In this chapter
- Inspection
- Beef Carcass Evaluation
- Understanding Beef Prices (From Hoof to Rail—Carcass to Counter)
- Beef By-products

Carcass evaluation is an important factor when determining the success of your market steer project. The ultimate goal of a market or dairy steer project is to produce a wholesome carcass with an industry acceptable quality and yield grade.

**Inspection**

By law, every animal slaughtered for meat sale must be inspected. This mandatory process is to ensure wholesomeness (the product is safe to eat), and is performed by the Food Safety Inspection Service (FSIS), which is paid for by tax dollars.

**Beef Carcass Evaluation**

Beef carcass evaluation is accomplished through two grading systems: **quality grading and yield grading**. While these two grading systems are based on completely different standards, they are both **used to determine the value of a beef carcass**. An accomplished livestock judge is able to evaluate live animal traits and accurately relate them to the end product on the rail. Grading is a voluntary process and is paid for by those wanting the service (usually the harvest/packing facility). It is performed by the Agricultural Marketing Service (AMS). Both FSIS and AMS are divisions of the USDA.
Quality Grading

Beef carcass quality grades are based upon marbling and maturity. Maturity is estimated by size, shape and ossification of bones and cartilage, as well as color, firmness and texture of the meat (lean muscle). Marbling is intramuscular fat (small flecks of fat within the muscle) that can enhance the flavor, juiciness and tenderness of the meat.

Genetics and management of the market animal play a large role in the amount of marbling. As a general rule, animals that have more fat on the carcass also tend to have more fat dispersed within the muscle, which is referred to as marbling. Therefore, fatter animals tend to have higher quality grades because they tend to have more marbling. Marbling is the last fat to be deposited on the animal. It is also the first fat to be removed or used by the body as an energy source when the animal is exercised or loses weight. The quality grades are as follows:

**Young Animals**
(approximately 9 to 30 months of age)
- Prime
- Choice
- Select
- Standard

**Old Animals**
(approximately greater than 30 months of age)
- Commercial
- Utility
- Cutter
- Canner

*USDA Prime and Choice are in the greatest demand by consumers of fresh beef and are featured in most retail markets. These are the grades you should attempt to reach with a steer project. Most fed cattle in the U.S. are in the “A” to “B” maturity range. (Figure 8.01)*
Relationship Between Marbling, Maturity, and Carcass Quality Grade*

<table>
<thead>
<tr>
<th>Marbling Degree</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abundant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderately Abundant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slightly Abundant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slight</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traces</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practically Devoid</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Assuming that firmness of lean is comparably developed with the degree of marbling and that the carcass is not a “dark cutter”.

Example: A carcass with “A” maturity and a modest amount of marbling would grade Choice. A carcass with “B” maturity and a small amount of marbling would grade Standard.
**Yield Grading**

Yield grading is based upon the yield of boneless, closely trimmed retail cuts from the round, loin, rib and chuck and is commonly referred to as “carcass cutability”. Factors used in the formula to calculate yield grade include:

1. The amount of external fat over the rib eye at the 12th rib, adjusted to a final amount based on the fat cover over the rest of the carcass.
2. The area of the rib eye muscle at the 12th rib of the carcass.
3. Hot carcass weight.
4. The amount of kidney, pelvic, and heart fat (KPH) as a percentage of the hot carcass weight. The KPH percentage usually averages 2.5 percent.

Yield grades are expressed in numerical scores ranging from 1 through 5. Yield grade 1 is the most desirable as the carcasses are the leanest with an adequate amount of musculature. When a carcass becomes fatter or the degree of muscle becomes less, the numerical yield grade becomes higher. Yield grade 5 is considered the least desirable.

Figure 8.02 (side view) and Figure 8.03 (top view) show the approximate location of the 12th rib, the area where fat thickness and rib eye area are estimated. In Figure 8.02, the location of the 12th rib is identified with a heavy white line and is indicated by an arrow. In Figure 8.03, fat thickness is estimated at the point indicated by the X. This is done on both the right and left side of the top line. Figure 8.04 shows the location for measuring or estimating fat thickness at the rib eye.
Carcass Terms

Carcass
The muscle, bone, and fat associated with the harvest (slaughter) of an animal, after removal of the head, hide, feet and internal organs.

Cwt.
An abbreviation meaning hundredweight or 100 pounds.

Dressing
The removal of the hide, head, tail, lower legs, blood, organs (except kidney), and gastrointestinal tract at slaughtering.

Dressing Percentage
The proportion of carcass weight relative to live weight of an animal. Heavier muscled animals tend to have a higher dressing percentage. Animals with a higher degree of finish usually have a higher dressing percentage. The more weight that is contained in parts such as the rumen, hide, head, etc., the lower the dressing percentage. The average dressing percentage for steers and heifers is 62 percent, but can vary greatly with changes in the type of cattle. To calculate dressing percentage, take the carcass weight divided by live weight multiplied by 100.

\[
\text{carcass weight} \times 100 \over \text{live weight}
\]

Example:
\[
\frac{682}{1100} = .62 \times 100 = 62\%
\]

Fat Thickness
The typical linear measurement of fat taken over the rib eye between the 12th and 13th rib.

KPH
The amount of fat contained in the regions of the kidney, pelvis and heart as a percentage of the carcass weight.

