



Beef Grading

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Inspection

- Wholesomeness
- USDA
Food Safety Inspection Service
- Veterinarian
- Mandatory
- Taxpayer funded



Grading

- Value – Quality and Yield
- USDA
Agricultural Marketing Service
- Grader
- Voluntary
- Packer pays per hour



Grading

- The process of dividing a commodity into groups which differ in the marketing process
- Grades:
 - Must be based on factors that are important to buyers and sellers
 - Should reflect the final use of the product
 - Should be practical and conform, as closely as possible, to existing trade practices



Dressing Percentage

- $HCW/LW * 100$
- Steers & Heifers = 61 – 66%
- Cows = 48% (very variable)
- Affected by:
 - Fill
 - Finish (fat)
 - Muscling
 - Mud, Horns, Etc.



Yield Grading

- USDA YG 1, 2, 3, 4 or 5
- To predict CUTABILITY
- Percent boneless, closely trimmed retail cuts from the round, loin, rib, and chuck
- 1 = highest cutability (more muscle; less fat)
- 5 = lowest cutability (less muscle; more fat)



Yield Grading Factors

- Fat Thickness = Preliminary Yield Grade (PYG)
- Hot Carcass Weight (HCW)
- Ribeye Area (REA)
- Kidney, Pelvic & Heart Fat % (KPH)

Ribbing

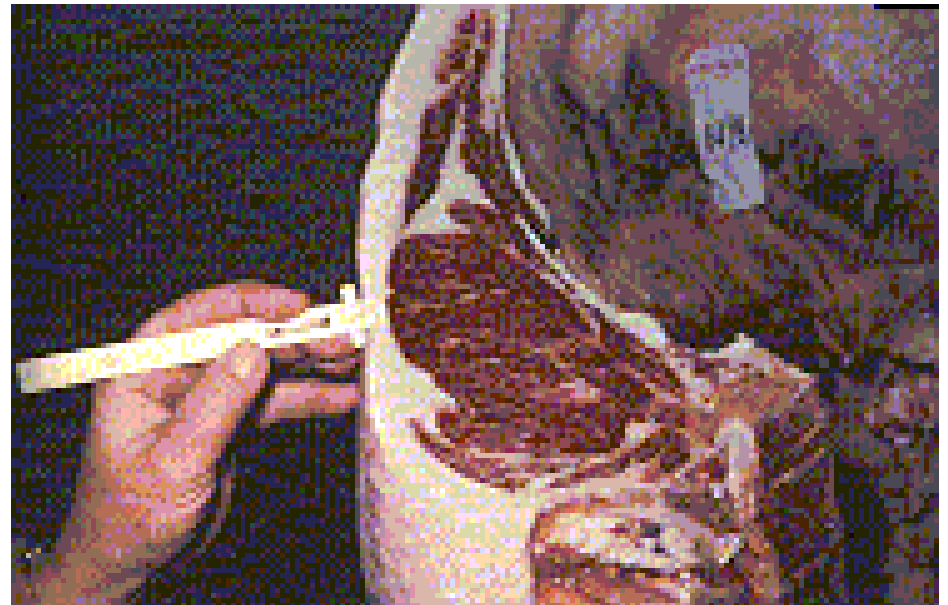
- Between the 12th & 13th Rib
- Bloom Time = approx. 15 min for oxygenation of the ribeye





Fat Thickness (PYG)

- $\frac{3}{4}$ Distance opposite the ribeye
- Can measure as fat thickness or PYG
- Must convert if use fat thickness
- Also, make adjustments based on fat of entire carcass





Fat Thickness to PYG

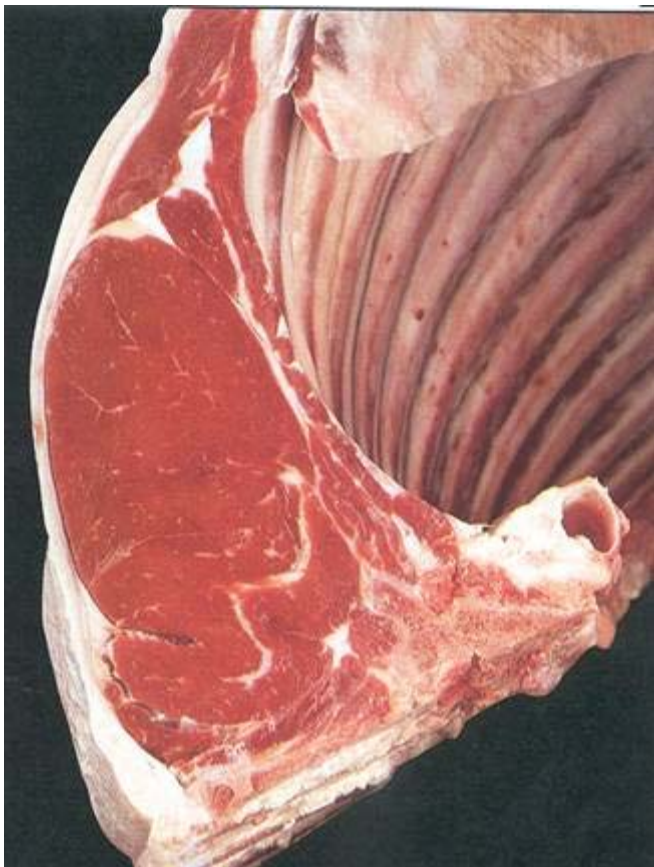
- 0.0" fat = 2.0 PYG
- For every 0.1" increase in fat increase PYG 0.25
 - 0.1" = 2.25 PYG
 - 0.2" = 2.5 PYG
 - 0.3" = 2.75 PYG
 - 0.4" = 3.0 PYG
 - 0.6" = 3.5 PYG
 - 0.8" = 4.0 PYG
 - 1.2" = 5.0 PYG



PYG 2.0

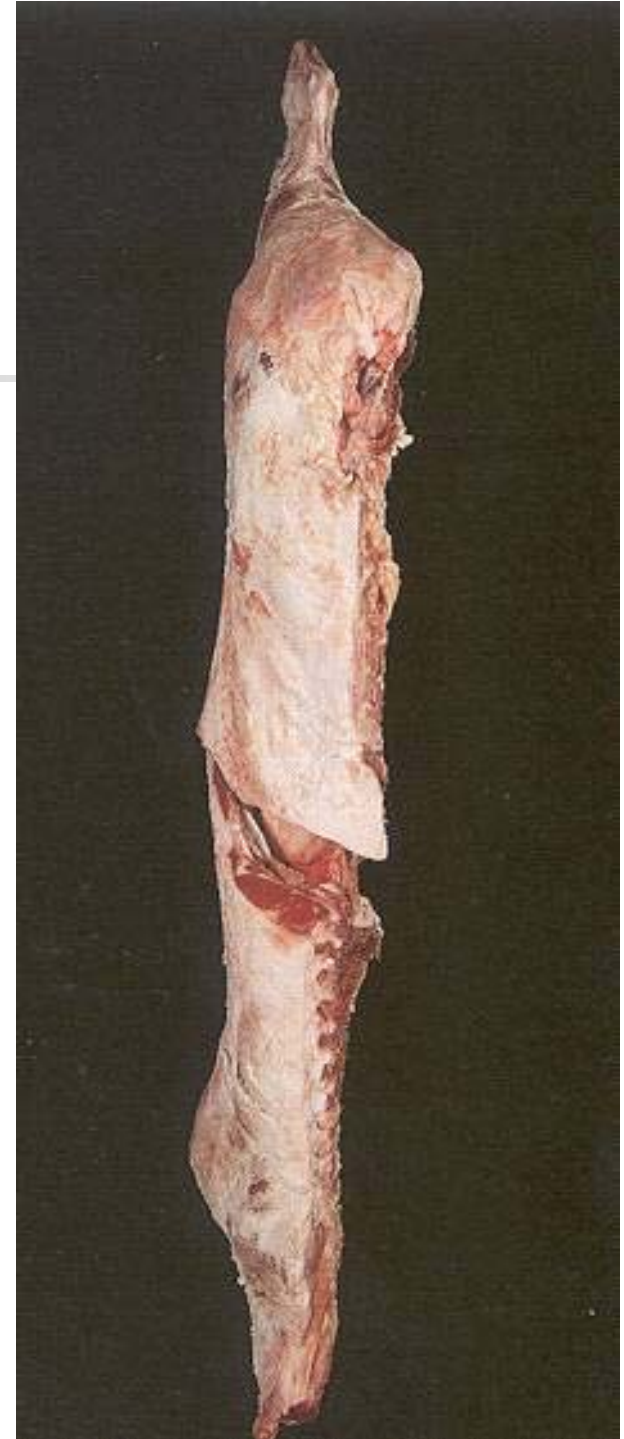
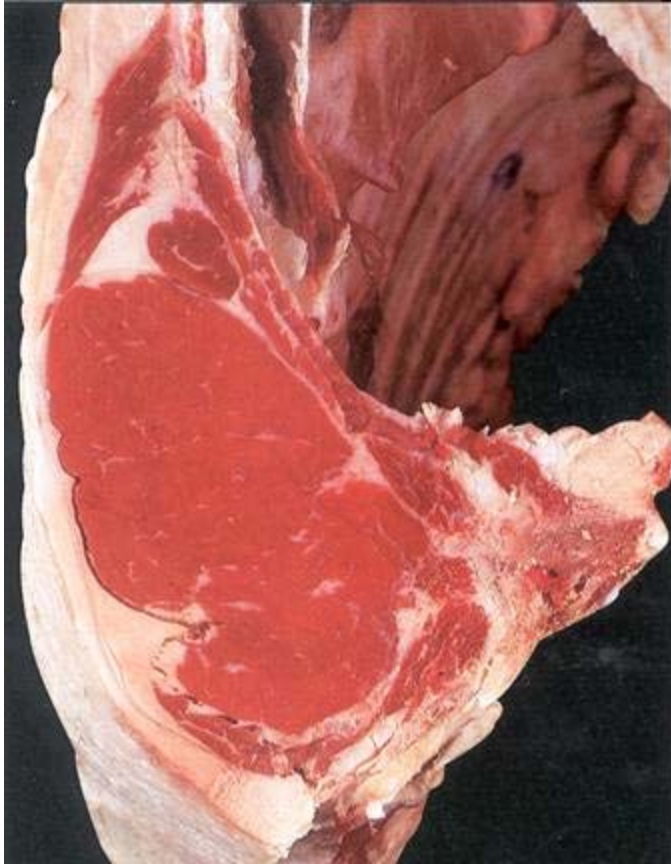


