The buzz word that is going around when talking about solutions for livestock feeding after the summer Midwest drought is “efficiency.” This is obviously due to crop crises across all types of feed for dairy and beef cows, from protein to corn, to corn silage and hay(lage). Livestock owners are faced with being as efficient as possible with their feedstuffs all the way from eliminating waste in feed storage and in TMR prep, to feeding to a clean bunk, to feeding a ration that produces more milk or meat and less manure (feed efficiency). This article will touch on a wide range of topics involving the forage side of your ration.

Sorghums

One of the biggest advantages for those of you who either planted a sorghum bmr Gene 6 product (Forage Sorghum, Sorghum-Sudan or a Sudan hybrid, hereinafter referred to as sorghum) for either an emergency forage or as a regular part of your forage program, is the efficiency of the bmr Gene 6 products. We know of no other feed that provides the energy in as efficient manner as the sorghums. Bear in mind, we are only talking about bmr Gene 6, not other higher lignin sorghum products. There is, however a recognition factor among nutritionists who look at a forage test result of our sorghums and only see the high NDF. This high NDF is very digestible and probably even higher in digestibility than the NIR (Near Infrared) test indicates. The energy value printed on the feed test report will appear to be mediocre

Here is the rub: there is no test for energy whether for corn silage, haylage or sorghum. All energy values (NE_L for lactating dairy cows or NE_G for steers or growing heifers) are calculations. Whereas energy values for corn silage and haylage are constantly being re-evaluated and researched, the energy values for sorghums have hardly been researched at all. Feed test results for sorghums are just run through the corn silage equations. Compared to corn silage, bmr Gene 6 sorghums are higher in

sugar, considerably lower in starch and lower in lignin (as a percent of the NDF). And as a wag might say, “other than that there is hardly any difference!”

The big problem with feeding bmr Gene 6 sorghum silage will occur when the diet is formulated with too much starch. Researchers (Grant, et al) at the Miner Institute in Chazy, New York have found that the addition of between 0.10 and 0.15 to the calculated NE_L from the feed test report will get the ration started on the right foot. That is, if the test report shows 0.60 NE_L, you would enter 0.75NE_L in the ration balancing program. To further define which number to use, 0.10 or 0.15, if the ADF is from 28 to 34%, formulate with the 0.15 addition and above 35% ADF, use 0.1 or 0.12. According to Tom Kilcer at Advanced Ag Systems (personal communications) the energy from starch is a huge burst (resulting in undesirable rumen pH fluctuations) and the energy from the high levels of 6-carbon and especially the 5-carbon sugars in the NDF of sorghums provide a steady-state delivery of energy to the rumen. This will bring the level of grain feeding into the correct realm. We are learning much about starch or rather how little we can feed of it as the price of corn spirals out of sight.

A feeding trial at Miner Agricultural Research Institute (Grant, et al) showed at remarkable 28% (1.62 compared to 1.26) increase in milk efficiency (SCM/DMI) in a ration with 45% bmr Gene 6 Sorghum-Sudan (SS) fed to mid-lactation cows compared to 45% corn silage (CS). Other treatments were 35% of the ration dry matter in either CS or bmr Gene 6 SS. With similar trending results The only other forage in the diet was 10% of the DM in alfalfa haylage. Even with the addition of 6#'s soy hulls to the corn silage diet, (none was fed to the SS cows) body weight gained (1$/day on the SS diet and stayed the same with the CS diet. Other findings included higher butterfat, higher rumen pH, lower excretion of phosphorus, higher acetate to propionate ratios and overall better utilization of nutrients in the total diet and most significantly, lower DMI for the same milk production!

This energy delivery advantage for sorghums over corn silage is coupled with a higher crude protein level which provides additional benefit as the prices of protein sources are spiraling upward also.

Here are some other considerations about the storage and preservation of sorghums. Chop length should be longer than corn silage or haylage and be in the range of ¾" to 1" cut. The crop will be wetter than corn silage (and not for a Harvestore storage!) and close to 70% moisture. Preservation should be with a homo-fermentative inoculant, (i.e. one that produces only one fermentation acid – Lactic) not a buchneri type. These homo-fermentation preservatives are the most plentiful in the marketplace and definitely will work faster and better for the large amount of 5-Carbon sugar contained in the sorghum silages. Fermentation will be very rapid (even as short as I day) due to the high sugar levels and better packing due to the dense (wet) forage. For highest quality, forage sorghum should be harvested as the lowest grain start to reach soft-dough stage. Dwarf sorghum-Sudan (AS6402) should be harvest at 32" and the other sorghum-sudans and sudan hybrids at 40" for optimum quality. If frost is involved when harvesting, be sure to let the silage ferment for 5-10 days before feeding to allow for the dissipation of any prussic acid.

Forage Triticales

Forage Triticales (as opposed to those bred entirely for grain production), although not suffering the same energy evaluation problems as sorghum, does have the same advantages when replacing corn silage in a dairy diet which includes the higher protein (than corn silage) and the steady-state delivery of energy from the 5-carbon sugars in the NDF compared to the rumen pH altering bursts from the corn silage starch. Feeders of high quality triticale will also find some of the efficiency (milk per # DMI) that we see in sorghum.

High quality triticale is harvested at the flag leaf stage. This is when the last leaf appears in a spike-like form and then opens and lays over. The next stage is the boot stage and slightly lower quality forage is produced from that time on until full head out when it eventually becomes straw. It is better to cut ahead of optimum rather than too late.

These forages which in many instances are being tried for the first time due to the need for emergency forage may become staples in Upper Midwest dairy forage programs. Double-cropping can be viable here as well as more temperate regions.

Cool Season Grasses

Everything just said about triticale can be can be attributed to high quality European grasses such as Tall Fescue, Meadow Fescue, Perennial Ryegrass Italian Ryegrass, a few Festuloliums and some Orchardgrasses due to their high levels of 5-carbon sugar compared to alfalfa and their lack of phenolic bonding compared to corn silage (kind of like bmr haylage!). There are two things to remember: first, the spread between the best and the worst of any of these species of grasses is very profound-much wider than the difference between the best and the worst alfalfas on the market. This is due to the lack of domestic grass-breeding programs in the US compared to Europe. Europe needed grasses because of their climate and their difficulty in growing alfalfa whereas the US became convinced that pure alfalfa was the answer 30 to 40 years ago as the existing early-heading grasses seemed to not hold the promise of the higher protein alfalfa. As more was learned about NDF digestibility, modern European late-heading grasses began to make more sense.

The second thing is that if a farm has both a mixed stand of alfalfa/grass and a stand of pure alfalfa, the highest upside is in making the mixed stand first. This will yield a haylage with only marginally less protein, but a much higher digestibility (energy). These grasses are late-heading, but will not wait forever when cuttings get delayed. The total package with mixed alfalfa/grass is you get a highly palatable haylage with more yield, better quality (as judged by Relative Forage Quality) and higher energy. It's an efficiency triple play!