WELCOME

• This session is being recorded live
• Participants are in listen-only mode
• Question and Answer segments– Use “Q&A” icon
• Audience Interactive Elements – Use “Poll” feature
• Follow up e-mail and participant’s survey

Cattle & Carcass Training

Slaughter Cattle Evaluation

Dr. Ty Lawrence
Director, Beef Carcass Research Center at
West Texas A&M University
Growth curve of bone, muscle, fat

Muscle growth increases at a decreasing rate
Fat growth increases at an increasing rate
Bone growth is constant and proportional to live weight

Relationship Between Live Animal Growth and increase of Muscle, Fat and Bone Mass

Owens et al. (1995)
Principles of live cattle evaluation

Estimation of carcass characteristics

• Dressed yield
  • Fill, Muscle, Fat, Genetic type, Pregnancy

• Yield grade
  • Carcass weight
  • Fat thickness
  • Ribeye area
  • Kidney, Pelvic, and Heart Fat (KPH)

• Quality grade
  • Marbling
  • Maturity
Dressed Carcass Yield

\[
\text{Dressing percentage} = \left( \frac{\text{Carcass weight}}{\text{Live weight}} \right) \times 100
\]

• Example:
  
  \[
  \left( \frac{828 \text{ lb carcass}}{1300 \text{ lb live animal}} \right) \times 100 = 63.7\%
  \]

• Also known as carcass yield, dress, dressing percentage
  
  • Normal range of 55 – 70%
  
  • Current national average = 63.24%
Dressed Carcass Yield

DP influenced by:

1. Amount of fill
   - More GI tract contents at slaughter = lower dressing percent
   - Less GI tract contents at slaughter = higher dressing percent

2. Degree of muscling
   - Light muscled cattle = lower dressing percent
   - Heavy muscled cattle = higher dressing percent

3. Hide weight
   - Heavy hided cattle (Brahman) = lower dressing percent
   - Light hided cattle (Dairy) = higher dressing percent

4. Degree of finish (FATNESS)
   - Extremely fat cattle have a higher dressing percent than extremely lean cattle
Which factor has the greatest influence on dressed carcass yield?

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<table>
<thead>
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<tbody>
<tr>
<td>A</td>
<td>Fatness</td>
</tr>
<tr>
<td>B</td>
<td>Fill</td>
</tr>
<tr>
<td>C</td>
<td>Hide weight</td>
</tr>
<tr>
<td>D</td>
<td>Muscling</td>
</tr>
</tbody>
</table>
Yield Grading

Hot Carcass Weight
- Weight of the freshly dressed carcass immediately prior to chilling

Fat Thickness
- Linear measure of backfat

Rib eye Area
- Cross-section area of longissimus muscle

Estimated % of Kidney Pelvic and Heart Fat
- Subjective evaluation of weight of internal fat in relation to carcass weight
Which component of the yield grade has the greatest influence on final yield grade?

<table>
<thead>
<tr>
<th></th>
<th>Estimated % kidney-pelvic-heart fat</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>12&lt;sup&gt;th&lt;/sup&gt; rib fat thickness</td>
</tr>
<tr>
<td>B</td>
<td>Hot carcass weight</td>
</tr>
<tr>
<td>C</td>
<td>Ribeye area</td>
</tr>
</tbody>
</table>
Fat thickness

Estimation of backfat over the 12th rib

• Normal range of 0.12 to 1.0 inches
  • As fat thickness increases, numerical yield grade increases, but cutability and retail yield decreases
Subcutaneous fat deposition - exponential

- Initial 2mm
- Initial 4mm

Brethour, 2000
Ribeye area

- Cross-section area of the *longissimus* muscle at the 12th rib
  - Normal range of 10.0 to 18.0 square inches
    - As ribeye area increases, numerical yield grade decreases, but cutability and retail yield increase
      - Heifer will have ~1.0 in² less REA than steers
  - Light muscled cattle
    - Estimate ~ 0.9 in²./100 lb. of live weight
  - Average muscled cattle
    - Estimate ~ 1.1 in²./100 lb. of live weight
  - Heavy muscled cattle
    - Estimate ~ 1.3 in²./100 lb. of live weight
Kidney, Pelvic, and Heart Fat (KPH)

