Supplementing Stocker Cattle on Pasture

by Dan Undersander, Dan Schaefer, and Mike Siemens, University of Wisconsin

Most of the time, well-managed pasture can provide most of the energy, protein and fiber needs of stocker cattle. However, it is important to understand changes in pasture composition during the growing season. This, along with knowledge of the animal needs, will suggest when supplementation may assist in meeting performance goals.

In terms of forage quality, pastures generally go through three stages during the growing season from an animal nutrition standpoint. The first is early spring growth which is high in energy but low in fiber. The low fiber is not likely to be a consideration to stocker cattle but associated high plant water content may be. This growth is high in crude protein but 50-70% of the nitrogen may be nonprotein nitrogen. The second period occurs as the grasses begin to head when fiber content increases while energy and protein content decrease. The third phase is late season regrowth which is high in energy and protein but may be limiting in tonnage.

Several studies of animal supplementation on pasture have been conducted which relate to this seasonal pattern and suggest management alternatives.

The first study was conducted with sixty Holstein steers on mixed perennial cool season grass/legume pasture. Treatments consisted of a control, use of an implant/re-implant program (on 1 and 84 days), daily provision of 200 mg Bovatec in 1 lb of pelleted wheat middling formulation, coarsely ground corn fed at up to 1% of body weight, and combinations of the preceding. The study included three replicates of animal groups each of which were moved to a new paddock twice weekly.

Results are shown in Table 1. Corn supplementation increased weight gain all years but conversion of corn to gain was relatively inefficient (7.7-21.4). Corn consumption was only 25-50% of the available amount early in the season. The less than planned intake may have caused responses to corn only occurring in the last months of the grazing season. It may also be that pasture had sufficient energy early and that the corn would have produced little benefit even if consumed.

Corn supplementation may not be necessary as an energy supplement in high quality pastures. However, it can stretch pasture during periods of shortage and allow increased stock rates in times when grain is inexpensive relative to beef. Consumption of corn was low early in the season when pasture was lush; indicating that the most cost effective use of corn on pasture may be strategic supplementation only when pasture quality or availability is low.

Synovex-S only improved daily gain statistically in one of the three years. Since implants function by increasing lean growth at the expense of fat deposition, it is likely they will exert influence only when fat deposition is possible. The implant response was significant only when unimplanted steers gained in excess of 2.3 lb/d. If the additional 49 lbs of gain noted is valued at $.70/lb then apx. $5 in implants yielded $34.30. Bovatec supplementation resulted in significant effects only in 1996. The advantage achieved was very costly, particularly if labor for feeding is considered.

Continuation of the study through the finishing phase in 1997 indicated that the treatments receiving Synovex-S had the slowest growth rate. Control steers compensated for their lighter final weights in the grazing phase to the extent that they had the numerically heaviest carcass weights following finishing. Thus, the decision to feed corn may depend, in part, on how long ownership is retained.

A second study, begun in 1998, gives some interesting information on the value of rumen undegraded protein (RUP, by-pass protein) for growing animals on pasture. In this study, 64 Holstein steers weighing apx. 450 lbs were randomly divided into four groups. Two groups were moved to new paddocks every 2 days and two groups were moved every 4 days. Pasture size was apx. 0.5 and 1.0 acre for the two treatments but was adjusted so that animals had apx. equal forage allowance. Bypass protein treatments were check (no protein supplement), soybean meal (45% CP and 35% RUP), and Soy-Plus (44% CP with 55% RUP).

Results shown in Table 2 are from one year's data and should be considered preliminary. The 2 vs. 4 day movement to new paddocks had no effect on animal performance. Adequate forage was present, as judged by residue remaining after cattle were removed, insuring no reduction in animal consumption. Data from some studies have suggested that quality of pasture declines each day the animals are on the paddock and that animals with higher performance levels should be moved faster than animals with lower energy needs. Data suggest that cool-season grass pasture may provide adequate energy with either 2 or 4 days on pasture if adequate forage is present so that intake is not limiting. It could be that, while pasture quality is declining, it is still sufficiently high to meet animal needs or that some animal compensatory effects are involved. The study also suggests that RUP may be beneficial to stocker cattle on pasture. This relates to the high NPN content of pasture, particularly in the early season and is not unexpected.

Table 1.

	Average Daily Gain (lb/day)		
Treatment	1995	1996	1997
Control	1.55[a]	2.05[a]	2.38[a]
Synovex-S	1.66[a]	2.21[a]	2.68[b]
Corn	1.92[b]	-----	-----
Synovex-S & Corn	2.14[c]	2.44[b]	2.92[c]
Synovex-S and Bovatec	-----	2.48[b]	2.57[ab]
Synovex-S, Corn and Bovatec	2.19[c]	2.74[c]	2.99[c]

a,b,c Means within the same trial with different superscripts are different (P<.05)

Table 2. *Summary of RUP protein supplements on pasture at UW Research Station, Lancaster, WI in 1998.*

	Average Daily Gain (lb/day)	
Treatment	2-day Movement	4-day Movement
Control	2.39	2.22
Soybean meal (35% RUP)	2.67	2.36
Soy Plus (55% RUP)	2.60	2.56

These studies suggest that supplementation during the grazing season should change to meet changing pasture quality and producer goals. In both studies, fiber may have been limiting early in the season. Studies have indicated that animals given additional fiber in early season will improve in performance. Indications are that the animals will consume up to 40% of their intake from these fiber sources. It is also likely that an RUP protein source will improve stocker performance due to the high NPN in early season growth, especially from small grains.

Fiber is not likely limiting as the season progresses and grasses begin to head. During this period crude protein may be low and need to be supplemented. Grain may provide additional energy. It may also help stretch the pasture if forage is short.

Late season growth is leafy and will be high in quality. The most limiting factor is likely to be tonnage and forage density to allow adequate intake. Grain supplementation may provide increased gain. However, the decision to feed may depend on forage availability and whether or not the ownership is retained through finishing. There may be compensatory gain during finishing to offset the increased gains from feeding grain on pasture.