



Grass-Fed Beef Case Studies:

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Case Study #1

Grass-Fed Beef

We manage the ranch by ourselves and run about 300 head of cows that calve starting in February, and we take on about 200 head stockers in the fall and run them through until mid-summer when they go into the feedlot. We keep our own replacement heifers on the ranch as well. Our commute to town (Eureka or Arcata) is about an hour and 15 minutes. We like to minimize trips to town and manage to keep busy enough on the ranch. When we started our Ranch Meats, we did not intend to create another full-time job; we just wanted something to supplement our income in a down cattle market. We believed we could bypass that funnel effect of many producers to a few meat packing plants back to many consumers.

In Spring of 1995, we decided to harvest (the term that I use at Farmers' Markets, so we don't have to refer to slaughtering) our open two-year-old heifers. At that time, we pregnancy-tested our heifers in June and sold the open heifers when they would be at their heaviest and in their best condition. In our first year we sent out 50 or so fliers advertising halves and quarters to a number of individuals we thought would be interested in our product. We sold a half of one animal. But the verbal response we received was very enthusiastic about the kind of grass finished product we were trying to sell. At the time, we felt that our stumbling block to increased sales was that a half or quarter of a beef was both too much meat and too much money for an individual or family to deal with at one time. We also gave away another half beef to friends in about 40 pound boxes with a survey about whether they liked the product and how the quantity was. Also during that summer I sat with our meat cutters when they were cutting up that half of a beef and figured out what cuts we wanted, how thick they should be cut and how many packages of each cut I would have.

In February of 1996 we met with a friend of ours who is a graphic artist and another woman who was starting a product-marketing business. From that meeting we started developing our logo and brochure. The marketing woman was absolutely clueless about some of the challenges we faced, such as marketing a seasonal product and the fact that a beef animal does not yield all steaks. She felt her services were worth \$500/month. We did not hire her. She claimed that Costco had the best ground beef she had ever eaten and did not think that ours would be able to compare. I gave her several sample packages. She loved it and later purchased some ground beef.

Throughout the spring we worked with our graphic artist on the brochure. Our goal from the outset was to sell all of the meat prior to slaughter for the obvious reasons that we did not want to sit on the frozen product and we did not want the intensive labor involved in moving the product. We wanted to hit a niche market of individuals who were willing to pay top dollar for a specialty, quality product such as ours. The brochure needed to be very professional, etc. Since neither my husband nor I am very artistic we felt we needed professional help. We believed that when we completed the brochure we would send them out to a selective group of people who had the ability to spend a little more of their dollars on our Ranch Grass Finished Beef. While we were developing the brochure we were also figuring out how many packages and which cuts would go into each box and how best to utilize the whole carcass.

It was a challenge to look into the future and predict how much of each cut an animal was going to yield and how to put that together in a box that would sell. In the end, we developed three different boxes with the thought that they could all fit in the top of someone's freezer. The different boxes were pretty much divided into the top end Steak Box, the middle end of various

cuts, and the basic ground beef, stir fry box. Since I don't cook a lot of stews or pot roasts, I made the mistake of thinking my customers wouldn't either. This year we are carrying more stew meat and chuck roasts. One of our other goals was to make it seem easy, thus the stir fry. I included with each box some hints and a number of recipes; the professional look again cut into our profits. We also felt that mail order was another way to market our beef. Mail order is expensive and challenging. Since we are dealing with a perishable product, we needed cold chests, dry ice and second day air. Figuring it out so that we could set a price on it for the brochure was difficult. Setting a price in general for the different boxes prior to having product was challenging since everything we figured was based on $\frac{1}{4}$ of 1 animal that I had cut up 8 months before.

Our next challenge was deciding how we wanted our product to look when we delivered it to these customers who were now expecting this great beef. We realized that the label was important and although the gentlemen who owned that the wholesale meat plant were more than glad to use their USDA label on the meat, it would then carry their name not ours. We decided we wanted our own USDA label. We worked with our local meat inspector. I wanted to have the label state that the meat was grass finished, but in order to do that he would have had to inspect the live animals weekly if not daily. Not a reality! We settled for a simple label that just said our ranch name and added "Meats" and has the USDA number of the plant we use. So then we were just down to developing meat labels, shipping labels, shipping chests and local delivery boxes. It took quite a while to work out something that did not cost an arm and a leg, but at the same time had the look that we were trying to create. We are still modifying that part of it.

Finally, our brochures were completed and ready to be mailed. We mailed them to our selective group of people and sat back and waited for the new phone to ring. Did I mention the need for a second phone line and answering machine? Somehow having a seven- year old answer the phone was not a part of my vision of a professional image. Not a whole lot happened. Our goal of having all the meat sold prior to slaughter did not happen. We moved on to our second consultant and new ideas. One of the ideas we came up with was the idea of Farmers' Markets. I contacted our local Farmers' Market and set up a card table at the market and started handing out brochures. Again, not a whole lot happened, people really wanted to try the product. I decided that giving out samples was fairly easy to do. I had done a lot of that sort of thing over the years for our local CattleWomen's unit. It was at this stage that I encountered our local Environmental Health Department. This is the agency that oversees the Retail Food Facilities Law which is the health code that governs the safety of products being sold at Farmers' Markets. Our discussion was so bad that our second meeting with them was arranged by our attorney. Their entire department turned out at the meeting with secretaries to take notes. In the end, we conceded the issue of giving out samples because we wanted them to let us sell frozen product at the market, which they did. I got everything together that I thought they had requested of us. I called to let them know I was ready for market and found out that they had decided that I needed some sort of mechanized refrigeration. I borrowed an ice cream cart from a fellow who couldn't wait to support me in my endeavor of challenging the Environmental Health Department. The first market I attended the Environmental Health Department made a check of the market, the only one of the season. Unfortunately, several people were cited for different infractions, I was not one.

