



## Consumer Evaluation of Beef Strip Loins of 3 Quality Grades Cooked To Multiple Degrees of Doneness

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### Objectives

The objective of this study was to determine the effect of enhancement on consumer palatability scores of three quality grades of beef strip steaks when cooked to three degrees of doneness.

### Materials and Methods

Strip loins ( $n = 72$ ) were selected to equally represent three quality grades: USDA Prime, Low Choice, and Low Select. Within each grade, half were enhanced to 108% of the green weight with a water, salt, and alkaline phosphate solution. All strip loins were aged 21 d and cut into 2.5-cm thick steaks. Each strip loin was sectioned into thirds, with each third assigned to 1 of 3 degrees of doneness (DOD; Rare: 60°C; Medium: 71°C; or Very Well-Done: 82°C). Within each third, paired steaks were assigned to either consumer evaluation or objective measurements of Slice Shear Force (SSF) and Pressed Juice Percentage (PJP). Steak assignment was balanced across all strip loins in each treatment and steaks were individually frozen ( $-20^{\circ}\text{C}$ ) until subsequent analyses. One steak was evaluated for SSF and PJP, the other was evaluated by consumers ( $n = 252$ ) for juiciness, tenderness, flavor liking, and overall liking on 100-mm line scales. Consumers were also asked to rate each trait as either acceptable or unacceptable and to categorize samples into 1 of 4 quality levels (unsatisfactory, every day, better than every day and premium).

### Results

Consumer panelists rated all enhanced treatments, regardless of quality grade, similar ( $P > 0.05$ ) for ratings of juiciness, tenderness, flavor liking, and overall

liking and were greater ( $P < 0.05$ ) than all non-enhanced treatments. Among non-enhanced treatments, ratings of flavor liking and overall liking decreased ( $P < 0.05$ ) as quality grade decreased. Non-enhanced Prime and Low Choice were similar ( $P > 0.05$ ) for tenderness and juiciness, but were greater ( $P < 0.05$ ) than non-enhanced Low Select. Consumers reported increased ( $P < 0.05$ ) ratings of juiciness, tenderness, and overall liking as DOD decreased. All enhanced samples and non-enhanced Prime had a similar ( $P > 0.05$ ) percentage rated acceptable for tenderness and juiciness. Non-enhanced Prime and Low Choice samples had a similar ( $P > 0.05$ ) percentage of samples rated acceptable for tenderness, juiciness, flavor liking, and overall liking, but both were greater ( $P < 0.05$ ) than non-enhanced Low Select. A greater ( $P < 0.05$ ) percentage of samples were rated acceptable for tenderness, juiciness, and overall liking as DOD decreased. All enhanced samples had a similar ( $P > 0.05$ ) percentage of samples classified as better than everyday quality and premium quality, but a higher ( $P < 0.05$ ) proportion than all of the non-enhanced treatments. Instrumental tenderness measurements of SSF reported no differences ( $P > 0.05$ ) across all treatments. No differences ( $P > 0.05$ ) of PJP were reported for quality treatments of samples; however, values of PJP decreased ( $P < 0.05$ ) as DOD increased.

### Conclusion

These results indicate enhancement has a substantial, positive effect on beef palatability; however, this improvement is not independent of marbling. Enhancement of higher quality beef does not provide an additive palatability benefit and, therefore, provides the most economic palatability advantage in lower quality beef products.