Lb.
An abbreviation meaning pound.

Ossification
When cartilage turns from soft tissue to a hard bone-like structure.

Packer
The person or entity that harvest (slaughters) and dresses the animal and sells the carcass whole or as primals and wholesale cuts.

Quality Grade
A grade that reflects palatability (flavor, tenderness, and juiciness) and is determined by estimating the amount of marbling and the physiological age.

Retail Cuts
The cuts of meat that the consumer buys at the meat counter.

Retailer
The person or entity that buys primal or wholesale cuts and then processes and packages retail cuts for the consumer.

Rib Eye Area
The surface area of the longissimus dorsi (eye) muscle between the 12th and 13th rib of a beef carcass. Rib eye area can be measured in carcasses that are ribbed (the muscle area is visible between the 12th and 13th ribs, Figure 8.04) by taking a direct grid reading of the rib eye muscle. When using this method, place the plastic grid on the rib eye and count the dots located within the perimeter of the muscle. Be sure not to count the smaller muscles that surround the rib eye muscle. After counting the dots, divide the total by 10 to calculate the rib eye area in square inches. Rib eye area is an important indicator of muscling. A typical 600-pound carcass should have an 11 square-inch rib eye. Rib eye size will vary with the musculature of the animal and the carcass weight. (Figure 8.05 and Table 8.01)
(a) The rib eye on the left is smaller and has less external fat over the rib eye.

(b) Differences in KPH fat are 4.0%, 2.5%, and 1.0%.

(c) Rib eye area measures 13.0 square inches.

(d) Unribbed beef carcass.

(e) Ribbed beef carcass (between the 12th and 13th rib).

(f) Side view of unribbed beef carcass.
Example of plastic grid card used for measurement of loin eye (beef rib eye area)

Iowa State University of Science and Technology - Ames, Iowa
Cooperative Extension Service - August 1982 - AS-234


(Figure 8.06)

Chapter 8 - Carcass Evaluation 8-7
Instructions for using plastic grid card for quick measurement of loin eye (beef rib eye area)

The plastic grid is designed for measuring loin eye area. The area surrounding each dot is equal to 1/10 (0.10) of one square inch (10 dots equal one square inch).

The user will notice the numbers – 8, 9, 10 – and the heavy black lines. These help speed up the counting process. The area within the heavy black line, designated by 8, contains 80 dots or 8 square inches; area 9 (area 8 plus 10 dots) contains 90 dots or 9 square inches; area 10 contains 100 dots or 10 square inches. (Source: Iowa State University of Science and Technology)

Steps for using grid

1. Place grid over the actual loin eye or a tracing of the loin eye. (Figure 8.08)

2. Lay the grid so that one or more of the areas blocked out with heavy black lines falls within the loin eye outline.

3. Count the dots within the loin eye outside the blocked area. Count only those dots that lie within the loin eye.

4. Add the number of dots to the 80, 90, or 100 enclosed by the heavy black lines. Divide the total number of dots by 10 to get the area in square inches.

---

<table>
<thead>
<tr>
<th>Hot Carcass Weight (lbs.)</th>
<th>Expected Rib Eye Area (in²)</th>
<th>Hot Carcass Weight (lbs.)</th>
<th>Expected Rib Eye Area (in²)</th>
<th>Hot Carcass Weight (lbs.)</th>
<th>Expected Rib Eye Area (in²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>350</td>
<td>8.0</td>
<td>625</td>
<td>11.3</td>
<td>900</td>
<td>14.6</td>
</tr>
<tr>
<td>375</td>
<td>8.3</td>
<td>650</td>
<td>11.6</td>
<td>925</td>
<td>14.9</td>
</tr>
<tr>
<td>400</td>
<td>8.6</td>
<td>675</td>
<td>11.9</td>
<td>950</td>
<td>15.2</td>
</tr>
<tr>
<td>425</td>
<td>8.9</td>
<td>700</td>
<td>12.2</td>
<td>975</td>
<td>15.5</td>
</tr>
<tr>
<td>450</td>
<td>9.2</td>
<td>725</td>
<td>12.5</td>
<td>1000</td>
<td>15.8</td>
</tr>
<tr>
<td>475</td>
<td>9.5</td>
<td>750</td>
<td>12.8</td>
<td>1025</td>
<td>16.1</td>
</tr>
<tr>
<td>500</td>
<td>9.8</td>
<td>775</td>
<td>13.1</td>
<td>1050</td>
<td>16.4</td>
</tr>
<tr>
<td>525</td>
<td>10.1</td>
<td>800</td>
<td>13.4</td>
<td>1075</td>
<td>16.7</td>
</tr>
<tr>
<td>550</td>
<td>10.4</td>
<td>825</td>
<td>13.7</td>
<td>1100</td>
<td>17.0</td>
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<tr>
<td>575</td>
<td>10.7</td>
<td>850</td>
<td>14.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>11.0</td>
<td>875</td>
<td>14.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Rib Eye Area (REA) is the expected rib eye area for carcasses with typical muscling at the listed hot carcass weight.

Table 8.01
Practice measuring loin eye (rib eye) areas by measuring objects that you are familiar with such as a soda-pop can or a deck of cards.

**Soda-pop Can**

What is the area covered by the bottom of this soda-pop can?

