BRISKET – BACK TO THE BASICS

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I. OBJECTIVES

The objective of this study was to identify an ending temperature for optimizing beef brisket yield and tenderness.

II. MATERIALS AND METHODS

USDA Choice beef briskets ($n = 96$), with deckle fat removed and trimmed to 0.8 cm fat cover, were selected in 2 separate batches from representative commercial lots and randomly assigned a final temperature (75°C, 80°C, 85°C, or 90°C) and hold time (0 or 3 h) combination. Briskets were cooked in duplicate batches (n = 6/batch; 16 total batches) that were blocked by brisket raw weight. Commercial, single-truck smokehouses were utilized to cook the briskets. Yield information was recorded before doneness was examined using a unique brisket poker connected to a texture analyzer to measure the force that a 1-cm-diameter ball needs to penetrate the cooked brisket. Briskets were chilled, separated into point and flat pieces, and sliced for further analyses. Warner-Bratzler shear force (WBSF) was conducted from a 2.54-cm-thick slice immediately for each portion, where max peak force was recorded. Slice shear force (SSF) and trained sensory slices (0.9 cm thick) were reheated via *sous vide* method to 63°C. Slices from each flat and point were served to a 5-member trained panel to evaluate and come to a consensus on the degree of cohesiveness, cohesiveness of mass, muscle fiber tenderness, moisture release, and connective tissue using a 16-point hedonic intensity scale. Data were analyzed using JMP Pro 15 software (SAS Institute Inc., Cary, NC). Differences in yield, poke, WBSF, SSF, and collagen were found utilizing analysis of variance with assigned final temperature, hold, and their interaction as main effects with rep included as a random block effect. Linear contrasts were used to identify influential temperature and/or hold classifications. Linear regression models were generated for each analysis, and pairwise correlations were measured.

III. RESULTS

Hot and chilled cook yield differed ($P < 0.001$) by temperature and hold time. Briskets cooked to 90°C with a 3-h hold time had the greatest loss in chilled yield, whereas briskets cooked to 75°C with 0-h hold time had the greatest cooked product yield (55.2% vs. 70.2%, respectively). Poke force decreased ($P < 0.001$) with increased temperature and increased hold time. Poking briskets at the central location resulted in more reliable ($R^2_{adj} = 0.60$) tenderness outcome than poking at the flat or point. Overall, increased ending temperature and increased hold time resulted in less ($P < 0.01$) cohesiveness, cohesiveness of mass, and moisture release as well as more ($P < 0.01$) muscle fiber tenderness and absence of connective tissue. WBSF and SSF values of the point decreased ($P < 0.05$) with increased temperature and hold time. Moderate correlations ($P < 0.001$) existed between yield evaluation, sensory attributes, and instrumental texture measurements with the exception of moisture release, which had no ($P > 0.05$) correlation.

IV. CONCLUSION

Endpoint temperature and hold time affect brisket tenderness differently between the flat and point. Compared to 90°C with a 3-h hold, briskets cooked to 85°C with a 3-h hold achieved enhanced yield (56.0% vs. 59.3%, respectively) without sacrifice to tenderness attributes.

Keywords: beef brisket, collagen, cooking endpoint temperature