



Food satisfaction: Integrating feelings before, during and after food intake



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ABSTRACT

Consumers' satisfaction is important for the food industry to ensure product success. Determinants to food satisfaction are multifactorial and a method approaching the multiple determinants would provide a detailed picture of determinant behind consumers' hedonic food appreciation.

The aims of this study were (1) to develop a method that could give detailed information about sensory- and food satisfaction (2) to study differences in sensory satisfaction in a case study, and (3) to study the factors related to food satisfaction. Focus group interviews and a literature study provided an overview of factors with potential to affect food satisfaction. A total of four questionnaires, covering factors before-, during- and after intake as well as demographics, were developed to measure factors related to satisfaction. The questionnaires were utilised in a cross-over consumer study with 79 subjects consuming two sensory different variants of chicken soup. Soups were sensory evaluated utilising expert statements. The consumer study showed that sensory satisfaction was highly influenced by liking of taste and appearance, whereas liking of odour and texture influenced sensory satisfaction moderately. Food satisfaction was influenced by factors measured during- and post intake; sensory satisfaction, fulfilment of expectations, reason for ending intake, product performance relative to expectations, hunger and fullness after intake were found highly influential in food satisfaction. Pre-intake factors did not substantially influence food satisfaction. Though the use of multiple variables gave a detailed picture of factors involved in food satisfaction, there was still variation in food satisfaction that remained unaccounted.

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1. Introduction

Product satisfaction is an essential goal for the food industry when developing, maintaining, optimizing and evaluating their products (Stone & Sidel, 1993). Ratings of preference and acceptance are the most commonly used measures when studying, how products hedonically are perceived by consumers. Preference refers to liking/disliking of food names whereas acceptance refers to liking/disliking of foods that are tasted (Cardello, Schutz, Snow, & Leshner, 2000). Often acceptance ratings are combined with sensory descriptive analysis, to determine the sensory attributes responsible for differences in liking.

Despite the extensive use of liking ratings as single measures for hedonic food impression, researchers acknowledge that multiple factors before, during and after intake as well as contextual factors can affect consumers hedonic food impression. Cardello and colleagues suggest "satisfaction" as a more appropriate measure of consumers' response to foods than liking (Cardello et al., 2000), as they believe satisfaction to connote a more generalized

appreciation of the food, incorporating a variety of situational aspects along with aspects related to the sensory food properties.

One such aspect is "expectations". Expectations about liking are affected by memory of previous food experiences and a variety of contextual factors independent of the food itself. Previous studies have found, that when the difference between expected and experienced liking is relatively small, experienced liking move in the direction of expected liking, referred to as assimilation (Cardello & Sawyer, 1992; Schifferstein, Kole, & Mojet, 1999 and Tuorila, Cardello, & Leshner, 1994). On the other hand, if large differences between expected and experienced liking are perceived contrasting effects have been found (Zellner, Strickhouser, & Tornow, 2004 and Cardello & Sawyer, 1992).

Another factor that has been found to affect consumers' hedonic food impression is the "appropriateness" of the food for the eating situation. While a food may be well liked if it is served in an appropriate situation, liking can decrease, if it is served in an inappropriate situation (e.g., Meiselman, Johnson, Reeve, & Crouch, 2000 and Rozin & Tuorila, 1993). Appropriateness was especially stated important when measuring acceptance in laboratory settings (Schutz & Cardello, 1996), where the choice of food is out of influence of the consumer.

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Cardello and colleagues hypothesize, that satisfaction implies something about the food's value, its utility and its adequacy for the situation. They showed that satisfaction was better predicted by pre- and post-consumption variables than were acceptance or consumption measures (Cardello et al., 2000). A focus group study, focusing on consumers' views on determinants to food satisfaction backed up the assumptions done by Cardello and colleagues (to be published elsewhere). It was found that consumers mentioned expectations and desires pre intake, sensory properties during intake and physical well-being post intake (e.g., satiation, energy level) as well as various contextual factors (e.g., occasion), as determinants to satisfaction. What was missing from the focus group interviews was an evaluation of the importance of the single determinants to satisfaction. Together, the focus group interviews and the study by Cardello and colleagues suggested a need for more research to be focused on the variables influencing satisfaction.

