

Measuring Food Behavior in the Restaurant of the Future

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Abstract

Most of the consumer decisions with regard to food choice and intake behavior are the result of sub-conscious rather than conscious processing. Sub-conscious processes are not readily accessible via introspection and self-report. Hence, we believe that food sensations, food choice and intake behavior can be best studied 1) with a combination of explicit (e.g., questionnaires) and implicit (e.g., physiological) tests in a (semi-) controlled laboratory environment, and 2) in a natural environment where consumer behavior can be observed and recorded objectively. For this purpose, the research facilities of the “Restaurant of the Future” was founded in 2007 in Wageningen, the Netherlands, as part of the Wageningen University Research Center. The research facilities consist of physiological, behavioral, and sensory laboratories and an actual instrumented lunch restaurant.

1. The laboratories consist of:
 - a chewing lab where oral movements during chewing are recorded in detail with a 3-D electromagnetic articulograph. Ongoing studies are aimed at identifying the relationships between specific types of oral behavior and specific sensations (e.g. [6,7]). These results can be used by food companies to optimize their foods with regard to desirable sensations.
 - a physiological lab where bodily responses, such as facial expressions (automatically registered and analyzed with FaceReader software), heart rate and skin conductance responses, to food-related stimuli are collected. These stimuli can involve the foods themselves but also their aromas, packaging, brand names, etc. Bodily reactions are probably indicative of product emotions, an important determinant of food choice and purchasing behavior (e.g. [2,4,8]).
 - The mood rooms, where light, sound, and odor ambiances can be varied systematically and their effects on consumer behavior towards food and non-food stimuli can be assessed with objective and subjective tests (e.g. [4]).
 - a sensory laboratory where food sensations are assessed using state of the art taste tests by both experts and naive consumers.
2. The lunch restaurant, consists of an actual instrumented lunch restaurant equipped with a series of ceiling-mounted video cameras (powered by Noldus Information Technology software), a built-in weighing scale, an automatic consumer tracking system, and automated cash registers. More than 1000 registered visitors, all WUR employees, visit the restaurant regularly and sometimes on a daily basis. During their visits, food choices of each identified visitor are recorded automatically, providing insight in the composition of lunches and in determinants of repeated lunch selections of individual consumers, and allowing answers to questions such as: are repeated selections based on energy, or preference for specific types of products and nutrients, or other variables such as price and weight? (e.g. [1,3,9]). Other methods are used to achieve more in-depth insight in consumer processes at the moment that lunch selections are made. The cameras and tracking systems monitor the routing of the consumers between the various buffets providing information on frequency and duration of inspection and whether or not this results in a purchase (e.g.[5]). If required, selected visitors can be equipped with eye tracking systems and physiological sensors to provide information on intentional processes and product emotions.

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