**Deck of Playing Card**

How many square inches are covered by the area underneath this deck of cards?

Below: What is the area covered by the bottom of this soda-pop can and the deck of cards?

Soda-pop can = 4.6 sq. in.  
Deck of cards = 6.8 sq. in.  
Can and cards = 13.6 sq. in.

(Figure 8.07)
What do these rib eye area tracing measure?

15.1 sq. in.  
13.6 sq. in.  

(Figure 8.08)
Wholesale Cuts
Large cuts that are further cut and trimmed into smaller retail cuts. The wholesale cuts of beef include: loin, rib, chuck, round, brisket, flank, plate and shank.

Yield Grade (also called Cutability)
The numerical designation (1–5) for the percentage of boneless, closely trimmed retail cuts from the round, loin, rib and chuck of the carcass. 1 is the most desirable and 5 is the least desirable.

Wholesale/Retail Cuts of Beef
Wholesale Cuts of Beef
(Picture of wholesale cuts Figures 8.05 & 8.06 and detailed in Table 8.01)

"Thin Cuts"
Brisket
Flank
Plate
Shank

"End Meats"
Chuck
Round

"Middle Meats" (High Priced Cuts)
Loin
Rib

Wholesale Cuts of Beef

<table>
<thead>
<tr>
<th></th>
<th>% of Carcass Weight</th>
<th>% of Total Carcass Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round*</td>
<td>22</td>
<td>29</td>
</tr>
<tr>
<td>Loin* (Short loin and sirloin)</td>
<td>17</td>
<td>29</td>
</tr>
<tr>
<td>Rib*</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Chuck</td>
<td>27</td>
<td>21</td>
</tr>
<tr>
<td>Brisket</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Shank</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Plate</td>
<td>8</td>
<td>2.5</td>
</tr>
<tr>
<td>Flank</td>
<td>5</td>
<td>1.5</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>4</td>
<td>0.5</td>
</tr>
</tbody>
</table>

*The loin, rib, and round together account for about 50% of the carcass weight and about 70% of the carcass value.

Table 8.02

Photographed examples of meat cuts may be reviewed within the color photo section of this book.
Wholesale Cuts of Beef

The shaded area indicates 49% of the carcass weight and 69% of the carcass value.
(Figure 8.10)

Understanding Beef Prices
From Hoof to Rail - Carcass to Counter

Have you ever wondered why beef in the grocery store costs so much more than the price you receive for your steer? Several steps must take place before the finished product reaches the meat case.

Look at an example of a steer on a short, simple marketing channel from the producer to the packer to the retailer.

Producer
You produce a 1,100 pound choice grade, No.2 yield grade steer and sell it for the market price of $0.60 per pound. You receive $660.00.

Packer
Buys steer at $0.60 per pound = $660.00

The steer dresses as follows:

\[
\text{Hot carcass weight (682) X 100} \\
\text{Live weight (1,100)} = 62\%
\]

\textbf{Packer Expenses}

\begin{align*}
\text{Initial cost} & = \$660.00 \\
\text{Cost to produce carcass} & = \$60.00  \\
& \quad \text{(labor, transportation, grading, equipment, etc.)} \\
\text{Weight loss shrinkage in cooler} & = 2.0\% \times 682 \text{ lbs.} = 14 \text{ lbs.} \\
& = 14 \text{ lbs. x } $1.04 = \quad = \$15.00 \\
\text{Total expenses} & = \$735.00
\end{align*}

\textbf{Packer Income}

\begin{align*}
\text{By-products sold} & = \$60.00  \\
& \quad \text{(hide, organs, etc.)} \\
\text{Both sides of carcass sold to retailer at } & \$1.04 \text{ per pound x 668 lbs.} \\
& = 682 \text{ lbs. x 2% cooler shrink} \\
& = \$695.00 \\
\text{Total income} & = \$755.00
\end{align*}

\textbf{Profit}

\[
\$755.00 \text{ income - } \$735 \text{ expenses} = \$20.00
\]

8-12 Beef Resource Handbook
Does $1.04 per pound seem like a lot compared to the 60 cents per pound you received for your live steer? If you dressed the steer yourself, how much would you have to receive per pound for the carcass to break even with the 60 cents per pound you would receive for the 1,100 pound steer? Have a parent or advisor help you figure this.

**Retailer**

Retailer Buys 668 pound carcass at $1.04 per pound = $695.00

Cutting loss (trimming and boning) = 22%

Pounds lost
668 pounds x 22% = 147 lbs.

Pounds of salable retail cuts
(668 lbs. - 147 lbs.) = 521 lbs.

The retailer also has operating losses in weight of about five percent due to shrinkage, spoilage, rework, and repackaging, etc.

521 lbs. x 5.0% = 26 lbs.

521 lbs. - 26 lbs. = 495 lbs.

The retailer will base prices on 495 pounds of retail beef cuts to actually be sold.

For example, assume that the retailer can sell 495 pounds of retail cuts for an average of $1.88 per pound (on average the retailer will get 15 cuts). Retail prices for beef must cover carcass cost, cost of processing, refrigeration, transportation, rent, taxes, labor, etc. In the end, retail stores must price their beef competitively so that they sell all of it, including the lower quality cuts.

