

Improving the Consistency and Competitiveness of Beef in the U.S.A. -- Results of the National Beef Quality Audit

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In an attempt to reduce the price, and to improve the quality, of beef in the U.S.A., the National Beef Quality Audit--1991 was conducted by scientists from Colorado State University (CSU) and Texas A&M University (TAMU) for the Industry Information Program of the National Cattlemen's Association (NCA). Funding for the Audit was provided by the Cattlemen's Beef Promotion and Research Board. Gary Smith (CSU) and Jeff Savell (TAMU) were Co-Project Leaders while Darrell Wilkes (NCA) and Chuck Lambert (NCA) were Project Contract Coordinators. Other scientists involved were: Paul Clayton (ConAgra Red Meat Companies & CSU), Tom Field (CSU), Davey Griffin (TAMU), Dan Hale (TAMU), Mark Miller (Texas Tech University), Ted Montgomery (West Texas State University), Brad Morgan (CSU), Daryl Tatum (CSU) and Jim Wise (Livestock Division, AMS/USDA & CSU). The Audit was initiated on September 1, 1991 and was completed on March 31, 1992. Following is the Executive Summary of the National Beef Quality Audit--1991.

The Goal of the National Beef Quality Audit--1991 was "to conduct a quality audit of slaughter steers/heifers (their carcasses, cuts and dress-off/offal items) for the U.S. beef industry in 1991, establishing baselines for present quality shortfalls and identifying targets for desired quality levels by the year 2001."

The National Beef Quality Audit--1991 consisted of three Phases. Phase I consisted of the Face-to-Face Interviews, Phase II was comprised of Slaughter-Floor and Cooler Audits in 28 beef packing plants, and Phase III was a Strategy Workshop.

Phase I: More than 100 persons were questioned by the Interview Team to identify quality problems, defects, shortcomings or shortfalls with slaughter steers/heifers,

their edible/inedible offal, their carcasses, their wholesale/retail cuts and the processed beef made from their trimmings. Beef was found, by both FDA and USDA, to be very safe in terms of residues of pesticides, hormones and antibiotics. There are food-borne pathogens on some beef, but efforts to reduce numbers/incidence of those microbes, by packers and USDA-FSIS personnel, are succeeding; public-education programs directed toward end-use preparers of beef will minimize impact of those microbes on ultimate consumers of beef. In general, those interviewed found greatest fault with beef's inconsistency, fatness, palatability and price.

In Face-to-Face Interviews with supermarket meat-management personnel ("retailers"), the top ten Concerns About The "Quality" Of Beef were: (1) **Excessive External Fat**, (2) **Excessive Weights/Box**, (3) **Too High Incidence of Injection-Site Blemishes**, (4) **Excessive Seam Fat**, (5) **Low Overall Cutability**, (6) **Low Overall Uniformity**, (7) **Inadequate Tenderness**, (8) **Too Frequent Bruise Damage**, (9) **Too Many Dark Cutters**, and (10) **Too Large Ribeyes/Loineyes**.

In Face-to-Face Interviews with those who wholesale beef to the food-service industry ("purveyors"), the top ten Concerns About The "Quality" Of Beef were: (1) **Excessive External Fat**, (2) **Too High Incidence of Injection-Site Blemishes**, (3) **Too Large Ribeyes/Loineyes**, (4) **Too Frequent Bruise Damage**, (5) **Excessive Seam Fat**, (6) **Low Overall Uniformity**, (7) **Too Many Dark Cutters**, (8) **Low Overall Cutability**, (9) **Low Overall Palatability**, and (10) **Low Overall Appearance**.

In Face-to-Face Interviews with those who purchase, prepare and present beef to customers in hotels, restaurants, institutions, fast-food franchises, etc.

("restaurateurs"), the top ten Concerns About The "Quality" Of Beef were: (1) **Excessive External Fat**, (2) **Too High Incidence of Injection-Site Blemishes**, (3) **Excessive Seam Fat**, (4) **Too Large Ribeyes/Loineyes**, (5) **Insufficient Marbling**, (6) **Low Overall Cutability**, (7) **Too Many Dark Cutters**, (8) **Inadequate Tenderness**, (9) **Inadequate Flavor**, and (10) **Low Overall Uniformity**.

In Face-to-Face Interviews with those who purchase live cattle and convert them into carcasses, edible offal and inedible offal ("packers"), the top ten Concerns About The "Quality" Of Beef were: (1) **Too Frequent Hide Problems, Caused By Brands, Insects, Parasites, and Mud/Feces/Urine**, (2) **Too High Incidence of Injection-Site Blemishes**, (3) **Excessive Carcass Weights**, (4) **Too Many Bruises**, (5) **Reduced Quality-- Lower Marbling Scores, More Ossification of the Skeletal System, Elevated Incidence of Dark Cutters, Decreased Tenderness -- Due to Use of Implants**, (6) **Too Many Liver Condemns**, (7) **Too Few U.S. Choice Carcasses**, (8) **Too Many Yield Grade 4 and 5 Carcasses**, (9) **Lack of Uniformity of Live Cattle and Carcasses**, and (10) **Too Many Dark Cutters**.

