# Forage-Based Beef Production in the Bioenergy Era

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In 2007, the increase in demand for corn resulted in the greatest number of total acres planted since 1933. Combined with advances in management and genetics, the result will be a National Agricultural Statistical Service (NASS) forecasted record level of production, despite many areas having yields reduced by drought.

The increased demand for corn has increased corn prices resulting in higher feed costs for feeders across the U.S. According to the September 2007 Cattle on Feed Report, the number of head under 600 lbs placed in yards during July and August was down nearly 28% from a year ago. The change in feeder cattle prices also indicates a slight change in preference as the average price paid for 850 lb steers from January through August is down only 1.25% and 1.62% in comparison to 2006 and 2005 prices, respectively (based on data from Cattle-Fax). The average price for 550 lb feeder steers for the same time period is down 6.7% and 5.8% from 2006 and 2005, respectively.

The numbers indicate that yards are considering the increased production costs and placing heavier cattle in comparison to a year ago. Those attempting to reduce the "buyers' market" angle and capture more value in feeder calves are contemplating backgrounding feeders and selling at heavier weights. Additionally, discussions in the Midwest are beginning on the efficacy of non-corn finishing diets. There may be economic advantages to attaining more of the background gain from pasture/grazing with less use of expensive grain portions in the backgrounding diet. It remains to be seen whether these strategies are sustainable and economically viable as the competition for land between forage and grain production is expected to result in higher forage costs.

Pasture land value across much of the Midwest and plains areas saw an increase in land values. Pasture rental rates were increased by 5.9%, 6.3% and 8.4% for the Corn Belt, Lake States, and Northern Plains regions according to NASS. Does the current situation provide an opportunity for pasture finishing in which investments in facilities are minimal and gains from genetic improvement can be realized for smaller enterprises?

Recent research from the eastern U.S. illustrated that the rate of gain during the overwintering or backgrounding phase impacted future performance and carcass characteristics of steers finished on pastures. During the backgrounding period, gains on pasture were reduced for cattle assigned to treatments which supported rates of gain greater than 1.0 lb/day in comparison to those that gained 0.7 lb/day. Daily gains during the finishing period on pasture averaged 2.0 lbs/day (Neel et al., 2007). However, this compensatory gain was not sufficient to yield similar carcass weights to those assigned to the high rate of gain during the backgrounding or growing period when harvested at the same end point. Hence, improved or compensatory gain failed to offset total gain over the backgrounding period. The USDA quality grade and dressing percentage were also reduced for cattle on the slow rate of gain compared to those on the high rate of gain. As the authors indicate, the economic impact of backgrounding and finishing strategies on carcass traits is dependent upon marketing, as price premiums may be obtained for other factors related to management practices (e.g., locally produced, grass finished). These premiums increase carcass value, partially offsetting the reduced returns from a lower USDA quality grade. Yet, there are some entities that seek grassfed beef with clearly defined carcass specifications which must be met before they are willing to pay a premium, thus marketing strategies are expected to influence management of pasture-based finishing systems.

From 1975 to 1978, a grazing trial was conducted at the University of Wisconsin Lancaster Agricultural Research Station in which cattle received no corn or were supplemented with corn at a rate of 1% of body weight (700 lb steer received 7 lbs of corn) initiated in early July each year. Cattle fed corn gained approximately 16% more than the grass-only cattle and had dramatically more carcasses grading "Choice" (based on the standards at the time), 83% vs. 17% for corn and grass, respectively. Similar results were observed in later Missouri trials in which corn supplementation increased performance compared to pasture finishing steers. The increased energy intake improved carcass characteristics as well, producing carcasses that would be acceptable for commodity market channels. This research suggests that hybrid grazing/supplementation systems can provide increased management flexibility, precision, and profitability in producing valued "commodity" beef channels.

