

# INTRODUCTION

This manual has been developed as a study guide for the Florida State Fair Beef Skillathon which is part of the Champion Youth Program. The topic for this year's Skillathon is **Products and Marketing**.

The Florida State Fair recognizes that agricultural education instructors, 4H agents, parents, and leaders provide the traditional and logical instructional link between youth, their livestock projects and current trends in the animal agriculture industry. **PLEASE NOTE:** This manual is provided as a **study guide** for the skillathon competition and should be used as an additional aid to ongoing educational programs.

Sections are labeled **Junior, Intermediate & Senior, Intermediate & Senior, or Senior** to help exhibitors and educators identify which materials are required for each age level.

**\*\*** Denotes additional information in the study manual for preparing for the Champion of Champions competition.

The knowledge and skills vary by age group and may include:

**Juniors (age 8-10 as of September 1, 2020)**

By-Products  
Wholesale cuts of Beef & Beef Primals

**Intermediates (age 11-13 as of September 1, 2020)**

all of the above plus...  
Retail Cuts of Beef  
Feeder Cattle Grading  
Cookery

**Seniors (age 14 and over as of September 1, 2020)**

all of the above plus...  
Quality & Yield Grading  
Buying on the Grid  
Quality Assurance  
Skeletal Anatomy

**GOOD LUCK!**

## Products and Marketing\*\*\*

Youth livestock projects focus on the selection, raising, showing and often selling of animals. By virtue of their participation in livestock projects, youth become part of an industry that provides food and fiber for the world. The steps involved in the movement of animals and animal products from producer to consumer are known as *processing and marketing*. Tremendous changes have occurred in recent years in the ways animal products are harvested and marketed but the fundamentals remain the same. Price is dependent on *supply and demand*. We can impact supply through increased breeding but demand is more difficult to affect. In order to maintain a stable market for animal products, consumers must have confidence in the **wholesomeness and quality** of what they are buying. That means the products must be safe, nutritious and tasty. Many livestock organizations have implemented promotion programs to increase market share, improve prices and increase export markets. The Beef Checkoff is an example of such a program with the slogan "Beef, its what's for dinner." Read about it at: <http://www.beefboard.org/promotion/checpromotion.asp>

Marketing may be as simple as receiving a set price per pound or may involve a pricing system known as 'Value Based Marketing'. **Value based pricing systems** account for quality and apply deductions or bonuses as products deviate from an accepted *baseline*. This should ultimately improve the quality of products offered to consumers, therefore boosting consumer confidence. Animal products may be marketed at auctions, by direct sales, contracts or electronically with the use of computers and satellite technology. Regardless of the marketing method, the seller is trying to receive the highest *price* while the buyer is trying to receive the greatest *value* (high quality and reasonable price).

## Beef Cattle Products and Marketing\*\*\*

Cattle production is the most important agricultural industry in the United States, accounting for \$67.1 billion in cash receipts in 2018. Overall, cattle production represents about 18 percent of the \$371 billion in total cash receipts from agricultural commodities in 2018. <https://www.ers.usda.gov/topics/animal-products/cattle-beef/sector-at-a-glance/>

The beef cattle industry is structured differently than most other types of livestock production. The major segments of the industry are *seedstock* producers, *commercial cow-calf* producers, *yearling or stocker* operators, and *feedlot finishing* operations. The products of these segments in the order listed are: bulls and replacement females for breeding, feeder calves to be shipped to feedyards or stocker operations, stocker calves that are grown to heavier weights on forages before entering the feedlots, and finished cattle to be harvested and hung on the rail. Animals used for breeding are eventually harvested as well with their carcasses being boned out for use in processed products like hamburger and hot dogs.

Lower priced competing meats, inconsistent products and reduced consumer confidence have been cited as reasons for reduced beef consumption throughout the 1990's. The National Cattlemen's Beef Association <http://www.beefusa.org/>, working at many levels has turned this trend around through research, education and promotion programs. Maintaining profitability in beef production is a challenge and we see the number of cattle operations decreasing while the average size operation is increasing. Efforts to integrate the various segments of the industry show promise.

