



J. Dairy Sci. 101:1–15
<https://doi.org/10.3168/jds.2018-14855>
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Identification and characterization of fluid milk consumer groups

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ABSTRACT

Consumption of fluid milk has steadily declined over the last few decades. Understanding the attributes of fluid milk products that are attractive to specific consumer groups may provide a sound basis for education and marketing to encourage increased dairy consumption and reverse the downward trend. The objective of this study was to identify the attributes of fluid milk that specific consumer groups find attractive and attributes that suggest a higher purchase likelihood. An adaptive choice-based conjoint (ACBC) survey was designed to assess attributes of fluid milk. The ACBC survey included Kano, importance, labeling identification, and beliefs questions to determine the key attributes that dictated consumer purchase and consumption. Self-reported purchase habits and attitudes for organic food products were also collected. Attributes in the ACBC exercise included fat content, package type, shelf life, and label claims. Maximum difference scaling was used to rank the importance of attributes in fluid milk that affected purchase. Maximum difference scaling was also used to rank qualities and issues associated with organic milk that were most motivating for those who identified as organic milk consumers. Results were analyzed by univariate and multivariate statistics. A total of 1,163 fluid milk consumers completed the survey, and of those, 434 were regular purchasers of organic milk. The ideal fluid milk from conjoint analysis was 2% milkfat, organic, packaged in a plastic jug, conventionally pasteurized, and contained no additives or label claims. The belief that “organic milk is healthier” was the most important motivator for purchases of organic milk, followed by the beliefs that “organic milk production encourages ethical treatment of animals” and “organic milk production supports local farms and farmers.” Conjoint importance scores of all fluid milk consumers showed that milkfat content was the most important attribute, followed by flavor,

package size, and price. For all milk consumers, designation as organic was ranked as the 8th most important of 14 attributes. Evaluation of these results on both aggregate and individual levels suggest that fluid milk consumers are not a homogeneous consumer group and that underlying consumer groups are led to purchase decisions by specific product features or expectations.

Key words: milk, organic milk, conjoint analysis, Kano, maximum difference scaling

INTRODUCTION

Fluid milk is a product that is often treated as a dietary staple. However, fluid milk sales have decreased significantly in recent years, with a 2.6% decline observed in 2016 (DMI, 2017). Several reasons for the decline have been proposed, such as the growing popularity of milk alternatives, flavor concerns, and shelf-life concerns (McCarthy et al., 2017b). Although sales within the fluid milk category are generally in decline, sales of organic milk continue to climb. The US organic industry has increased steadily over the last decade, reaching \$47 billion in sales in 2016 (OTA, 2017). Dairy is an important part of this movement and is currently the second most purchased organic food category, behind only fruits and vegetables (OTA, 2017). Relatively few studies have sought to identify and profile the typical organic dairy user. McCarthy et al. (2017b) identified that some consumer groups had a preference for organic designation relative to other label claims in fluid milk products. Similarly, consumer choice exercises have identified consumer segments with a preference for organic designation in flavored milk products and other dairy beverages (Kim et al., 2013; Li et al., 2014; Oltman et al., 2015). The preference for organic designation in fluid milk is typically linked to increased willingness to pay a premium price (Smith et al., 2009; Schott and Bernard, 2015). Fluid milk label claims such as pasture-raised and recombinant bovine somatotropin (rbST)-free designations have been similarly associated with greater willingness to pay by certain consumer groups (Kolodinsky, 2008; Wolf et al., 2011). With evidence of consumer interest

Received March 31, 2018.

Accepted June 25, 2018.

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in mind, further investigation and appropriate valuation of different features in commercially offered fluid milk products are essential for milk producers in the modern market.

