

# USDA Seeks Input on Revisions to Beef Grading Standards



**USDA** UNITED STATES DEPARTMENT OF  
**AGRICULTURE**



United States Department of Agriculture  
Agricultural Marketing Service



## USDA Seeks Input on Revisions to Beef Grading Standards

Release No.: 180.14

Contact:  
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48112

### Notices

WASHINGTON, August 14, 2014—The Agricultural Marketing Service (AMS) is seeking public input on recent improvements and instrument grading.

When beef is voluntarily graded principally for flavor and satisfaction of consumers, carcasses are Prime, Choice, and Standard regimens, instrument graded, and other sources before purchase.

The yield grade is used and is an important to equation was developed yield, and AMS is se

AMS is also requested by the American Meat General (OIG). The

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This section of the FEDERAL REGISTER contains documents other than rules or proposed rules that are applicable to the public. Notices of hearings and investigations, committee meetings, agency decisions and rulings, delegations of authority, filing of petitions and applications and agency statements of organization and functions are examples of documents appearing in this section.

#### DEPARTMENT OF AGRICULTURE

#### Agricultural Marketing Service

[Doc. No. AMS-LPS-14-0052]

#### United States Standards for Grades of Carcass Beef

**AGENCY:** Agricultural Marketing Service, USDA.

**ACTION:** Notice, request for comments.

**SUMMARY:** The Agricultural Marketing Service (AMS) of the Department of Agriculture (USDA) is seeking public comments on revising the United States Standards for Grades of Carcass Beef. USDA is requesting comments concerning, but not limited to, the beef yield grade standard and carcass

contact Lawrence Yates at: [Lawrence.Yates@ams.usda.gov](mailto:Lawrence.Yates@ams.usda.gov), or (402) 621-0836.

**SUPPLEMENTARY INFORMATION:** Section 203(c) of the Agricultural Marketing Act of 1946, as amended, directs and authorizes the Secretary of Agriculture "to develop and improve standards of quality, condition, quantity, grade, and packaging and recommend and demonstrate such standards in order to encourage uniformity and consistency in commercial practices." AMS is committed to carrying out this authority in a manner that facilitates the marketing of agricultural commodities and makes copies of official standards available upon request. The United States Standards for Grades of Carcass Beef do not appear in the Code of Federal Regulations but are maintained by USDA. These standards are located on USDA's Web site at <http://www.ams.usda.gov/AMSV1.0/LSSTDZ>. On the right side of the Web page select Standards to locate the Beef Carcass Grade Standard. To change the United States Standards for Grades of Carcass Beef, AMS plans to utilize the procedures it published in the August

#### Federal Register

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Friday, August 15, 2014

the palatability or eating satisfaction of cooked beef principally through the characteristics of marbling and maturity. The principal official USDA quality grades for young (maturity groups "A" and "B") cattle and carcasses are Prime, Choice, Select, and Standard.

USDA recognizes that the beef standards must be relevant to be of greatest value to stakeholders. Recommendations for changes in the standards may be initiated by USDA or by interested parties. The beef yield grade standard and equation was developed 50 years ago, and the cattle industry has undergone considerable change during those years. At that time, carcasses weighed in the 500 to 600 pound weight range. Today, carcasses average weight is in the 800 to 900 pound range, a 50 percent increase. These carcasses are clearly beyond the scope of USDA's current yield grade equation. This is illustrated by research that has shown the application of the USDA's yield grade equation introduces a ribeye area bias, thereby skewing carcass values. It is imperative that the current yield grade standard and associated metrics be applicable to

2014 / Notices

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**United States  
Department of  
Agriculture**

**Agricultural  
Marketing  
Service**

**Livestock  
and Seed  
Division**

# **United States Standards for Grades of Carcass Beef**

**Effective date January 31, 1997**

# Background

- The Beef Standards were designed to provide the basis for uniformity in reporting and marketing of beef carcasses
- The first Official United States Standards for Grades of Carcass Beef was promulgated by the Secretary of Agriculture on June 3, 1926
- Over the years, changes were made to:
  - Meet the needs of producers and buyers
  - Reflect research regarding effects on palatability

# History of Changes

## 1939

- Provided single standards for the grading of steer, heifer and cow beef with similar inherent quality characteristics
- The grade terms *Medium*, *Common*, and *Low Cutter* became *Commercial*, *Utility*, and *Canner*

## 1941

- Grade terminology was established for all beef: *Prime*, *Choice*, *Good*, *Commercial*, *Utility*, *Cutter* and *Canner*

## 1949

- Elimination of fat color

## 1950

- *Prime* and *Choice* were combined into the *Prime* grade, the *Good* grade was renamed *Choice*, and the *Commercial* grade was divided into the *Good* grade and the *Commercial* Grade.