## Animal By-Products

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Animal by-products are anything of economic value other than the carcass that comes from animals during harvest and processing. They are classified as edible or inedible for humans. There may be some disagreement about what is edible but we can all agree that there are many uses for what is left after the carcass is rolled into the cooler. In developing countries by-products may become jewelry, religious implements, tools, fuel, construction material, fly swatters, or musical instruments. In developed countries, advances in technology have created many products from non-animal sources (synthetics) which compete with animal by-products, thus reducing their value. Still, by-products represent multibillion dollar industries in the United States and other developed countries. An added benefit of changing inedible parts of carcasses into useful products is that the decaying materials don't pile up and cause environmental problems. **Rendering** is the term for reducing or melting down animal tissues by heat and the rendering industry refers to itself as the "original recyclers". The creativity of meat processors in finding uses for by-products has led to the saying "the packer uses everything but the moo".

### Edible by-products

#### Raw Material

Brains, Kidneys, Heart, Liver, Testicles  
Spleen, Sweetbreads, Tongue  
Oxtails  
Cheek and head trimmings  
Beef extract  
Blood  
Fats  
Intestines  
Esophagus  
Bones

#### Principal Use

Variety Meats  
  
Soup stock  
Sausage ingredient  
Soups and bouillon  
Sausage component  
Shortening (candies, chewing gum)  
Sausage casings  
Sausage ingredient  
Gelatin for confectioneries (marshmallows),  
ice cream and jellied food products

### Inedible by-products

#### Raw Material

Hides

#### Processed by-product

Leather  
Glue  
Hair

#### Principal Use

various leather goods  
paper boxes, sandpaper, plywood, sizing  
Felts, plaster binder, upholstery, brushes,  
insulation  
Industrial oils, lubricants, soap, glycerin  
Insecticides, weed killers, rubber,  
cosmetics, antifreeze, nitroglycerine,  
plastics, cellophane, floor wax,  
waterproofing agents, cement, crayons,  
chalk, matches, putty, linoleum  
Livestock and poultry feeds  
Glue, hardening steel, refining sugar,  
buttons, bone china  
Animal feed, fertilizer, porcelain enamel,  
water filters  
Fine lubricants  
Leather preparations  
Medicines  
Pet foods  
Livestock and fish feeds  
Leather preparations, textile sizing  
Livestock, pet and poultry feeds

Fats

Inedible tallow

Bones

Tankage  
Dry bone

Bone meal

Feet

Neatsfoot stock  
Neatsfoot oil  
Pharmaceuticals

Glands

Lungs

Blood

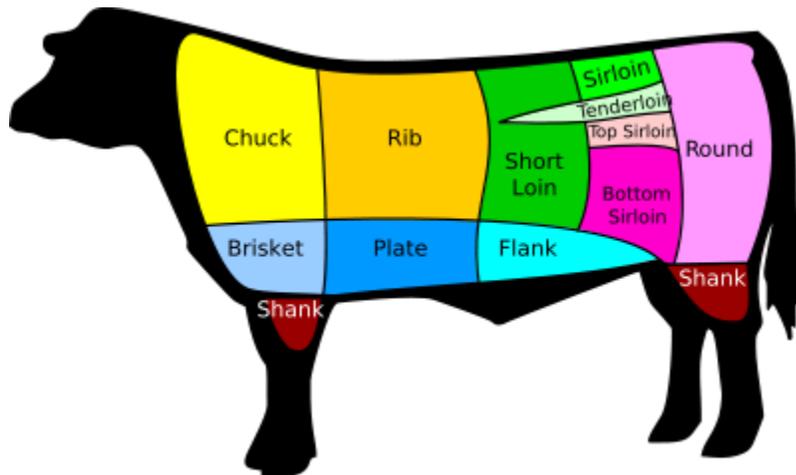
Blood meal  
Blood albumen  
Meat meal

Viscera and  
meat scraps

# Wholesale Cuts of Beef

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Fabrication of carcasses is the cutting of the carcass into wholesale and retail cuts for distribution to various markets. The size of the carcass and the preferences of the customer will determine how it is fabricated. For beef carcasses, wholesale cuts come from standard cutting methods developed to: a) Separate fat from lean portions b) Separate tough from tender sections c) Separate thick from thin sections d) Separate valuable from less valuable cuts e) Separate retail cuts by cutting across the grain.

