MILLENNIAL VERSUS NON-MILLENNIAL CONSUMER PERCEPTIONS OF BEEF, PORK AND CHICKEN SENSORY ATTRIBUTES

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Abstract – **Differences in beef, pork and chicken flavor were created using beef Top Choice top loin steaks, beef Select outside round roasts, boneless pork loin chops, inside ham roasts, and chicken breasts and thighs cooked to two internal temperatures on a food-service grill or Crock-pot®. Trained descriptive sensory and consumer attributes in a consumer central location test were evaluated. Millennials and non-millennials that were light or heavy beef eaters were selected. Cooking method, cut, and internal temperature impacted meat descriptive flavor and texture attributes. The Crock-pot®-cooked meat had less positive flavor attributes than the grill-cooked meat. Descriptive and consumer attributes differed by consumer group, but price, appearance and variety where important for consumer groups.**

Key Words – **consumer, trained, sensory, millennials, non-millennials.**

I.   INTRODUCTION

Meat flavor has been shown to be an important component of consumer demand [1, 2] and beef descriptive attributes have been correlated to consumer perceptions [3, 4]. Beef consumers like beefy flavor, the versatility of beef in recipes and understand that beef is an excellent protein source [3, 4]. Millennials, individuals ages 18 to 34 years in 2015, did not consume beef at the same proportion as non-millennials [5]. Non-millennials are Generation X and baby boomers. The millennial generation has over 25% of the buying power and is expected to grow [5]. They have distinctly different behaviors, values and attitudes due to being born when society moved from the industrial to the internet age [5]. It is imperative to understand perceptions of millennials for beef and to know if positive and negative beef flavor attributes are different for millennials versus non-millennials and light- versus heavy-beef eaters. Objectives were to select four consumer groups, millennials and non-millennials that were light (eat beef 2 to 4 times per month) or heavy (eat beef 3 or more times per week) beef eaters in four cities and evaluate descriptive sensory attributes and consumer liking of beef, chicken and pork cooked to create differences in flavor.

II.   MATERIALS AND METHODS

Top Choice top loins, Select outside rounds, boneless pork loins, inside hams, and chicken breasts and thighs were purchase. Top loins and pork loins were cut into steaks/chops (2.54 cm thick, 0.25 cm external fat) and randomly assigned to trained or consumer sensory evaluation across treatments (cooked to 58.3°C for beef, 62.7°C for pork or 80°C on a commercial electric flat grill). Beef bottom rounds, flat roasts and inside ham roasts (0.9 kg) were cut and randomly assigned to trained or consumer sensory evaluation across treatments (cooked to 58.3°C or 80°C in a Crock-pot® set at high with 1.4L of water). Split chicken breasts (cooked to 62.7°C or 80°C on a commercial flat grill at 204.4°C) and thighs (Crock-pot® cooking to 62.7°C or 80°C) were assigned to treatment. Sensory analysis was conducted using lexicons within species [7,8,9,10] with 16-point scales (0 = none;15 = extremely intense). Consumers (n = 120 per city) were selected in Griffin, GA; Olathe, KS; State College, PA; and Portland, OR and were millennials (M; ages 18-34; n = 60) or non-millennials (N; n = 60; ages greater than 34) and within age categories to be light (L; n = 30 per age group; eat beef 2-4 times per month) or heavy beef eaters (H; n = 30 per age group; eat beef $\geq$3 times per week). Overall, flavor, meat flavor, grilled flavor, juiciness and tenderness liking were evaluated (1=dislike extremely; 9=like extremely). Warner-Bratzler shear force[10] (WBSF) cuts were cooked as defined. Partial least squares regression biplots (PLS; XLSTAT) are presented.

