Feeding Calves to Produce Quality Beef

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Introduction

There are many reasons that we might wish to wean calves earlier than the traditional 205 days of age. Some of these conditions include: when forage supplies are low such as in a drought, when forage supplies are low quality like pure fescue pastures in mid summer, when you are having problems getting cows and/or first calf heifers bred, when you wish to market cull cows that have calved on a better market than the fall market, when winter feed supplies are limited and you want the cows to enter the winter in better condition, when you want to summer calve to reduce winter feed cost for the cow, and when you wish to produce high quality beef from your calves.

Beef quality and consistency have been identified as major problems in the beef industry by the National Cattlemens Beef Association (NCBA). This was well documented in the National Beef Quality Audit which was just completed by NCBA. NCBA has encouraged producers to reduce fat and improve the quality of the beef they produce. Producers have been successful in reducing fat, but they have also reduced quality. The audit found that fat thickness declined from .59 to .47 inches and the percent choice and prime declined from 55% to 48% from 1991 to 1995. The audit also compared the ideal mix of cattle quality grades to what was produced in 1995. They found that we need 7% prime cattle and we produced 1%, we need 21% high choice cattle and we produced 11%, we produced 34% low choice cattle and we need 36%, we produced 38% select cattle and we need 36%, and we don’t need any standard cattle and yet we produced 5%. This clearly illustrates the need for more high quality beef to meet consumer demand. The development of new marketing grids that pay for cattle based on quality and yield grade are a result of the lack of sufficient supplies of high quality cattle.

Illinois Research

We have been conducting research to evaluate the influence of calf management systems on the economics of beef production systems. More specifically, we have evaluated the effects of weaning time and creep feeding on cow performance, calf performance and carcass merit of the calves at slaughter. We have found that changing these practices has a dramatic influence on calf performance in the feedlot and carcass merit. The following discussion summarizes our results at this time. We continue to research systems to produce high quality beef.

Our creep feeding research has demonstrated that source of creep feed, amount of creep feed consumed and length of time calves receive creep feed all have an influence on carcass quality grade. We have seen an increase in final quality grade as the amount of creep feed consumed increased (Faulkner et al., 1994). The source of creep feed also has a dramatic influence on final quality grade. Calves creep fed with a corn based diet had much higher final quality grades than those fed a soyhull based diet, even though the daily gains of the calves were
similar (Faulkner et al., 1994). This might be due to differences in the volatile fatty acids produced from the different diets. Calves consuming the corn based diets had higher propionate and lower acetate levels than the soybean hull fed calves or the non creep fed calves (Faulkner et al., 1994). Based on our published and unpublished data it appears that the calves need to be on creep feed for about 80 days to increase quality grade (Faulkner et al., 1994; Tarr et al., 1994).

We have seen little difference in feedlot performance between the different creep feeding strategies and no creep feed, except in one study when the non creep fed calves gained only 1.2 lb/day (Faulkner et al., 1994; Tarr et al., 1994). In that study the calves exhibited compensatory gain in the feedlot (Tarr et al., 1994). All of our research has been based on weaning calves at 205 days of age and adapting them to a finishing diet within 28 days of weaning.

We have also evaluated the influence of creep feeding heifers on their subsequent milk production. Previous research has suggested that creep feeding heifers results in about a 25% reduction in milk production as cows. Much of this research was conducted with British bred heifer calves. We conducted a study with Simmental x Angus crossbred heifers and found a similar 25% reduction in milk production (Buskirk et al., 1996). We would not recommend creep feeding heifer calves, but we feel that creep feeding steer calves can improve quality grade with no decrease in feedlot performance.

Currently we are evaluating the influence of early weaning on feedlot performance and carcass merit. We have found that weaning at 150 days improves quality grade dramatically and improves feed efficiency in the feedlot (Myers et al., 1997). We found a 30% increase in calves that graded average choice or above due to weaning at 150 days. We have also observed a slight increase in the carcass weights of the early weaned calves compared to non creep fed calves. All calves were slaughter at .4 in of backfat, so the increased carcass weight and quality grade improvement were not due to the calves being fatter. Overall, the number of calves with carcasses in this high quality range varied from 70 to 95% depending upon the breed type. We observed that Simmental x Angus crossbred calves had about 30% less high quality carcasses than Angus x Hereford crossbred calves, but treatment differences were the same.