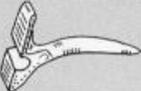


Source: Wikimedia commons

## Primal Cuts

Of the wholesale cuts, those that are *lean, tender, thick, and valuable and that contain a large proportion of their muscles running in the same direction* are called *primal* cuts. The **primal beef cuts are round, loin, rib and chuck.**

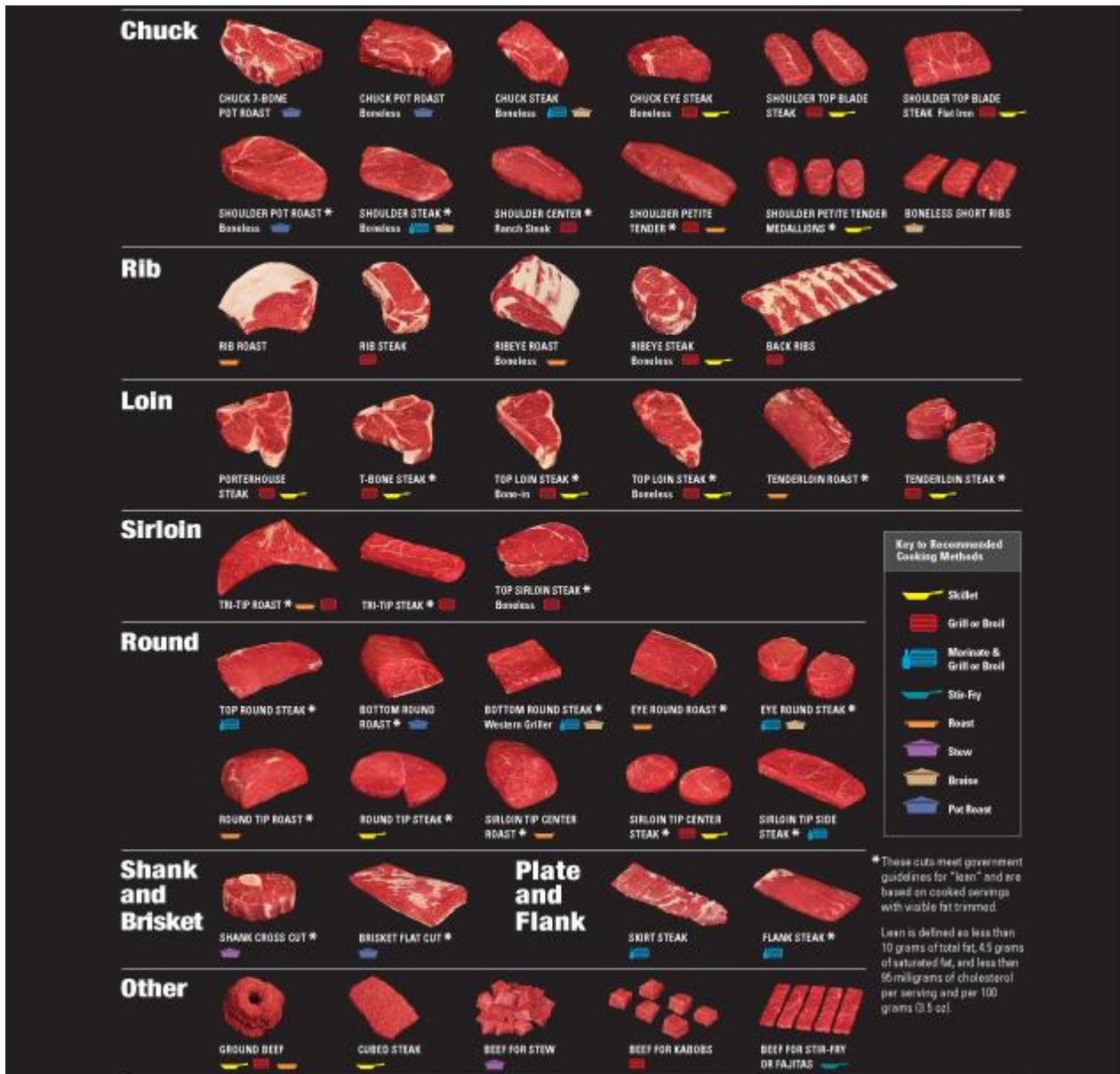
(Copied with permission from NCBA, "The Guide to Identifying Meat Cuts")

