

MEAT TECHNOLOGY

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Content:

- Inspection
- Carcass yield
- Types of cuts
- Meat grading

TERMINOLOGY

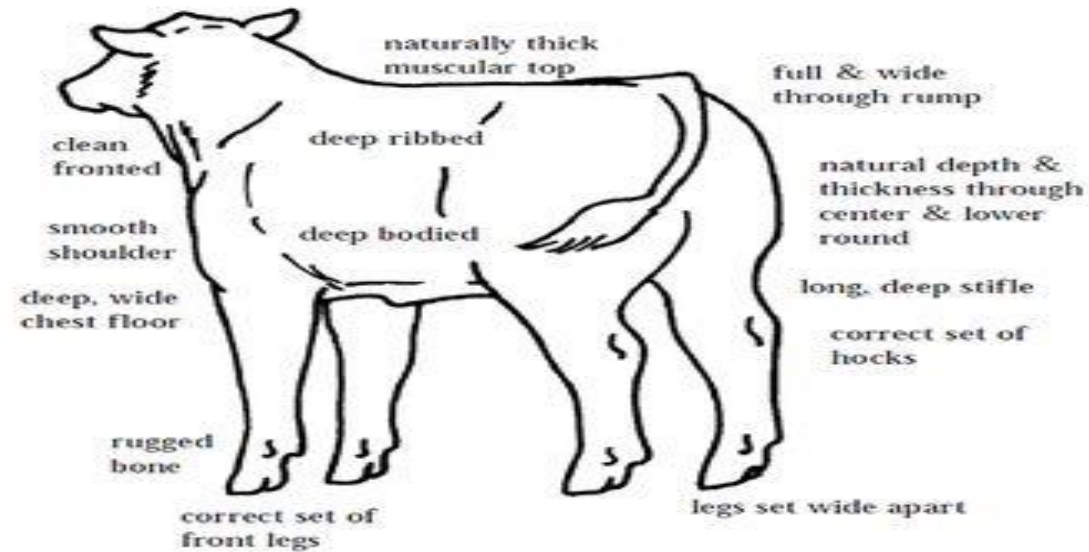
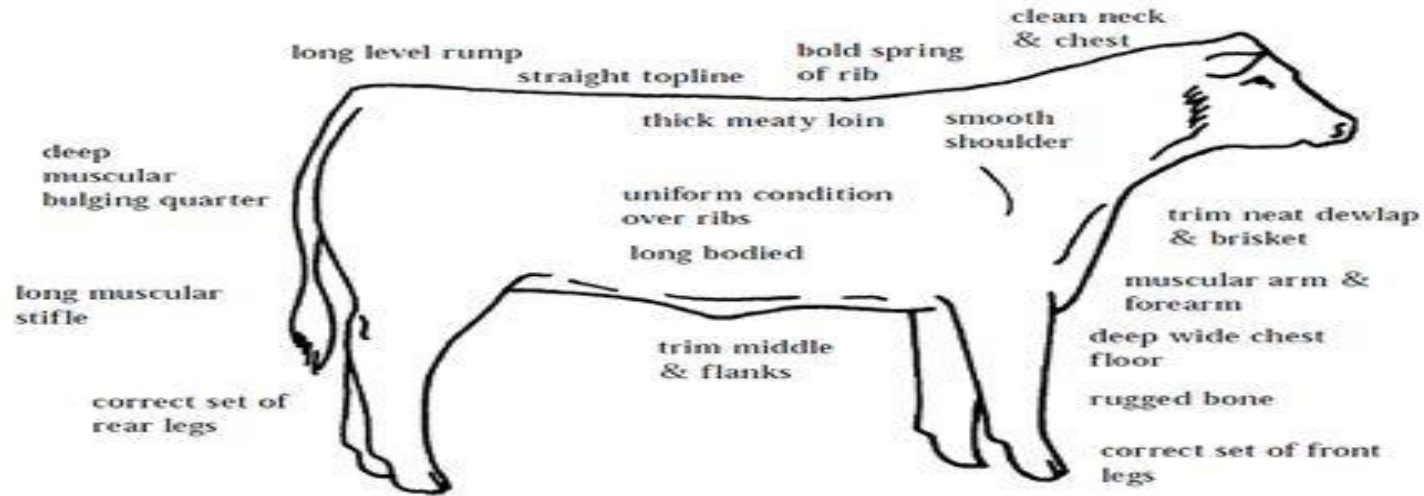
- Meat grade- A step in quality of different animal carcasses.
- Primal cuts of meat- Large cuts of meat from an animal. Also known as the wholesale cuts of meat.
- Retail cuts of meat- Smaller cuts of meat made from the primal, or wholesale, cuts.

INSPECTION

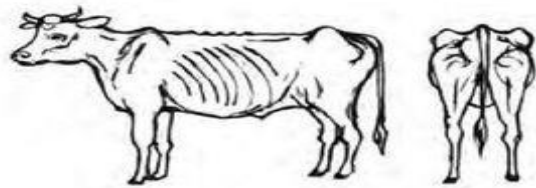
- It consists primarily of inspectors' **examining specified organs of beef carcasses for visible lesions that may indicate that the animal was diseased prior to butchering.** Traditional inspection also involves checking for proper dressing of the carcass, including removal of bruises or other blemishes.
- Meat is from healthy animals and slaughtered under sanitary conditions.
- Free from contamination and safe to eat at the time of inspection.
- Mandatory- all meat sold must pass inspection.

INSPECTION

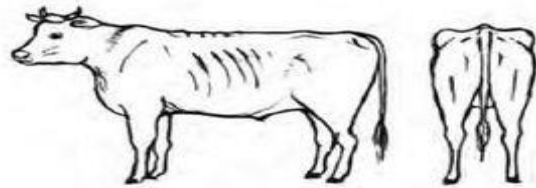
Ideal Market Steer



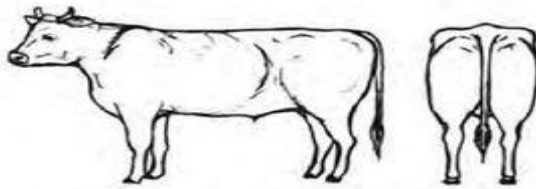
INSPECTION



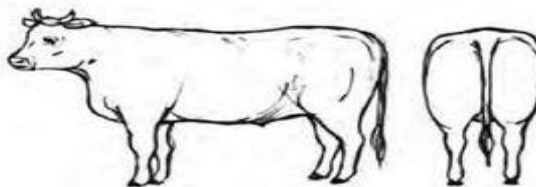
Condition score 1
Backbone prominent
Hips and shoulder bones prominent
Ribs clearly visible
Tail-head area recessed
Skeletal body outline



