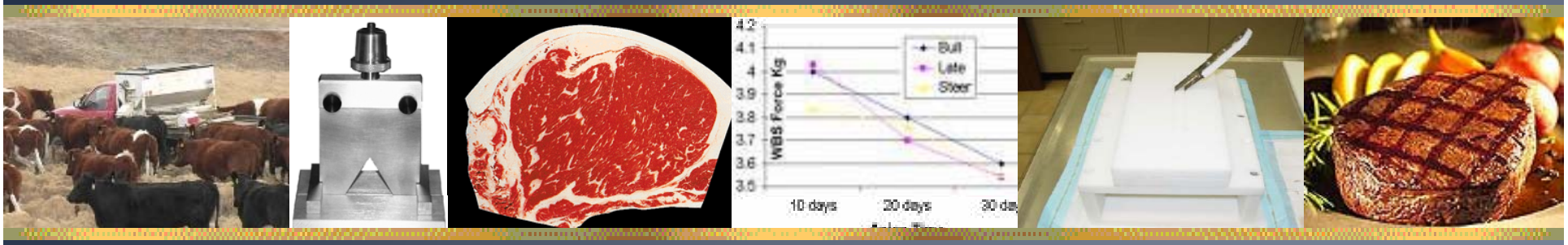


# AMS Meat Tenderness II Forum

June 22, 2008

University of Florida Hilton
Conference Center

**Martin E. O'Connor**
Chief
Standards, Analysis and Technology Branch

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# Agenda

- Welcome
- Background
- Sub-committee Updates
- Open Discussion
- Sub-committee Breakout Sessions
- Sub-committee Reports & Discussion
- Closing Remarks

# Background

- Recognition of the need for a Tenderness Performance Standard to assist in the marketing of meat products
- Proposed standard was offered for comment in December 2002
- AMS Tenderness Forum March 27, 2007
  - Sub-committees formed

# Questions Developed

1. How do we define tenderness? Are we really trying to define palatability? What is the goal?

   – Assess Tenderness

# Questions Developed

2. Should the tenderness threshold be the same for all species? If not, how do we segregate?

   – Data indicates that consumers have different expectations of tenderness for different species

# Questions Developed

3. Will tenderness evaluation be objective or will it be a total quality management system?

   – Flexibility is desired by the industry to evaluate **either** every carcass **or** use a total quality management system

# Questions Developed

4. Will a tenderness claim apply to the entire carcass or only the middle meats?

   – Correlations for tenderness between middle meats and the entire carcass are weak

   – Development of an adjustment factor to characterize tenderness based off of *Longissimus dorsi*

# Questions Developed

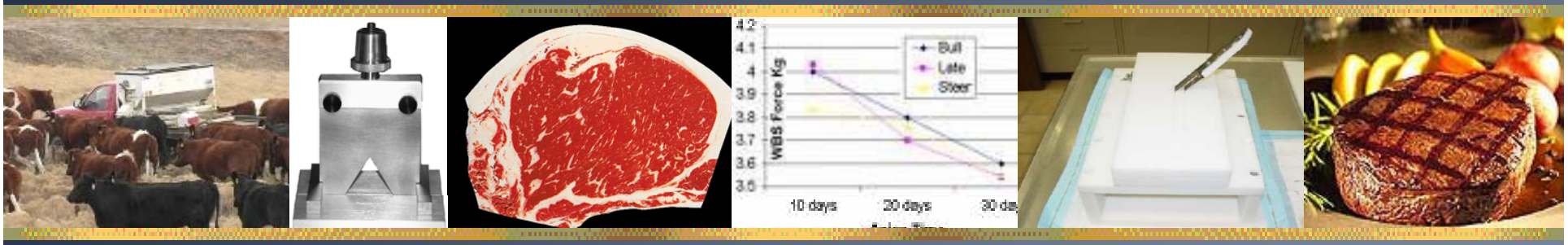
5. What is the best method to evaluate tenderness? Can methods other than the "best" be used?

   – Verification Methodologies – Warner-Bratzler shear force, slice shear force, or trained sensory panel

   – Predictive Technologies – Prediction made at *Longissimus dorsi*

# Questions Developed

6. Is an "improvement" in tenderness relevant to the standard?
   - Standard should reflect consumer preference
   - Common industry practices should be allowed
   - Initial claim should focus on intact muscles




# Consumer Implications and Sensory Update

**Darin R. Doerscher**
Marketing Specialist
Standards, Analysis and Technology Branch

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# Objectives

- To determine what attributes of palatability are most important (consumer perspective). Tenderness?
- To determine what the typical consumer's perception of "tender meat."