My trips to town were now two days a week to the Farmers' Markets, pulling a trailer with the ice cream cart. I could not fit in the designated parking, because I was too long so I would hoist my cart off the trailer and take it to my place. The biggest market I did was at the plaza in Arcata which is the home to many individuals who have some radically different political and social beliefs than most of us in agriculture. Our sales increased immediately, I even had repeat customers and our reception was very warm. But I was selling just individual packages, only occasionally the boxes. Soon I started to notice that my daily sales did not even come close to the larger farmer's and some of the specialty grower's. Since I was in town anyway I decided to hit up some restaurant's which lead to some great stories about what they wanted and what I could realistically provide them with. The only item that I had enough quantity of was the ground beef. Unfortunately, we need too much money for our ground beef for any restaurant to be interested in it.

Because we did not move all the meat as we initially intended storage now became an issue. I had literally a wall of meat at the Meat Plant. The gentlemen who own the plant were very generous with their space as well as knowledge and encouragement. I have provided them with great entertainment, but we did make sure at the end of the season that we tipped them very well - important but another unexpected dip into our profits. At the end of the Farmers' Market Season I had pretty well moved most of my meat (into locker's at least). A grand total of 6 head!!!

By the end of the year I was burnt out. As we started 1997 we took a critical look at how we did in 1996. As we started to look in depth at our budget v. actual costs and income there appeared to be a large hole in real v. anticipated income. As we examined it further we discovered that the problem area seemed to be control of inventory. We gave away a tremendous amount of meat which I did not track carefully. I also was not very good about tracking inventory as I sold it at the market - I was just relieved to see the mountain diminish.

In January, my husband and I attended the Fancy Food Show in San Francisco. We got inspired by all the great packaging ideas and by the fact that there was only one Beef Company there, B3R. I tracked down the woman who started the company

and got a very unpleasant and negative response from her. By spring of 1997, we revamped the brochure and boosted our prices. I contacted Farmers' Markets in Santa Rosa and Davis. They both would have loved to have had us, but again I had to meet the criteria of their Environmental Health Department and how the officers in those areas interpreted the Retail Food Facilities Law. I also knew that the ice cream cart had some real limitations both with regard to the capacity it carried and the fact that if I traveled that far it would need some sort of power source to maintain the temperature. I also discovered that now I was going to have to get product liability insurance for at least one of the markets. Santa Rosa was the closest, but was a good four and a half hours from Eureka. We decided against pursuing it much further because we were beginning to look at a capital investment of a freezer truck or trailer. Since we had lost money the year before I was not too intrigued with the idea of working harder and more than I do for real work (on the ranch) which at least I get to do on horseback.

This year we sent out brochures to all of our customers from 1996. We also had been highlighted on the California Heartland program and got a great response from a number of viewers. We sent out brochures to about 200 people who had already either expressed an interest in our product or who were so pleased with it that they had let us know that they would definitely purchase this year. Our response was maybe ten percent. I did not follow up with phone calls which probably would have helped, but it is not in my comfort zone to do that sort of thing. We slaughtered three head. As time for the Farmers' Market approached I found that I was busy with other things - furthermore the cattle market has gone up. Bottom line is I just never made it to the market. I still have some inventory from the three head to move. My family is glad I was home more this summer. Cattle work was much easier with my husband not bearing the brunt of the load. I don't think that we have given up on the idea, but it needs to be larger than just me marketing it, and honestly, neither my husband nor I am willing to go that far out on a limb with it. We are currently taking the approach that it needs to stand on its own and we will see what happens by word of mouth over the next several years.

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Case Study #2

Grass-Fed Beef

RANCH PHILOSOPHY or WHY WE SELL GRASS FEED BEEF

Our decision to market our ranch raised "natural" beef was born originally from a desire to promote local participation in agricultural commodities, specifically beef. If anything, it was never started as a way to replace traditional marketing strategies used by this ranch.

For years, this ranch has sold cattle that did not fit the traditional feeder calf market directly to consumers or on the rail to a packing plant. As the beef market tightened, the need for more flexible marketing strategies arose. Cattle that were not shipped due to weight, size, heiferettes, etc., left this ranch with cattle which needed to be sold.

We have eaten a lot of our own grass fed beef. We believe in the environmental responsibility of beef produced this way, however, the window to produce high quality beef from grass is very short, generally only five months out of the year. To keep cattle available, we incorporate supplementation while leaving the cattle on grass. This produces the desirable hard finish that can only be obtained during those two months on grass alone.

Some of the most pressing issues that helped to form the idea of selling locally were:

- public perception of pharmaceuticals used in beef production
- public perception concerning stewardship of the land as well as the question of sustainability
- lack of availability of dry-aged beef
- a burning desire to work with conscientious consumers who are concerned about where their food comes from.