Expressed as percentage of HCW:

- (1) kidney, (2) kidney fat, (3) pelvic fat, (4) heart fat
- Normal range 1.0% to 4.5%
  - As KPH increases, numerical yield grade increases, but cutability and retail yield decrease
  - Estimate 0.5% for every 0.1 inch of backfat thickness
    - Heifers have ~1.0% more than steers
    - Small framed cattle have ~1.0% more
    - Large framed cattle have ~1.0% less
    - Dairy type cattle have ~1.5-6.0% more
Which finished steer would you expect to have the greatest percentage of KPH?

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<tbody>
<tr>
<td>A</td>
<td>Braford</td>
</tr>
<tr>
<td>B</td>
<td>Charolais x Angus</td>
</tr>
<tr>
<td>C</td>
<td>Hereford</td>
</tr>
<tr>
<td>D</td>
<td>Jersey</td>
</tr>
</tbody>
</table>
Quality Grading

- **Marbling**
  - subjective evaluation of the quantity of intramuscular fat in the *longissimus* muscle between the 12\(^{th}\) and 13\(^{th}\) ribs

- **Maturity**
  - primarily a subjective evaluation of the extent of ossification (conversion of cartilage to bone) of the vertebral column

---

Garcia et al. 2008
Which quality grade occurs in lowest quantity?

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>A</td>
<td>Choice</td>
</tr>
<tr>
<td>B</td>
<td>Prime</td>
</tr>
<tr>
<td>C</td>
<td>Select</td>
</tr>
<tr>
<td>D</td>
<td>Standard</td>
</tr>
</tbody>
</table>
Intramuscular fat deposition – power curve

Brethour, 2000
<25% EBF
USDA Standard
25% EBF
USDA Select
28.6% EBF
USDA Choice
37% EBF
USDA Prime
MUSCLE AND FAT ARE ANTAGONISTS
## Distribution matrix of USDA QG x YG - 2019

<table>
<thead>
<tr>
<th></th>
<th>Prime</th>
<th>Choice</th>
<th>Select</th>
<th>Standard</th>
<th>Commercial</th>
<th>Utility</th>
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</thead>
<tbody>
<tr>
<td>YG 1</td>
<td>0.06</td>
<td>2.20</td>
<td>2.68</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>YG 2</td>
<td>1.27</td>
<td><strong>22.49</strong></td>
<td>9.75</td>
<td>0.00</td>
<td>0.01</td>
<td>0.14</td>
</tr>
<tr>
<td>YG 3</td>
<td>5.20</td>
<td><strong>37.09</strong></td>
<td>5.49</td>
<td>0.01</td>
<td>0.04</td>
<td>0.36</td>
</tr>
<tr>
<td>YG 4</td>
<td>2.02</td>
<td>8.46</td>
<td>0.65</td>
<td>0.00</td>
<td>0.04</td>
<td>0.17</td>
</tr>
<tr>
<td>YG 5</td>
<td>0.51</td>
<td>1.22</td>
<td>0.08</td>
<td>0.00</td>
<td>0.01</td>
<td>0.04</td>
</tr>
</tbody>
</table>
# Slaughter Cattle Evaluation

