ONA REPORTS

published in

THE FLORIDA CATTLEMAN AND LIVESTOCK JOURNAL

August-1996

Protein Supplementation for Cattle Grazing Limpograss

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Limpograss (Hemarthria) is a warm season perennial grass adapted to areas higher in organic matter which may retain moisture. Acreage planted to limpograss is increasing due to its high forage production, and better growth in the early-spring and late-fall than other tropical grasses. Generally limpograss is lower in crude protein (CP) but higher in total digestible nutrients (TDN) than other tropical grasses. This has important implications in protein supplementation programs for cattle consuming limpograss pasture, hay, or silage.

Protein requirements of cattle are broadly categorized into: (1) needs of the rumen microbes, and (2) needs of the host animal. Rumen microbes obtain protein from feedstuffs that are broken down in the rumen (degradable protein). Protein requirements of the host animal are met by rumen microbes which flow from the rumen and are utilized in the small intestine, and by feedstuff protein which escapes ruminal degradation (escape protein). Factors such as physiological state of the animal, energy concentration of the diet, quantity of available forage, and characteristics of the dietary protein (amounts of degradable and escape protein) influence the host animals protein requirement. In some cases, protein derived from rumen microbes may be sufficient to meet the host animals protein requirement, while cattle with high protein requirements may require escape protein in addition to protein derived from rumen microbes. Therefore, in addition to the absolute CP concentration of a feedstuff, the relative amounts of degradable and escape protein should be considered when formulating protein supplementation schemes for cattle. For example, the CP concentration of ryegrass is high (15 percent or greater), however most of the protein is ruminally degraded, and improved cattle performance has been obtained by feeding a protein source which escapes ruminal degradation.

Protein supplementation for cattle is usually not considered necessary during the spring-summer-fall grazing season when grasses are actively growing, but under certain conditions limpograss can be low in CP relative to its TDN concentration, and a response to protein supplementation might be expected. In four years of experiments at Gainesville, steers grazing Floralta limpograss during the summer and early-fall were fed protein supplements containing urea and escape proteins. Limpograss pasture was low in CP (five to eight percent) and blood of cattle fed no protein was low in urea-nitrogen indicating that cattle were protein deficient. In all years, cattle fed supplemental protein had greater daily gain than those fed no protein. In three years of experiments at the Range Cattle Station at Ona, growing steers grazed Floralta limpograss during the summer and early-fall, and were fed molasses-based supplements containing no protein, or combinations of urea and feathermeal. In two years, steers gained over 1.0 lb daily, with no response to protein supplementation. In one year, cattle fed the supplement with no added protein gained .6 Ibs daily, and daily gain was increased to 1.0 Ib with protein supplementation.

In experiments at Gainesville, pastures were grazed in a rotational manner to utilize most of the available forage. In experiments at Ona, limpograss pastures were grazed so that excess forage was always available. This may have allowed more selective grazing by cattle resulting in a diet that was high enough in CP relative to the TDN so that additional protein was not required. In earlier studies at Ona with fistulated cattle, CP and TDN concentrations of diets consumed by cattle on limpograss pasture with excess forage available averaged 10 and 60 percent, respectively indicating that CP was not limiting relative to TDN, and a response to protein supplementation might not be expected.

Protein supplementation for cattle fed limpograss should consider the animals production stage, available forage, and time of year. Under conditions of excess forage during the spring and summer where cattle have the ability to graze selectively, a response to protein supplementation may not always be obtained. However, if limpograss pastures are managed so that most of the forage is utilized and selective grazing is limited, performance of cattle with high protein requirements may be improved with protein supplementation. As forage availability and quality declined into the fall and winter, additional protein and energy may be needed for some classes of cattle.