**AM 2013-001 Effects of feeding sugar on mitigation of rumen acidosis**

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Background: Rumen acidosis is a persistent metabolic disorder for high-producing dairy cows; the effort to increase the diet fermentability to increase milk yield is often associated with rumen acidosis and milk fat depression. Feeding high sugar diets can be a novel nutritional approach to increase milk yield without increasing the risk of rumen acidosis and milk fat depression.

Objectives:

1. Evaluate the effects of feeding sugar on rumen pH and productivity
2. Develop novel nutritional approaches to mitigate SARA

Methods:

* Study 1: 4 cull cows were dosed with different levels of sucrose, lactose, or starch directly into the rumen through the cannula and blood, rumen fluid, rumen digesta and rumen pH was sampled.
* Study 2: 12 id-lactation cows will be fed 4 different diets (control 27% starch, 4% sugar; high starch 32% starch, 4% sugar; High sugar 27% starch, 9% sugar (with sucrose or lactose) After 17 days blood, rumen fluid, rumen digesta and rumen pH was sampled

Outcome:

* Study 1: replacing dietary starch with sugars may effect rumen fermentation and metabolism regulating intracellular pH and fermentation acid absorption in ruminal epithelial cells, and these effects may be greater for sugar than starch. Sucrose and Lactose increased total VFA and sucrose decreased rumen pH.
* Study 2: the sugar diets increased DMI, energy corrected milk yield, milk fat and milk protein but decreased rumen pH. Sucrose had lower nutrient digestibility than lactose but there was no effect on milk components.

Recommendations: Although rumen pH was decreased by high-sugar diets there were production benefits. There may also be differences depending on the type of sugar fed.

Benefits to industry: In western Canada, barley grain and barley silage are commonly used in dairy diets, and the risk of rumen acidosis is generally higher than the eastern Canada and the US where corn is the primary feed ingredients. As such, understanding diet formulation approaches to increase milk yield while maintaining milk fat content, or to increase milk fat content while maintaining milk yield, particularly under western Canadian settings, is very important.

KTT:

* Presentations at WCDS, WNC and ADSA
* 2 peer-reviewed publications