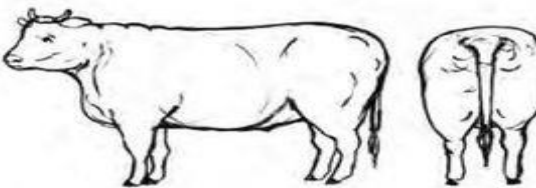
Condition score 2
Backbone visible
Hips and shoulder bones visible
Ribs visible faintly
Tail-head area slightly recessed
Body outline bony



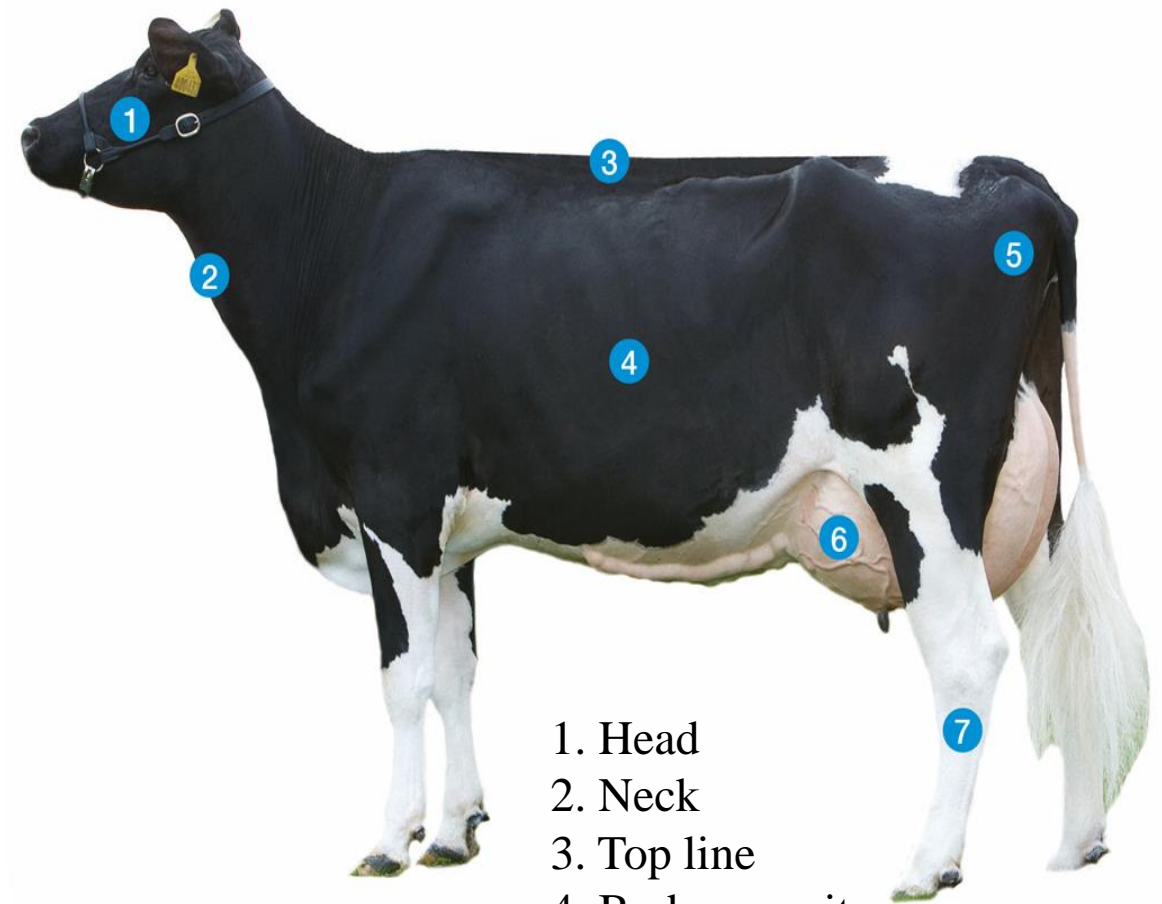
Condition score 3
Hip bones visible faintly
Ribs generally not visible
Tail-head area not recessed
Body outline almost smooth



Condition score 4
Hip bones not visible
Ribs well covered
Tail-head area slightly lumpy
Body outline rounded



Condition score 5
Hip bones showing fat deposit
Ribs very well covered
Tail-head area very lumpy
Body outline bulging due to fat



1. Head
2. Neck
3. Top line
4. Body capacity
5. Hindquarter
6. Udder
7. Legs and feet

CARCASS YIELD

- Carcass yield is one of the criteria of the grading.
- Generally sheep, goat, cattle and buffalo carcasses include the portions of body after removal of the blood, hide/skin, head, feet, digestive tract, bladder, pluck and adhering tissues etc.
- In case of pig carcass, skin and head are included in the carcass.
- Carcass mainly consists of :
 - muscular tissues,
 - fatty tissues,
 - bones, tendons and other connective tissues,
 - large blood vessels etc.
- Approximately, 50, 55 and 75 % of the live weight of sheep, cattle and pigs respectively remains in the carcass.

CARCASS YIELD

Component	Cattle (%)	Pig (%)	Sheep (%)
Carcass meat	34	52	32
Bones	16	17	18
Organs	16	7	10
Skin and attached fat	6	6	15
Blood	3	3	4
Fatty tissues	4	3	3
Horns, hooves, feet and skull	5	6	7
Abdominal and intestinal contents	16	6	11

CARCASS YIELD

- Dressing percentage is a comparison of the carcass weight in relation to the live weight of the animal and it is calculated as follows:

$$\text{Dressing percentage} = \frac{\text{Dressed weight (carcass weight)}}{\text{Live weight of the animal}} \times 100$$

Sometimes edible offals like heart, liver, kidney, spleen etc. are also included in the dressing percentage because these are sold with the meat at same price.

TYPES OF CUTS

- Whole carcass
- Halves- «sides of beef»
- Quarters
 - Hind quarter
 - Front quarter



CARCASS SEGREGATION

- The carcass is divided into quarters, **the forequarter and hindquarter**, between the 12th and 13th ribs.
- The major wholesale cuts fabricated from the forequarter are the chuck, brisket, foreshank, rib, and shortplate.
- The hindquarter produces the short loin, sirloin, rump, round, and flank.

