

## **Project Summary**

# **Economic Value of a Beef Tenderness-based Fed Cattle Valuation System**

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# **Economic Value of a Beef Tenderness-based Fed Cattle Valuation System: Project Summary**

## **Background**

A compilation of previously conducted research was summarized by Kansas State University researchers to evaluate the economic value of a beef tenderness-based fed cattle valuation system.

The summary report had three objectives:

1. Determine how current pricing systems would differ if objective measures of meat tenderness were incorporated into the valuation. This analysis included an assessment of how fed cattle values would change if meat tenderness levels were incorporated together with USDA quality and yield grades in the valuation method;
2. Design augmented alternative grid pricing/valuation systems for fed cattle that explicitly incorporate meat tenderness value components into the price grid;
3. Demonstrate how tenderness-augmented valuation systems would value fed cattle more consistently with meat quality relative to current price grids.

## **Methodology**

The researchers identified 12 studies reporting a total of 29 different premium estimates for tender steaks. Results were analyzed through a regression analysis. The analysis incorporated previously conducted research that included hypothetical consumer surveys, where the participant is not bound to pay the price premium, and binding experiments where an actual exchange of money took place. The 16 hypothetical experiments, as well as a few of the non-hypothetical experiments, were choice experiment protocols. Choice experiments are situations where the consumer is faced with two or more alternative steaks possessing different attributes and the consumer is asked to pick which they prefer. The 12 studies varied considerably in the sample population and sample size used.

In addition to the literature reviews, the researchers also collected retail beef steak prices specifically to determine whether the term “tender” on the label is associated with a higher steak price after adjusting for other relevant factors. Prices for ribeye and strip loin steaks were collected from selected retail grocery stores located in Colorado, Kansas, and Nebraska during March through April 2008. A total of 20 different retail outlets were visited (some being the same chain in different locations), and prices and associated product label characteristics were collected for 112 ribeye and strip loin steak packages.

The researchers compiled a summary of selected programs that offer beef products with a tenderness guarantee.

As part of the objectives of this project, the researchers developed and evaluated a tenderness-augmented grid pricing system for fed cattle. Carcass data from the U.S. Meat Animal Research Center (MARC) were used to exemplify how a tenderness-augmented grid pricing system would affect fed cattle prices. Data collected on 3,563 carcasses, including carcass weight, USDA quality and yield grades and Warner Bratzler shear force (WBSF) values, were used to develop the grid pricing system. In addition, consumer sensory panel ratings were collected for tenderness, juiciness and flavor. Any carcasses that weighed less than 600 pounds or more than 900 pounds were excluded from the analysis, so the final analysis included 3,154 carcasses. The data were used to

assess how cattle would have been valued under traditional dressed and grid pricing systems and compared with valuations based upon actual meat tenderness as assessed by WBSF.

## **Findings**

In reviewing the various studies, the researchers that compiled this review felt the single most important finding was that across all 29 different estimates provided in the 12 studies, consumers are on average willing to pay statistically significant premiums for tender beef steak. In the researchers' opinion, this number is significant in that the typical consumer values beef steak tenderness. The premiums for tender steaks ranged from \$0.42 per pound to \$7.35 per pound across the 29 estimates.

Six of the 29 observed tenderness premiums involved consumers actually tasting the product and then revealing their willingness to pay a premium. Five of the 29 observations did not reveal a tenderness statement about the steaks to the consumer in the experiment; instead they let the consumer make that determination. One study included in the literature review determined that telling the consumer that a product was tender increased the premium they were willing to pay from \$1.23 per pound to \$1.84 per pound on average.

Based on this review, it is apparent that estimates from hypothetical surveys, where the consumer is not bound to pay the price premium they reveal for tender steaks, are considerably greater than when the experiment was binding (i.e., actual exchange of money for steak occurs). The average premium for tender steaks in binding studies was \$1.52 per pound compared to \$3.26 per pound for hypothetical studies.

The regression analysis developed by the researchers explained 93 percent of the variability in willingness to pay premiums for non-hypothetical estimates from previous research. Among the studies analyzed, choice experiments resulted in \$3.72 per pound greater willingness to pay estimates than other protocols. The researchers noted that the use of choice experiment protocols resulted in much larger premiums for tenderness assurances for steaks than other methods and the researchers stated that this aspect should be considered in future experiments.

The literature review also revealed that consumers that had an opportunity to taste the steaks would pay a \$0.86 per pound greater premium than if they did not have a chance to taste the steak. Additionally, consumers that were told a steak was tender versus those that were not told, were willing to pay \$1.12 per pound more for the steak. The researchers said that steak labeling with tenderness assurances are likely to garner premium prices with the typical consumer.

The analysis of retail price data revealed that steaks labeled as tender premium had a \$1.82 per pound higher price than product not carrying that designation. "Tender premium" steaks were those that had tenderness assurances associated with them beyond just putting the term "tender" on the package label. The premium for those steaks was \$1.82 per pound.

For the steaks that had only the term "tender" on the label, prices were generally not higher than products that did not have the term. According to this research compilation, the term "tender" in itself did not add a statistically significant price premium. The researchers hypothesized that while this seemed to be in contradiction to previous research reviewed, it is because the term "tender" in itself is not very meaningful since it has no standard benchmark.

The tenderness-augmented grid pricing system analysis indicated that 91 percent of the USDA Prime carcasses had a WBSF value less than 3.8 kilogram. As quality grade declined from Prime to upper Choice, the percentage of carcasses that had a WBSF less than 3.8 declined with 44 percent of Select and 24 percent of Standard carcasses having a WBSF of less than 3.8. The researchers noted that many of the Select carcasses had WBSF values that indicated more tender steak products than either lower or upper Choice grade carcasses. In a tenderness-based program, many of the Select steaks would have received a premium, while many of the Choice steaks would have been discounted.

Carcasses were valued using three different grid pricing systems:

1. Traditional grid;
2. 3.8 kilogram WBSF base tenderness-augmented grid;
3. 4.6 kilogram WBSF base tenderness-augmented grid.

The 3.8 kilogram tenderness augmented grid resulted in sizeable premiums on average for higher quality grade carcasses than traditional grid valuation. For the upper Choice grade, about 25 percent of the carcasses would have received at least a \$6.00 per hundred weight (cwt) higher price with tenderness premiums than under traditional grids. Approximately 24 percent of the upper Choice carcasses would have received a \$6.00 per cwt or greater discount because of toughness issues. Lower Choice carcasses would also have had sizeable value adjustments under a tenderness-augmented grid with about 29 percent earning a \$4.00 per cwt or more premium and 20 percent a \$4.00 per cwt or larger discount relative to a traditional grid system. Select and Standard carcasses showed similar value realignments.

### **Implications**

Some of the findings summarized in the retail price data analysis give more credence in the current USDA Agricultural Marketing Service (AMS) efforts to develop beef tenderness grading standards as the term “tender” in itself does not incur a price premium as there is no benchmark definition.

The researchers felt that it was important to keep in mind that when comparing estimates is that “premium tender” products are probably not targeted to the “typical” or “average” consumers.

The researchers recommended that future national retail beef tenderness surveys collect detailed data related to product prices and labeling, as well as other potentially important value information, in addition to the product quality and meat tenderness attributes that have been collected in previous studies. The national beef tenderness benchmarking surveys provide essential data about the profile of beef products in the marketplace, more information about product labeling claims, pricing and whether labeling is consistent with eating experience. The researchers felt that this information would be valuable in guiding the further development of beef grading and labeling standards.

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