**Retailer Expenses**

| Purchase price of carcass | $ 695.00 |
| Operating costs |
| (facilities, labor, equipment, advertising, etc.) | $ 182.00 |
| **Total** | **$ 877.00** |

**Retailer Income**

Sale of retail cuts
495 lb. x $1.88/lb. = $ 930.60

**Total** $ 930.60

**Profit**

$930.60 income - $877.00 expenses = **$ 53.60**

In the end the 1,100 pound steer did not yield 1,100 pounds of beef. The steer yielded a 682-pound carcass. About 187 pounds of fat and bone were lost to shrinkage, cutting, and trimming leaving about 495 pounds of retail beef cuts. This is less than half of the initial weight.

1,100 lb. steer - 495 lbs. retail beef cuts = 605 lbs. remaining

Although the 605 pounds cannot be used as retail cuts, it still has value. It includes variety meats such as the liver, heart, and tongue, which are tasty alternatives used in gourmet dishes. In addition, by-products are used in a variety of items, including medicines such as insulin and heparin.
**Beef By-Products**

**Edible By-Products**
The beef industry is an active part of our economy. By-products serve as a source of material for hundreds of other industries. Without beef as a renewable resource, not only would the producers and retailers be out of work, but so would businesses that produce pharmaceuticals, chemicals, and textiles.

Did you know there are some edible products that are not quite so obvious, such as gelatins in products like ice cream and yogurt that are made from the bones of the cow? Take a look at some other basic edible by-products:

- **Collagen-based** - Sausage Casings
- **Blood** - Blood sausage, Protein extracts
- **Fatty Acid-based** - Oleo margarine,
  - Oleo shortening, Chewing gum
- **Gelatins** - Ice cream, Flavorings,
  - Yogurt, Marshmallows, Candies,
  - Mayonnaise
- **Plasma protein** - Cake mixes, Imitation seafood, Pasta, Deep-fry batters

**Inedible By-Products**
Even beef by-products that we consider inedible are used to feed other animals. Beef fat, protein and bone meal are used in feeding poultry, pork and domesticated fish. Now that’s food for thought.

**Cows in My House?**
Items manufactured from inedible by-products from cattle surround us in our daily environments. The soap you washed your face with this morning, the baseball equipment in the closet, even the sheet rock in the wall of your home contains beef by-products.

How many of these are part of your everyday life?

- **From fats/fatty acids and protein meals:**
  - Candles, Perfumes, Cellophane, Paints, Ceramics, Plastics,
  - Cosmetics, Shoe cream, Crayons, Shaving cream, Deodorants, Soaps,
  - Detergent, Textiles, Insecticides, Pet foods, Insulation, Floor wax,
  - Linoleum, Horse and livestock feeds, Freon/refrigerant

- **From the hooves and horns:**
  - Tortoise shell, Combs, Imitation ivory, Piano keys.

- **From the hide:**
  - Leather sporting goods, Luggage, Boots, Shoes

- **From collagen-based adhesives:**
  - Bandages, Wallpaper, Sheet rock, Emery boards, Glues

- **From hair:**
  - Artist’s paint brushes

- **From gelatin:**
  - Camera and movie film, Phonographic records
Cows Can Help Me When I Am Sick?
The medical world also relies on many beef by-products for many medical treatments used in surgery, research, or routine health care. Cattle have great similarities in organic chemical structure to humans. Our bodies will easily accept a medication or treatment made with these animal components. Some of these products can be synthesized, but many are still made from beef animals because they are much more economical without sacrificing quality.

From the pancreas:
- Insulin – for diabetes
- Pancreatin – aids digestion
- Glucagon – treats hypoglycemia
- Trypsin and Chymotrypsin – for burns and wounds, promotes healing

From the blood:
- Fraction I – hemophilia
- Fraction V – kills virus
- Blood albumin – RH factor types
- Thrombin – blood coagulant
- Iron meal – anemia

From the bone:
- Bone marrow – blood disorders
- Soft cartilage – plastic surgery
- Bone meal – calcium and phosphorus source

From the spinal cord:
- Cholesterol – hormone products

From the intestines:
- Medical sutures

From the pituitary gland:
- Prolactin – promotes lactation
- Pressor hormone – regulates blood pressure
- Vasopressin – controls intestinal and renal functions
- ACTH – arthritis and allergies

From the liver:
- Heparin – anticoagulant
- Liver extract – treatment of anemia
- Vitamin B – prevention of B-complex deficiencies

When It Gets Us There
By-products are used in all types of mechanical items to get us where we are going. Chemical manufacturers use numerous proteins and fatty acids (from inedible beef fats) for all sorts of lubricants and fluids. Antifreeze contains glycerol derived from fatty acids. Tires have stearic acid which makes the rubber hold its shape under continuous surface friction. Glue from colloidal proteins has been used in automobile bodies. Even the asphalt on our roadways has a binding agent from fat.

Some other unusual but necessary products from cattle sources:
- Hydraulic brake fluid
- Airplane lubricants and runway foam
- Various machine oils and viscous fluids
- Steel ball bearings containing bone charcoal
- Car polishes and waxes
- Textiles for car upholstery
Another Benefit from the Beef Industry
Cattle have a complex four-compartment stomach, which enables them to digest and convert all types of vegetation, indigestible by humans, into energy and important building blocks of the body. The simple human system cannot utilize vegetation efficiently and therefore these potentially valuable resources would be wasted if we did not get them from another source.

