



## Effects of Enhancement and Degree of Doneness on Trained Sensory Panel Ratings of Beef Strip Loin Steak Palatability

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### Objectives

To determine the effect of enhancement on trained sensory panel palatability ratings of beef strip loin steaks of three quality grades cooked to three degrees of doneness (DOD).

### Materials and Methods

USDA Prime, Low Choice, and Low Select strip loins ( $n = 72$ ; 24/grade) were used in the study. Within each quality grade, one-half were enhanced to 108% green weight with a water, salt, and alkaline phosphate solution. Strip loins were aged for 21 d, fabricated into 2.5 cm steaks, vacuum packaged, and frozen at  $-20^{\circ}\text{C}$  until further analysis. Consecutively cut steaks were paired, with one steak from each pair assigned to trained sensory panel evaluation and the other to Warner-Bratzler shear force (WBSF) determination. Steak pairs from each strip loin were assigned to one of three DOD: Rare ( $60^{\circ}\text{C}$ ), Medium ( $71^{\circ}\text{C}$ ), and Very Well Done ( $82^{\circ}\text{C}$ ). Steaks were cooked using clamshell grills and internal temperature was monitored using a thermocouple. Sensory panelists were trained according to procedures described by the American Meat Science Association Sensory Guidelines (2015) and evaluated samples for initial and sustained juiciness, myofibrillar tenderness, connective tissue amount, overall tenderness, beef identity, beef flavor intensity, salt intensity, and off-flavor intensity on continuous 100 mm line scales with verbal anchors at each end and midpoints.

### Results

Among the 3 quality grades, enhanced steaks were similar ( $P > 0.05$ ) for initial juiciness, sustained juiciness, myofibrillar tenderness, connective tissue amount,

and overall tenderness. Additionally, all enhanced steaks rated higher ( $P < 0.05$ ) than non-enhanced Low Choice and Low Select steaks for initial juiciness, myofibrillar tenderness, and overall tenderness. Enhanced steaks were also rated higher ( $P < 0.05$ ) in salt intensity when compared to non-enhanced steaks. As quality grade decreased in enhanced steaks, salt intensity ratings increased ( $P < 0.05$ ; Low Select  $>$  Low Choice  $>$  Prime). Enhanced steaks, regardless of quality grade, were similar ( $P > 0.05$ ) to non-enhanced Prime steaks for initial juiciness, sustained juiciness, myofibrillar tenderness, and overall tenderness. Panelists rated non-enhanced Prime steaks higher ( $P < 0.05$ ) than either non-enhanced Low Choice or Low Select for sustained juiciness, beef identity, and beef intensity. Non-enhanced Prime steaks were rated similar ( $P > 0.05$ ) to non-enhanced Low Choice steaks for myofibrillar tenderness, connective tissue amount, and overall tenderness. Additionally, when cooked to Rare, non-enhanced Prime steaks were similar ( $P > 0.05$ ) to non-enhanced Low Choice steaks for initial juiciness. As DOD increased, panelists' ratings for initial juiciness, sustained juiciness, myofibrillar tenderness, and overall tenderness decreased ( $P < 0.05$ ; Rare  $>$  Medium  $>$  Very Well Done). For instrumental tenderness, all enhanced treatments and non-enhanced Prime steaks had similar ( $P > 0.05$ ) WBSF values. However, in non-enhanced steaks, Low Select steaks had higher ( $P < 0.05$ ) WBSF values than either Prime or Low Choice steaks. Moreover, Rare steaks had lower WBSF values ( $P < 0.05$ ) than Medium and Very Well Done steaks.

### Conclusion

After enhancement, palatability traits were unaffected by quality grade, with few differences found among quality grade treatments in enhanced samples. These results indicate enhancement does not provide an additive effect with marbling level for beef palatability traits.