

## 9. Fermentation of endogenous protein in the colon of pigs determined by a gas production technique

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Protein fermentation in the hindgut of pigs is often regarded as harmful to health. One of the strategies to reduce the negative impact is to limit protein intake. However, not only dietary protein but also endogenous protein (EP) may contribute to fermentation as it enters the hindgut. Therefore, the fermentability of porcine EP was investigated. Ileal digesta samples from pigs fed nitrogen-free diets in 5 different studies, colonic mucus and whey protein isolate (WPI) were tested in an *in vitro* gas production system with porcine faecal inoculum. Nitrogen limiting microbial activity through the use of a nitrogen -free buffer and an excess of fermentable carbohydrates. Gas production (GP) was recorded for 48 h. Compared to most of the digesta samples, mucus had a greater maximum gas production rate ( $R_{max}$ ,  $25.0 \pm 2.0$  vs  $18.5 \pm 4.0$ ) and shorter time to reach its maximum rate ( $T_{max}$ ,  $5.1 \pm 0.6$  vs  $7.2 \pm 2.8$ ) while WPI as intact protein showed the lowest  $R_{max}$  ( $12.2 \pm 2.3$ ) and highest  $T_{max}$  ( $12.9 \pm 5.0$ ). Differences in  $R_{max}$  and  $T_{max}$  were also found between different digesta samples ( $p < 0.05$ ). Subsequently, we tested the hypothesis that smaller molecular proteinaceous structures are easier to ferment. Indeed, WPI mixtures with a higher degree of hydrolysis showed higher  $R_{max}$ . Also size-exclusion chromatography showed that higher quantity of small fractions (1.0-2.5 kD) resulted in higher GP in the endogenous samples from pigs ( $p < 0.05$ ). Altogether this study provides a first understanding of the fermentation potential of EP.