

CONSUMER EVALUATION OF BEEF MUSCLES FOR USE AS "FAJITAS" AFTER MECHANICAL AND/OR ENZYMATIC TENDERISATION

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Introduction

Beef fajitas, a popular Mexican food dish in the U.S., were initially prepared using the outside beef skirt (diaphragm muscle). Today, the inside and outside skirts and flank muscle are commonly used as fajitas, and with increasing demand for these muscles, other sources are of interest to meet the growing demand for the raw materials for this product.

If other muscles are to be used for beef fajitas, their sensory characteristics will have to be comparable with that expected by consumers of this dish. Some muscles may have to be tenderised, either mechanically or with enzymes, to make them more suitable for this unique preparation. We evaluated seven muscles and different combinations of mechanical and enzymatic tenderisation treatments to see if we could find alternative muscles and processing procedures for beef fajita applications.

Materials and Methods

Sixty USDA Choice beef chucks, plates, outside skirts, inside skirts, and flaps were purchased and shipped to the Rosenthal Center at Texas A&M University. *M. rhomboideus* and *M. trapezius* were removed from beef chucks and *M. latissimus* and *M. serratus ventralis* were removed from beef plates. Four different treatments — papain (P), blade tenderisation (B), papain + blade tenderisation (P+B), and control (C) — were applied to all muscles. Muscles were cut into steaks and frozen at -10°C for subsequent consumer evaluation. Steaks were thawed 48 hours and cooked to an internal temperature of 70°C. Randomly selected consumer panelists (n=81) evaluated overall like of flavour and tenderness using 9-point scales (9=like extremely; 1=dislike extremely). Steaks were cut into fajita strips (4.5 cm × 1 cm), and were presented to consumers rolled in flour tortillas (12 cm × 4.5 cm).

Statistical analyses were performed using SAS PROC MIXED (v. 6.12). For consumer data, Box-Cox transformations were used to produce normally distributed errors. Least squares means were generated and tested for significance ($P < 0.05$) using PDIFF.

Results and Discussion

Treatments

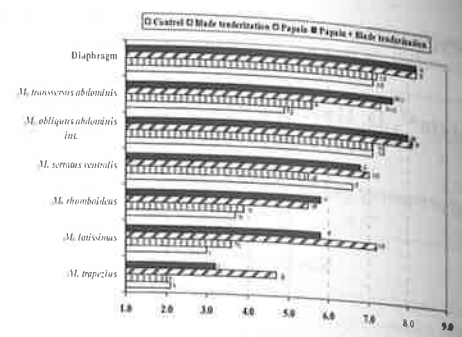
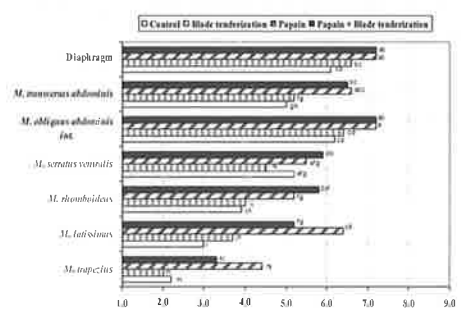
Of muscles and treatments combinations, consumers preferred the diaphragm, *M. transversus abdominis*, and *M. obliquus abdominis int.* muscles that were treated with papain. In contrast, the *M. trapezius* B and C treatment combinations were the least favored. Addition of papain to the *M. latissimus* greatly increased the consumer preference, which was similar to the P treated *M. transversus abdominis*.

Flavour

Consumers preferred the flavour of the diaphragm and *M. obliquus abdominis int.* treated with papain. The flavour of *M. trapezius* (C and B) and *M. latissimus* (C) was the least liked by consumers. The P and P+B treatments improved ($P < 0.05$) consumer flavour of inside skirt, flap, *M. rhomboideus*, *M. latissimus*, and *M. trapezius* fajitas.

Tenderness

Consumers preferred the tenderness of the diaphragm (P and P+B), *M. transversus abdominis* (P+B), and *M. obliquus abdominis int.* (P and P+B). However, consumers disliked the tenderness of the C and B of the *M. trapezius*. The *M. serratus ventralis* and *M. latissimus* with the P treatment can be compared in tenderness to the C steaks of the diaphragm. Consumer tenderness ratings were lower for P and P+B fajitas except in the *M. serratus ventralis* where fajitas from all treatments were tender. Inside skirt, *M. serratus ventralis*, and *M. latissimus* had similar ($P > 0.05$) tenderness when the P treatment was applied.



Conclusion

Consumers preferred the flavour and tenderness of beef fajita strips that were treated with P and P+B. Papain and blade tenderisation increased tenderness to a sufficient degree for consumers to have a positive eating experience. Regardless of the initial tenderness state of beef muscles, papain alone or the combination of papain and blade tenderisation improved tenderness. The addition of these two treatments to lower valued beef muscles may increase the supply of muscles that can be used for beef fajitas.