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A Quality Audit of the Beef Industry

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A QUALITY AUDIT OF THE BEEF INDUSTRY

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"Quality," in the context it will be discussed here, includes all of the factors that affect value/desirability of U.S. slaughter cattle (steers/heifers slaughtered at 9 to 42 months of age, immediately following a period of 90 to 300 days of high-concentrate feeding) in terms of the value/desirability of their carcasses and dress-off/offal items.

A "NATIONAL BEEF QUALITY AUDIT-- 1991"

The beef industry is presently conducting a quality audit of slaughter cattle (their carcasses and dress-off/offal items), establishing baselines for present quality shortfalls and identifying targets for desired quality levels by the year 2001. The cattle industry cannot expect improvements in prices for its products/byproducts when "quality" doesn't warrant such increases. The industry cannot manage its quality problems until it can measure them (W. Edwards Deming, "Out of the Crisis," 1986; "Measure....Define....Manage").

Impetus for the National Beef Quality Audit-- 1991 originated from statements made in 1990 by Dr. Darrell Wilkes (Vice President of the National Cattlemen's Association) including "the beef industry must identify its quality shortfalls because one of these could result in its downfall unless the root-causes can be ferreted-out so the problems can be corrected. The beef industry must proceed beyond its present policy of correcting quality shortfalls by use of 'band-aid' and 'put out the fire' approaches. What the cattle industry needs is to conduct a 'quality audit' -- to determine where it is in 1991 -- and to allow for identification of meaningful decade-away targets -- to decide where it should be by 2001." On August 1, 1991 the National Beef Quality Audit--1991 was initiated.

PREVIOUS ATTEMPTS TO ASSESS SLAUGHTER CATTLE QUALITY

Rod Bowling (then Vice-President of Monfort of Colorado) was the first to assess quality of slaughter cattle and to provide estimates of quality shortfalls in monetary terms. In 1989, he reported a production-potential shortfall of $107.32 per slaughter steer/heifer attributing $10.57 of that total to Management defects, $19.95 to Quality deficiencies and $76.80 to Yield problems. Distributed across all of the cattle slaughtered each year by Monfort of Colorado and using actual incidence/costs for each defect/deficiency/problem, the shortfalls were as follows: (a) Management defects -- $1.80 for carcass and offal condemnations, $0.43 for bruises, $0.25 for parasites and insects, $0.40 for dark cutters, $2.00 for mud, $1.44 for injection-site damage and tissue residues, and $4.25 for brands. (b) Quality deficiencies -- Relative to proportions that would be ideal, Monfort of Colorado was, at that point in time (1989), producing too few U.S. Prime carcasses, inadequate numbers of U.S. Choice carcasses, too many U.S. Select carcasses and excessive numbers of carcasses that had to be sold as "No Rolls." Pro-rated back across the

entire steer/heifer slaughter consist, these grade/quality-level inadequacies/excesses cost Monfort of Colorado $19.95 per head. (c) Yield problems -- Because a dressing percentage of 63.5% is considered the minimum necessary for maintaining a competitive (with other packers) posture relative to hot carcass cost, and because -- to achieve or exceed that dressing yield -- it is often necessary to over-feed cattle -- thereby increasing fatness of carcasses -- the distribution of carcasses by U.S. Yield Grade is shifted undesirably toward the higher-numbered (less desirable) Yield Grades. Relative to proportions that would be ideal, Monfort of Colorado was, at that point in time (1989), producing too few carcasses in Yield Grades 1 and 2, and too many carcasses in Yield Grades 3 and 4. Pro-rated back across the entire steer/heifer slaughter consist, these fatness/yield/Yield Grade problems cost Monfort of Colorado $76.80 per head.

