The 1997 USDA Beef Quality Grading System "B" Maturity Grade Change Audit II

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United States Department of Agriculture, Agricultural Marketing Service, Livestock and Seed Program

Background

Federal beef grading in the United States is a voluntary fee for service program, provided under the Agricultural Marketing Act of 1946, as amended, and administered by the U.S. Department of Agriculture, Agricultural Marketing Service (USDA). A primary purpose of the grades is to divide the population of cattle and beef into uniform groups (of similar quality, yield, value, etc.) in order to facilitate marketing. Grades provide a simple, effective means of describing product that is easily understood by both

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When beef is graded, the official grade consists of a quality and/or yield grade. The quality grades are intended to identify differences in the palatability or eating satisfaction of cooked beef principally through the characteristics of marbling and maturity. The maturity of beef carcasses is determined by evaluating the size, shape, and ossification of the bones and cartilages--especially the split chine bones--and the color and texture of the lean flesh (USDA, 1997). In the split chine bones, ossification changes generally occur at an earlier stage of maturity in the posterior portion of the vertebral column (sacral vertebrae) and at progressively later stages of maturity in the lumbar and thoracic vertebrae. Marbling is evaluated in the exposed lean surface of the ribeye muscle at the division between the 12th and 13th ribs. To facilitate the application of these principles, the standards recognize five different maturity groups and ten different degrees of marbling. The five maturity groups are A, B, C, D, and E, in order of increasing maturity. The degrees of marbling referenced in the specifications, in order of decreasing quantity are: abundant, moderately abundant, slightly abundant, moderate, modest, small, slight, traces, and practically devoid. The principal official USDA quality grades for young (maturity groups A and B) cattle and carcasses are Prime, Choice, Select, and Standard.

In developing and maintaining the grades, USDA follows the philosophy that, to be effective, beef grades should sort the supply of beef carcasses into homogeneous groups having a sufficiently narrow range of grade-determining factors so that carcasses within a given grade are essentially interchangeable. Another primary objective is to provide as uniform and consistent a product as possible within a given grade.

USDA recognizes that the beef standards cannot be static--they must be dynamic to be of greatest value to the various users. In keeping with this philosophy, USDA has made changes in the standards as necessary to meet the changing needs of users of the system. Recommendations for changes in the standards may be initiated by USDA or by interested parties. When it appears that a change would improve the standards, a proposal is published in the U.S. Federal Register and interested parties are provided an opportunity to comment. In such instances, a decision regarding adoption of the proposed change is made only after receipt and analysis of all comments.

Effective January 31, 1997, the official U.S. standards for grades of carcass beef and related standards for grades of slaughter cattle were revised in response to a June 1994 petition by the National Cattlemen's Association (currently named the National Cattlemen's Beef Association; NCBA) of the United States. This petition requested USDA to modify the beef quality grade standards by removing "B" maturity carcasses with small and slight marbling scores from the Choice and Select grades and to include such carcasses in the Standard grade. The NCBA petition stated the modern beef animal today is typically marketed at 12 to 15 months of age when fed as calves and 18 to 24 months of age when fed as yearlings. These modern animals are the result of progressive breeders and feeders who produce faster growing, more efficient cattle. If these animals receive proper care and nutrition, they should have no difficulty producing carcasses in the "A" maturity group (less than 30 months of age). Carcasses of "B" maturity are typically from cattle which are 30 to 42 months of age when marketed, however, many other factors besides chronological age can affect physiological maturity (Waggoner et al., 1995).

Research conducted for USDA using trained taste panels indicated "B" maturity carcasses possessing a small or slight amount of marbling add to the variability of palatability within the Select and Choice grades (Smith et al., 1984) and they do not epitomize the "modern beef carcass." Permitting "B" maturity carcasses with slight and small degree of marbling to be graded Choice and Select when they have been shown to be considerably more variable in palatability than "A" maturity carcasses with slight and small marbling creates no incentives for the industry to decrease production and marketing of cattle which do not conform to consumer demand for quality and consistency.

Although the results of numerous research projects found that these carcasses comprised only a small percentage of the total U.S. fed beef supply, no significant study specifically evaluating the overall prevalence of "B" maturity carcasses or assessing differences between region of the country or gender had ever been conducted (Hale et al., 1995; Lorenzen et al., 1993). Therefore, USDA, in cooperation with the Colorado State University Department of Animal Sciences and NCBA, conducted a six week audit in 1996 to identify the prevalence of "B" maturity carcasses being processed at federally inspected steer and heifer slaughter establishments (Morris et al., 1997).

