Ruminal Acidosis in Cattle

Subacute Ruminal Acidosis is defined as a drop in ruminal pH as a result of (relative) overfeeding of readily fermentable carbohydrates in the non-adapted ruminant.

The rumen is the key to all things in dairy cows. It is a huge ‘reactor-vat’ where the bulk of the feed taken in is fermented by micro-organisms, ready for further digestion in the rest of the intestinal tract or direct use by the animal for things like milk production. The ‘rods’ in the ‘reactor vat’ are all sorts of micro-organisms, operating in a fine balance around an optimal pH. The rumen operates best at a pH between 6 and 7. This balance is maintained by buffering agents in the saliva, which are produced by chewing the cud, and by absorption in the body of weak acids, mainly VFa’s (volatile fatty acids), the essential for milk fat production.

Readily fermentable carbohydrates cause problems in the system because they do not induce cud-chewing (because of lack of fibre) and because of the production of stronger acids like lactic acid, that give a stronger pH drop and are not as readily absorbed by the body.

Subacute Ruminal Acidosis (SARA) is a condition usually associated with high producing, high carbohydrate intake cattle. In fact Eric Kolver et al. did a study in 2001, where ruminal pH for pasture fed cows was simulated in a test tube. In this test the pH did not drop below 5.6, which is usually not enough to bring on signs of acidosis.

Still, the fact remains that we in the field often see ruminal acidosis, and not only in cows that gorged on maize or meal. I think all farmers are aware that spring grass contains little fibre and high contents of readily fermentable carbohydrates (sugars). With the increase in feeding of byproducts like molasses, PKE and other forms of dairy meal, the sugar level in the diet has even increased more.

A recent study by Lincoln University has found rumen pH in pasture fed cattle dropping to as low as 4.6, which goes beyond SARA to acute ruminal acidosis. Sugar levels in grass in the Waikato are slightly lower than on the South island, but a decrease in pH to levels between in 5 and 5.5 is still very likely.

SARA can be hard to diagnose, common findings are varying appetite, teeth grinding and diarrhoea, to name a few. The follow on effects from this condition can be quite severe and costly, ranging from ulcers in the abomasums (4th stomach) and first part of the small intestine and liver abscesses to ruminitis (inflammation of the rumen) and lameness, mainly because of white line disease.

SARA is a condition that is hard to pick up, so prevention is the key. Prevention consists of making sure that cows are offered enough fibre (silage from mature pasture, hay, straw or lucerne silage) in their diet. Introduction of additional readily fermentable carbohydrates should occur over a period of time, by adding a couple of kilograms every third day. Additional support in preventing SARA from occurring can be achieved by adding ionophores (Bovatec or Rumensin) to the diet.