



EXTENSION

Institute of Food and Agricultural Sciences

Guidelines to Selecting a Liquid Feed for Winter Supplementation of Producing Beef Cows in South Florida¹

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Selecting a Liquid Feed for the Specific Feeding Situation

Pasture Situations with Winter/Spring Breeding Season

Bahiagrass, 7% crude protein (CP), 45% Total Digestable Nutrients (TDN). Feed a liquid supplement during calving/breeding season to provide about 3 lbs of TDN and .75 to 1.0 lbs of CP/cow/day. This would require a liquid feed containing 15 to 20% CP. For cattle up to 4 years old, thin older cows (condition score 2 to 4 at breeding), or cows not separated by age, over 75% of the total CP should be natural protein. For cows 5 years and older maintained in a separate herd and in good body condition (condition score of 5 or more at calving), all added CP can be non-protein nitrogen (NPN).

Stockpiled hemarthria (or pangola), 5% CP, 55% TDN. Feed a liquid supplement during calving/breeding season to provide 1.5 lbs of TDN and .75 to 1.0 lbs of CP/cow/day. This would require a liquid feed containing 30 to 40% CP. For cattle up to 4 years old, thin older cows, or cows not separated

by age, over 50% of the total CP should be natural protein. For older cows kept in a separate herd and in good body condition, all added CP can be NPN. Do not feed high NPN liquid feeds to hungry cattle.

Situations with Hay Providing Most of Forage with Winter/Spring Breeding Season

Good quality stargrass or bermudagrass hay, 10% CP, 55-60% TDN. No supplement needed.

Moderate quality stargrass, bermudagrass or bahiagrass hay, 7% CP, 50% TDN. Supplement similar to bahiagrass pasture described previously.

Hemarthria hay, 5% CP, 55% TDN. Supplement similar to stockpiled hemarthria pasture described previously.

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What to Look for When Comparing Liquid Supplements

Crude Protein Concentration

Total crude protein and % equivalent protein derived from non-protein nitrogen are on the feed tag. Natural protein can be calculated from these values as: natural protein (%) = total CP (%) - equivalent protein derived from NPN (%).

Natural protein. Where it cannot be added, natural protein can be fed as a separate supplement with a liquid feed as a meal, range cube, or as a free-choice protein in a salt-mineral mix. Total CP of .75 to 1.0 lbs/cow/day needs to be provided in the liquid and dry mixes.

Bypass protein is protein not degraded in the rumen but digested in the true stomach and intestines. Such proteins provide more and a better balance of amino acids to cattle, thus improving production. Liquid feed fed to grazing cows should contain by-pass protein when the addition of a natural protein is recommended. A by-pass protein value is not listed on the feed tag, but proteins like feather meal, blood meal, fish meal, and cottonseed meal contain by-pass protein and will be listed on the tag if they are added.

Energy Concentration

It is difficult to compare the energy concentration of different liquid supplements because common energy values such as TDN are not given. The following feed tag values will assist in making such comparisons.

Moisture content. A liquid feed can contain from 20 to 40% (or more) moisture. Water contributes no energy and a liquid feed with less moisture usually has a higher energy value.

Total invert sugar. Sugars are the major source of energy in most liquid feeds. Invert sugar can be as high as 40 to 48%. The higher the better.

Fat content. Fat contains 2.25 times the energy of sugar or starch. The addition of fat increases the energy value of a liquid feed.

Ingredient composition. Good ingredients for making liquid feed are cane, citrus, beet and corn molasses. Molasses distillers solubles provide more protein and vitamins than molasses, but the energy value is much lower than the original molasses because sugars have been fermented into alcohol. In comparison to molasses, molasses distillers solubles have a much higher ash content which provides no energy.

Estimated TDN. The TDN value of a liquid feed can be estimated using the above values with the following formula: $TDN = \text{total invert sugars (\%)} + \text{natural protein (total CP - NPN) (\%)} + \text{fat} \times 2.25 (\%) + 8 \times ((100 - \% \text{ moisture}) \div 78)$.

Minerals and Vitamins

Minerals and vitamins are less important than protein and energy and may not be needed if cattle consume adequate levels of a good mineral/vitamin supplement.

Cost

To figure cost, set a goal as to supplemental nutrient needs/cow/day and then determine what it will cost to meet this goal. For example: one might wish to supplement older brood cows grazing bahiagrass pasture 3 lbs/cow/day of TDN and 1.0 lb/cow/day of total CP. Estimate the TDN (as-fed value) of the feed; say it is 52% in this example. The quantity of liquid feed that needs to be fed to provide 3 lbs/cow/day of TDN is 5.75 lbs (3 divided by .52). To provide 1.0 lb of CP, divide 1.0 by 5.75 and multiply by 100. This will give the % CP the feed should contain (crude protein % = 1.0 ÷ 5.75), which is 17% CP in this example. If the liquid feed selected sells for \$115/ton, it will cost \$0.33 (33 cents)/cow/day ($\$115 \div 2000 \times 5.75 \text{ lbs/cow/day}$).