Based upon results of the Face-to-Face Interviews, estimates were made of Quality Losses Per Slaughter Steer/Heifer due to problems, defects, shortcomings and shortfalls. It was determined that the industry was losing \$256.27 for every steer/heifer slaughtered in the U.S. during 1991.

It was not intended that the Face-to-Face Interviews Phase of the National Beef Quality Audit--1991 result in ultimate conclusions regarding Concerns About The "Quality" Of Beef or Quality Losses Per Slaughter Steer/Heifer. Phase III -- the Strategy Workshop -- was designed to use results of Phases I and II, to attain consensus on those two matters.

Phase II: The Federally Inspected Slaughter (FIS) of steers and heifers was surveyed during October, November and December 1991 in 28 packing plants chosen to approximate at least 70% of the FIS and to represent the geographic distribution of slaughter/dressing facilities in the U.S. From each lot of cattle in a given packing plant, 50% of the animals were evaluated for hide defects (N=32,365), viscera condemnation

(N=37,925), head/tongue condemnation (N=30, 646) and bruises (N=31, 619). In addition, from each lot of cattle in a given packing plant, 10% of the carcasses were evaluated/measured for gender as well as USDA Quality and Yield Grade factors (N=7, 375) by the Packing-Plant Audit Team.

Slaughter-floor audits revealed the following: (a) Brand Incidence -- 55.0%, no brand; 29.9%, butt brand; 13.8%, side brand; 0.8% shoulder brand; 2.1%, multiple brands; (b) Brand Size -- 5.13 sq. in., 6.50 sq. in., and 0.19 sq. in., for butt, side and shoulder brands, respectively; (c) Presence of Horns -- 68.9%, polled or dehorned; 31.1%, horned; (d) Excessive Mud -- 6.8%, excessive mud; (e) Viscera Condemns -- 19.24%, 5.07%, 3.49% and 0.07%, of livers, lungs, tripe and total viscera, respectively, were condemned by FSIS-USDA Meat Inspectors (abscesses accounted for 72.66%, 53.59% and 87.58%, respectively, of liver, lung and tripe condemnations); (f) Head/Tongue Condemns -- 1.06% of the heads and 2.70% of the tongues were condemned by FSIS-USDA Meat Inspectors; (g) Pregnancies -- 0.93% of heifers contained a fetus; and (h) Bruises -- 16.8%, 15.7%, 25.5%, 2.3%, 0.0% and 0.3% of the chuck, rib, loin, round, brisket and other-cut areas, respectively, had at least "superficial" bruises.

Cooler audits revealed the following: (a) Gender -- 61.1%, steer; 37.8%, heifer; 1.1%, bullock; (b) Carcass Maturity -- 93.0%, A; 6.7%, B; 0.3%, C; (c) Marbling Score -- 0.3%, Practically Devoid; 5.9%, Traces; 36.5%, Slight; 37.2%, Small; 12.4%, Modest; 5.4%, Moderate; 1.8%, Slightly Abundant; 0.5%, Moderately Abundant; 0.2%, Abundant; (d) Dark Cutter Discounts -- 94.9%, none; 3.4%, one-third grade; 1.2%, two-thirds grade; 0.5%, one full grade; (e) Occurrence of Blood Splash in Ribeye -- 99.3%, no; 0.7%, yes; (f) USDA Quality Grade -- 2.3%, Prime; 52.7%, Choice; 36.9%, Select; 7.6%, Standard; 0.5%, Commercial/Utility/Cutter/Canner; (g) Carcass Weight -- 3.9%, less than 600 lb; 22.7%, 600 to 700 lb; 40.2%, 700 to 800 lb; 26.3%, 800 to 900 lb; 6.9%, more than 900 lb; (h) Fat Thickness, Three-Quarter Measure, 12th/13th Rib -- 2.2% less than .20 in.; 18.0%, .20 to .39 in.; 32.6%, .40 to .59 in.; 27.5%, .60 to .79 in.; 12.9%, .80 to .99 in.; 6.7%, more than 1.00 in.; (e) Ribeye Area, 12th/13th Rib -- 2.4%, less than 10.0 sq. in.; 7.5%, 10.0 to 10.9 sq. in.; 17.6%, 11.0 to 11.9 sq.

in.; 25.8%, 12.0 to 12.9 sq. in.; 22.3%, 13.0 to 13.9 sq. in.; 14.1%, 14.0 to 14.9%; 6.5%, 15.0 to 15.9 sq. in.; 3.8% more than 16.0 sq. in.; (j) USDA Yield Grade -- 10.0%, Yield Grade 1; 33.9%, Yield Grade 2; 39.6%, Yield Grade 3; 13.6%, Yield Grade 4; 2.9%, Yield Grade 5.

