Project Summary

Alternative Fabrication Methods and Merchandising Strategies to Accommodate for the Growing Trend of Heavier Carcass Weights

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Study Completed
May 2008

Funded by The Beef Checkoff

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Background

Excessive carcass and subprimal weights have been identified as a top-ten quality challenge for the beef industry in all four checkoff-funded National Beef Quality Audits. Carcass weights have increased each year since 1995 from 748 lbs to 796 lbs in 2005, and industry goals established by the 2005 National Beef Quality Audit include "targeting weights that maximize profits without creating conflicts with consumer preference." The beef industry faces a new dilemma of adapting fabrication and marketing schemes to accommodate the larger and heavier beef subprimals as opposed to developing strategies to decrease carcass weights to industry-preferred weight ranges. Creative fabrication of carcasses and the variety of innovative cuts that will be derived from each may help adjust for the increased subprimal sizes the industry faces.

The objectives for this project were to:

1. Identify alternative fabrication methods for subprimals from carcasses greater than 1000 lbs.
2. Create merchandising strategies that can apply to typical industry environments and account for variability in carcass weights.

Methodology

Beef subprimals (n=144) from U.S. Select carcasses were obtained from a major beef processor. Selected subprimals (top sirloin butt, ribeye, strip loin) represented two different carcass weight ranges: 700-800 pound carcasses were designated as average weight, and 1000-1100 pound carcasses were designated as heavyweight. A total of 24 carcasses were selected for the study and subprimals were collected from 12 heavyweight and 12 average weight carcasses. Beef subprimals were obtained by plant personnel from each of the selected carcasses following industry standards as defined by Institutional Meat Purchase Specifications (IMPS) and described by USDA (1996) and NAMP (2003).

A retail market environment was simulated by modifying a refrigerated cutting room for the purpose of conducting retail yield tests. National Cattlemen's Beef Association retail meat cutters with extensive knowledge and cutting experience were enlisted for the study. Merchandising schemes that best represented current industry practices for each subprimal were developed for the conventional method. Merchandising schemes that characterized innovative methods of fabrication were discussed and decided upon by the team. These schemes were intended to best utilize the subprimals from heavyweight carcasses when compared to the subprimals from carcasses of average weight. The cutting tests for the conventional and innovative methods of fabrication were conducted following the procedures used by Voges et al. (2006).

Processing times were recorded as an estimate of labor requirements for each merchandising scheme. In the conventional cutting method there were two major phases of the process: bag opening (removing the subprimal from the vacuum-packaged bag) and cutting (removal of external and seam fat, removal of connective tissue, separation of individual muscles, and the production of tray-ready cuts when applicable). Times recorded from the two phases were combined for total processing time.

From the Beef Loin, Top Sirloin Butt, Boneless (IMPS #184), inch-thick Top Butt Steaks were cut end-to-end. Fabrication of the innovative sirloin started with removal of the *biceps femoris* (coulotte) and inch-thick steaks were cut across the grain and trimmed to 1/8 inch. The *gluteus accessorius* and the *gluteus profundus* were removed from the remaining sirloin section. The *gluteus medius* was split in half (anterior to posterior) and each portion was cut into 1 inch-thick top sirloin center-cut steaks.

The conventional style for the Beef Rib, Ribeye, Lip-On, Boneless (IMPS #112A) consisted of the subprimal being cut into 1 inch-thick Ribeye Steaks, Boneless (UPC# 1214). The innovative method of cutting the 112A started at the posterior end of the subprimal, and four lip-on ribeye steaks were generated. The remainder of the *spinalis dorsi* then was removed following the natural seam; the *spinalis dorsi* then was cut across the grain into 1.5 inch-thick sections for *spinalis* steaks. The *complexus* was removed from the anterior end of the remaining subprimal. The seam fat that was revealed in this method of cutting was removed. The remaining *longissimus thoracis* was cut into 1.5-inch-thick ribeye filets.

