

Niche Beef Production

Chapter 1. Introduction

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This publication is a beginning resource for anyone who is interested in developing a niche beef marketing program. Here you will find information on finishing, processing, labeling, and marketing the niche beef product as well as case studies of beef enterprises that will help you better understand the meat product you will be producing.

Traditional beef cattle operations are land-, labor-, and capital-intensive. Profit margins for traditional ranches that sell calves into the commodity trade are relatively low. A recent UC Cost study estimates a return over cash costs of approximately negative \$20 per cow (Forero et al. 2008), and when the value of cattle is adjusted for inflation, returns are even lower (Figure 1.1) (Forero 2002).

The combination of high operation costs and relatively thin profit margins has led to increased interest in offering a value-added, ranch-raised product that will sell for higher prices. The scale of the operation can range from a few head to thousands of head per year. The availability of ranch-raised meat products has increased in recent years, to where they are now found in natural food stores, restaurants, and farmers' markets.

Changing the business structure of a ranch that sells live animals for meat requires a new set of skills and knowledge. To be successful, the producer must know how to produce the product and also how to work well with people; he or she must be able to produce a high-quality, wholesome product, and to market the product as "story beef."

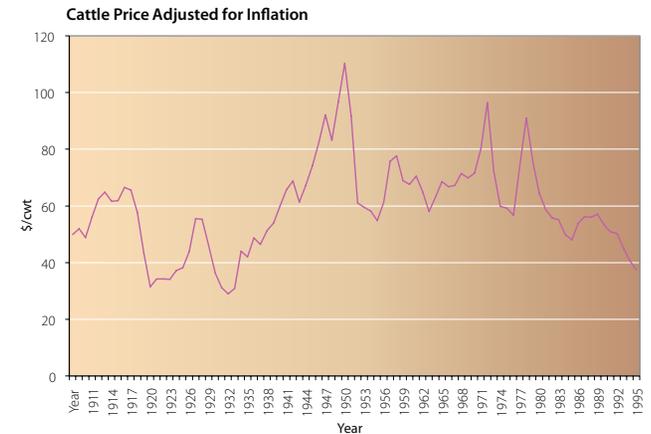


Figure 1.1. Price received for beef cattle, 1909–1995 (adjusted for inflation).



Colorado State University's Dr. Gary Smith believes that story beef is the wave of the future (Smith 2004). His research indicates that the following qualities and factors are the most important motivations for consumers to purchase natural beef:

- Hormone free
- Antibiotic free
- Ranch name
- No animal by-products used for feed
- Proper treatment of the animals
- Environmental stewardship

WHY DO YOU WANT TO MARKET BEEF DIRECTLY?

Before you move forward with a niche beef enterprise, you need to know the answer to a fundamental question: Why do you want to market beef directly? Many consumers today want more and more to have a closer connection with the production of their food, and this trend has increased sales of niche beef products. Many producers are motivated by the higher prices they can command and by a desire to produce and market locally raised food. It is important, though, to understand that higher prices do not automatically translate to higher profits.

Ranchers who are interested in raising and selling beef into the niche meat trade have two options for marketing their live finished cattle:

- Selling directly off the ranch to individuals, restaurants, and retail stores
- Selling to an existing niche beef marketing business

The option you select should reflect your strengths as a producer and the goals of your enterprise.

If you choose to sell direct from the ranch, that means you have control of the entire process from conception to consumption: genetics, production, finishing, processing, packaging, storage, marketing, sales, distribution, payment collection, and business management. Producing and finishing an animal to meet the individual customer's demands for a quality eating experience is a novel idea for most ranchers and something you should carefully consider and investigate through small production testing prior to business startup. Possible direct market outlets include

- Sale of carcass beef to the consumer
- Sale of packaged cuts at farmers' markets or via the Internet
- Sale of individual cuts or primals (e.g., rib, loin, sirloin, round, chuck, shank, brisket, plate, or flank) to retail stores or restaurants (wholesale)

If you sell instead to an existing niche beef business, you can access the opportunities for higher returns without having to manage feeding the cattle to finish and marketing the beef.

Producers can sell their product into an existing meat marketing company that purchases beef based on carcass weight and quality. By working with an established niche beef business, you benefit from its marketing and business expertise. This approach maximizes reliance on the greatest strength of most producers: raising animals.

You really need to develop a niche meat business plan before you start your business. Most ranchers start small and then develop their business as they gain experience and knowledge about this aspect of the beef trade (see chapter 7). The chapters that follow will give you a clear understanding of the elements required for successful development of a niche beef enterprise and should help you avoid costly mistakes.

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Chapter 2. Niche Beef Business Considerations

In chapter 7 we will discuss niche beef marketing plans in detail. For now, though, we need to get some sense of the potential target market because it has a bearing on production, processing, and labeling decisions, as well as on other matters, that will be discussed in chapters 2 through 6.

Marketing beef directly to consumers (sometimes referred to as vertical integration) may or may not increase the overall profitability of your ranch. Historically, retail prices for beef have been more stable than live prices for feeder cattle. Entry into this segment of the market may provide you with an excellent return on investment during years when feeder calf prices are low, but may yield lower returns than conventional beef production when feeder cattle prices are high. Diversification of your operation to include niche beef production may help to insulate your ranch from the volatility of the conventional beef market.

Producers face many challenges in starting a niche beef marketing enterprise, including the time and money costs involved in developing a market, a shortage of available USDA-inspected processing plants, the need for logistical planning for distribution and storage, the need for land resources for grass-finishing, and the work of maintaining adequate cash flow. In this type of enterprise, ranchers do not have the flexibility to move quickly in and out of markets. The initial efforts require a long-term commitment. Many successful niche beef enterprises start small and commit only a portion of the larger cattle operation's livestock to this system, effectively putting only a small percentage of the ranch's income at risk while the owners develop their marketing skills and establish their customers base.

DETERMINING YOUR TARGET MARKET

The first step toward determining your target market is to clearly define what your product is and what consumer demands exist for your product in your market area. It is important that the product you raise match the consumer's preference. Is it grain-finished or grass-finished? Can it be marketed as antibiotic free with no added hormones? What portion sizes does the customer want? Is the meat fresh or frozen? Will it be sold as individual cuts, quarters, or half carcasses? Will you sell it directly to consumers or go through a wholesaler to retail stores or restaurants? Will the product require third-party certification? Will it be marketed by the producer (you)? Will you be a supplier for an existing niche beef business?

Once you have defined your product, you can go on to research your intended customers: to whom will you sell the product, why would they want to buy this product, and how much will they pay? Definition of the target market is a critical component of your business plan. The business plan must reflect the realities of your ranch's current capacity (in terms of production, financial resources, etc.) as well as its potential for growth. It must also realistically address the demographics and economic considerations of the



target consumers. You must be flexible enough to make adjustments to the enterprise if market research indicates greater opportunities than you expected or a different kind of market.

You can either hire a marketing consultant to identify your consumers' demographics or you can tackle that for yourself. Here's how:

1. **Look at US Census data** for the areas where you would like to market your product.
2. **Contact your county Office of Economic Development** to see what demographic data they have available.
3. **Visit farmers' markets** in the areas where you would like to market your product and see what the vendors are selling and who the customers are. You can also contact the market manager to get a better idea of who shops at a specific farmers' market.
4. **Market your beef directly** at a farmers' market or other venue to get first-hand customer feedback.
5. **Explore fitness groups** that tend to emphasize a diet that includes meat. For example, the paleo diet puts emphasis on eating more protein.
6. **Talk with people at work, friends, and others** to find out what factors influence their meat-buying decisions.

The purpose of a demographics analysis is to assess the interests and product concerns of your prospective customers and then to use that information (whether developed through focus groups or consumer surveys) as a basis for aligning your products with those customers' interests. By identifying the groups, retail stores, and restaurants that actively seek local food sources, such as local Slow Food (slowfoodusa.org) and Weston Price chapters (westonprice.org), you can greatly increase your marketing opportunities.

One excellent marketing tool for reaching these and other groups is a 15-minute slide show that tells the story of your ranch and how your product is raised. This is something you can share online and at live events. Other activities for a live event can include

providing people with cooked samples of your product and giving away coupons, both of which can entice people to buy the product. Try holding a tasting event with other agricultural producers (e.g., partner with a wine tasting) to help get your product in front of prospective customers. Another market segment could be people who prefer a ranch-raised product and have sufficient freezer space to buy a half or quarter of beef. Your main customer base should not be made up of people looking for the lowest price they can get. Some producers have identified fresh pet food markets as places where they can merchandize bones, organs, and low-value cuts of meat. It can be a real challenge to develop and maintain a personal connection with customers and at the same time complete all of the tasks associated with production and marketing.

POTENTIAL MARKET OUTLETS

Identification of the intended customer and development of a marketing plan to target that customer are the foundations of any business plan. Once you accomplish that, you need to find potential sales outlets. Each will have its own unique requirements.

On-ranch live animal sales

If the meat is to be sold directly from the ranch to the consumer, it must be harvested and processed at a USDA-inspected plant. This means that marketing options for a producer who is not close to a USDA-inspected plant may be limited. In that situation, "direct-live" sale to the consumer might be the best option: you sell a live, ready-for-harvest animal to a customer, who then hauls it off the ranch, either directly to his or her home or to a harvest plant where it will be processed. It is illegal for you to sell a live animal to a consumer and then process it for the consumer on your own ranch.

Farmers' markets

More and more farmers' markets now feature meat vendors alongside their traditional produce booths. The farmers' market is another form of direct marketing to the consumer. People who patronize farmers' markets do so in part because they want local food. You can get a current listing of farmers' markets from the California Federation of Certified Farmers' Markets

(<http://cafarmersmarkets.com>). Contact the market manager for information on that market's requirements for selling meat. It can be difficult to secure a weekly spot at a farmers' market. Sales levels vary greatly between markets.

In most cases, producers must contact the Environmental Health Office (EHO) or Department of Public Health in the county in which the farmers' market is held before they can sell meat or provide cooked samples to the public. The products must be prepackaged and must have a USDA label that includes the processor identification number. Guidelines are more stringent for the preparation and distribution of samples than for actual sales of frozen products at a farmers' market. Some farmers' markets require that you have product and business liability insurance, and the market manager may also ask that the market be listed in your insurance as an "Additional Insured."

Retail facility

The biggest challenges of a retail marketing venue include the need to maintain a constant supply of product and the need to be able to react to swings in demand. Marketing a complete product line of hamburger, steaks, and roasts is a minimal challenge. Some retail sources are only interested in primal cuts that they can then divide into individual, consumer-scale cuts. If you can identify a few retail outlets that are able to take whole carcasses, you can ease the pressure of having your own business hold unsold inventory. Even when you work through a retailer, though, the ranch-to-consumer relationship still needs to be strong. To many potential customers, it is important that they have an understanding of how the rancher produces and processes the animal. Product sampling and retail store advertisements are great ways to get people to try your product and then, if all goes well, make a purchase.

Here are some important considerations for producers contemplating sales through a retailer:

- Do you have sufficient supply to meet a retailer's demand for a year-round presence in the meat case?
- Do you have a backup plan in case you are unable to maintain store inventory?

- Is the retail store willing to sign a contract to ensure that you will be paid a specific price?
- Is the retail store interested in a "seasonal product" if you are not able to produce year-round?
- Which retail outlets are willing to purchase the whole carcass or primal cuts to re-cut in their own butcher shop?

Restaurants or meat purveyors

When you sell directly to restaurants or to those who supply meat to restaurants, your customers will be most interested in the quality and consistency of your product, since their goal is to ensure a favorable eating experience for their customers. These buyers also have a highly variable demand for product, which may require that you either maintain an inventory or have a way to move products quickly from live to usable, processed form. Because they are interested in high-end cuts as the majority of their purchase, you will need to develop different marketing avenues for hamburger and roasts. Some restaurants with buffets are interested in large roasts that can be carved on demand for customers, and some develop informational materials that describe the products they use in order to build rapport with customers and set themselves apart from other dining experiences. This area of marketing may provide the greatest return on investment for high-end cuts, but in general it is a smaller market overall, and requires more work per unit of sales.

Carcass beef

By marketing USDA-inspected meat in whole, half, or quarter carcasses, the producer can reduce or eliminate packaging and most marketing costs. These large units can be sold directly to consumers, who then have them cut and wrapped by the meat processor. Customer processing of the product adds more time before you receive payment: aging, cutting, wrapping, and pick-up time may add four weeks.

Consumer direct

Some niche beef producers market directly to the ultimate consumer of their product. This customer purchases beef directly from the ranch. You can develop this market through a combination

of e-mail, newspaper, mail order, and ranch direct sales. In order to be able to serve this market, you must have your meat processed by a USDA-approved processing facility. This option allows you to market animals on a schedule that matches the demand. It may decrease the amount of effort you have to put into inventory management for retail marketing.

Internet

Another avenue for direct market sales is Internet sales through your ranch website, Facebook account, Twitter account, or other online point of contact. Shipping can be the major cost of operation for this market, since the meat must be shipped in a cooler that is packed with Dry Ice. It is costly to ensure that the product stays at the correct storage temperature during shipping, but is absolutely necessary for food safety reasons. For Internet sales, it makes sense to sell in units made up of assorted cuts (steaks, roasts, and hamburger) in sufficient quantity to keep the per-pound shipping costs low. By marketing assorted cuts as a single sales unit, you ensure that the less-desirable cuts will still be sold.