# Sub-committee Members

- Mark Boggess
- Kent Harrison
- Gretchen Hilton
- Jared Long
- Floyd McKeith
- Mark Miller
- Rhonda Miller
- Dean Pringle
- Paul Rodgers

# Literature

- Majority of tenderness research is in Beef
  - Pork research is readily available, but Lamb is very limited.
- Moderate to strong relationships exist between the measures of WBSF, SSF, Star-Probe and sensory panel ratings in beef and pork.

# Correlations Between Measurements of Meat Tenderness Found in the Literature

| Instrument | Trained Sensory Panel | Consumer Panel |
|---|---|---|
| Slice Shear Force | 0.58 to 0.76[a,b,c] | 0.92[d] |
| Warner-Bratzler Shear | -0.18 to -0.85[e,f,g] | -0.16 to -0.72[h,i] |
| Star-Probe | -0.54[g,j,k] | |

[a]Shackelford et al., 1999
[b]Wheeler et al., 2000a
[c]Shackelford et al., 2004
[d]Wheeler et al., 2004
[e]Otremba et al., 1999
[f]Rhee et al., 1999
[g]Lonergan et al., 2001
[h]Lorenzen et al., 2003
[i]Destefanis et al., 2008
[j]Huff-Lonergan et al., 2002
[k]Lonergan et al., 2007

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# Implications

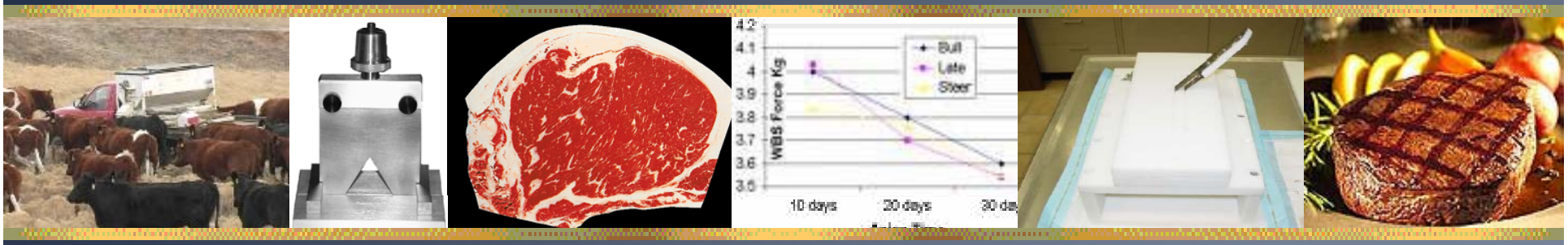
- Consumers can differentiate between tough and tender beef and pork cuts.
- Are consumers willing to pay for tender beef?
  - Dr. Mark Miller, TTU
- Can the processor afford to sort for this?
  - Will the premium earned offset the COGS?
- Wholesale/retail perspective is needed on the level of risk they would consider acceptable to make a labeling claim.

# Sub-Committee Discussions

- Prediction Equations Discussed
  - Dr. Rhonda Miller, TAMU/Dr. Mark Miller, TTU/Dr. Keith Belk, CSU
  - Relationships (although slight) exist between consumer like and shear force values in beef
  - Analyzing like data sets from different studies/Meta Analysis
  - Pork relationships
- Lamb Study
- More in-depth discussion during the open forum

# Sub-Committee Discussions

- Beyond differentiation between tough and tender, the data suggests that there are different consumer tenderness expectations for different species.
- Would differing tenderness expectations for each species suggest that a “line in the sand” would be needed for verification purposes?




# Methodologies, Testing and Verification Update

**Carol L. Lorenzen**
Visiting Professor Fellow
Standards, Analysis and Technologies Branch

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# Objectives

- To determine what methodologies/instruments are accepted by all stakeholders
- To set the performance criteria for instrument performance in the field
- To determine verification activities associated with a tenderness claim

# Sub-committee members

- Keith Belk
- Chris Calkins
- Jerry Cannon
- Michael Dikeman
- Bucky Gwartney
- Dwain Johnson
- John Killefer
- Virginia Littlefield
- Brian McFarland
- Ann Rasor-Wells
- Brian Reuter
- Steven Shackelford
- Deb VanOverbeke
- Tommy Wheeler
- Lora Wright

# Key points in developing a tenderness claim

- Flexibility is needed so that producers, packers, and further processors can apply the claim.
- Should be about the ultimate consumer experience.