The downside of all this was industry criticism for daring to comply with consumer demands, ie: no use of hormones nor fed antibiotics. To us, the fact that these never were practices used by this ranch became a natural way to promote our product. Common sense dictates that it costs far more to convince a skeptical consumer to embrace the notion that implants and fed antibiotics are fine, than to provide them a product they are asking for, which is implant-and hormone-free.

With every pound of beef that we retail, we are selling our philosophy. We believe that the way we raise our cattle is something to brag about. Our animal genetics are chosen to do more than produce beef--they are chosen to work in harmony with environment, both the natural environment as well as the operational demands of our management needs.

We fly in the face of most recommended or accepted methods of management promoted by our industry and universities, making us a constant target of skepticism. Yet we have a program which works here. We calve year 'round so that we have a constant supply of beef available; we use genetics that compliment our diverse terrain; we manage for hardy cattle which do not require fly control, implants or excessive use of pharmaceuticals.

The Marketing Outlets Used

We have worked on two aspects of marketing natural beef:

1. marketing through a local meat locker
2. selling them on the carcass level through a packer

The concept of this marketing plan is to diversify the points of sale and to take animals that do not fit the traditional feeder calf market and sell them on a carcass basis. We also feel that during low fat cattle prices, if they use natural by-product feeds and grass, producers can economically feed animals and sell them as a wholesale and retail product.

Local Retail

When we sell truckload lots of cattle, there are always those that do not fit the size, weight or any other sales parameters required. It is these animals that we have used to supply the local retail meat lockers. We have been marketing through a local

jump through the necessary hoops to legally sell our beef by the package--did not fit into our time constraints. While selling carcass beef limits the market, juggling pounds of less desirable cuts, freezer time, and coordinating too many variables such as retailers, customers, agencies, and restaurants would not leave enough time to manage our ranch operations.

Our first leap into the retail arena included advertising. We spent more than \$12,000.00 on name recognition alone with local radio in the first year. We were not offering the cheapest beef in town. We offered the consumer a choice of types of beef such as lean, grass fed, or fatter, fed cattle. Choosing a radio station can be very tricky. For us, the radio brought desired name recognition, but not enough sales to justify the cost.

The work involved in radio can be staggering if you don't hire a consultant. We wrote our own ads and used our philosophy as the focus. They were "comfort" ads, which didn't scream price, but offered a part of the traditional past of raising and processing beef.

We now understand that before deciding on radio for advertising, one must study the market of the station to see if it fits the type of customers that are desired. We did not do a good job of that, and paid a hefty price for our ignorance. Because we are selling food, the type of advertising we do must be on a "consumer acceptable" level, which means that we don't take out "want ads" as an avenue for advertising.

Because we already had loyal customers through our local butcher shop, we decided to market our beef through them. To date, we find that newspaper advertising works well for us. That can cost from \$400.00 up, depending on the size of the ad. We also invested in a professional graphics designer to help create the image we want to present to the public. Costs can vary widely; ours was \$750.00.

Getting butchers to cooperate can be very tricky. Usually they have their own supply of beef that already works for them. Essentially, we represent a way for them to get more cutting and wrapping customers. This why it is imperative to market our beef based on our own philosophy, which does not necessarily coincide with the way retail shops conduct their own business. Essentially, consumer demand for our type of product has grown enough that retail shops understand its importance.

Ad design is critical to any advertising. We wanted to gain consumer confidence about our product by letting them know our beef is 100% unconditionally guaranteed, and locally raised. We started this venture when consumer confidence was at an all time low. Apocalyptic horror stories about beef were bombarding the media, making it extremely difficult to find acceptable ways to promote a product that was (and is) perceived as less healthy than chicken, and environmentally unfriendly to boot.

We will undoubtedly try radio again, however for now, print media is more cost effective. When we advertise, duration and size of the ads are determined by our inventory. It does no good to market what you don't have, or to make a customer wait.

One critical component of the retail business is to know what is under the hide. We would not be able to market locally if we produce low-yielding carcasses. We stay close to rail prices and add the cutting and wrapping charge on top. Our retail consumers would not stand still for "wastey " carcass. We continue to weigh the "yellow fat" issue which is merely beta carotene. Public perception comes to play again since yellow fat does not "look" as palatable as white.

One caveat that can kill any retail program is the locker itself. We cannot stress enough the importance of locker temperatures as well as content. It doesn't take much to spell disaster for the beef carcass. Failure or under-capacity (too many carcasses for the size) of a compressor; or too many game carcasses can render your product unusable.

Our plans for the future include contracts with Coleman Meats, brochures that tell our story, as well as dabbling on the Internet. What we have works as long as the feeder market is not extremely high. We keep our costs at a minimum by mixing our own feed and minerals.

COSTS & PAYMENT

| | |
|----------------------|-------------------------------|
| Carcass | \$1.00 per pound (rail price) |
| USDA processing | \$20.00 per head |
| Cutting and Wrapping | 35 - .44 per pound |
| Advertising | varies |

Our customers pay the butcher for the beef. We bill the butcher for the cold rail weight at the rail price.