Buyers clubs

Community Supported Agriculture (CSA) is an arrangement in which customers in a community pledge support to a farm operation so that the farmland becomes, whether legally or just in spirit, the “community’s farm.” The growers and the consumers each provide their own form of support as they share both the risks and the benefits of food production. Typically, members or shareholders of the CSA farm pledge in advance to cover the anticipated costs of the farm’s operation and the farmer’s salary. In return, the shareholders receive shares of the farm’s bounty throughout the growing season, along with the sense of satisfaction gained from their reconnection to the land and their more-direct participation in food production. In a beef CSA, the producer offers a box of different cuts of beef on a weekly, monthly, or quarterly basis. Shareholders pay for their boxes three, six, or twelve months in advance in order to help the producer cover anticipated costs of production. The shareholders/consumers benefit by getting a quality meat product from a known and trusted source. More information on the CSA model is available

online from the USDA (www.nal.usda.gov/afsic/pubs/csa/csa.shtml).

Following are a few examples of niche beef enterprises that were developed by five different operators. They differ in size, scope, and complexity. The beef enterprise can be as simple or as complex as the operator chooses to make it. As you review the different scenarios, consider what each one sells and to whom each one markets its products.

INVENTORY MANAGEMENT

Changing from live-animal to meat-product marketing could change the production focus of your operation. Most ranches are managed for a short calving season and a narrow marketing time period to improve the efficiency of the operation and ensure a uniform-aged group of animals. Meat product marketing may require that you to alter that system in ways that allow you to provide market-ready animals over a longer time period. You may need to shift to a longer breeding season or you may have to purchase outside animals so you can provide meat product over a longer period of time.

Matching the production quantity to meet variable consumer demands can be a challenge. The larger scale of a bigger operation with diverse marketing outlets may allow that producer more flexibility in managing inventory. Restaurant markets are the most challenging, as they may have varying levels of demand for specific cuts of meat. Direct marketing to consumers may allow you to focus instead on seasonal production. If you freeze your beef you will be more flexible in your ability to manage inventory, but in return you will have to deal with increased storage costs.

Example 1: Locker beef

Locker beef is a term for animals that are sold as halves or quarters to customers for storage in a household freezer.

A northeast California ranch has a long history of beef production, feeding, and meat processing. When the owners closed their packinghouse in the late 1960s they shifted the ranch focus to the cow-calf side of the operation, but they continued to feed some cattle for their own consumption. As time went on, friends and neighbors inquired about buying beef for their own freezers.

The ranch owners looked into the legal requirements they would have to meet in order to accommodate these requests, and began to feed a few head of cattle for this purpose. Now meat sales of this type make up a small enterprise that compliments the ranch's commercial cow-calf/yearling operation. The owners do not advertise this service or actively market their product. The product is sold as sides of beef and is harvested in a USDA-inspected plant. The ranch delivers the live animal to the plant and then delivers the meat to the customer.

- History: selling sides of beef since 1994
- Product: sides of beef processed at a USDA-inspected plant for freezer trade
- Feeding: grass-fed through yearling phase, then feed-lotted and fed grain approximately 120 days
- Scale: 13 head (26 half-carcasses) annually
- Marketing: repeat customers and word of mouth

Example 2: Seasonal grass-fed retail/wholesale

To accommodate seasonal variability in forage quality, one producer developed a simple business plan that increased net income without all of the complexities of selling a retail product. This producer sells grass-finished heifers and steers to customers on a live basis off the ranch each May, allowing the customers to use natural forage to finish the animals at the time of year when forage energy values are highest. Customers have the option of having the ranch transport all of the animals to a USDA-inspected harvest plant in a single, large lot and then transport the carcasses, under refrigeration, back to one of two local processors where they will be cut and wrapped to the customers' specifications. Partial payment is required in advance to reserve the animal; final payment is due before delivery of the carcass to the local processing plant.

- History: selling to individuals since 1998
- Product: whole and half carcasses
- Feeding: grazed on grass

- Scale: 64 head
- Marketing: repeat customers, word of mouth, newsletter, and website

Example 3: Grass-fed retail/wholesale

A core group of four producers owns a company that markets natural grass-fed beef from more than 40 ranches in order to provide sufficient volume and year-round production to allow sales through more than 150 retail outlets. They have a production protocol that provides for 30 days of standardized feeding in order to get consistent flavor from animals that come from different ranches. They also have a harvest age restriction on the calves to provide a younger, more tender product.

- History: selling to retail and restaurants since 2002
- Product: all retail beef products
- Feeding: grazed on grass and then fed a forage diet (using a haylot) for 30 days before processing
- Scale: more than 3,000 head annually
- Marketing: direct contact with distributors, retail outlets, restaurants, brochures, and website

Example 4: Wholesale and retail grass-fed

This producer has established a grass-finished beef operation by first selling at a major farmers' market and then growing the business to where it has its own retail store along with sales to regional restaurants and health food stores. The operation raises its own livestock and also purchases livestock from partner ranches in order to fill in seasonal gaps in production. The production protocol calls for no growth hormones, no administered or fed antibiotics, and 100 percent pasture-raised beef. The same producer also sells pasture-raised poultry (broilers and eggs).

- History: selling quarter, half, and whole carcasses or assorted packages of different products since 2002 (Beef also sold retail at farmers' markets and restaurants since 2002. Ranch now operates its own retail outlet in the form of a Community Supported Agriculture (CSA) program.)

- Product: all retail beef products
- Feeding: grazed on grass only
- Scale: more than 400 head annually
- Marketing: direct contact with retail customers and restaurants via brochures, quarterly ranch tours, and website

Example 5: Retail and wholesale natural-fed cattle

This ranch has a long history of exploring new alternatives in cattle marketing. The ranch started selecting bulls for carcass and maternal traits in the mid 1980s, and after several years of carcass testing they began to market their cattle exclusively to a specialty beef processor. The year 2000 saw corporate and philosophical changes within that processor's organization, so the ranch started to explore ways to market its own brand of premium, natural beef. This began with feeding and finishing a few head of cattle and marketing them under the ranch's own USDA label in 2002. By 2004, sales had grown to where the ranch installed a walk-in freezer to hold inventory in order to be able to service local and distant customers. The operation was expanded to include long-distance markets by delivering whole carcasses to high-end markets in the San Francisco Bay Area.

- History: retailing meat since 2002, wholesaling meat since 2004
- Product: whole and half carcasses, wholesale and retail cuts
- Feeding: grazed on grass through yearling phase, finished on grains in a small feedlot
- Scale: increased from 20 head in 2002 to 85 head in 2007
- Marketing: ranch website for shipment nationwide, local restaurants and markets, urban area markets and high-end restaurants, word of mouth

These examples show how different producers have approached direct marketing in an effort to improve profitability. By matching consumer demands with your own skills and interest, location, and operation size, you may be able to find your own way into the niche meat business. The proximity of your ranch to a USDA-inspected processing plant is a critical financial cost factor, as is location of your targeted consumers.

A number of producers in California have experience in direct meat sales. Find out who in your area is involved in niche meat marketing and talk with them. You will find that their experience is invaluable.



Chapter 3. Meat Product Evaluation

Once the animal has reached the desired weight for the chosen market, you need to manage the final meat product for quality and appearance. It is important that you fully understand the impact that your feeding and breeding system has on the product. The dressing percentage and ultimate retail yield need to be evaluated before you can fully understand the economic implications of the business venture.

The beef packing industry in the United States has a system for ensuring the safety and quality of the final beef product. This system is made up of two programs: Federal Meat Inspection and Federal Meat Grading. Both programs are administered by the United States Department of Agriculture.

FEDERAL MEAT INSPECTION

USDA inspection is mandated for all meat entering the retail, wholesale, restaurant, and institutional trades. USDA Federal Meat Inspectors are part of the Food Safety Inspection Service (FSIS). The purpose of their inspection is to safeguard the consumer's health by eliminating unfit meat from consumer channels. This inspection ensures that harvest and processing facilities are sanitary and that the animal has been maintained in good health. Federal veterinarians conduct necessary inspections (live, carcass, and visceral inspections). Determination of the beef product's quality and yield grade is a separate and optional service paid for by the processor (A. L. Nueman, *Beef Cattle Production*, 1977).

FEDERAL MEAT GRADING SERVICE

The voluntary Federal Meat Grading Service is paid for by the processing facility. The system was established in 1923 in order to ensure uniform quality for contract beef purchases (Craig Morris, USDA). The purposes of the federal meat grading are

- to establish the quality and quantity of meat from the carcass, on the basis of which a price structure can be established
- to provide a consistent system for differentiation of meat quality in the marketplace
- to assist in the promotion and marketing of the beef product

USDA Meat Grading Service personnel use a uniform, standardized data collection methodology to determine the beef carcass attributes.

CARCASS DATA

The data collected by the USDA grader determines two different attributes associated with a beef carcass: its quality grade and its yield grade. Quality grade is an estimate of the quality of the eating experience a consumer should



expect from the meat that comes from the carcass. Yield grade refers to the amount of meat the carcass will yield. After these two attributes are determined, the carcass is identified as having specific quality and yield attributes and is marketed as such.

QUALITY GRADE

The determination of quality grade is based on two factors:

- Maturity
- Marbling

Maturity

Carcass maturity refers to the physiological age of the animal, ranked from A (youngest) to E (oldest). Maturity is important because there is a relationship between the age of a beef animal and the tenderness of its meat (the younger the animal, the more tender the meat). Maturity is determined on the basis of bone characteristics, using the ossification of cartilage to estimate the animal's actual physiological age. Maturity Group A cattle are estimated to be from 9 months to less than 30 months old at harvest, while Maturity Group E cattle are estimated to be in excess of 96 months old (table 3.1).

As mentioned, inspectors determine maturity by evaluating how much of the carcass cartilage has changed to bone (ossified) for specific bones in the vertebral column when the carcass is split. As animals mature, the vertebral cartilage gradually undergoes a natural process of ossification. The size and shape of the rib bones also change with the animal's age. Rib bones tend to be round and red in a younger animal, but tend to become more flat and white as the animal ages.

Table 3.1. Carcass maturity and approximate live age

| Carcass maturity | Approximate live age |
|------------------|----------------------|
| A | 9 to < 30 months |
| B | 30 to < 42 months |
| C | 42 to < 72 months |
| D | 72 to < 96 months |
| E | ≥ 96 months |

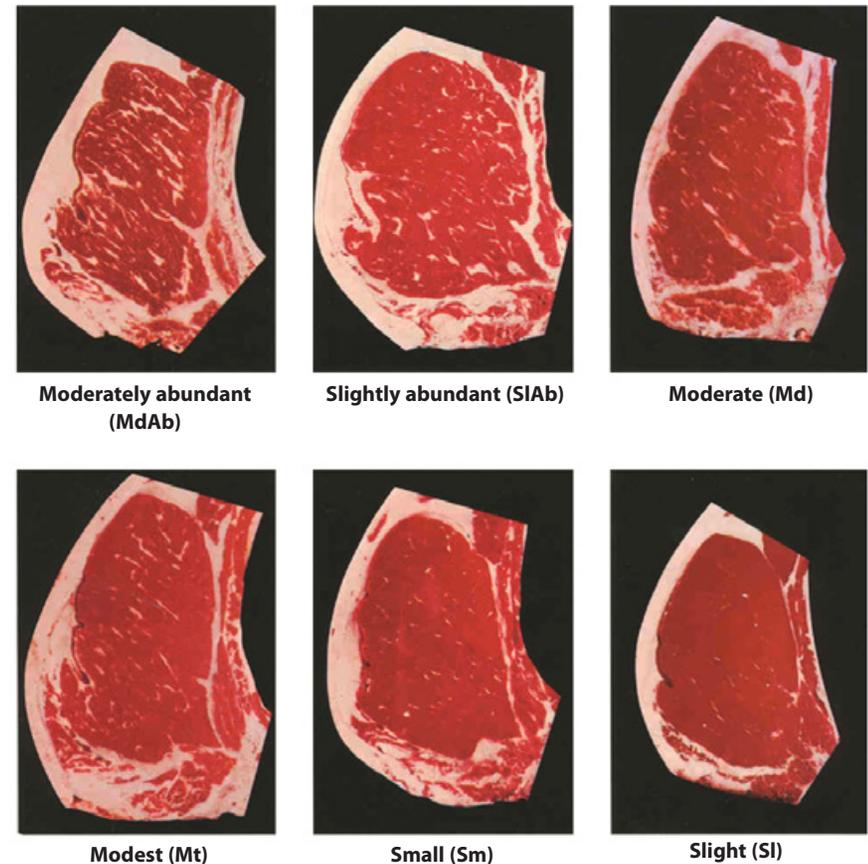


Figure 3.1. Degrees of marbling. Source: USDA-AMS, USDA-FSIS

Marbling

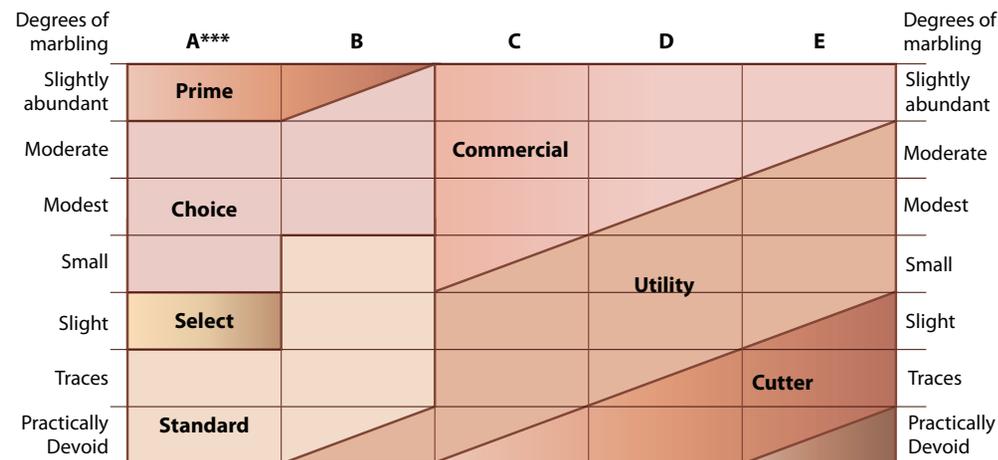
The term marbling refers to the distribution of fat within the lean meat of the ribeye muscle. This is referred to as intramuscular fat. In general, more marbling indicates that the meat will have a better and more consistent eating quality. Marbling is evaluated at the cut surface of the ribeye between the 12th and 13th ribs. A carcass half is said to have been ribbed if it has been opened up between the 12th and 13th ribs to expose the ribeye muscle for grading purposes. The degree of marbling is a major determinant in the quality grade earned by a beef carcass (figure 3.1).