So, When Is A Cow More Than A Cow?
Whenever we depend on its renewable resources to be part of world that helps us.

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Ohio Cattlemen’s Association, Westerville, Ohio, USA
Marketing

In this chapter
• The Marketplace
• Feeder Calf Marketing Options
• Marketing Decisions
• Market Bound Show Cattle

• Suggestions for Minimizing
  Dark Cutting Incidence
• Beef Quality Assurance
• Selling Your Steer or Feeder Calf
• Sample Thank You Letters

Marketing Functions
Understanding what functions (services) a market might perform is critical when marketing livestock. Some important functions of the market are:
• Assembling – bringing the livestock together in sufficient numbers for sorting and grading, as well as selling and buying. Assembling occurs all the way from the farm to the packing plant. This permits each buyer to buy just what is needed for his or her purpose in terms of numbers and quality.
• Transportation – moving the meat animal from the farm to the processing plant. The cost of transportation is a factor in determining the value of meat animals.

The Marketplace

Until now, you have been involved primarily with the production aspect of the market or dairy steer project. However, to be truly successful, you will need to understand marketing, and why it is an integral part of a beef production program.

Too often, the first and sometimes only marketing alternative that comes to mind is the junior fair livestock sale at the county fair. Although this marketing opportunity will have a direct economic effect on your market or dairy steer feeding project, you must be aware of and understand other marketing alternatives available to beef producers.
• **Price determination** (price establishment or price discovery) – Who wants to sell and who wants to buy at what price? This is the most important service function of a market. It is accomplished most effectively and most satisfactorily in a truly competitive, open market where many buyers compete for the opportunity to buy.

• **Others** – Other functions a market might perform include financing and risk bearing.

In addition to understanding the functions performed by the marketplace, it is important to know and understand the different types of markets:

• **Terminal public markets** – Large numbers of livestock come together with many buyers. Trading is by private treaty, an important type of marketing in earlier days. Today, there are fewer terminal markets handling smaller numbers of livestock.

• **Auction markets** – established places of business where livestock are assembled at regular intervals and sold to the highest bidder.

• **Livestock dealers** – independent operators who buy and sell livestock for a profit. They are known as country buyers or local dealers.

• **Concentration yards** – private stockyards that are maintained for the purpose of assembling large numbers of livestock for reshipment.

• **Direct-to-packer sales** – direct delivery of livestock to the packing plant. The price is determined between the buyer and seller.

• **Carcass weight and grade sales** – the price received by the producer is determined by the weight and grade of the carcass on the rail (also referred to as rail selling).

• **Electronic markets** – a relatively new concept in the marketing of livestock. This type of market allows a producer's livestock to be offered to several buyers via computer terminal or phone. A seller also has the right to accept or reject bids being offered for their livestock.

• **Commodity markets** – includes marketing alternatives such as hedging and options. The commodity market allows the producer the opportunity to forward price livestock (to price livestock ahead of time) as a means of price protection in the event of declining prices when the livestock are ready to sell. The 4-H project book *Commodity Marketing* is available to 4-H members interested in learning more about the commodity markets.

### What Influences the Value of Market Animals?

• **Supply and demand** – How many of what kind are available for sale and how many buyers want to buy them (strong competition for a uniform lot results in a higher price).

• **Weight and grade** – Most market animals have an ideal market weight and grade, depending on their intended use. The ideal market weight and grade will command a better price.

• **Location** – Where livestock are located in relationship to the processing plant will help determine price. This involves the cost of transportation, as well as where the market animal will be weighed to determine sale weight. Animals shrink (lose weight) in transit.
• **Dressing percentage** – This is a term used to express the relationship between the live weight of a market animal and the weight of its carcass. An animal with a high dressing percentage generally will command a higher price.

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### Feeder Calf Marketing Options

**Marketing Options**

As calves from the herd approach weaning age, marketing plans must be made. Marketing decisions are based on feed, labor, time, facilities, and management skills available to the producer. There are many marketing options available. Five are discussed.

1. **Sell calves in the fall through a direct sale, graded feeder cattle auction, or weekly auction.**

   • **Direct sale** – The biggest advantage to selling cattle directly to a buyer on the farm is the reduction in health problems. In addition, the buyer knows the source of the cattle and chances are good that they will return the next year. The disadvantage with a direct sale is that it is difficult to establish a price.

   • **Graded feeder cattle auctions and weekly auctions** – Auctions are held in the fall and spring when there is the largest number of calves ready for sale. Cattle are sorted into groups by sex, breed, grade, and weight. Graded sales were developed to bring together large numbers of cattle and to improve the prices over the weekly auction. In general, when feed prices are low and cattle numbers are low, the price received for feeder cattle will be high.

2. **Sell cattle at weaning, using a preconditioning program.**

If calves are to be sold at weaning, a preconditioning program is recommended. The process of preconditioning by the producer is a series of health and management practices performed before selling cattle in order to minimize the stress and to ensure that cattle remain healthy as they move through the marketing system.

The procedures for preconditioning may include:

   • Vaccinations against Infectious Bovine Rhinotracheitis (IBR), Parainfluenza (PI3), Bovine Virus Diarrhea (BVD), and clostridial diseases (such as Blackleg).