Shoulder Arm Cuts	 Arm Bone
Shoulder Blade Cuts (Cross Section of Blade Bone)	 Blade Bone (near neck)  Blade Bone (center cuts)  Blade Bone (near ribs)
Rib Cuts	 Back Bone and Rib Bone
Short Loin Cuts	 Back Bone (T-shape) T-Bone
Hip (Sirloin) Cuts (Cross Sections of Hip Bone)	 Pin Bone (near short loin)  Flat Bone (center cuts)  Wedge Bonet (near round)
Leg or Round Cuts	 Leg or Round Bone
Breast or Brisket Cuts	 Breast and Rib Bones

# Retail Cuts of Beef

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At the retail markets, boxed cuts are used to generate retail cuts for the meat case. Different stores have their own styles for each cut in an attempt to meet customers' needs. Retail specifications include size or thickness of cut, external fat trim, boneless or bone-in, and number of cuts per package. Items generated other than steaks and roasts may include stir fry, kabob, cubing material, and grinding material for processed or value-added products. Labels on meat must be specific for species, wholesale cut and retail cut names (example: Beef Rib Steak). A printable chart for retail cuts can be found at: <https://www.beefitswhatsfordinner.com/cuts/cut-charts>



Visit the grocery store and practice visually identifying retail cuts of beef or go to:

<http://aggiemeat.tamu.edu/meat-identification-pictures/>

## Feeder Cattle Grading

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Florida is a cow/calf state and is a major supplier of feeder calves (between six months and one year of age sold to feeders; light, med, heavy, mixed, all sex classes) to western states for backgrounding operations and feedlots. Feeder cattle are yearling steers and heifers between one and two years of age (light, medium, heavy and mixed) and are graded based on frame, muscling and thriftiness. The feeder cattle standards recognize three frame size grades and four muscle thickness grades.

Frame size refers to the animal's skeletal size— its height and body length— in relation to its age. It relates to the weight at which, under normal feeding and management conditions, an animal will produce a carcass that will grade Choice. Large frame animals require a longer time in the feedlot to reach a given grade and will weigh more than a small-framed animal would weigh at the same grade.

Muscle thickness in feeder cattle refers to the development of the muscle system in relation to skeletal size. Thicker muscled animals will have a carcass with more lean meat and a better Yield Grade. Muscles scores range from 1 (Moderately Thick) to 4 (less thickness than No. 3).

In addition to the twelve combinations of feeder cattle grades for thrifty animals, an **Inferior** grade exists for unthrifty animals. Thriftiness refers to the apparent health of an animal and to its ability to grow and fatten normally. Unthrifty feeder cattle may have any combination of thickness and frame size. “Double-muscled” animals are included in the Inferior grade because they are unable to produce carcasses with enough marbling to grade Choice.

The twelve possible grades of feeder cattle that have been determined to be thrifty are as follows: Large Frame No. 1, Large Frame No. 2, Large Frame No.3, Large Frame No.4, Medium Frame No. 1, Medium Frame No. 2, Medium Frame No. 3, Medium Frame No. 4, Small Frame No. 1, Small Frame No. 2, Small Frame No. 3, and Small Frame No. 4.

Source: <https://www.ams.usda.gov/grades-standards/feeder-cattle-grades-and-standards>

FRAME			MUSCLE SCORE	
	Expected Weight to Grade Choice		MINIMUM	
FRAME	STEERS	HEIFERS	THICKNESS	DEGREE OF THICKNESS
Large +			1	Moderately thick -
L Large	↑	↑	2	Tends to be Slightly Thick -
Large -	1250#	1150#	3	Thin -
Medium +			4	
M Medium	↑	↑		
Medium -	1100#	1000#		
Small +	1100#	1000#		
S Small	↓	↓		
Small -				