Table 3.2. Correspondence of marbling grade to marbling score

| Marbling grade | Amount of intramuscular fat (marbling score) |
|----------------|--|
| Prime + | Abundant 00 (Ab) |
| Prime | Moderately abundant 00 (MdAb) |
| Prime - | Slightly abundant 00 (SlAb) |
| Choice + | Moderate 00 (Md) |
| Choice | Modest 00 (Mt) |
| Choice - | Small 00 (Sm) |
| Select + | Slight 50 (Sl) |
| Select | Slight 00 (Sl) |
| Standard + | Traces 00 (Tr) |

Each marbling score is divided into 100 subunits, indicated by a superscript number (00 to 99) that represents the least and greatest amounts of marbling within the score. Marbling scores with their corresponding quality grades are shown in table 3.2.

Relationship between marbling, maturity, and carcass quality grade*



* Assumes that firmness of lean is comparably developed with the degree of marbling and that the carcass is not a 'dark cutter.'

** Maturity increases from left to right (A through E).

*** The A maturity portion of the figure is the only portion applicable to bullock carcasses.

Figure 3.2. Relationship between marbling, maturing, and carcass quality grade.

Color and texture

Younger beef cattle carcasses will tend to have a finer texture and a lighter red color. Older beef will tend to be coarse textured and darker red. The grader can make an adjustment in maturity based upon color and texture.

The final quality grade of a carcass is determined on the basis of maturity and marbling. Because age has an influence on tenderness, both factors must be considered. Figure 3.2 shows the relationship between age and marbling. Note that it is impossible for an animal in Maturity Group B (30 to 42 months) to be graded Prime and that it is also more difficult for such an animal to be graded Choice. Older animals need to have more marbling—at their age, a small amount of marbling is no longer sufficient to earn the Choice quality grade.

The higher the quality grade, the more consistent the eating experience is. You should try to grow beef that will earn at least a low Choice grade (Ch-) whenever possible. If your carcasses are consistently being graded at low Select (Se-), your animals need more time on feed or you need to raise smaller-framed animals. Grass-finished steers or heifers can grade Choice if you finish them on higher-energy forage.

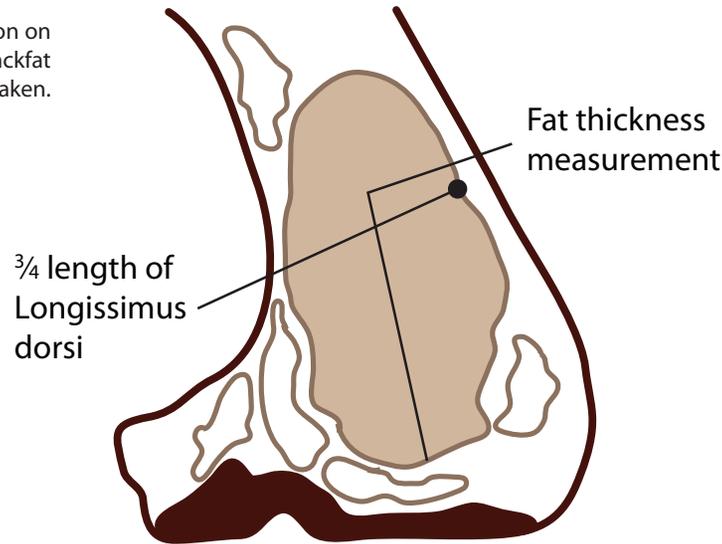
YIELD GRADE

Yield grade is the second component determined by the USDA grader. Yield grades estimate the yield of Boneless, Closely Trimmed (approximately 0.30 inch), Retail Cuts (BCTRC) from the round, loin, rib, and chuck. These four wholesale cuts make up approximately 75 percent of the weight of a beef carcass, but about 90 percent of its monetary value.

The carcass information required to determine yield grade includes

- hot carcass weight (see definition below)
- thickness measurement for backfat
- area measurement for ribeye
- estimated percentage of kidney, pelvic, and heart fat weight

Figure 3.3. Location on beef carcass where backfat measurement is taken.



HOT CARCASS WEIGHT (HCW)

Hot carcass weight is the weight (in pounds) of the harvested beef animal after removal of the hide, head, and entrails, and before chilling.

BACKFAT THICKNESS

The standard measure for external fat on a carcass, called backfat thickness, is taken on the cut surface of the ribeye between the 12th and 13th ribs at a point three-fourths of the ribeye length from the chine bone (figure 3.3). Fat thickness is a major determinant of yield grade in a carcass.

RIBEYE AREA

The area of the ribeye muscle (longissimus dorsi) is measured at the 12th rib using a grid (figure 3.4). The measurement is expressed in square inches.

Place the dot grid on the loin eye and count the number of dots that touch red meat. Each dot represents 0.10 square inch.

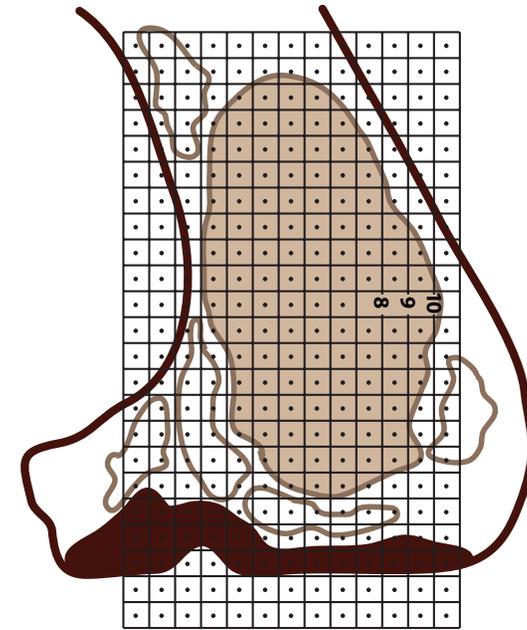


Figure 3.4. Measuring the ribeye muscle with a grid.

KIDNEY, PELVIC, AND HEART FAT

The amount of kidney, pelvic, and heart fat on a carcass is estimated by the USDA grader. It represents the amount of fat surrounding the kidney knob plus the amount of fat in the pelvic and thoracic (heart) areas, expressed as a percentage of the total carcass weight.

To calculate the yield grade for a specific carcass, plug these measurements into this standard formula:

$$\begin{aligned} \text{Yield grade} = & 2.5 + (2.5 \times \text{backfat thickness [in inches]}) \\ & + (0.2 \times \text{percentage kidney, pelvic, and heart fat}) \\ & + (0.0038 \times \text{hot carcass weight [in pounds]}) \\ & - (0.32 \times \text{ribeye area [in square inches]}) \end{aligned}$$

This formula produces USDA yield grades ranging from 1.0 to 5.9, but for practical purposes the grader uses whole numbers to

Table 3.3. Relationship between yield grade and cutability

| Yield grade | Cutability (percentage of closely trimmed retail cuts from rib, loin, chuck, and round) |
|-------------|--|
| 1 | 52.6 – 54.6 |
| 2 | 50.3 – 52.3 |
| 3 | 48.0 – 50.0 |
| 4 | 45.7 – 47.7 |
| 5 | 43.3 – 45.4 |

denote a yield grade. Unlike most mathematical values, yield grades are not rounded to the next higher whole number. This means that a carcass with a yield grade of from 3.0 to 3.9 is considered as yield grade 3, those with a yield grade of from 4.0 to 4.9 are considered yield grade 4, and so on.

Yield grades are a means of quantifying differences in cutability among beef carcasses. The lower the yield grade value, the higher the percentage of closely trimmed retail cuts from the rib, loin, chuck, and round. Low yield grades translate into a greater quantity of meat to sell. Table 3.3 demonstrates this relationship. The challenge is to keep the yield grade low while maintaining a Choice quality grade. The more fat there is on a carcass, the higher its yield grade.

QUALITY GRADE AND YIELD GRADE IN THE MARKETPLACE

Quality grade and yield grade are used to establish price in the traditional commodity marketplace. An animal with a higher quality grade typically brings more money than one with a lower

quality grade. Table 3.4 shows market data that demonstrate this relationship.

Yield grade is also considered in price determination. Animals with a high yield grade (more fat, less lean) will typically bring less money per pound than their cohorts with a lower yield grade. Most niche beef producers do not have their product yield graded, with the possible exception of product testing done as part of the development of a business plan. Table 3.5 uses market data to demonstrate the price-yield grade relationship.

RETAIL YIELD OF THE CARCASS

Not all of the live weight of a beef animal ends up in the freezer. Dressing percentage is the first estimate of meat yield. To calculate dressing percentage, divide the hot carcass weight (HCW) by the live weight and then multiply by 100 to change the number to a percentage. A higher dressing percentage can indicate a higher yield of meat. An ideal range is between 60 and 66 percent. The industry average dressing percentage is around 64 percent for grain-fed steers. Grass-fed steers will normally range between 55 and 60 percent.

Table 3.5. Relationship between yield grade and price

| Yield grade | Price per cwt (carcass) | Price per 800 lb carcass |
|-------------------------|----------------------------|-----------------------------|
| Prime 1 to 3, Prime 4 | \$13.60 | \$108.80 |
| Choice 1 to 3, Choice 4 | \$15.46 | \$110.72 |

Table 3.6. Relationship between live, carcass, and salable meat weights for a grain-fed beef animal

| Type of weight | Percentage of live weight (multiplier) | Pounds |
|--|---|--------|
| Live weight | — | 1,250 |
| Hot carcass weight (HCW) | 62% of live weight ($\times 0.62$) | 775 |
| Pounds of meat for sale (includes fat, bones, shrinkage) | 45% of live weight ($\times 0.45$) | 558 |

Table 3.4. Relationship between quality grade and market price

| Quality grade | Carcass weight (lb) | Yield grade | Value (\$/cwt, 7/28/2010) | Value per animal |
|---------------|---------------------|-------------|------------------------------|------------------|
| Prime | 600 – 900 | 1 – 3 | \$153.29 | \$1,226.32 |
| Choice | 600 – 900 | 1 – 3 | \$145.58 | \$1,164.64 |
| Select | 600 – 900 | 1 – 3 | \$136.81 | \$1,094.48 |
| Standard | 600 – 900 | 1 – 3 | \$122.97 | \$983.76 |

In general, the net salable quantity of meat product from a grain-fed animal is about 45 percent of its live weight. Table 3.6 gives an estimate of the amount of meat you could expect to get from an animal with a live weight of 1,250 lb.

Once the animal has been processed, the carcass must be fabricated into the various meat products. The first step of fabrication is generally breaking out chuck, rib, round, and loin (these are often referred to as the primal cuts). The chuck, rib, shank, brisket, flank, and trim cuts make up an average of 77

Table 3.7. Approximate yields of cuts from beef quarters (300-lb side, yield grade 3)

| Quarter and cut | Pounds | Percentage of quarter |
|--------------------------------------|--------|-----------------------|
| Hind quarter (144 lb) | | |
| Round steak | 27.0 | 18.8 |
| Rump roast (boneless) | 9.9 | 6.9 |
| Porterhouse, T-bone, and club steaks | 15.3 | 10.6 |
| Sirloin | 24.9 | 17.3 |
| Flank steak | 1.5 | 1.0 |
| Lean trim | 21.0 | 14.6 |
| Kidneys | 0.9 | 0.6 |
| Waste (fat, bone, and shrinkage) | 43.5 | 30.2 |
| Total hind quarter | 144 | 100 |
| Front quarter (156 lb) | | |
| Rib roast | 18.3 | 11.7 |
| Blade chuck roast | 26.7 | 17.1 |
| Arm chuck roast (boneless) | 17.4 | 11.2 |
| Brisket (boneless) | 6.3 | 4.0 |
| Lean trim | 49.2 | 31.6 |
| Waste (fat, bone, and shrinkage) | 38.1 | 24.4 |
| Total front quarter | 156 | 100 |

percent of the carcass. The loin (about 23% of the carcass, on average) contains the most desirable and highest-priced retail cuts.

After the carcass is broken into the primal cuts, it is further processed into cuts for the consumer. Table 3.7 is a general outline of what you might expect to get from a 600-lb carcass.

Lean trim (the portion of the carcass that remains after removal of the primal cuts) makes up the largest amount of product. Selling these large quantities as hamburger can be a challenge. Some producers merchandize lean trim as beef sticks, beef jerky, or sausage. Beef stick and jerky shrink greatly with the loss of moisture during processing, and this marketing avenue needs to be researched (e.g., amount of shrink, processing and packaging costs) to make sure it has a profit advantage over selling hamburger.

LIVESTOCK HANDLING AND CARCASS QUALITY

The care, management, and handling of cattle can have a significant influence on carcass quality. Cattle should be managed in accordance with a beef quality assurance (BQA) program. One part of a BQA program is the institution of a vaccination protocol that ensures animal health while at the same time reducing the incidence of injection site blemishes. Another element of BQA is the close examination of facilities for protruding boards, gate hinges, and other things that may cause animal bruising. When cattle are transported to the processing plant, they should be handled quietly and gently, in a way that causes as little stress as possible. Stress prior to the animal's harvest can trigger a temporary depletion of glycogen, a condition that may result in the animal's being classified as a "dark cutter." The muscle in a dark cutter remains dark rather than turning cherry red when the carcass is ribbed. Consumers associate dark beef with meat from an old animal, which they associate with a tough texture and poor flavor.

