The effect of extrinsic attributes on liking of cottage cheese

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ABSTRACT

Preference mapping studies with cottage cheese have demonstrated that cottage cheese liking is influenced by flavor, texture, curd size, and dressing content. However, extrinsic factors such as package, label claims, and brand name may also influence liking and have not been studied. The objective of this study was to evaluate the role of package attributes and brand on the liking of cottage cheese. A conjoint survey with Kano analysis (n = 460) was conducted to explore the effect of extrinsic attributes (brand, label claim, milkfat content, and price) on liking. Following the survey, 150 consumers evaluated intrinsic attributes of 7 cottage cheeses with and without brand information in a 2-d crossover design. Results were evaluated by 2-way ANOVA and multivariate analyses. Milkfat content and price had the highest influence on liking by conjoint analysis. Cottage cheese with 2% milkfat and a low price was preferred. Specific label claims such as "excellent source of calcium (>10%)" were more attractive to consumers than "low sodium" or "extra creamy." Branding influenced overall liking and purchase intent for cottage cheeses to differing degrees. For national brands, acceptance scores were enhanced in the presence of the brand. An all-natural claim was mwore appealing than organic by conjoint analysis and this result was also confirmed with consumer acceptance testing. Findings from this study can help manufacturers, as well as food marketers, better target their products and brands with attributes that drive consumer choice.
Key words: cottage cheese, extrinsic attributes, consumer liking

INTRODUCTION

Cottage cheese is a fresh cultured dairy product defined as a "soft uncured cheese prepared by mixing cottage cheese dry curd with a creaming mixture" (21CFR 133.128; Code of Federal Regulations, 2004). Cottage cheese lost a significant amount of consumer market share in the 1970s and 1980s (Reiter, 1993), and sales have continued to slowly decline in recent years (Dairy Market Trends, 2005; Davis et al., 2010). In the United States, 511 million kg of cottage cheese were manufactured in 2011, an increase in production compared with 185.4 million kg produced in 2006 (USDA National Agricultural Statistics Service , 2007). Cottage cheese is primarily consumed by the young (<25 yr old) and individuals 55 yr old and older (Davis et al., 2010). Companies have altered packaging to make cottage cheese more appealing and convenient, and product flavor and texture have become more consistent due to better quality controls (Makhal et al., 2013), but the product may still be seen by most consumers as a diet food (Tong, 2013). High-quality cottage cheese by dairy judging standards should have a mild, diacetyl flavor with little to no aftertaste, and curds should be uniform in size and shape, with a meaty texture without being too firm or rubbery (Bodyfelt and Potter, 2009). Drake et al. (2009) confirmed that consumers also preferred buttery (diacetyl) flavor as well as salty taste, milkfat flavor and mouth coating, and smoothness of texture in cottage cheese.

Studies of the sensory and consumer perceptions of cottage cheese are limited. Antinone et al. (1994) demonstrated that the flavor compound diacetyl had a positive effect on consumer acceptance of cottage cheese, which was later confirmed in a preference mapping study conducted by Drake et al. (2009). Studies have addressed the effect of a variety of processing and packaging methods on cottage cheese flavor and texture characteristics (Puspitasari et al., 1991; Maniar et al., 1994; Monsoor et al., 2003). A limited number of studies have evaluated consumer preferences for cottage cheese, and none have included the role of extrinsic factors.

Consumer behavior in product choice in a grocery store is a complex process influenced by both sensory (intrinsic) product attributes as well extrinsic attributes (brand, packaging, label claims, and other market influences; Moskowitz et al., 2006; Gelici-Zeko et al., 2012). Consumer testing has shown that if the external

nonsensory characteristics of a product are accepted, the product is more likely to be accepted and the sensory characteristics of the product will drive liking (Moskowitz et al., 2006; Childs et al., 2008; Bayarri et al., 2011; Torres-Moreno et al., 2012). Brand and other label characteristics can also alter consumer liking of a food product (Jervis et al., 2012b; Paasovaara et al., 2012; Torres-Moreno et al., 2012; Kim et al., 2013). Depending on the type of product, the influence of brand may have more or less of an influence on liking. Priilaid (2006) demonstrated that wine liking was strongly influenced by branding. Kim et al. (2013) showed that consumer acceptance of chocolate milk was influenced by fat and sugar content more than brand. A dark chocolate consumer acceptance and purchase intent study by Torres-Moreno et al. (2012) demonstrated that purchase intent of dark chocolates was largely affected by the brand. Sixty-five percent of consumers indicated that they would purchase premium brand chocolate compared with 40% for store brand.