Multiple survey and auction methods have been suggested to be useful for understanding and measuring consumer perceptions relating to commercial products. Conjoint analysis is one such method that is particularly useful because it mimics the real-life trade-off scenarios that consumers encounter in everyday life (Orme, 2010). Conjoint analysis is a survey-based market research technique that uses complex statistical designs to derive the importance of product features using simple rating or choice exercises on randomly assembled product profiles. There are multiple types of conjoint analysis, such as menu-based choice, choice-based conjoint (CBC), and adaptive choice-based conjoint (ACBC), as well as many specific methodological applications for each type. For evaluation of commercial consumer goods, the most commonly used conjoint method is CBC. The CBC surveys are conducted by comparing multiple product profiles at once and simply asking consumers to simulate a typical shopping experience by choosing one of the products from a set. This process is repeated multiple times until trends in consumer choice behavior can be effectively mapped and subjected to utility estimation (Orme, 2010). Although CBC surveys are effectively used market research initiatives, CBC surveys require price to be handled as a discrete level, making realistic price estimation difficult. Furthermore, sizeable CBC surveys may require large amounts of respondents, which can be expensive and demanding of time and resources.

The ACBC surveys are useful because they effectively engage respondents and address concerns associated with CBC because they require fewer responses to estimate utility values (Chapman et al., 2009; Cunningham et al., 2010; Jervis et al., 2012). The ACBC, like CBC, simulates a realistic consumer experience using discrete choice exercises. However, the ACBC software operates by utilizing an algorithm to analyze consumer responses during the survey and adapts upcoming exercises to best investigate the motivators behind consumer choice. In addition to lower sample size requirements, ACBC has been shown to be superior to CBC in evaluations including pricing attributes (Cunningham et al., 2010; Jervis et al., 2012). The ACBC surveys have been effectively used to profile consumer desires for several food products such as sour cream and bacon, and provided stable estimates of valuation for product features that were tested (Jervis et al., 2012; McLean et al., 2017). Using an ACBC survey, Kim et al. (2013) effectively investigated the effect of brand, packaging, and label

claims for commercial chocolate milk products. In this way, ACBC shows its value because it can simultaneously estimate features that are intrinsic to a product such as size or flavor, as well as extrinsic features such as label claims.

Other effective methods for assessing consumer perceptions include Kano model analysis and maximum difference (MaxDiff) scaling. Similar to conjoint analysis, MaxDiff employs the use of trade-off scenarios to determine consumer choice patterns, but lacks the multiattribute model that is used in conjoint. The MaxDiff exercises are useful in research applications because they are easy to administer, easy for respondents to understand, and provide concise rankings and ratings for a list of items. In a MaxDiff experiment, subsets from a master list of items are presented and the respondent is asked to choose the “best” and “worst” option from the set (Louviere and Woodworth, 1990). Following several evaluations, and statistical analysis via multinomial logit or hierarchical Bayesian regression, an easy-to-understand ratio-scaled list of importance for the given attributes is produced. The MaxDiff analysis has been applied in several food studies, including applications for products such as beer, wine, and ground beef (Goodman et al., 2005; Lusk and Parker, 2009; Chrysochou, 2014). McLean et al. (2017) also used MaxDiff exercises to better understand how consumers visually assessed lean-to-fat ratios in commercial bacon products. Unlike MaxDiff and conjoint exercises, Kano model analysis seeks to describe consumer sentiments about product features through assessment of their usefulness or function in response to the degree to which they are implemented (Kano et al., 1984). In practice, questions in the Kano model ask about the consumer’s feelings if a product feature is present versus how the consumer would feel if the feature was missing. The joint answers from the functional and dysfunctional questions are then used to categorize the utility of the feature in question (Lofgren and Witell, 2008). Categorized Kano results provide valuable data on their own merits, but are particularly useful as a means for complementing and explaining the calculations from methods like conjoint analysis from a more qualitative perspective. Kim et al. (2013) used the Kano model in conjunction with conjoint analysis to understand consumer perspectives for chocolate milk and found agreement between positive Kano classifiers and higher utility values. Kano model analysis has also been applied to numerous other food and beverage products including black beans, eggs, and cottage cheese (Kuo et al., 2014; Wardy et al., 2014; Hubbard et al., 2016).

The aforementioned survey methodologies, whether administered on their own or conjunctively with other

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