GETTING CARCASS DATA ON YOUR CATTLE

If you receive no feedback at all from the consumer, that does not necessarily mean that he or she was satisfied with the product. Most people will not take the time to give feedback or are reluctant

to give negative feedback. You need to develop minimum carcass standards for your own operation in order to ensure that the meat you provide to your customers is a consistently appealing and good-tasting product.

You may be able to get carcass data from USDA graders (contact information available through your harvest facility), but they may charge you a fee for the data. As a producer, you might consider working with a harvest facility located on a university campus (in California these are found at the University of California at Davis, California State University at Chico, California State University at Fresno, or Cal Poly at San Luis Obispo). In such a setting, the tenderness of the meat can be evaluated by taste testing and shear-force experiments. Since hamburger will make up almost 50 percent of the product from a carcass, consider what percentage of fat you want to allow. Some amount of fat will be required for flavor and to bind the meat together during cooking.

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Chapter 4. Finishing on Grass or Grain

This chapter covers the production parameters required to finish beef animals for the consumer, assuming the desired endpoint for the animal to be “A” maturity and a minimum of a low Choice (Ch–) quality grade. Remember that the quality of the eating experience is most closely correlated to the age of the animal and the amount of intramuscular fat. We will discuss ways to determine when an animal has reached the desirable degree of finish based on external indicators. Both grass and grain finishing will be discussed as well as the genetic factors that influence carcass quality.

DETERMINING THE ENDPOINT

There are several ways to determine the point at which an animal has achieved enough marbling. Beef cattle first deposit fat in the brisket, the cod, and over the back. Intramuscular area is one of the last places fat is deposited. There is a general relationship between the amount of back fat on a beef animal and the amount of its intramuscular fat. Generally, one can assume that if an animal has 0.50 inch of back fat, it should grade a minimum of Choice– (assuming “A” maturity) (Dhuyvetter 1995). While there is a general correlation between back fat and Choice– quality grade, it is not an absolute correlation. Because of this, producers should try to collect actual carcass data that they can use to validate the results of the feeding program and genetics of their operation.

Figures 4.1 and 4.2 show two steers at differing degrees of finish. Compare the appearance of the brisket, rib area, and tail head areas on the two animals. When you compare figure 4.1 with figure 4.2, the difference in cover is notable. The steer in figure 4.2 lacks finish across in the brisket, over the ribs, and the tail head area. The steer in figure 4.1 is well covered, while the steer in figure 4.2 has sharper points visible. Figures 4.3 and 4.4 are the respective ribeyes from the two steers after harvest. The effects of the cover are visible in the ribeye in figure 4.3. Note the back fat and the flecks of fat (marbling) in the ribeye muscle. The lack of this sort of finish is exemplified in the ribeye shown in figure 4.4. Note the lack of back fat there and the reduction in intramuscular fat.



Figure 4.1. Beef steer exhibiting external indicators of finish.



Figure 4.2. Beef steer lacking prominent external indicators of finish.



Figure 4.3. Corresponding ribeye for beef steer exhibiting external indicators of finish.



Figure 4.4. Corresponding ribeye for beef steer lacking prominent external indicators of finish.

There is a relationship between the size of cattle and their finished weight. Smaller-framed cattle are quicker to mature and generally will finish at a lower weight. British breeds (e.g., Angus, Hereford, and Shorthorn) generally are smaller-framed than continental breeds (e.g., Limousin, Charlois, Semimetal) and typically reach a finished weight at a younger age. But there is as much variation within a single breed as there is between breeds. Breed selection is an important factor in the development of a niche beef program. It is well documented that Angus cattle have a higher propensity to marble than other breeds. If a shorter feeding period is important to you, it could make sense for you to incorporate this breed into your feeding program.

One way to estimate how long to feed cattle is to use the frame score to estimate what the weight the animal will have to reach in order to achieve the desired quality grade. The Beef Improvement Federation has developed a numerical system to categorize frame size: The animal is measured from the ground to the top of the hip, directly over the hook bones, using a specially designed measuring stick. For more information on frame scoring, see *Frame scores and feeder cattle grades* (Torell, Bruce, and Dansie 1999). Table 4.1 demonstrates the relationship between frame score and finish weight that will yield a carcass with a half inch of back fat.

Table 4.1. Relationship between frame score and harvest weight

| Type of beef | Frame score | | | | |
|--|-------------|-------|-------|-------|-------|
| | 3 | 4 | 5 | 6 | 7 |
| Harvest weight (lb) to provide 0.5 inch of fat cover | | | | | |
| Steer | 1,010 | 1,105 | 1,200 | 1,295 | 1,390 |
| Heifer | 860 | 940 | 1,020 | 1,100 | 1,180 |

Regardless of the method you use to finish cattle, it is useful to know what the animal weighs as it enters the finishing phase. If you know the target date and weight for the finished animal, you can calculate the required gain in terms of pounds per day. Many processing plants are busy places, and if you have an estimated harvest date it can help you match your processing to your customers' demands. Try to schedule the processing early to make sure the processor will be able to take the stock when it is ready.

GENETICS

As previously discussed, breed selection is an important factor in the development of a niche beef program. Individual animals within a breed vary tremendously in their genetic potential. Cattle perform differently depending on conditions. It is important to match performance conditions to customer preference. A record keeping system that includes carcass data and is appropriate for the size of

your operation can be used to help determine which animals are performing well and producing progeny that are best-suited to the target market. The animals that, in terms of genetics, most closely resemble those that have best met your production goals should be identified and retained. Animals that are closely related will be more genetically similar and will produce similar products. For example, two sons (bulls) that come from the same parents will be more genetically similar than will two bulls chosen at random. However, there can also be large differences between even animals that share the same pedigree. Breed associations have developed tools called Expected Progeny Differences (EPDs) that estimate genetic differences between individuals in the same breed. EPDs are available for many traits, including loin eye size and intramuscular fat content.

For more information on this topic, read Drake and Chapman (2008) and Drake (2003), and obtain information from breed associations.

GENETIC TESTING

Genetic (or *DNA*) testing can be done on cattle for a variety of traits. These tests may provide useful data when you are selecting cattle. A wide variety of traits can be evaluated using DNA tests, including traits for weaning weight, marbling, external fat thickness, fertility, and disease resistance. Currently all of these tests are potentially valid for purebred Angus cattle. The American Angus Breed Association already incorporates some of these tests into their published EPD values. The accuracy of these tests in non-purebred Angus cattle is unknown, and in that case they are not recommended tools for selection.

DEVELOPING A FINISHING PROGRAM

Finishing beef to the desired weight can be accomplished in several ways. Depending on the market, beef can be finished on pasture, on a combination of pasture and grain supplementation, or on a complete grain finishing ration. Knowledge of the nutritional value of the available feed is critical when finishing cattle.

Sidebar 4.1.

Consider the following example for a steer started on feed in the spring:

March 1 to August 10 = 163 days

Incoming weight = 700 lb

Target finish weight = 1,150 lb

Total gain needed = 450 lb

Average daily gain needed =

450 lb gain ÷ 163 days = 2.8 lb per day

Protein and energy are important nutrients for growing cattle. Protein is critical for muscle development, and energy is required to fuel all growth processes. The levels of these and other nutrients in feed are determined using standard laboratory analyses and calculations, and each nutrient may be reported in a variety of ways. Protein is commonly expressed as the percentage of crude protein (CP). The energetic component of a feed is frequently expressed as the Total Digestible Nutrients (TDN). Among forages, alfalfa hay is considered a good protein source, ranging from 16 to 24 percent CP (compared to oat hay at 10 to 12% CP or corn silage at 8 to 10% CP). Corn grain is considered a high-energy feed with 80 percent TDN.

Finishing cattle generally requires less protein than does growing the animals. Rather than protein, the finishing process requires large amounts of energy in the feed. It takes 2.25 times more energy to increase the amount of lean muscle for finishing. The more energy you give to the animal, the more quickly it will finish.

It is important that in addition to meeting the animals' protein and energy needs, you also ensure that their vitamin and mineral requirements are met. Work with your local farm advisor or veterinarian to get a recommendation on a mineral program suitable for your area. For local information on Selenium (Se) and Copper (Cu) for beef cattle, refer to the Trace Minerals for California Beef Cattle website (<http://animalscience.ucdavis.edu/MineralProject/>).

GRAIN-FED BEEF

When finishing cattle on grain, keep in mind both the environmental conditions at the feeding location and the availability of a feed storage area. The ideal feeding location for cattle finished on grain will have only minimal mud. Animals standing in mud gain less weight due to heat loss. You also need to be able to store feed in bulk at the feeding location.

The amount of time it takes to finish a beef animal will vary from 60 to 110 days, depending upon the animal's starting weight, frame score, and diet. The larger the frame score, the longer the finishing period. When cattle are fed to finish in a dry lot, the

ration should contain both a concentrate and roughage. For top performance, about 70 to 80 percent of this feed should be in the form of a concentrate (Wilson and Beall 1979).

Generally, a growing beef animal will eat 2.5 to 3 percent of its body weight (dry matter basis) every day. A 700-lb steer will eat between 17.5 and 21 lb of feed a day. At full feed, 13 to 16 lb of grain plus 4 to 5 lb of hay will be necessary for maximum gains. On good pasture, the amount of concentrate mix can be reduced by 50 to 70 percent, but faster gains are possible on higher rations of concentrate. The animals can get energy from grains (corn and barley) or from byproduct feeds such as almond hulls or rice bran. Table 4.2 shows the variation in dry matter, crude protein, and TDN values for several types of feed.

Grains are used more efficiently by the animal when they have been processed, rolled, or cracked. However, this feed comes at additional cost. Packaged grain mixes are available with processed corn, oats, and barley and a molasses treatment that increases the palatability of the feed. Studies show that feeding an animal Vitamin E for 30 days will improve the storage quality and flavor of its meat (Chiang and Ringkob 1999)

The introduction of energy into the ration should be a slow, incremental process that allows time for the microflora in the animals' rumen to adjust for proper digestion and avoid problems such as acidosis, an elevated acid condition (pH 5.3 to 5.7) in

Table 4.2. Dry matter, crude protein, and TDN for selected feedstuffs

| Feed | Dry matter | Crude protein | TDN |
|--------------------------|---------------|---------------|-----|
| | ----- % ----- | | |
| Alfalfa hay, early bloom | 91 | 17.9 | 52 |
| Oat hay | 91 | 8.6 | 46 |
| Corn | 88 | 8.1 | 80 |
| Almond hulls | 90 | 4.1 | 66 |
| Rice bran (with germ) | 91 | 13.0 | 64 |

Source: Ensminger 1990

the rumen caused by rapid consumption or overconsumption of readily fermentable feed. To reduce the risk of acidosis, make only slow increases to the percentage of concentrates in the diet (Taylor and Field 1999). By starting cattle slowly on grain, at about 0.5 percent of body weight, you can help prevent acidosis. Additions of sodium bicarbonate, fed free-choice or mixed into the ration, can buffer the rumen pH. Consider feeding 3 to 5 ounces of sodium bicarbonate (baking soda) per head per day to reduce the potential for acidosis. After 3 to 5 days, when the cattle are consistently consuming the grain offered, you can increase the amount of grain by 1 pound per animal. Continue to increase the grain by 1 pound every 3 to 5 days until it reaches 1.5 percent of body weight, dry matter basis. Each animal will respond differently. Larger-framed animals have a higher intake capacity, so you can increase their grain intake more quickly than that of smaller-framed cattle.

GRASS-FED BEEF

In California, there are three grass sources available, depending on the season: annual rangeland, irrigated pasture, and mountain

meadows. For our purposes, irrigated pasture and mountain meadows will be considered as the same.

Annual Rangeland

The coastal and inland valleys of California have green forage from February to June on nonirrigated rangelands. Production is highly dependent upon the timing and amount of rainfall. Figure 4.5 illustrates the variation in pounds of forage production per acre at a site near Redding that produced an average of 1,500 pounds per acre for the 1973–1974 through 2009–2010 forage years.

The UC Sierra Foothill Research and Extension Center (SF REC) in Browns Valley has collected monthly forage production data on an annual range site for more than 30 years. Figure 4.6 shows the average per-acre forage production by month. It is important to note that the vast majority of forage is produced during the months of March and April.

It is also important to realize that during those two months forage contains a high percentage of moisture. Animals generally make their best gains in the period just after the plants they eat begin to dry but before they are completely desiccated.