# Location of measurements for Prediction and Identification

- Correlations between tenderness in the LD and other muscles ranged from -.05 to .73.

- Tenderness classification based on the LD can segment other muscles into the same classifications.

# Recommendation for Measurement Location

- Current beef grading activities and practicality in an industrial plant setting indicate that the *Longissimus* muscle is the logical muscle to use in tenderness prediction.

# Methodologies to be used in Verification

- Should have standards set by another governing body such as AMSA.
- Should be open to new technologies that can be validated.
- Should be a direct measure of tenderness.

# Recommendation of Methodologies used in Verification

- Warner-Bratzler shear force
- Slice shear force
- Trained sensory panel


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# Recommendation of Processing Techniques and Processes

- Common industry practices need to be allowed
  - TenderStretch
  - Electrical stimulation
  - Aging
- Initial claim should focus on intact muscle that is tender

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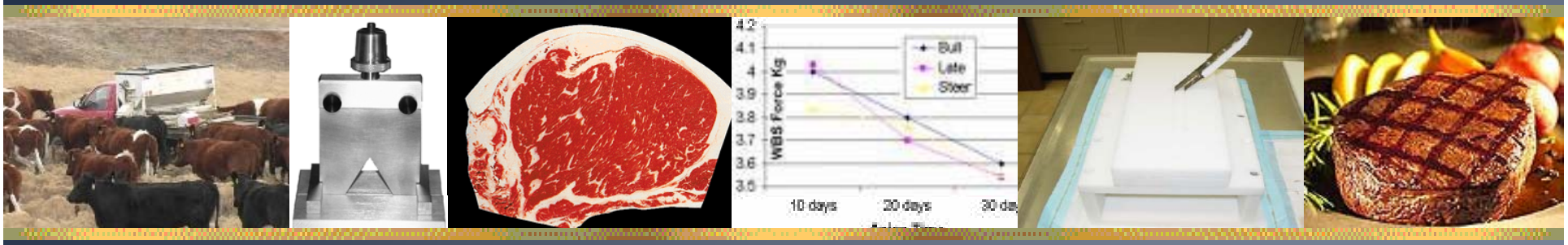


# Economic Implications Update

**Lawrence Yates**
Marketing Specialist
Standards, Analysis and Technology Branch

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# Objectives

- To determine the economics of a tenderness-based beef marketing system
- Determine the implications at all points of the food chain

# Sub-committee Members

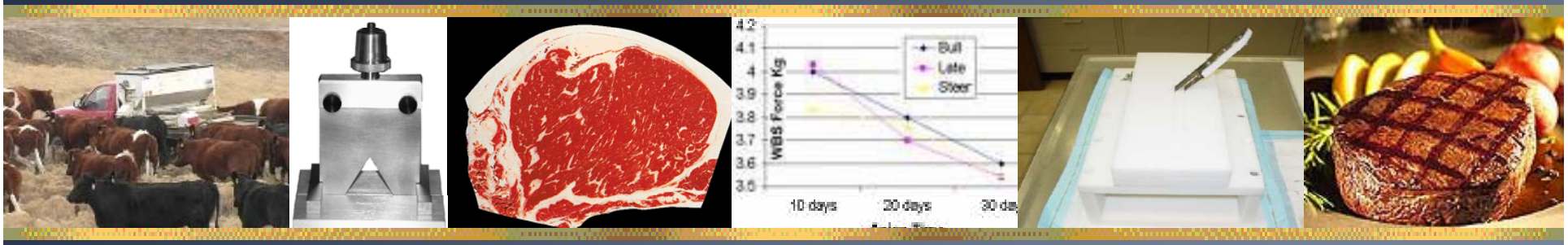
- Charlie Bradbury
- John Green
- Warren Mirtsching
- Bo Reagan
- Ted Schroeder

# Key Points

- USDA Quality Grade does not adequately reflect tenderness
- Generic "Tender" claims were not associated with significant premiums
- Tenderness "Assured" or "Verified" programs resulted in a $1.82 premium

# Key Points

- Premium typical for 20% of carcass weight
- Tenderness premiums were typically associated with particular consumer segments (e.g., Wild Oats)