COMMENTS

Our retail marketing program was not born solely from a profit motive. Our expectations are that we will continue to develop a larger retail market as time and money permit. Retail is a tricky if not a fickle endeavor, and requires a great amount of dedication and patience. Paramount to us is to gain consumer confidence in eating beef, and to allow our community a chance to experience beef that has been properly aged, and does not taste like cardboard.

This type of endeavor is time consuming and produces many a headache when something in the chain does not follow through. It is much like the old Excedrin headache commercials where someone was being chewed out because someone else down the chain did not live up to a commitment. Raising and selling beef in the traditional manner is much easier on the heart, but the rewards of seeing your product through to a satisfied customer is well worth the effort to us.

It cannot be said enough that anytime we are interviewed about our beef, we received dozens of phone calls from people who DO NOT WANT ADDED HORMONES OR FED ANTIBIOTICS in their meat. We see no reason to tell them otherwise.

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Case Study #3

Grass-Fed Beef

Three producers from Northern California, through a consortium, submitted ten animals each to the California State University, Chico meat laboratory for testing the grass-fed beef marketing project. The animals were sold through a retail outlet and E-mail. Purchasers were asked to fill out a questionnaire after consuming the meat.

The 30 head of cattle of mixed breeds and sexes were slaughtered during a three week period, at the rate of ten head per week. The first group of cattle was black bald-faced heifers averaging 912 lbs. live weight. The second group was mixed steers averaging 1031/lbs. live weight. The final group was Beefmaster heifers that averaged 1023 lbs. live weight. Cattle were delivered to the Chico facility the day before slaughter. Live weights were taken upon arrival. Animals were also filmed for reference after processing. The first group was slaughtered on June 4, 1996. The second and third groups were slaughtered on June 11 and 18, respectively.

Carcasses were allowed 24 hours to chill before grading. Dr. Dave Daley conducted the yield and quality grading and determined lean color and texture and fat color. Fat color was measured on a scale of 1 to 4 with one being very white and four being very yellow. Lean color scale is from 1 to 8, with 1 being pink and 8 being very dark cherry red. The lean texture scale is from 1 to 5; 1 is very fine, 5 is very coarse.

For the entire trial, average yield grade was 1.6. Fifty percent of the cattle graded standard, 46.7% graded select and 3.3% graded choice. The dressing percents for the third group were lower than anticipated, for unknown reasons.

The USDA grades, weight and carcass traits for the three groups of cattle are reported in Table 1.

Table 1. Carcass traits of forage fed beef.

| Group | Live Wt | C. Wt. | Dressing% | 12th Rib fat | REA | %KHP | YG Marb. |
|-------|---------|--------|-----------|--------------|------|------|----------|
| 1 | 912 | 484 | 53.1 | .11 | 9.1 | .8 | 1.8 |
| 2 | 1031 | 597 | 58.0 | .12 | 12.0 | 1.5 | 1.5 |
| 3 | 1023 | 496 | 48.5 | .11 | 10.4 | .4 | 1.5 |

Table 2. Meat Color:

| |
|--|
| |
|--|

| Average for Group | 1 | 2 | 3 |
|-------------------|-----|-----|-----|
| Fat Color | 1.8 | 2 | 2.9 |
| Lean Color | 4.1 | 3.4 | 3.9 |
| Lean Texture | 3.2 | 3.1 | 3.3 |

The cattle were aged for approximately four days at the CSUC Meats Lab and then the carcasses were sent to Meat Locker for fabrication and needle tenderization. This mechanical process was projected to improve the tenderness. All product that was not tenderized was ground into 90% lean ground beef. The meat was vacuum packaged and sold through the store and by E-mail on the CSU Chico campus.

Evaluating Eating Quality

Samples of each carcass were transported to the UC Davis meats lab and evaluated by Dr. Y.B. Lee for tenderness with a Warner-Bratzler Shear Force technique and by myofibrillar fragmentation.

Table 3. Average Shear Force

| Group Averages | 2 | 3 | Steaks |
|-----------------|-----|-----|--------|
| Warner-Bratzler | 6.7 | 7 | 6.8 |
| Lee-Kramer | 132 | 153 | 146 |

The average Warner-Bratzler shear value for the forage-fed steaks was about 7.0. Previous study showed that normal steaks (no needle tenderization treatment) of WB shear value 7.0 were rated satisfactory. However, Lee-Kramer shear which mimics the chewing action more closely than WB shear shows a high average value of about 142 which is equivalent to Slightly Tough sensory rating.

Dr. Lee offered these eating quality comments on the samples.

The initial tenderness during the first few chewings appears to be satisfactory in general. However, the residual toughness due to connective tissue gives an overall tenderness rating of slightly tough. Furthermore, the lack of marbling results in dryness or lack of lubrication effect, thus making it hard to swallow.

Moisture content of cooked steak was about 67.5% which is quite high for a cooked meat. Even though there was a substantial amount of drip after defrosting, the loss of moisture during cooking was not high, resulting in high moisture content in cooked steak. Therefore, the sensation of dryness during chewing and swallowing is not due to low moisture content but due to lack of marbling fat.

Needle tenderization appears to have improved the tenderness greatly. However, it is not enough to make the forage-fed beef steaks acceptable. Additional treatment with marinades may make the steaks more acceptable.

Meaty flavor is rich and very good, but the steaks lack in mellow fat flavor due to deficiency of marbling. In this first round of samples, Group 2 was more tender than Group 3. In addition, steaks from three animals of Group 3 were "very" to "extremely tough". It means that these steaks are not consistent in quality with large variations.

