

A COMPARISON OF CONSUMER RESPONSE USING PAPER AND DIGITAL BALLOTS FOR EATING QUALITY ASSESSMENT OF BEEF STEAKS

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I. OBJECTIVES

The ultimate goal of Meat Standards Australia is the continual improvement to the predictive capability of the carcass grading system, where carcass inputs can be used to predict eating quality of a variety of cuts in the beef carcass. According to Meat Standards Australia protocol, consumer data, which have been collected from thousands of consumers globally, have historically been collected on paper ballots with 100-mm line scales for evaluation of tenderness, juiciness, liking of flavor, and overall liking. Ballots are then scored either digitally or by hand before compiling the consumer data. These methods can be quite time-consuming and leave room for human error during the scoring and data entry processes. The use of electronic devices equipped with sensory software or digital ballots has emerged as an efficient means of collecting data from sensory trials. The purpose of this study was to determine whether consumers scored beef palatability traits differently on paper versus with digital ballots.

II. MATERIALS AND METHODS

Beef subprimals were collected to represent 4 treatments with inherent variation in eating quality: USDA Select eye of round aged 7 d postmortem, USDA Select strip loin aged 7 d postmortem, USDA Choice tenderloin aged 21 d postmortem, and USDA Prime strip loin aged 21 d postmortem. Accessory muscles, external fat, and connective tissue were removed from subprimals. Muscles were fabricated into 2.5 cm steaks and further divided into 2 equal halves for consumer testing. Consumers ($n=360$) were served 8 cooked samples divided into 2 blocks representing the 2 ballot types. Select strip loin samples were always served in the first and fifth position to start each ballot block, with the remaining 3 treatments served in a randomized order between the latter 3 positions within each ballot block. Consumers rated each steak sample for tenderness, juiciness, flavor liking, and overall liking on either a paper or digital ballot, and then rated the paired steak halves on the opposite ballot during the second block of sample testing. Both ballots utilized 100-mm line scales for the scoring of palatability traits, with reference hash marks at 20, 40, 60, and 80 mm.

III. RESULTS

No interactions between treatment and ballot type were observed ($P > 0.05$) for any palatability traits. Ballot type influenced ($P < 0.02$) all traits, as consumers scored tenderness, juiciness, flavor liking, and overall liking greater ($P < 0.05$) on paper ballots compared to digital ballots, regardless of treatment. The smallest margin between paper and digital ballots was observed for tenderness, where scores only differed by 1.8 units. However, juiciness, flavor liking, and overall liking all differed by 3.4 units in favor of paper ballots. Treatment influenced ($P < 0.05$) all palatability traits. Overall, Choice tenderloin were liked the most, followed by Prime strip loin, Select strip loin, and Select eye of round, with a significant decline ($P < 0.05$) between each treatment.

IV. CONCLUSION

Consumers scored palatability traits greater on paper ballots compared to digital ballots, and these findings were consistent across treatments. The findings of this study need to be taken into consideration when comparing studies conducted with paper ballot versus a digital ballot or vice versa. Furthermore, an adjustment factor may be necessary to accurately compare data collected using the 2 ballot types.

Keywords: consumer, digital ballot, palatability, sensory panels