Methodologies exist for assessing the importance of extrinsic factors on product liking. Two such methodologies are Kano analysis and conjoint analysis. Kano analysis is a consumer research tool that can be used to define the relationship between customer needs and customer satisfaction (Xu et al., 2008; Kuo et al., 2014). This method is used to identify particular attributes with the potential to produce customer satisfaction/delight and dissatisfaction/frustration (Xu et al., 2008). This form of analysis is particularly useful and unique because it can identify asymmetric and nonlinear relationships between variables (Chen, 2012). Conjoint analysis is another technique that can be used to assess the importance of extrinsic product features. Conjoint analysis, also referred to as trade-off analysis, allows a quantitative assessment and comparison of multiple attributes across multiple products. It can be used to determine consumer drivers of purchase and relative importance of various product features that typically characterize a product. In addition, conjoint analysis can be key in product development by allowing for hypothetical products to be evaluated compared with products currently on the market (Mahanna et al., 2009). Both Kano analysis and conjoint analysis have been used in a wide range of food applications including sour cream, chocolate milk, produce, and eggs to determine the importance of extrinsic and intrinsic product attributes on acceptance (Mesías et al., 2011; Onozaka and McFadden, 2011; Jervis et al., 2012a; Kim et al., 2013). To our knowledge, no published studies have evaluated the role of extrinsic attributes of cottage cheese. The objective of this study was to evaluate the effects of packaging attributes and brand on consumer liking of cottage cheese.

MATERIALS AND METHODS

Experimental Overview

An online survey (n = 460) was performed with cottage cheese consumers to determine the influence of packaging, fat content, brand, and label claim on purchase intent of cottage cheese. The survey had 2 components; an adaptive-choice-based conjoint (**ACBC**) and a section with Kano satisfaction/dissatisfaction attribute questions. A consumer acceptance test (n = 150) was subsequently conducted with 7 cottage cheeses evaluated with brand and without brand.

Conjoint Analysis and Kano Analysis

An online survey was created using SSI Web (Sawtooth Software version 7.0.22, Orem, UT). Five attributes (fat content, pricing, brand, label claim, and package size) were selected based on current commercial products. Levels within each attribute were selected to encompass a comprehensive range of choices that consumers would encounter in a typical purchasing environment (Table 1). The survey was designed as an ACBC analysis model using one build-your-own (**BYO**) sequence (Orme, 2010). The BYO sequence was followed by 10 screening tasks with 4 product concepts per task, with the possible responses of "a possibility" or "won't work for me" for each product concept (Cunningham et al., 2010; Jervis et al., 2012a; Kim et al., 2013). These questions were followed by 10 choice task tournament segments consisting of 3 concepts per choice task. The ACBC was chosen as the form of conjoint used in this study because ACBC has been previously reported to yield more accurate individual utility scores because of the adaptation while maintaining choice behavior, and requires fewer respondents (Cunningham et al., 2010; Gensler et al., 2012; Jervis et al., 2012a).

Consumers were asked a series of Kano-related questions to determine how their satisfaction/dissatisfaction was influenced by cottage cheese attributes. Both the satisfaction and dissatisfaction questions in the survey were phrased, "If you have the following choices for cottage cheese, how will you feel?" The answer choices for satisfaction and dissatisfaction question were: like, must have, do not care, can live with it, and dislike (Xu et al., 2008). Kano results are used to gain insight on how product features may influence consumer liking of a product by placing product attributes into categories into 4 categories, including must have, attractive, indifferent, and one-dimensional.

The survey was uploaded to an Internet server, and cottage cheese consumers (n = 460) were recruited through e-mail list-serves and internet postings on