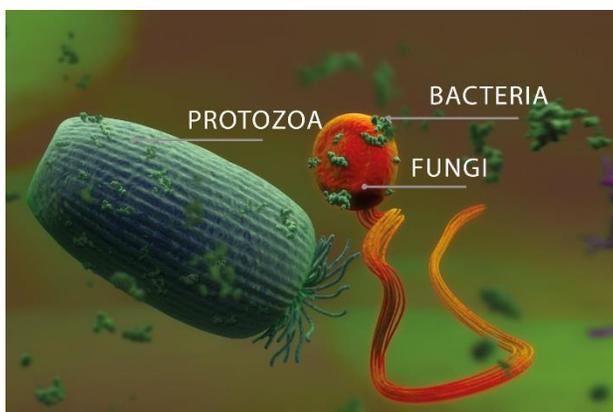
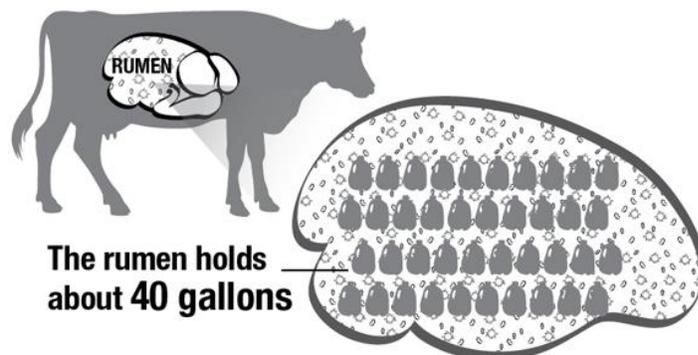


## Microbes in the Rumen

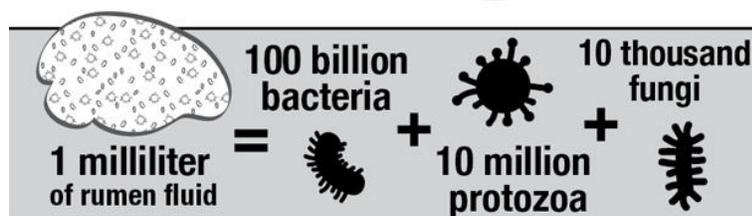
We know ruminant animals can digest forages, but do we know how? Ruminant animals are cable of digesting forages, for their rumen is filled with microbes. These microbes play a big role in the rumen. The microbes break down feed to produce volatile fatty acids, which are used by the cows as energy for maintenance and milk production. The rumen microbes are also digested and absorbed in the small intestines as the main protein source for milk production – providing up to 70-90% of a cow's protein requirements.



There are three different types of microbes produced in the rumen. They are fungi, bacteria and protozoa. Each different microbe has different digestion roles such as, digesting fiber, starch, sugar, or protein. These different microbes are split up into two groups: the slow-working fiber-digesters located on the fiber mat in the rumen, and the fast-working microbes that float around in the rumen fluid, looking for easily-digested nutrients like sugars and starches. Each feed influences the microbe type, digestion and intake. Concentrates and lush forages (containing lower amount of fiber) build up the fast-working 'floating' microbe population, and feed is moved quickly through the rumen digestive system. The cow wants more food, and intake is potentially increased. Mature forages contain higher fiber and lower soluble nutrients, which build up the slow-working, fiber-digesting microbes and cause feed to move more slowly through the system. The cow feels less hungry, and intake is reduced.



