Effects of Saponins on Gut Motility

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Dietary saponins have long been associated with legume bloat in cattle. They act as foaming agents, reduce microbial protein production (Lu et al., 1987) and protozoal numbers (Lu and Jorgensen, 1987). Bloating in cattle is characterised by an increase in intraruminal pressure due to the trapping of ruminal gases in a stable foam that cannot be eructated due to the inhibition of eructation contractions.

The administration of lucerne saponins to the rumen of sheep, leads to a substantial reduction in reticulorumen contractions (Lindahl et al., 1957). The mechanism of this inhibition of motility is unknown, but may play a role in the pathophysiology of bloating.

An isolated rabbit ileal preparation was developed that allows pharmacological manipulation of an intestinal segment in an organ bath with concurrent recording of the tissue’s spontaneous motility using a computerised recording apparatus.

Application of quillaja saponin, a triterpenoid saponin similar to that found in lucerne, initially increased the smooth muscle tonus of the intestinal segment, followed by a gradual inhibition to below the basal tonus. It also markedly reduced the frequency of contractions. These actions were not inhibited by atropine or adrenaline. In fact saponin restored motility to normal after inhibition with adrenaline. These data suggest that saponins may not be acting via normal autonomic receptors.

References