Native Pasture Is Not the Cheapest Feed for Range Cows in May

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Results from a recent study that compared the costs of forage strategies for lactating cows during May will surprise some beef producers, says a North Dakota State University range scientist.

"Traditional evaluation methods comparing forage cost per unit of weight suggest that traditional forage choices are the least expensive feeds, but this measure does not accurately reflect livestock feed costs," states Lee Manske, a range scientist at NDSU's Dickinson Research Extension Center. "A broader consideration of factors indicates that producers using well-chosen forage alternatives to native range and mature crested wheatgrass hay should see lower feed costs and improved profit margins."

The study, conducted at the Dickinson facility, evaluated the costs of native rangeland, unfertilized and fertilized crested wheatgrass pastures, and two harvested-forage types--mature crested wheatgrass hay and forage barley hay cut at the milk stage--as feed for 1200-pound range cows during the 31-day spring lactation production period in May. Evaluations included land rent values, production costs per acre (including equipment and labor), forage dry matter costs per ton, crude protein costs per pound, and total feed costs per day and per period. Costs per pound of calf gain and returns after pasture costs were compared for pasture types.

"The pasture- or harvested-forage type with the lowest cost per ton or the lowest cost per acre is not the lowest-cost livestock feed," emphasizes Manske. "Land costs, production costs, equipment costs, and labor costs per acre are important, but these costs do not regulate the costs of livestock feed. The cost of livestock feed is determined primarily by the cost per unit of weight of the nutrients contained in the forages."

Native range pasture had lower land rent value, equipment costs, labor costs, and production costs per acre than forage barley hay but had the highest per day feed cost. During May, native rangeland grass tillers have not yet produced their third new leaf. An acre of this immature growth yields only 195 pounds of forage dry matter and 32 pounds of crude protein for range cows to consume, and 4.77 acres are required to provide adequate forage for a 1200-pound cow for the 31-day period.

The forage with the lowest feed cost per day during May was forage barley hay cut at the milk stage. This hay has 4,733 pounds of forage dry matter and 606 pounds of crude protein per acre for cows to consume, and a 1200-pound cow requires the forage from only 0.13 acres during May. The greater production costs per acre for forage barley hay are prorated across greater quantities of nutrients per acre, so lower costs per pound of nutrient and lower livestock feed costs per day result, he explains.

Crested wheatgrass hay cut late is expensive livestock feed because it has high costs per pound of crude protein, observes Manske. Cutting domesticated grass hay at a mature plant stage yields about the amount of forage dry matter per acre the plants will potentially produce that year, but the low yield in weight of nutrients per acre causes high nutrient costs. Crested wheatgrass hay cut at the boot stage yields 19 percent less dry matter but 85 percent more crude protein per acre than mature crested wheatgrass hay. Feeding lactating range cows early cut wheatgrass hay rather than mature crested wheatgrass hay in May results in a 50 percent lower cost of nutrient per pound and a 39 percent reduction in the livestock feed cost per day for that period.

Livestock feed costs per day do not differ between unfertilized and fertilized crested wheatgrass pastures. Production costs per acre are nearly 60 percent greater for the fertilized pastures, but the land area requirement is about 60 percent less. The important difference, however, is in the weight gain of the livestock. The amount of nutrients captured per acre and converted into saleable calf weight greatly affects the economic returns per acre, states Manske. Cows gain 78 pounds per acre more and calves gain 58 pounds per acre more on fertilized crested wheatgrass pastures. Cost per pound of calf gain is 11 percent lower and returns after pasture costs are 26 percent greater per cow-calf pair and 215 percent greater per acre on fertilized crested wheatgrass pastures.

Evaluation of costs of pasture forage and harvested forage should be based on costs per unit of weight of the nutrients, stresses Manske. Generally, the lowest-cost livestock feed is the forage with the lowest cost per pound of nutrient.

Spring native range forage had a crude protein content of around 16.3 percent, production costs of $8.76 per acre, forage dry matter costs of $89.85 per ton, and crude protein costs of 28 cents per pound. During the spring lactation period, a grazing cow-calf pair required 4.77 acres, at a cost of $41.85 for the period, or $1.35 per day. Calves gained an estimated 1.80 pounds per day, or 11.70 pounds per acre, at a cost of 75 cents per pound of gain. When calf weight was assumed to have a value of 70 cents per pound, returns after pasture costs were a loss of $2.79 per cow-calf pair and a loss of 60 cents per acre.

Spring unfertilized crested wheatgrass pasture had a crude protein content of around 16.8 percent, production costs of $8.76 per acre, forage dry matter costs of $35.39 per ton, and crude protein costs of 11 cents per pound. During the spring lactation period, a grazing cow-calf pair required 1.88 acres, at a cost of $16.47 for the period, or 52 cents per day. Calves gained an estimated 1.91 pounds per day, or 32.18 pounds per acre, at a cost of 27 cents per pound of gain. When calf weight was assumed to have a value of 70 cents per pound, returns after pasture costs were $24.98 per cow-calf pair and $13.29 per acre.

Spring fertilized crested wheatgrass pasture had production costs of $21.26 per acre and forage dry matter costs of $34.29 per ton. During the spring lactation period, a grazing cow-calf pair required 0.75 acres, at a cost of $15.95 for the period, or 51 cents per day. Calves gained an estimated 2.18 pounds per day, or 90.11 pounds per acre, at a cost of 24 cents per pound of gain. When calf weight was assumed to have a value of 70 cents per pound, returns after pasture costs were $31.36 per cow-calf pair and $41.82 per acre.

Crested wheatgrass hay cut late, at a mature plant stage, had a crude protein content of around 6.4 percent, production costs of $28.11 per acre, forage dry matter costs of $34.80 per ton, and crude protein costs of 28 cents per pound. During the spring lactation period, mature crested wheatgrass hay would be fed at 27 pounds of dry matter per day to provide 1.7 pounds of crude protein per day. An additional 0.8 pounds of crude protein per day would need to be provided, at a cost of $7.27 per period. Production of mature crested wheatgrass hay for a lactating cow would require 0.58 acres and would cost $21.70 for the period, or 70 cents per day. Total forage and supplement costs would be $28.97 for the period, or 93 cents per day.

Forage barley hay cut early, at the milk stage, had a crude protein content of around 13 percent, production costs of $68.21 per acre, forage dry matter costs of $28.80 per ton, and crude protein costs of 11 cents per pound. During the spring lactation period, early cut forage barley hay would be fed at 19.3 pounds of dry matter per day to provide 2.5 pounds of crude protein per day. An additional 10.7 pounds of roughage per day would need to be provided, at a cost of $5.80 per period. Production of early cut forage barley hay for a lactating cow would require 0.13 acres and would cost $8.68 for the period, or 28 cents per day. Total forage and supplement costs would be $14.48 for the period, or 47 cents per day.