

BEEF BRISKET SUBJECTIVE MEASURE OF DONENESS AND TENDERNESS

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I. OBJECTIVES

The objective of this study was to identify the final temperature of beef briskets without the use of instrumentation.

II. MATERIALS AND METHODS

USDA Choice beef briskets ($n=96$), with deckle fat removed and trimmed to 0.8 cm fat, were selected and randomized into separate groups and assigned a treatment combination for cooking. Final temperatures were 75°C, 80°C, 85°C, or 90°C, and hold time consisted of 0 h or 3 h. Measurements, including weight, length, flop, pH, and initial temperature, were taken from the raw briskets. Length of the brisket was measured with the fat side up and on the side closest to the forerib from the top of the point to the flat. For the flop measurement, the brisket was allowed to fall over the side of a flat surface, using the segment of the point and flat muscle overlay as the point of bending in the "flop." Horizontal and vertical length of the brisket, lean side up, when flopped were measured using a framing square. Flop distance was determined using the Pythagorean theorem. Briskets were cooked in commercial, single-truck smokehouses. Measurements to determine yield and degree of doneness were recorded. Pokes by a texture analyzer fitted with a custom 1-cm-diameter spherical head were done in triplicate over 3 locations: the flat, center (where the natural seam attaches the 2 muscles), and point. Briskets were chilled, separated into point and flat, and sliced. Warner-Bratzler shear force (WBSF) was conducted immediately on a 2.54-cm-thick slice. Slice shear force and sensory were conducted on slices (0.9 cm thick) proximate to the WBSF slice after being chilled and reheated to 63°C utilizing the *sous vide* method. A sensory panel consisting of 5 trained members evaluated the degree of cohesiveness, cohesiveness of mass, muscle fiber tenderness, moisture release, and connective tissue using a 16-point hedonic intensity scale of each slice. Differences in means were detected using analysis of variance and Student *t* mean separation with JMP Pro 15 (SAS Institute Inc., Cary, NC), using final temperature, hold time, and their interaction as fixed effects for each muscle. Pearson's pairwise correlations were used to show the relationships of flop data to data from instrumentation.

III. RESULTS

Briskets cooked to 90°C with a 3-h hold time had the greatest loss in hot cooked yield, whereas briskets cooked to 75°C with 0-h hold time had the greatest hot cooked product yield (56.0% vs. 73.2%, respectively). Flop angle of cooked briskets was dependent on final internal temperature as an increase in final temperature resulted in a narrower ($P<0.05$) angle. Increased angle of the cooked briskets resulted in greater ($P<0.05$) cohesiveness, cohesiveness of mass, moisture release, tenderness, and amount of connective tissue scores. Angle of cooked briskets was weakly positively correlated ($P<0.05$) to WBSF, point poke, center poke, and flat poke ($r=0.21, 0.33, 0.39$, and 0.31 , respectively). WBSF and slice shear force values decreased ($P<0.05$) as the raw length of the briskets increased.

IV. CONCLUSION

Final temperature influences yield, texture, and sensory attributes of brisket. The degree of flop with increased final temperature for cooked briskets was positively related to instrumental measurements of tenderness and may be used to detect when briskets are done.

Keywords: beef brisket, tenderness