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## **Post-weaning diarrhoea is associated with protein fermentation, alterations in intestinal microbiota, and host physiological parameters in piglets**

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In Dutch farming, piglets are commonly weaned abruptly around 28 days of age. This abrupt separation from the sow is often associated with a check in feed intake, intestinal morphological changes, and/or aberrations in microbiota composition and activity. Furthermore, the ability to digest solid feed is often underdeveloped, and due to the sudden shift in dietary source often leads to decreased digestion of dietary components, such as protein, in the small intestine. This ultimately leads to a higher flow of undigested nutrients into the colon. In the colon, the long residence time and limited nutrient absorption facilitate microbial proteolysis and accumulation of metabolic end products some of which may be detrimental to the host. Results of our on-farm studies have shown a strong negative correlation between ammonia concentration and dry matter content of the faeces, indicating that diarrhoea is associated with increased ammonia. Furthermore, profiling of the microbial composition revealed an increase in the relative abundance of bacterial groups known for their protein fermenting capacity, and absolute concentrations of genes encoding for specific diarrhoeic toxins, in animals suffering from diarrhoea. To model direct intestinal responses, we assessed molecular mechanisms in our two-dimensional organoid model using protein fermentation metabolites ammonia and hydrogen sulphide, each eliciting distinct cellular responses. From this, we conclude that there are associations between protein fermentation and intestinal health in piglets post-weaning.