimpson indices were not changed by treatment and time. Time clusterized for the Beta diversity (p=0.003). Per phylum abundances were quite homogenous among diets and time point and dominated by Bacteroidetes (52%) followed by Firmicutes (43%). At species taxonomic level, *Lactobacillus reuteri* remained longer after weaning in XY (p<0.05).

Discussion & Conclusion

The xylanase supplementation favoured the persistence of xylose-fermenting *L.reuteri*, considered beneficial. This may explain the mild increase of the villus length. The supplementation with xylanase did not improve growth and robustness against pathogenic *E. coli*, but the effect on some beneficial bacteria species is worth further studies.