

SISKIYOU STOCKMAN

What's New in the "Top of the State". A report for Siskiyou Livestock Producers put out by the Farm Advisors Office, Cooperative Extension of the University of California, located at 1655 South Main Street, Yreka, California 96097

September 2007



- Implications of Postweaning Nutrition on Carcass Characteristics and Feed Costs
- Red Books Available
- Sire Selection Symposium

Calendar

Nov 7 Sire Selection Symposium, at California Cattlemen's Association annual meeting, held this year in Reno, NV

Implications of Postweaning Nutrition on Carcass Characteristics and Feed Costs

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Some producers have few options and have to ship calves immediately after weaning. Others will feed weaned calves for anywhere from a few days to several months. Calf nutrition postweaning can have a significant effect on profit and ultimately on carcass quality.

A short postweaning feeding program is probably most helpful in educating the calf to bunk or trough feeding. It is also needed to get them ready for more intensive feeding programs while not greatly increasing live weight. Postweaning feeding is an important step, and part of a good pre-conditioning program.

Longer postweaning feeding periods can add significant amounts of weight (and impact price per pound), substantially delay marketing, and impact carcass attributes. The importance of any of those factors will depend on the marketing system that is used. Individuals with terminal marketing plans (selling weaned calves) will be more concerned with cost of gain and weight impacts on price per pound. Their decisions on postweaning feeding programs will depend on feed costs and availability, feeding facilities, animal performance and health, price changes (weight and seasonal), and risks compared to selling calves directly, or soon after weaning. As feedlots and processors keep more detailed records on performance of purchased backgrounded or stocker cattle, terminal sellers may want to also consider affects on the carcass. Those that retain ownership or market through some type of vertical integration will want to consider postweaning nutrition impacts on carcass characteristics.

Since finished or feedlot cattle are typically marketed when they are “ready” as judged by fat cover, the heavier the in-weights into the feedlot, the heavier the out-weights and carcasses. In general, heavier carcasses are more efficient for the packer and produce more desirable (larger) hides. To maintain acceptable yield grades heavier carcasses require larger ribeyes. Potentially ribeyes can get too large for a particular market. This is illustrated (Table 1) showing that as carcass weight increases (and fat thickness and kidney, pelvic and heart fat remain the same) that ribeye area must increase to maintain the same yield grade. For some markets, a ribeye size over 15 square inches is too large, and carcasses more than 900 pounds would need even larger ribeye areas to maintain the same yield grade.

Table 1. Relationships between increasing carcass weight, ribeye area and yield grades (with fat thickness and kidney, pelvic and heart fat the same).

| Carcass wt | Fat Thickness | Ribeye area | Kidney, Pelvic & Heart Fat | Yield Grade |
|------------|---------------|-------------|----------------------------|-------------|
| 550 | 0.35 | 10.7 | 2.5 | 2.5 |
| 600 | 0.35 | 11.4 | 2.5 | 2.5 |
| 650 | 0.35 | 12.1 | 2.5 | 2.5 |
| 700 | 0.35 | 12.7 | 2.5 | 2.5 |
| 750 | 0.35 | 13.3 | 2.5 | 2.5 |
| 800 | 0.35 | 13.9 | 2.5 | 2.5 |
| 850 | 0.35 | 14.4 | 2.5 | 2.5 |
| 900 | 0.35 | 15 | 2.5 | 2.5 |

From a practical standpoint, many producers have a fixed length of time for postweaning feeding that is limited by feed supply, often weather conditions, or other factors. Muddy, cold conditions are not conducive to efficient gains. With that in mind, the rate of gain during postweaning feeding has implications when the length of the feeding period is fixed. Postweaning feeding with higher rates of gain compared to lower rates of gain over the same number of days will result in heavier cattle entering the feedlot. The rate of gain or feed composition during the backgrounding or stocker phase may

influence carcass quality. Work conducted at UC Davis (Sainz et al 1995) with 3 different backgrounding rations (Table 2) showed the ration during the backgrounding phase will impact carcass quality (Table 3). Their rations were: 1.) 96 percent forage (64 % alfalfa, 32 % oat straw) fed free choice, (daily gains were 1.7 lb/day), 2.) 75 percent grain ration but fed in limited amounts to produce gain similar to the forage diet, (daily gains were 1.5 lb/day) and 3.) the same grain diet free choice, (daily gains were 4.3 lb/day),

Table 2. Backgrounding period results for British breed steers fed from 520 to 720 pounds on 3 different rations. Feed costs are estimates.