In conclusion, the tenderness of forage-fed beef was rated slightly tough and was less than satisfactory with a large variation among the steaks in spite of needle tenderization treatment. Further studies are needed to improve the quality of forage-fed beef or acceptable quality by selecting right kinds of cattle and proper feeding at the end of finishing period and additional postmortem treatment or employing different cooking methods.

E-mail Surveys

The meat was also marketed through the CSU, Chico E-mail system. Customers would E-mail the Farm office with an order and meat would be delivered the following week. Surveys were handed out with each order that was delivered.

Thirty-one surveys were returned at the time of this summary. Twenty-two of these were for the ground beef and nine were for steaks. The people that returned these surveys were moderate beef eaters (between 2 to 4 times a week). The following survey results are simple means calculated from the data set of answered questions.

GROUND BEEF

| | | | |
|-----|---|-------------|----------------|
| 1. | How often eat beef? | n=22 | mean: 2.7/week |
| 2a. | Juiciness? | n=20 | mean: 3.6 |
| 2b. | Flavor? | n=20 | mean: 3.55 |
| 2c. | Tenderness? | n=20 | mean: 4.15 |
| 2d. | Overall eating satisfaction? | n=21 | mean: 3.95 |
| 2e. | Cooking quality? | n=18 | mean: 4.33 |
| 3. | Would you buy this product again? | Yes: 90.91% | No: 9.09% |
| 4. | Rank this beef compared to others. | n=21 | mean:4.02 |
| 5. | What would you be willing to pay? | n=22 | mean: 2.18 |
| 6. | Would the product be worth a premium? | Yes: 72.73% | No: 27.27% |
| 7. | Concerns with traditional beef? | Yes: 54.55% | No: 45.45% |
| 8. | Have these concerns affected buying (out of those answering Yes to question 7)? | Yes: 83.33% | No: 16.67% |

STEAK

| | | | |
|-----|---|-------------|------------|
| 1. | How often eat beef? | n=8 | mean: 2.88 |
| 2a. | Juiciness? | n=9 | mean: 4.0 |
| 2b. | Flavor? | n=9 | mean: 4.0 |
| 2c. | Tenderness? | n=9 | mean: 4.33 |
| 2d. | Overall eating satisfaction? | n=9 | mean: 4.11 |
| 3. | Would you buy this product again? | Yes: 100% | No: 0% |
| 4. | Rank this beef compared to others? | n=9 | mean: 4.33 |
| 5. | What would you be willing to pay? | n=9 | mean: 2.22 |
| 6. | Would the product be worth a premium? | Yes: 62.5% | No: 37.5% |
| 7. | Concerns with traditional beef? | Yes: 44.44% | No: 55.56% |
| | Have these concerns affected buying (out of | | |

| | | | |
|----|-------------------------------------|-----------|--------|
| 8. | those answering Yes to question 7)? | Yes: 100% | No: 0% |
|----|-------------------------------------|-----------|--------|

Tenderness evaluation of forage-fed beef

Group 2

| Animal I.D. | Warner-Bratzler Shear kg/2 cm core | Lee-Kramer Shear kg/20 g meat | Comments |
|-------------|---------------------------------------|----------------------------------|---------------------------------------|
| 1 | 6.1 | 123 | Satisfactory |
| 2 | 6.7 | 140 | Slightly tough |
| 3 | 5.9 | 132 | Satisfactory |
| 4 | 8.1 | 168 | Tough |
| 5. | 6.1 | 133 | Satisfactory |
| 6 | 7.5 | 145 | Slightly to moderately tough |
| 7 | 7.0 | 146 | Slightly to moderately tough |
| 8 | 6.8 | 116 | Satisfactory |
| 9 | 6.1 | 103 | Slightly tender |
| 10 | 6.5 | 111 | Satisfactory |
| Ave | 6.7 | 132 | Satisfactory to slightly tough |

Group 3

| | | | |
|------------|------------|------------|-------------------------------------|
| 3-4272 | 5.9 | 145 | Slightly tough |
| 3-4194 | 8.6 | 190 | Very to extremely tough |
| 3-4095 | 6.8 | 145 | Slightly to moderately tough |
| 3-4103 | 6.2 | 146 | Slightly tough |
| 3-943 | 8.8 | 203 | Extremely tough |
| 3-4134 | 9.3 | 192 | Extremely tough |
| 3-4370 | 6.9 | 148 | Slightly to moderately tough |
| 3-4361 | 5.8 | 115 | Slightly tender |
| 3-4101 | 7.2 | 147 | Slightly to moderately tough |
| 3-4299 | 4.8 | 94 | Moderately tender |
| Ave | 7.0 | 153 | Slightly to moderately tough |

Other steak samples

| | | | |
|------------|------------|------------|-------------------------------------|
| 1 | 6.8 | 145 | Slightly tough |
| 2 | 6.1 | 128 | Satisfactory |
| 3 | 8.8 | 173 | Very tough |
| 4 | 8.1 | 182 | Very tough |
| 5 | 4.3 | 105 | Slightly to moderately tender |
| Ave | 6.8 | 146 | Slightly to moderately tough |

Economics

Merchandizing Breakdown

1. Cost for hanging precooled beef in quarters. Weighing cost @ .02lb.
2. Boning into primals.
3. Running primals through a tenderizer, some three times, others four.
4. Form primals, or mold with freezer film to hold in shape and freeze.
5. Remove from freezer, remove mold film, and cut into desirable portion control cuts.
6. Place in individual vacuum pouches.
7. Run through vac. pack.
8. Label.
9. Weigh each individually, and so marking.
10. Box, label box, and get net weight.