Over the period of October 28 to December 4, 1996, 21 USDA Supervisory Meat Grading and Certification Branch personnel evaluated carcasses from 1,039 lots representing a commercial slaughter of 97,210 head in 40 geographically dispersed packing plants. Of the 40 packing plants surveyed, 17 process carcasses during two shifts per day. In these establishments, data were collected in each of the two shifts, therefore, a total of 57 total audits were performed. Data collected included animal lot size, packing plant and region of slaughter, and carcasses were evaluated for lean, skeletal and overall maturity, marbling degree at the 12th

rib interface, and gender. Carcass lean, skeletal and overall maturity, and marbling degree at the 12th rib interface were determined using USDA procedures established in the official United States standards for grades of carcass beef (USDA, 1997). Data were collected, final quality grades calculated for both the 1996 and 1997 standards, and statistical means determined by Colorado State University using Microsoft Excel (Version 7.0; Microsoft Corporation, Roselle, IL, USA).

Tables 1 and 3 present the results of the 1996 audit. Although the results of the 1996 audit found that less than 2% of the beef supply would be affected by the grade change, NCBA requested that USDA conduct a year-long audit of the prevalence of "B" maturity carcasses in case the 1996 audit was not representative of the entire year-long cattle cycle.

Objectives

Given the short time frame of the 1996 audit, the objectives of this study were to more accurately quantify the prevalence of

rib interface, and gender. Carcass lean, skeletal and overall maturity, and marbling degree at the 12th rib interface were determined using USDA procedures established in the official United States standards for grades of carcass beef (USDA, 1997). Data were collected, final quality grades calculated for both the 1996 and 1997 standards, and statistical means determined by Colorado State University using Microsoft Excel (Version 7.0; Microsoft Corporation, Roselle, IL, USA).

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Objectives

Given the short time frame of the 1996 audit, the objectives of this study were to more accurately quantify the prevalence of "B" maturity carcasses in the U.S. fed beef supply over the entire year-long cattle cycle by gender, region and for the entire nation.

Methods

From February 1, 1997, through January 23, 1998, similar data to that collected in the 1996 audit were also collected on a monthly basis. In addition to the original 57 audits, an additional 4 plants were included which brought the overall total audits each month to 61. During these audits, data were collected for a random two-hour period each month. For the year, the audits at each plant represented approximately four days' slaughter. The total carcasses represented by the audits were 351, 238.

Results and Discussions

Overall, 0.61 percent of the carcasses were affected by the grade change (Table 2). The percentage of steers and heifers affected was 0.34 and 0.98, respectively. Overall, all regions had less than 1% of carcasses affected by the change during the audit (Table 4). Although not shown in tabular form, throughout the year-long audit, affected steers were less than 0.5% except for February. Heifers generally decreased throughout the first six months then had a small increase in the fall months.

Conclusions

These data, coupled with the earlier data from the 1996 audit and from the National Beef Quality Audit, would indicate the overall occurrence of "B" maturity carcasses affected by the grade change has continued to decrease as a result of the 1997 grade change.

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Table 1. Maturity Scores by Gender for 1996 Audit

Gender	Number	% ≥ C Overall	% B Overall	% B Affected
Steer	49,019	0.75	1.71	1.24
Heifer	31,522	2.73	3.03	2.25
Mixed	16,669	1.79	2.10	1.31
Total	97,210	1.57	2.21	1.58

Table 2. Maturity Scores by Gender for 1997-98 Audit

Gender	Number	% ≥ C Overall	% B Overall	% B Affected
Steer	204,561	0.59	0.60	0.34
Heifer	146,677	2.97	1.82	0.98
Total	351,238	1.58	1.11	0.61

Table 3. "B" Maturity Carcasses by Region for 1996 Audit

Region	Number	% B Overall	% B Affected
Eastern	10,003	2.36	1.49
Nebraska	24,504	2.60	1.85
Kansas	25,417	1.46	1.05
Texas	18,988	3.47	2.53

Table 4. "B" Maturity Carcasses by Region for 1997-98 Audit

Region	Number	% B Overall	% B Affected
Eastern	54,918	1.54	0.91
Nebraska	73,025	2.32	0.87
Kansas	90,768	1.42	0.41
Texas	73,767	1.38	0.41