<table>
<thead>
<tr>
<th>Trait</th>
<th>English</th>
<th>Exotic</th>
<th>Brahman</th>
<th>Dairy</th>
<th>English X Exotic</th>
<th>English X Brahman</th>
<th>Exotic X Brahman</th>
<th>Trait</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat thickness</td>
<td>0.3 in Standard</td>
<td>0.2 in Standard</td>
<td>0.4 in Standard</td>
<td>0.2 in Select</td>
<td>0.4 in Select</td>
<td>0.4 in Select</td>
<td>0.5 in Select</td>
<td>Fat thickness</td>
</tr>
<tr>
<td>Pones</td>
<td>X</td>
<td>MOST</td>
<td>MOST</td>
<td>MOST</td>
<td>MOST</td>
<td>MOST</td>
<td>MOST</td>
<td>Pones</td>
</tr>
<tr>
<td>Lower round 1/4</td>
<td>MOST</td>
<td>MOST</td>
<td>X</td>
<td>MOST</td>
<td>X</td>
<td>MOST</td>
<td>X</td>
<td>Lower round 1/4</td>
</tr>
<tr>
<td>Cod/udder</td>
<td>MOST</td>
<td>MOST</td>
<td>MOST</td>
<td>NO</td>
<td>X</td>
<td>MOST</td>
<td>MOST</td>
<td>Cod/udder</td>
</tr>
<tr>
<td>Brisket</td>
<td>X</td>
<td>MOST</td>
<td>X</td>
<td>MOST</td>
<td>MOST</td>
<td>X</td>
<td>X</td>
<td>Brisket</td>
</tr>
<tr>
<td>Flank</td>
<td>X</td>
<td>X</td>
<td>MOST</td>
<td>MOST</td>
<td>X</td>
<td>MOST</td>
<td>X</td>
<td>Flank</td>
</tr>
<tr>
<td>Cheeks/jowls</td>
<td>MOST</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>NO</td>
<td>X</td>
<td>Cheeks/jowls</td>
</tr>
<tr>
<td>Turn over the top</td>
<td>MOST</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>MOST</td>
<td>X</td>
<td>Turn over the top</td>
</tr>
<tr>
<td>Round creases-heifers only</td>
<td>MOST</td>
<td>MOST</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>MOST</td>
<td>MOST</td>
<td>Round creases-heifers only</td>
</tr>
<tr>
<td>Disposition</td>
<td>X</td>
<td>X</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>Disposition</td>
</tr>
<tr>
<td>Dew claws</td>
<td>Black English</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>Dew claws</td>
</tr>
<tr>
<td>Thickness</td>
<td>X</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>Thickness</td>
</tr>
</tbody>
</table>

MOST = Most important factor to consider when determining final quality grade
X = Very important factor to consider when determining final quality grade
NO = Does not assist when determining final quality grade
Cattle & Carcass TRAINING

Market Steer Evaluation Practice
Live weight = 1257 lbs.
880 HCW
69.9% Dress
Standard
YG 0.5
EBF 22.0%
Live weight = 1162 lbs.
753 HCW
64.8% Dress
Select
YG 3.2
EBF 28.4%
Live weight = 1094 lbs.
715 HCW
65.3% Dress
Choice
YG 3.7
EBF 32.1%
Live weight = 1315 lbs.
827 HCW
62.8% Dress
Choice -
YG 4.2
EBF 34.1%
Live weight = 1300 lbs.
Which is the quality and yield grade of this steer?

A | Choice – 1.9
B | Prime – 3.9
C | Select – 2.4
D | Standard – 1.5
• HCW = 825
• Dress = 66.1%
• QG = Choice-
• YG = 1.9
• EBF = 26.1%
Live weight = 1600 lbs.
Which is the quality and yield grade of this steer?

A Choice – 3.9
B Prime – 4.2
C Select – 2.8
D Standard – 3.5
• HCW = 992
• Dress = 64.6%
• QG = Choice+
• YG = 3.9
• EBF = 35.2%
Live weight = 1680 lbs.
Which is the quality and yield grade of this steer?

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<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>Choice – 4.4</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Prime – 5.6</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Select – 3.8</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Standard – 3.7</td>
<td></td>
</tr>
</tbody>
</table>
HCW = 1048
Dress = 65.0%
QG = Choice-
YG = 4.4
EBF = 35.5%
Cattle & Carcass Training

Live Cattle Videos

United States Department of Agriculture
Lot 5019

<table>
<thead>
<tr>
<th>In weight</th>
<th>DOF</th>
<th>ADG</th>
<th>Shrunken Out Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>773</td>
<td>137</td>
<td>3.61</td>
<td>1264</td>
</tr>
</tbody>
</table>
Which is the quality and yield grade of this steer?

A Choice – 2.9
B Prime – 3.2
C Select – 2.0
D Standard – 1.9
• HCW = 819
• Dress = 64.8%
• QG = Select-
• YG = 2.0
• EBF = 25.5%
| Lot | 4828 |

<table>
<thead>
<tr>
<th>In weight</th>
<th>DOF</th>
<th>ADG</th>
<th>Shrunken Out Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>356</td>
<td>280</td>
<td>3.08</td>
<td>1112</td>
</tr>
</tbody>
</table>
Which is the quality and yield grade of this steer?