PYG 2.5

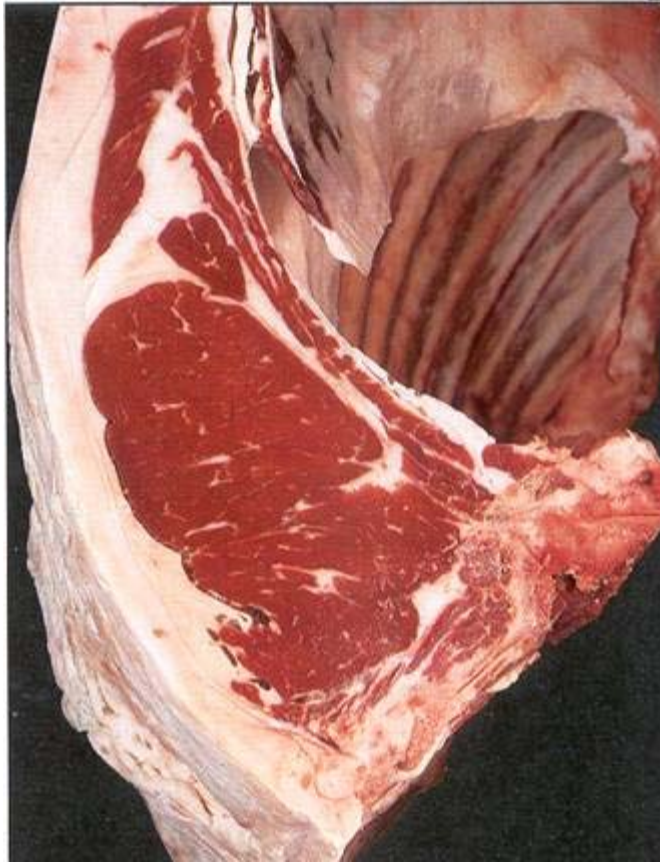




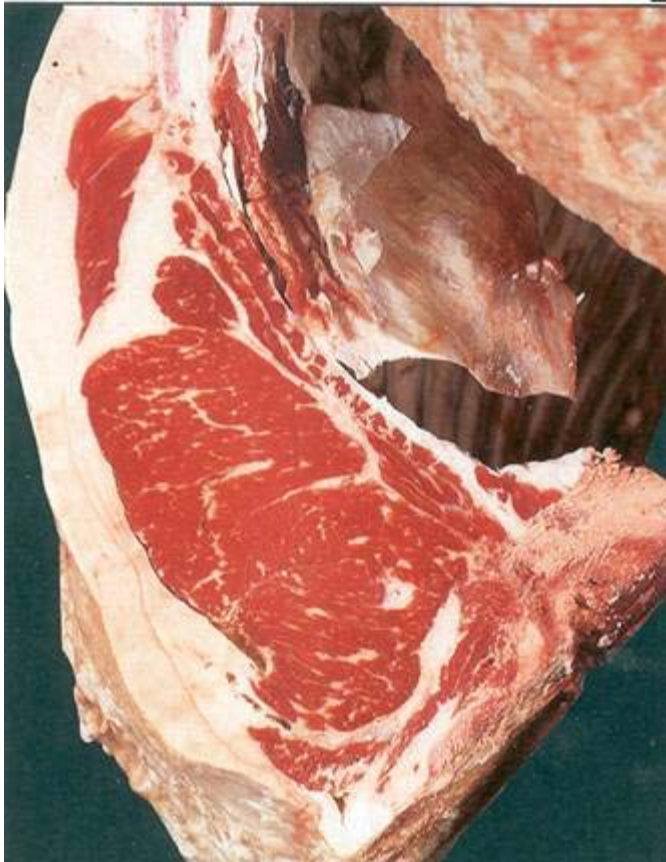
PYG 3.0



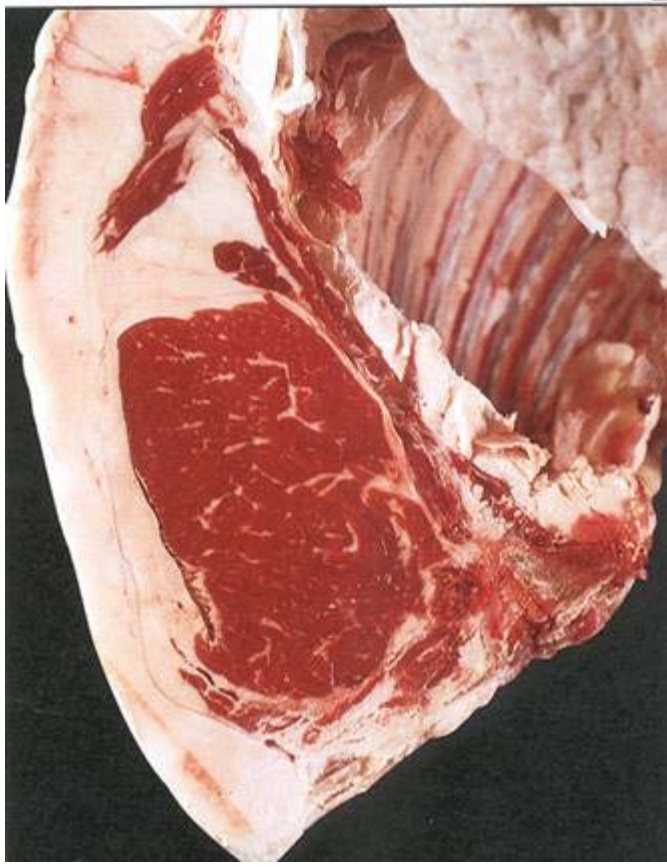
 **PYG 3.5**



PYG 4.0



 **PYG 4.5**





PYG 5.0



Hot Carcass Weight & Ribeye Relationship



- 600 lbs carcass requires an 11.0 sq. in. ribeye
- Each 100 lbs increase in carcass weight requires an additional 1.2 sq. in. REA
 - 700 lbs carcass requires 12.2
 - 800 lbs carcass requires 13.4
 - 500 lbs carcass only requires 9.8



HCW/REA Schedule

HCW	REA	HCW	REA
500	09.8	700	12.2
525	10.1	725	12.5
550	10.4	750	12.8
575	10.7	775	13.1
600	11.0	800	13.4
625	11.3	825	13.7
650	11.6	850	14.0
675	11.9	875	14.3

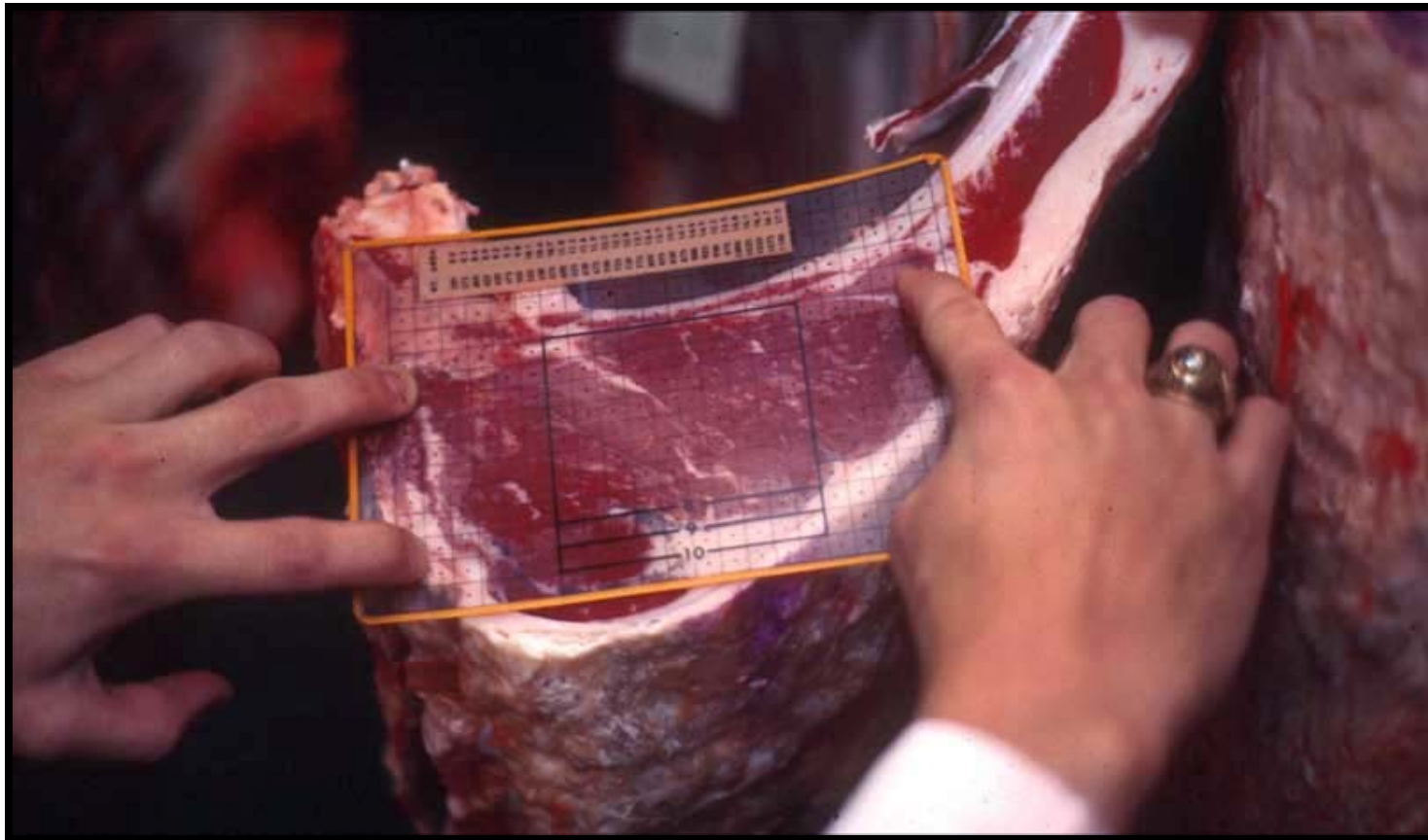


HCW/REA adjustment

- If larger than needed, subtract from PYG
- If smaller than needed, add to PYG
- For every 0.3 difference from needed size add or subtract 0.1 to PYG
- Examples:
 - 600 lbs/11.0; measures 12.2; -0.4 to PYG
 - 800 lbs/13.4; measures 12.5; +0.3 to PYG
 - 750 lbs/12.8; measures 16.8; -1.3 to PYG



