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# Effects of evoked meal contexts on consumers' responses to intrinsic and extrinsic product attributes in dry-cured ham

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ABSTRACT

To achieve product success in the market, it is important to understand the interplay between sensory and non-sensory product attributes, since both dimensions must be optimised during the product development process. Contextual factors have been shown to affect the outcome of acceptance studies, and it is important that consumer responses to food products are studied in an appropriate eating context. The main objective of this study was to explore how evoked meal contexts affect consumer responses to a set of products in relation to intrinsic and extrinsic cues. Six types of dry-cured ham were described by means of sensory profiling and presented to 120 consumers in a central location test, first in a blind condition (intrinsic rating) and then in an informed condition (extrinsic rating). The measured responses were acceptance and probability of buying. The extrinsic product attributes presented were origin, ageing time and price. Moreover, two meal contexts were presented during both intrinsic and extrinsic rating: a traditional meal and a novel meal. The meals were introduced to consumers by means of written texts and pictures. The evoked meal contexts affected both the intrinsic and the extrinsic rating, with the strongest effect being observed for the extrinsic rating. Moreover, consumers were somewhat more discriminating when evoking a traditional meal than when evoking a novel meal. Accordingly, it is important to develop existing consumer testing procedures further, and to incorporate instruments allowing for possible effects of the consumption context.



## Introduction

Traditional consumer sensory testing often takes place in a controlled sensory laboratory setting. However, this type of setting has been criticised for not taking into account the product's consumption context (Meiselman, 1996; Köster, 2003). According to Köster (2003), consumer testing in the absence of a context may imply a "situational fallacy" with the consequence that consumers may be less involved in the selected products and thus unable to give an accurate hedonic rating. The reason for lack of involvement may be that while the sensory qualities of food allow for product recognition and identification, mental concepts such as product associations created through earlier eating situations/experiences are absent (Lyman, 1989, chap. 11). Therefore, including the consumption context in consumer testing gives a food product more complete meaning and creates more valid responses.

Several approaches have been used to evoke consumption contexts in studies on hedonic rating of food products. Physical environments were varied in Bell and Meiselman (1994) and Hersleth, Mevik, Næs, and Guinard (2003). This approach was extended by Petit and Sieffermann (2007), who used visual, olfactory and auditory cues to induce context. Another approach that may evoke a consumer's sense of presence in a real situation is the use of written scenarios (Hein, Hamid, Jaeger, & Delahunty, 2010, 2012; Jaeger & Meiselman, 2004). Written scenarios are statements or brief texts meant to evoke a sense of presence in a real situation. Interesting use was made of this technique in Hein et al. (2010), where test participants developed written scenarios that effectively caused participants to imagine an occasion when they desired a refreshing beverage. Greater sample discrimination was observed under the evoked context condition when written scenarios were used than under a control condition with no evoked context. Further, Sester et al. (2013) investigated the impact of ambience on drink choices. They used physical means (i.e., furniture, colours) to evoke different ambiences in two bar-like environments. The results showed that drink choices differed depending

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on ambience, and the authors concluded that such an "immersive" approach might be a good tool for exploring the integrated influence of contextual variables on food and drink choices. Finally, recent studies have explored the impact of evoked consumption contexts and appropriateness on emotional responses (Piqueras-Fiszman & Jaeger, 2014a,b,c). These studies aimed at exploring how evoked consumption contexts affect associative emotional responses to products, and the results identified the rationale for evoking consumption contexts during emotion-related tasks.

The influence of consumption context on food perception varies from product to product. Some products are strongly affected by consumers' expectations (Deliza & Mac Fie, 1996; Hersleth, Lengard, Verbeke, Guerrero, & Næs, 2011), and associations with specific usage scenarios (Guerrero et al., 2010). For example, wine is a product for which sensory perception is strongly influenced by consumers' expectations (Hersleth et al., 2003). In contrast, semi-hard cheeses are in many cultures more frequently used products, and acceptance scores are consequently more stable across different eating situations (Hersleth, Ueland, Allain, & Næs, 2005). Accordingly, the need to evoke a consumption context and/or meal context will vary according to the type of product. In some cases, the collected responses will be robust across different contexts/meals, while in other cases the appropriateness of the eating situation is essential for achieving representative results (Schutz & Martens, 2001). Constructing appropriate testing conditions is therefore critical for securing valid consumer responses.

The product evaluated in this study was dry-cured ham, a traditional product in both southern and northern Europe (Hersleth et al., 2011). A traditional way of consuming this product in Norway is in a meal consisting of dry-cured pork, lamb or mutton ham, salami sausage, scrambled eggs and sometimes potato salad. This meal is typically eaten in the summer and/or on special occasions. However, nowadays many Norwegians travel to southern Europe and try other dishes based on dry-cured ham, such as appetisers, finger food and/or tapas. As a result, these novel ways of serving dry-cured ham have become common in Norway. Moreover, imports of Serrano ham and Parma ham to Norway are increasing. In this study we will aim at evoking the two meal formats described above (traditional and novel), using written scenarios and pictures.

