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CONSUMER SENSORY ASSESSMENTS, DESCRIPTIVE PROFILING AND PURCHASE BEHAVIOR TOWARDS FRESH VS. FROZEN GOAT MEAT

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I. INTRODUCTION

Meat suppliers are often interested in selling product both in fresh forms, but also needing flexibility to sell high quality frozen product throughout the year. Many studies exist which have measured the impact of freezing on the quality of meat, demonstrating the improved technologies of freeze and thaw [1]. Beef, lamb/mutton and chicken are meat products produced in the greatest quantities worldwide and have been studied more extensively than goat. In 2024, Fevold, et al. [2], found that untrained university faculty and staff preferred lamb loins fresh never frozen, whereas no significant differences in liking were found between fresh vs. frozen lamb legs. Consumer preferences in fresh vs. frozen beef strip loins were studied by Beyer et al. [3], wherein the frozen samples were rated as more tender than the fresh, but no other significant differences were found. This research explores target market consumers' sensory assessments and opinions of fresh versus frozen goat meat quality to determine if significant sensory differences exist and which attributes may drive consumer preference.

II. MATERIALS AND METHODS

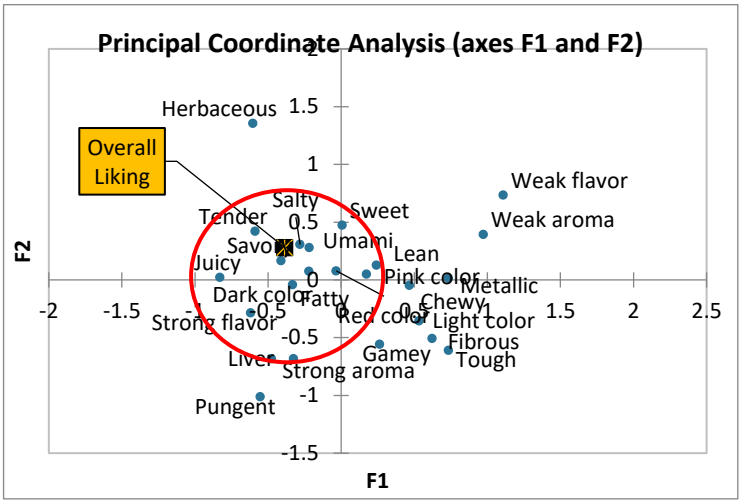
We have sought to understand consumers' motivations for purchasing goat meat in an online consumer survey (n=1,772, 44% female, aged 18 and over, USA) and have explored the sensory taste perceptions, descriptive profiling, and purchasing decisions of frequent goat meat consumers in a central-location-test (CLT; n=105, 45% female, aged 18 and over). Consumer sensory acceptability of fresh and frozen goat tenderloin (*Psoas major*) and loin (*Longissimus dorsi*) were conducted in Portland, Oregon, USA at the Oregon State University (OSU) Food Innovation Center, with approval from the OSU IRB #2023-573. Loins were pan seared and oven finished to 68 degrees Celsius by a professional chef and served on while ceramic plates in individual sensory booths under white light. Samples were served blind coded in a balanced design. The products were evaluated hedonically for overall liking, overall appearance, aroma, meat flavor, flavor strength, overall texture, tenderness and juiciness utilizing the Compusense Cloud v21.0.25 (Academic Consortium, Compusense Cloud, Compusense, Inc., Guelph, ON, Canada) software. Consumers described the sensory properties of both products employing the check-all-that-apply (CATA) methodology. Consumers provided their perceptions about the fresh and frozen samples related to quality, sustainability and purchase intent in agree/disagree statements. XLSTAT 2022.4.1 software [4] was used to analyze the data where analysis of variance was performed on all hedonic attributes. Tukey's Honestly Significant Difference was employed to compare means at a 95% confidence level. CATA data was analyzed using Principal Coordinate Analysis (PCoA) and measured for significance in a penalty analysis.

