

High-Quality Forages Reduce Feeding Costs

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It appears rather certain for 2011 and perhaps longer, that livestock feed will be relatively high-priced. Ruminant animals have the advantage of using some feedstuffs, like forages, that are not used in human diets and not in high demand for bio-fuels either. The logical thing would be to utilize as much forage as possible while still maintaining a productive level acceptable to the producer. Within forage sources - alfalfa, grass, corn silage, small grains or straw - it is an advantage to have higher quality forage to feed. But just what is higher quality forage and why is that the goal?

With regard to animal requirements, whether the animal is growing or producing milk, it has a set of requirements for that activity. These are in amounts per day of energy, protein, minerals, vitamins and fiber. But more specifically, there are amounts of metabolizable energy (ME), metabolizable protein (MP) and NDF. Metabolizable energy and protein is what reaches the small intestine with the potential to be digested and absorbed. Metabolizable protein is ~60% MP from the rumen microbes and 40% dietary proteins not digested in the rumen. There are further constraints with NDF - there is a minimum amount needed each day as forage NDF to provide an amount of effective fiber and a maximum amount so it does not limit dry matter intake (DMI). Sources of ME are starch, digestible NDF and fats.

Protein content of forage is influenced by species and relative maturity. Because protein is expensive to provide in feed, immature forage is often preferred, usually alfalfa, to provide a source of crude protein (CP). Unfortunately, alfalfa can be too high in soluble protein and end up wasting protein when it is converted to non-protein nitrogen in the rumen and not utilized by rumen microbes. Alfalfa, even immature alfalfa, is higher in lignin and thus lower in NDF digestibility or NDFD, than other forage species like grass or corn.

In recent years, grasses, especially high quality grasses, are once again being considered as forage for dairy animals. Grasses typically are lower in CP than alfalfa at similar maturities. However, they have a role in balancing the amount of soluble protein in alfalfa and the amount of starch in corn silage while providing NDF and greater NDFD. Lignin content of grasses is typically about half that of legumes which allows increased digestibility of the NDF. Grasses have been criticized in the past as poor forage for dairy animals because they were higher in NDF than legumes and were unjustly discounted in the RFV formula. With the advent of Relative Forage Quality index (RFQ), grasses are valued because of their higher NDFD.

Grasses are slower to digest, which provides a more effective fiber mat. However, they are more completely digested than legumes. This eliminates the need for addition of straw to diets of lactating cows.

Corn silage provides less CP per unit of forage but excels in energy content due to starch content and digestible DM and NDFD. The forage portion can be higher in NDFD than alfalfa as well as the grain and cob portion, which is highly digestible. Corn silage also brings consistency and yield potential to a forage system. Within corn hybrids, corn breeders are identifying certain varieties that are referred to as silage specific. These varieties are above average in NDFD in forage portion, have high DM yields and may have a softer endosperm in the corn. An extreme example for NDFD is the BMR hybrids. Although often lower in total DM yield, yield of digestible NDF may be greater than other hybrids.

In the future, producers will likely need to increase the amount of forage in diets fed to dairy animals and other ruminants in order to save money while maintaining productivity. This can be done by combining different species of high quality forages. Mathematical models will be used to better understand the combinations which will accomplish that goal. Evaluations may need to be shifted to yields of digestible NDF and CP that will yield the greatest ME and MP in the animal. This will be in addition to the many other management practices already used while still relying on adequate rainfall and good weather at harvest to maximize yields and minimize losses.