



ASK YOUR HERD NUTRITIONIST ABOUT RUMEN EFFICIENCY

Rumen efficiency largely determines your herd's ability to get the most nutrient value possible from its rations. When meeting with your herd nutritionist, discuss ways to increase rumen performance and achieve greater herd production and performance.

1) Why be concerned with rumen performance?

Paying attention to rumen microbial populations can result in greater feed efficiency. It allows nutritionists and producers to further optimize cow and herd production and performance. Rumen fermentation rates can be improved by providing the right nutrients to bolster microbial populations. For example, more glucose can be liberated from fibrous feeds containing highly indigestible carbohydrates, such as celluloses and hemicelluloses. This increased supply of nutrients to the microbes generates more energy (VFAs) and metabolizable protein.

2) How do I define a "rumen efficiency product"?

Rumen efficiency products are fed to augment the rumen environment to maximize the rumen condition and fermentation. These products have traditionally been fed as single components such as live yeasts or yeast cultures, live bacterial cultures or exogenous enzymes. More recently nutritionists have been feeding multiple component products to capitalize on the synergistic benefits when fed in a complete package.

3) What role do the components play in the rumen?

Yeast culture provides

iso-acids. These branch chain amino acids are used by fiber-digesting microbes to produce proteins. The variety of metabolic byproducts yeast culture contains, such as vitamins, enzymes and co-factors, also stimulate rumen microbial production.

Live yeast assists in stabilizing rumen pH. The live yeast ferments without producing hydrogen ions which would contribute to rumen acidity. Bacteria populations that reduce lactate levels are nurtured which helps avoid acidosis.

Live bacterial cultures or direct-fed microbials (DFMs) attach to the rumen wall itself. Their presence prevents pathogenic bacteria from attaching and getting a foothold. Populating the rumen with beneficial bacteria helps inhibit the establishment of bad or pathogenic bacteria such as *E-coli* and *Salmonella*. The beneficial bacteria also serve a second purpose; they eventually become a source of enzymes, vitamins and nutrients for rumen microbes.

Enzymes degrade complex carbohydrates, such as starch and fiber, into simple sugars which are more easily digested by rumen microbes. As a result, the enzymes increase the nutrient supply to the cow and decrease the amount of whole grains and fiber in the manure. Commercial enzymes are effective in a wider pH range than natural enzymes and

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therefore, help cows during times of grain overload and lowered ruminal pH.

4) Should we feed a single- or multi-component product?

The multi-component rumen efficiency products provide value by incorporating the beneficial attributes of multiple ingredients to the rumen environment. As seen in the table below, these components work in concert with each other, maximizing the nutrient value of feedstuffs and providing a solid return on your investment. □

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Effects of adding a multi-component rumen efficiency product on feedstuff digestibility

Feedstuff	Properties	% NDF	% ADF	NDF Digestion	ADF Digestion	% Solubility
Corn silage	Mainly cellulose	49.0	29.0	+1.00	+4.00	+0.40
Alfalfa silage	Abundant hemicellulose	47.0	36.0	Unchanged	+7.30	+2.08
Timothy hay	β-glucans, complex carbs	69.0	36.0	+5.00	+2.00	+4.23
Dry corn grain	Insoluble starch	13.0	3.00	+5.50	Unchanged	+15.4
Soybean meal	High in complex carbs	9.50	7.50	+3.00	+1.80	+14.5

A multi-component product was utilized in trial work. Selected feedstuffs were incubated in rumen fistulated cows. Samples were then collected and analyzed after 6, 12 and 24 hours of incubation. The changes seen in digestibility result in more glucose being directly available to rumen microbes for a greater supply of microbial protein.