



This seems to be question that arises quite often among breeders. It really could go unsaid that the bovine as a ruminant was designed to thrive on grass and other roughages. Its ability to harvest energy from forages with the aid of rumen microbes is really an amazing task. With all that said, where does grain fit in the picture? All grain fed to livestock is basically the seed of some type of grass plant. It is not "foreign" to the ruminant stomach, but if fed in excess too quickly it can be lethal to the bovine. The rumen is the fermentation vat of the ruminant and is the first of the four compartments. It is the largest compartment of the stomach holding up to 20+ gallons in a full-size bovine. It is populated with several different microbes (protozoa & cellulolytic bacteria) that aid in the breakdown of the plant tissue. The healthy rumen is constantly contracting; mixing the feed consumed with the resident microbes. There are also small "finger-like" projections on the surface of the rumen called papillae. These papillae are useful in the absorption of nutrients. The size and function of the rumen allow for consumption of a large amount of feed in a relatively short period. Once they are done feeding or laying down resting you will notice the trademark "cud-chewing" taking place. This is the result of the reticulum (the second, small, "honeycomb" compartment) contracting and the esophagus regurgitating the rumen contents up to the mouth to be "re-chewed". This re-chewing and re-swallowing allows for further breakdown of stem length and mixing of the feed with rumen microbes. It also aids in further saliva production which is a natural buffer, along with the belching of rumen gas (a constant byproduct of rumen fermentation).

This whole process can be detrimentally interrupted by giving a bovine free access to a pile of grain or by feeding too much too quick. The rumen microbes adjust their population by what is being consumed. In other words, a bovine eating grass and a bovine on "full-feed" (primarily grain) have different microbe populations. It takes approximately 2 weeks for the rumen to adjust to a feed change. So when the change is abrupt and quick they will often quit eating entirely as a result of the damage to the gut. An excessive amount of lactic acid is produced by the microbes within 2-6 hours of an overconsumption of highly fermentable grains. This in turn lowers the pH of the rumen, which is normally neutral to only slightly acidic (pH 6-7). If the pH is low enough (<5) it will shut down the rumen completely; meaning no rumen contractions, no regurgitation or belching of gas, and often an insult to the papillae which leaves an open wound for bacteria to enter the bloodstream. If no gas is expelled it builds up in the rumen causing severe bloat which can eventually suffocate the animal by the pressure placed on the lungs. At this point it is crucial that the animal receive bloat relief (gas removal) followed by an oral buffer (sodium bicarb) and absorbent charcoal. Oral mineral oil can also be given to help speed the excess grain through the body. Antibiotics are usually given to prevent a systemic infection caused by the damaged papillae.

So with all that said, does grain ruin the rumen? I think much of this question stems from those who have purchased animals that have been raised on a higher grain ration. Once they get home they put them on pasture and they lose weight and appear underconditioned within the first month. Much of this is due to the reverse abrupt change to the rumen microbe population. They are being forced to quickly adjust to a lack of grain in their diet and they basically aren't harvesting any nutrients from what they're consuming. This is even more pronounced in grain fed bulls being thrown on pasture to go to work breeding the herd, but haven't been accustomed to a forage only diet. They use most of the energy pursuing cows while not getting much nutrient benefit from the grass. The conclusion is that the animal's rumen was ruined due to grain. However, the rumen is quite an adaptable organ that adjusts to whatever they eat. The key is that the feed transition take place slowly over at least a two week period, no matter which direction you're heading towards. Certain bloodlines of cattle tend not to finish well if they don't receive some sort of grain supplementation. If you are looking for grass

Does Grain Ruin A Bovine's Rumen?

-only cattle, it may be most helpful to buy from those who don't supplement grain. Fortunately, most Dexter lines finish very nicely on a grass only ration- though supplementation does not hurt them! Remember it's the transition that counts!

Please feel free to forward any questions for future Vetcorner articles to my e-mail: cowvet03@yahoo.com. Happy Summer Grazing!