REA Measurement



Kidney, Pelvic & Heart Fat Percentage



- Based on percentage of HCW
- 3.5% = 0.0 adjustment
- For every 0.5% deviation from 3.5 +/- 0.1 adjustment to PYG
- If more than 3.5%, **add** to PYG
- If less than 3.5%, **subtract** from PYG



KPH

- 5.0% = +0.3
- 4.5% = +0.2
- 4.0% = +0.1
- 3.5% = 0.0
- 3.0% = -0.1
- 2.5% = -0.2
- 2.0% = -0.3
- 1.5% = -0.4

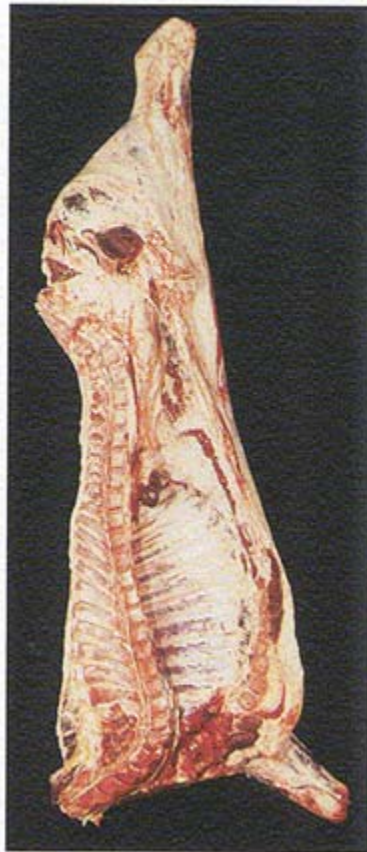


KPH



KPH examples

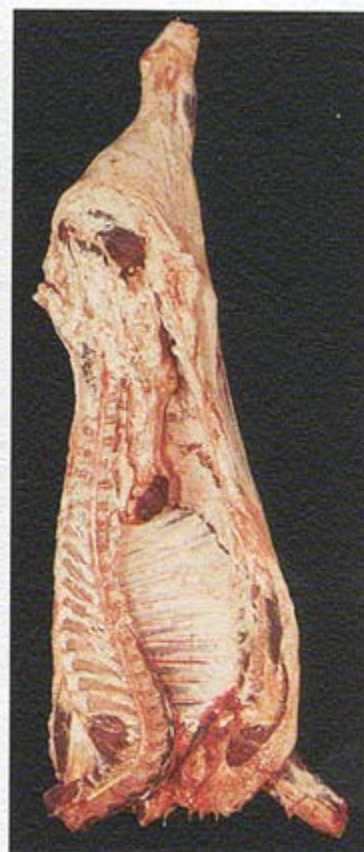
KPH Fat



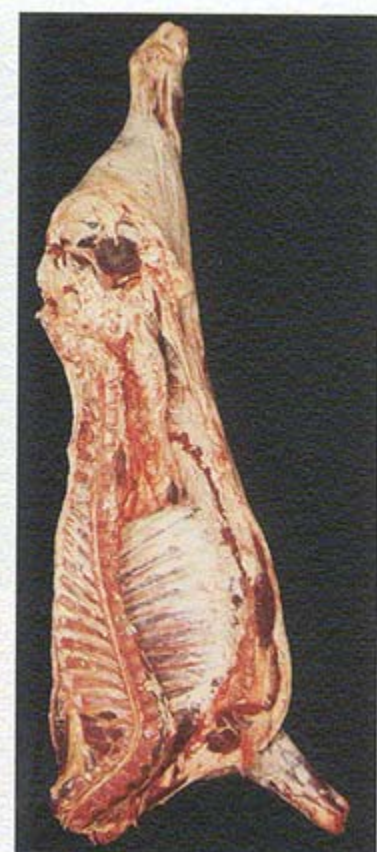
1½%



2½%



3½%



4½%



Determining USDA YG

- Determine PYG
- Make Adjustments to PYG
 - HCW
 - REA
 - KPH
- Examples!!!

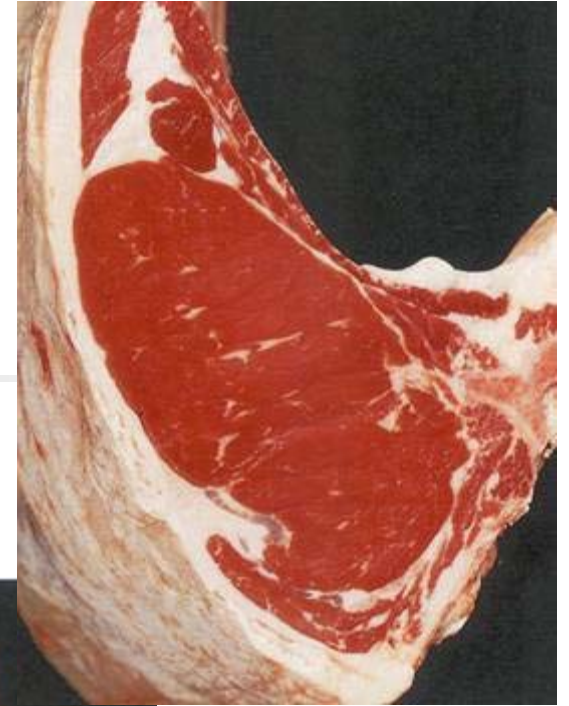
HCW = 700

PYG = 2.7/2.8

REA = 15.5

KPH = 2.0%

YG = 1.5



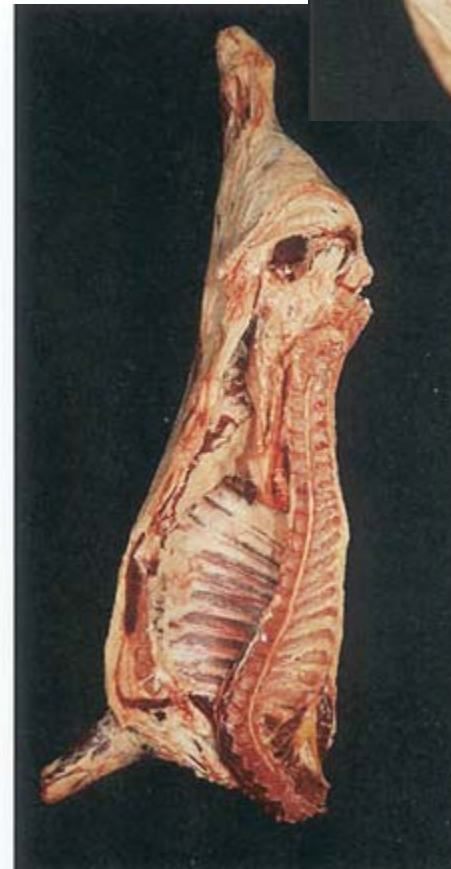
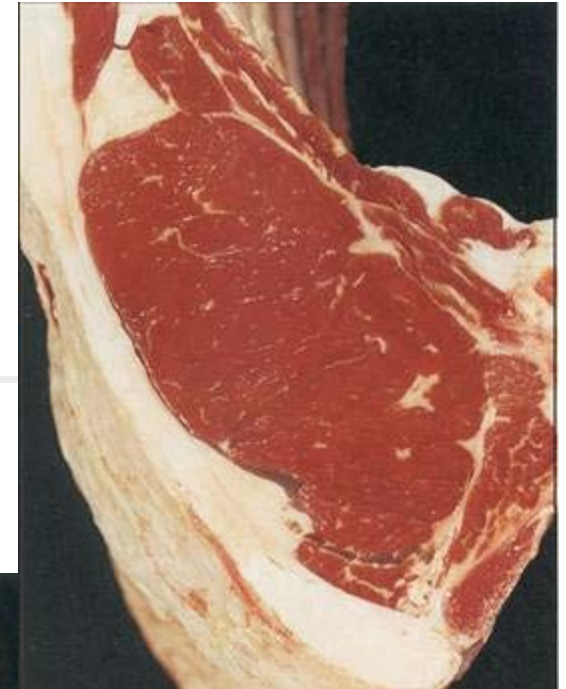
HCW = 784

