



## Effects of Enhancement with Phosphate or Sodium Bicarbonate on the Eating Quality of Five Beef Muscles Prepared as Fajita Meat

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### Objectives

The Australian meat industry exports over 70% of its beef, with a large portion going to the US. Due to the popularity of fajita meat in the US, there is an opportunity to export value-added fajita cuts from Australia to the United States. A consumer study was conducted to measure sensory differences between five muscles subjected to two different enhancement solutions.

### Materials and Methods

Five muscles were collected from cattle at a commercial abattoir in Rockhampton, Australia. The muscles included were top round cap/*gracilis* ( $n = 81$ ), inside skirt/*transversus abdominis* ( $n = 81$ ), outside skirt/*diaphragm* ( $n = 95$ ), flank/*rectus abdominis* ( $n = 81$ ), and sirloin flap/*obliquus externus abdominis* ( $n = 81$ ). The muscles were vacuum packaged and shipped refrigerated to Texas Tech University for processing. All muscles were cut into equal halves, and then assigned to no enhancement (CON), phosphate enhancement (PHOS), sodium bicarbonate (SBC) enhancement. Muscles were vacuum tumbled to 115% of green weight with their respective solution. Muscles were cooked and sliced into 1.3-cm strips, 5-cm long, and kept warm until serving. The samples were cooked to a medium degree of doneness (71°C) and evaluated for juiciness, flavor liking, and overall liking on 100-mm line scales. Data were analyzed using PROC GLIMMIX of SAS using MSA carcass grade, muscle, enhancement, and their interactions as fixed effects ( $\alpha = 0.05$ ).

### Results

No interactions were detected for any eating quality traits ( $P > 0.05$ ). MSA grade only influenced tender-

ness ( $P = 0.04$ ), where Classic (4\*) had greater ( $P < 0.05$ ) tenderness scores than Premium (5\*) and ungraded cuts but did not differ ( $P > 0.05$ ) from Selected (3\*). Muscle influenced all palatability traits ( $P < 0.0001$ ). The sirloin flap (*obliquus abdominis internus*) steaks had the highest tenderness score (73.7), juiciness score (66.7), flavor score (67.5) and overall liking score (68.6), differentiating itself from the other 4 cuts ( $P < 0.0001$ ). The top round cap/*gracilis* had the lowest tenderness scores (49.2), juiciness score (44.7) and overall liking score (51.2) ( $P < 0.01$ ). Also, enhancement method influenced tenderness and juiciness ( $P < 0.0001$ ). Between the phosphate enhancement, sodium bicarbonate enhancement and non-enhanced samples, the sodium bicarbonate samples were rated the highest for tenderness 64.1 ( $P < 0.0001$ ). Moreover, clean enhanced fajita samples rated highest for overall liking (64.0), with phosphate being similar (63.2). The control samples were ranked the lowest in tenderness (46.7), juiciness (42.7), flavor (44.2) and overall liking (43.9).

### Conclusion

The sirloin flap/*obliquus externus abdominis* samples were rated highest in all palatability scores, while the top round cap/*gracilis* had the lowest tenderness, juiciness and overall liking scores. Between the 3 enhancement treatments, the sodium bicarbonate enhancement was significantly the highest rated on tenderness and juiciness. The sirloin flap/*obliquus externus abdominis* samples that are enhanced with the sodium bicarbonate treatment could maximize the highest palatability scores from consumers. The innovation muscle, the top round cap/*gracilis*, was rated the lowest of the five muscles in every palatability category but could improve scores through a sodium bicarbonate enhancement.