   • Treatment for internal parasites, grubs, and lice.

   • Dehorning, castration, and healing before sale date.

   • Weaning and starting calves on feed. (Recommendations are that calves be started on feed and weaned a few weeks before performing the health procedures.)

Preconditioning should be done at least three weeks and not more than eight weeks before cattle are shipped.

3. **Use backgrounding to optimize marketing strategies and sell cattle at a later date.**

The practice of putting on gain slowly for a short time with grass, hay or crop residue is called backgrounding or stockering. Backgrounding is an option for producers that have extra feed or inexpensive forages available and anticipate a better market at a later date.
4. Keep the calves and place them in a feedlot where they are fed to harvest (slaughter) weight.

This procedure is called retained ownership. Producers may retain the ownership of calves and feed them out on their own farm, or at another operator's farm (custom feeding). In custom feeding, a contractual agreement is drawn up between the owner and the feedlot operator.

5. Market cattle through breed association activities.

The sale of purebred registered calves can be approached differently. Producers can choose to market breeding stock by becoming involved in local and state breed association activities including shows, sales, field days, exhibiting at area fairs, advertising in breed magazines, and enrolling in a herd performance testing program.

Marketing Decisions

Marketing is the final step in the livestock producer's operation. It sets the profit or loss on the labor and capital investment. A good job of breeding, feeding, and management is rewarded or nullified at the marketplace depending on your marketing strategies. Marketing decisions must be considered carefully using all the market information available, if the livestock producer is to market livestock effectively.

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**Market Bound Show Cattle**

By William Lloyd

*Beef Quality Assurance Coordinator*

*National Cattlemen's Association*

From a corporate public relations standpoint, most packers are anxious to bid on show steers and heifers at shows, whether it be from county, state, or national shows. Packers have many employees in their administrative, quality assurance, and management ranks who had the opportunity as a youngster to participate in 4-H or FFA. They are very appreciative of the fact that young men and women currently showing cattle will be the future agriculturists with whom they deal and perhaps may become future employees.

It may sometimes be a mystery to show officials why the cattle buyer with whom they deal may be a bit hesitant to bid on the cattle. Having worked for a packer and been in these discussions with cattle buyers, I can give you some of the legitimate reasons they give for their hesitancy.

The most prevalent reason is that, generally speaking, show cattle do not grade as well as normally fed cattle. This may be an artifact of stress incurred at the show, or it may be a result of an animal getting a bit too fat and pulled back before the show. Marbling is the energy store that is closest to the muscle cell and is the first to be used when there
is an energy shortage which would occur when animals are on a finishing ration and then put on a restricted ration just prior to the show.

When show cattle are brought to the show, they are sometimes hauled long distances and introduced to a strange environment around strange cattle, while experiencing new sounds and odors. This stress can cause dark cutters, which is a condition caused by long-term stress. The stress burns up the glycogen (sugar and energy source) in the muscle so that there is no energy available for post-mortem cellular metabolism. This results in a lower lactic acid level (higher pH) in the muscle, which causes it to be a dark purple instead of a bright cherry red color. Consequently, the merchandising value of the carcass is not as high when the packer sells the product (boxed beef), because it cannot be merchandised through normal retail and food service channels. Its acceptability to the consumer is not as high. Not all show cattle are dark cutters, but in a group or lot of show cattle purchased by a packer, the percentage of dark cutters is generally higher. (See Suggestions for Minimizing Dark Cutting Incidence.)

Another area of concern is the presence of a chemical residue in show cattle. There have been many instances of antibiotic residues found, and recently much attention has been focused on those who choose to cheat to gain a competitive advantage and have administered an illegal muscle enhancing drug, clenbuterol, to their cattle. Exhibitors must understand that their project is not only a chance to gain the experience of raising an animal and competing in the show ring, but also they are raising food which will ultimately be sold to a consumer. These actions increase the risk to a packer of putting a product in the market place, which would jeopardize food safety. If that were to happen, it is the liability of the packer and their reputation that is damaged.

In respect to antibiotic residues, exhibitors must be aware of the withdrawal times stated on the label if a drug is used to treat an animal. If an animal must be treated, the exhibitor must inform the packer so that the animal is not harvested until the appropriate withdrawal time has passed. This will assure that no antibiotic residues remain at the time of slaughter.

A more difficult scenario to deal with is when a cheater administers an illegal drug like clenbuterol or a food adulterant such as oil to make an animal appear more muscular than they actually are genetically. Show officials must take every measure to permanently extricate these people from the shows, and, when it is appropriate, insure that due process is exercised against those who choose to break the law. Our industry can not afford the adverse perception by consumers that these actions may bring to the beef industry. If this problem is not dealt with, the consequence of discontinuing market animal shows because of the unethical actions of a few may be exercised against those that follow the rules.
Suggestions for Minimizing Dark Cutting Incidence

- Avoid selecting project animals that have excitable temperaments.
- Always handle cattle in a calm manner. Load and unload cattle at their speed, not yours. When cattle get excited or stressed, chances of dark cutters increase.
- Make sure surfaces where cattle walk or stand are not slippery.
- Avoid crowding cattle during transport.
- Minimize the time between the county fair load out and slaughter (preferably less than 6–12 hours).
- Minimize mixing of cattle for an extended period of time prior to slaughter if they have not been together before.
- Do not use more than one trenbolene acetate (TBA) containing implant and do not use these implants within 100 days of slaughter.
- Do not restrict feed or water.
- Keep animals cool during hot weather. Dark cutting incidences are highest in July through October.