One of the reasons too many slaughter cattle are nearly obese by the time they are capable of yielding a carcass that weighs 63.5% as much as did the animal alive relates to inadequacies in muscling. Very muscular cattle will have dressing percentages in excess of 63.5% at relatively low levels of fatness (less than 0.30 inches of external fat thickness at the l2th-l3th rib interface); thinly muscled cattle, slaughtered at live weights of 1200 to 1350 pounds, will often be very fat (more than 0.60 inches of external fat thickness at the l2th-l3th rib interface) by the time their dressing percentage equals 63.5. Inadequate muscling can result in lessened yields (based on combined short-comings in dressing percentage and cutability) worth almost $100 per head (on a $60 per cwt live cattle market) as was reported by Rod Bowling in a 1987 comparison of such values based upon Monfort of Colorado data for 1200 pound (alive) Hereford vs. Holstein steers. In the latter comparison, dressing percentages were 65% vs. 59%, seam-fat discounts were 0.0% vs. 1.5%, carcass costs were $99.79 vs. $114.92 per cwt, carcass premium/discount for differences in cutability (yields of boneless trimmed primals) were + $5.47 vs. -$9.66 per cwt, and live-cattle values were $63.29 vs. $54.96 per cwt (resulting in a difference of $99.96 per head), for Hereford vs. Holstein steers, respectively.

The Value-Based Marketing Task Force of the National Cattlemen's Association in their August 1990 report, entitled "War On Fat" computed estimates of the quantities/costs of production of excess fat on slaughter steers/heifers. The NCA Task Force concluded that: (a) If "an fat in excess of what consumers will eat" is, by definition, EXCESS FAT -- then a carcass of U.S.D.A.. Yield Grade 2.5 has 30% EXCESS FAT and a carcass of U.S.D.A. Yield Grade 3.5 has 35% EXCESS FAT. (b) If "fat in excess of 0.25 inches at the l2th-l3th rib interface -- the amount necessary to prevent cold-shortening and toughening of muscle fibers" -- is, by definition, EXCESS FAT -- then a carcass of U.S.D.A. Yield Grade 2.5 has 18% EXCESS FAT and a carcass of U.S.D.A. Yield Grade 3.5% has 22% EXCESS FAT. (c) Average EXCESS FAT from fed cattle is 88 pounds per head. (d) Total weight, annually, of EXCESS FAT from fed cattle is 2.07 billion pounds. (e) Total cost, annually, of EXCESS FAT from fed cattle is $1.99 billion.

In the U.S.D.A/Texas A&M University/Safeway Stores Study of beef carcass cutability in 1977, percentages of fat in excess of 0.50 inches (subcutaneous -- external -- and intermuscular -- seam -- fat plus adjusting the fat content of all ground beef and stew meat trimmings to the desired 25%-fat level) for carcasses of U.S.D.A. Yield Grades 1, 2, 3, 4 and 5, were 9.1, 14.0, 17.7, 21.0 and 25.0, respectively, while percentages of total fat (removing all of the external and

seam fat from steaks and roasts plus adjusting the fat content of all ground beef and stew meat trimmings to the desired 25%-fat level) for carcasses of U.S.D.A. Yield Grades 1, 2, 3, 4 and 5, were 20.8, 29.6, 34.9, 39.1 and 43.7, respectively. Presuming that normal retail-preparation protocol calls for leaving no more than 0.125 inches of subcutaneous/intermuscular fat on or in steaks and roasts and that 25% fat is normal content for ground beef and stew meat, percentages of excess fat for carcasses of U.S.D.A. Yield Grades 1, 2, 3, 4 and 5, would be 17.9, 25.7, 30.6, 34.6 and 39.0, respectively. Using the latter estimate, and if the average Yield Grade and carcass weight of the U.S. fed-cattle consist is 3.0 and 720 pounds, the average weight of EXCESS FAT on a carcass is presently 202.7 pounds (28.15% times 720 pounds) -- an astounding quantity of nearly worthless tissue. Add to that the fact that fat percentage on stew meat and in ground beef is not now 25% -- it is presently about 20%, and rapidly declining -- and that number could easily approach 210 pounds.