Total Average

| | | | | |
|---------------------------------|-------------------|-----------|------|--------|
| Top Round | 508 lbs @ 3.25 = | \$1651. | 16.9 | 55.03 |
| Top Sirloin | 427 lbs @ 5.00 = | \$2135 | 14 | 71.16 |
| Cattlemen Steak | 713 lbs @ 2.79 = | \$1989.27 | 23.8 | 66.31 |
| Kansas City Steak | 335 lbs @ 3.87 = | \$1296.45 | 11.2 | 43.22 |
| Eye of Chuck | 251 lbs @ 8.4 | | | |
| Rib Eye | 296 lbs @ 5.50 = | \$1628 | 9.9 | 54.26 |
| New York Steak | 480 lbs @ 5.00 = | \$2400 | 16 | 80. |
| Flank Steak | 51 lbs @ 4.00 = | \$204 | 1.7 | 6.8 |
| Tri Tips | 88 lbs @ 3.69 = | \$324.72 | 2.9 | 10.83 |
| Filet | 173 lbs @ 6.50 = | \$1124.5 | 5.7 | 37.47 |
| Ground Beef 7% fat | 2738 lbs @ 1.75 = | 4791.5 | 91.3 | 159.72 |
| Ground lean Pattie under 7% fat | 2371 lbs @ 1.75 = | 4149.25 | 79 | 138.31 |
| Short Ribs | 305 lbs | | 10.2 | |
| Rib Eye sent to Davis | 19.21 lbs | | .6 | |

| | | | | |
|---|------------------------|--------------------|-------------------|-----------------|
| Hot weight on these cattle | 8755.21 lbs | \$21,693.69 | 531.3(lbs) | \$723.12 |
| Average \$/lb. $(8755.21 - 575.21) / \$21693.69 = \2.65 | | | | |
| Precooled beef hang | .02 /lb. | 318.80 | 10.63 | |
| Processing and the ten procedures | .3950/ lb. | 6296.30 | 209.87 | |
| Holding in freezer | 1.95/cubic feet/month | 1000 | 33.33 | |
| Live animal value at slaughter | (992 lbs. x \$.55/lb.) | <u>16362.34</u> | <u>545.42</u> | |
| | | 23974.44 | 799.25 | |
| Net | | -2280.75 | -76.25 | |

*One group of cattle was heavily bruised, not giving us a good percentage on the primals.