Forage production in lbs/acres, Redding, CA

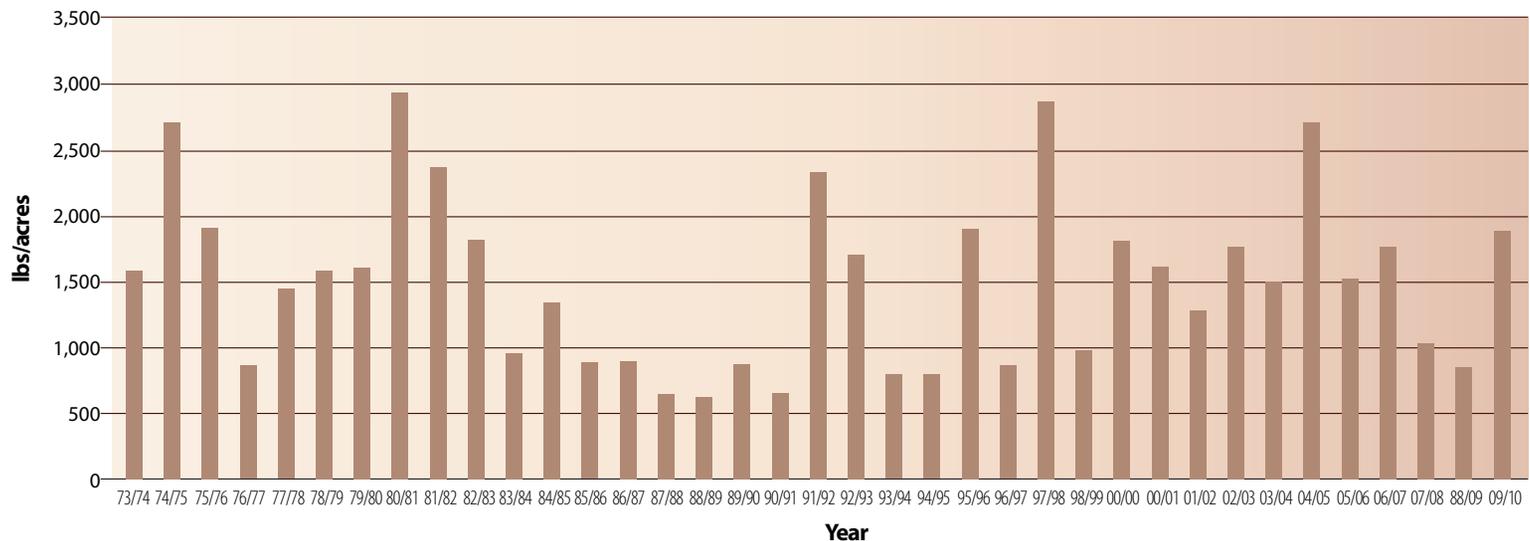


Figure 4.5. Annual rangeland production, Redding, California, for 37 years.

Generally, annual forage tends to be high in protein early in the season and to increase in energy later in the season (George et al. 2001; see that publication for more detail on annual range nutrient content). The forage quantity and quality are highly dependent on precipitation patterns and temperature. The energy level of pasture forage and the gains that result from its consumption will vary with its plant composition and vegetative state. Table 4.3 estimates the energy component of pasture forages at various stages of growth and development.

Average monthly forage production at Sierra Field Station

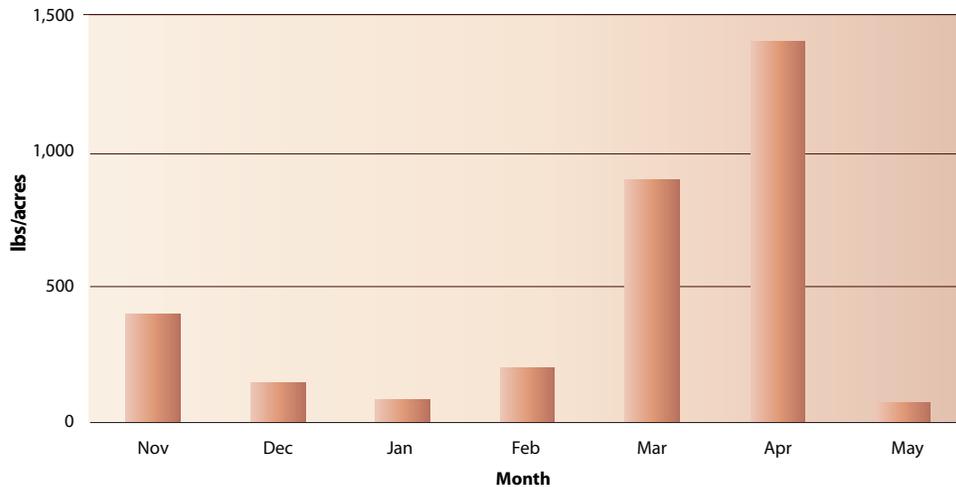


Figure 4.6. Monthly production in pounds per acre at Sierra Foothill Research and Extension Center over 30 years.

Table 4.3. Estimates of total digestible nutrients (energy) at seven stages of forage maturity

| Stage | TDN (energy, %) | | |
|------------------|-----------------|---------|------------|
| | Annual grass | Filaree | Bur clover |
| Early vegetative | 77 | 97 | 91 |
| Late vegetative | 74 | 94 | 89 |
| Early flowering | 72 | 91 | 86 |
| Late flowering | 67 | 84 | 80 |
| Mature | 61 | 72 | 72 |
| Dry | 58 | 69 | 69 |
| Dry, leached | 58 | 67 | 67 |

Source: George et al. 2001

Irrigated Pasture/Mountain Meadows

Irrigated pastures provide green feed from May through October. These pastures are generally made up of cool-season grasses, and the bulk of their production comes in the spring and fall. There are also native mountain meadows in the Sierra Nevada and in the northeastern California intermountain area. Irrigated pasture is often overlooked as a source of highly digestible, nutrient-dense feed for finishing cattle. Figure 4.7 compares the relative crude protein and TDN levels for Shasta County irrigated pastures, averaged across the growing season, with those of corn and alfalfa hay.

The quality of irrigated pasture is dependent upon the forage species present, the plants' vegetative state, and the soil's fertility. Figure 4.8 shows the variation in TDN during the 2008 grazing season across nine irrigated-pasture ranches in the Central Valley of California.

Ideal pastures would contain orchardgrass or tall fescue, or both, along with around 50 percent ladino clover and possibly other legumes such as birdsfoot trefoil. Cattle will take longer to grass-finish on pastures that are predominantly dallisgrass, bermudagrass, some

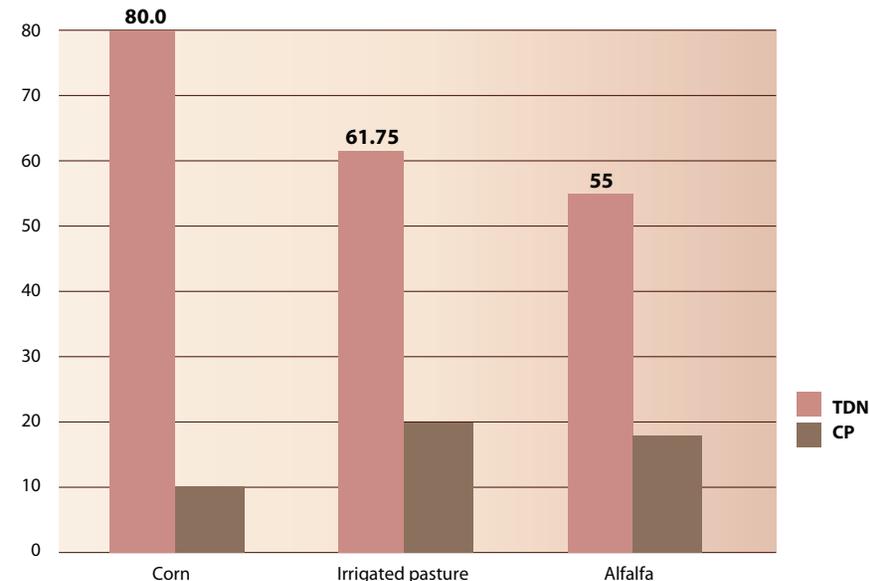
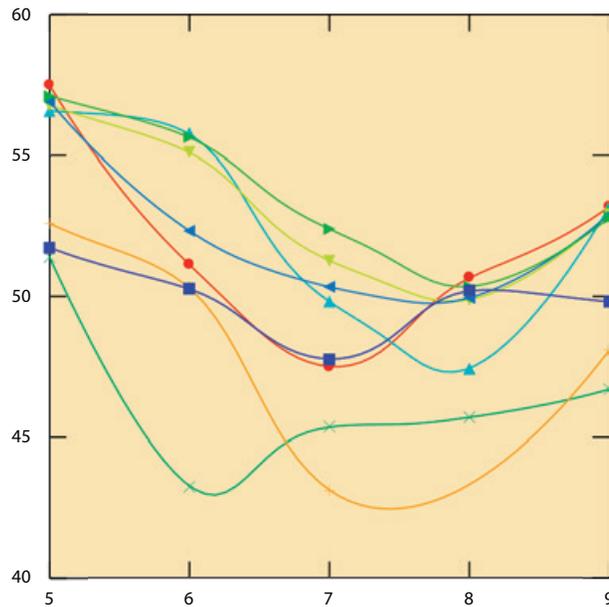


Figure 4.7. Comparison of energy and crude protein for corn, alfalfa, and irrigated pasture.

Figure 4.8. Clipped forage TDN from grass production (percentage) from nine Central Valley irrigated pasture ranches in 2008.



orchardgrass, tall fescue, and ladino clover pasture, due to the lower quality of the forage.

SUMMARY

The diversity of green forage available in California provides many options for grass-fed cattle finishing operations. It can be a challenge to try to finish cattle on a year-round basis, given the variety of forage quality. By correctly timing the animals' growth stage and feed requirements to match the natural production cycle and energy flow of the range or pasture, though, you can provide adequate nutrients to finish cattle. It is important to keep in mind that, because pasture and range forage has a lower energy level than grain feed, it may take more time to finish cattle on pasture,

Sidebar 4.2.

In 2005, five head of yearling heifers were finished on irrigated pasture in Placer County at an elevation of about 175 feet. Pasture was adequately irrigated, was not fertilized, and was composed of about 65 percent cool-season grasses with strawberry clover, ladino clover, and birdsfoot trefoil making up the balance of the forage mix. The heifers were 14 months of age and weighed 750 lb when they were turned onto grass on June 1 and were harvested on October 1 (122 days later) weighing 946 lb. The cattle gained 1.61 lb per day during the grass-finishing phase.

Carcass quality

| Frame score | Carcass weight (lb) | Dress percentage | Quality grade | Back fat | Ribeye area | Kidney, pelvic, and heart fat | Yield grade |
|-------------|---------------------|------------------|---------------|----------|-------------|-------------------------------|-------------|
| 3 | 546 | 58.3 | Choice – | 0.25 | 11.4 | 1.2 | 1.8 |

Average yield of primal cuts and trim (in pounds)

| Carcass weight | Chuck | Rib | Loin | Round | Shank, brisket, flank | Trim | Stew | Total retail yield |
|----------------|-------|------|------|-------|-----------------------|-------|------|--------------------|
| 546 | 62.8 | 21.2 | 59.6 | 35.1 | 22.8 | 120.4 | 6.5 | 322.4 |

This example demonstrates that it is possible to finish cattle on grass if forage quality is matched with the appropriate breed of cattle at a time when forage quality is high.

and that can mean you will end up with older cattle at finish, and a possible reduction in the meat's tenderness.

The two most important factors to take away from this discussion are

- selection of cattle with the genetics that will allow you to fatten your animals economically on your ranch
- timing the availability of your feed supply to match your animals' nutritional requirements so they will gain needed weight and put on the intramuscular fat necessary for superior eating quality

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Chapter 5. Protocols and Labels

In all distribution and marketing channels, there are common laws and regulations that must be followed. This chapter we will talk about how to develop protocols that will serve as the basis for label claims and we will provide some examples. Production protocols are valuable tools that can be used to substantiate label claims, reassure consumers about your production practices, and standardize a product that is produced by multiple ranches. These protocols are the operational framework for third-party certification.

PRODUCTION PROTOCOLS

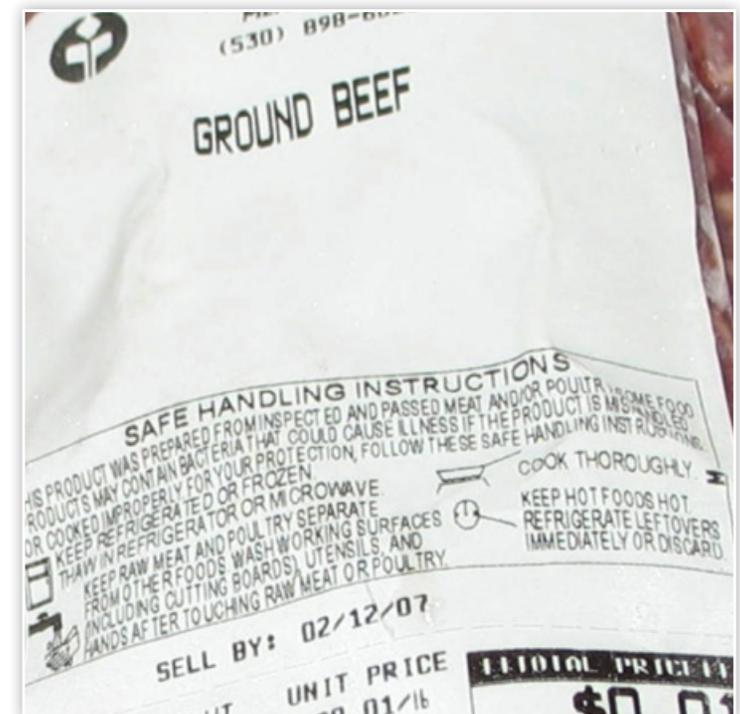
Several examples of label claims are provided below to illustrate additional certification procedures. Most producers look to see how many label claims they can include in their production protocol in order to add connection points for consumer and product value. Here are some protocols that a producer may choose to consider:

- Grass Fed
- Natural
- Organic
- Humane Raised
- Born & Raised in the USA
- Predator Friendly
- Food Alliance

In order to make any of these claims on a label, a producer must follow specific production protocols. Any label claims must be submitted to the Food Safety and Inspection Service's Labeling Program and Delivery Division (LPDD) for approval. A number of beef alliances also have their own production protocol requirements. Before you implement any specific protocol, you need to review certification requirements, fees, and any additional production costs that will be involved in meeting those requirements, as well as the impact the resulting label claim may have on your product's market demand and price.