## 1956

- The *Commercial* grade was divided into the *Standard* (young) and *Commercial* (mature) grades

## 1965

- Less emphasis was placed on the changes in maturity in the younger grades
- Carcasses were required to be ribbed before grading
- Yield Grade standards were adopted similar to the 1962 trial system

## 1973

- Separated quality grades for young beef from young bulls
- Created the *Bullock* grade and *stag* grades were eliminated

## 1975

- Reduced the marbling requirement to the same minimum degree throughout the youngest maturity group for a given grade and eliminated conformation
- Required all carcasses to be both quality and yield graded

## 1980

- Required all carcasses to be ribbed at least 10 minutes before grading and only carcasses would be graded only in the location where they were slaughtered

## 1987

- The name of the *Good* grade was changed to *Select*

## 1989

- Grades were "uncoupled" allowing for either quality and/or yield grading

## 1996

- The minimum marbling level for *Choice* was changed to minimum Modest throughout B maturity and the *Select* grade was limited to A maturity

[49 FR 23826, June 8, 1984]

**PART 36—PROCEDURES BY WHICH  
THE AGRICULTURAL MARKETING  
SERVICE DEVELOPS, REVISES,  
SUSPENDS, OR TERMINATES VOL-  
UNTARY OFFICIAL GRADE  
STANDARDS**

Sec.

36.1 General information.

36.2 Initiating action on grade standards.

36.3 Public notification of grade standards  
action.

AUTHORITY: 7 U.S.C. 1621–1627.

SOURCE: 62 FR 43439, Aug. 13, 1997, unless  
otherwise noted.

**§ 36.1 General information.**

The Agricultural Marketing Service (AMS or agency) of the U.S. Department of Agriculture (USDA) facilitates the fair and efficient marketing of agricultural products by promulgating voluntary official grade standards for dairy, fresh and processed fruits and vegetables, livestock, meats and meat products, eggs, poultry and rabbit products, tobacco, wool, mohair, and other agricultural products. AMS standards provide a uniform language for describing the quality of various agricultural commodities in the marketplace. These standards may cover (but are not limited to) terms, classes, sizes (including quantities of packaged

tion: Functional Committee for Standards. Communications about specific standards (such as a request to develop or revise a standard) should be addressed to the Director of the appropriate Division (Dairy, Fruit and Vegetable, Livestock and Seed, Poultry, or Tobacco). All communications should include in the address: Agricultural Marketing Service, U.S. Department of Agriculture, P.O. Box 96456, Washington, DC 20090–6456.

**§ 36.2 Initiating action on grade standards.**

The Agency will develop, revise, suspend, or terminate grade standards if it determines that such action is in the public interest. Any standardization action should reflect the broad interest of individuals or an industry involved in manufacturing, producing, packaging, distributing, testing, consuming, or using the product; or the interest of a Federal, State, or local agency. Proposed actions should always be based on sound technical and marketing information and should include careful consideration of the factors that determine a commodity's quality and condition and that will allow trained personnel to determine objectively conformance or non-conformance.

(a) AMS encourages interested parties to participate in the review, development, and revision of grade standards. Interested parties include grow-



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(a) AMS encourages interested parties to participate in the review, development, and revision of grade standards. Interested parties include growers, producers, processors, shippers, distributors, consumers, individuals, or

...THE RECOMMEND THAT AMS DEVELOP, RE-  
vise suspend, or terminate a grade  
standard. Requests for Agency action  
should be in writing, preferably accom-  
panied by a draft of the suggested  
change.