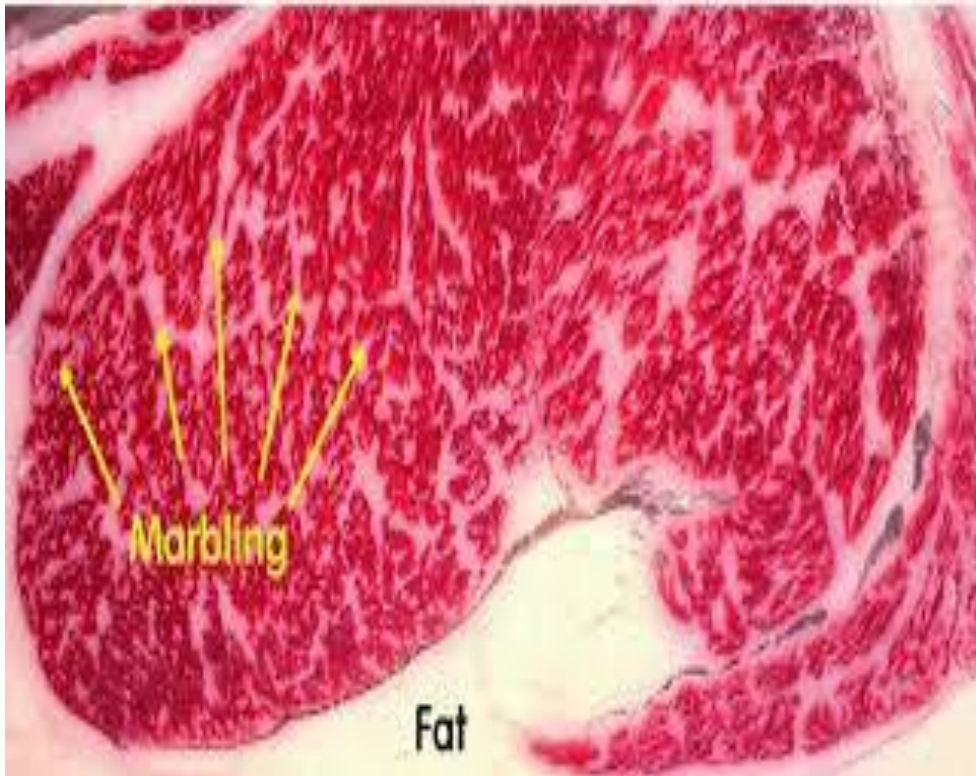


GRADING

- Meat grading is a procedure by which carcasses are segregated on the basis of their expected palatability (how it will taste with respect to tenderness, juiciness, and flavor) and yield attributes (closely trimmed edible cuts from the carcass).
- Voluntary service paid by meat processors; cost is passed on to consumers in price.
- Provides information relating to taste/palatability of meat.

BEEF GRADES ARE BASED ON TWO FACTORS:

- 1. Degree of marbling
- 2. Degree of maturity of the animal



BEEF GRADES ARE BASED ON TWO FACTORS:

- **1. Degree of Marbling**
- Marbling. Within a maturity group, marbling (the amount and distribution of intramuscular fat) within the ribeye is the primary determinant of Quality Grade.
- Visual evaluations of marbling in the ribeye (at the 12th rib cross-section) are related to differences in eating quality of beef.
- Beef cuts with high levels of marbling are more likely to be tender, juicy and flavorful than cuts with low levels of marbling.



BEEF GRADES ARE BASED ON TWO FACTORS:

- **2. Degree of Maturity of the animal.**
- Mature Steer vs Young Steer Maturity.
- The age of a beef animal has a direct effect on tenderness of the meat it produces.
- As cattle mature, their meat becomes progressively tougher.
- To account for the effects of the maturing process on beef tenderness, evaluations of carcass maturity are used in determining Quality Grades.

2. DEGREE OF MATURITY OF THE ANIMAL

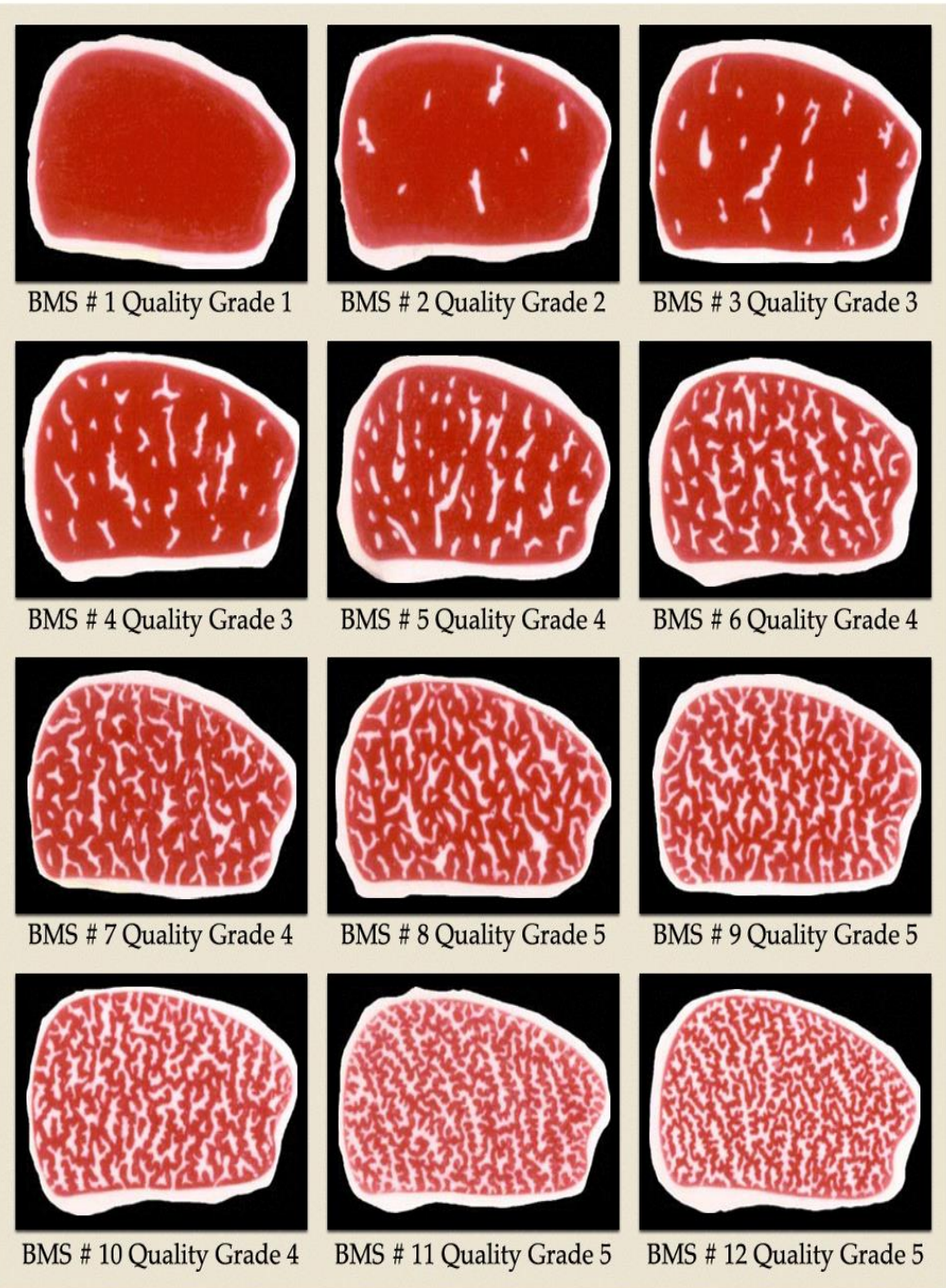
- There are five maturity groupings, designated as A through E.
Approximate ages corresponding to each maturity classification are:
- A — 9 to 30 months
- B — 30 to 42 months
- C — 42 to 72 months
- D — 72 to 96 months
- E — more than 96 months