Particularly striking was the contrast between results of an audit (The USDA Market Consist Report, 1974) conducted 17 years ago and those from the present audit (in 1991). During that period of time, there were: (a) decreases of .30 of a grade, in USDA Yield Grade; .03 in., in Fat Thickness, Three-Quarter Measure, 12th/13th Rib; .80 percentage points, in Kidney/Pelvic/Heart Fat; and, two-thirds of a score, in Marbling Score; (b) increases of 1.10 sq. in., in Ribeye Area, 12th/13th Rib; and, 81.20 lb., in Hot Carcass Weight; and (c) no change in Carcass Maturity Score and USDA Quality Grade. Recall that the battle cry in the War On Fat has been "Get Rid Of The Waste Fat -- Keep The Taste Fat," results of the contrast of the 1974 vs. 1991 audits and of USDA Quality Grade Consist Data (FY-87 through FY-91) suggest that the beef industry may be doing neither and, in fact, may have "Kept The Waste Fat -- But Lost The Taste Fat."

Phase III: At the start of the Strategy Workshop which was Phase III of the National Beef Quality Audit--1991, the 43 participants/guests were asked to complete a questionnaire. The questionnaire consisted of two parts: (a) There were 43 specific quality problems, defects, shortcomings or shortfalls that had been identified by purveyors, restaurateurs, retailers and/or packers -- to which each person was asked to assign a score from 10 ("severe problem") to 1 ("not a problem") based on his/her perception of severity of that defect as a problem in cattle, dress-off/offal items, carcasses and/or cuts; and (b) There was a question asking each person to list, in descending order, the five most serious quality problems, defects, shortcomings or shortfalls for present-day beef as compared to beef in the past and to other meat, poultry and fish items that are competitors to beef. Aggregated responses in terms of "Quality" Concerns from that exercise were as follows: (1) **Excessive External Fat**, (2) **Low Overall Uniformity of Beef**, (3) **Low Overall Uniformity of Live Cattle**, (4) **Excessive Seam Fat**, (5) **Price Too High**, (6) **Inadequate Understanding of the Value of Closer-Trimmed Beef**,

(7) **Low Overall Cutability**, (8) **Low Overall Palatability**, (9) **Too Frequent Hide Problems**, (10) **Too High Incidence of Injection-Site Blemishes**, (11) **Insufficient Marbling**, (12) **Inadequate Tenderness**, (13) **Inadequate Juiciness**, (14) **Perceived Unhealthfulness of Beef**, and (15) **Excessive Weights/Box**.

"Quality" Concerns were then discussed in a series of 32 presentations made by individuals selected to have unique expertise in the subject-matter assigned to them. Following completion of the 32 presentations, the same questionnaire as was used at the beginning of the Strategy Workshop was distributed, it was completed by all participants/guests and the results were compiled. Aggregated responses in terms of "Quality" Concerns from that exercise were as follows: (1) **Low Overall Uniformity of Beef**, (2) **Excessive External Fat**, (3) **Low Overall Uniformity of Live Cattle**, (4) **Price Too High**, (5) **Excessive Seam Fat**, (6) **Low Overall Palatability**, (7) **Inadequate Tenderness**, (8) **Low Overall Cutability**, (9) **Insufficient Marbling**, (10) **Too Frequent Hide Problems**, (11) **Too High Incidence of Injection-Site Blemishes**, (12) **Excessive Weights/Box**, (13) **Excessive Live/Carcass Weights**, (14) **Inadequate Understanding of the Value of Closer-Trimmed Beef**, and (15) **Too Large Ribeyes/Loineyes**.

The over-riding consensus that beef could be made more competitive in price with alternative protein-sources if it could be made more uniform and consistent, caused the participants/guests at the Strategy Workshop to reconfigure the form in which the aggregated "Quality" Concerns from the National Beef Quality Audit--1991 were summarized. As a result, "Low Overall Uniformity of Beef," "Low-Uniformity of Live Cattle," and "Price Too High" were extracted from the list of "Quality" Concerns and the inverse of those Concerns was made the desired outcome of attempts to improve the "Quality" of beef. It was agreed that the ultimate goal in capitalizing upon the knowledge gained from this endeavor would best be characterized as "Improving The Consistency and Competitiveness Of Beef" (A Blueprint for Total Quality Management In The Beef Industry). By increasing the uniformity, consistency and conformity of beef (i.e., reducing the cost of nonconformance -- now and forever), its price/quality/value relationships could be improved.