# Predictive Technology Update

**Kerry R. Smith**
Marketing Specialist
Standards, Analysis and Technology Branch

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# Objectives

- To determine what ante-mortem practices and technologies are available to predict tenderness
- To determine what post-mortem practices and technologies should/should not be considered in manufacturing a product under a tenderness claim
- Upstream prediction

# Sub-committee Members

- Glenn Ross
- Elisabeth Huff-Lonergan
- Andy King
- Kasey Maddock-Carlin
- Brian McFarlane
- Brad Morgan
- Bob Richmond
- Dan Shiley
- Jeyam Subbiah
- Dale Woerner
- Brent Woodward
- Lora Wright
- Duane Wulf

# Key points in developing a tenderness claim

- Flexibility to us a system to sort and/or a total quality management system
  - Evaluate **either** every carcass **or** verify the process
  - Consideration of the entire system
    - Pre-harvest
    - Post-harvest enhancements
    - Objective measurements
    - Prediction instruments

# Current Predictive Technologies*

- Hyperspectral imaging
- Near-infrared spectroscopy
- Video image analysis
- Fluorescence based biological sensor

*Taken from the National Beef Instrument Assessment Plan III Meeting Executive Summary

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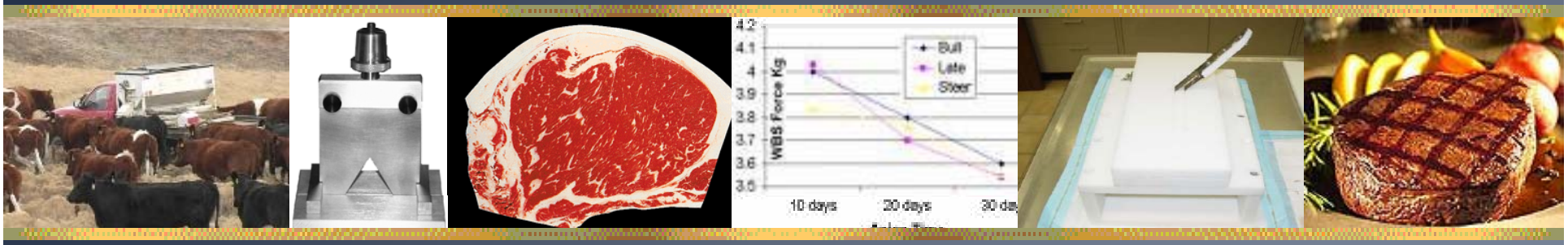
# NCBA Study

- National Cattlemen's Beef Association will be funding a study for the validation of tenderness prediction instruments
  - Objective: To compare current meat tenderness prediction instruments in a plant setting to determine the accuracy and precision of these systems on the same set of cattle.
  - Status: Design phase




