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TITLE
IN VITRO PREBIOTIC PROPERTIES OF ARABINOXYLAN-RICH INGREDIENTS IN THE GASTROINTESTINAL TRACT OF WEANED PIGLETS

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CONTENT
Due to weaning stress, the piglet's intestines become more susceptible to the invasion of pathogens. Gut health could be supported through the use of dietary strategies, based on fermentable carbohydrate fractions, to minimize post-weaning associated disorders and thus, the use of antibiotics. To date, mainly purified fractions have been tested for their prebiotic properties at weaning while trials on potential health promoting effects of cereals and corresponding by-products remain rare. In this study, arabinoxylan-rich feed ingredients (wheat, rye, their bran and wheat distillers grains) and arabinoxylan-oligosaccharides (AXOS) have been tested for their prebiotic activities via an in vitro enzymatic digestion and fermentation model. In addition to fermentation kinetics, short-chain fatty acids (SCFA) were analysed by HPLC after 6, 12 and 24h and the abundance in butyryl-CoA : acetate-CoA transferase gene was measured by qPCR after 12h. Rye and wheat, in contrast to their corresponding by-products (rye and wheat brans) exhibited an extensive and rapid fermentation equivalent to the one of AXOS. After 12 and 24h of incubation, AXOS demonstrated the highest level of total SCFA while the brans, the lowest. Expressed as ratio of total SCFA, all arabinoxylan-rich ingredients except for wheat distillers grains induced high proportions of butyrate after 12 and 24h in comparison to AXOS, which expressed high acetate and propionate ratios. Wheat distillers grains were characterized by an elevated propionate proportion. Rye bran and wheat bran, which induced the highest proportions of butyrate, also demonstrated high levels of butyryl-CoA : acetate-CoA transferase after 12h, whereas wheat distillers grains displayed the lowest abundance of this transferase. It can be concluded that all arabinoxylan products and by-products, except for wheat distillers grains, reached interesting prebiotic potential based on SCFA profiles and therefore could be used as feed supplement to manipulate gut ecology for health purposes in piglets.