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Effective communication of novelty: The case of ripened cheese

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ABSTRACT

Acceptance of foods is affected by a multitude of factors, not least information. The objective was to ascertain the effect of description on the acceptance of a novel Emmental-type cheese. Participants ($n = 229$, 19–63 years) completed a questionnaire on demographics and psychographics and received a cheese sample for home-use. They were allocated to one of four information groups of similar size, balanced for age, sex, food neophobia score (FNS) and food technology neophobia score (FTNS) and were sent an online questionnaire 2 days later. The cheese was described as 'Traditional Emmental "Blue Label"'; 'New-type ripened cheese'; 'New-type ripened cheese made from low-pressure homogenised milk' or 'Cheese'. Participants rated the pleasantness, purchase intent and suitability of descriptive words before (expected) and after (actual) tasting. Description did not affect expected pleasantness but did affect expected purchase intent, where age and FTNS score also influenced the predictive model. The 'New-type' group reported highest expected purchase intent and the 'Cheese' group the lowest. Participants expected the cheese to be saltier and less mild than when tasted. Communication of the novelty of the process raised purchase intent of those with low FNS and low FTNS. Understanding of psychographic dimensions of target consumers helps to formulate a message which emphasises favourable aspects of the product or prevents associations that may banish key customers.

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Introduction

Optimisation of the sensory characteristics of foods is a common step in product development and while important, it is not the only key to product success (Cardello, 2003; Costell, Tárrega, & Bayarri, 2010; Solheim & Lawless, 1996). Numerous factors influence the choice to buy and consume food products, including characteristics of the food, the consumer and the environment (Costell et al., 2010). The acceptance of new foods can also be affected negatively by neophobic tendencies of consumers (Arvola, Lähteenmäki, & Tuorila, 1999) although this can be improved with repeated exposures. Studies have investigated the link between neophobia (usually measured by the Food Neophobia Scale, FNS, designed by Pliner & Hobden, 1992) and acceptance of food. For example, Tuorila, Meiselman, Bell, Cardello, and Johnson (1994) showed greater expected and actual liking for novel foods in persons with low neophobia scores. More recently, consumer concerns over new technologies in food processing have been shown to affect acceptance and expectations (Cardello, 2003; Cox & Evans, 2008), where concern can reduce expected liking, but can be improved by providing

information. Neophobia towards technology may be increasing, as consumers are becoming savvier to food processing techniques and are likely to have a negative reaction if a technology used in production is 'discovered', rather than being openly described on the package (Cox & Evans, 2008). In order to evaluate reactions to new food technologies in foods, the Food Technology Neophobia Scale (FTNS) was developed and validated (Cox & Evans, 2008; Evans, Kermarrec, Sable, & Cox, 2010).

Expectations, and whether or not they confer with actual liking on experiencing of food, were proposed to follow 4 models, namely assimilation, where actual liking is in the same direction of expected liking; contrast, where actual liking moves in the opposite direction to expected liking; generalised negativity, a decrease in acceptance when disconfirmation between expected and actual liking occurs; and assimilation-contrast, where assimilation occurs if differences between expected and actual liking are below a certain limit and if not, contrast occurs (Cardello & Sawyer, 1992; Cardello, 1995). Expectations could be based on product names, previous knowledge, brands and other information (Cardello, 2003). Expectations are important for choice of food, as they help to bridge the gap if scarce information about product quality is available (Goering, 1985). Information provided on food products can influence expectations (Kähkönen, Tuorila, & Lawless, 1997;

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Kähkönen & Tuorila, 1998) both positively and negatively, as can product exposure (Cardello, 2003). The effect of information also depends on other factors, e.g. age-related health concerns and neophobia (Tuorila, Andersson, Martikainen, & Salovaara, 1998).

During a previous study, Emmental cheese was produced with a novel production process including low-pressure homogenisation of milk (Deegan et al., 2013). Resultant cheeses were profiled by a trained panel, who evaluated the consequences of the pre-processing routine on taste, odour, texture and appearance attributes. In the evaluation, the term 'Emmental' was used, even though the cheeses produced with the highest pressure did not resemble conventional Emmental cheese. In a subsequent study (Deegan, Holopainen, McSweeney, Alatossava, & Tuorila, 2014), full- and reduced-fat cheeses were produced with the same low-pressure homogenisation method and in a projective mapping task with naïve consumers, were positioned away from commercial Emmental cheeses, closer to Edam and Gruyère-type cheeses. Again, quite different descriptors were used to describe the novel cheeses than normally used for conventional Emmental cheeses.

The objective of this study was to explore whether, by using different descriptions, expectations or perceptions of a novel Emmental-type cheese produced with low-pressure homogenisation could be modified or adapted. Another aim was to investigate how individuals' psychographic backgrounds or cheese usage influenced expectations and perceptions.