| Forage Fed Beef Data | | | | | Fat Color Scale | | | Lean Color Scale | | | Lean Text | | |
|---|------------------|---------------|-----------------|-----------------|-----------------|----------------|---------------|--------------------------|-----------------|-----------------|----------------|--------------|------------|
| | | | | | 1 = White | | | 1 = Pink | | | 1 = | | |
| | | | | | 4 = Yellow | | | 8 = Very Dark Cherry Red | | | 5 = | | |
| Group 1 - 10 Black Baldy Heifers | | | | | | | | | | | | | |
| | Animal | Live | Dressing | 12th Rib | | Carcass | % | Yield | | | Quality | Fat | Le |
| Date | I.D. | Weight | % | Backfat | R.E.A. | Wt. | K.P.H. | Grade | Maturity | Marbling | Grade | Color | Co |
| 6/4/98 | 1-5 | 955 | 51.10% | 0.08 | 8.9 | 488 | 1.0% | 1.9 | A | Tr 70 | Standard | 2 | 3 |
| 6/4/98 | 1-40 | 893 | 53.30% | 0.08 | 9.8 | 478 | 1.0% | 1.8 | A | Tr 80 | Standard | 2 | 3 |
| 6/4/98 | 1-8 | 880 | 55.12% | 0.05 | 8.1 | 474 | 0.5% | 1.9 | A | SI 10 | Select - | 2 | 6 |
| 6/4/98 | 1-37 | 930 | 54.52% | 0.13 | 10.5 | 507 | 1.0% | 1.8 | A | Tr 90 | Standard | 1 | 4 |
| 6/4/98 | 1-45 | 880 | 51.93% | 0.15 | 8.8 | 457 | 1.0% | 1.9 | A | SI 40 | Select - | 1 | 4 |
| 6/4/98 | 1-148 | 910 | 53.08% | 0.18 | 10.6 | 483 | 1.0% | 1.8 | A | SI 60 | Select | 2 | 4 |
| 6/4/98 | 1-21 | 830 | 53.25% | 0.10 | 8.5 | 442 | 0.5% | 1.8 | A | Tr 40 | Standard | 2 | 6 |
| 6/4/98 | 1-20 | 985 | 52.85% | 0.10 | 8.9 | 510 | 0.5% | 1.9 | A | Tr 90 | Standard | 2 | 4 |
| 6/4/98 | 1-32 | 1010 | 52.48% | 0.18 | 8.4 | 530 | 1.0% | 2.5 | A | Tr 70 | Standard | 2 | 4 |
| 6/4/98 | 1-3 | 885 | 52.88% | 0.05 | 8.7 | 468 | 0.5% | 1.7 | A | Tr 60 | Standard | 2 | 3 |
| | Averages: | 911.8 | 53.05% | 0.11 | 9.1 | 483.6 | 0.8% | 1.84 | | | | 1.8 | 4. |
| Group 2 - Mixed Steers | | | | | | | | | | | | | |
| 6/11/98 | 2-1 | 1010 | 58.12% | 0.10 | 12.7 | 587 | 1.25 | 1.2 | A | SI 0 | Select - | 2 | 3 |
| 6/11/98 | 2-2 | 1000 | 59.80% | 0.10 | 13.1 | 598 | 1.25 | 1.1 | A | SI 10 | Select - | 2 | 3 |
| 6/11/98 | 2-3 | 900 | 58.22% | 0.05 | 11.0 | 524 | 1.25 | 1.3 | A | Tr | Standard | 2 | 3 |
| 6/11/98 | 2-4 | 950 | 58.84% | 0.10 | 11.7 | 559 | 1.25 | 1.4 | A | Tr | Standard | 2 | 4 |
| 6/11/98 | 2-5 | 1100 | 57.18% | 0.15 | 12.3 | 629 | 1.25 | 1.6 | A | Tr | Standard | 2 | 4 |
| 6/11/98 | 2-8 | 1075 | 58.93% | 0.05 | 12.1 | 612 | 1.50 | 1.4 | A | SI 30 | Select - | 2 | 4 |
| 6/11/98 | 2-7 | 1080 | 59.17% | 0.20 | 11.8 | 639 | 1.25 | 2.0 | A | SI 20 | Select - | 2 | 4 |
| 6/11/98 | 2-8 | 1075 | 58.19% | 0.10 | 12.1 | 604 | 1.25 | 1.4 | A | SI 0 | Select - | 2 | 3 |
| 6/11/98 | 2-9 | 995 | 57.89% | 0.10 | 11.1 | 578 | 1.50 | 1.7 | A | Tr 90 | Select - | 2 | 2 |
| 6/11/98 | 2-10 | 1125 | 57.16% | 0.20 | 12.6 | 643 | 1.50 | 1.7 | A | SI 50 | Select + | 2 | 4 |
| | Averages: | 1031 | 57.95% | 0.115 | 12.03 | 597.1 | 1.33 | 1.5 | | | | 2.0 | 3. |
| Group 3 - Beefmaster Heifers | | | | | | | | | | | | | |
| 6/18/98 | 3-4272 | 1020 | 47.35% | 0.20 | 9.7 | 483 | 0.25 | 1.8 | A | SI 0 | Select - | 3 | 3 |
| 6/18/98 | 3-4194 | 1035 | 50.24% | 0.10 | 11.4 | 520 | 0.50 | 1.2 | A | SI 30 | Select - | 4 | 4 |
| 6/18/98 | 3-4095 | 1110 | 47.48% | 0.05 | 11.3 | 527 | 0.25 | 1.1 | A | SI 50 | Select | 3 | 4 |
| 6/18/98 | 3-4103 | 975 | 48.15% | 0.05 | 9.0 | 450 | 0.50 | 1.8 | A | Tr 80 | Standard | 2 | 4 |
| 6/18/98 | 3-943 | 925 | 45.95% | 0.05 | 8.8 | 425 | 0.25 | 1.5 | A | Tr 40 | Standard | 4 | 4 |
| 6/18/98 | 3-4134 | 980 | 51.67% | 0.05 | 11.9 | 498 | 0.00 | 0.7 | A | Tr 70 | Standard | 3 | 4 |
| 6/18/98 | 3-4370 | 1095 | 49.22% | 0.20 | 11.8 | 539 | 0.50 | 1.4 | A | SI 20 | Select - | 2 | 3 |
| 6/18/98 | 3-4361 | 1095 | 49.32% | 0.10 | 10.7 | 540 | 0.25 | 1.4 | A | Tr 70 | Standard | 3 | 6 |
| 6/18/98 | 3-4101 | 1005 | 49.35% | 0.20 | 8.5 | 498 | 1.00 | 2.4 | A | Tr 80 | Standard | 2 | 3 |
| 6/18/98 | 3-4299 | 1010 | 48.12% | 0.10 | 11.3 | 486 | Forage 1 | 1.1 | A | Sm 10 | Choice - | 3 | 4 |
| | Averages: | 1023 | 48.48% | 0.11 | 10.42 | 496.2 | 0.40 | 1.4 | | | | 2.9 | 3.1 |

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Case Study #4

Grass-Fed Beef

This rancher was interested in developing an alternative market for his cattle in addition to providing a hamburger source for the foreign tourists that come to his ranch to see part of the Old West. Two heifers that did not conceive during the normal breeding process at the ranch were fattened out on non-irrigated dry feed during the summer months. These two 1020 and 1100 lb. heifers were slaughtered at 24 months of age. The interest was to see if animals could indeed be fattened out on the dry rangelands, which would lessen the yellow fat that was experienced in the green rangeland fattened beef from Case Study #2. There was also interest in reducing his cost of production significantly by not having to feed any by-products to fatten the animals.