# Open Discussion

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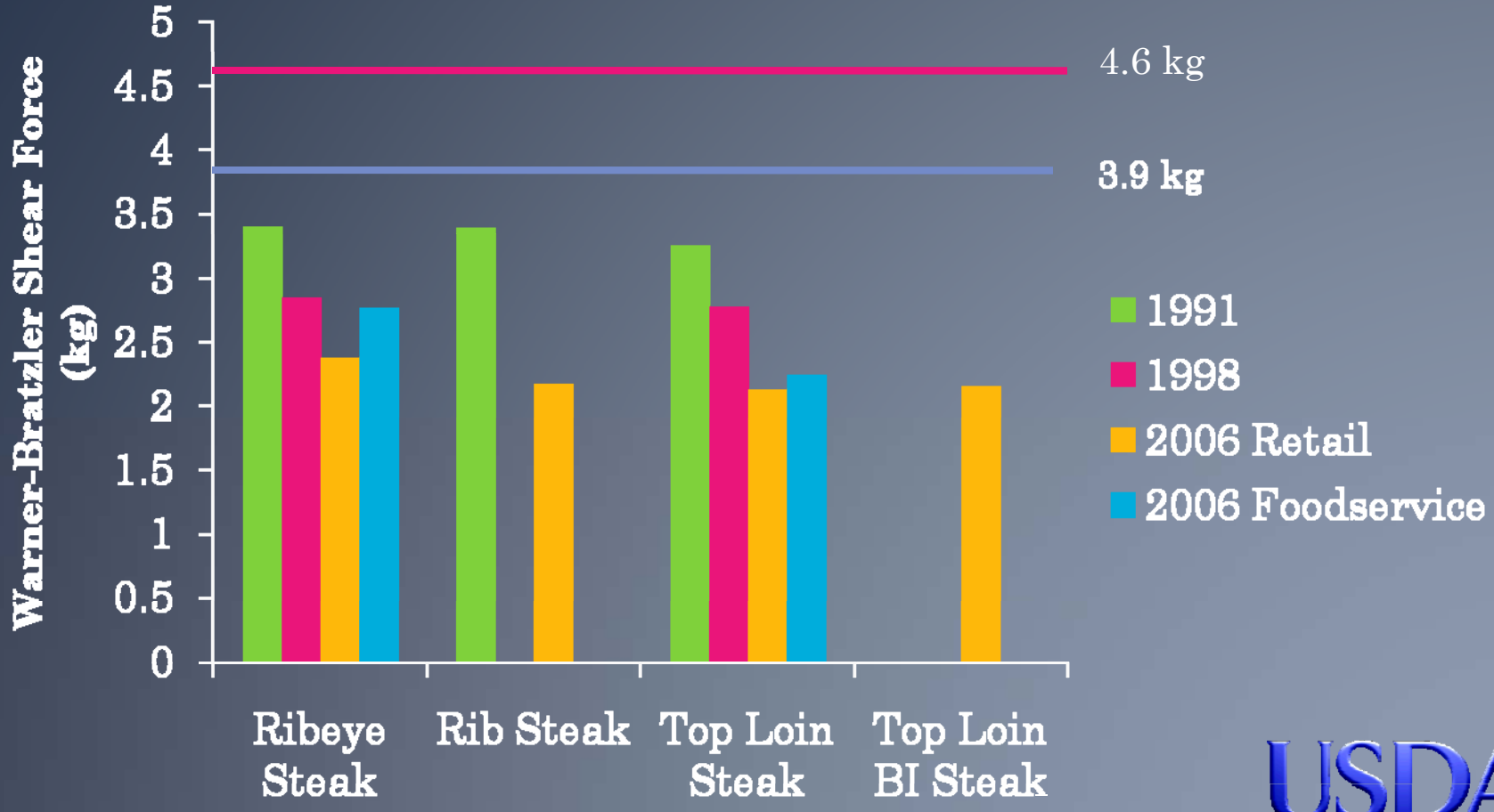
# National Beef Tenderness Surveys