Visit the following web site for a Power Point presentation of feeder cattle grading:  
[http://extension.missouri.edu/webster/documents/presentations/2013-01-26\\_diversifiedagconference/2013-01-26\\_usda\\_cattle\\_grading\\_and\\_market\\_news-rickhuffman-screen.pdf](http://extension.missouri.edu/webster/documents/presentations/2013-01-26_diversifiedagconference/2013-01-26_usda_cattle_grading_and_market_news-rickhuffman-screen.pdf)

# FRAME SIZE

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**Large**



**Medium**

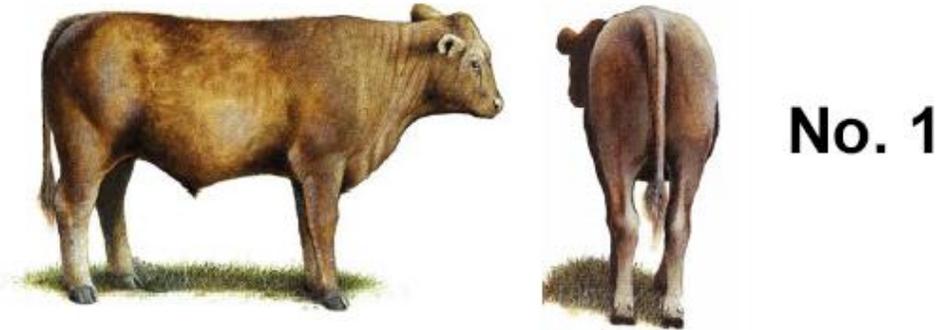


**Small**

Large and Medium frame pictures depict minimum grade requirements. The small frame picture represents an animal typical of the grade.

# MUSCLE THICKNESS

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No. 1, No. 2, and No. 3 thickness pictures depict minimum grade requirements. The No. 4 picture represents an animal typical of the grade.

## Meat Cookery

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Methods of cooking meat include dry heat or moist heat. Dry heat cookery methods improve flavor of meat through crust formation and caramelization but increase chewiness and decrease tenderness because of protein hardening. Moist heat cookery methods increase the tenderness of meat cuts that are comprised of muscles containing large amounts of connective tissue. Cookery under moist conditions for long periods at relatively low temperatures generates steam that then converts the collagen in connective tissue into gelatin. Methods should be selected based on initial tenderness of the cut, desired quality characteristics of the resulting product, available cooking facilities/equipment, and the amount of time available for preparation.

### Dry Heat

Dry Heat methods of cooking are suitable for tender cuts of meat or less tender cuts which have been marinated. Use cuts low in collagen and elastin.

**Roasting** - This method of cooking is recommended for larger cuts of meat. Meat is seasoned and placed in an open roasting pan with a cooking thermometer placed in the center to determine degree of doneness.

**Broiling** - This method is most suitable for tender, usually thin cuts of meat. Less tender cuts may also be broiled when marinated. Meat is directly exposed to the source of heat from above or from both sides at the same time. It involves high heat and produces a distinct caramelized flavor.

**Grilling** - This method is actually a method of broiling. Meat can be grilled on a grid or rack over coals, heated ceramic briquettes or an open fire.

**Pan-Broiling** - This method is faster and more convenient than oven broiling for cooking thinner steaks or chops. It involves conduction of heat by direct contact of the meat with hot metal. Fat drippings are poured off as they accumulate.

**Pan-Frying** - This method differs from pan-broiling in that a small amount of fat is added first, or allowed to accumulate during cooking. Pan-frying is for ground meat, small or thin cuts of meat.

**Stir-Frying** - This method is similar to pan-frying except that the food is stirred almost continuously. Cooking is done with high heat, using small or thin pieces of meat.

**Deep-Fat Frying** - This method is cooking meat immersed in fat. This method is only used with very tender meat.

**Microwave Cookery** - High frequency electrical energy causes molecules inside the product to vibrate creating friction and heat without heating the surrounding air. The rapid speed of microwave cooking makes it ideal for frozen cuts in institutions and restaurants. Consumers complain that microwaved meat is inferior in flavor.

**Moist Heat**

Moist Heat methods of cooking are suitable for less tender cuts of meat. Moist heat cooking helps to reduce surface drying in those cuts requiring prolonged cooking times. With moist heat cookery, meat may lose some water-soluble nutrients into the cooking liquid. However, if the cooking liquids are consumed, as in stews or soups, nutrients are transferred and not totally lost. Meat should never be boiled because high temperatures toughen protein.