The present paper describes the development and usage of a method measuring satisfaction with food. The method was meant to provide a detailed picture of the factors influencing consumers' feeling of satisfaction, when satisfaction was measured post intake. Opposite to many studies conducted within sensory science, which primarily focused on liking of sensory properties, the present method included measures of subjective states and attitudes pre-intake, hedonic evaluation of sensory properties during intake, well-being related sensations post intake and measures related to the specific subject; demographics and factors related to general attitude and behaviour towards the specific food type. By including these factors a holistic investigation of consumers' food experience was applied. In the method two satisfaction terms were regarded key variables; sensory satisfaction and food satisfaction. Sensory satisfaction referred to the hedonic experience of the products sensory properties. Thereby, the term was closely related to the well-known measure of liking. In contrast to liking, which have been shown primarily to reflect liking of a foods taste/flavour (Moskowitz & Krieger, 1992, 1995), the consumers were asked to express degree of satisfaction with the sensory food properties; appearance, odour, taste and texture altogether, when rating sensory satisfaction. It could thereby be assumed that consumers paid attention to all four sensory properties in their rating of sensory satisfaction. The second satisfaction-term, food satisfaction, was measured after food intake, and the concept can be outlined as follows: food satisfaction was believed to represent a generalised hedonic response to the food. In this response the consumers were believed to evaluate sensations related to the sensory experience, psychological- and physical well-being (e.g., satiation, energy level) and conformity with expectations and desires. Regarded as such our measure of food satisfaction is comparable to the measure of "food quality" described by Ko (2009). However, in the present study "food satisfaction" differs from "food quality" by including measures of food induced physical- and psychological well-being and excluding extrinsic product characteristics (e.g., packaging and labelling). Regarded as such "food satisfaction" can be described as a positive response to the food, after perceiving it and food induced physical- and psychological well-being related sensations.

The aims of this study were (1) to develop a method that could give detailed information about sensory- and food satisfaction; (2) to study differences in sensory satisfaction in a case study and (3) to study the factors influencing food satisfaction.

2. Method

2.1. Development of the method

The method is based on questionnaires that were given to consumers before, during and after intake.

2.1.1. Development of questionnaires

Questionnaires were developed based on a literature search and two focus group interviews (to be published elsewhere). The focus group interviews served to enter the field of satisfaction from a consumer point of view, and aimed to study how consumers experienced satisfaction while eating and which factors they identified as important for a feeling of satisfaction. The literature study and focus group interviews provided an overview of factors with potential to affect satisfaction and did in general serve as a framework the development of questionnaires.

2.1.2. Pre-test of questionnaires

Prior to the consumer study (explained below), a pre-test of the questionnaires was carried out with 9 non-involved or otherwise uninformed employees. Pre-testing questionnaires is a general recommended procedure (Lawless & Heymann, 2010). The pre-test was followed by an interview among 4 of the employees, to check for inconsistencies and/or misinterpretations. After the pre-test the questionnaires were modified slightly; response categories were adjusted to be approximately identically for the sake of ease to fill out the questionnaires, and a few questions were added to facilitate pre- vs. post-intake comparisons and for the sake of precision. Further, the serving temperature was adjusted, so that the food was ready-to-eat at the time of serving.

2.1.3. Final questionnaires

This section gives a description of the response variables included in the four questionnaires and the scales applied. Table 1 show the response variables included in the four questionnaires. Questions were presented for consumers in the order presented in Table 1.

The first questionnaire aimed to measure the baseline of consumers' physical- and psychological state and attitude. It included ratings of: state of hunger, stomach fullness, overall physical- and psychological well-being, energy level, expected linking, strength of conviction (how confident consumers felt that their expectations would be fulfilled), desire to eat and appropriateness. The questions followed the form "do you feel...?" and were answered on a 9-point labelled scale ranging from "no, extremely not" to "yes, extremely". The consumers filled out the first questionnaire before intake. Information about the soups was given in written form and only included information about the type of soup.

The second questionnaire was filled out during intake of the food product. Consumers were asked to rate: liking of the sensory attributes; appearance, odour, taste and texture and sensory satisfaction. Liking of sensory attributes were measured on a 9-point hedonic scale ranging from "dislike extremely" to "like extremely". "Sensory satisfaction" was measured by asking consumers to rate how satisfied they felt, when considering the appearance, odour, taste and texture all together. Ratings were given on a 9-point hedonic scale ranging from "extremely unsatisfied" to "extremely satisfied".

The third questionnaire was filled out immediately after intake. It included measures of: reason for ending intake, food satisfaction, fulfilment of expectations, product performance relative to expectations, state of hunger, stomach fullness, desire for other foods, desire to eat again, overall physical- and psychological well-being compared to before intake and energy level compared to before intake. Reason for ending intake was assessed using the fixed response categories: "I was satiated", "the food bored me", "the food felt unpleasant to eat", "my conscious told me not to continue eating" and "other reason" following a clarification. Fixed response categories were also used to assess product performance and included the categories: "worse than expected", "as expected" or "better than expected". Further fixed response categories were used to assess if physical- and psychological well-being and energy

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