Other estimates have been made of differentials in carcass value associated with differences in U.S.D.A. Quality Grade. In the N.C.A./Texas A&M University/Swift Study conducted in 1988, increased value for a carcass grading U.S. Select rather than U.S. Standard (holding carcass weight constant) was $40, for U.S. Choice rather than U.S. Select was $70, for the upper two-thirds of U.S. Choice (hence qualifying for designation as Chefs Exclusive, Sterling Silver or Certified Angus Beef) rather than for the lower one-third of U.S. Choice was $50, and for grading U.S. Prime rather than qualifying for brands predicated upon quality in the upper two-thirds of U.S. Choice was $25. Thus, across the complete range of U.S.D.A. Quality Grades for young beef (from U.S. Standard to U.S. Prime), at the time of the N.C.A./T.A.M.U./Swift Study (in 1988), differences in marbling alone accounted for a difference in the value of a carcass of $185. Periodic assessments of the magnitude of that marbling/quality level/carcass-value differential (across the U.S. Standard to U.S. Prime range) have been as low as $140 (in 1989) and as high as $206 (in 1991). Obviously, the average cost per slaughter steer/heifer marketed caused by inadequacies in marbling level or quality level or U.S.D.A. Quality Grade depends largely on supply/demand components of the market at given points in time, and across time (price differentials between adjacent quality-levels would not be the same if proportions of carcasses on either side of that quality-level line changed) and upon the total quality-level consist of carcasses in the slaughter steer/heifer supply.

The NCA Value-Based Marketing Task Force, in 1990, attempted an assessment of what should be the consist of U.S.D.A. Quality Grades in the U.S. fed-beef population to satisfy retail market needs -- they determined that it should be 1% "High Quality Beef," 62% U.S. Choice and 37% U.S. Select -- but their estimate made no provision for food-service beef needs. Gary Smith (Professor at Colorado State University), at the "Lowering Costs For Beef Production Conference" in October 1990, speculated that the desired percentages of beef carcasses of specified quality levels to meet demands for supermarket and food-service (combined) needs would be 3% U.S. Prime, 6% "High Quality Beef" (in the upper two-thirds of the U.S. Choice grade), 70% U.S. Choice, 6% "Lean & Palatable Beef" (in the upper portion of the U.S. Select plus lower portion of the U.S. Choice grades), 15% U.S. Select and no (0%) U.S. Standard.

Relative to percentages of carcasses by U.S.D.A. Quality Grades and Yield Grades in the total (not just slaughter steers/heifers) Federally Inspected Slaughter for 1989 (the latest year for

which data are available), A.M.I. Meat Facts -- 1990 reported 1% U.S. Prime, 48% U.S. Choice, 6% U.S. Select and 0.5% U.S. Standard and lower grades, with 44% not Quality Graded, and 3% Yield Grade 1, 28% Yield Grade 2, 31% Yield Grade 3, 3% Yield Grade 4 and less than 0.5% Yield Grade 5, with 35% not Yield Graded. Such data are of little value for purposes of the proposed "quality audit"; data are needed for the year 1990 and the early part of 1991, and for only the fed and non-fed slaughter steer/heifer population, to allow for meaningful assessments of where we now are, in this regard, and to what or where we should aspire in the future.

Chuck Lambert (Economist for the National Cattlemen's Association) in a 1990 paper entitled "Lost Opportunities In Beef Production," commented that "beef producers must compete on a relative price and quality basis with producers of other meat as well as with foreign producers of beef. Compared to pork and poultry, beef has become less competitive in the U.S. since the 1970's. In 1970, beef sold for about 1.3 times the price of pork and about 2.0 times the price of broilers. During the first half of 1990, beef sold for 1.4 times the price of pork and 3.2 times the price of broilers. Much of the changing price relationship between beef and the other meats can be explained by changing costs throughout the production/processing/marketing chain. Competing-meat producers have been more aggressive in reducing production costs and processing/marketing margins than beef producers. Also, beef is produced and consumed in a dispersed and segmented industry consisting of seedstock, cow-calf, stocker/grower, feedlot, packer/fabricator, breaker/distributor, retailer and consumer segments. By comparison, poultry (and, increasingly, pork) is produced and consumed in a system with fewer steps -- integrator/grower, retailer and consumer. An integrated system costs less because fewer middlemen make a margin. Even without embracing the integrated structure, many economic opportunities from excess costs in the current beef system could be corrected to reduce the overall cost of delivering beef to the end-consumer."