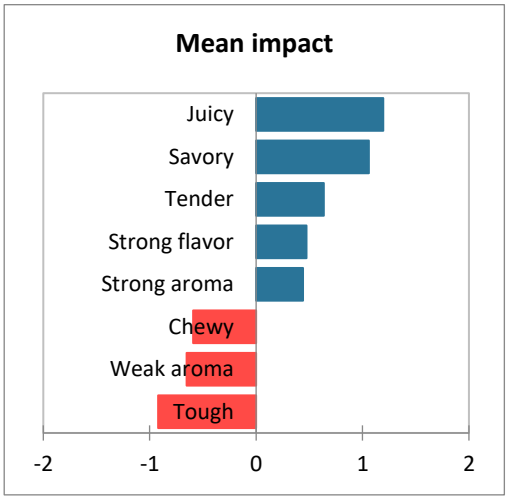
III. RESULTS AND DISCUSSION

Goat meat consumers rated their liking of blind coded fresh and frozen goat loins (Table 1). In all attributes, the fresh and frozen loins were liked equally ($p<0.05$). Descriptive CATA data as analyzed by PCoA (Figure 1) and displayed in a mean impact chart (Figure 2), shows the attributes with a significant positive/negative impact on the liking of the goat meat; 'juicy' having the highest impact. 'Supporting the livelihoods of local ranchers/communities' and 'higher nutritional value' were the two most important reasons selected to purchase more goat meat (Figure 3).

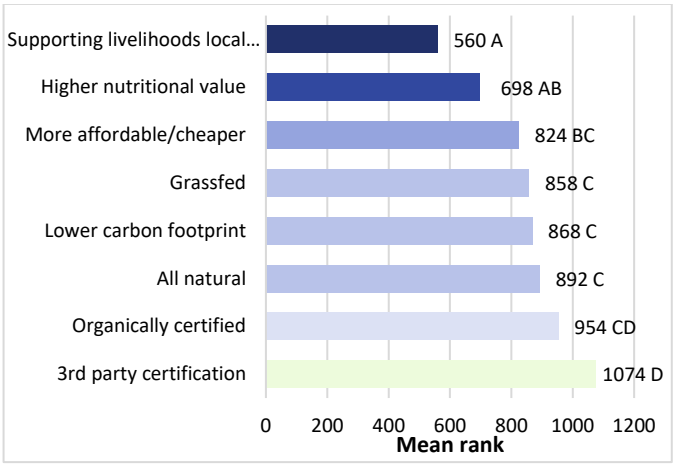
Table 1 – Consumer hedonic ratings (9 pt. hedonic scale) and purchase intent (5 pt. purchase intent scale) mean scores. Means with different letters were significantly different ($p<0.05$) using Tukey's HSD test.

Goat loins	Overall Liking	Aroma Liking	Appearance Liking	Texture Liking	Tenderness Liking	Juiciness Liking	Meat Flavor Liking	Flavor Strength Liking	Purchase Intent
Frozen	7.56 a	7.98 a	8.02 a	6.95 a	6.50 a	7.79 a	7.88 a	7.64 a	3.84 a
Fresh	7.41 a	7.72 a	7.84 a	6.64 a	6.28 a	7.75 a	7.70 a	7.41 a	3.70 a





Figures 1 & 2. Principal Coordinate Analysis of sensory descriptors contributing to consumer overall liking and descriptors with the most positive (blue) and negative (red) impact on consumer liking scores.



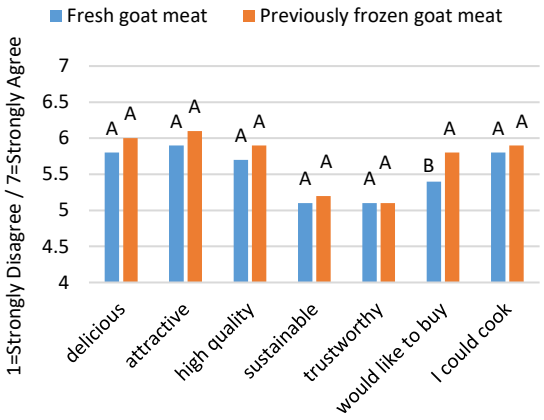


Figure 3. Ranked reasons to buy more goat meat.

Figure 4. Agree/disagree statements about fresh/frozen goat meat

IV. CONCLUSION

In blind sensory evaluations with target market goat meat consumers, frozen and fresh goat meat were liked equally in all attributes tested. Samples with the attributes 'juicy', 'savory' and 'tender' were most liked, while consumers did not like samples described as 'tough'. Frozen samples were also rated statistically higher as being 'something I would like to buy' than fresh samples in agree/disagree statements (Figure 4). Ranchers should have confidence that well frozen goat meat will be equally liked to fresh counterparts and well accepted by consumers. Future research looks to investigate frozen storage.

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