



Sorting Beef Subprimals by Ribeye Size at the Packer Level to Maximize Utility and Product Uniformity in Foodservice and Retail Sectors

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Objectives

To determine the impact of sorting beef carcasses at the packer level by ribeye area, instead of sorting subprimals by weight, to provide more consistent products for the end user via foodservice and retail channels

Materials and Methods

Instrument grading technology was used to select 100 USDA Choice, yield grade 2 or 3 sides, and 100 USDA Select, yield grade 2 or 3 sides. Carcass sides were sorted into one of five ribeye area (REA) categories, as outlined in Table 6.

USDA Choice carcass sides were fabricated to remove beef rib, ribeye, lip-on (IMPS 112A) and beef loin, strip loin, boneless (IMPS 180) from each USDA Choice. Beef loin, tenderloin, full, side muscle on, partially defatted (IMPS 189B) subprimals were procured from each USDA Select side. Subprimals were weighed, trimmed to specification, and passed through a 3-D visual analysis portioning machine and to obtain scan data for a variety of portioning outcomes generated by simulation software.

Results

Based on input from our foodservice collaborators, 1.25 inches (3.18 cm) was identified, for ribeye and strip loin steaks, as the targeted optimal thickness to meet consumer expectations. After evaluation of multiple portioning outcomes, it was determined that a 14.00-ounce (396.89 g) portion, for each REA category, most consistently delivered the preferred steak thickness identified previously. REA categories 1 and 2 most frequently produced desirable thickness and portion weight outcomes in ribeye and strip loin steaks. Statistical analysis of number of portions per subprimal stratified by portion weight and

portion thickness revealed differences ($P < 0.05$) across all REA area categories in both ribeyes and strip loins. As portion weight and thickness increased, steak portion number tended to decrease. In tenderloins, an optimal steak thickness of 1.75 to 2.00 in (4.45 to 5.08 cm) was identified as optimal. Most frequently, 8, 9, and 10-ounce (226.80, 255.15, and 283.50 g) portions met the targets for optimal portion weight and thickness parameters. For tenderloins, number of portions by portion weight showed significant differences ($P < 0.05$) in all ribeye area categories with the exception of 7-ounces (198.45 g) and showed no differences when stratified by portion thickness. In this investigation, USDA Choice carcasses ($r = 0.76$) and USDA Select carcasses ($r = 0.56$) expressed moderate correlation between REA area and hot carcass weight.

Conclusion

Results of the present study suggest strip loin, ribeye, and tenderloin subprimals from carcasses possessing a ribeye area ranging from 74.8 cm² to 87.1 cm² offered the greatest level of utility when portioned for use in foodservice and retail sectors. Further research is warranted to continue examining the merit of sorting carcasses by ribeye area at the packer level, but results of this study suggest that there is potential for improved consistency and utility of subprimals in the foodservice and retail sectors.

Table 6. Ribeye area (REA) categories and associated acceptable REA ranges.

REA Category	LM area (cm ²)	Allowable range (cm ²)
1	77.4	74.8 to 80.6
2	83.9	81.3 to 87.1
3	90.3	87.7 to 93.5
4	96.8	94.2 to 100.0
5	103.2	100.6 to 106.4