MATURITY

- As animal ages
 - Cartilage turns to bone
 - Lean becomes darker
 - Accumulates myoglobin
 - Lean becomes coarser
- Thus bone and lean are considered when assessing carcass age.

WHAT IS MARBLING ?

- Marbled meat is meat, especially red meat, that contains various amounts of intramuscular fat, giving it an appearance similar to marble.



MARBLING

- Intramuscular fat
 - Adds flavor
 - Slightly related to tenderness
 - Protects tenderness at high degrees of doneness
- For grading purposes
 - Observed within the ribeye muscle
 - Measured in degrees based on official standard cards

THERE ARE 8 GRADES OF BEEF

Grades for human consumption

- Prime
- Choice
- Select

Grades used in other commercial products

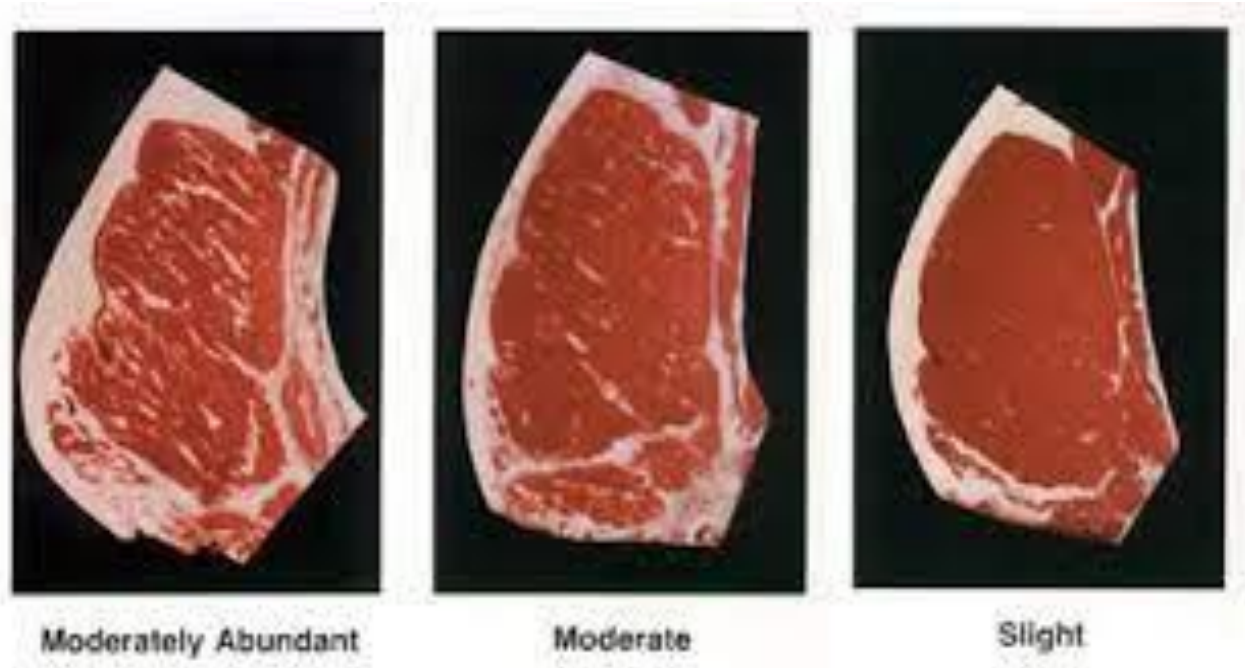
- Commercial
- Utility
- Cutter
- Standard
- Canner

GRADES OF BEEF

The grade of an animal is based on the amount of fat.