(1) The Agency, in cooperation with  
interested parties, as applicable, will:

(i) Determine the need for new or re-  
vised standards;

(ii) Collect technical, marketing, or  
other appropriate data;

(iii) Conduct research regarding new  
or revised standards, as appropriate;  
and,

(iv) Draft the proposed standards;

(2) [Reserved]

(b) If the Agency determines that  
new standards are needed, existing  
standards need to be revised, or the  
suspension or termination of existing  
standards is justified, it will undertake  
the action with input from all inter-

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USDA is requesting comments concerning,  
*but not limited to:*

- The beef yield grade standard
- Carcass maturity
- The review of the Department's beef instrument-grading program that was conducted by the American Meat Science Association

$$\text{Yield Grade} = 2.50 + 2.5 \times \text{AFT} + 0.2 \times \text{KPH} + 0.0038 \times \text{HCW} + 0.32 \times \text{REA}$$

AFT - Adjusted Fat Thickness

KPH - Kidney, Pelvic and Heart Fat

HCW - Hot Carcass Weight

REA - Ribeye Area

# Technical note: The United States Department of Agriculture beef yield grade equation requires modification to reflect the current longissimus muscle area to hot carcass weight relationship

T. E. Lawrence,<sup>1</sup> R. L. Farrow, B. L. Zollinger, and K. S. Spivey

Department of Agricultural Sciences, West Texas A&M University, Canyon 79016-0001

**ABSTRACT:** With the adoption of visual instrument grading, the calculated yield grade can be used for payment to cattle producers selling on grid pricing systems. The USDA beef carcass grading standards include a relationship between required LM area (LMA) and HCW that is an important component of the final yield grade. As noted on a USDA yield grade LMA grid, a 272-kg (600-lb) carcass requires a 71-cm<sup>2</sup> (11.0-in.<sup>2</sup>) LMA and a 454-kg (1,000-lb) carcass requires a 102-cm<sup>2</sup> (15.8-in.<sup>2</sup>) LMA. This is a linear relationship, where required LMA = 0.171(HCW) + 24.526. If a beef carcass has a larger LMA than required, the calculated yield grade is lowered, whereas a smaller LMA than required increases the calculated yield grade. The objective of this investigation was to evaluate the LMA to HCW relationship against data on 434,381 beef carcasses in

the West Texas A&M University (WTAMU) Beef Carcass Research Center database. In contrast to the USDA relationship, our data indicate a quadratic relationship [WTAMU LMA = 33.585 + 0.17729(HCW) - 0.0000863(HCW<sup>2</sup>)] between LMA and HCW whereby, on average, a 272-kg carcass has a 75-cm<sup>2</sup> (11.6-in.<sup>2</sup>) LMA and a 454-kg carcass has a 96-cm<sup>2</sup> (14.9-in.<sup>2</sup>) LMA, indicating a different slope and different intercept than those in the USDA grading standards. These data indicate that the USDA calculated yield grade equation favors carcasses lighter than 363 kg (800 lb) for having above average muscling and penalizes carcasses heavier than 363 kg (800 lb) for having below average muscling. If carcass weights continue to increase, we are likely to observe greater proportions of yield grade 4 and 5 carcasses because of the measurement bias that currently exists in the USDA yield grade equation.

**Key words:** beef, yield grade, longissimus muscle area, hot carcass weight

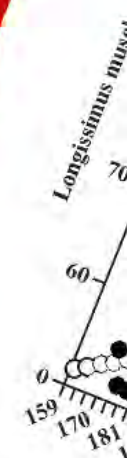
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J. Anim. Sci. 2008. 96:1434–1439  
doi:10.2527/jas.2007-0143

## INTRODUCTION

Hot carcass weight and LM area (LMA) are 2 c

Figure 1. The USDA area per HCW relationship



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were to 1) evaluate the sim  
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## METHODS