In general, anything that causes stress could result in a dark cutting carcass. Compounding several factors together will likely increase the incidences of dark cutters. There is approximately one to two percent dark cutters in the commercial market steer and heifer populations. Dark cutting incidences in junior fair animals are often much higher and have been reported as high as 30-40 percent at some county fairs. If a beef carcass is a dark cutter, the value of that carcass is decreased by at least $150.00.

Beef Quality Assurance

Most beef producers understand the value of learning about beef selection, showmanship, management, and health care. Even more important than acquiring these skills is taking the responsibility to provide a product that people want to buy.

Quality, Time After Time

Consumers want the beef they buy next week in the grocery store to be as good as the beef they bought this week. They want to select from a consistent product in the meat case. Practicing quality assurance means making sure there are no harmful residues in the beef products you market. It is the bridge that links the responsibilities of production and marketing. Every beef producer must accept the responsibility of consistently providing quality beef products.

Residue avoidance is an important part of a beef quality assurance program. Many organizations, including consumer groups, government agencies, and beef producers are interested in the production of residue-free beef products. If you want to be a successful producer, you need to make the practice of avoiding residues an essential part of your production and marketing strategies. Know the medications you use and their withdrawal times, how to properly mix feed and deliver it, how to identify treated cattle,
and how to use feeders and pens to minimize residues. The National Cattlemen’s Beef Association has additional information on quality assurance programs.

**What is Residue?**

You may gain a clearer understanding of what a residue is by imagining yourself drinking a glass of milk. If you finish the glass of milk and fill it again with water without rinsing it, your water will be cloudy. This is because milk left a residue in the glass.

A residue is the amount of a substance that remains in an animal’s body tissue after exposure to a substance. The substance can enter the animal’s body when it is used as a feed or water additive, as an injectable or external treatment, or by accident. Some substances may leave an animal’s body tissues a few hours after exposure, others may leave in several months, and some may never completely leave certain tissues. Some low-level drug residues are not physically harmful to humans, but may cause loss of confidence in the quality of the food products.

**Why the Concern?**

It is illegal to alter a food substance. This is why the United States Food and Drug Administration (FDA) and the United States Department of Agriculture (USDA) have set strict guidelines to protect our food supply. Random tests at slaughter facilities can indicate which producers are not following regulations. If illegal levels of residue are found in the tissue of a slaughtered animal, the USDA can stop a facility from accepting beef cattle from that producer until the herd tests safe for residue. This loss of a market can cause great economic loss to a beef producer.

Perhaps the worst consequence of not obeying withdrawal guidelines is that it can cause consumers to lose confidence in beef. Consumers are increasingly health conscious. They demand that their food be lean and wholesome. Some consumers are concerned that certain people may develop severe allergic reactions if traces of medications are present in meat. Although this is not likely to happen, it is important that residues in animal products be kept below FDA levels.

**How You Can Prevent Residue Problems in Your Animals?**

Not all medications pose a potential residue problem. The withdrawal time listed on labels tells you when to remove medications to prevent illegal residues. The withdrawal time is when the medication must be removed from an animal before it is slaughtered. The time varies from one day to several months, depending on the type of medication.
The following are Beef Quality Assurance Guidelines from the National Cattlemen’s Beef Association.

**Feedstuffs**
- Maintain records of any pesticide/herbicide used on pasture or crops that could potentially lead to violative residues in grazing cattle or feedlot cattle.
- Adequate quality control program(s) are in place for incoming feedstuffs. Programs should be designed to eliminate contamination from molds, mycotoxins, or chemicals of incoming feed ingredients. Supplier assurance of feed ingredient quality is recommended.
- Suspect feedstuffs should be analyzed prior to use.
- Ruminant-derived protein sources cannot be fed per FDA regulations.

**Feed Additives and Medications**
- Only FDA approved medicated feed additives will be used in rations.
- Medicated feed additives will be used in accordance with the FDA Good Manufacturing Practices (GMP) regulation.
- Extra-label use of feed additives is illegal and strictly prohibited.
- To avoid violative residues, withdrawal times must be strictly followed.
- Complete records must be kept when formulating or feeding medicated feed rations.
- Records are to be kept a minimum of two years.
- Operator will assure that all additives are withdrawn at the proper time to avoid violative residues.