| Ration | Days Back-grounded | Daily Intake, lbs. | Total Feed, lbs. | Estimated Values | | |
|-----------------------------------|--------------------|--------------------|------------------|--------------------|-----------------|-------------------------------|
| | | | | Ration Cost \$/ton | Total Feed Cost | Difference compared to forage |
| 1.) Free choice forage | 112 | 18.5 ^a | 2077 | 145 | \$151 | |
| 2.) Limited amount of concentrate | 112 | 10.0 ^b | 1124 | 300 | \$168 | \$ +17 |
| 3.) Free choice high concentrate | 57 | 18.5 ^a | 1057 | 300 | \$158 | \$ +7 |

Adapted from Sainz et al 1995
 Values within columns with different letters are significantly different

Carcass Results

Steers from all groups were fed the same during the finishing period and harvested at about 1100 pounds shrunk weight. Steers receiving the forage diet for backgrounding had lighter carcasses, less backfat thickness, more kidney, pelvic and heart fat, and

smaller ribeyes than their mates that were backgrounded on free choice grain diets (Table 3). Marbling, quality grade and yield grades were not statistically different. The steers backgrounded on the grain diet but fed for growth rates similar to the forage-fed steers had carcasses more like the free

choice grain fed steers. This shows that the composition of the diet had an impact on carcass

characteristics, while the rate of gain during backgrounding was not as important.

Table 3. Carcass characteristics of steers that were fed 3 different backgrounding rations but finished the same.

| Ration | Carcass wt, lbs. | Backfat, in. | KPH Fat, % | REA, sq in | Marbling Score | Quality Grade | YG |
|-----------------------------------|------------------|--------------------|-------------------|-------------------|------------------|---------------|------------------|
| 1.) Free choice forage | 652 ^a | 0.25 ^a | 2.1 ^a | 9.3 ^a | 8.7 ^a | SE+ | 3.4 ^a |
| 2.) Limited amount of concentrate | 667 ^b | 0.29 ^{ab} | 1.9 ^{ab} | 10.6 ^b | 8.9 ^a | SE+ | 3.2 ^a |
| 3.) Free choice high concentrate | 678 ^b | 0.32 ^b | 1.6 ^b | 10.3 ^b | 8.0 ^a | SE | 3.3 ^a |

Adapted from Sainz et al 1995
 Values within columns with different letters are significantly different

Note that the grid price of these carcasses would be the same since the quality and yield grades only varied due to random differences between animals (not due to backgrounding treatments). The differences in carcass weight would result in more money for the steers backgrounded on the concentrate rations compared to the forage backgrounded cattle.

Feed Costs

The feed costs of the 3 different backgrounding programs varied greatly using \$300/ton for high concentrate rations and \$145/ton for forage rations. **Using these costs**, backgrounding feed costs varied from \$151 for the forage diets to \$168 for the limit fed concentrate diet (Table 2). In the feedlot, steers backgrounded on forage (Ration 1) required 22 days longer than those fed limited amounts of concentrate

rations during backgrounding (Ration 2) and 15 more days in the feedlot than steers fed high concentrate free choice during backgrounding (Ration 3). This resulted in feedlot feed costs of \$457, \$323 and \$287 for each group, respectively. Combining the backgrounding days on feed with the feedlot days on feed resulted in 70 days and 22 days respectively more of feeding for the forage-fed steers compared to the free choice and limit fed high concentrate programs. **Using these feed costs**, the steers backgrounded on limited amounts of concentrates (gaining 1.5 lb/day), had feed costs \$117 lower than the steers backgrounded on forage (and gaining 1.7 lb/day). Steers backgrounded on free choice concentrate ration (gaining 4.3 lb/day) had \$163 lower feed costs.

Table 4. Feed costs of steers fed 3 different backgrounding rations but finished the same.

| Ration | Feedlot Period Only | | | | Combined Background & Feedlot Feed Costs, \$ | Difference compared to forage backgrounded |
|-----------------------------------|--------------------------------|----------------------|--------------|---------------------|--|--|
| | Estimated Ration Cost (\$/ton) | Daily intake, lb/day | Days on feed | Total feed cost, \$ | | |
| 1.) Free choice forage (hay) | 300 | 25.8 ^a | 118 | 458 | 608 | |
| 2.) Limited amount of concentrate | 300 | 24.2 ^a | 89 | 323 | 492 | \$ -117 |
| 3.) Free choice high concentrate | 300 | 19.9 ^b | 96 | 287 | 445 | \$ -163 |

Adapted from Sainz et al 1995
 Values within columns with different letters are significantly different

Conclusions

Numerous research trials have explored the area of postweaning nutritional management on backgrounding gains and subsequent carcass quality. While there is still much to be learned, on some points a few guidelines are becoming clearer.

