EVALUATING THE BEEF EATING QUALITY FROM ZEBU CATTLE AT DIFFERENT AGING TIMES USING BRAZILIAN CONSUMERS

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I. INTRODUCTION

Consumer satisfaction with beef quality depends on attributes such as tenderness, juiciness, and flavor. Understanding the factors that influence meat quality is important for developing strategies. Various strategies can be employed to optimize these quality traits. Additionally, meat aging can be utilized to enhance tenderness [1]. In Zebu animals, improving tenderness is a crucial strategy. Nelore breeds, in particular, are generally known to produce less tender meat compared to other breeds. Therefore, prioritizing tenderness enhancement can significantly improve meat quality and increase consumer satisfaction. Research conducted with untrained consumers provides a more accurate representation of the impact of product characteristics on the final outcome [2]. Thus, the objective of the present study was to determine whether untrained Brazilian beef consumers would perceive differences in steaks with varying aging times.

II. MATERIALS AND METHODS

In this study, ten Nellore female carcasses were evaluated. The *longissimus thoracis et lomborum* muscles were collected and aged for different periods: 5, 15, 20, and 25 days. To assess the quality of the steaks, sensory analysis was conducted with untrained consumers following the Meat Standards Australia protocols [3]. A neighbor-balanced Latin square design (6 × 6) with two block factors, consumer, and assessment order, was used. The samples were grilled according to the MSA protocol for the consumer test. A total of 240 untrained Brazilian consumers rated the tenderness, juiciness, flavor, and overall liking of the steaks on a 0-100-point scale. The consumers were from the state of Sao Paulo, Brazil. They were aged between 18 and 65 years, with 35% women and 65% men. A variance analysis was performed to compare the scores across different aging times, followed by a post-hoc test for pairwise comparison.

III. RESULTS AND DISCUSSION

The average scores of beef quality classes attributed by consumers to the steaks based on aging time are presented in Figure 1. The scores for tenderness, flavor, juiciness, and overall liking are shown in Table 1. The steaks aged for 5 days had lower average scores compared to the others, while the aging times of 15, 20, and 25 days had similar scores. The greatest difference in means for overall liking was between 15 and 5 days, with a difference of +12.9 points. Regarding tenderness and juiciness, 25 days of aging had a significant impact, with an average difference of +15.4 points and +12.4 points, respectively, compared to 5 days. For flavor, 15 days had the highest score. Generally, beef from Nellore cattle shows a significant improvement in sensory quality starting from 15 days of aging. Determining the optimal aging time is crucial considering the supply chain costs. The implementation of post-slaughter practices can contribute to increasing tenderness as perceived by consumers.

Figure1: Scores of overall liking, tenderness, juiceness and flavour for the 5, 15,20 and 25 days of aging.

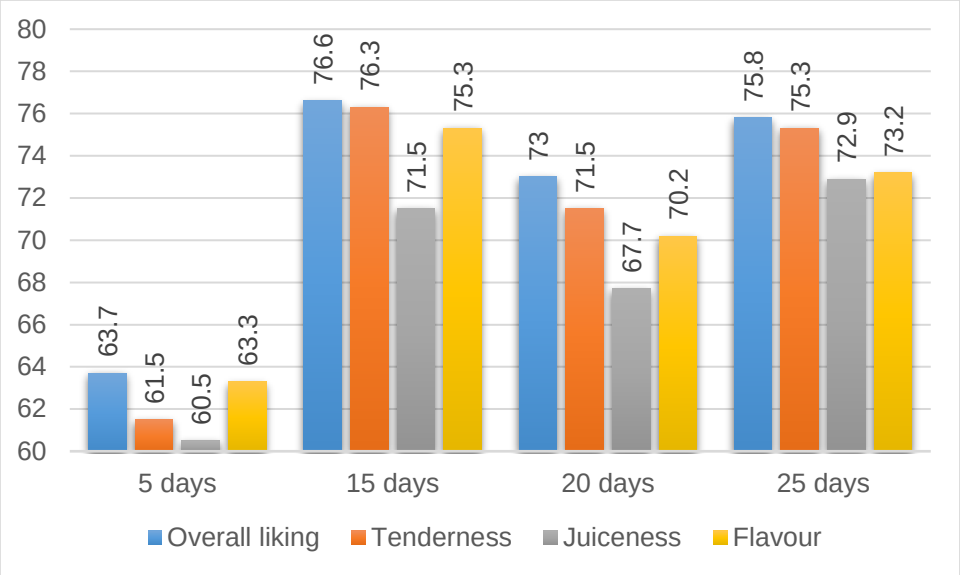

Table 1. Averages scores (± standard error) of tenderness, juiciness, flavour liking and overall liking for differents aging times.

Aging Time	Overall Liking	Tenderness	Juiciness	Flavor
	Mean (SE)	Mean (SE)	Mean (SE)	Mean (SE)
5 Days	63.7^{a} (1.46)	61.5 ^{a} (1.63)	60.5 ^{a} (1.45)	63.3 ^{a}
15 Days	76.6 ^{b} (1.25)	76.3 ^{b} (1.36)	71.5 ^{b} (1.28)	75.3 ^{b}
20 Days	73.0 ^{b} (1.66)	76.0 ^{b} (1.64)	67.7 ^{b} (1.67)	70.2 ^{b}
25 Days	75.8 ^{b} (1.44)	76.9 ^{b} (1.53)	72.9 ^{b} (1.59)	73.2 ^{b}
P.values	<0.001	<0.001	<0.001	<0.001

SE - Standard Mean Error , different subscripts show statistically different means with p-value <0.05

IV. CONCLUSION

The aging time for Nellore carcasses significantly improves the eating quality of beef. Particularly, a 15-day aging period was found to be an optimal timeframe, resulting in significant enhancements across all sensory attributes of the meat.

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