Contextual effects may influence both consumers' probability of buying based on extrinsic product attributes (i.e., in a shop), and consumers' hedonic perception of products based on intrinsic product attributes. Moreover, when communicating food products in the market, it is desirable that consumers perceive consistency between extrinsic product attributes (i.e., information about price, nutritional value and processing conditions), and intrinsic attributes (i.e., sensory quality during the subsequent eating experience). Accordingly, market success demands an understanding of consumer perception and a focus on the full conceptual presentation of the products. The interplay of intrinsic and extrinsic attributes is therefore a highly interesting topic to study, since both dimensions have to be optimised during the product development process. Various studies have investigated the impact of extrinsic product attributes on consumer acceptance, purchase probability and choice decisions. Examples of important factors are brand and/or price impact (Enneking, Neumann, & Henneberg, 2007; Grunert, 2002), origin and/or manufacturing processes (Caporale & Monteleone, 2004; Hersleth et al., 2011; Iaccarino, Di Monaco, Mincione, Cavella, & Masi, 2006), and nutritional labelling (Johansen, Næs, Øyås, & Hersleth, 2010; Van Trijp, 2009). Moreover, sensory literature includes a large assortment of papers discussing the effects of intrinsic product attributes on consumer acceptance of all kinds of products (Lawless & Heymann, 2010). Finally, the interplay between extrinsic and intrinsic attributes has recently been explored using various approaches to conjoint analysis (De Pelsmaeker, Dewettinch, & Gellynch, 2013; Enneking et al., 2007; Johansen et al., 2010; Menichelli, Veflen Olsen, Meyer, & Næs, 2012).

The main objective of this study was to explore how two different evoked meal contexts affect consumer responses to a set of products in relation to intrinsic and extrinsic cues. The product was dry-cured ham and the contexts were a traditional meal and a more novel meal – today the two most common ways of serving dry-cured ham in Norway. The effects of the evoked meals were studied by reference to both the intrinsic product attributes and various extrinsic product attributes (origin, ageing time and price). Two common approaches to consumer-testing of food were applied, namely acceptance testing – where consumers' sensory perception of product attributes is the main focus, and probability of buying – where consumers' valuation of extrinsic product attributes (cues) is the main interest.

## Materials and methods

### *Products and evoked meals*

Six types of dry-cured ham were selected for the study: two Norwegian, two Italian and two Spanish hams. The Norwegian hams were aged for 4 months (traditional variant) and 15 months (recently developed for the Norwegian market), respectively. The Italian hams (both Parma), were aged for 15 and 24 months, respectively. The Spanish hams (both Serrano), were aged for 9 and 18 months, respectively. Table 1 gives an overview of the hams, including information about origin, price and salt levels. The selected hams (origin and ageing times) and the prices represent the most common types available on the Norwegian market. Accordingly, asking consumers about probability of buying such products corresponds to a realistic situation. To ensure the availability of sufficient raw materials, two different legs of hams were evaluated in the case of products N4, S9 and N15 (Table 1), while one leg was enough for the remaining products.

Two common Norwegian meal contexts were introduced to the consumers. The first was a traditional meal consisting of dry-cured ham and scrambled eggs (meal 1), while the second (meal 2) was more novel in the Norwegian market, and comprised several small dishes, i.e., "finger food" or "tapas". Note that the word "tapas" is often used on Norwegian menus to describe meal 2.

### *Descriptive analysis*

Descriptive profiling was done at Nofima to reveal significant differences between the hams. The panel consisted of 12 selected assessors (ISO, 1993), and the method used was Generic Descriptive Analysis (Lawless & Heymann, 2010). The sensory laboratory was designed according to guidelines in ISO (1988). The panel developed a test vocabulary describing differences between samples and agreed upon a consensus list of 25 attributes in total. These attributes related to appearance (colour hue, colour intensity, whiteness, colour uniformity, marbling, dots), odour (sourness, ripe/cured, metallic, meat, rancid), flavour/taste (sourness, sweetness, saltiness, bitterness, ripe/cured, metallic, meat, rancid, after-flavour) and texture/mouth feel (hardness, tenderness, fatness, juiciness, stickiness). A continuous, non-structured line scale was used for evaluation. The left anchor of the scale corresponded to no intensity of each attribute (value 1.0), while the right anchor corresponded to distinct intensity (value 9.0). In a pre-test session, the assessors were trained in the definition of the attributes by testing samples that were considered as extremes of selected attributes typical of dry-cured ham. The slices were cut to a thickness of 0.6 mm on an electrical slicing machine and stored at room