- Lower energy backgrounding rations will result in reduced rates of gain, lighter feedlot in-weights and/or longer backgrounding periods.
- Fat deposition during the feedlot phase is impaired for cattle on low energy or restricted energy backgrounding rations compared to those on more moderate energy diets. Significantly longer finishing periods are required for cattle from energy restricted backgrounding to reach a fat constant endpoint.
- Intra-muscular fat deposition during the feedlot phase may be impaired due to a prolonged low energy stocker phase. Conversely to the theory of impaired fat deposition, IM fat deposition may not be impaired due to prolonged stocker phases. It may be reduced simply due to fewer feedlot days on feed (when fed to the same end-weight) and therefore cattle may not have time on feed to achieve the same marbling as cattle entering the feedlot at lighter weights (i.e. shorter stocker phase).
- Lower energy backgrounding rations can be effective in adding apparent size to moderate frame cattle, albeit at the cost of additional days on feed and reduced feed efficiency.
- Increasing the background period (when on moderate or better rations) can reduce the use of concentrates in the finishing phase to achieve the same degree of fat cover.
- During the backgrounding phase, cattle on superior diets will consume more feed and have better conversions than cattle on lower energy diets. During the finishing phase intake, conversion and daily gain comparisons are more varied when fed to a fat constant endpoint. This point may be modified if background restrictions are sufficient to result in compensatory gains during the finishing phase.
- Impacts of postweaning nutrition vary depending on the genotypes (breeds).
- Moderate frame cattle will reach a fat constant end point sooner than large frame cattle regardless of whether on low or high gaining background periods.
- When backfat thickness is used to determine harvest timing, forage backgrounding will increase feedlot out-weights and carcass weights.
- Forage-fed backgrounding even at higher daily gains (2.0 lbs/day) will add weight but not increase backfat so that cattle entering the feedlot will have less backfat thickness.

In many respects these principles can be boiled down and support the concept that cattle can be “grown” out to larger size on lower gaining, forage type rations. But the ramifications when cattle are subsequently finished under the typical endpoint of a specific fat thickness are days on feed increase, feed conversions decline, and carcass weight increases.

A few examples of these principles in application: If cow herd conditions dictate use of relatively small cows that have been producing carcasses that are too small, then feeding a forage type backgrounding ration will help to increase carcass weights and ribeye size. Length of the backgrounding phase can be increased to exacerbate that response. On the flip side, if carcasses tend to be too large, a shorter background phase with higher energy would help to lower feedlot in-weights, reduce the feedlot period and lower carcass weights. Each of these scenarios will have economic consequences that must be evaluated. Understandably some producers have few options. Others are vigorously seeking alternatives and options to capture more value from each calf they produce. In these cases, they may be able to capture additional financial returns by adjusting postweaning nutrition.

Information for this article was adapted from the following publications.

- Sainz, R.D., F. De la Torre and J.W. Oltjen. 1995. *J. Anim Science* 73:2971
- Duckett, S.K., J.P.S. Neel, R.N. Sonon Jr., J.P. Tontenot, W.M. Clapham and G. Scaglia. 2007. *J. Anim Sci* online doi:10.2527/jas.2006-734.
- Owens, F.N., D.R. Gill, D.S. Secrist and S.W. Coleman. 1995. *J Anim Science* 73:3152

Pfizer Cattlemen's College Session Beef Cattle Sire Selection

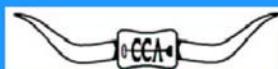
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College Session, or the
2007 CCA/NCA Annual
Convention (Nov. 7-9)
please contact your state
Cattlemen's Association
CCA: 916-444-0845
NCA: 775-738-9214

This all-day educational event will cover the basic principles of beef sire selection and explain how to use some recently available tools (decision support software, DNA-markers). The afternoon session will be a lively, hands-on workshop to select the best sire for different ranch scenarios.

Wednesday, November 7, 2007

9 a.m.- 12 noon and 1 p.m.- 4 p.m.

Ponderosa A Room

John Ascuaga's Nugget, Sparks, NV

9:00 a.m. The National Beef Cattle Evaluation Consortium

John Pollak, Cornell University

9:30 a.m. Basics of Sire Selection

Darrh Bullock, University of Kentucky

10:10 a.m. Break

10:40 a.m. Decision Support Software

Dorian Garrick, Iowa State University

11:20 a.m. DNA Technologies and Marker Validation

Alison Van Eenennaam, UC Davis

12 Noon LUNCH (on your own)

1:00 p.m. Maximizing Genetic Potential in Beef Operations

Richard Linhart, Pfizer Animal Health

1:30 p.m. Panel Discussion

2:00 p.m. "Hands On" Sire Selection Workshop

Bob Weaber, University of Missouri

Darrh Bullock, University of Kentucky

4:00 p.m. Adjourn

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Sincerely,



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