



Research report

Consumer perceptions of satiety-related snack food decision making

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ABSTRACT

The aim of this study is to gain more insight into how consumers' perceptions of the satiety value of snack products influence their choice of such products and to get a better understanding of consumer terminology and perceptions about product-related satiety. Participants were asked to indicate their individual product choice in response to a scenario. Scenarios varied as a between-subject factor in terms of whether information on the time gap till the next meal occasion (favorite main dish) was provided or not, and whether this meal would be eaten after one hour or four hours. To get a better understanding of consumer terminology a repertory grid task was used to elicit consumer attributes relating to satiety. This research shows that, when consumers are confronted with situations that vary in satiety requirements, they do not make significantly different snack products choices. But they do have specific ideas about the product features that influence the perceived satiety level of a product. Products perceived as fat, high in protein, with a savory taste and in one piece are expected to have a higher level of satiety compared to sweet products and products that exist of multiple small items.

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Introduction

In many Western societies, a more individualized consumption pattern is replacing the traditional structure of eating three meals a day at fixed times and places (Bisogni et al., 2007; Jastran, Bisogni, Sobal, Blake, & Devine, 2009). Work roles, family organization, and lifestyle changes are causing food intake to become more irregular, often without fixed meal times, away from home, and between meals (Mestdag, 2005; Poulain, 2002). This irregularity can result in large time gaps between meals, whereas the human body requires a regular energy supply. Consumers frequently bridge this energy need by eating between meals, often outside the home environment. Consumption outside the home is on the rise (Kant & Graubard, 2004; Le Francios et al., 1996; Lin & Frazao, 1997; Orfanos et al., 2007; Ribas-Barba et al., 2007), not only in terms of actual meals but also in terms of snacking (Vandevijvere, Lachat, Kolsteren, & Van Oyen, 2009).

Snacking can be defined as the consumption of food and drinks between the three main meals of the day (De Graaf, 2006; Savige, MacFarlane, Ball, Worsley, & Crawford, 2007) and occurs most often in the afternoon (Anderson, Macintyre, & West, 1993; Cross, Babicz, & Cushman, 1994; Savige et al., 2007). Recent research has shown that snack products contribute to approximately 40% of the daily energy intake (Bell, Kremer, Magarey, & Swinburn, 2005; Rangan, Randall, Hector, Gill, & Webb, 2008; Rangan, Schindeler,

Hector, Gill, & Webb, 2009). Some authors (Bhutani & Varady, 2009; de Groot & van Staveren, 2002; Titan et al., 2001) have argued that increasing the number of eating occasions across the day could actually be beneficial to weight management. However, this of course is only the case if additional caloric intake *between* meals (from snacking) is effectively compensated for in caloric intake *within* meals. Unfortunately, other studies demonstrate that consumers are not particularly effective in this process of energy compensation after eating a snack (Marmonier, Chapelot, Fantino, & Louis-Sylvestre, 2002; Whybrow, Mayer, Kirk, & Stubbs, 2007; Zandstra, Stubenitsky, de Graaf, & Mela, 2002).

Snacking is a complex, poorly understood and under-researched phenomenon. From a caloric intake perspective, effective snacking requires consumers to predict their future caloric needs and preferences – a process that consumers are not particularly good at (Kahneman & Snell, 1992) – and to select a snack product that can fulfill these satiety preferences. There is limited reason to believe that consumers' snack categorizations are organized around the satiety properties of foods. Rather, these goal-derived categories are organized around appropriateness for specific eating situations (e.g. Ratneswar & Shocker, 1991; Ratneswar, Pechmann, & Shocker, 1996) making them potentially habitual in nature. This does not exclude these categorizations from containing a level of learning (Higgs, 2008) and hence appropriateness for specific situations that can include satiety considerations (e.g. Morwitz, 1997), but to our knowledge this has not been specifically addressed in previous studies. It is known that consumers adjust their appropriateness judgments about snacks depending on their health goals (Ratneswar et al., 1996), but to the

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best of our knowledge no previous studies have specifically explored snack consumption in relation to appropriateness for satiety-related consumer goals.