**Braising** - In some regions of the country the term “fricassee” is used interchangeably with braising. The surface of the meat is seasoned, covered with flour and browned. Afterward the meat is placed in a covered pan with a small amount of liquid and cooked at low temperatures to soften the connective tissue and yield a more tender product.

**Stewing** – Small pieces of lean meat can be browned on the surface then covered with liquid and gently simmered in a covered pan until tender. Care should be taken not to let the temperature of the liquid exceed 195°F, because boiling toughens meat protein.

**Simmering** - Involves cooking in water at low temperatures (180°F) like stewing except more water is used and the meat is usually not browned first.

**Pressure Cooking** – Cooking under pressure produces steam which aids in softening connective tissue. Pieces of meat may be browned then cooked with a small amount of water in a special vented pressure cooker.

**Poaching** - Cook in a liquid that is not actually bubbling at 165 to 180 degrees. It is usually used to cook delicate foods such as fish and eggs. It takes one third less time than roasting. Poaching helps to keep shrinkage of the meat to a minimum.

**Meat Facts \*\*\***

100g Roasted	Calories (g)	Fat (g)	Sat'd Fatty Acids (g)	Protein (g)	Iron (mg)
Beef	216	9.9	3.79	29.58	2.9
Chicken	190	7.41	2.04	28.93	1.21
Goat	108	2.58	.79	29	3.3
Lamb	206	9.52	3.4	28.22	2.05
Pork	212	9.66	3.41	29.27	1.1
Rabbit (stewed)	206	8.41	2.51	30.38	2.37

## Slaughter Cattle Evaluation

Slaughter cattle are classified by weight, age and sex. Grading of live cattle is rarely practiced in modern marketing channels. Feeder cattle are placed in the feedlot in groups that are expected to gain in a similar fashion. They remain on feed for a specified amount of time and are sent to slaughter. Payment is made based on the quality and yield characteristics of the carcass upon harvest rather than on the live animal.

Though live evaluation is not used in modern beef production, steer shows require that the judge make a “*best guess estimate*” of how the animal’s carcass will look hanging on the rail. By visual appraisal and possibly with ultrasound information, judges evaluate cattle for quality and yield. Quality grades are estimated based on the amount and distribution of finish on the animal. The firmness and fullness of muscling and maturity of the animal are other factors involved in quality grading. The quality grades of steers and heifers are: *Prime, Choice, Select, Standard* and *Utility*. There are 5 possible yield grades; 1 indicates the animal with the highest yield of lean meat and 5 the lowest yield. Yield grades in live cattle are based on visual estimate of degree of fatness and the amount of muscling relative to body weight. To view a power point presentation of slaughter cattle evaluation, visit the web site:

<http://www.infovets.com/books/IER/F%20Beef%20and%20Sheep%20Industry/3-Livestock%20Evaluation%20&%20Judging/Beef%20Cattle/Beef%20Cattle%20Judging%20PowerPoint.ppt.htm>

## Carcass Evaluation

The young beef animal is usually ready to be harvested when it is 12 to 24 months old, weighing between 1,100 to 1,400 pounds and yielding about a 700 - 900 pound carcass. Carcasses may be graded for **quality and yield** as previously discussed with live cattle grading.

**Quality grades** infer *palatability* of the carcass or how good the carcass will taste. When determining quality grade of beef you must determine the class or sex of the carcass, maturity or age of the carcass, color and texture of the meat, and marbling. Marbling, at certain levels, is necessary for palatability, juiciness, and flavor. There are nine levels of marbling:

(Ab) Abundant, (MA) Moderately Abundant, (SA) Slightly Abundant, (Md) Moderate, (Mt) Modest, (Sm) Small, (Sl) Slight, (Tr) Traces, and (PD) practically devoid.