PYG = 3.0/3.2

REA = 14.4

KPH = 2.5%

YG = 2.6



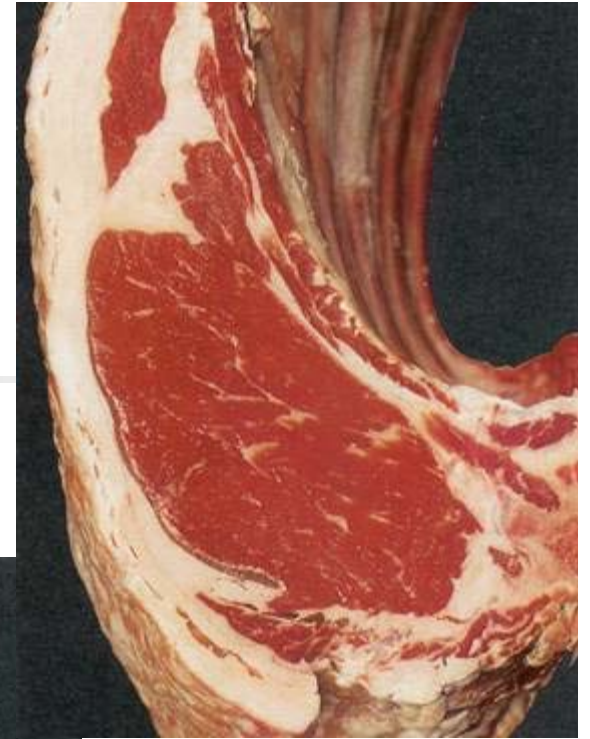
HCW = 636

PYG = 3.1/3.4

REA = 10.8

KPH = 3.0%

YG = 3.5



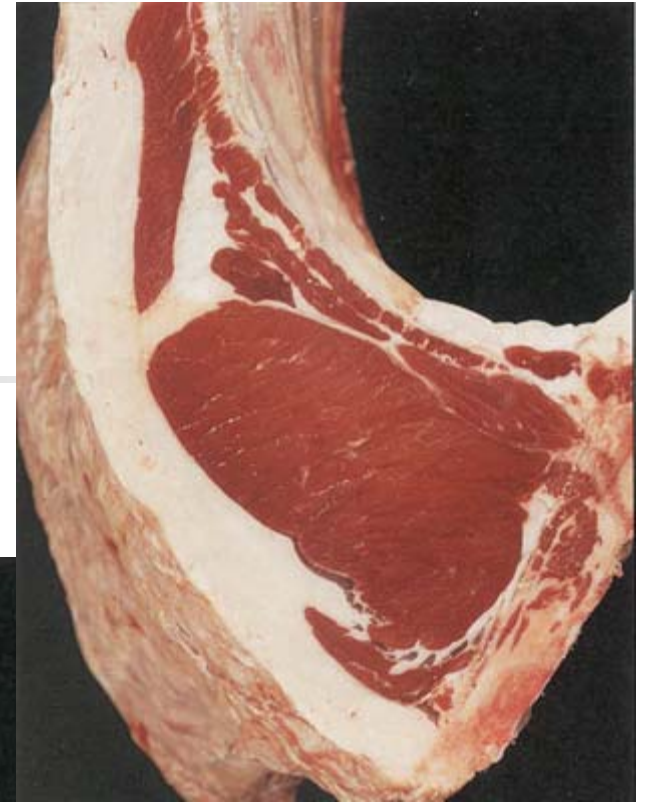
HCW = 801

PYG = 4.3/4.5

REA = 13.1

KPH = 3.0%

YG = 4.5



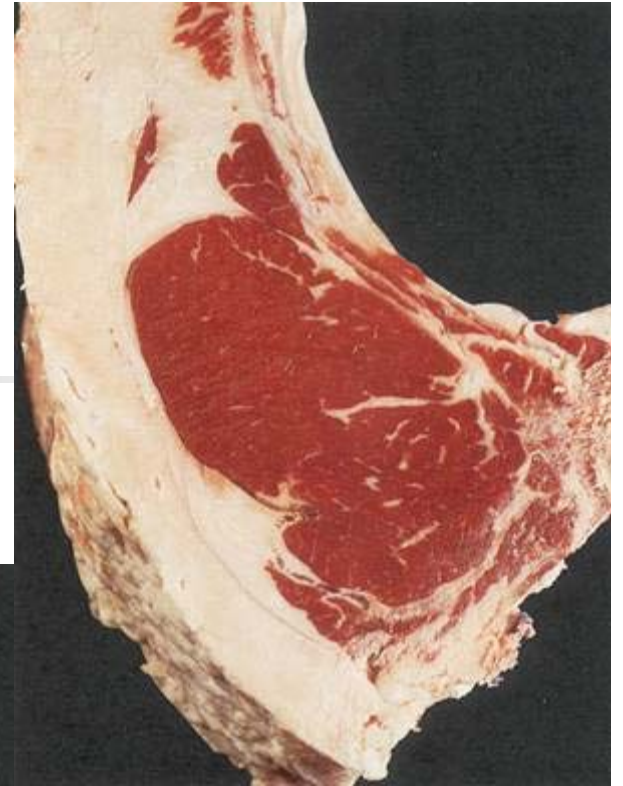
HCW = 738

PYG = 4.8/5.2

REA = 12.0

KPH = 4.0%

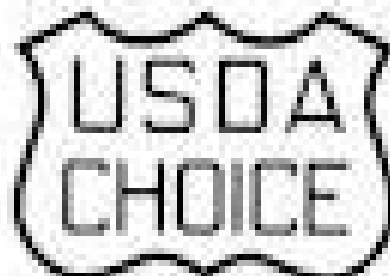
YG = 5.5





Quality Grading

- Estimates palatability
 - Tenderness, Juiciness & Flavor
- Based:
 - Maturity (Physiological)
 - Marbling Score





USDA Quality Grades

- “Young” – cattle < 42 mos.
 - Prime
 - Choice
 - Select
 - Standard
- “Old” (Hardbone) – cattle > 42 mos.
 - Commercial
 - Utility
 - Cutter
 - Canner

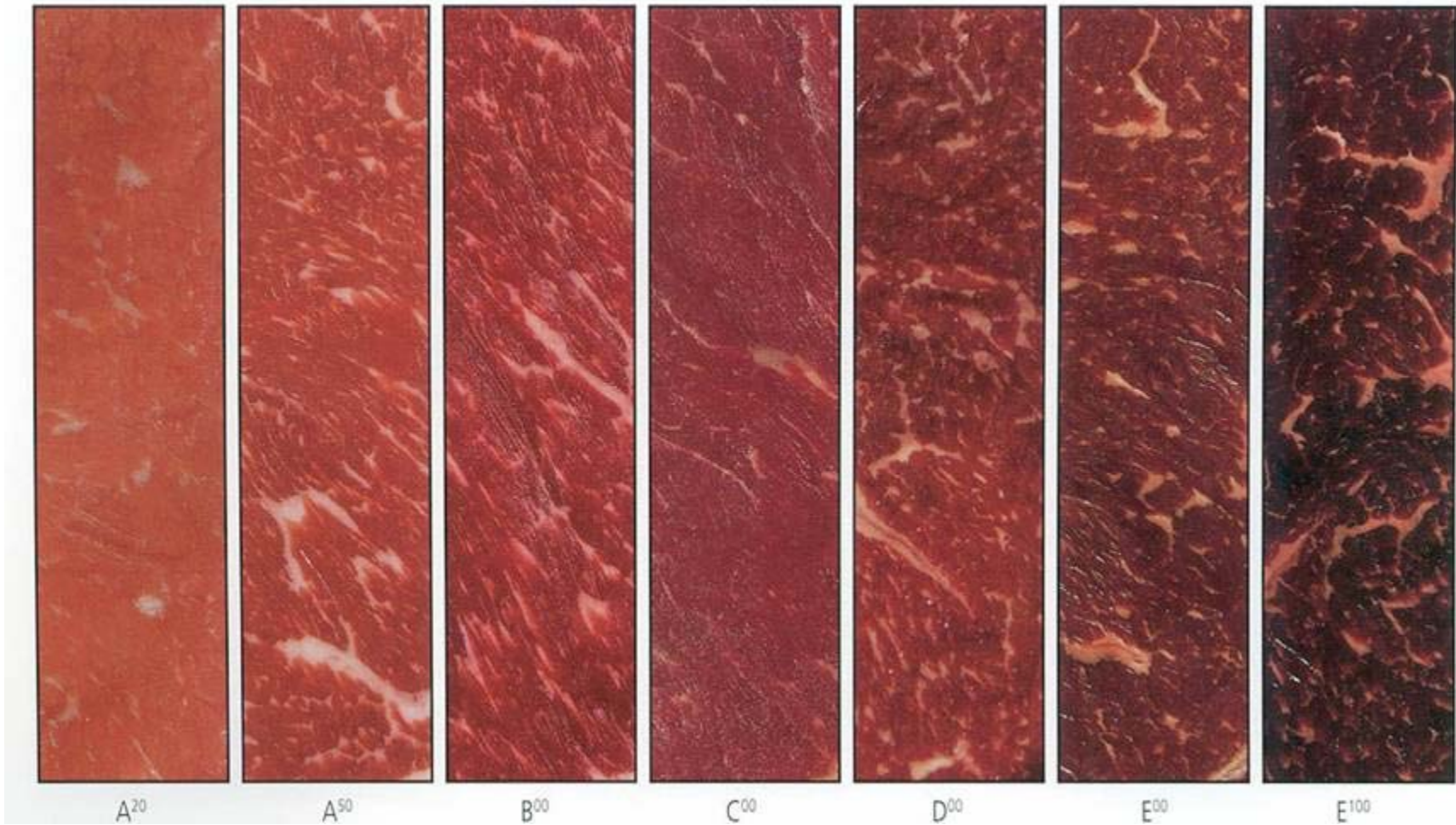


USDA Quality Grade Factors

- Maturity – A, B, C, D, E
 - Lean Maturity
 - Lean Color
 - Lean Texture
 - Skeletal Maturity
 - Bone Ossification
 - Shape & Color of Ribs
- Marbling
 - Amount & Distribution of Intramuscular Fat