The animals were processed and evaluated at the University of California animal Science Meats Lab. They graded "high standard" and "select+." They had approximately a half inch of fat thickness. They had a slight yellow tinge. The carcasses were aged for 13 days. As typical with grass-fed beef operations, the dressing percent was a low 53%.

| | #1 Select TAG 557 Wholesale | Retail | #2 Standard TAG 555 Wholesale | Retail |
|----------------|-----------------------------------|--------------|-------------------------------------|--------------|
| <u>Hind</u> | | | | |
| Shank | 31.8 | G.B. | 31.4 | G.B. |
| R Top Round | | 22.6 | | 17.0 |
| O | | | | |
| U Bottom Round | 84.6 | 18.1 | 86.9 | 17.1 |
| N | | | | |
| D Rump | | 17.7 | | 14.2 |
| Flank | 32.0 | 3.6 | 30.7 | 2.5 |
| Sirloin | 45.5 | 27.9 | 43.6 | 27.2 |
| Shortloin | 29.4 | 26.7 | 31.4 | 28.1 |
| Sirloin Tip | <u>31.3</u> | <u>23.2</u> | <u>32.0</u> | <u>23.2</u> |
| Total | 254.6 | 139.8 | 256.0 | 129.3 |
| <u>Front</u> | | | | |
| Rib | 31.5 | 26.0 | 29.9 | 24.0 |
| Plate . | 45.6 | G.B. | 45.4 | G.B. |
| Chuck | 148.3 | 55.8 | 148.1 | 46.4 |
| Shank | 18.0 | G.B. | 17.8 | G.B. |
| Brisket | <u>23.9</u> | <u>G.B.</u> | <u>17.7</u> | <u>G.B.</u> |
| Total | 267.3 | 81.8 | 258.9 | 70.4 |

| | | |
|-----------------------|---------|--------|
| Jerky | -114.8 | 125.4 |
| Live Weight | -1054 | 1005 |
| Cold Carcass Wt. | -552 lb | 534 lb |
| Wholesale Wt. | -521.9 | 514.9 |
| Cooler Shrink | -5.4% | 3.6% |
| Primal Wt. | -221.6 | 199.7 |
| Primal/G.B./Jerky Wt. | -497.2 | 473.6 |
| Carcass Dressing % | -52.4 | 53.1 |
| % Retail Yield | -47.2 | 47.1 |

PALATABILITY OF GRASS-FED BEEF

Procedures of palatability evaluation

Ribeye steaks from two grass-fed heifers (#555 and #557) were defrosted overnight and broiled to an internal temperature of 150°F. Choice grade ribeye steaks from a supermarket were also similarly broiled. Core samples of 1.27 cm diameter were taken and Warner-Bratzler shear value was determined. Sensory evaluation of tenderness, juiciness and flavor was performed by a panel of four people.

Results

| | | | | | |
|----|-------------------------------|--------|------|------|-------------------|
| 1. | Sear value, kg/core | | | | |
| | Choice steak from supermarket | | | | 2.0 |
| | Grass-fed #555 | | | | 3.2 |
| | Grass-fed #577 | | | | 3.0 |
| 2. | Sensory scores (1-8)* | Choice | #555 | #577 | Ave. of 555 & 577 |
| | Tenderness | 6.5 | 4.6 | 5.0 | 4.8 |
| | Juiciness | 6.0 | 5.9 | 6.0 | 6.0 |
| | Flavor intensity | 5.3 | 5.7 | 5.2 | 5.5 |
| | Flavor Score (desirability) | 6.0 | 5.8 | 5.7 | 5.8 |
| | Overall palatability | 6.0 | 4.6 | 5.2 | 4.9 |

*1 = Extremely tough, extremely dry, extremely bland, extremely off-flavor, and extremely unpalatable
 5 = Slightly tender, slightly juicy, slightly intense, slightly off-flavor, and slightly palatable
 8 = Extremely tender, extremely juicy, extremely intense, extremely flavorful, and extremely palatable

Conclusion:

1. Steak from grass-fed cattle were tougher than Choice steaks. However, an average shear value of 3.0 kg and average tenderness sensory score of 4, 8 indicates that steaks from grass-fed heifers were close to "slightly tender" and in the "acceptable range."
2. There were no differences in juiciness and flavor scores between Choice and grass-fed.
3. Overall palatability score of grass-fed was one full score lower than Choice. However, it was still marginally acceptable with "slightly palatable" score.
4. The steaks were cooked medium rare to avoid meat toughening of grass-fed animals. If the steaks were cooked to a higher temperature, grass-fed animals may not have acceptable palatability and the difference between Choice and grass-fed would be greater.

In Summary

This case study shows that it is possible to fatten animals out on high-quality dry rangelands. Because of the poor spring the clover composition in that pasture this year (1997) was very low. It is assumed that on a normal year the animals might have performed even better. This addresses the concern of being only able to produce grass-fed beef during the green season. The decreased yellow fat that has been a problem in other case studies was addressed here by marketing them off the rangelands. Not all rangelands are alike and before preceding; a person may want to do their own test market and evaluate their rangelands for the energy content that is required to meet the animals' needs to put on some level of fat. The requirement for fat would mainly be for the meat product's moisture cooking ability, and to supply enough to make a low-fat content hamburger.

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