III.   RESULTS AND DISCUSSION

Cooking method, cut, and internal temperature impacted meat descriptive flavor and texture attributes and consumer groups responded similarly to the aforementioned treatments (data not presented). Relationships between trained flavor descriptive attribute, consumer liking and meat treatments indicated that meat cuts within species cooked to different internal temperature endpoints had similar flavors and consumer attributes (Figure 1). Consumer overall liking was most

closely related to consumer flavor attributes with juiciness and tenderness liking not as closely related. Consumer juiciness and tenderness liking were closely associated with trained tenderness and juiciness attributes and inversely related to WBSF. Consumers tended to like steak, chops and breast cuts more than roast and thigh cuts, most likely due to cook method. Meat flavor liking was associated with brown/roasted, salty, umami, overall sweet and sweet descriptive attributes. Chicken breasts were clustered with wet feather, burnt, fat-like and juiciness descriptive attributes. Chicken thigh meat was associated with sour, spoiled/putrid, sour milk and astringent attributes; whereas, beef bottom round and ham roasts were clustered with metallic, warmed over, liver-like, chemical, cardboard, sour aromatic, nutty, and bloody/serumy attributes. Consumer groups responded similarly when evaluating consumer attributes for the 8 cooked cuts (data not presented). Figure 2 is presented to understand if consumer groups were affected by differences in descriptive and consumer sensory attributes. ML were associated with astringent, pork identity, sour aromatic, and liver-like. ML and MH were clustered close to chicken identity. NH consumers were associated with consumer attributes and muscle fiber tenderness, whereas NL were related to sweet, salty, overall sweet beef identity and burn attributes. Overall tenderness, WBSF, juiciness, umami, nutty, bloody/serumy and cardboardy were similarly related to non-millennial consumers, regardless of beef usage. Consumer verbal responses segmented by consumer groups (Figure 3) showed that price was the main driver for protein selection across consumer groups with appearance, variety and menu being second in importance.
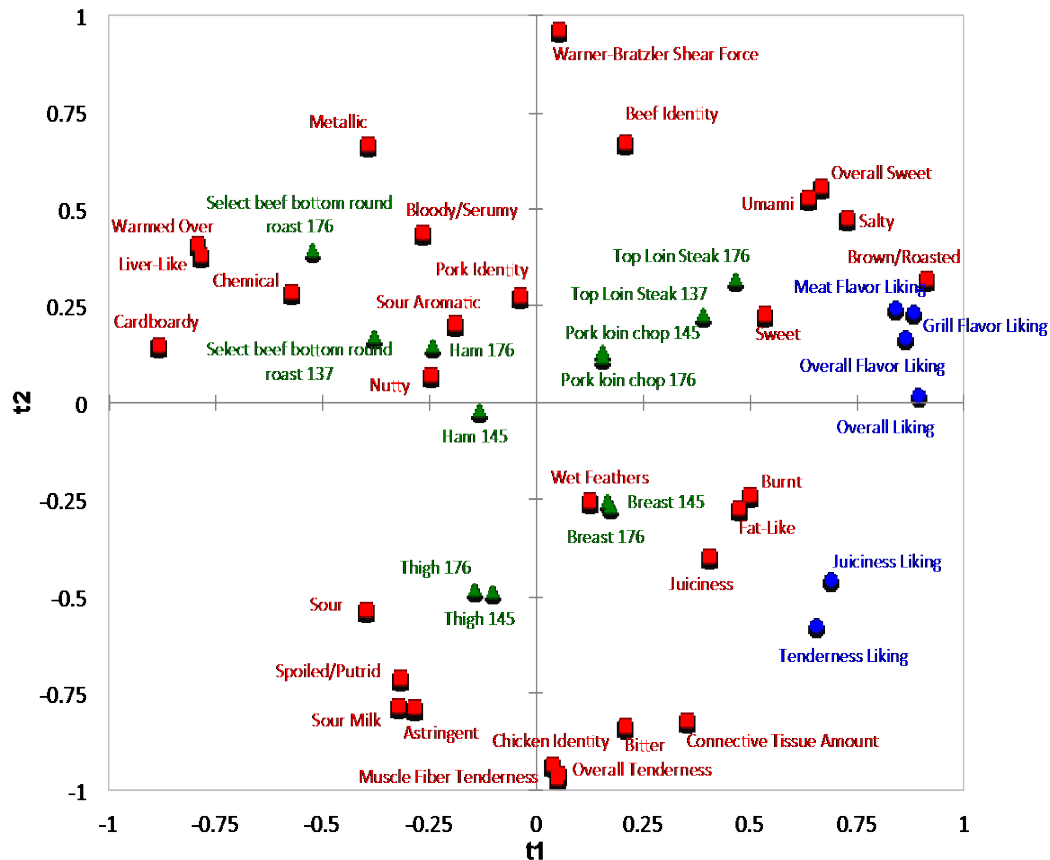

