



PROJECT SUMMARY PRODUCT QUALITY

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Flavor of Ground Beef – Phase II

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Flavor of Ground Beef – Phase II: Project Summary

Background

Ground beef comprises between 50 and 60% of the beef consumed in the United States and is manufactured from beef trimmings from either commodity, grain-fed beef or lean trimmings from older, mature cows and bulls. Emerging restaurant concepts that focus on ground beef (Five Guys, Smash Burger, etc.) vary in ground beef formulation, grinding procedures and cooking methods. Flavor is incredibly important to the long-term success of beef products and serves as the “guard rails” to beef quality. Researchers have found that flavor was the most important factor affecting consumers’ buying habits and preferences when tenderness was held constant. Recent research has shown that beef flavor is more closely related to overall consumer liking than beef tenderness and juiciness.

Objectives

The objective of this study was to utilize 16 treatments that differ in descriptive flavor attributes to understand trained descriptive beef flavor and texture attributes, volatile flavor aromatic compounds, and consumer attitudes and preferences in ground beef in a central location (to emulate foodservice preparation) and in-home placement study (to emulate in-home retail use) conducted in Olathe KS, Portland OR, Atlanta GA and State College PA.

Methods

Beef round sirloin tip (knuckle) peeled, outside round flats, chuck shoulder clods, 80/20 coarse ground beef, and 50/50 beef trim were all purchased trimmed of all visible fat and connective tissue on the external surface as appropriate. Each primal was then cubed into chunks and coarse ground using a grinder. Each meat source was then formulated to contain either 20 or 10% fat. Within meat source and fat level, the coarse ground meat was either final ground using a 6.4 mm plate or bowl chopped. This resulted in 16 final treatments. Patties were formed from each treatment and evaluated by an expert, trained descriptive attribute sensory panel for flavor and texture attributes, or by consumers in Griffin GA, Manhattan KS, Portland OR, and State College PA for liking in a Central Location test, or by the same consumers in a home-use test. Patties from each of the 16 treatments also were evaluated for volatile aromatic compounds associated with flavor attributes. Ground beef samples were cooked on a commercial flat top with a flip temperature at 35°C to an end temperature of 71°C for the descriptive sensory, Central Location consumer test and volatile aromatic compound evaluations. After completion of the Central Location testing, a subset of consumers were asked individual questions about their eating experience in one-on-one interviews. For the home-use test, consumers took home frozen ground beef patties or beef chubs from the treatments. They were asked to fill out information about cooking preparation and methods and then they evaluated each product as they traditionally would.

Important Findings

Consumers prefer 6.4 mm ground beef patties that contain 20% fat patties that are derived from chuck lean sources. This was apparent when the ground beef was prepared for consumers and when consumers prepared the product at home. Consumers preferred the texture of 20% fat patties over 10% fat patties, and 20% fat patties also scored higher across many positive trained panel attributes compared to the 10% fat patties. Interestingly, when consumers prepared either patties or chubbed ground beef at home, they preferred 10% lipid ground chuck beef in patties or chubs ground to a 6.4 mm grind size.

It was interesting that consumers preferred the 6.4 mm grind over the bowl chopped patties across all consumer attributes. Some specialty ground beef concepts use bowl chopped ground beef. Bowl chopping results in harder ground beef with less defined particle size. When not associated with marketing or concept, consumers did not prefer bowl chopped ground beef compared to normal grind-type ground beef.



Industry Impact

Ground beef constitutes approximately 50 to 60% of the beef consumed in the U.S. Ground beef is sold extensively at retail and in the foodservice industry. One of the most recent trends in the foodservice industry is “premium ground beef concepts” where you can get the best burger in town. As an industry, we have not examined the multiple factors that impact ground beef flavor while we know that flavor is a key driver of consumer acceptability. Last year, a project was conducted to evaluate the effect of meat source (mature versus commodity grain fed), fat level (20 versus 5%), grind or chop method (chopping versus 2 grind sizes), patty thickness (1 versus ¼ inch), formation (hand versus machine), cooking method (dry heat versus steam cooking), and holding time in a steam table (0, 1 or 3 hours) on the flavor and texture of ground beef. In this phase, the 8 treatments that impacted beef flavor were taken to the greatest extent to understand how consumers respond to differences in the flavor of ground beef in combination with differences in texture. Additionally, the in-home placement study provided insight into how consumers prepare ground beef in their home. These results provide information on recommendations to consumers and the foodservice industry on cooking methods, meat sources, forming technologies, and patty size for ground beef.