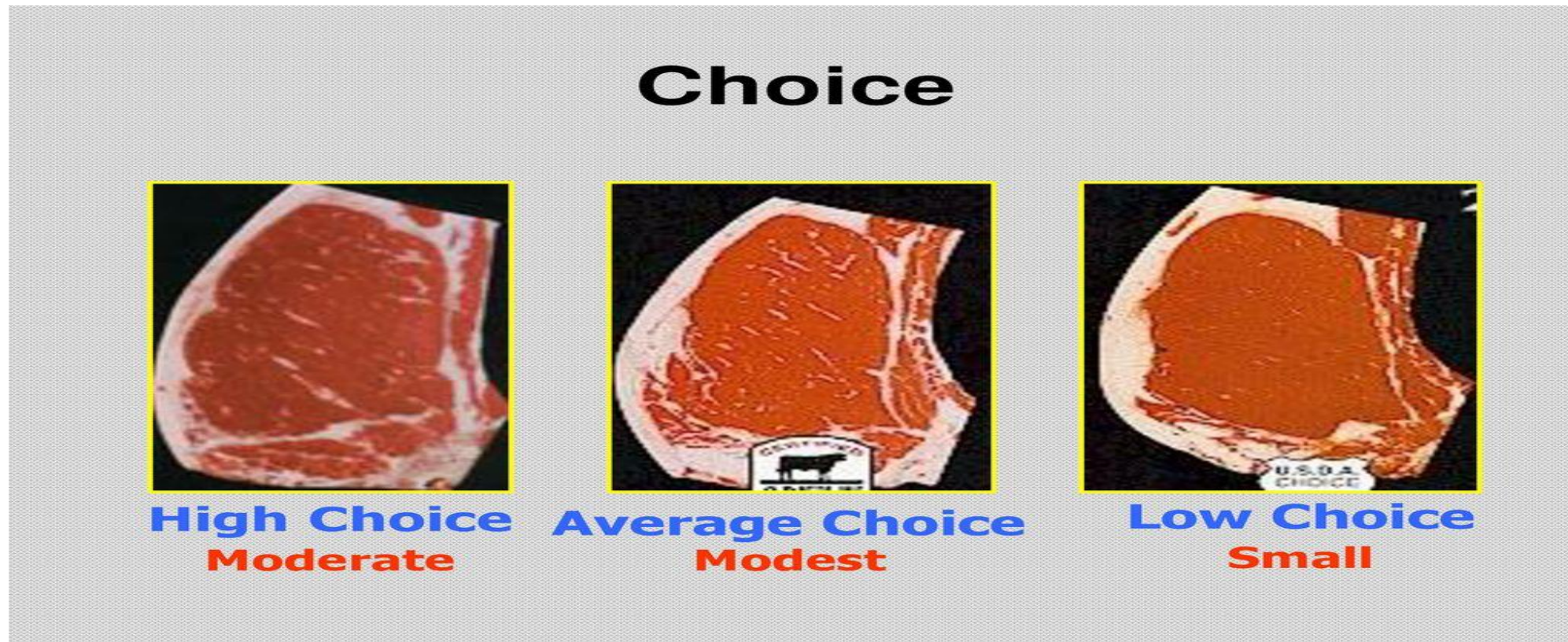
1. Prime- High in fat

- inter-muscular (between muscles and its fat cap)
- intra-muscular (marbling)
- Ex: Prime rib
- High in price



GRADES OF BEEF

- 2. Choice- Moderate amount of fat
 - Less inter + intra muscular fat
 - Ex: «Standing rib roast



GRADES OF BEEF

Select and Standard



High Select
Slight⁵⁰⁻⁹⁹

Low Select
Slight⁰⁰⁻⁴⁹

High
Standard
Traces

Low
Standard
Practically
Devoid

3. Select- little to no fat

- Little intra muscular fat (marbling)
- Small or non-existent fat cap
- Lower end markets
- Ex: Roast

TWO BASIC CUTS OF BEEF

- **Primal cuts**
 - Larger cuts of meat
 - Shipped to grocery stores and meat markets to be cut smaller by butcher.
 - Also called **wholesale cuts**
- **Retail cuts** are the family sized or single serving cuts that are purchased at the store.

WHOLESALE CUTS VS. RETAIL CUTS

- There are nine basic wholesale cuts from which we get our retail cuts.

