Abstract 29:

Steering protein fermentation in the porcine intestinal tract by adding fermentable fibres

Lonneke Noorman[1] , Sonja de Vries[2], Walter Gerrits[2]

[1] Utrecht University, Faculty of Veterinary Medicine, Department of Population Health Sciences, The Netherlands
[2] Wageningen University & Research, Department of Animal Sciences, Animal Nutrition, The Netherlands
* Corresponding author. E-mail: l.noorman@uu.nl

Competition with human feed resources and societal developments urge the livestock sector to include more agricultural by-products that cannot be used for human consumption, as profitable alternatives to the currently used feed ingredients for animal diets (Breewood and Garnett 2020). Due to the relatively poor protein digestibility of these by-products, more undigested protein will enter the hindgut, prone to be fermented by microbiota. Protein fermentation results in the production of metabolites (biogenic amines, volatile fatty acids, ammonia, hydrogen sulfide, indolic and phenolic compounds, and nitric oxide) that may impair intestinal health (Gilbert et al. 2018; Rist et al. 2013). The inclusion of dietary fermentable fibres, shifting N-excretion from urine to feces, can reduce the production of nitrogen (N)-derived metabolites. Microbiota use the fermentable fibres as energy source, while N is used for bacterial growth. To study the interaction between dietary fibres, protein fermentation, and intestinal health, pigs received three different fibre treatments (no, rapidly fermentable-, or slowly fermentable fibres) combined with three different protein sources varying in digestibility. Both rapidly and slowly fermentable fibres reduced the concentration of N-derived metabolites in digesta by an average of 29 mmol/kg DM ($p < 0.001$), with rapidly fermentable fibres having a slightly greater effect in the ileum and cecum, and slowly fermentable fibres having a greater effect in the proximal and distal colon. No interaction between fibre treatment and protein source, and no differences in intestinal permeability were observed.