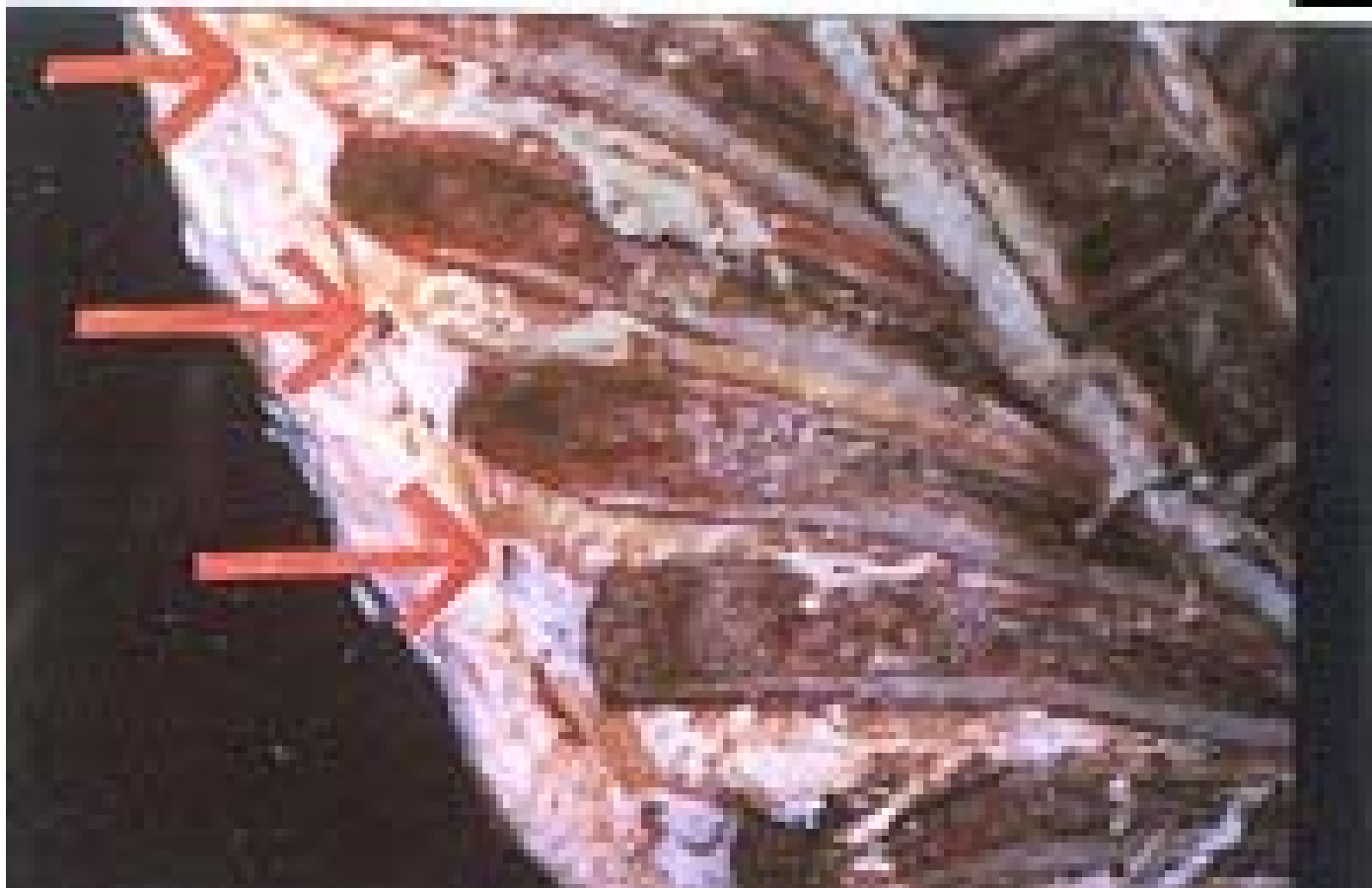


Lean Maturity





Thoracic Buttons



Ossification of Thoracic Buttons



Maturity	Thoracic	Sacral	Lumbar	Ribs
A ⁰	0%	Distinct Separation	None	Red & Round
B ⁰	10%	Complete	Nearly Complete	Slightly Wide & Flat
C ⁰	35-75%	Complete	Complete	
D ⁰	75-95%	Complete	Complete	Moderately Wide & Flat
E ⁰	95-100%	Complete	Complete	Wide & Flat (White)

A Maturity Thoracic Buttons



B Maturity Thoracic Buttons



C Maturity Thoracic Buttons



D Maturity Thoracic Buttons



E Maturity Thoracic Buttons

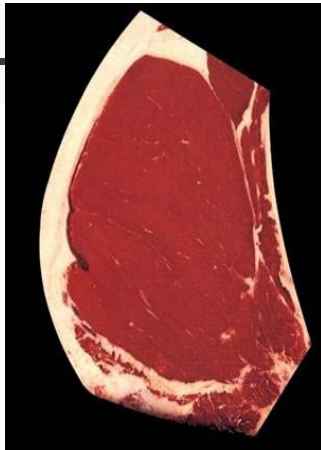




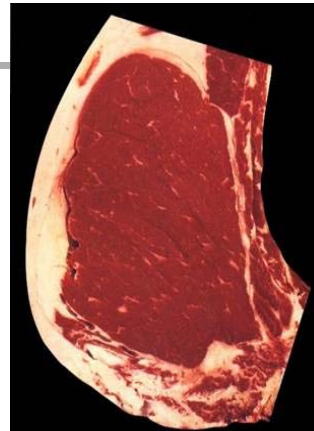
Marbling Scores

- Abundant
- Moderately Abundant (Mab)
- Slightly Abundant (Slab)
- Moderate (Md)
- Modest (Mt)
- Small (Sm)
- Slight (Sl)
- Traces (Tr)
- Practically Devoid (Pd)
- Devoid (D)

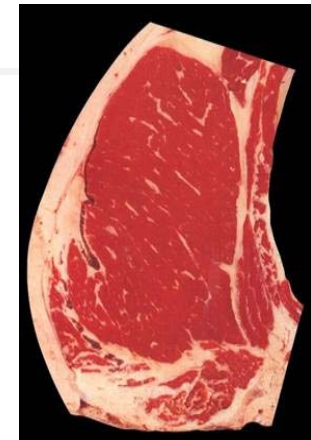
Marbling



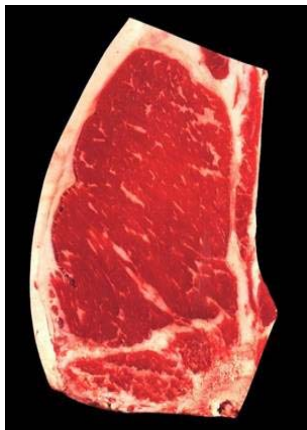
Slight



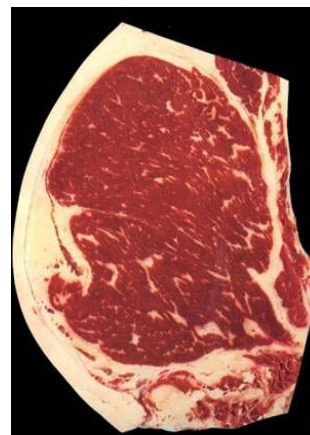
Small



Modest



Moderate



Slightly Abundant



Moderately Abundant



Quality Grading Chart

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 Devoid	Standard					Practically Devoid



Determining the Quality Grade

- Determine Lean & Skeletal Maturity
- Balance Maturities
- Determine Marbling Score
- Determine Final Quality Grade





A Maturity

- Ab = Pr+
- Mab = Pr⁰
- Slab = Pr-
- Md = Ch+
- Mt = Ch⁰
- Sm = Ch-
- SI⁵⁰ & up = Se+
- SI⁴⁹ & down = Se-
- Tr = St+
- Pd = St-



B Maturity

- Must have enough marbling to make up for degree of maturity
 - B³⁰ maturity would need Slab³⁰ to be Pr-
 - B³⁰ & Slab²⁰ = Ch+
- If B maturity overall & Small or Slight marbling then **USDA Standard!!!!!!**



C, D, E Maturity

- Must have enough marbling to make up for degree of maturity
- Can only be Commercial, Utility, Cutter or Canner
- Remember C^0 needs Sm^0 to be Cm -

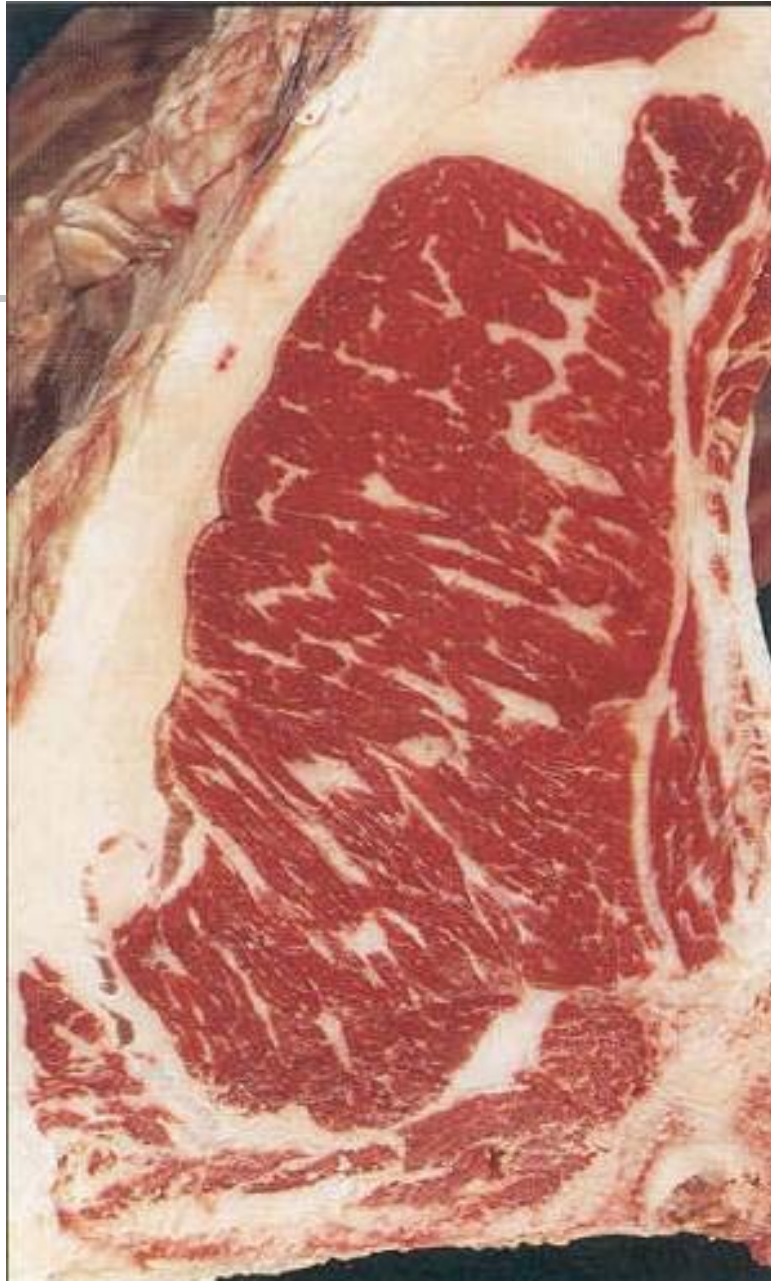


C, D & E Chart

Quality Grade	C	D	E
Cm+	Md	Slab	Mab
Cm ^o	Mt	Md	Slab
Cm-	Sm	Mt	Md
Ut+	Sl	Sm	Mt
Ut ^o	Tr	Sl	Sm
Ut-	Pd	Tr	Sl

