

Rumen Microbial Populations React to Ration Ingredients

Dry rough land, stony poor soils, steep topography all describe areas where ruminants can flourish because of their well known rumen. This type of land has little if any value for crop production but can be used to graze cattle, sheep and other ruminants. Their ability to selectively graze, choosing high nutritive value grasses and other plants which are processed in the rumen, help them survive, grow and reproduce. Beef cattle have been selected for decades to be more efficient at utilizing forages, and, forages have been improved to produce a plant which contains more digestible nutrients.

The rumen is a large biochemical reactor. It is temperature and moisture controlled such that a stable population of bacteria, moulds and fungi can live. Rumen populations react to the ration ingredients and move up or down. If changes are sudden then changes in pH can cause rumen upset. These bacteria have a specific role to play in that these multiple populations can break down the various fibres in plants and deliver to the animal high quality nutrients in the bodies of dead microbes, not otherwise valuable to life and growth. Carbohydrates are fermented in conjunction with nitrogen derived from the breakdown of proteins to produce more microbes for use in the monogastric portion of the digestive system. The carbohydrates can only be use when nitrogen is available in the needed amount. It becomes clear that energy from carbohydrates needs a specific amount of nitrogen to build microbial protein. Excesses or deficiencies of either carbohydrates or nitrogen are wasteful and can upset the delicate rumen environment. Here is where more precision in feeding can pay off with stable rumen pH leading to steady performance.

Rumen microbial populations are quite diverse, each population with its own job. Cellulolytic bacteria digest cellulose while assisting in freeing up nitrogen from proteins for fermentation, and some bacteria are predators which eat other microbes. Methanogens use CO₂ and H to get rid of hydrogen which is generated through fermentation. Years ago several ration additive products came out which attempted to alter rumen microbial groups but it was seen that there was little if any consistent response. It now appears that the animal exerts a genetic influence over its own rumen microbes each animal having a unique bacterial profile. Researchers have identified certain bacteria which are always present in high amounts with more efficient cattle and in lesser amounts with less efficient cattle. Identifying these populations may supply another selection tool for choosing breeding stock. Being able to choose a superior animal by looking at microbes associated with low intake and high average daily gain would be quite advantageous. It may be in selecting the cattle with high populations of favourable bacteria that they would handle high energy diets better and produce more.

As we look at the great information research is generating we can see two important areas are to be noted. The genetic ability of the beef cow to utilize forages and grains is changing. Also new strains of forages and grains with different fibre and starch levels are available which represent nutritional advantages based on how rumen microbes react to dietary ingredients. An annual review of farm management strategies matched to herd performance may indicate new approaches need to be employed which use the rumen and its microbial populations to advantage. Upsetting the balance in the rumen always leads to problems and inefficiencies. This situation is to be avoided when designing and implementing a feeding program. Higher levels of precision are helpful and financially beneficial in managing the herd feed supply.

Highline® has used this understanding of the ruminant in designing and building our complete line of feeding equipment. The fully equipped Bale Pro® can generate a chopped product blended with grain to meet the nutritional needs of each animal group. Chopping crop residues, greenfeed and medium and low quality hay improves intake, reduces wastage and lowers the cost of feed during the winter feeding period. In addition with more field grazing and extended winter feeding in pastures supplementing the needed extra protein and energy can be done quickly and with more accuracy with the Bale Pro®.

Better nutrition, lower costs and less time feeding means a Highline® Bale Pro® is an advantage to today's modern beef managers.



CORPORATE RUMINANT NUTRITION

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