In another study by Myers et al. (1997), creep feeding for 55 days prior to weaning had little benefit probably because the time was insufficient to initiate marbling deposition. The cows from which the calves were early weaned gained 85 lbs more than the cows nursing calves. This weight might be beneficial to reduce the need for supplemental feed.

When comparing 90, 150 or 210 days of age at weaning we observed that the calves weaned at 90 days tended to have more high quality cattle Myers et al. (1998). There was little response to the 150 day weaning in this study. These calves were harvested at less backfat (.3 in) and were not fed for as long. These two factors may account for some of the differences observed. Overall, there were over 50% of the cattle in the premium beef grades (above average choice) even when the calves were harvested at less backfat.

**Recommended Strategies**
Based on our work, we would recommend the following steps to produce quality beef.

- Decide if you want to creep feed or early wean the calves. Calves should be creep fed for at least 80 days. If you are early weaning the calves, you can wean at about 80 days (just prior to breeding) to get reproductive benefits for the cow, performance benefits for the calf and carcass benefit for the calf. Alternatively, you can wean at about 150 days and get performance and carcass benefit for the calf. Calves need to be on a high concentrate diet as early as possible to initiate marbling deposition. The diets should be based on corn or other high-energy grains, rather than high fiber supplements like soyhulls, to maximize the initiation of marbling. Whole shelled corn works very well in these diets with commercial supplements used in the Holstein feeding program. If the calves are fed a low energy diet after they were on a high-energy diet for some period of time, they may loose the marbling that was initiated and ultimately not grade as well. These high-energy diets can be any high grain feedlot diet. The only difference is that the protein level should be about 16% until the calves weigh 600 lbs. It can then be reduced to about 12.5%. Feed companies have supplements that are designed for feedlot diets and contain an ionophore (i.e. Rumensin or Bovatec). The ionophores are important to reduce acidosis and bloat.

- The calves should be implanted twice about 100 days apart with estrogenic implants (i.e. Ralgro, Synovex). For the last 120 days, the calves should be implanted with a combination estrogen-androgen implant (i.e. Revelor, Synovex-plus). These implants will increase final weight and will not reduce marbling in our system.

- The calves can be marketed at about 210 days of age or ownership can be retained until harvest. At 210 days of age, the calves will be about 100 to 200 lbs heavier than normal weaned calves (depending on weaning age), will be very efficient in their gain (under 4 to 1 feed to gain) and may be discounted for being fleshy under the current marketing system. It might be difficult to sell the calves for what they are worth unless you find a cattle feeder that is aware of this system.

- Let the cow be a low input, low cost “factory”. Part of the feed cost of early weaning can be recovered through reduced supplemental feed cost of the cow. Early weaning the calves also effectively increased stocking rate by over 35%. This is important during midsummer when stocking rates are at their low point. The cost may also be reduced due to improve reproduction if the calves are weaned prior to weaning.

- If you make the effort to produce high quality beef from your calves, it is important that you find a market that will pay you for this product. Compare marketing alternatives if you feed the calves on your farm to those available through a custom feedlot. This system can pay dividends in markets that reward quality.

**Conclusions**

We have demonstrated that the goal of producing high quality carcasses from steers
placed on feed as calves is achievable. Management of the calves to get them on a high-energy diet as early as possible is critical. This management has been more important than the calf’s genetic merit for marbling in our studies. However, the effects of high marbling EPD’s have been additive with our management program, so both are important. Producers desiring to produce high quality cattle for the marketplace should consider the breeds they use in their crossbreeding program, the marbling EPD in the bulls they use, and the management of their calves to get them on a high energy diet as early as possible. This research proves that we can reduce fat and improve quality by using appropriate management strategies.

References (on our web site www.ansci.uiuc.edu/beefnet/)


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