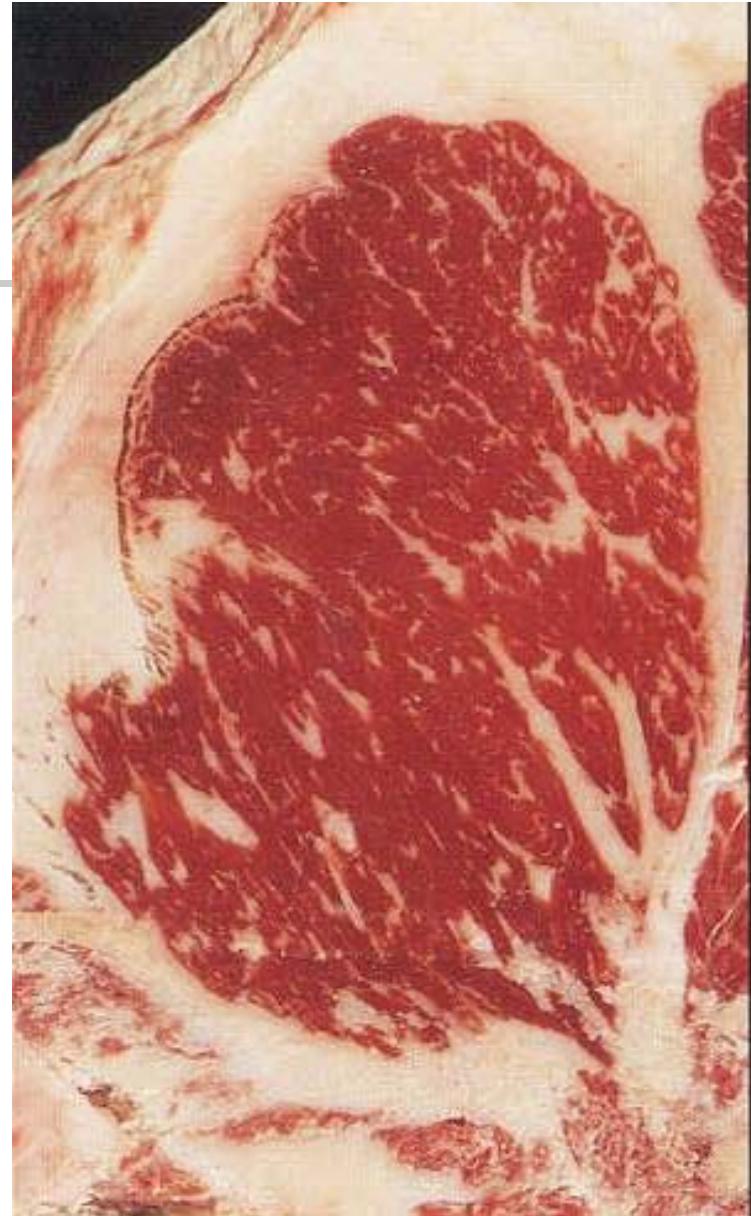


Prime+ (Ab)





Prime^o (Mab)



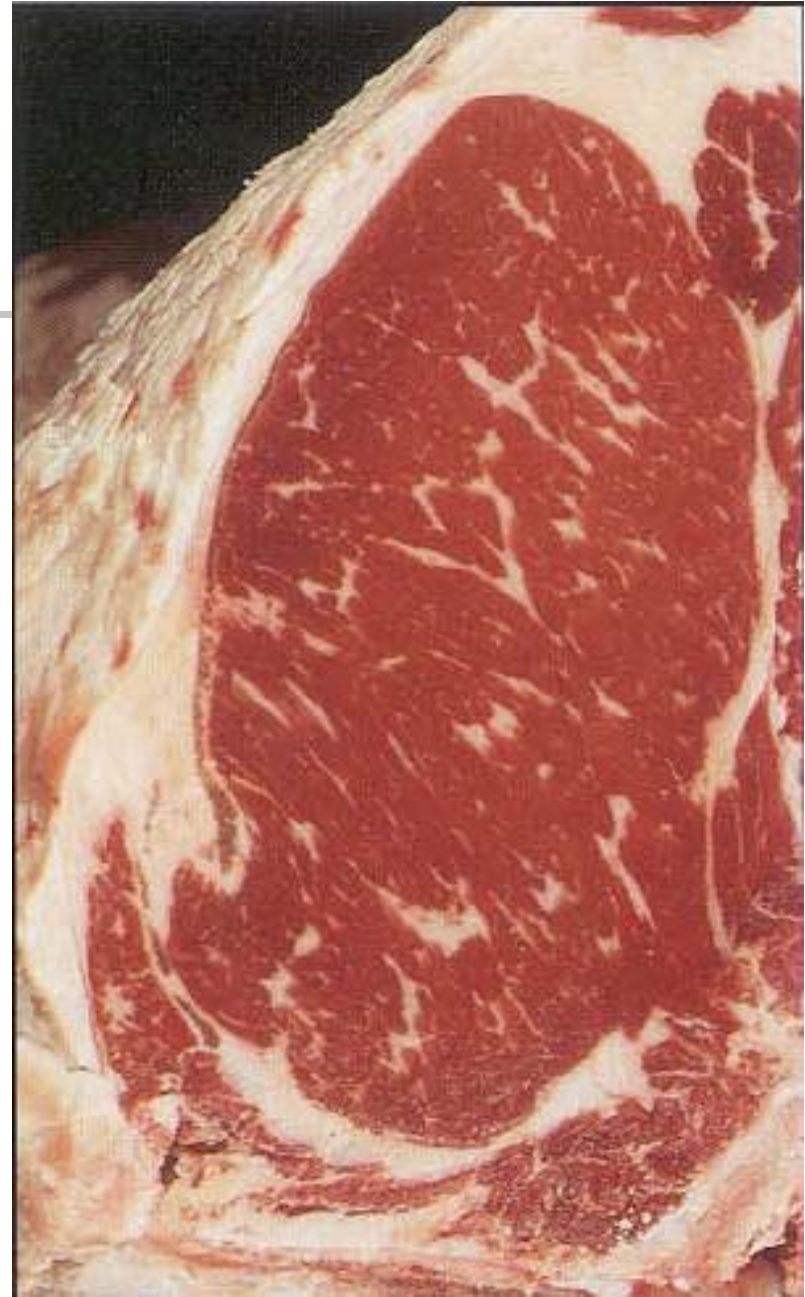


Prime- (Slab)



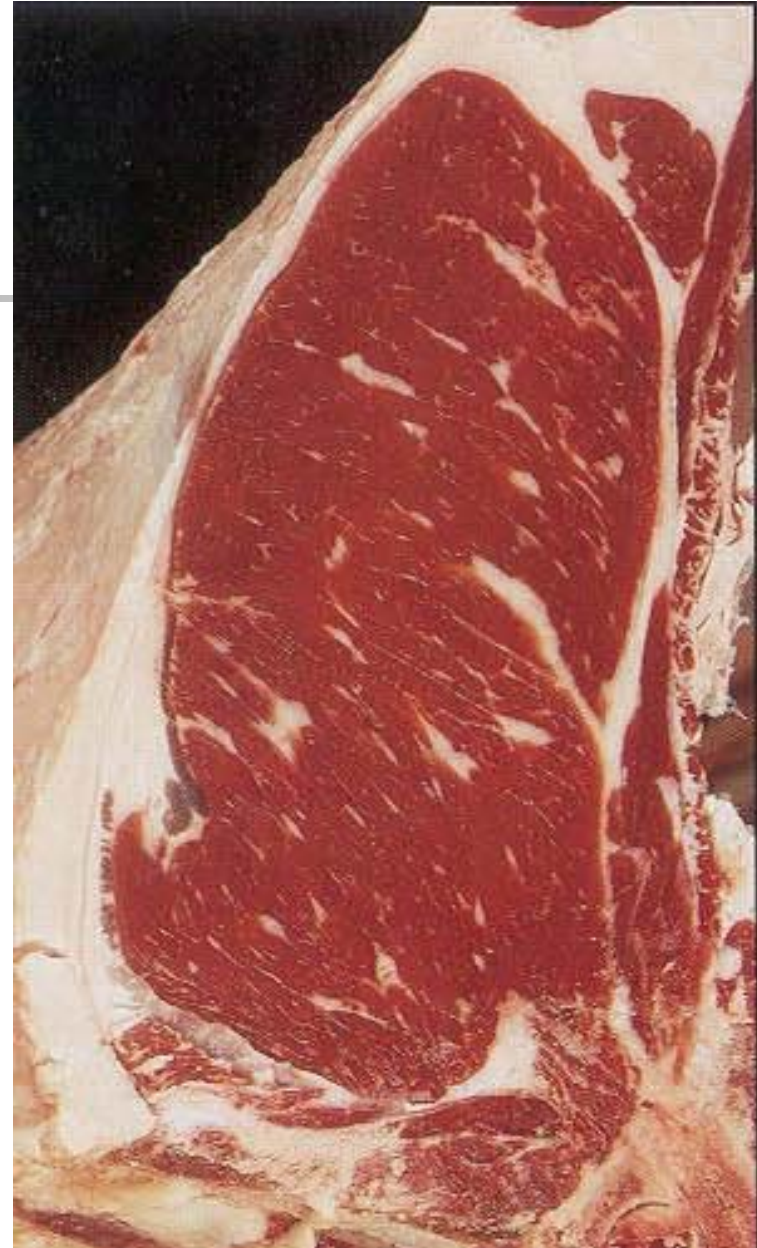


Choice+ (Md)