Snacking behavior is initiated by feelings of hunger, or at least a desire to eat. Adequate snacking behavior thus requires a delicate balance between the direct reward of reducing feelings of hunger (satiety) versus the more temporal goal of bridging the time span until the next meal (satiety) (Bellisle, 2008; Benelam, 2009; Blundell, Hill, & Rogers, 1988). From a nutritional point of view, the macro and micronutrient composition of food products is known to have a differential effect on the satiety properties of foods (van Kleef, van Trijp, van den Borne, & Zondervan, in press). For example, proteins are more satiating than carbohydrates, carbohydrates are in turn more satiating than fat, which is more satiating than alcohol (Skidmore, 2007). However, it is questionable whether consumers' snacking behavior is guided by such nutritional knowledge. Rather, consumers are more likely to base their snacking decisions on lay beliefs based on perceived appropriateness for the situation than on detailed nutritional knowledge (Wansink, Payne, & Shimizu, 2010). Recently, increased research attention has been paid to consumers' tacit knowledge regarding satiety and satiation properties of foods. Murray and Vickers (2009) in a qualitative study have shown that consumer perceptions of fullness and hunger are affected not only by the physiological properties of the food but also by more psychological factors relating to the method of consumption. For example, in the Murray–Vickers' study, warmer foods made the participants feel fuller, whereas after consuming oranges for breakfast, participants felt physically full but still mentally hungry. Apparently, the oranges had not satisfied them completely. This research is important as it shows that consumer perception of satiety and satiation depends on a combination of the nutritional quality of the food and lay knowledge about food and food consumption. However, this research fails to provide adequate guidance on the key issue of consumer choice in relation to snack products specifically.

Brunstrom and colleagues (Brunstrom, Rogers, Pothos, Calitri, & Tapper, 2008; Brunstrom & Shakeshaft, 2009; Brunstrom, Shakeshaft, & Scott-Samuel, 2008) have more specifically examined consumers' lay beliefs on expected satiety. Brunstrom (Brunstrom & Shakeshaft, 2009) makes the compelling point that consumer meal-size selection is to large extent guided by perceptions of *expected satiety* even more so than product liking. Brunstrom (Brunstrom, Rogers, et al., 2008) developed an innovative methodology to quantify these perceptions of expected satiety on the basis of perceived equi-caloric portion sizes. Brunstrom, Shakeshaft, et al.'s (2008) research shows that consumer perceptions of expected satiety value guide consumer choices, but also that this lay knowledge on expected satiety tends to deviate from the scientific nutritional knowledge of the objective satiety value based on the energy content of food products (Brunstrom, Shakeshaft, et al., 2008). Brunstrom et al.'s research is particularly relevant in the context where consumers can vary the portion size to adjust for required satiety value (i.e. enough to bridge the gap until the next meal). We build on this research by considering more than one time span (Brunstrom et al. examined a five-hour gap till the next meal) and by the usage of snack products with a fixed portion size rather than quantities that are adjustable to the ideal. After all, in most real-life situations snack products are available in fixed portion sizes, and consumers tend to eat full portions as these represent the consumption norm (Wansink, 2004).

The present research aims to bring this important line of research on consumer perceptions of satiety one step further in the context of snacking behavior. Specifically, it has the following research aims:

1. Explore consumers' snack product choice in situations that differ in the time gap between meals and hence in satiety requirements. (This is an extension of the Brunstrom and Shakeshaft (2009) research that addresses a five-hour time span.) More specifically, we hypothesize that;
 - a. Items higher in carbohydrates are chosen more frequently in a one-hour time gap till the next meal than in a four-hour time gap till the next meal.
 - b. Items higher in protein are chosen more frequently in a four-hour time gap till the next meal than in a one-hour time gap till the next meal.
 - c. Items higher in fat are more frequently chosen in a four-hour time gap till the next meal than in a one-hour time gap till the next meal.
 - d. In a one-hour time gap till the next meal more products are selected that have a lower level of perceived satiety.
 - e. In a four-hour time gap till the next meal more products are selected that have a higher level of perceived satiety.
2. Explore consumer terminology and perceptions in relation to product-related satiety. (This is an extension of the Murray and Vickers (2009) research as our study focuses on product-related satiety knowledge rather than on the more abstract concepts of hunger and fullness.)
3. Understand how perceived satiety value differs between snack products as a result of nutritional composition and consumer perceptions.
4. Identify groups of individuals by similarities or dissimilarities in their satiety judgments.

Methodology

Participants

One hundred forty Dutch-speaking undergraduate and graduate students of Wageningen University (98 women and 42 men) ranging in age from 17 to 29 years ($M = 20.57$, $SD = 2.18$) were recruited around college campus in the spring of 2009. They received € 5,- for their participation in the experiment.

Stimuli

The products in this study were selected to systematically vary in their macronutrient content and were classified as either relatively high or low in fat (high = >25 g per 100 g), carbohydrate (high = >35 g per 100 g), and protein (high = >10 g per 100 g). As there are three macronutrients in which products can be either high or low, eight groups were needed to cover all the possible macronutrient combinations. For each of the eight groups, two exemplars were selected (see Table 1) to ensure realism. To select the two most appropriate snack products per experimental cell, an objective measure was needed to compare the products. Since it is standard in the Western society to depict all nutritional information on products per 100 g, this was used as the objective measure to select the sixteen snack products.

The 16 selected snack products were all available at regular *AH To Go* shops, convenience stores at Dutch railway stations offering ready-to-eat products.

Procedure and measures

Product choices

Participants were randomly assigned to one of the three experimental conditions and asked to indicate their individual product choice in response to the scenario with which they were confronted. Scenarios varied as a between-subject factor in terms

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