USDA beef yield grade requires modification

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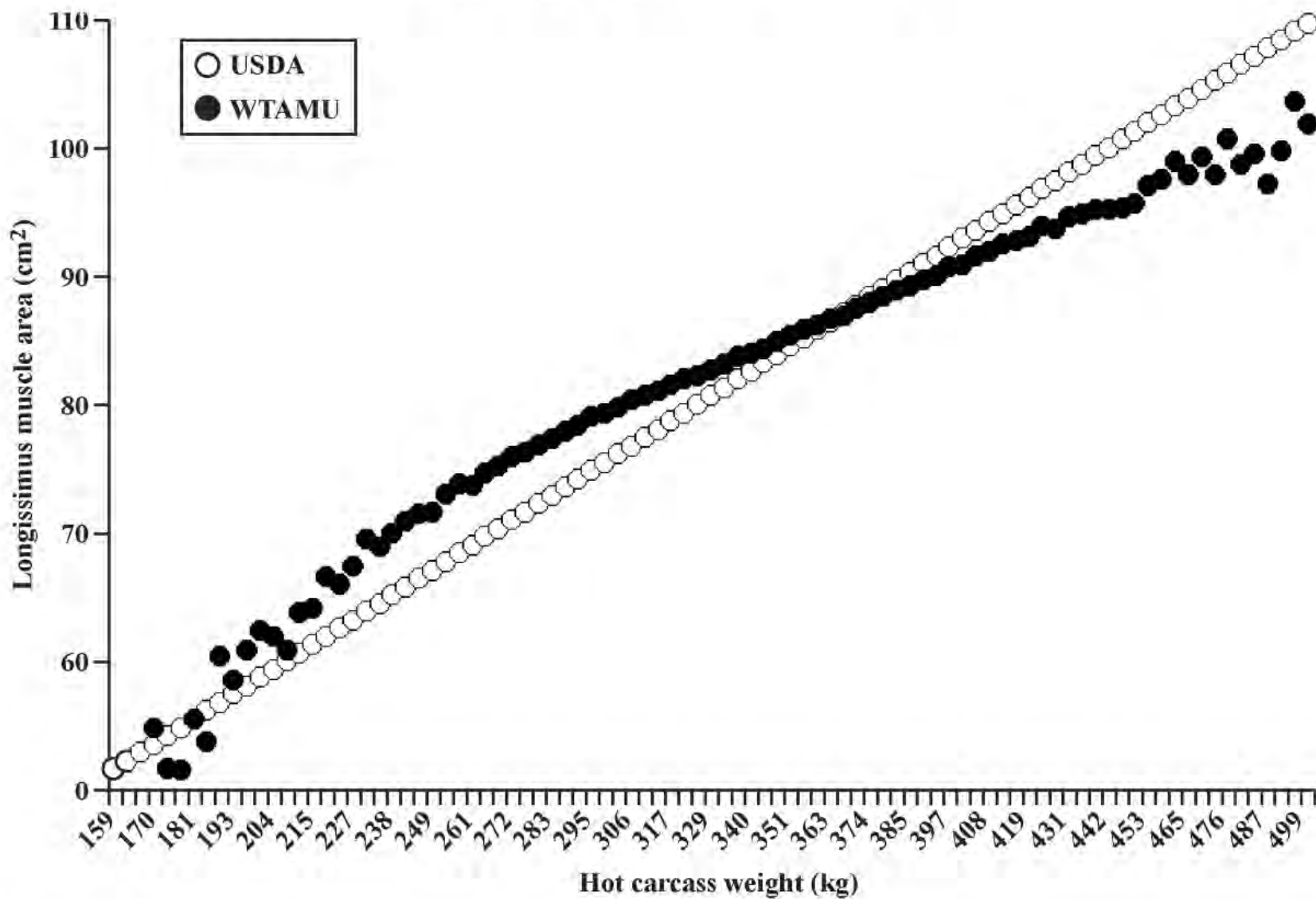


Figure 1. The USDA LM area per HCW relationship and the mean West Texas A&M University (WTAMU) LM area per HCW relationship.

# Impact

HCW < 800 lbs

- Have *larger* REA than predicted by the YG Equation

HCW > 800 lbs

- Have *smaller* REA than predicted by the YG Equation

417 to 741 lbs

- Calculated YG *lower* by 0.1 to 0.2 units than expected

833 to 1,100 lbs

- Calculated YG *higher* by 0.1 to 0.5 units than expected



**Should Other YG Factors be Considered?**

## KPH ???

Weekly Livestock Slaughter (head):	580,000
Average Dressed Weight (HCW):	820 lbs
Assumed Average KPH:	2.5 %
KPH Fat Produced in 1 Week:	11,890,000 lbs

USDA is requesting comments concerning,  
*but not limited to:*

- The beef yield grade standard
- **Carcass maturity**
- The review of the Department's beef instrument-grading program that was conducted by the American Meat Science Association