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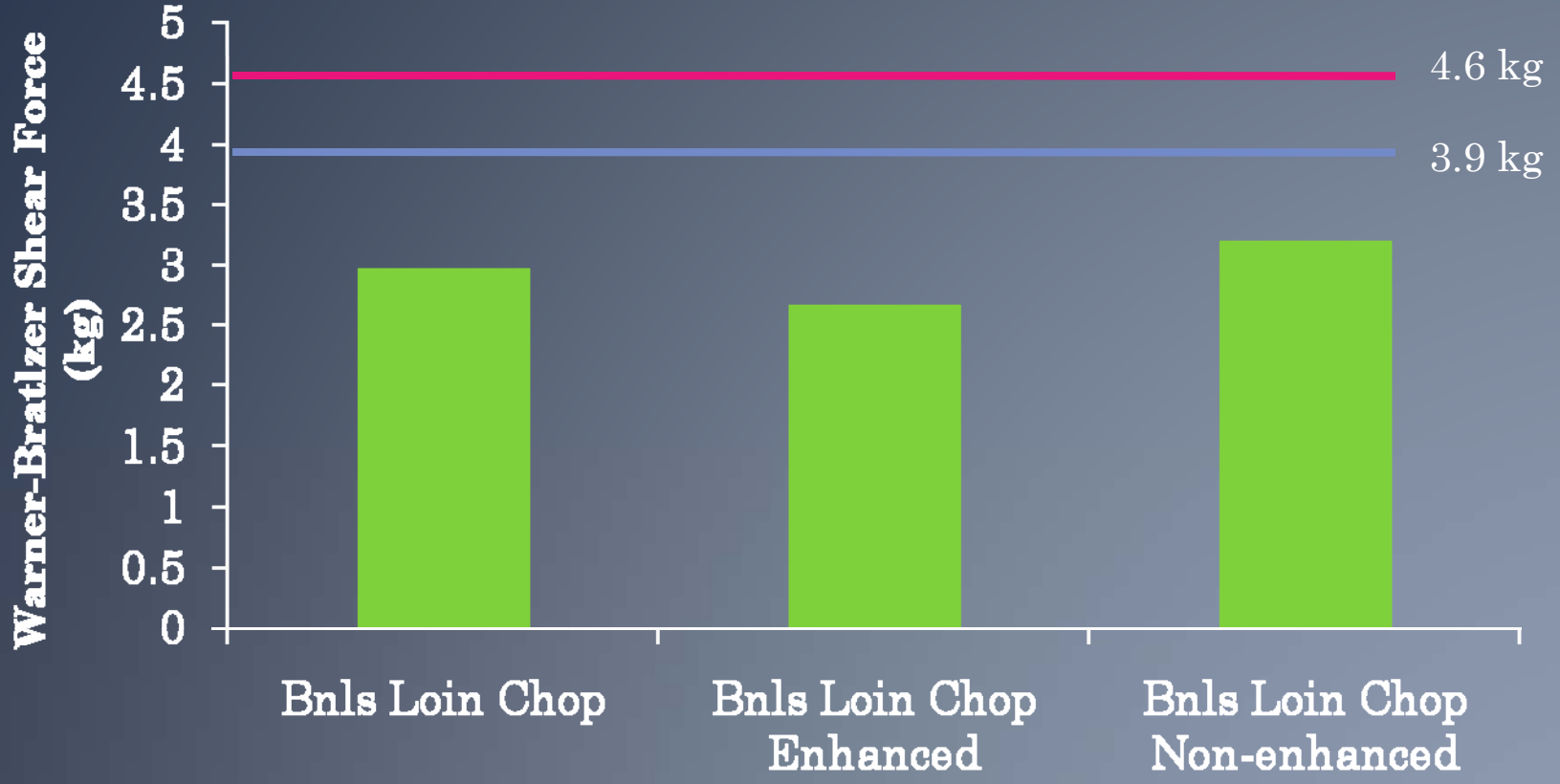
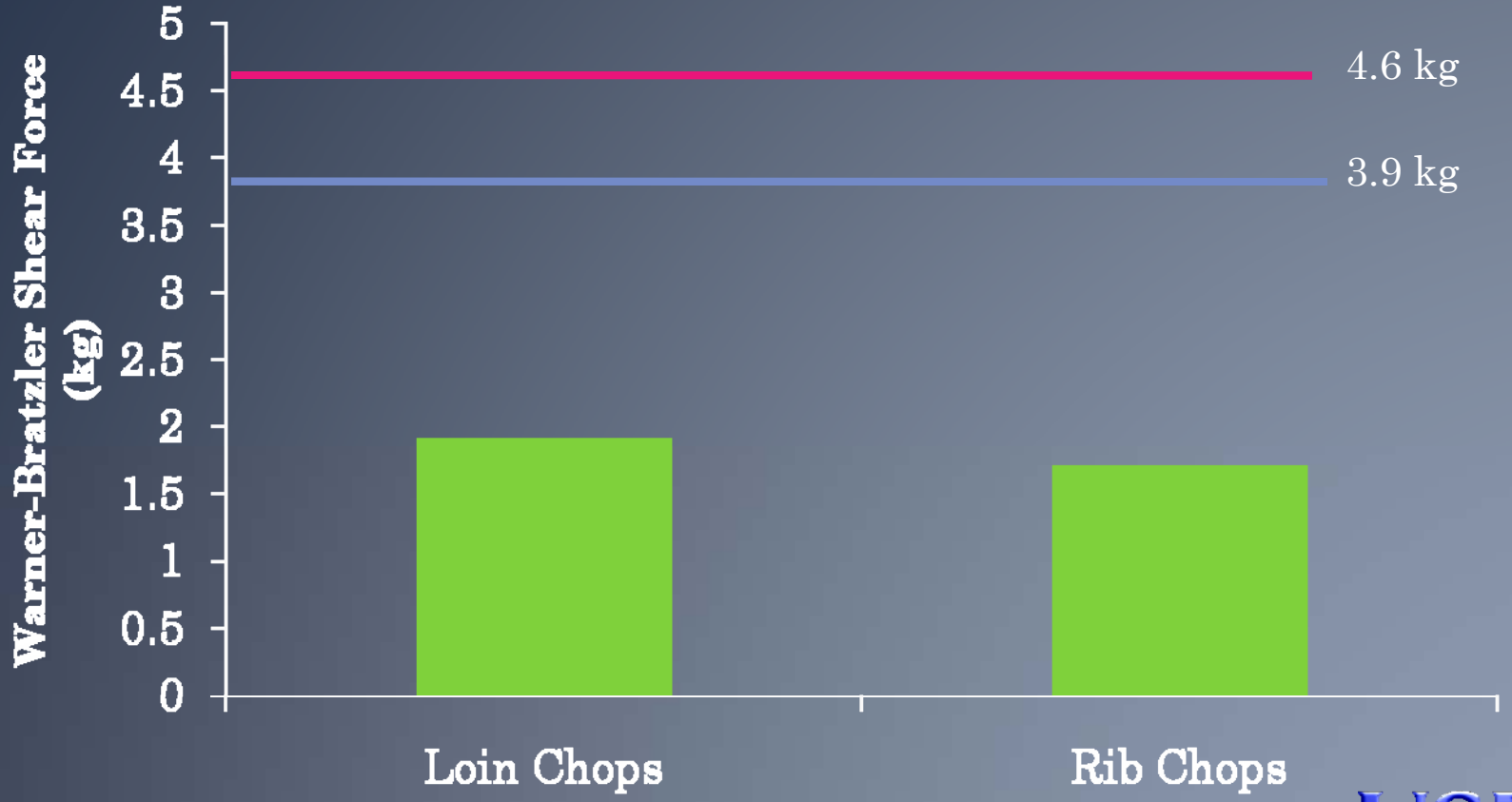
# Pork Benchmarking Study