<p>| | |</p>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>Choice – 2.5</td>
</tr>
<tr>
<td>B</td>
<td>Prime – 3.2</td>
</tr>
<tr>
<td>C</td>
<td>Select – 2.9</td>
</tr>
<tr>
<td>D</td>
<td>Standard – 1.7</td>
</tr>
</tbody>
</table>
• HCW = 697
• Dress = 62.7%
• QG = Select-
• YG = 2.9
• EBF = 24.7%
Lot 5016

<table>
<thead>
<tr>
<th>In weight</th>
<th>DOF</th>
<th>ADG</th>
<th>Shrunken Out Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>874</td>
<td>140</td>
<td>3.33</td>
<td>1473</td>
</tr>
</tbody>
</table>
Which is the quality and yield grade of this steer?

A Choice – 3.6
B Prime – 5.2
C Select – 2.8
D Standard – 2.4
• HCW = 933
• Dress = 63.3%
• QG = Choice ⁰
• YG = 3.6
• EBF = 32.9%
Lot 4708

<table>
<thead>
<tr>
<th>In weight</th>
<th>DOF</th>
<th>ADG</th>
<th>Shrunken Out Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>677</td>
<td>337</td>
<td>2.20</td>
<td>1292</td>
</tr>
</tbody>
</table>
Which is the quality and yield grade of this steer?

<table>
<thead>
<tr>
<th></th>
<th>Quality Grade</th>
<th>Grade</th>
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<tbody>
<tr>
<td>A</td>
<td>Choice</td>
<td>3.4</td>
</tr>
<tr>
<td>B</td>
<td>Prime</td>
<td>5.8</td>
</tr>
<tr>
<td>C</td>
<td>Select</td>
<td>4.1</td>
</tr>
<tr>
<td>D</td>
<td>Standard</td>
<td>2.5</td>
</tr>
</tbody>
</table>
- HCW = 898
- Dress = 69.5%
- QG = Prime -
- YG = 5.8
- EBF = 39.5%
Chicago Mercantile Exchange (CME) Live Deliveries

Jodie Pitcock
USDA Agricultural Marketing Service
Livestock and Poultry Program, Market News Division
Jodie.Pitcock@usda.gov
USDA’s Responsibility

- Unbiased Third Party
- Apply USDA Live Slaughter Cattle Grade Standards
- Certify Contract Specifications
Terms

• **Delivery Point** – Location where the delivery process will occur.

• **Long** – Created an open position, owns the cash commodity, willing to take possession.

• **Short** – Sold an open position, entered contract as a seller, has possession of the commodity.

• **Specifications** – outlines the criteria of the contract.
Who determines if a contract will be delivered on a live or carcass basis?

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<tbody>
<tr>
<td>A</td>
<td>The Long</td>
</tr>
<tr>
<td>B</td>
<td>The Short</td>
</tr>
<tr>
<td>C</td>
<td>USDA</td>
</tr>
<tr>
<td>D</td>
<td>CME</td>
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</table>
Who determines if a contract will be delivered on a live or carcass basis?

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</tr>
<tr>
<td>D</td>
<td>CME</td>
</tr>
</tbody>
</table>
Live Delivery Locations

- Sterling, CO
- Wray, CO
- Worthing, SD
- Burwell, NE
- Kearney, NE
- Lexington, NE
- Ogallala, NE
- West Point, NE
- Syracuse, KS
- Dodge City, KS
- Dalhart, TX
- Tulia, TX
- Amarillo, TX
- Texhoma, OK
- Clovis, NM
Who determines which Delivery Location the live contract will be delivered to?

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<td>C</td>
<td>USDA</td>
</tr>
<tr>
<td>D</td>
<td>CME</td>
</tr>
</tbody>
</table>
Who determines which Delivery Location the live contract will be delivered to?

