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

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Abstract – An in-home study evaluated the differences in beef, pork and chicken flavor using Choice strip loin steaks, Select outside round roasts, boneless pork loin chops, and chicken breasts on Millennial or non-Millennial light and heavy beef eaters. Home use test (HUT), trained descriptive sensory, and volatile aromatic compounds were evaluated. Millennial light beef eaters tended to rate some attributes lower, but this was seen across the four meat cuts. Millennial consumers, both heavy and light, were negatively associated with consumer liking attributes indicating that they had different liking scores for consumer attributes. Consumers rated HUT liking higher than the central location test (CLT).

Key Words – consumer, trained, sensory, volatile aromatic compounds.

I. INTRODUCTION

Millennials are the biggest generational segment since the Baby Boomers and represent more than a quarter of the population[1]. Their sheer size along with their purchasing power makes Millennials an essential market segment for the future success of any industry. Since the Millennials have had constant Internet and social media outlets to connect with anybody, they are more likely to be open to change and are more self-expressive than older generations[2]. With a new generation of consumers, it is important to understand what is driving acceptability. A higher percentage of Millennials, ages 18 to 34, do not consume beef compared to Non-millennials[3]. Meat flavor has been shown to be an important component of consumer demand[4,5]. 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 determine their perceptions of beef liking based on beef, chicken and pork in an in-home placement study. The HUT design allows a unique perspective to understand how consumers choose how they prepare and eat the products[6]. It is vital to understand Millennial's perceptions of beef, what factors drive their decisions to eat beef and how we can increase their beef consumption.

II. MATERIALS AND METHODS

Beef Top Choice top loins, Select outside rounds, boneless pork loins, and chicken breasts were purchased. Top loins and pork loins were cut into steaks/chops (2.54 cm thick, 0.25 cm external fat) and randomly assigned to trained (cooked to 58.3°C for beef, 62.7°C for pork or 80°C on a commercial electric flat grill) or in home consumer sensory evaluation across treatments. Beef bottom rounds, flat roasts (0.9 kg) were cut and randomly assigned to trained (cooked to 58.3°C or 80°C in a Crock-pot® set at high with 1.4L of water) or in home consumer sensory evaluation across treatments. Split chicken breasts (cooked to 62.7°C or 80°C on a commercial flat grill at 204.4°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 = 80 per city) were selected in Griffin, GA; Olathe, KS; State College, PA; and Portland, OR and were millennials (M; ages 18-34) or non-millennials (N; ages greater than 34) and within age categories to be light (L; eat beef 2-4 times per month) or heavy beef eaters (H; eat beef $\geq$3 times per week). Consumers were provided one Top Choice beef top loin steak, one Select beef bottom round flat roast, one chicken breast and one boneless pork loin chop. Consumers were asked to answer a questionnaire as they prepared each product that included cooking method, ingredients added, degree of doneness, cuisine classification, and preparation time. Consumers also were provided a ballot and asked to rate the cooked product for appearance, overall, flavor and texture liking using 9-point hedonic scales[10]. Consumers were provided color scales for determination of degree of doneness using the American Meat Science Association Beef Steak Color Guide and the Pork Chop Cooked Color Guide and descriptions of cooking methods. Warner-Bratzler shear force[10] (WBSF) cuts were cooked as defined. Partial least squares regression biplots (PLS; XLSTAT) are presented.

III. RESULTS AND DISCUSSION

NH, NL, MH and ML used slightly different cooking methods when cooking beef, pork and chicken. Visual appearance, both before cooking and after cooking, was more important to non-millennial heavy beef eaters. Additionally, non-millennial light beef eaters liked meat that was more tender, where as non-millennial heavy beef eaters liked beef that was more bloody/serumy or had been cooked to lower degrees of doneness and had higher levels of beef identity flavor. Relationships between trained flavor descriptive attribute, in-home consumer liking and meat treatments are indicated in Figure 1. Chicken breasts were

closely associated with the trained meat tenderness attributes, chicken identity, astringent, burn and bitter flavor attributes. Pork loin chops were clustered with nutty and pork identity. Juiciness and sour aromatics were closely associated. Top loin steaks were closely associated with fat-like, overall sweet, juiciness, beef identity, umami and sweet attributes. Bottom round roasts were clustered closely with liver-like, cardboardy, sour and spoiled putrid attributes. Sour aromatics, metallic, bloody/serumy and warmed over flavor aromatics were negative attributes and clustered with each other. Consumers least liked beef bottom round roasts. Figure 2 is presented to understand if consumer groups were affected by differences in descriptive and consumer sensory attributes. Juiciness and tenderness were closely associated and were similarly clustered with overall flavor and appearance before cooking liking. Cooked appearance liking was not as closely related to overall liking as other consumer liking attributes. NH were clustered with bloody/serumy, sweet, sour, sour aromatic and spoiled putrid attributes and these consumers were the consumer group most closely associated with overall liking indicating that they rated meat samples highest for consumer liking attributes. NL were closely associated with overall tenderness, burnt and astringent attributes and negatively associated with cardboardy and liver-like attributes. NL where somewhat related to consumer liking ratings, but not to the same degree as NH. Millennial consumers were negatively related to consumer liking ratings indicating that they rated liking of meat lower than Non-millennials. MH were most closely associated with warmed over flavor. ML were opposite of NH indicating that different flavors drove their liking ratings. ML were clustered with overall sweet, nutty, salty, fat-like, brown roasted, umami and connective tissue amount attributes. In Figure 3, the relationships between CLT, the HUT and the consumer liking scores are examined. The HUT treatments were more closely clustered with the consumer liking scores than the CLT treatments. Since the consumers could prepare the meat themselves to their liking, they likely responded with higher liking scores for the HUT compared to the CLT.

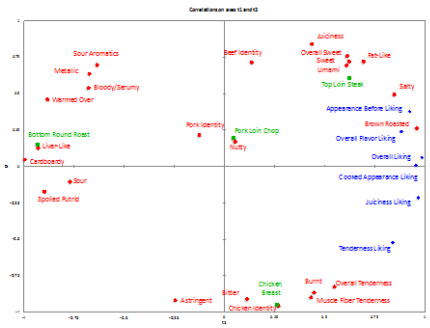

Figure 1. PLS regression biplot (R^2=95%) for in-home consumer sensory attributes (in blue), trained descriptive attributes (in red), and meat source (in green).

Figure 2. PLS regression biplot (R^2=95%) for in-home consumer sensory attributes (in blue), trained descriptive attributes (in red), and consumer treatments (in green).

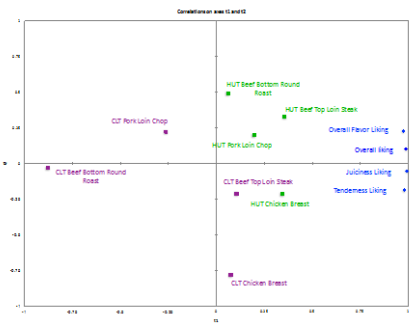

Figure 3. PLS regression biplot (R^2=95%) for in-home consumer sensory attributes (in blue), central location meat sources (in purple), and in-home meat sources (in green).

IV. CONCLUSIONS

As the beef industry evolves, the importance of sensory attributes of their products has become apparent. Flavor continues to be one of the most important sensory attributes and a driver for beef consumption. Millennials versus Non-millennials were shown to have different flavor drivers influencing their perception. The millennials were more critical of the samples then Non-millennials. Other factors could be driving their consumption including lifestyle, health or financial reasons. This generation will be, if not already a huge driving force in the economy and the beef industry should capitalize on this market and cater towards them to increase consumption.

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