GRASS FED

Grass fed protocols require that grass and forage serve as the animal's primary energy source. The October 16, 2007, USDA voluntary standard for the Grass



(Forage) Fed claim, as contained in the Federal Register (volume 72, number 199; pages 58,631–58,637, www.ams.usda.gov/lsg/stand/claim.htm) states that animals must be fed a 99 percent grass- or forage-based diet that includes grass (annual and perennial), forbs (legumes, *Brassica*), browse, forage, or stockpiled forages, and postharvest crop residue. Supplemental feeds that can be fed to animals produced under the voluntary grass fed label are defined by the USDA in this way: “any feed high in crude fiber and low in total digestible nutrients, on an air-dry basis (cottonseed hulls, peanut hulls, and almond hulls) can be supplemented in a grass diet.” Given the variations in grass-growing season, species present, and nutrient content at different locations, there is actually a wide variety of protocols.

NATURAL

On January 16, 2009, the USDA Agricultural Marketing Service (USDA–AMS) placed a notice in the Federal Register establishing a voluntary standard for a “naturally raised” marketing claim. Once the standard becomes effective, livestock producers who follow the voluntary AMS standard can hire a third-party verification service to audit their “naturally raised” claims. In certain cases, such producers will have access to markets that require this AMS certification.

The naturally raised standard is as follows:

“Naturally Raised”—Livestock used for the production of meat and meat products that have been raised entirely without growth promotants, antibiotics (except for ionophores used as coccidiostats for parasite control), and have never been fed animal (mammalian, avian, or aquatic) by-products derived from the slaughter/harvest processes, including meat and fat, animal waste materials (e.g., manure and litter), and aquatic by-products (e.g., fishmeal and fish oil).

Product labels that include the voluntary “naturally raised” marketing claim must be submitted to the Food Safety and Inspection Service’s Labeling Program and Delivery Division (LPDD) for approval. FSIS will require that processors provide “substantiation” of the claim at the time of label approval

application. Also, the notice clearly states that the AMS “naturally raised” marketing standard “is independent of and distinct from FSIS label approval policies governing use of natural claims with regard to postharvest processing. The naturally raised claim pertains only to preharvest livestock production practice.” AMS will be working with FSIS on a forthcoming Federal Register document to develop a coordinated approach to defining labeling terms such as natural and naturally raised.

ORGANIC

Certified Organic has been a small but steadily increasing label claim for beef (Clause USDA 2006). To be certified as organic, beef must come from animals raised under organic management from the last third of gestation, which means that breeding stock must be managed as organic. All feeds must be certified 100 percent organic and the animals may not be given hormones to promote growth or given antibiotics for any reason. Producers will not withhold treatment from a sick or injured animal, but treated animals cannot be sold as organic. Most rangelands and pastures must be operated under the organic protocols for three years before they can be certified as organic. Ruminant animals must have access to pasture for 120 days, receiving 50 percent of their dry matter intake. Temporary confinement is allowed only for reasons of animal health and safety or to protect soil and water quality.

A 2005 University of California Organic cost study for grass-fed beef based on a 50-head cow-calf operation in Mendocino and Lake counties can be found at <http://coststudies.ucdavis.edu/files/organicbeefnc05.pdf>.

Challenges in organic production systems include the following:

1. parasite and fly management. Pasture rotation and integrated parasite management (<http://attra.ncat.org/attra-pub/livestockipm.html>) are two common management practices used to address internal parasites.
2. acquisition of organically produced feeds at an economical price
3. locating USDA-inspected organic processors

4. lag time of 2 to 3 years in the transition from conventional to certified organic. During this period the producer must develop animal production and operational protocols for on-ranch operations, harvest, and postharvest handling. These protocols must be verified by an accredited certifying agency or organization (government or independent) every year to ensure compliance with the United States Department of Agriculture's National Organic Program (<http://1.usa.gov/1bN35Ni>).
5. initial cost of certification and annual costs for maintaining certification, which need to be considered in the budget

HUMANE RAISED

American Humane Certified

The American Humane Certified program (formerly known as the Free Farmed program) provides independent verification that the care and handling of livestock meets specific animal welfare standards (www.americanhumane.org). The standards require that livestock have clean and sufficient food and water, a safe environment, sufficient protection from weather, sufficient space allowance, and other provisions intended to ensure their safety, health, and comfort. In addition, the standards require that managers and staff be thoroughly trained, skilled, and competent in animal husbandry and animal welfare, and that they have a good working knowledge of their own operation's production system and the livestock in their care.

Born & Raised in the USA

Born & Raised in the USA is a program that provides a USDA-approved "trace-back system" to prove that the animal spent its entire life in the United States. Qualifying animals must also be processed in the United States. This is a certification process that allows the enrolled producer and retailer to use a trademarked label (a U.S. flag with the words "Born & Raised in the USA"). Producers certify by affidavit that the animals in their herd were born and raised in the United States. Participating processing facilities need to maintain the identity of the meat from certified animals (only as a lot) all the way through the plant. There is a fee to enroll, and then

a per-hundredweight charge is required for use of the label at the point of sale. More detailed information is available online (<http://bornandraisedintheusa.com>).

Predator Friendly

The idea for Predator Friendly certification (www.predatorfriendly.org) originated with a group of woolgrowers, wildlife biologists, and clothing designers in Montana who worked together to provide an incentive for landowners to use nonlethal methods to prevent conflicts between livestock and predators. The certification program encourages nonlethal methods of predator control, recognizes farms and ranches that work with wildlife, provides an economic incentive and marketing benefits, and offers producer-to-producer information sharing and access to research findings.

Food Alliance

Food Alliance (foodalliance.org) is a nonprofit organization that promotes sustainable agriculture. The guiding principles of the Food Alliance Certified program include safe and fair working conditions, healthy and humane treatment of animals, raising animals without added hormones and antibiotics, raising crops without genetically modified organisms, reducing pesticide usage, conserving soil and water resources, preserving and protecting wildlife habitat, and maintaining a commitment to the continuous improvement of the practices that address these goals. Food Alliance is a third-party certification program.

PRODUCT LABELING

Each individual package of meat is marked with a label. We suggest that newcomers to organic beef production use their processing establishment's label, which will include the producer's identification number and safe handling instructions. "Organic" is considered to be a label claim, and in order to make a label claim you need to make sure your product meets certain conditions.

At some point in the evolution of your business, you will most likely want to have your own product label. It is critical that your label include the meat processor's identification number. If you ever



Figure 5.1. Beef package label includes safe handling instructions and the telephone number for the processor.

change to a different meat processor, you will need to create a new label with that processor's identification number.

How to Create Your Own Label

The first step in developing your own label is to create a picture or sketch showing how you want the label to look. Make sure to include these important items:

- the colors used on your application to USDA
- the address of the producer
- instructions for handling of the product (e.g., “Keep Frozen”)
- a space for printing the net weight, price per pound, total price, and cut of meat
- any claims that you might be making about the product. Make sure that you have documentation to support all claims made on the label, such as
 - a. operational protocol, describing in detail the production practices employed

- b. affidavits and testimonials
- c. feed formulas
- d. relevant certificates (e.g., for certified organic ingredients)

Remember: DO NOT mislead the consumer in any way. Be careful about the words you use on the label. Good information on labeling is available online at the All Things Grass Fed website hosted by California State University at Chico (www.csuchico.edu/grassfedbeef/regulations/product-labeling.shtml).

For answers to any other questions, please refer to the U.S. Code of Federal Regulations (CFR), 9 CFR 317.4 and 381.132, which you can find in the Federal Register:

- www.gpo.gov/fdsys/pkg/CFR-2005-title9-vol2/pdf/CFR-2005-title9-vol2-sec317-4.pdf
- www.gpo.gov/fdsys/pkg/CFR-2005-title9-vol2/pdf/CFR-2005-title9-vol2-sec381-132.pdf

Label Application Guidance

The USDA Labeling and Consumer Protection Staff (LCPS) is the agency expert group on the composition of meat, poultry, and egg products, including safe and suitable ingredients. LCPS employees ensure that all product labels are accurate and that they do not falsely inform potential buyers. Labeling pertains to all forms of product identification, claims, net weight, species identification and nutrition related to meat, poultry, and egg products. Questions regarding product labeling and additive policies should be mailed to this address:

- USDA, FSIS, OPPED
Labeling and Consumer Protection Staff
1400 Independence Avenue, SW
Room 602—Annex Building
Washington, DC 20250–3700

Submitting a Label Application

The CSU Chico/UC grass-fed beef website has additional information on labeling (www.csuchico.edu/grassfedbeef). To begin the approval process for your label, complete FSIS application form

7234-1 (www.fsis.usda.gov/wps/wcm/connect/4aeeca8c-8ba6-4288-a222-e6ca8764a9f7/FSIS_7234-1_Approval_of_Labels.pdf?MOD=).

The following instructions should be typed unless otherwise noted on the labeling form:

1. preparation of application. Submit two copies of each label application. An additional copy is needed for Foreign, Child Nutrition, Animal Production, or Organic Claims.
2. submission of labels. This includes sketches for your label.
3. foreign language. Labels printed in foreign languages must be accompanied by an English language translation.
4. assembly of application. Staple together, using only one staple, pages 1, 2, etc., one copy each. Staple all copies of the label to the back of the application forms packet. If you only use page 1, staple all copies together. Use as few staples as possible and do not use paper clips.

Hand-sketched draft labels will be accepted, so long as the labeling is legible. Businesses must provide the required number of copies of the FSIS form, with all pages in the proper sequence, along with the label.

Mail the completed application to this address:

- USDA, FSIS, OPPDE
Labeling and Consumer Protection Staff
1400 Independence Avenue, SW
Room 614 Annex Building
Washington, DC 20250-3700

Correspondence about labeling applications may be faxed to the Labeling Compliance Team at (202) 205-0145 or (202) 205-0271. The fax must include a cover sheet indicating the reason and purpose for the fax.

For more information about labels or labeling, call the Labeling and Consumer Protection Office at (202) 205-0623 or (202) 205-0279.

Food Labeling Compliance Dates

The Food Safety and Inspection Service (FSIS), an agency within USDA, periodically changes the label requirements for a variety of foods, including meats and poultry, and sets uniform dates for compliance with those changes in order to minimize their economic impact on the industry. The following announcements were issued on March 5, 2007:

- January 1, 2008, is the compliance date for new food product labeling regulations issued between January 1, 2005, and December 31, 2006.
- January 1, 2010, is the compliance date for new food product labeling regulations issued between January 1, 2007, and December 31, 2008.

For further information regarding compliance dates, contact

- Robert C. Post, Director
Labeling and Consumer Protection Staff
Office of Policy, Program, and Employee Development
FSIS
USDA
(202) 205-0279 Phone
(202) 205-3625 Fax

USDA EVALUATION PROCESS

Animal Production Claims

Here is an outline of the current process for evaluating label claims that bear on animal production:

1. Validation process for animal production claims
 - a. Evaluate labeling claims
 - b. Provide or deny labeling approval or return for additional supporting documentation
 - c. Update and maintain files (if the producer is making any updates or revisions to the already-approved label)
2. Evaluation of labeling claims
 - a. The USDA will send your label confirmation or your rejection notice to you by mail.

If you want to follow the progress of your application through the USDA approval process, you may check on it either online or over the phone.

SUMMARY

Government-issued protocols need to be adapted in such a way that they can be conducted economically on your farming operation and to ensure that they are production procedures that are valued by consumers.

REFERENCES

American Grassfed Association. www.americangrassfed.org

Clause, Reginald. 2006. Iowa State University Extension.
www.agmrc.org/agmrc/commodity/livestock/beef/organicbeefprofile.htm

Food Safety and Inspection Service. 2002. Guidance for minimizing the risk of *Escherichia coli* O157:H7 and salmonella in beef harvest operations. <http://haccpalliance.org/alliance/BeefSlaughterGuide.pdf>

Hamilton, Neil D., 1999. The legal guide for direct farm marketing. Des Moines: Drake University Agricultural Law Center. 235 pp. www.law.drake.edu/centers/default.aspx?pageID=agPublications

USDA Economic Research Service. 2006. Organic production. www.ers.usda.gov/data/Organic/



Chapter 6. Legalities and Liability

This section provides an overview of the regulations on selling meat and on product labeling information. For answers to specific questions, call the contact numbers listed in this chapter. A list of USDA-inspected California harvest and processing sites for niche beef producers is included at the end of the chapter.

LIVE ANIMAL SALES AND HARVESTING

The Legalities of Selling Meat

If it is your intent to sell meat to consumers (e.g., to individuals, farmers' markets, or via retail or wholesale channels), you must harvest it at a plant that has passed current United States Department of Agriculture inspection. If your operation is not close to a USDA-inspected plant, you may have to limit your marketing efforts to direct live sales. For more information about complying with regulations, you can contact

- California Department of Food and Agriculture
Meat and Poultry Inspection Branch
Dr. Douglas Hepper, Staff Veterinarian
1220 N Street, Room A-125
Sacramento, CA 95814
Phone (916) 654-0504
Fax (916) 654-2608
dhepper@cdfa.ca.gov
- Producers Cannot:
 - b. harvest an animal themselves or through custom on-ranch slaughter and then sell the meat
 - c. sell a live animal and then harvest it (whether done by the producer or by a custom processor) on the ranch for the new owner
 - d. sell a live animal and allow the new owner to harvest it (whether done by the new owner or by a custom processor) on the ranch
- Producers Can:
 - a. sell a live animal and have it leave the ranch alive (After it leaves, the rancher is not liable for the harvest method/technique.)
 - b. sell a live animal and direct the buyer to a California Department of Food and Agriculture (CDFA) -licensed custom livestock slaughterhouse or a USDA-inspected slaughterhouse that can do the harvesting for the buyer



LEGALITIES

Federal Inspection

Animals must be harvested at a federally inspected facility if they are to be sold retail or wholesale. The animal can be further processed (cut up and packaged) under federal inspection and be sold for either wholesale or retail.