With improving the latter relationships as the overall objective of attempts to improve the "Quality " of beef, the specific objectives are: (1) Attack Waste -- by reducing excessive external fat, decreasing excessive seam fat, improving overall cutability and increasing understanding of the value of closer-trimmed product; (2) Enhance Taste -- by improving overall palatability, increasing tenderness and assuring sufficient marbling; (3) Improve Management -- by lessening occurrence of injection-site blemishes, decreasing hide problems (caused by brands, insects, parasites, and mud/feces/urine), improving implantation practices and protocols, decreasing bruises, reducing liver abscesses and lowering incidence of dark cutters; and (4) Control Weight -- by reducing excessive weights of live cattle and carcasses, lessening occurrence of excessive weights of beef in boxes and lowering incidence of ribeyes/ loineyes that are too large.

Two weeks prior to the Strategy Workshop, at least one participant was asked to conduct an independent economic assessment of the cost of each of the Quality Losses Per Steer/Heifer (for which a total loss of \$256.27 had been assigned following the Face-to-Face Interview Phase of the NBQA--1991). Following discussion of each of the values, consensus was achieved for individual components, and the total, of the economics of the Quality Losses Per Slaughter Steer/Heifer due to problems, defects, shortcomings and shortfalls. It was agreed-upon that the beef industry was losing \$279.82 for every steer/heifer slaughtered in the U.S. during 1991.

Amounts lost associated with: (a) Waste (total = \$219.25) were \$111.99 for Excessive External Fat; \$62.94 for Excessive Seam Fat, \$14.85 for Fat In Excess of 20% In Beef Trimmings and \$29.47 for Incorrect Muscling and Muscle:Bone (either too much or too little); (b) Taste (total = \$28.81) were \$2.89 for Inadequate Overall Palatability (especially Inadequate Tenderness), \$21.68 for Insufficient Marbling (the extent to which the present consist of USDA Quality Grades fails to conform to the desired consist -- identified by participants/guests at the Strategy Workshop -- of 7% Prime, 24% Upper Two-Thirds of Choice, 40% Lower One-Third of Choice, 29% Select, 0% Standard and lower Grades), \$3.80 for Maturity Problems (too young or too old at the time of slaughter) and \$0.44 for Gender Problems (failure to

castrate; pregnancies); (c) Management (total = \$27.26) were \$16.88 for Hide Defects, \$1.35 for Carcass Pathology, \$0.56 for Liver Pathology, \$0.35 for Tongue Infection, \$1.74 for Injection-Site Blemishes, \$1.00 for Bruises, \$5.00 for Dark Cutters and \$0.38 for Grubs, Blood-Splash, Calluses, Yellow Fat; and (d) Weight (total = \$4.50) were \$4.50 for Carcasses Weighing Less Than 625 Or More Than 825 lb.

Participants/guests at the Strategy Workshop determined that the ten best Strategies for "Improving The Consistency and Competitiveness of Beef" were these: (1) Encourage Quarter-Inch As The New "Commodity" Fat-Trim Specification For Beef Primals/ Subprimals; (2) Change Live:Carcass Price Logic -- From Dressing Percentage (Untrimmed Carcass Weight ÷ Live Weight x 100) To Red Meat Yield (Weight Of Carcass Trimmed To Quarter-Inch Fat-Trim ÷ Live Weight x 100); (3) Keep The "Heat" On Communicating Cutability To Retailers And Packers By Improving Understanding Of The Value Of Closer-Trimmed Beef; (4) Go After, And Correct, Management Practices That Create Non-Conformity; (5) Eliminate Biological Types Of Cattle (Not Breeds per se) That Fail To Conform; (6) Institute Quality-Based Marketing; (7) Identify Outlier-Values (Ribeye, Too Large Or Too Small; Marbling Level, Too Low; Weight, Too Heavy Or Too Light; Etc.) For Carcass Traits To Facilitate Meeting Of Targeted Outcomes; (8) Design And Conduct The "Strategic Alliance Field-Studies" (Partnering Between Cow/Calf Producers, Feeders, Packers, Retailers And Purveyors As Demonstrations Of Functional Integration Based On Total Quality Management Principles -- A Proposal Approved In Principle By The NCA Industry Information Committee), (9) Use The National Beef Carcass Data Collection Program (Plus DNA Fingerprinting And Determination Of Shear Force Requirements) To Identify Superior Seedstock, and (10) Repeat The National Beef Quality Audit At Periodic Intervals To Assess Progress And Identify New Opportunities For Improvements In Consistency And Competitiveness Of Beef.

By the means identified in the National Beef Quality Audit, seedstock producers, commercial cattlemen, feedlot operators, packers, purveyors and retailers in the U.S.A. intend to improve the consistency and competitiveness of beef.