Chuck

Short loin

Round

Flank

Short plate

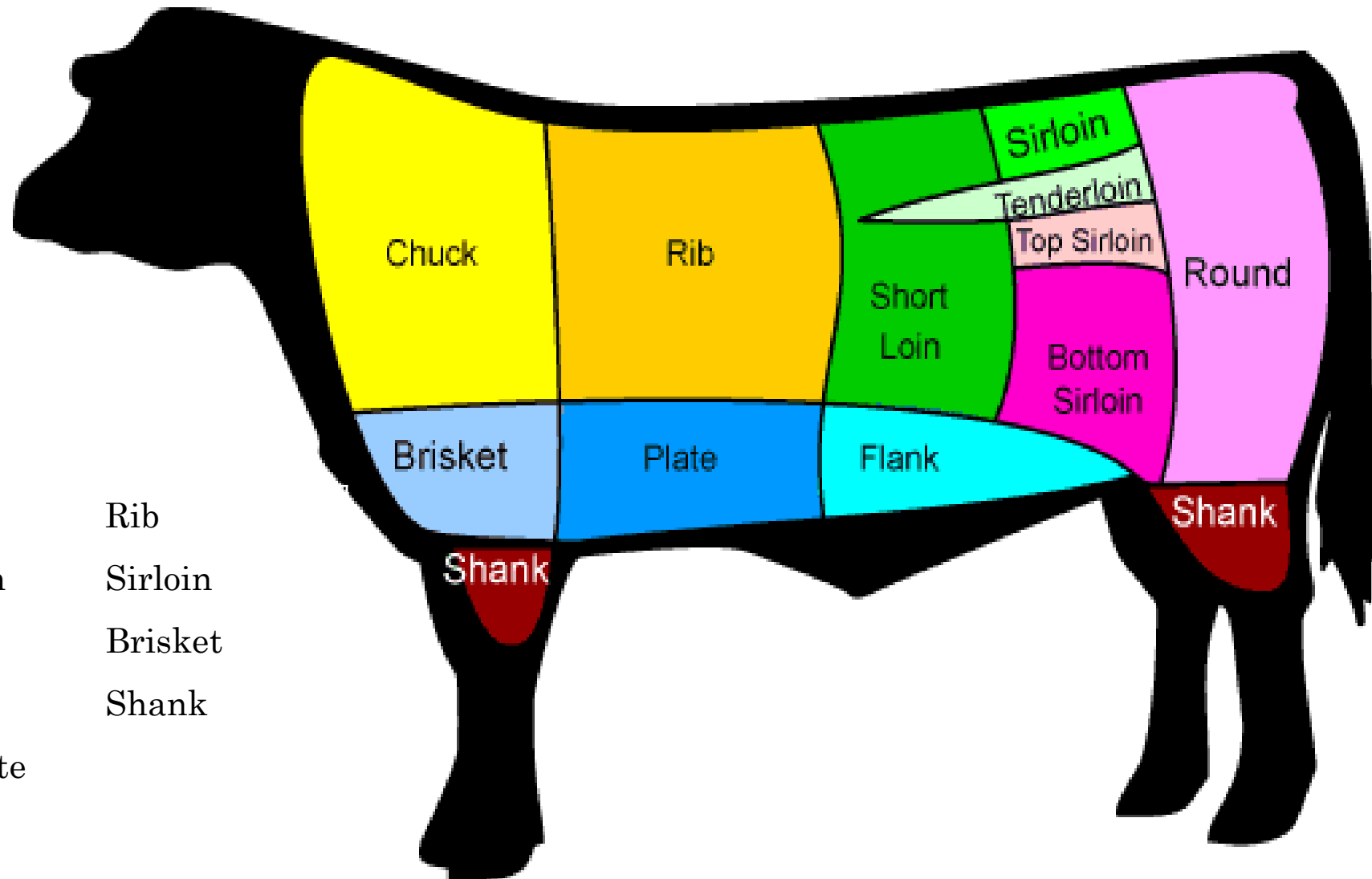
Rib

Sirloin

Brisket

Shank

HOW THE WHOLESALE CUTS OCCUR ON THE STEER



Chuck

Rib

Short loin

Sirloin

Round

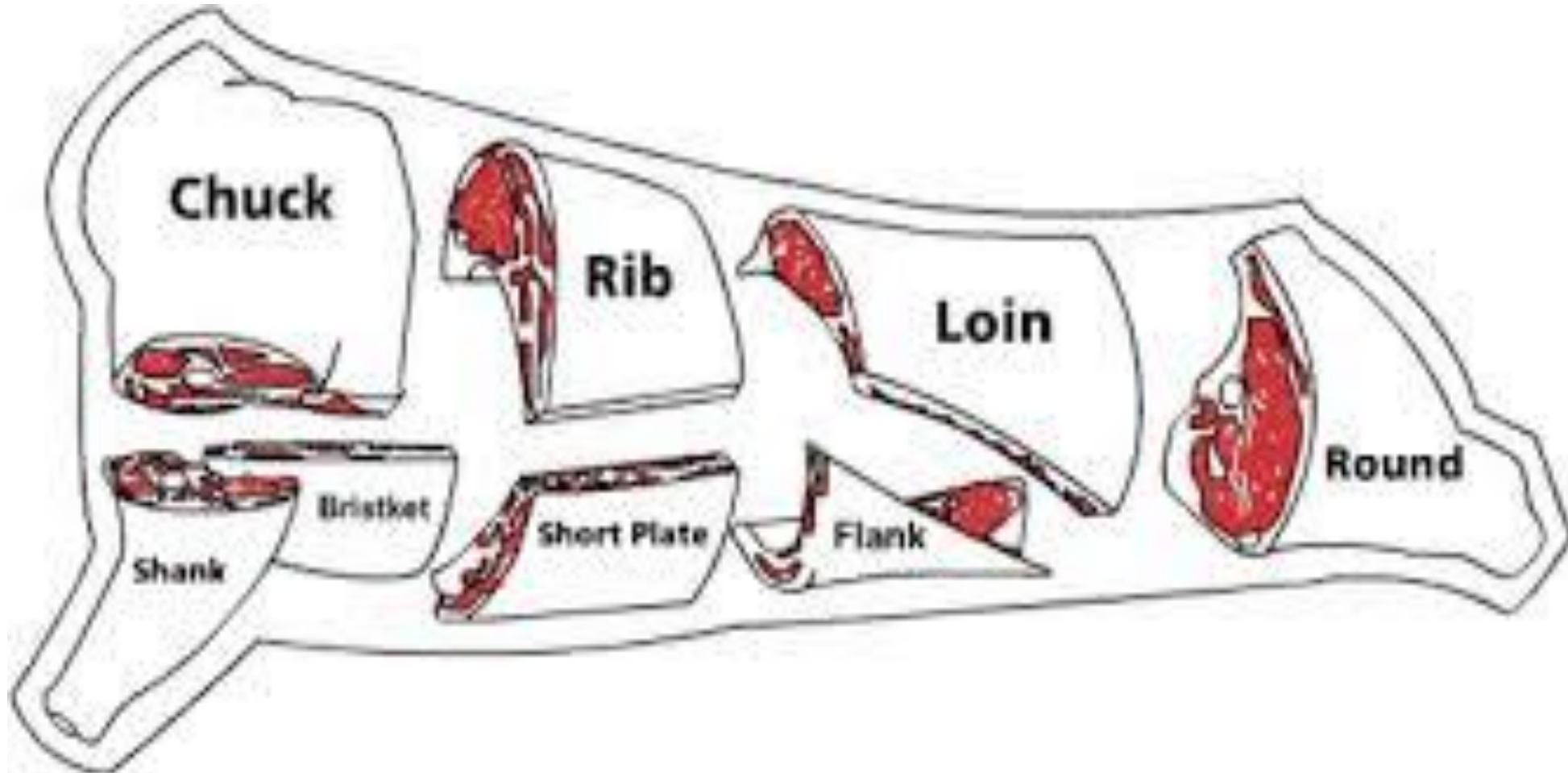
Brisket

Flank

Shank

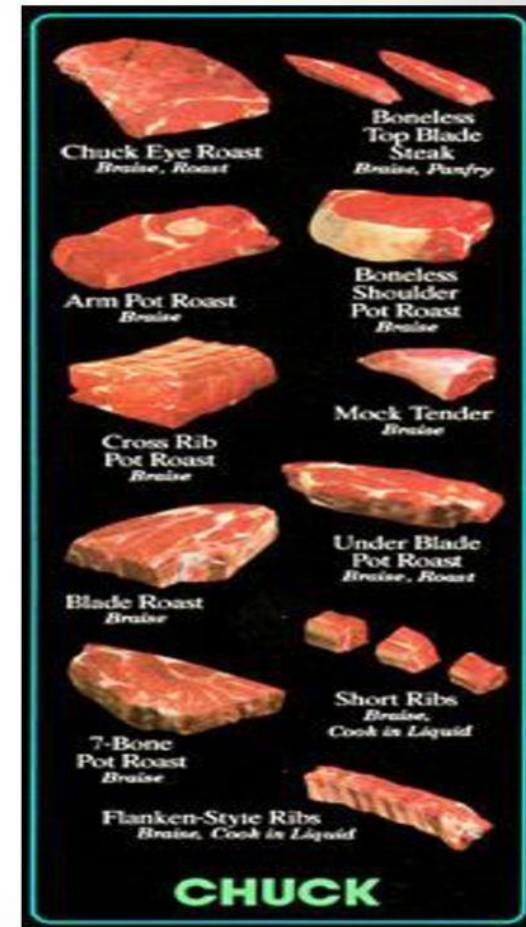
Short plate

THE 9 WHOLESALE CUTS ON A CARCASS



CHUCK

- From the neck region
- Most economical cuts-
 - Less tender
 - Moist heat
- Retail cuts:
 - Boneless Chuck
 - Roast,
 - Cross rib roast
 - Short ribs
 - Pot roasts