This concept of producing beef that could be marketed in commodity markets using non-corn supplements and seasonal pasture finishing has been the focus of current research at the Lancaster station. A series of treatments compared forage-based vs. non-starch supplemented steers with and without an ionophore. During two of the three years, steers were harvested when forage availability from pastures became limiting. During the other year, steers were harvested based on target backfat thickness as determined by ultrasound. Offering the grazing steers up to six pounds of soybean hulls and three pounds of dried distiller grains greatly improved daily gains (Figures 1.1,1.2) while steers consuming alfalfa pellets also responded with increased average daily gains. This response may partially be attributed to increased dry matter (DM) intake and increased energy availability. Supplementation not only increases animal gain, but it also reduces forage intake allowing for slightly increased carrying capacity or the ability to stretch limited forage supplies.

With carcass traits, the ability to produce beef meeting commodity beef market specifications in a single grazing season following weaning can be challenging. The increased weight preference by processors can influence the phenotype of the animal and, to some extent, the genetics that fit these production systems. The need to produce carcasses grading at least "USDA Select" to avoid severe discounts requires emphasis on genetic selection and cost-effective feeding. Non-starch grain co-products can increase energy intake of grazing steers and improve carcass characteristics minimizing commodity market discounts (Figures 2.1-2.2). The ability to utilize non-grain co-products from the bio-energy industry to compliment pasture forages in finishing systems is biologically possible. The challenging question is whether such systems will be economically viable. Marketing strategies will drive management decisions to produce carcasses that return acceptable profit margins.

**Figures 1.1-1.2** *Average daily gain of steers grazing cool-season grass/legume mixed pastures supplemented with alfalfa pellets, a combination of soybean hulls + dried distillers grains, or soybean hulls + dried distillers grains + ionophore.*[1]
**Figures 2.1-2.2** *Percentage of carcasses "USDA Select" or better from steers grazing cool-season grass/legume mixed pastures harvested either when available forage was limiting (2005) or similar backfat (2006).*

**Figure 1.1** *2005 data*

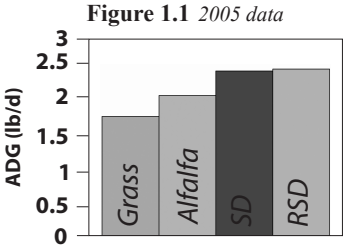



**Figure 2.1** *2005 data*

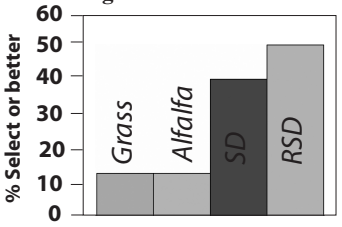



**Figure 1.2** *2006 data*

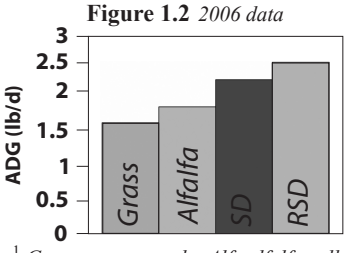
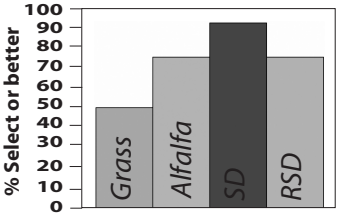



**Figure 2.2** *2006 data*




[1] *Grass=pasture only; Alf=alfalfa pellets; SD=67:33 soybean hulls:dried distillers grains; RSD=SD plus Rumensin; all supplements offered up to 9 lbs/steer/day.*

Maintaining high quality forage availability to support targeted gain rates is an important consideration, yet the inability to control drought conditions makes a hybrid system of grass and supplementation attractive. Supplementation on pasture can also provide increased management flexibility as well as increased product consistency, which is valuable in markets with carcass specifications. This differs from the finishing systems that rely solely on grass or forage and derive a product premium from niche markets. This hybrid production model focuses on a low facility overhead cost structure. This results in reduced costs of gain and marketing beef into commodity market channels while allowing producers to capture value derived from investments in genetic improvement and an ability to diversify marketing strategies by spreading financial risk over multiple markets. As the U.S. moves into an era in which agricultural products find new markets and grain demand for energy production increases, alternative production models may be increasingly viable. However, these systems must still produce carcasses that meet consumer expectations and be economically competitive with grain-based production systems. Available land base is needed for the production of high quality forage for these systems.

Though untraditional, with the volatility in today's markets, it pays to keep an open mind and consider alternative production systems if profit margins can be increased.