# National Market Basket Survey for Lamb

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# What can a USDA marketing claim look like?

- Certification/Branded Programs
  - Certified Angus Beef
  - Sterling Silver
- U.S. Standard for Livestock and Meat Marketing Claims
  - Grassfed
- Performance Standards
  - Prime I
  - Prime II

# Questions for open discussion

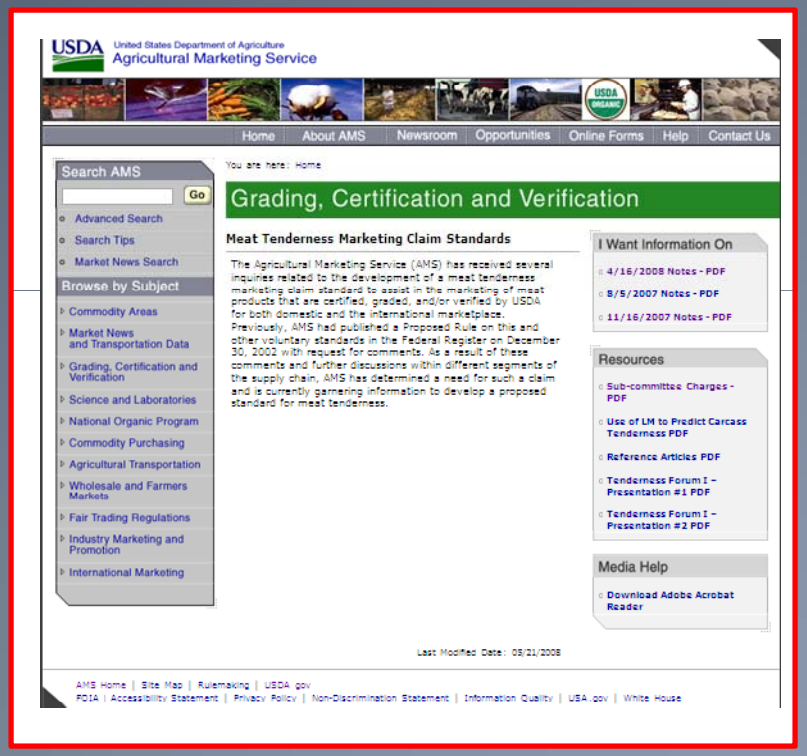
- In your opinion, what should a tenderness claim look like?

# Breakout Session – Room Assignments

- PT - Magnolia
- MTV- Dogwood
- CIS - Live oak
- EI - Cedar

# Meat Tenderness Claim Standard Initiative Website

- Available in July
- Address will be sent to participants
- Contents
  - Contact Info
  - Literature
  - Presentations
  - Meeting Notes
  - Working Data

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# Summary of Tenderness Initiative to date

- Spent the past year defining what a tenderness claim will look like.
- NEXT: Sub-committees will work on their specific objectives.