Chuck Lambert, in that 1990 paper, identified $11.999 billion in "Economic Opportunities Lost To The Beef Industry Annually" and said "In 1989, total gross revenues from beef sales and fed cattle products and by-products were approximately $44.85 billion. The beef industry could increase gross revenues by 27% if existing lost opportunities were corrected. The total cost of these beef industry inefficiencies amounts to nearly $458 per fed-cattle. There will always be some lost opportunities or slack in the beef production system. However, if even one-half of the total lost opportunities in the beef industry could be addressed, gross industry returns would increase by over $229 per fed steer/heifer. Alternatively, current industry net margins could be maintained at current levels in each sector and retail beef prices could be reduced by over $229 per fed steer/heifer. Producers in each sector would have the same net dollars of profit that they have under the existing system while increasing beefs competitiveness and market share."

If :Economic Opportunities Lost To The Beef Industry Annually" in the Lambert (1990) analysis due to shortfalls in Reproductive Performance ($2.600 billion), Death Loss ($1.860 billion), Weaning Weight ($.299 billion), Multiple Processing ($.110) billion), Feed Efficiency ($.325 billion), Retail Shrink ($.852 billion) and Out-of-Stocks ($.916 billion) are removed from the $ 11.999 billion total, $5.037 billion remains. Of the $5.037 billion ($192.36 per slaughter steer/heifer), $.180 billion was due to Hot-Iron Branding ($14 per hide for those multiply

branded and $8 per hide for those butt-branded), $.304 billion for Outlier Cattle ($.0262, $.0448, $.0400, $.0220 and $.1710 billion, respectively, for carcasses that are too light, are too heavy, grade U.S. Standard, are "dark cutters," and are Yield Grades 4 or 5), $4.410 billion for Excess Fat ($1.99 billion to produce it on cattle and $2.42 billion to purchase it on carcasses and cuts and then to remove it) and $.143 for Management Losses ($.047 for carcass and offal condemnations, and $.096 for bruises, injection-site damage, and abscesses).

Gary Smith, at the NCA Cattle Trends Seminar in January 1991, estimated that perhaps as much as $200 per slaughter steer/heifer is lost to the industry because of "quality" shortfalls. He attributed such losses to problems, deficiencies or inadequacies of the following kinds: (a) Hide Problems (perhaps $15 per head) -- mud/dung locks make dressing difficult, contaminate the carcass, are a source of food-borne pathogens and lessen hide value; grubs/mites decrease productivity of cattle, lessen hide value and cause carcass trim losses; and, firebrands lessen hide value. (b) Management Practices (perhaps $20 per head) -- bruises cause carcass trim; dark cutters lower U.S.D.A. Quality Grade, lessen storage-life of cuts and necessitate grinding of all or some carcass parts; injection-sites cause carcass trim losses, result in claims (from retailers/purveyors to packers) and irritate middlemen (e.g., wholesalers and purveyors who must explain such anomalies to end-users); and, horns/testes cause bruises, dark cutters and lowered U.S.D.A. Quality Grade -- if allowed to remain -- or result in production set-backs -- if removed. (c) Muscling (too much, perhaps $5 per head, or too little, perhaps $15 per head; either can cause problems) -- too much muscling can cause problems with ribeyes/loineyes that are too large for effective merchandising and can lessen probability of attainment of the desired U.S.D.A. quality grade, while too little muscling can lower muscle-to-bone ratio and reduce carcass cutability. (d) Palatability (perhaps $30 per head) -- inadequacies in flavor can cause consumers to trade-off to fish/fowl if flavor is bland rather than "beefy"; lack of juiciness can result in general dissatisfaction with the product because it should be moist during chewing; and insufficient tenderness can result in customers switching to pork/fish/fowl because the latter meats so readily fragment during chewing. (e) Marbling (perhaps $30 per head) -- inadequate marbling (i.e., less than a minimum-Slight amount, which is equivalent to 3.0% intramuscular fat) can result in inconsistent palatability (i.e., product that can be tough or bland or dry) and will result in a U.S.D.A. Quality Grade discount, while carcasses with marbling in the wrong quintile of a marbling spectrum consisting of Slight, Small, Modest, Moderate and Slightly Abundant can receive a U.S.D.A. Quality Grade discount or fail to receive a quality-level premium or have palatability attributes inappropriate for the intended use of, or market for, that particular carcass (that is so because a carcass with "Slight" marbling grades U.S. Select, one with "Small" marbling grades U.S. Choice, one with "Modest" or "Moderate" marbling qualifies for designation as Chefs Exclusive, Certified Angus Beef or Sterling Silver, and a carcass with "Slightly Abundant" marbling grades U.S. Prime). (f) Fatness (perhaps $85 per head) -- inadequate external fat (i.e., less than 0.25 to .30 inches at the l2th-l3th rib interface) can allow cold-toughening of muscle fibers, can enable excessive carcass shrinkage and can result in inadequate marbling levels and U.S.D.A. quality grades, while excessive external fat (i.e., more than .50 inches at the l2th-l3th rib interface) can allow retarded chill-down of the carcass, will create too much trim fat and excessive seam fat, and can result in thin (or "rough") cuts that are too fat to qualify for the higher classes/categories of boneless manufacturing beef.