# A comparison of the USDA ossification-based maturity system to a system based on dentition

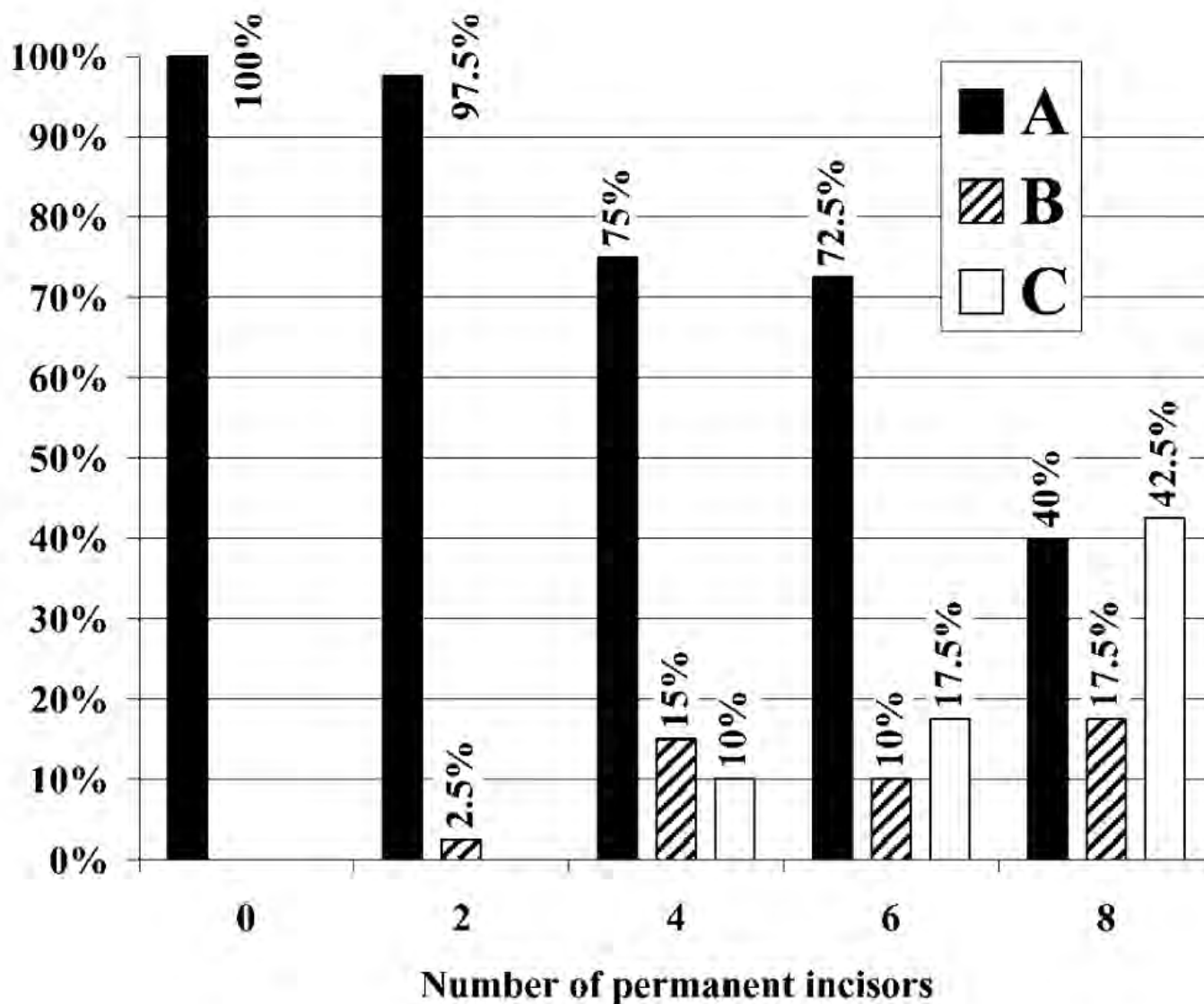
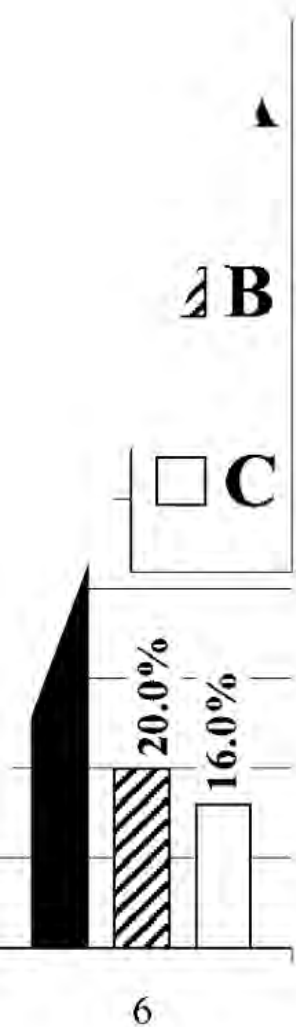
T. E. Lawrence<sup>1</sup>, J. D. Whatley<sup>2</sup>, T. H. Montgomery<sup>3</sup>, and L. J. Perino<sup>4</sup>