**Processing Records and Treatment**
- Follow all USDA/FDA/EPA guidelines for product(s) utilized.
- All products are to be used per label directions.
- Extra-label drug use shall be kept to a minimum and used only when prescribed by a veterinarian working under a valid Veterinary-Client-Patient Relationship (VCPR).
- Strict adherence to extended withdrawal periods, as determined by the veterinarian within the context of a valid VCPR, shall be followed.
- Treatment records will be maintained with the following recorded:
  - Individual animal or group identification
  - Date and time treated
  - Condition being treated
  - Estimated weight
  - Product administered and manufacturer’s lot/serial number
  - Dosage used
  - Route and location of administration
  - Name of person who administered treatment
  - Instructed withdrawal
  - Earliest date animal will have cleared withdrawal period
  - The name, address and phone number of the veterinarian - If an extra label or Rx drug was used.
- All cattle fed and non-fed that are shipped to slaughter will be checked by appropriate personnel to assure animals that have been treated meet or exceed label or prescription withdrawal times for all animal health products administered.
- All processing and treatment records should be transferred with the cattle to the next production level. Prospective buyers must be informed of any cattle that have not met withdrawal times.
**Injectable Animal Health Products**

- All products labeled for subcutaneous (SQ) administration shall be administered SQ ahead of the point of shoulder.
- All products labeled for intramuscular (IM) use shall be given in the neck region only. There are no exceptions regardless of age.
- All products cause tissue damage when injected IM. Therefore all IM use should be avoided if possible.
- Products cleared for SQ, intravenous (IV) or oral administration are recommended.
- Products with low dosage rates are recommended.
- No more than 10cc of a product is administered per IM injection site. If more than 10cc needs to be administered, then keep injections at least 6 inches apart.

**Care and Husbandry Practices**

- All cattle will be handled/transported in such a fashion as to minimize stress, injury, and bruising.
- Facilities (fences, corrals, load-outs, etc.) should be inspected regularly to ensure proper care and ease of handling.
- Strive to keep feed and water handling equipment clean.
- Provide appropriate nutritional and feedstuff management.
- Strive to maintain a clean environment appropriate to the production setting.

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**Selling Your Steer or Feeder Calf**

Most 4-H members market their steers or feeder calves at their county fair or show sale. If you sell your project animal by this method, you should check with your 4-H leader about the market price farmers are receiving for steers of similar weight and quality. If you receive more than this amount, it’s due to the generosity of the person who bought your steer. You should consider it a reward for your efforts and not as the true value of the animal.

Many 4-H clubs find it advantageous to promote their county fair sale. You can promote your sale by visiting or sending letters to local businesses asking them to support the county Junior Fair Steer Sale.

If you do not market your steer at your county fair sale, there are livestock auctions and buying stations statewide that will buy desirable steers. Your 4-H leader can help you choose one of these markets.

No matter where you sell your steer, have it look as attractive as possible and avoid filling it with extra feed and water. Buyers don’t want to pay for this extra fill. They base their price on the pounds of meat your calf will produce. Market your steer when it is finished to the proper grade and as near the desired weight as possible.
Send a thank you letter to the buyer of your 4-H steer or feeder calf as soon as you get home from the show. This tells the buyer you appreciate his/her efforts and encourages the buyer to support future sales. It is also a good idea to thank your show and sale officials for their efforts in organizing a good show and sale. Also, remember to thank your 4-H leader, parents, and 4-H staff for all their help during the year.

Sample letters. (Figures 10.01, 10.02, and 10.03)

**Example 1**

100 Farm Lane
Hometown, OH 43210
August 31, 20XX

Country Springs Co-op
333 Mill Court
Hometown, OH 43210

Dear Country Springs Co-op:

I am writing to thank you for purchasing my market steer at the 20XX Sandusky County Junior Fair. I have been involved with the Junior Fair for eight years and it is buyers like you who really help to keep the Junior Fair going strong.

Since I started taking market steer projects, I have been placing the money in a savings account to help pay for college. I hope to attend college to study animal science and continue working in the field of agriculture.

Over the past eight years of being involved with market steer projects in 4-H, I have learned the importance of keeping good records in order to raise healthy animals. Most importantly, raising beef cattle has taught me hard work, responsibility, and organizational skills.

Again, thank you for supporting the 20XX Sandusky County Junior Fair Livestock Sale. You helped make this year one of the best yet! I hope you continue to support the Junior Fair.

Sincerely,

Dee Davis

Dee Davis

Figure 10.01
Example 2

Thank-You Letter

Mr. and Mrs. Jones
Emerald Acres Farm
4444 Clover Crossing
Hometown, OH 43210

Dear Mr. and Mrs. Jones,

I am writing to thank you for buying my steer at the 20XX Clinton County Junior Fair. I have put all the money into a savings account, which I plan to use for future projects.

This was my third year to show at the fair and you helped make it a wonderful experience. I have learned a lot while taking this project. Mostly I learned responsibility and how to take care of my steer every day. I am looking forward to taking another market steer project next year.

Thank you for supporting the 20XX Clinton County Junior Fair. You helped make it a successful year and I hope you will continue your support in the future.

Sincerely,

Andrew Smith

Andrew Smith

Figure 10.02
Example 3
321 Green Pastures Road
Hometown, OH 43210
August 21, 20XX

Ms. Smyth
President
Hometown City Bank
987 Finance Way
Hometown, OH 43210

Ms. Smyth:

Thank you for coming to the Ashland County Junior Fair Sale and
for purchasing my market steer. I plan on saving the money to
help pay for college. My parents have taught me how to keep a
check and I opened my own savings account.

This was my first year taking a steer project. I had a lot of fun and
learned a lot while taking care of my steer. I learned how to keep
good records, about how much feed my steer ate, and how many
pounds he gained. I am looking forward to taking a market steer
project again next year.

Thank you for supporting the Junior Fair Sale. I really learned
many things this year. I am glad that people like you help support
programs like 4-H for kids like me.

Sincerely,

Tracey Jones
Tracey Jones
The information in this Marketing chapter was;

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