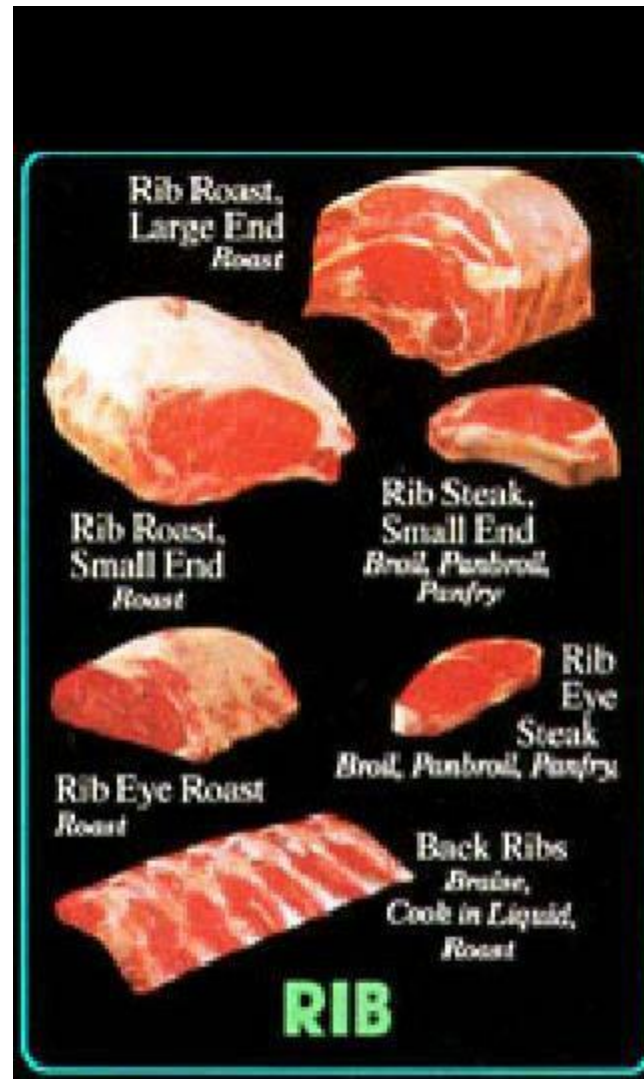
RIB

- Used for many applications
- One of the most desirable in terms of tenderness



RETAIL CUTS FOR THE RIB

- Back ribs
- Rib eye roast
- Rib eye steak
- Rib steak



THE RIB

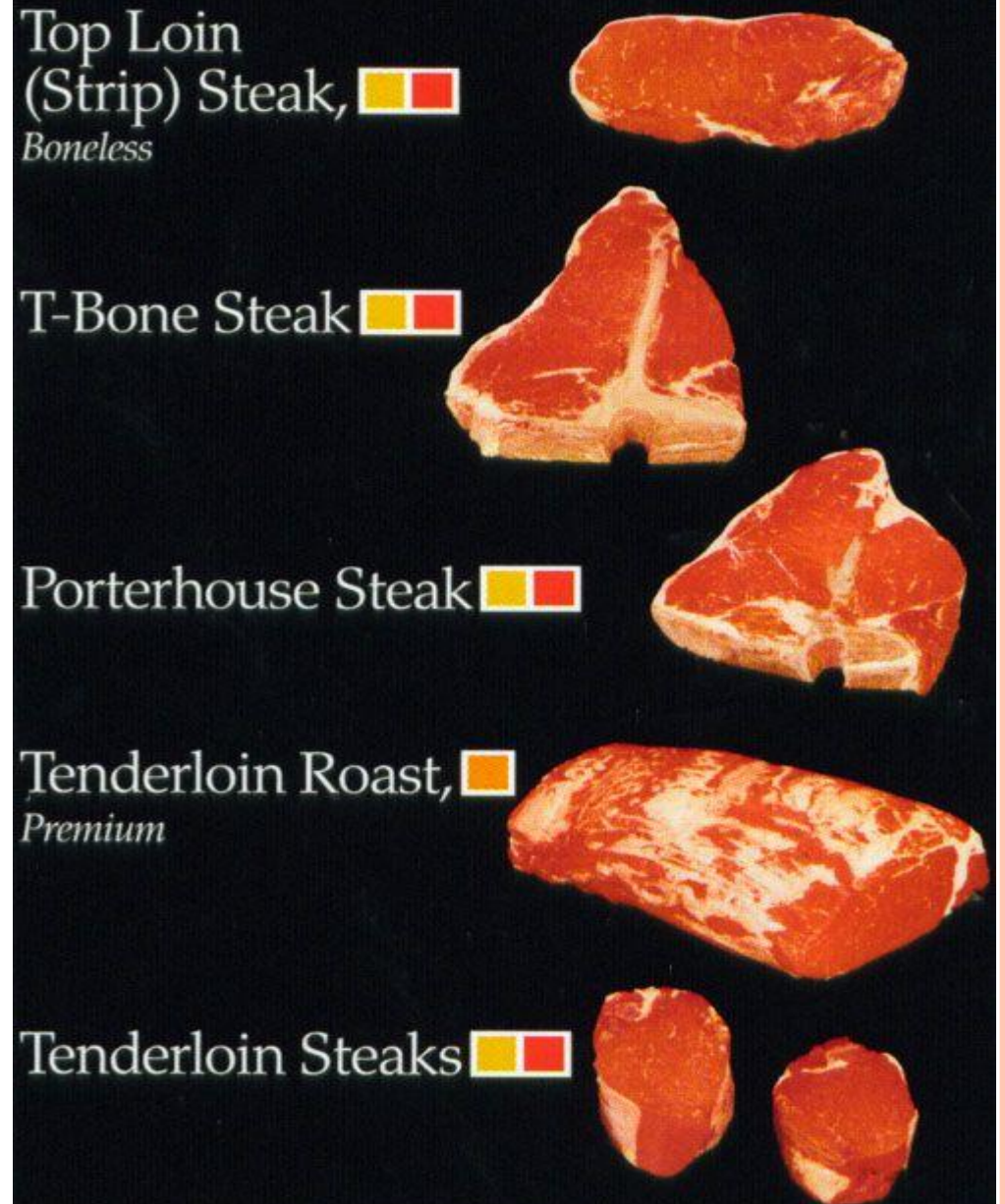
The rib cut is the rib section of the animal.

We derive several retail cuts from this area including prime rib, and back ribs.