Beef Loin, Strip Loin, Boneless (IMPS #180) were cut into 1 inch-thick top loin steaks. Center-cut Strip Steaks and Vein Steaks (steaks that had a *gluteus medius* on both sides of the cut) were weighed and recorded separately. The innovative method of cutting the subprimal began by cutting the strip loin dorsal to ventral at a point anterior to the *gluteus medius*. The posterior section containing the *gluteus medius* was split in half (anterior to posterior) and 1 inch-thick steaks were cut from each side, generating what the merchandisers labeled as "petite strip steaks." The anterior portion of the strip loin also was cut in half, anterior to posterior, and each half was netted. The posterior end of the medial side of the strip loin generated three to eight 1-inch-thick medial steaks, and the remaining lean was left as a netted roast. The lateral side of the strip loin generated five to ten lateral steaks, cut 1-inch-thick.

Findings

Data revealed a greater initial cut weight, higher salable yield, and a greater total processing time for the subprimals from heavy weight carcasses when compared to subprimals from carcasses of average weight. Differences were found in top sirloin butt total processing time ($P=0.0107$) and salable yield ($P=0.0200$) between cutting styles. When comparing the top sirloin butt in the two weight classifications, total processing time was significantly greater ($P=0.0006$) for the subprimals from heavyweight carcasses. Cutting style comparisons found differences in total processing times ($P<0.0001$) and salable yield ($P<0.0001$) for ribeyes. Salable yield was significantly greater ($P=0.0049$) for the ribeyes from heavy weight carcasses. Total processing time ($P=0.0119$) was greater for the innovative strip loins when compared to the conventional total processing times. Differences were found when comparing strip loins from the two weight classifications. Total processing time ($P=0.0496$) was significantly greater and salable yield ($P=0.0029$) was higher for the subprimals from heavy weight carcasses.

To determine a merchandising strategy for the subprimals in the innovative cutting style an average profit per hundred pounds was calculated using the conventional cutting style. Local retail stores in the Bryan/College Station area were surveyed for retail cut prices. Price per pound was assigned to the generated cuts, lean, and cube material when applicable. Lean and cube prices were held constant in both cutting styles. An average profit was calculated and applied to the innovative subprimal in a spreadsheet. From this total, the weight of the cuts generated were used to calculate an average price for all innovative cuts within of that subprimal in order to maintain an equitable value for the two cutting styles.

The profit per hundred pounds for a conventional top sirloin butt was approximately $400.84. Targeting that total, a price for the innovative center cut steaks and coulotte steaks must average $6.08 per pound (versus $5.48 per pound for conventional cuts) in order to assign one-hundred pounds of the innovative top sirloin butt with a profit of $401.05. To have an equitable sales profit for the two cutting styles, the cuts from the innovative subprimal must be marketed 9.87 % higher than its conventional counterpart.

The profit per hundred pounds for conventional ribeyes was $679.38. With that total, the average price for the cuts generated out of the innovative ribeye must be priced at approximately $10.84 per pound (versus $8.48 per pound for conventional cuts) to generate a profit per hundred pounds at $679.70. To have an equitable sales profit for the two cutting styles, the cuts from the innovative ribeye must be marked up 21.7% when compared to the conventional ribeye.

The profit per hundred pounds for conventional strip loins was approximately $663.17. Targeting that total, the cuts generated out of the innovative strip loin must average a price of $8.60 per pound (versus $8.48 per pound for conventional cuts) to generate a profit of $663.24 per hundred pounds. In order to have an equitable sales profit, the innovative cuts generated must be marketed 1.4% higher than conventional strip loins.

Implications

Carcass size impacted salable yield for the ribeyes and strip loins, as well as processing times for the top sirloin butts and strip loins. There were significant differences between cutting styles for the top sirloin butts and ribeyes as innovative cuts had lower salable yields than those from the conventional style. This was most apparent for the ribeyes where retail prices would have to be increased by 21.77% for the innovative style to be able to achieve an equitable sales profit compared to the traditional style. Processing times differed significantly for all three subprimals when comparing cutting styles. This information will be helpful to retailers as they work to adapt merchandising schemes conducive to marketing cuts from large sized subprimals.

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