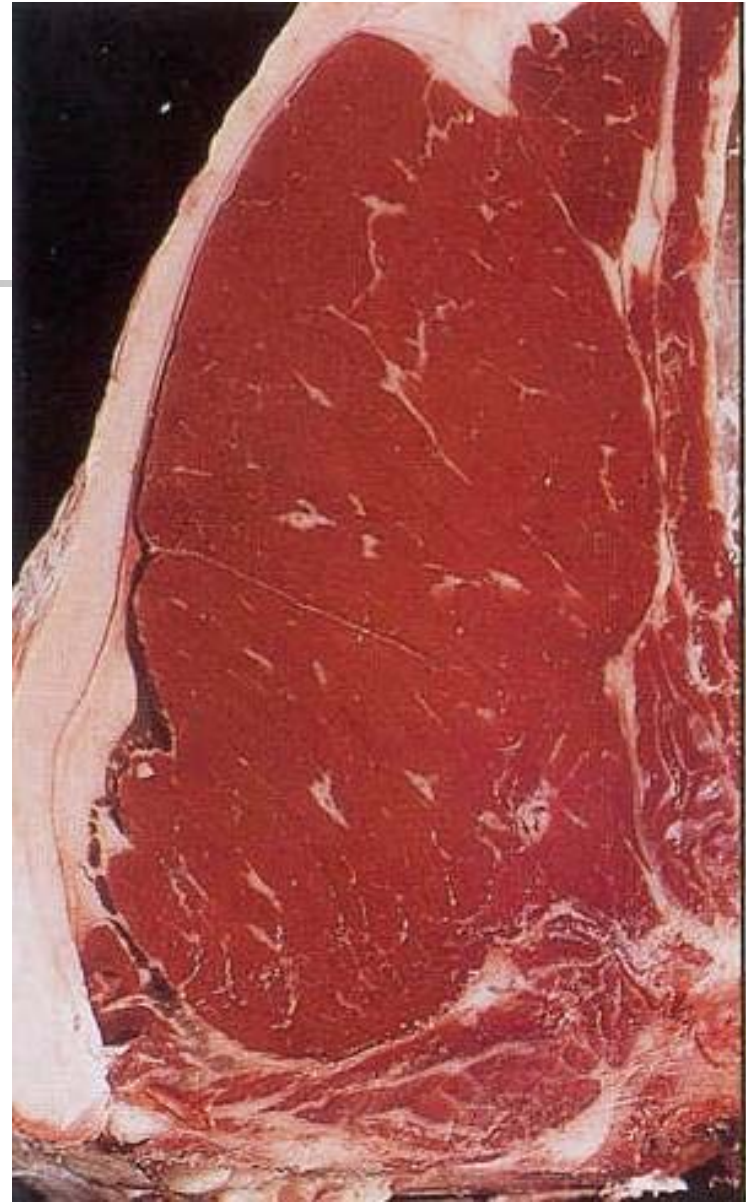


Choice^o (Mt)



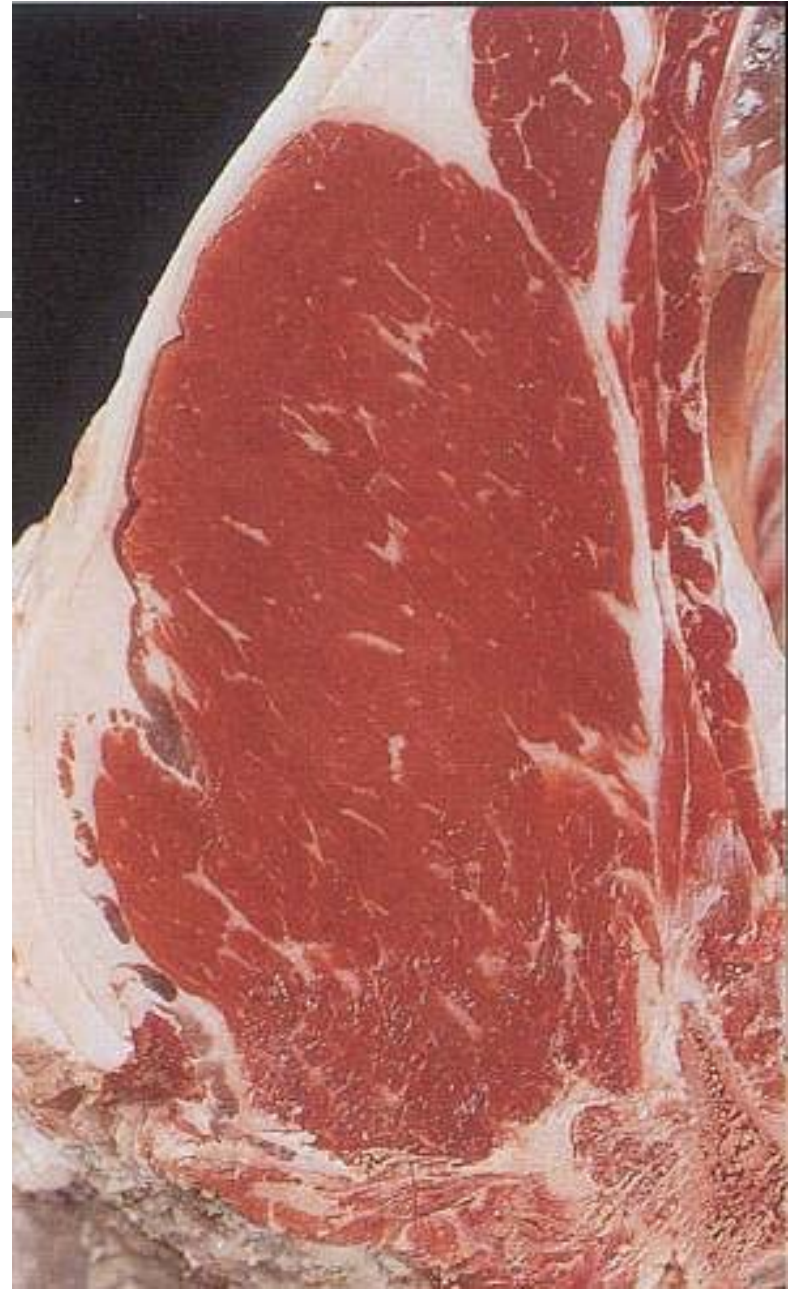


Choice- (Sm)



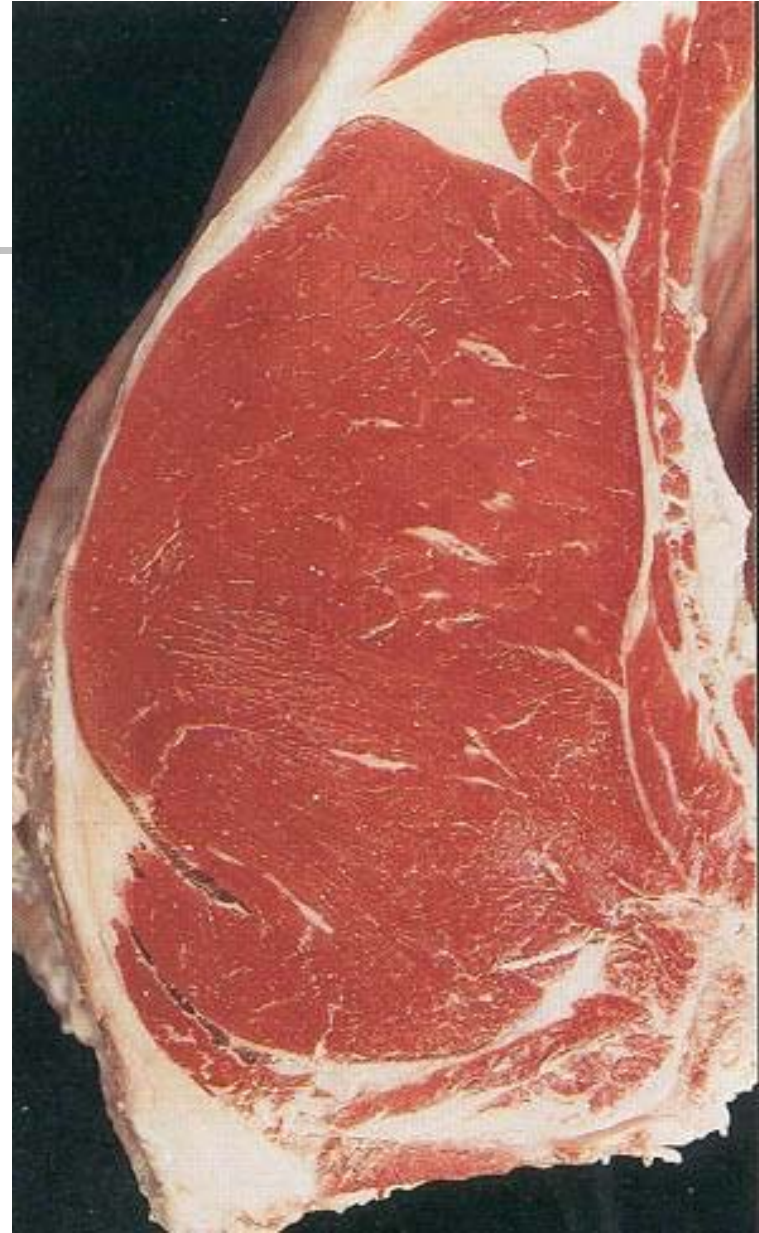


Select+ (SI+)