SHORT LOIN

- Consists of the loin and short ribs of the steer
- One of the most desirable for tenderness.
- Typically the most expensive
- Retail cuts
 - Top loin (strip) steak
 - T-Bone steak
 - Porterhouse steak
 - Tenderloin roast
 - Tenderloin steak

SHORT LOIN 3



SIRLOIN

- Is the waist of the animal, located between the ribs and round.
- Top sirloin steak is a favorite cut from this section.
- Retail cuts:
 - Top sirloin steak
 - Sirloin steak



ROUND

- The rump and tip muscles.
- It can be used in multiple applications and is fairly inexpensive.
- Fat content is generally 5-8%.
- Low in fat makes it tougher
- Retail cuts
 - Round steak
 - Boneless rump roast
 - Tip steak
 - Top round roast
 - Tip roast
 - Bottom round roast
 - Top round steak



FLANK

- The flank is the area between the body and the hind legs.
- No bones to identify.
- Retail cuts:
 - Flank steak
 - Flank steak rolls



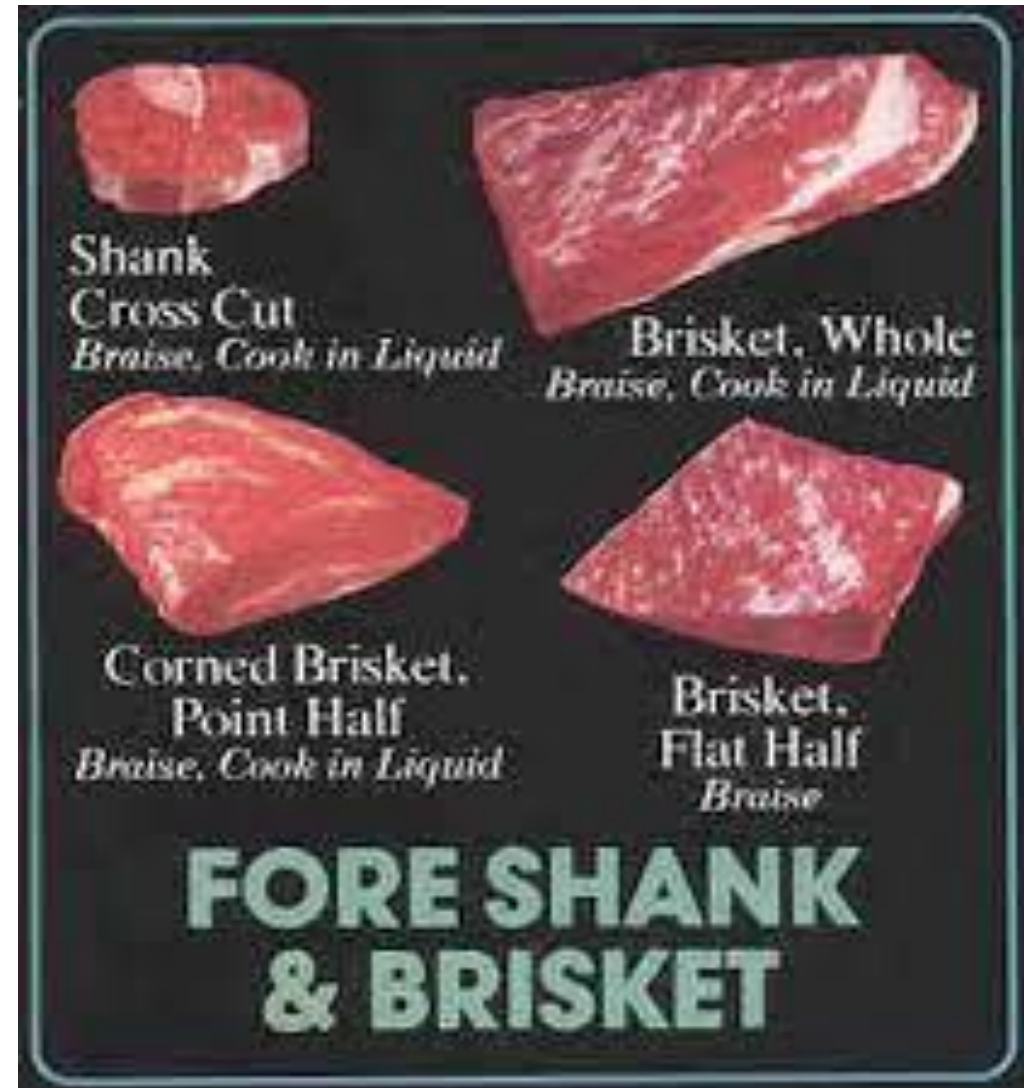
PLATE

- The plate is sometimes referred to as the short plate.
- The plate is the section that is separated from the rib.
- The retail cuts include:
 - Skirt steak
 - Short ribs



FORE SHANK AND BRISKET

- Taken from the breast section beneath the Chuck, under the first five ribs.
- Brisket is the most common retail cut.
- Retail cuts:
 - Corned brisket
 - Brisket-whole and half
 - Shank cross cut



RIB EYE STEAK

Bone out

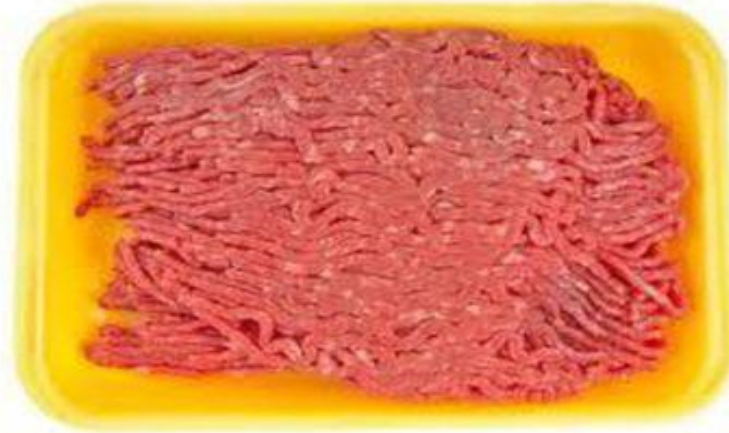


Bone in



Retail Cuts

Retail cuts- Individual cuts of meat sold to consumers



MEAT TENDERNESS

A. Indicators/Clues

- 1. Location of cut on animals (see wholesale cuts)
 - **Suspension muscles-** muscles which do not receive exercise; tender muscles; dry heat cooking methods.
 - **Locomotion muscles-** muscles which are exercised in moving the animal; tough muscles; moist heating methods.