Division of Agriculture, West Texas A&M University, Canyon 79016-0001

**ABSTRACT:** Two studies using commercially fed cattle were conducted to determine the relationship of the USDA bone ossification-based maturity system to one based on the number of permanent incisors present at slaughter. These studies showed that 91.5 to 100% of cattle with zero permanent incisors (< 23.8 mo of age), 89.1 to 97.5% of cattle with two permanent incisors (23.8 to 30.4 mo of age), 75 to 82.2% of cattle with four permanent incisors (30.4 to 38.0 mo of age), 64 to 72.5% of cattle with six permanent incisors (38.0 to 45.3 mo of age), and 40% of cattle with eight permanent incisors (> 45.3 mo of age) were graded as A maturity by the USDA maturity classification system. Kappa tests revealed no statistical relationship between the dentition- and skeletal ossification-based maturity systems. Den-

titon-based maturity agreed with ossification/lean maturity for only 162 of 1,264 carcasses in Exp. 1 and only 54 of 200 carcasses in Exp. 2. Cattle with two, four, six, or eight permanent incisors were classified in more youthful categories of USDA bone ossification/lean maturity than they should have been. Male cattle were more likely to be misclassified into a younger age category by the USDA system than were female cattle. It seems that determining physiological maturity by number of permanent incisors rather than by the current USDA method of subjectively evaluating skeletal and lean maturity may prove to be a more accurate technique of sorting beef carcasses into less-variable age groups.

Key Words: Beef, Dentition, Maturity, Ossification



C maturity  
dentition groups  
(1).

**Figure 3.** Percentage of USDA A, B, and C maturity carcasses found within dental classification groups among 200 carcasses randomly chosen by dentition group from 11,136 carcasses (Exp. 2).

# Effects of USDA carcass maturity on sensory attributes of beef produced by grain-finished steers and heifers classified as less than 30 months old using dentition<sup>1</sup>

R. J. Acheson, D. R. Woerner, and J. D. Tatum<sup>2</sup>

Department of Animal Sciences, Colorado State University, Fort Collins 80523-1171

**ABSTRACT:** This study compared sensory properties of LM steaks from A maturity and B maturity or older carcasses that were produced by grain-finished steers and heifers classified as less than 30 mo old at the time of slaughter using dentition. Carcasses were selected to represent 2 maturity groups and 3 marbling categories within each maturity group, resulting in 6 maturity × marbling subclasses, each subclass consisting of 75 carcasses. Maturity groups consisted of carcasses classified by USDA graders as either A<sup>00</sup> to A<sup>99</sup> overall (A) maturity or B<sup>00</sup> to C<sup>99</sup> overall (B-C) maturity; marbling categories consisted of carcasses with instrument marbling scores of Slight (SL), Small (SM), or Modest<sup>00</sup> or greater (MT+). Carcasses were selected in pairs so that each carcass chosen to represent the B-C maturity group was paired with an A maturity carcass of the same sex and marbling score ( $\pm 30$  marbling units). Strip loin (LM) steaks were obtained from both sides of each carcass. After a 14-d aging period, 1 LM steak was measured for Warner-Bratzler shear force (WBSF) and slice shear force (SSF), whereas the other LM steak was used for sensory analysis by a trained descriptive attribute panel. No differences ( $P > 0.05$ ) in WBSF, SSF,

or sensory panel ratings for tenderness, juiciness, or flavor were detected between LM steaks from carcasses classified as A maturity and steaks from B-C maturity carcasses. However, marbling categories effectively stratified carcasses (MT+ > SM > SL) according to differences ( $P < 0.0001$ ) in LM tenderness, juiciness, meaty/brothy flavor, and buttery/beef fat flavor. Increased marbling also was associated with lesser ( $P < 0.01$ ) intensities of bloody/serumy and livery/organy flavors and reduced ( $P < 0.01$ ) values for WBSF and SSF. Of the traits tested, only bloody/serumy flavor was affected ( $P < 0.05$ ) by the maturity × marbling interaction. Interaction means showed that LM steaks from B-C maturity carcasses with SL marbling had a less intense bloody/serumy flavor than did steaks from A maturity carcasses with SL marbling. Results of this study suggest that, when applied to carcasses from grain-finished cattle whose dental ages are less than 30 mo old at the time of slaughter, USDA quality grades would be no less effective in identifying eating quality differences if the A and B-C maturity groups were combined and quality grades were assigned using only marbling.