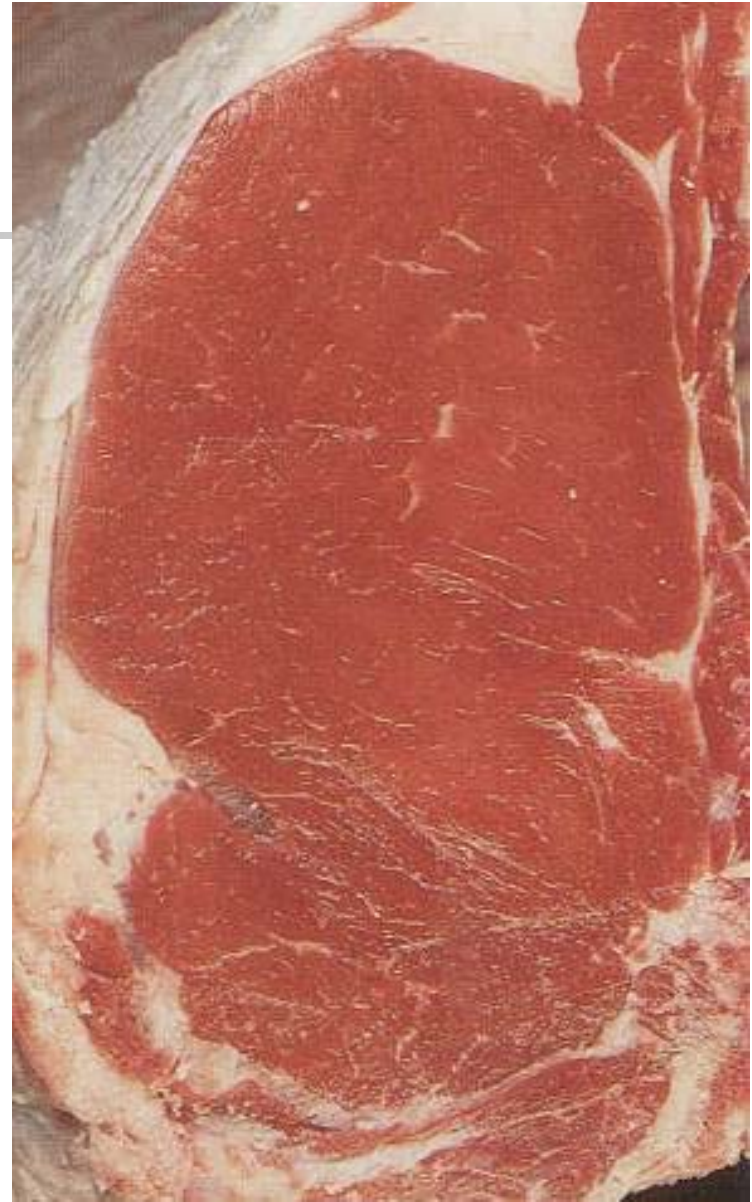


Select- (SI-)



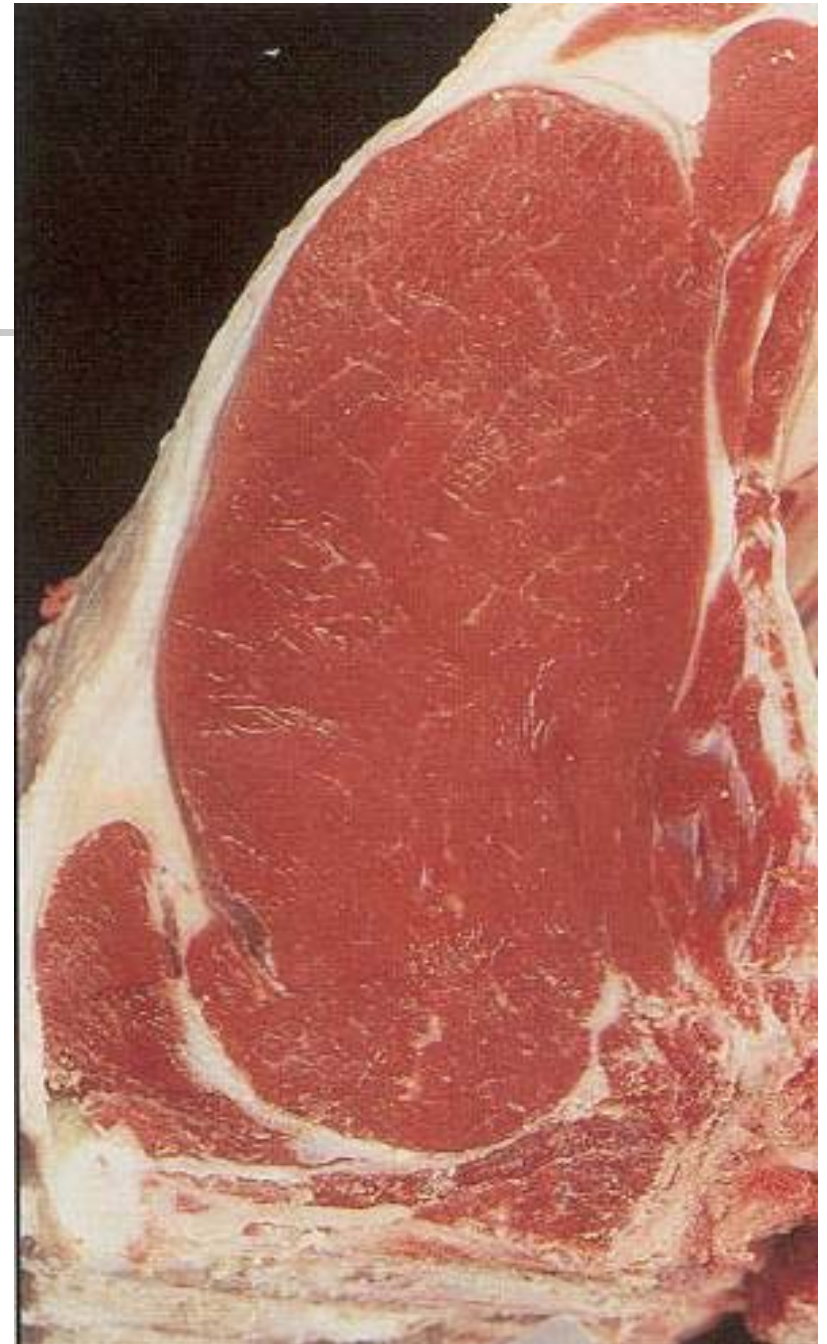


Standard+ (Tr)





Standard- (Pd)



Ranking Beef Carcasses & Cuts

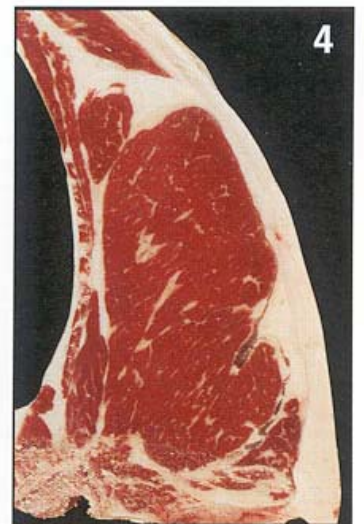
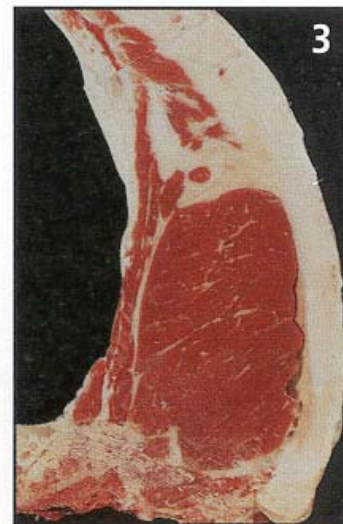
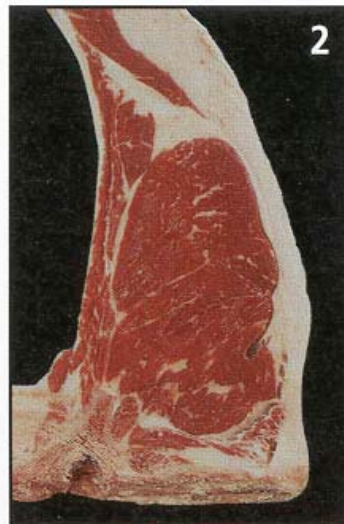
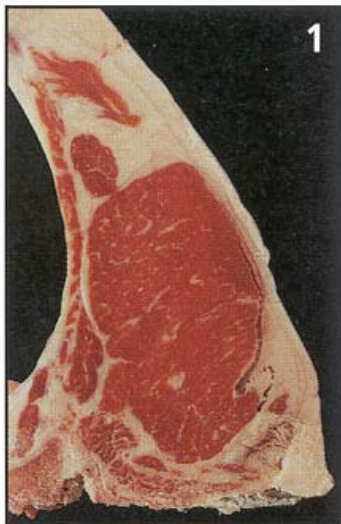
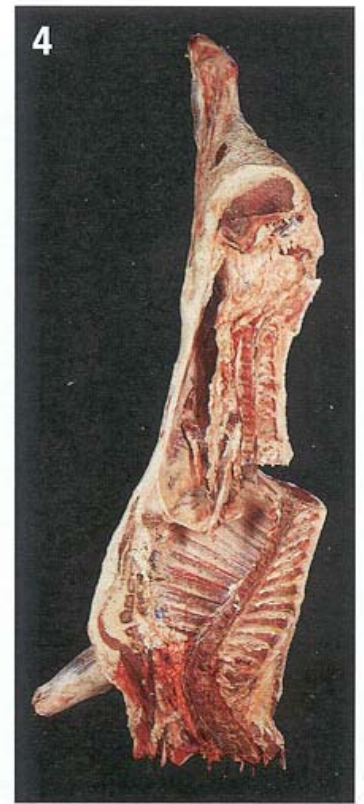
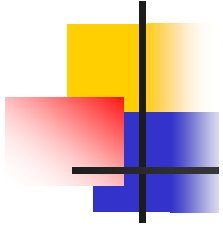
- Carcasses, Ribs, Shortloins, Loins
 - Quality First
 - Then Cutability
- Rounds
 - CUTABILITY





Ranking of Quality Classes

- Determine QG
 - Prime, Top Choice, Low Choice, Select, Standard
 - Standards always go LAST!
- Determine differences in cutability
- Rank accordingly





Questions?

