

Effect of pH and 22:6n-3 on the biohydrogenation of 18:2n-6 by *Butyrivibrio fibrisolvens* and *Propionibacterium acnes*

Highly fermentable carbohydrates have been increasingly introduced in ruminant livestock production systems to support higher production rates and increased demand for animal products. Such feeding practices increased the incidence of milk fat depression (MFD) in dairy cattle. The basis for MFD is the biohydrogenation theory which proposes that under certain dietary conditions, typical pathways of rumen biohydrogenation are altered to produce unique fatty acid intermediates that inhibit milk fat synthesis. There is a shift toward the formation of *trans*-10, *cis*-12 CLA at the expense of *cis*-9, *trans*-11 CLA. This *trans*-11 to *trans*-10 shift is described to occur when high starch diets are fed, when rumen pH is low or when marine oils are fed. In this study the formation rate of *cis*-9, *trans*-11 CLA and *trans*-10, *cis*-12 CLA by *Butyrivibrio fibrisolvens* and *Propionibacterium acnes*, respectively, was investigated during *in vitro* batch incubations under different rumen conditions to give more insight in this shift. A low pH and 22:6n-3 reduced the CLA formation by both bacteria but this reduction was higher with *Butyrivibrio fibrisolvens*. As the CLA formation rate by *Propionibacterium acnes* was much slower compared to the other bacterium, the *trans*-10 shift cannot be explained by an increase in *trans*-10 producers alone. Possibly the balance between both bacteria is more important in explaining this shift.