**Key words:** beef, carcass, grading, maturity, quality, tenderness

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SSF specifi-  
cation

$P = 0.2356$

74.6  
69.3  
5.21

$P = 0.0003$

57.4<sup>b</sup>  
75.5<sup>a</sup>  
80.4<sup>a</sup>  
6.37

$P = 0.1829$

59.6  
73.3  
86.2  
55.1  
77.6  
72.9  
7.65

carcasses differed in sensory tenderness and WBSF.

## *Implications of Results*

According to results of the 2011 National Beef Quality Audit, 7.2% of the U.S. fed steer and heifer population produced carcasses that were classified as B maturity or older (Moore et al., 2012). O'Connor et al. (2007) reported official USDA maturity scores for more than 4,300 beef carcasses produced by cattle of known ages (11 to 30 mo) and found that cattle as young as 14 mo old produced carcasses classified as B maturity or older. Results of the present study indicate that A and B-C maturity carcasses have similar LM sensory attributes and shear force measurements when they originate from grain-finished cattle that have been classified as less than 30 mo old at the time of slaughter. These findings do not support the current grading concept of using skeletal and lean maturity characteristics to reflect age-associated tenderness differences in this subpopulation of cattle.

## LITERATURE CITED

USDA is requesting comments concerning,  
*but not limited to:*

- The beef yield grade standard
- Carcass maturity
- The review of the Department's beef instrument-grading program that was conducted by the American Meat Science Association



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# ***Review of Instrument Augmented Assessment of USDA Beef Carcass Quality Grades***

*Gretchen Mafi<sup>1</sup>, Bailey Harsh<sup>1</sup>, and John Scanga<sup>2</sup>*

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## **INTRODUCTION**

Assessment of marbling score (MS) at the 12<sup>th</sup>-rib interface of beef carcasses has long been the major determining value of carcasses and their cuts. Determination of MS is subjective, and besides for training from USDA, the only tool available to aid in the assessment of MS are marbling photographs illustrating the lower limits of marbling degrees. The tremendous variation and range in MS presented to graders and the human's visual assessment of MS can result in discrepancies (Cross, et al. 1980, 1984). Hueth et al. (2007) determined that there is a plant-to-plant bias assessing yield grades, as well as noting that graders are more consistent and accurate when grading lower quality carcasses. Therefore, all segments of the industry wish to utilize instruments that can assess MS and yield grade accurately and consistently.

In June 2006, two instruments for marbling assessment were approved for use by USDA. Nevertheless,

2013) that stated the USDA-Agricultural Marketing Service (AMS) needs to more effectively utilize its camera-based grading system and made several recommendations to AMS. The first recommendation was to form an ad hoc committee of independent and objective third party experts. Thus, AMS requested that the American Meat Science Association (AMSA) form a committee to address recommendations of OIG and respond to their audit findings. The audit also states camera grading is feasible and offers AMS flexibility in staffing needs but maintains cameras must provide consistent, accurate grades, and the system must be transparent to the public.

## **OBJECTIVE**

The objective of this review is to publish major milestones of automated grading systems for USDA Quality Grading. In response to an official audit conducted by the USDA Office of the Inspector General (OIG), this review will

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Vol. 79, No. 158, Page 48112

Comments are due no later than November 13, 2014

- By Mail:

Beef Carcass Revisions

Standardization Branch

LPS Program, AMS, USDA,

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Washington, DC 20250

- By fax: (202) 690-2746

- By email: [beefcarcassrevisions@ams.usda.gov](mailto:beefcarcassrevisions@ams.usda.gov)

# USDA Seeks Input on Revisions to Beef Grading Standards



**USDA** UNITED STATES DEPARTMENT OF  
**AGRICULTURE**