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<tbody>
<tr>
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<td>The Short</td>
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<td>C</td>
<td>USDA</td>
</tr>
<tr>
<td>D</td>
<td>CME</td>
</tr>
</tbody>
</table>
Live Contract Specification
Live Contract Specification

• Par Delivery Unit: 65% Choice, 35% Select, Yield Grade 3 (through Dec 2020)
  o 40,000 pounds (variation between 38,000 and 42,000 pounds)

• USDA Grading Standards for Live Cattle

• Born/Raised exclusively in the United States
  o Sellers must sign Exchange Affidavit
    ➢ Part of the Certificate of Delivery
    ➢ Must always accompany the Certificate
Live Contract Specification

• Weight
  ○ Steers
    ➢ 1,050 to 1,550 pounds. Cattle over 1,500 up to 1,550 receive a weight discount.
    ➢ Feb. 2021. 1,050 to 1,600 pounds, with cattle over 1,550 up to 1,600 receiving a discount.
  ○ Heifers
    ➢ 1,050 to 1,350 pounds.
Live Contract Specification

- All cattle shall be HEALTHY.
- Unmerchantable cattle are NOT allowed: crippled, sick or bruised.
- No predominance of dairy breeding or prominent humps.
- Heiferettes, cows or bred heifer are NOT allowed.
- Dressing Percent greater than 60% – Applied to the load.
Live Contract Specification
- Arrival

- Delivered to approved Delivery Point
- Confined in a secured pen by 9:00AM
- Can the “Certification Process” occur prior to 9:00AM?
- Is Feed and Water allowed?
Certification Process

• The Short must ensure cattle are penned, sorted and ready.
• The Delivery Point usually represents the Short.
• Cattle are presented in groups of 3 to 5 head.
Live Contract Specification – Grading Process

USDA Grader:

- Determines that animals are in good condition (Healthy).
- Determines contract specification for health, age, physical conditions and weight are met.
- Applies USDA Live Quality and Yield Grade Standards.
- Calculates the Estimated Dressing Percent of the lot.
Live Contract Specification – Grading Card
Live Contract Specification
– Dressing Percent

• Par is 63%
• Greater than 60% acceptable
• Factors that affect Dressing Percent:
  • Muscling and Fat Cover
  • Breed, Gender, Diet and Seasonal
  • Fill
  • MUD
Live Contract Specification – Weighing

• Lots must weigh between 38,000 to 42,000 pounds.
  • Load can be weighed as a split load, if the scale size at Delivery Point will not handle a full load.
  • Number of animals in each load can vary from 26 to 32 head.
• Load must be weighed within one hour of grading.
Live Contract Specification – Change of Ownership

- After each lot is weighed, they go to a “sealed pen”.

- USDA submits grading results electronically to CME on a Certificate.

- CME Clearinghouse changes livestock ownership to the Long.

- Lot is released by CME to be loaded on the Long’s truck.

- Certification Process is complete.
Live Contract Specification – Rejected

If a load is rejected?

• It is the Short’s responsibility to work out an alternative with CME.

• USDA has no control at this point.

• CME will contact USDA once a solution have been resolved.
Live Contract Specification – USDA Rights

• If the Short fails to present suitable cattle, they are subject to a fine.

• If the Short presents a load that is not properly sorted and unnecessarily slows down the grading process- they are subject to a fine.

• If the Long or their agent delays, disrupts, or interferes with the delivery- they are subject to a penalty.

• In Summary: Bring deliverable cattle and let USDA do their job.
Live Contract Specification –
Accept or Reject?
Reject – Due to weight.
Live Contract Specification –
Accept or Reject?
Live Contract Specification – Accept or Reject?
Reject –
Due to belly rupture.
Live Contract Specification –
Accept or Reject?
Reject – Hump
Live Contract Specification –
Accept or Reject?
Accept
Live Contract Specification – Settlement

- National Boxed Beef Cutout – Negotiated Sales

- USDA By-Product Drop Value
  - https://www.ams.usda.gov/mnreports/nw_ls447.txt

- 5-Area Weekly Weighted Average Direct Slaughter Cattle – Premium and Discounts
My Market News – Public Data

• My Market News
  • https://mymarketnews.ams.usda.gov/

• Market Analysis & Reporting Services (MARS)

• Public Data

• Standard Report Format

• Application Programming Interface (API)
Thank you for Participating

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