State Inspection

Custom livestock harvesting, other than on the property of the producer for the producer's consumption, is controlled through the state. The meat cannot be sold retail or wholesale. These packages of meat are labeled "NOT FOR RESALE."

The state licenses and inspects meat-processing establishments. These are processors that cure, smoke, or dry meat and poultry for retail sale to the consumer. If a processor only cuts, grinds, or marinades the meat, for instance, it is not subject to inspection by CDFA.

Meat-processing establishments usually operate under the federal retail exemption. Retail stores that are exempt from USDA inspection can sell up to 25 percent of their gross retail sales (up to a certain dollar limit set each year by USDA, somewhere in the \$50,000 range) to hotels, restaurants, and institutions (HRI). However, they cannot sell cured, smoked, or dried products. This information can be found in section 303.1(d) of the Code of Federal Regulations.

Farm Harvest

In farm harvest, the producer or a custom butcher harvests the animals where they have been raised. The carcass can then be transported to a custom processor or locker plant to be cut and wrapped for consumption. This meat can only be consumed by the producer, by the producer's family, or by the producer's employees and non-paying guests, and it does not require state or federal inspection. This meat cannot be sold to an individual as carcass beef or as individual cuts on a retail or wholesale basis.

County Regulations

If you plan to sell meat locally, you should check with your county's Environmental Health Department. Their main focus will be on

maintaining proper temperatures when storing the meat. You should use a commercial freezer to store your meat.

Individual counties' regulations vary. Generally, meat must be kept at a temperature of less than 41°F. You should have a thermometer in any refrigeration unit or freezer used for storage and should keep a temperature log. Check with the appropriate county Environmental Health Department for specific regulations that apply to your business.

Only farmers and ranchers who raise livestock may sell the meat products created from those animals at a Certified Farmers' Market. Meat vendors at such a market are typically required to have a retail health permit and to comply with code sections pertaining to Certified Farmers' Markets. Vendors who have not raised the livestock used in the meat products they wish to sell may not sell them in any area that is designated as a Certified Farmers' Market. Such vendors must sell in a separate area not considered to be within the designated area of the Certified Farmers' Market and they must obtain their own health permit (usually a temporary food facility permit) since they are not covered by the permit obtained by the Certified Farmers' Market.

The handling of the products and the containers used to store the products held for sale at a Certified Farmers' Market must meet the applicable requirements set forth in Health and Safety Code Section 113980. To ensure protection of the public health, the methods for holding meat for sale must meet defined temperature requirements.

Chest freezers can prove difficult to manage for several different cuts. A producer may have to pull out half of the product in the freezer to find a particular cut. In general, upright freezers are easier to organize than chest freezers since they have different compartments.

Walk-in coolers and freezers offer another storage option. These units may be available second-hand when a store is undergoing a remodel. The cost to install and operate such units can be significant and deserves careful consideration.

LIABILITY

Risk management is an important area of consideration in any business. Two approaches to minimizing risks are the purchase of the right insurance coverage and the implementation of risk analysis and management. Most beef producers hold significant financial assets (mostly in the form of land) that could be at risk if a claim were filed against the operation. Diversification of the operation to include direct marketing of meat products to consumers adds additional risks that need to be properly addressed in order to protect ranch assets. A producer should consider conducting a risk analysis of the proposal to sell a food product to consumers before going ahead with the enterprise.

Most producers assume that their farm or ranch liability policy will cover this extension of ranch business, but insurance agents we consulted indicate that their general farm liability packages do not cover processed foods or off-farm retail activity. Unless you change your insurance policy, it will not provide the product liability coverage you need to have in order to safely sell meat products to the public. The institution of on-farm sales, farm tours, or farm stays that bring members of the public onto the ranch may require the purchase of a business liability policy. Some Certified Farmers' Markets require that you have product and business liability policies, and they may also ask that the market be listed among the policy's "Additional Insured."

It is best to work with your insurance agent to make sure your business is properly insured, based on its actual operations and the risks involved. Most insurance agents are unfamiliar with the coverage requirements for selling meat, and their underwriting companies may be even less knowledgeable. Without a good description of the business and the ways in which risk will be managed, they may not be able to see the value of attempting to define the risk. In some cases, they may either quote a very high price or simply state that they do not provide a policy in that area. If you give a thorough explanation of what is involved in processing the animals, aging the carcass, transport and storage of the carcass and meat, and marketing of the meat, your insurance agents will

use this information as a basis for defining the risk that you will incur. Insurance companies operate on a small margin and use economies of scale to keep themselves profitable. They generally do not provide business-specific coverage, choosing instead to create general packages. It is critical that you make sure the agent clearly understands the business and has a package that adequately covers the risks. When contacting an insurance agent, ask if the agency offers a ranch package that includes coverage for diversification of the ranch business. Then be ready to describe succinctly what is involved in your business and to show that the risks and management actions have undergone appropriate review.

Below are some things to consider covering in the description of your business that you prepare for the insurance company.

Questions for You

1. For how many years have you been raising cattle?
2. For how many years have you been marketing meat?
3. How many pounds of meat do you sell annually?
 - c. What is the estimated annual value of your meat sales (two previous years' sales plus this year's sales, divided by three)?
4. Is agritourism on the farm or ranch a part of your marketing effort?
5. Describe the meat marketing process for your farm or ranch.
 - a. What market outlets (either direct to or through) do you use for your meat products? If you market through a cooperative, describe their insurance coverage.
 - b. Describe the chain of ownership for your meat products as they make their way through the marketing process.
 - c. Is the meat sold as a fresh product or a frozen product?
6. Who processes the animals?
 - a. Describe the processing plant and meat inspection process.
 - b. What quality control procedures does the processor use?
 - i. For USDA inspected plants, describe the plant's Hazard Avoidance Critical Control Program (HACCP) plan.

- c. Has the processor ever had a product recall?
 - d. Will the meat be stored on the processor's property?
 - e. What sort of plant security does the processor have (alarm system, fence, etc.)?
7. Have recall safety measures been implemented?
 - a. If so, what is the recall safety process?
 - b. Are there trace-backs? To plant? To animal? To package?
 - c. If not, how would a recall be handled?
 - d. If yes, what is the plant number and what is the process?
 8. How is the product transported from the processing plant to the sales site?
 - a. Does the store pick the meat up, do you (the insured) deliver the meat, or do you hire a firm to make deliveries?
 9. How is the meat handled at the retail level?
 10. If there is any overnight mailing of beef products, how do you ensure that the products stay frozen and are handled correctly by the consumer upon receipt?
 11. How will your business make certain that any contractors who handle the meat will maintain appropriate temperatures for the meat?
 - b. At the processing plant?
 - c. During transport?

Questions for Your Insurance Agent

12. Does the farm or ranch liability policy cover your direct marketing enterprise as described?
13. Is there a policy limit to the amount or type of direct marketing that is covered?
14. Does the commercial business policy include product liability?
15. For how much money should the operation be insured?
16. Is the policy a "claims made" or "occurrences" policy?
 - d. Does all coverage end if the operation changes insurers? If a lawsuit is filed for an incident that occurred when you were

covered by a previous insurance company, which company will cover the operation for that lawsuit?

17. What are the policy exclusions?

- e. Are legal defense costs included within the limit of liability? Or are they considered to be unlimited (i.e., outside the limit)?

In his book *The Legal Guide for Direct Farm Marketing*, Neil D. Hamilton (1999) points out that you need to understand whether an insurance agent is working for a specific insurance company as a "general agent" or whether he or she is working as an "independent" agent, someone who sells policies issues by a number of different companies:

In situations where the agent is employed directly by the company, what the agent knows and what the agent says can be held directly accountable to the company. But in situations where agents are independent, the information shared with them such as what activities conducted, and what the agent says about coverage, may not bind the company.

Hamilton points out that Arkansas and some other states have passed laws making insurance companies liable, in certain circumstances, for the promises of independent agents. So it is best to check with the agent to make sure you fully understand his or her relationship with the underwriting company. Hamilton also points out that it is essential that you understand the terms and conditions of the insurance policy.

Some policies have a limit that states that the *claims and the occurrences* must happen during a period of coverage. For a policy that includes this condition, Hamilton states,

...the effect of this could be that if the occurrence happened one year but the actual claim against the insurance isn't made until the next year, there would only be coverage if the same policy was still in force with the same insurer. This provision requires people to stay with the same insurance company or there may be a gap in between the occurrence and the claim causing the former insurer to say there is no coverage.

Hamilton also notes another policy condition to consider: *declining value*. With this condition, the loss is interpreted to include the amount of money the insurance company spends on defense of the claim. Depending how much coverage was involved and how difficult the defense were, one effect could be that the cost of legal defense could use up all of the coverage, effectively leaving the ranch without any remaining insurance to cover the actual claim or liability. If the current policy includes this condition, consider shifting to a higher coverage value in order to fully protect the ranch.

The American Grassfed Association (AGA) provides a service to its members by which it works with a specific insurance company to offer a commercial general liability insurance product that is designed specifically for direct meat marketers, and that includes coverage for products and completed operations. The amount quoted for your insurance premium is based on favorable claims experience and business longevity. If the price quote from AGA is acceptable, your operation will still have to join AGA (www.americangrassfed.org) in order to be eligible for coverage.

Farmers' markets can impose additional insurance and risk management requirements. Some farmers' markets require that you show proof that you have \$1 million, or as much as \$2 million, in liability insurance. Many require proof of insurance and require that they be listed on the policy as an "Additional Insured." Providing samples of a cooked product at the farmers' market is a good way to promote your product, but because it may increase your liability risks it is not allowed at some farmers' markets. Here are some areas to address in order to reduce risks:

- hand washing for each vendor who prepares or serves samples
- equipment and utensils that are easy to clean, in good condition, and free of cracks and crevices
- meat for samples must be cooked to the appropriate temperature
- meat products must be properly stored between cooking and tasting

Internet sales introduce the further challenge of maintaining an appropriate storage temperature during shipment to the customer. Most companies have attempted to address this through

additional vacuum-packaging of meat, inclusion of ice packs or dry ice in the package, using appropriate insulated packaging, and working with a guaranteed-delivery shipper.

Maintaining the proper temperature of meat—generally called cold chain security—is an important element in risk management. Temperatures above 40°F allow the growth of E. coli bacteria. Short-term storage and transportation of fresh meat should be at a refrigerated temperature of 30° to 35°F, while the optimum temperature for long-term storage is 28.6°F. In smaller plants, the chilling down of processed carcasses can be a concern if more animals are processed on a particular day than the compressors can quickly chill. Refrigeration parameters should be defined, established, and recorded so you can be certain that carcasses will reach a temperature of 40°F or less within 24 hours of harvest. Frozen meat products should be stored and transported at 0°F or below. Adequate air movement to quickly freeze meat, which is achieved by using wire baskets or spacers between the boxes, should always be guaranteed.

Another way to protect the ranch and farm assets is to form a separate corporation to merchandize the meat, as this limits the potential liability for loss to the amount of money that is actually invested in that business. A limited liability corporation could be an effective tool for helping provide liability protection, but it can add to operational costs and may have tax impacts. Another possibility is to form a cooperative of limiting liability, which can also effectively increase the size of the operation and so reduce costs and secure larger markets. Cooperatives also involve an additional challenge, in that they require that a number of growers work as a group, meaning that each must agree to lose some degree of the independence that most ranchers highly value.

REFERENCES

- Copeland, John. 1992. Understanding the farmers' comprehensive personal liability insurance policy: A guide for farmers, attorneys, and insurance agents. NCALRI, University of Arkansas, Fayetteville, Arkansas.
- Hamilton, Neil D. 1999. Legal guide for direct farm marketing. Drake University Agricultural Law Center, Des Moines, Iowa.

Partial list of USDA-inspected harvesting (slaughter) facilities in California (List is accurate as of publication date.)

| Beef Facilities | | Educational Beef Facilities | |
|--|--|--|--|
| <p>Creston Valley Meats 3280 Calf Canyon Way Creston, CA 93432 1-805-286-7533 (cell) 1-805-227-6200 (plant) Certified organic Beef, Sheep, Swine, Chicken, Rabbit http://www.crestonvalleymeats.com</p> | <p>Los Baños Abattoir 21104 West Highway 152 Los Baños, CA 93635 (209) 826-2212 Beef, Dairy Open to the public Monday–Friday</p> | <p>California State Polytechnic University Animal Science Department Meat Processing Center One Grand Avenue San Luis Obispo, CA 93407 (805) 756-2254</p> | <p>California State University Fresno Meat Lab E. Barstow & Woodrow Fresno, CA 93740 (559) 278-2697 Beef, Sheep, Swine Not open to the public</p> |
| <p>Cutting Edge Meat 130 Santa Fe Grade Rd Newman, CA 95360 (209) 862-2558 Certified organic Beef, Sheep, Goat Open to the public Monday–Friday http://www.cuttingedgemeat.com</p> | <p>Rancho Feeding Corporation 1522 Petaluma Blvd Petaluma, CA 94962 707-795-3649 Open to the public Monday–Friday USDA-inspected harvest</p> | <p>California State Polytechnic University, Pomona Meat Science & Processing, Bldg. #34 3801 West Temple Avenue Pomona, CA 91768 (909) 869-2143 Beef, Dairy, Sheep, Swine Open to the public Monday–Friday Custom harvesting, cut and wrap services</p> | <p>University of California, Davis Meat Lab Cole Facility, Bldg. #C One Shields Avenue Davis, CA 95616 (530) 752-7410</p> |
| <p>Harris Ranch Beef Company 16277 S McCall Avenue Selma, CA 93662 (559) 896-3081 Beef, Dairy Not open to the public</p> | <p>Redwood Meat Company 2440 Myrtle Avenue Eureka, CA 95501 (707) 442-3797 Beef, Dairy, Sheep, Swine Open to the public Monday–Friday</p> | <p>California State University Chico Meats Lab 311 Nicholas C. Schouter Lane Chico, CA 95928 (530) 898-6028</p> | <p>Wolfpack Meats 5895 Clearwater Way Reno, NV 89502 (775) 857-3663 Open to the public Monday–Friday, 6:00 am–3:00 pm Beef, Sheep, Goats, Swine</p> |
| <p>Islamic Meat and Poultry Company 1320 South Aurora Street Stockton, CA 95206 (209) 462-8022 Beef, Dairy, Goat, Sheep, Swine Open to the public Monday–Friday</p> | <p>Stagno's Meat Company E. Barstow & Woodrow Modesto, CA 95353 (209) 578-1748 Beef, Dairy, Goat, Sheep, Swine Open to the public Monday–Friday</p> | | |
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Chapter 7. Developing a Business Plan

One of the challenges facing producers who are interested in niche beef marketing is the amount of capital and time it takes to develop the business. Many successful niche beef operations started small, committing only a portion of their operation's cattle to the niche beef system. This approach ensures that only a small percentage of ranch income is at risk while the business is being developed.

