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Effects of Enhancement Techniques of Beef Flanks On the Palatability of Fajita Meat

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Objectives

Value added products are typically enhanced either through needle injection or vacuum tumbling, and both techniques carry certain benefits, whether that be more even distribution of the brine or improved palatability. However, it is unknown if tumbling itself can improve palatability without the addition of a marinade. Moreover, there is merit in determining if eating quality can be further improved by using both needle injection and vacuum tumbling. Therefore, the purpose of this study was to determine how different enhancement techniques influence palatability traits such as tenderness, texture, flavor, juiciness and overall liking of the *rectus abdominis* muscle when cooked and prepared for fajita meat.

Materials and Methods

USDA Select beef flank steaks (*rectus abdominis*) were procured from a commercial beef abattoir and processed at 10 d postmortem. Steaks (n = 100; 20/treatment) were assigned randomly to 1 of 5 different treatments: untreated control (CNT), vacuum tumbled control without marinade (TCNT), vacuum tumbled with marinade (TUMB), injected with marinade (INJ), and injected with marinade plus vacuum tumbled (IPT). In addition, non-enhanced USDA Choice flanks were used as a warm-up sample and to provide linkage across panel nights. Flanks were cooked to 72°C, sliced into 1.3-cm strips approximately 5-cm long, and kept warm until serving. Consumers (n = 200; 50/day) evaluated samples for tenderness, juiciness, flavor liking, texture, saltiness, and overall liking. Consumers were also asked if each trait was acceptable, as well as their willingness to pay (WTP) for each sample at retail.

Results

Treatment influenced ($P < 0.01$) the rating and acceptability of all palatability traits, overall liking, and WTP. Consumers similarly scored IPT and INJ more tender, juicier, and liked those samples more overall compared to all other treatments ($P < 0.05$). As a result, consumers were willing to pay more for IPT and INJ compared to all other treatments ($P < 0.05$). Although tenderness, juiciness, and flavor liking were intermediate for TUMB, consumers found the saltiness and overall liking of TUMB similar ($P > 0.05$) to IPT and INJ; however, consumers were not willing to pay as much for TUMB as IPT. Consumers scored CNT and TCNT similarly lower for tenderness, juiciness, flavor liking, saltiness (not salty enough), and overall liking compared to all other treatments, which resulted in lower WTP for these two treatments ($P < 0.05$). Acceptability generally followed the same trends as the ratings for each palatability trait.

Conclusion

Inclusion of a marinade or brine solution was critical for the eating quality of fajita samples, as evidenced by the outperformance of CNT, which was not enhanced, and TCNT, which was tumbled but without a brine solution, by all other treatments. The delivery method of the brine solution was not as important to eating quality as the presence of a marinade, as IPT, INJ, and TUMB were all similar for overall liking. Injection plus tumbling improved tenderness, juiciness, and flavor liking scores over tumbling alone, but did not significantly improve those traits in comparison to injection alone. Therefore, enhancement influenced palatability and the acceptability of those traits. However, minimal differences were observed between tumbling and need injection as long as a brine solution was included.