**Yield grades** represent the amount of edible meat that a carcass contains. Economically this is very important. Do not confuse dressing percent, often called yield with yield grade. The lower the yield grade number, the higher percent of carcass in total retail cuts. Yield grades are based on 4 carcass traits:

1. Amount of external fat measured between the 12<sup>th</sup> and 13<sup>th</sup> ribs known as FOE (inches)
2. Amount of kidney, pelvic, and heart fat otherwise known as KPH fat (percent)
3. Rib eye muscle (area) or REA (square inches)
4. Hot carcass weight or HCW (pounds)

Relationship Between Marbling, Maturity, and Carcass Quality Grade\*

Degrees of Marbling	Maturity**					Degrees of Marbling
	A***	B	C	D	E	
Slightly Abundant	Prime					Slightly Abundant
Moderate			Commercial			Moderate
Modest	Choice					Modest
Small						Small
Slight	Select			Utility		Slight
Traces					Cutter	Traces
Practically Devold	Standard					Practically Devold

\* 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.

## Calculating Yield Grades

1. Determine the Preliminary Yield Grade. Adjusted fat over the ribeye (FOE) of .40 equals a preliminary grade of 3.0. Each change of  $\pm .10$  inch from .40 inches changes the PYG by  $\pm .25$ .
2. Carcass Weight Determines how large the rib eye area must be. A 600 pound carcass requires an 11.0 inch<sup>2</sup> ribeye for no adjustment to PYG. Each additional 25 pounds carcass weight requires an additional .3 inch<sup>2</sup> REA and each 25 pounds less than 600 allows .3 inch<sup>2</sup> less REA for no adjustment to PYG.
3. Adjust for Ribeye Area Deviations from required size. Rib eye area in excess by 1 inch<sup>2</sup> changes PYG by -.3. For each 1 inch<sup>2</sup> deficiency in REA the PYG will increase by .3
4. Adjust for Percent KPH Deviations from 3.5 Percent. A change of  $\pm 1$  percent changes the PYG by  $\pm .20$  YG.

Work the following example and have your instructor check your work.

FOE = 0.5

Carcass Weight = 650 pounds

Rib Eye Area = 12.6 inch<sup>2</sup>

KPH = 2.5%

<http://meat.tamu.edu/beefgrading/>

## Buying on the Grid

In today's beef marketing systems packers do not buy live cattle. Rather they buy and sell cattle "on the rail" by "formula pricing" or with a "negotiated grid". The term "grid" is used because prices are determined by using a spreadsheet-type grid where values are arranged in columns and rows by USDA Quality and Yield Grades. Grids are constructed from **base prices**. For most, the base price is for a **Choice YG 3**, and carcasses are assigned **premiums or discounts** to that price. Some grids are splitting YG 2 and YG 3 into "A" and "B" divisions. The "A's" are 2.0 to 2.4 or 3.0 to 3.4 while the "B's" are 2.5 to 2.9 or 3.5 to 3.9. Cattle not fitting the grid, often called "out-cattle", consist of B maturity carcasses, Slight or less marbling score (no-roll), carcass weight falls outside stipulated range ( $\geq 900$  or  $\leq 550$ ) or dark cutters. Below is an example of the premiums and discounts that can be applied to the based price for a carcass value program. Premiums and discounts are additive.

Table 1. Grid arrangement of premiums and discounts for carcasses falling in various quality and yield grade categories (the top figure within each cell defines the quality grade adjustment, the bottom figure defines the yield grade adjustment).

Quality	Yield				
	1	2	3	4	5
Prime	+ 8.00 + 3.00	+ 8.00 + 1.50	+ 8.00	+ 8.00 - 20.00	+ 8.00 -25.00
Choice	+ 3.00	+ 1.50	Base	-20.00	-25.00
Select	- 7.40 + 3.00	- 7.40 + 1.50	- 7.40	- 7.40 -20.00	-7.40 -25.00
Standard	- 35.00	- 35.00	- 35.00	- 35.00	-35.00
Out cattle: Weight < 650		Weight > 950	No roll	Dark cutter	Age
Discount:	20.00	20.00	20.00	20.00	20.00

It is important to note that premiums and discounts vary over time based on market conditions. Premiums are more stable over time while discounts often vary weekly with wholesale boxed beef price spreads.