Materials and methods

Overview

Data was collected in two phases, at recruitment and from the home-use test. Between these occasions, four information groups were formed as described below. The study outline is shown in Fig. 1.

Stimulus

Cheese production was carried out in Valio Ltd., Lapinlahti, Finland. Raw milk (800 L) was standardised and treated according to the pre-treatment described in Deegan et al. (2013, 2014). Emmental cheese was produced as described by Mato Rodriguez, Ritvanen, Joutsjoki, Rekonen, and Alatossava (2011) with the modifications from Deegan et al. (2014). Cheeses were ripened for 13 d at 9 °C, 20 d at 25 °C and 67 d at 4 °C, cut into approx. 200 g pieces, vacuum packed and delivered to the University of Helsinki. Protein, fat and NaCl concentrations were determined by Valio Ltd., Research & Development, Helsinki, Finland. The cheese contained 25.6% protein, 28.1% fat and 1.9% NaCl.

Participants

Participants ($n = 229$, 46 men and 183 women, aged from 19 to 63 years, mean = 29.9, SD = 10.5) were recruited from two locations in the Viikki campus of the University of Helsinki on 1 day. Recruited participants were allocated into four similar groups based on the variables age, sex, FNS and FTNS (Table 1). The allocation was according to a design which minimised the average of the variances of the least squares estimates in a two-way interaction linear regression model. Due to the complexity of creating this design (A-optimal) in a two-way interaction model, the final grouping was created by combining random (Monte Carlo) simulations and sequential allocations. In each sequential step, 1000 random groupings and designs were created. The most influential participant from these random designs was located and allocated to his/her randomly chosen group. Following this, 1000 random

groupings and designs were created by randomly grouping those participants which had not been allocated to any of the four groups in the previous steps. The most influential, yet non-allocated, participant was then again located and allocated to their randomly chosen group. These steps were repeated until each participant was allocated to one of the four groups.

The final population, i.e. those who answered the home-use test questionnaire, consisted of 217 participants (43 men, 174 women, aged from 19 to 63 years, mean age = 30.0, SD = 10.8) as shown in Table 1.

Pre-sample questionnaire

On recruitment, respondents were asked to read and sign an ethical consent form and to fill in a background information questionnaire. Participants were asked their age, gender and how often they generally consumed cheese on a 6-point scale (1 = never; 2 = less than once a month, 3 = once or twice a month; 4 = once a week; 5 = a couple of times a week; 6 = every day). They were then asked how often they consumed specific named commercial cheeses (a young and a longer-ripened Finnish Emmental cheese, two Finnish Havarti-type cheeses, a Finnish Gouda cheese, and a Finnish Gruyère-type cheese). Finally, they filled in the food neophobia questionnaire (FNS) consisting of 10 statements about new foods (Pliner & Hobden, 1992), and the food technology neophobia scale (FTNS) consisting of 13 statements about new food technology (Cox & Evans, 2008). Statements in both the FNS and FTNS were rated on 7-point scales from 'strongly disagree' to 'strongly agree'. The FTNS was translated to Finnish and then back-translated to English by a licensed translator to ensure the statements were identical in Finnish. Respondents were given a vacuum packaged cheese sample and advised to store the sample in a refrigerator. They were asked not to open the package until they had received and started filling in the online questionnaire.

Home use test

An e-mail with a link to an online questionnaire was sent to all participants 2 days after recruitment. Instructions at the start of the form advised the respondents to take the cheese sample out of the refrigerator just before beginning the questionnaire. Respondents were asked to answer all questions based on their own opinion and not of those around them.

When they had viewed the description of the cheese on screen (in large font, surrounded by a thick border) and before opening the cheese package, respondents were asked to rate the expected pleasantness (7-point scale; 1 = very unpleasant, 7 = very pleasant) and expected purchase intent (7-point scale; 1 = no interest, 7 = very interested) before tasting the cheese. They were also asked to rate the suitability of 16 descriptive words (salty, elastic, soft, nutty, creamy, mild, full-bodied, tasty, traditional, industrial foodstuff, artificial foodstuff, normal foodstuff, necessary, healthy, natural, unnecessary) on a 7-point scale (1 = very unsuitable, 7 = very suitable).

Participants were instructed to open the package, slice 3 slices from the top surface of the cheese and discard them, take one slice from the freshly cut surface and taste it. After tasting the cheese the participants rated actual pleasantness/purchase intent as well as the suitability of the 16 descriptive words. In addition, they were asked to rate how well the cheese matched the expectations they had based on the description provided, and how well the cheese matched their expectations of a commercial "blue label" Finnish Emmental cheese using a 7-point just-about-right scale (-3, not very well, 0 = as expected, 3 = very well). Finally, participants were asked to describe the cheese in their own words.

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