Figure 1. PLS regression biplot (Y accounted for 77% of the variation in X and X accounted for 56% of the variation in Y) for meat treatments (♦); descriptive attributes and Warner-Bratzler shear force (■); and consumer sensory liking (●).
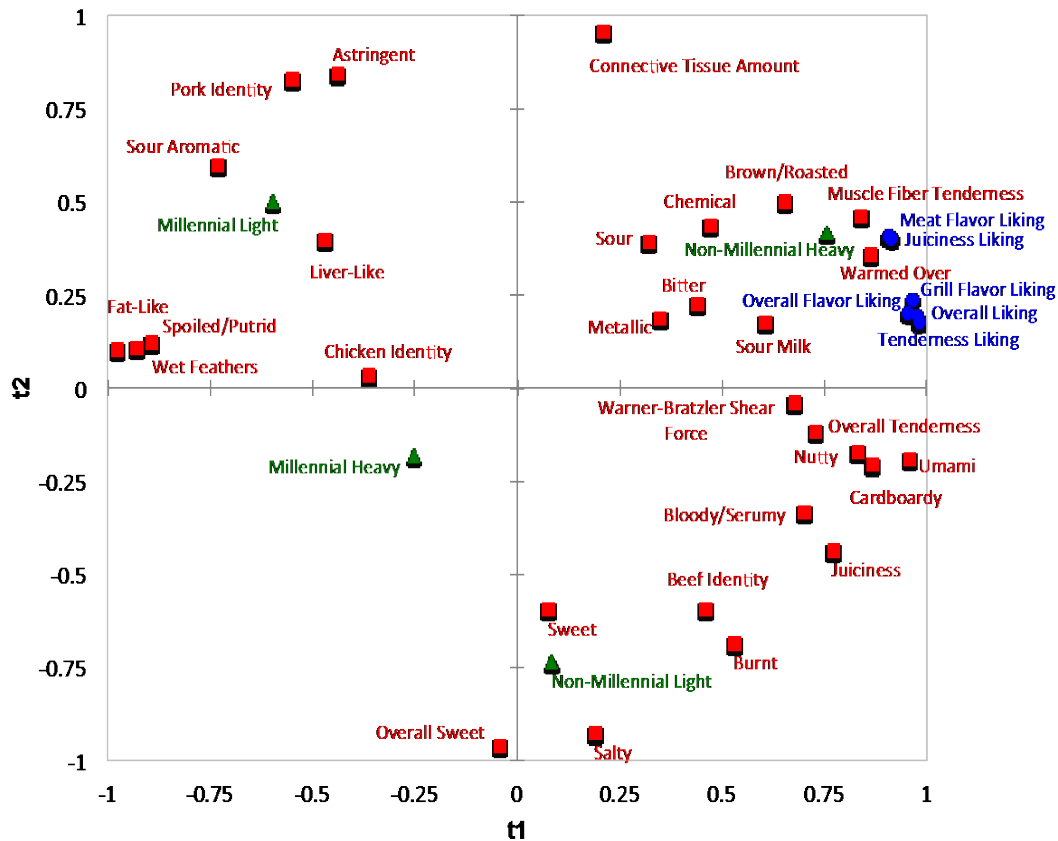
Figure 2. PLS regression biplot (Y accounted for 98% of the variation in X and X accounted for 66% of the variation in Y) for consumer groups (♦);descriptive attributes and Warner-Bratzler shear force (■); and consumer sensory liking (□).

Figure 3. Word cloud (www.wordle.net) for one-on-one interviews for beef, pork, and chicken purchasing decisions for Non-Millennial Light Beef Eaters (a), Millennial Light Beef Eaters (b), Non-Millennial Heavy Beef Eaters (c) and Millennial Heavy Beef Eaters (d).

IV. CONCLUSIONS

Cut, cooking method and internal cook temperature endpoint affected descriptive and consumer sensory traits and were similarly identified by ML, MH, NL and NH beef eaters. When cuts across species are cooked in a Crock-pot® consumers and trained panelists identified more negative flavor attributes and cuts cooked on a grill had more positive attributes. NL beef eaters tended to be associated with more negative consumer and descriptive attributes. Other factors, such as price, appearance, and menu variety, were important to consumers regardless of consumer treatment.

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