### Example

U.S. Choice YG 3 Beef Carcass that weighs 970 pounds (Base price = \$165)

Base price = \$165.00  
 YG 4 discount = -20.00  
Weight discount = - 20.00  
 Carcass price/cwt= \$125.00

Total carcass value - \$125/cwt x 970 pounds = \$1212.50

You can read more about this at: [http://beefmagazine.com/mag/beef\\_grid\\_pricing\\_primer](http://beefmagazine.com/mag/beef_grid_pricing_primer)

## Beef Quality Assurance

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Beef quality assurance (BQA) programs are in place within every segment of the cattle industry in order to provide safe and wholesome beef. Success of these programs is measured by consumer confidence which translates into increased consumer demand for beef. State programs are voluntary and administered through state beef councils, Land Grant Universities and state cattle associations. Cattlemen recognize that self-regulation is far superior to government regulation and that BQA programs are simply good business practices.

Every five years the beef checkoff program funds a national beef quality audit to evaluate progress the industry has made on a variety of production issues. The 2016 NBQA was designed to provide direction on the characteristics of beef in the areas of food safety, quality (eating satisfaction), weight and size, how and where cattle are raised and visual characteristics (branding and/or horns). The executive summary can be found at: [www.bqa.org](http://www.bqa.org)

Beef Safety - Harvest and processing occur under strict government inspection. USDA Food Safety Inspection Service (FSIS) is responsible for protecting the meat supply under the Federal meat Inspection Act. <http://www.fsis.usda.gov/wps/portal/fsis/home>. Pathogen Reduction/Hazard Analysis and Critical Control Points (PR/HACCP) system is used to identify and prevent food safety risks.

Beef Quality – improved quality and yield grades, uniformity, consistency, increased tenderness and palatability with a reduction in excess fat trim.

Beef Checkoff is Reaching millions of consumers through cutting edge artificial intelligence tools, like “Chuck Knows Beef,” to help revolutionize the meat shopping experience  
[www.mybeefcheckoff.com](http://www.mybeefcheckoff.com)

Consumer Safety – Visit the following web sites for information and video clips on safe handling and preparation of beef products: products [https://www.beefitswhatsfordinner.com/raising-beef/beef-safety?gclid=EAIaIQobChMIqMHM6pSs6gIVh4bACh3S3gM\\_EAAYASAAEgLfQfD\\_BwE](https://www.beefitswhatsfordinner.com/raising-beef/beef-safety?gclid=EAIaIQobChMIqMHM6pSs6gIVh4bACh3S3gM_EAAYASAAEgLfQfD_BwE)

- Use a separate cutting board when prepping raw beef. Wash the board thoroughly in hot, soapy water before using the same board for any other ingredients.
- Never put cooked beef back on the same plate you used for raw meat, and make sure to use clean utensils as well.
- Don't leave cooked food sitting out at room temperature for more than two hours.
- Use an ovenproof or instant-read thermometer to prevent over- or undercooking. Refer to safe cooking temperatures below.
- Roast meats at oven temperatures of 325°F or above.
- Keep cold foods cold and hot foods hot. If you're serving a buffet, you can keep cold foods on ice to maintain a temperature below 40°F, and keep hot foods on a hot plate or sterno flame to ensure internal temperatures stay above 140°F.
- As soon as your meal is over or within two hours (whichever comes first), place leftover food in the refrigerator. Allow hot or warm leftovers to cool in the fridge, not at room temperature.
- Divide large amounts of leftovers into small portions. The smaller size will not only be convenient for leftovers, but shallow containers will allow for quick chilling.
- Any leftovers should be covered, refrigerate and eaten within 3 to 4 days – or frozen up to 3 months. Reheat to 165°F throughout. Stir foods during reheating to be sure that all the food reaches the appropriate temperature.
- When in doubt, throw it out. Never taste leftover food that looks or smells strange.

### Safe Cooking Temperatures -

Product	Minimum internal Temperature (° F) for safety and quality
Fresh Beef	
Ground beef	160°
Whole cuts (roasts and steaks)	145°
Leftovers, casseroles	165°

# Beef Skeletal Anatomy

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When fabricating the carcass into wholesale and retail cuts, skeletal anatomy provides the framework and landmarks for each of the cuts. Identification of bone-in retail cuts is much simpler when you have a good grasp of the bones associated with each region of the carcass.

## BEEF SKELETAL CHART

Location, Structure and Names of Bones