An important component of a successful move into a new market is the written business plan. By taking the time to systematically develop a business plan you can reduce the number of costly mistakes you will make along the way. A written business plan will help you to keep costs under control, develop your understanding of product development and management early on, and ensure that you address in advance the marketing and distribution challenges you are likely to face. Once you have established a production and marketing system that is generating a positive return, you can shift your emphasis toward increasing the size and scope of the enterprise. A business plan for a niche beef enterprise should include the following components:

- clearly defined goals for the added enterprise
- an identified target market
- a well-developed production plan that will deliver a consistent, quality product at a profit
- a sound marketing plan
- a well-developed financial plan that recognizes costs of production, labor, and marketing as well as the fiscal requirements for fixed assets
- business analysis and evaluation

These components are discussed in detail below.

CLEARLY DEFINED GOALS FOR THE ADDED ENTERPRISE

It is important to spend time clearly defining your goals for the new, added enterprise. For many producers, the goal will be increased revenue. Many producers develop a niche meat enterprise with the intent of increasing their income. Will adding the new enterprise help your operation meet profit targets? Will adding the enterprise help the ranch reduce its debt, or make it possible for another generation of the family to come back to the ranch? Having a clear goal is critical: it gives you something against which to check the progress of the new enterprise. Depending on how well the enterprise is progressing toward the goal, you can then make adjustments to the business that will bring you closer to the goal.



AN IDENTIFIED TARGET MARKET

Who are your intended customers and how will you market your product to them? This was discussed in detail in chapter 2, and it is the most important component in the overall business plan. Considerations for defining the beef product to best address your target market might include the following:

- Will it be grain-finished or grass-finished?
- Will the animals be treated with antibiotics or implanted with growth promotants?
- What will the portion size be for the finished product? Does that size meet the needs of the target market?
- Will the product be sold fresh or frozen?
- Will the beef be sold as individual cuts or as quarters and halves?
- Will the product be sold direct to consumers or will it be marketed wholesale to retail stores and restaurants?
- Will the product be produced under organic standards?
- Will the product have third-party certification?
- Are there any existing alliances that would help market the product?

Make sure you are working from accurate consumer research that realistically depicts the demographics and economic considerations of your target consumer. This research can include consumer surveys, reviews of existing sales data, and test marketing.

A WELL-DEVELOPED PRODUCTION PLAN

A well-developed production plan will deliver a consistent, quality product at a profit. If you are unable to deliver a good product at a good profit, it is hard to justify continuation of the new enterprise. Do your homework in advance: research who you want to sell the product to and establish what it is that will motivate them to buy this particular product. Once you have clearly set your goals and have determined your target market, you can develop a production plan that aligns with this target market. The production plan must reflect the realities of your current capacity (including production capacity and financial capacity) as well as your overall operation's potential for future growth. Your plan must also be flexible enough

to let you adapt or adjust the enterprise if market research indicates greater opportunities with a different kind of market.

The production plan includes all of the production parameters associated with creation of the end product. In the niche meat business, it will include the acquisition of cattle, feed products needed to raise and then fatten the cattle, division of labor, transportation, health protocols, processing, distribution, promotion, advertising, sales, payment collection, and business operations as well as all other costs associated with production and marketing of the product.

The plan must also include a labor plan for implementation of both the production and marketing strategies. This can include taste-testing of the beef product to make sure the production plan or protocol is producing a product that will be seen as desirable by the target market. It must take into account the reality that there are not many USDA-inspected harvest and processing facilities in California. Because of this scarcity, it is important that you find a processing plant close to your operation and schedule an appointment when you can meet with the operators and ascertain their policies and procedures as well as their cost schedule, so you will be able to determine whether they can deliver the desired meat product in a way that is economically acceptable to you. Because there are so few USDA-inspected processing plants in California, niche beef producers must carefully calculate and control their postharvest costs, particularly those associated with transportation and distribution. A processing plant's production capacity is limited by its cooler space. If the cooler is full, they cannot process. Make sure to ask about the availability of cooler space for aging.

A SOUND MARKETING PLAN

When beef producers sell live cattle they have several options to consider (i.e., selling at an auction yard, video sale, or order buyer). Direct sale of meat requires careful identification of the target market and then a concerted effort to let the target market know about the meat product being offered. In many business plans, this is the weakest component. Do not fall into the trap of "If I produce it, they will come." That is a sure way to end up with a freezer full

of meat. The most successful marketing plans are well thought out and written down. They are periodically reviewed and adjusted. Remember, the best marketing plan, if left on the shelf to collect dust, is worse than a mediocre plan that is fully implemented. Make sure that the plan truly reflects the product being sold and that information on the product is getting out to the right people. Word of mouth or farmers' markets can be the least expensive avenues for developing a market. Media advertisement can be very expensive and requires proper expertise to secure a return on investment. It has been said that niche meat marketing is based on telling a story about the production of the animal as well as the quality attributes of the meat product itself.

One component of marketing is figuring out how to price the product such that it is both profitable to the operation and a good value for the consumer. To determine a profitable price for the product, you need to determine what it costs you to get the animal to a saleable weight. Cost components may include the following:

- the cost to carry a cow for one year in order to get the calf to a weaning weight
- stocker phase costs (approximately 500–800 lb)
- finishing phase costs (approximately 800–1,100+ lb)
- transportation
- harvest and processing costs
- storage
- marketing (ads and labeling costs)
- business costs (e.g., insurance, labor, and telephone)

The ranch needs to be compensated for the additional time it will take to realize income from the animals and the added risk that something may happen to the organically raised animals, such as death loss or health problems. Once you determined your costs, you can price the product in a way calculated to generate the desired profit from the new enterprise. Compare the price required to make a profit against present market conditions.

You can determine your target price by looking at the average retail price for meat. Check the Livestock Marketing Information Center (www.lmic2.info/meatscanner/meatscanner.shtml) for past retail scanner prices on beef. Scanner data are also available for purchase from private vendors, but at a significant expense. Another way to survey retail prices is to look at newspaper ads for meat. It is important to remember that the newspaper prices do not reflect the current price of commodity beef, but they can give you a starting point for determining how much you will want to raise the consumer price for your product. Target consumers will be people who are interested in purchasing local food and who have enough disposable income to pay a higher price than they would normally pay in a grocery store. Identify those markets where the ranch can capture the price premium needed to make your niche beef operation profitable.

A WELL-DEVELOPED FINANCIAL PLAN

A well-developed financial plan recognizes costs of production, labor, and marketing as well as the fiscal requirements for fixed assets. It is important that cash flow requirements be considered when you are starting a new business. Consider the lag time between calf weaning and the time you receive payment for the meat product, adding in all the additional costs that need to be financed. Is the ranch in a position to meet cash flow needs for that entire period, or will you need to take out an operating loan? If you are selling at a farmers' market, you might pay the processor, say, \$450, and then have to sell the prepared cuts, a process that might take a couple of weeks, a month, or maybe longer.

BUSINESS ANALYSIS AND EVALUATION

Determining the potential profitability of an added niche beef enterprise should be of significant interest to the producer. Did all the work, feed, financial commitment, and risk improve the bottom line for the ranch? Take the time to aggregate all of the expenses and income associated with this effort and determine the financial results of the endeavor. If the return is too low, can inputs be cheapened up? How did customers like the product? Can you increase the price? How did the inventory management work?

SAMPLE BUSINESS PLAN

Assume the ranch runs about three hundred cows and markets weaned steers and heifers through normal channels. Each year the ranch managers hold back 60 heifers (averaging 620 lb at weaning) as replacements, knowing that the ranch will need between 45 and 50 cows to remain in the herd. The ten or so heifers that don't make it as replacements are generally marketed as a small lot of yearlings (weighing about 800 lb) at an auction yard. The ranch owner has had several friends and neighbors who have asked about buying sides of beef over the years, but has never followed up. Now the ranch is giving this sales route serious consideration because the inquiries have increased.

Determine the goal of the added enterprise. The goal of this added enterprise is to diversify income stream for the ranch while improving profit. More specifically, the goal is to receive a return of at least \$200 per head over direct costs.

Determine the target market. The target market in this case is 20 people who have expressed interest in purchasing a side of beef. The product is defined as grain-fed beef delivered to a USDA-inspected processing plant. The addition of this enterprise will not require additional labor. Cattle will be fed in bunks located in an existing barn on the ranch. No additional capital costs will be incurred when this enterprise is implemented.

Production plan. The development of a production plan that will deliver a consistent, quality product at a profit is the core of the business plan. The decision was made to feed the ten heifers to a finish weight of 1,250 lb on a ration of corn and hay. The value of the heifers (November 19, 2010, SLA \$98.00–\$105.25) is estimated at \$1.00 per lb. Assumed value for the heifers added into the fed cattle enterprise is \$800. The assumption is that the heifers will gain 3.2 lb per day and will take 140 days to reach their finish weight. Cattle will be processed and packaged at a USDA-inspected processing plant located 100 miles from the ranch.

Develop a sound marketing plan. Up until this point the marketing effort has consisted of fliers with order forms distributed to friends and neighbors. A follow-up survey will be developed to send

to purchasers three months after delivery of the product to ascertain consumer satisfaction with the product as well as to determine whether they would consider purchasing the product again.

Financial plan. You also need to develop a financial plan that recognizes the costs of production, labor, and marketing as well as the fiscal requirements for fixed assets. The major expenses in the feeding phase of this enterprise are feed and cattle. Table 7.1 estimates feed costs on a per-head basis. Table 7.2 gives the estimated overall costs to produce a finished steer.

Cost estimates are based entirely upon projections and do not include allowances for loss of animals to sickness or death. This is how you determine the value of a fed heifer. Heifer carcasses are worth \$156.49 cwt (USDA 2/8/2011). With a carcass weight of 775 lb, the individual heifer will have a value of about \$1,213 in the commodity meat trade. This is slightly less than the cost of production, so in order to be profitable you will have to develop a market that will yield a price higher than the commodity carcass price.

See table 3.7 in chapter 3 for an outline of the percentage of cuts yielded from each quarter of a beef animal. For a 775-lb carcass, the amount of meat you can expect to put into the freezer totals about 558 lb (approximately 70% of the carcass weight).

Table 7.1. Estimated feed required and cost on a per-head basis

| Feed | Amount consumed per head over 140 days | Cost per ton | Feed costs per head |
|-------|--|--------------|---------------------|
| Hay | 700 lb (0.35 ton) | \$150 | \$53 |
| Corn | 3,640 lb (1.82 ton) | \$210 | \$382 |
| Total | | | \$435 |

Table 7.2. Estimated cost to produce a finished steer

| Cost component | Amount |
|----------------|---------|
| Cattle value | \$800 |
| Feed cost | \$435 |
| Total | \$1,235 |

Price must be carefully considered. If you are delivering an animal to a USDA-certified plant and the customer will pay for the harvest, cut, and wrap (\$70/head and \$0.50/lb of carcass weight: total \$458 for the 775-lb carcass), subtract this cost from the price. This works out to \$0.59 per pound on the 775-lb carcass (and \$0.82/lb on the 558 lb of meat going into the freezer). If the average retail cost for meat is \$4.00 per pound and you subtract the \$0.82 per pound processing cost, the per-pound value of the meat going into the freezer works out to \$3.18. On a 775-lb carcass yielding an estimated 558 lb of freezer meat, it would total \$1,774 (\$2.29/lb on the carcass weight). When gross revenue is subtracted from the cash costs, the estimated return on this enterprise is \$439 per animal (tables 7.3 and 7.4).

By following the fairly simple approach sketched out in this example, a producer can enter the meat trade at basic level. This approach affords the producer an opportunity to add value to a class of livestock that is more typically seen as a by-product of beef production.

Table 7.3. Estimate of all costs directly associated with production

| Item | Customer pays processing | Producer pays processing |
|-----------------------------|--------------------------|--------------------------|
| Value of heifer | \$800 | \$800 |
| Feed costs | \$435 | \$435 |
| Transportation, misc. costs | \$100 | \$100 |
| Processing | \$0 | \$458 |
| Total cost | \$1,335 | \$1,793 |

Table 7.4. Estimate of return over cash costs

| Item | Customer pays processing | Producer pays processing |
|---------------------------------------|--------------------------|--------------------------|
| Total cost | \$1,335 | \$1,793 |
| Meat value (assume 558 lb carcass) | \$1,774 (\$3.18/lb) | \$2,232 (\$4.00/lb) |
| Return over cash costs | \$439 | \$439 |

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LIVESTOCK
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