Jean L. Tancous (Executive Director of the U.S. Hide, Skin and Leather Association), is quoted in National Cattlemen Magazine, May 1991, as saying "Parasitic damage has increased dramatically over the past six months. Of the 27 samples sent in over the past six months, one-third have had parasitic damage. Most of the damage comes from scabies and mange but tick bites have been more frequent than in the past." In National Cattlemen Magazine, May 1991, Bob Koeppen, (President of Bluesides Company, Inc., which processes 2.5 million hides each year), is quoted as saying "Our company identified six different types of parasitic damage last year; the biggest source of pitting (damage) was from sucking and biting insects. The drop in ranking caused by damage from external parasites causes a $5 to $15 drop in the value of a hide." ARS-USDA scientists (Philadelphia, PA) have said that most of the recent increase in damage to cattle hides is caused by Damalinia bovis, Linognathus vituli and Solenopotes capillatus.

Admittedly, the estimates of potential losses made by Smith (1991) are -- at best -- educated guesses; none has been verified, authenticated or tested. But, as Darrell Wilkes (Vice-President of the National Cattlemen's Association), has said "Because we don't know -- exactly -- where we stand on "quality" or what each quality shortfall costs or which quality shortfall might lead to beef's downfall, the U.S. beef industry must conduct, in 1991, a beef quality audit. From such audit we will determine....where are we now??....where should we be in the year 2001, relative to quality??....We need a beef quality audit!!"

PRECEDENT FOR A QUALITY AUDIT

In March 1991, the Excel Corporation (one of the Big Three U.S. beef packers) released a report entitled "Truth in Value" to its boxed beef customers describing a just-completed audit of 20,000 pieces of beef (strip loins, top sirloin butts, 2" lip-on ribeyes, briskets, inside rounds, 2-piece boneless chucks, goosenecks, shortloins and peeled tenderloins) comparing product from Excel, I.B.P. and Monfort for tail length, fat thickness, blade length, clod length, skin removal, ear separation, ribbon-meat presence, side-muscle attachments, etc.; all measures of "quality" because presence/absence/conformity-to-specifications can become defect criteria. In the latter report as a letter by William Fielding (President of Excel Corporation) stating that "Excel Corporation is working hard through the Quality Improvement Process, to meet your requirements -- each and every time. We challenge the competition to do the same!!" A second letter by Fielding in that report, addressed "Dear Customer:" contains the following statements "It's no secret that foreign competitors have made serious inroads into many American markets, in our industry and in dozens of others. Most market analysts agree that at least some of these competitors' successes arise directly from their style of management, which venerates 'quality' as the cardinal virtue of any product or service. The concept makes good sense to us, in both economic and personal terms. Accordingly, Excel made the commitment about a year ago to embark on a process of 'quality improvement'. Please understand that we did so, not because we perceived immediate problems with our prevailing standards of 'quality,' but because we want to remain a viable, competitive company for years to come. Let me stress that our Quality Improvement Process goes beyond quality control of products. It reaches into every phase of our business. Using the Philip Crosby, Quality Management philosophy, there are four absolutes: (1) Quality is not 'goodness'! It is conformance to requirements. (2) Quality demands the prevention of problems. The discovery of and correction of, problems after the fact has nothing

to do with quality. (3) The only acceptable standard of performance is zero defects. (4) The measurement of quality is the price of nonconformance; the cost of correcting mistakes."

