The first National Beef Tenderness Survey was conducted to determine and compare the average sensory panel tenderness scores and Warner-Bratzler shear force values of a representative cross-section of U.S. retail cuts varying in USDA quality grade and subprimal source.

A National Livestock and Meat Board subcommittee convened to create the first National Beef Instrument Assessment Plan (NBIAP) and identified Video Image Analysis (VIA) technologies as the first research funding priority, which was instrumental in the evolution from ultrasound research.

The Beef Checkoff conducted consumer research published under the title, Customer Satisfaction II – The Value of Tender Beef. The research assessed the value of tender beef and its ability to enhance overall customer satisfaction.

The Carcass Merit Project collected carcass data to help build a database from which breeds could develop Expected Progeny Differences (EPD) for tenderness. The project found that tenderness has an implicit value in beef.

The National Beef Tenderness Survey revealed a 20 percent overall increase in tenderness compared to the initial survey in 1990.

The NBIAP II meeting determined that technology to classify carcasses based on tenderness must be accurate, fast, durable, reasonably priced, and have the ability to reflect the tenderness of the various cuts after advanced aging.

The National Beef Tenderness Survey revealed an 18 percent overall increase in tenderness compared to the survey in 1999.
Pre-Harvest Cattle Management Practices for Enhancing Beef Tenderness was published. This 24-page booklet explains how management practices of live cattle affect eating quality, specifically tenderness.

The Industry Guide for Beef Aging was published and provides optimal aging times for product to reach “tender” classification for a variety of subprimal cuts and USDA quality grades.

Pre-Harvest Factors Affecting Beef Tenderness in Heifers was published. This 20-page booklet highlights existing information concerning tenderness differences between youthful, grain-finished heifers and steers, and connects how cattle management and sex influence eating quality.

The NBIAP III meeting concluded that research was needed to establish a uniform tenderness threshold; develop new tenderness instrumentation technologies and compare those to existing tenderness technologies; and incorporate the tenderness technology into existing technologies used for instrument grading that can be verified by a third party.

Ranking of Beef Muscles for Tenderness was published. This fact sheet compiles the data from 60 years of tenderness and sensory research to create a definitive ranking of beef muscles.

Post-Harvest Practices for Enhancing Beef Tenderness was published. This 20-page booklet explains how practices administered to the carcass and/or primals and subprimals affect eating quality.

The History of Instrument Assessment of Beef was published. This 20-page booklet explains how instrument assessment of beef benefits the beef industry and provides a historical overview of the development of this technology over a 30-year period. Information about opportunities that exist with technology to predict beef tenderness is included.

Dry Aging of Beef was published. This executive summary describes dry aging and discusses the advantages and disadvantages of the process. Special attention is given to quality, palatability, and tenderness.

The results of the National Beef Tenderness Survey revealed that the overall tenderness of beef remained comparable to the tenderness results in the 2005 survey.

Animal Age, Physiological Maturity, and Associated Effects on Beef Tenderness was published. This white paper examines and summarizes existing scientific information concerning production-level effects on physiological maturation processes in cattle and relates these effects to the occurrence of advanced beef carcass maturity characteristics. Relationships among animal age, physiological maturity, and beef tenderness also are examined.

A web-based educational tool was added to beefresearch.org. Four animation videos illustrate the processes of muscle contraction and relaxation, rigor mortis, proteolysis and myoglobin oxidation. These natural processes that occur in postmortem beef muscle are essential in the development of beef quality, tenderness, color and shelf-life. A fifth animation discusses the storage life of meat.

The results of the National Beef Tenderness Survey confirmed that the tenderness improvements made in the 1990s and early 2000s have been maintained.

The results of the National Beef Quality Audit showed that tenderness and flavor remain the two specific beef quality factors that drive customer satisfaction.

Moving Forward …

The industry’s concerted efforts to improve beef tenderness over the last 25 years have generally achieved the goals set in the 1990s. Today’s beef is a higher-quality, more tender product than the beef in the late 20th century. Industry attention will continue to focus on consumer desires for consistently tender, flavorful beef through periodic tenderness assessments and ongoing beef quality research.