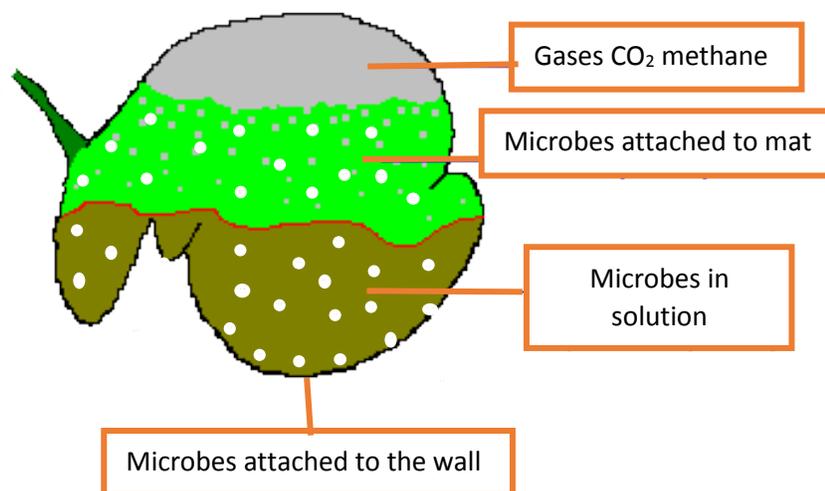
The rumen holds about **40 gallons**



**≥ 1,000,000,000,000,000 rumen bugs per cow**

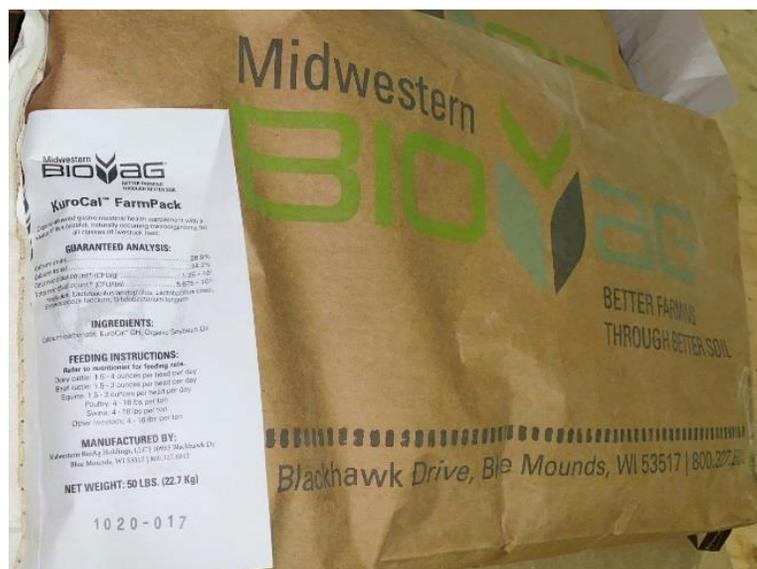
Microbes are very important to the rumen so it is very important that we keep the microbe population up. To keep these microbe populations up, the diet of the animal must be consistent. Microbes take time to recover and build up after sudden feed changes. Forage fiber-digesting microbes may take 4-6 weeks; starch (grain)-digesting microbes take 4-5 days; lactic acid-producing bacteria (from slug feeding) take 2-4 hours to build up. It's also important to make sure the rumen environment is stable for the microbes to live. A favorable environment for rumen microbes includes: anaerobic (no oxygen), temperature near microbial optimum of 102°F, and pH around 5.5 to 6.8. When cattle drink the water, this helps maintain the rumen liquid environment, which supports microbe metabolism, and dilutes acids in the rumen.

Lastly, you also need to feed the rumen microbes. Most energy for microbes to grow and multiply are sourced from: starches (cereal grains), sugars (lush forages and molasses), and digestible fiber (forages, cottonseed hulls, and palm kernel extract). They also need protein, both true protein (protein meal and pastures) and non-protein nitrogen (urea) for growth and reproduction. They also need minerals such as, calcium, phosphorus, sulfur, and magnesium as they are essential to grow and multiply. You are not feeding the cow, you are feeding the microbes. The microbes feed the cow!



## Product of the Week

### KuroCal FarmPack



KuroCal™ FarmPack is a feed additive formulated to support gut health in all types of livestock. It contains a live source of naturally occurring microorganisms, which work to improve performance and feed intake. Supporting gut integrity helps producers avoid costly herd health challenges, and limits stress during times of transition and feeding program changes. There is a minimum of  $1.25 \times 10^7$  CFU/g ( $5.675 \times 10^{10}$  CFU/lb) microbes in the KuroCal FarmPack. It includes *Lactobacillus acidophilus*, *Lactobacillus casei*, *Enterococcus faecium* and *Bifidobacterium longum*. It's good for all types of ages of livestock and excellent for replacement calves. Establishing gut health early builds a strong foundation for future performance. KuroCal FarmPack promotes good gut health in young calves and supports productive rates of gain and growth. It is very important to improve gut integrity for better herd health and production.