Total Quality Management was conceptualized by W. Edwards Deming (Internationally Renowned Consultant to Japan following World War II). Its basic tenet is that "higher quality products produce higher profits"; its rationale is that "improved quality increases profits because it generates sales and reduces production costs." Deming provided two definitions of "Quality" -- one, production-based, is best described as conformance to standards; the other consumer-based, is aptly defined as meeting consumer wants and needs. Deming conducted audits of numerous companies/firms/organizations and was eventually able to characterize them as highly successful to highly unsuccessful based upon relative emphasis placed on prevention vs. detection vs. failure in their quality management; those placing major emphasis on prevention were most successful.

Temple Grandin (Assistant Professor at Colorado State University), in 1990, audited incidence of slaughter cattle bruises and determined that 50% were due to rough handling and 50% were due to design defects in facilities and equipment.

Rod Bowling (the Vice-President of ConAgra Red Meat Companies), in 1990, conducted a quality audit for "dark-cutting beef." He reported that, in 1989, dark-cutting beef reduced potential income of the five beef slaughter plants in the Monfort/ConAgra group by $16,796,000. He ascribed these losses in carcass value to dark-cutter discounts in USDA Quality Grades ($54,000), reductions in USDA Quality Grades ($2,648,000) and generation of number 2 product and necessitated grinding of dark-cutting product ($13,618,000). Pro-rated across the 5 million slaughter steers/heifers processed by Monfort/ConAgra in 1989, the cost for dark-cutting was $3.36 per head. Bowling did not know but surmised that the possible causes of dark-cutting in their beef included handling stress, weather, gender, breed and growth promotants – singularly or in combination.

When ORE-IDA brand "Tater Tots" began to lose market share, Tom O'Reilly (Chief Executive Officer of Heinz and Company) performed radical surgery in an effort to cut costs, but sales -- and market share -- continued to go down. CEO O'Reilly then shifted gears; he decided to try Total Quality Management. In January 1991, after a year of trying TQM, O'Reilly reported that "Total Quality Management is expected this year, to save ORE-IDA and Heinz $200 million by slashing in half the costs of nonconformance -- what it costs the company to fix things that didn't go right the first time around. And, based on last year's returns (TQM boosted sales of "Tater Tots" by 18% in 1990) market share and profitability will increase. One of the primary benefits of TQM is that it blurs the image between management and labor."

WHAT THEN IS BEEF QUALITY?

We are just now -- in 1991 -- rethinking the logic of what we have historically termed "quality" in the light of dramatic changes in consumer attitudes about our endproducts, new markets for our projects in increasingly affluent foreign countries, and the current obsession of producers, manufacturers, wholesalers, retailers and consumers, with consistency, repeatability,

freedom-from-defects and conformity. By anyone's definition, "quality" must be comprised in large part of "consistency"; and yet, by anyone's definition, the beef supply is unbelievably inconsistent. Slaughter cattle, their carcasses and their dress-off/offal items can be "excellent" to "awful" and everything between; because we have exercised so little quality control, a single pen of finished steers/heifers -- as delivered to the packer -- can contain individual animals ranging from extremely valuable to nearly worthless. The time has arrived, and is fast running out, for us to do something about the variability in the products of the beef industry. And, finally, it appears that we are about to embark on embracing the "quality religion". It's broke; we need to fix it! The principles of W. Edwards Deming...."Measure....Define....Manage"....apply to the U.S. beef industry; this country cannot improve (through "management") the value of its beef carcasses, cuts and byproducts until it carefully and completely "defines" and "measures" the quality of its slaughter cattle population.