



Consumers' categorization of food ingredients: Do consumers perceive them as 'clean label' producers expect? An exploration with projective mapping

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ABSTRACT

Consumers are said to increasingly assess processed food in terms of whether or not they perceive it to be 'clean label' food. This term refers to what is seen as little processed and 'natural' or 'free from' negatively associated ingredients. However, it is difficult for food producers to predict how the product ingredients will be perceived, and how they should position new products. The present study aimed at exploring how consumers perceive and categorize food ingredients, and testing this under different communication frames. These frames are positioning the product in relation to different consumer choice motives. Potato protein as a replacement for negatively associated ingredients was used as a case study. Ninety consumers participated in a projective mapping task in Denmark that consisted of placing and characterising ingredients on a bi-dimensional surface. In a between-subjects design, three groups of consumers had to map the ingredients of four products (dairy-free ice cream, vegetarian candy, plant-based sausage, and a protein drink). In each group products were presented as either sustainable, healthy, or plant-based. The results showed that consumers categorized ingredients in terms of firstly and secondly, objective type of ingredient or its function, and thirdly, subjective individual assessment of its value. Communicational framing had little impact, but ingredient-level differences emerged from the comparison of the frames. Despite product-related differences, a similar pattern emerged for the different food categories. Findings confirm that consumers perceive ingredients according to a 'known-natural-good' vs. the opposite category. Implications for food industry are discussed.

1. Introduction

Consumers are increasingly interested in both health and sustainability aspects of their way of living in general (Euromonitor International, 2017; Aschemann-Witzel, 2015; Verain, Sijtsema, & Antonides, 2016) and their diet in specific. They demand foods which are more natural (Hemmerling, Asioli, & Spiller, 2016; Román, Sánchez-Siles, & Siegrist, 2017) and organic (Janssen, 2018), are less processed and 'free from' ingredients which are perceived negatively in various ways, such as, for example, allergen-related ingredients or additives (Ingredient, 2014). Conceptually, these are different trends on the food market, driven by different motives, as, for instance, health, sustainability, or risk avoidance (Grunert, 2013), but it is expressed in the phenomenon of a trend to consume more plant-based food products. Food producers are increasingly striving to meet these trends by offering 'clean label' foods (Ingredient, 2014). Such clean label foods are based on the assumption that consumers classify ingredients according to whether they appear natural and known, or processed and unnatural, and that they favourably perceive the first and avoid the latter.

Many clean label products are reformulated products with re-phrased ingredient descriptions, or new product developments. With many relaunched or new food products failing on the market (Stewart-Knox & Mitchell, 2003), it is particularly important to address potential consumer concerns early on (van Kleef, van Trijp, & Luning, 2005). This can be achieved by studying consumer behaviour using diverse and combined methods (Asioli et al., 2017), or involving consumers in consumer-led new product involvement (Costa & Jongen, 2006) and co-creation (Banović, Krystallis, Guerrero, & Reinders, 2016).

To identify success factors of the clean label trend, it is important to understand consumers' perception of individual ingredients in the context that they are presented in. That is, to have an in-depth understanding of firstly, how consumers categorize ingredients as such or in the context of the product category in question, and secondly, to have an understanding of which is the best positioning of the food product in relation to one of the market trends and consumer benefits communicated. However, there is limited research on consumer categorisation of food ingredients, even though food producers have assumptions about how consumers go about interpreting the ingredient lists. In

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particular, little is known about how categorisation of clean label food ingredients might be affected by the benefit communication of the product concept. Given the diversity of ingredients, food categories, trends and motives, a more in-depth understanding of consumers' categorisation behaviour and ingredient perception is needed to prepare the market entry of new ingredients or the launch of new clean label foods.

On this backdrop, the aim of the current research was to explore the following research questions, using plant-based products with potato protein as a new substitute ingredient as a case and a projective mapping approach:

1. How do consumers perceive and categorize ingredients of products from the 'clean label' trend?
 - a. Which ingredients are categorized together or apart, indicating perceived similarity or difference?
 - b. Which descriptors are applied to ingredient groups, indicating underlying distinctions that consumers use and the perception of the ingredient?
 - c. Are descriptors positively or negatively perceived?
2. Which differences in categorisation and perception are observed when the product is presented with different communicational framing as either a) more sustainable, b) healthier, or c) with a focus on the specific plant source?

1.1. Clean label consumer trend

There is no commonly accepted definition of a 'clean label' product (Asioli et al., 2017), but clean label products are typically understood as products which consumers prefer due to the absence of negatively perceived ingredients in the ingredient list. These can be allergenic ingredients, additives, industrially processed ingredients, or those perceived as unfamiliar and chemical-sounding. Instead, clean label products are characterised by the presence of ingredients perceived as natural, harmless and simple and which consumers know and use themselves (Busken, 2013; Ingredion, 2014; Varela & Fiszman, 2013). In its strict sense, 'clean label' products can be understood as foods exhibiting an ingredient list which is characterised by being "short, simple, no artificial ingredients, not 'chemical-sounding', with 'kitchen cupboard ingredients' that are expected and familiar" (Asioli et al., 2017, p. 61). Some market research companies use a broader definition and position organic, natural and 'free from' jointly under the umbrella term of 'clean label' (Ingredion 2014).

The basic driver of the trend is consumers' increasing desire to avoid certain ingredients and seek 'naturalness' (Euromonitor International, 2016). This trend also triggers consumers to turn to products such as certified organic food (Janssen, 2018) and food positioned as natural (Burdock & Wang, 2017). In fact, it has been found that organic food choice appears to be driven by modern health concerns (Devcich, Pedersen, & Petrie, 2007), negative associations with chemicals (Dickson-Spillmann, Siegrist, & Keller, 2011) as well as scepticism about functional food developments (Aschemann-Witzel, Maroscheck, & Hamm, 2013) and unknown ingredients (Evans, de Challemaison, & Cox, 2010). Naturalness in food is sought because of associations of more traditional and 'authentic' processing, leading to assumptions about favourable health effects (Amos, Pentina, Hawkins, & Davis, 2014). Consequently, food producers respond by altering their ingredient lists in order to move closer to the idea of 'clean label' foods.

1.2. Communicational framing

Consumer interest in understanding ingredients and preferring certain ingredients over others may have a number of underlying drivers. These may include healthy eating motivations, concern for the environment or sustainability impact of supply chain practices, preference for local food, or avoidance of risks (Sautron et al., 2015). Food

choice motives are related to the various dimensions of food quality (Grunert, 2005; Oude Ophuis & van Trijp, 1995). Which one of the aspects is most salient when a consumer inspects a product's ingredient list thus also depends on the accompanying information: While perceiving the product and arriving at an assessment, both internal and external information is retrieved and used. In line with framing theory (Scheufele, 2004), the context in which information – in this case the ingredient list – is embedded in, is crucially relevant. The context leads to the activation of respectively related previous knowledge or 'schema' in the consumer's mind (Nordfalt, 2010). When the context differs, the assessment and evaluation also differ. In the case of the same ingredient presented on differently positioned food products, this might lead to a different understanding of the ingredient's role in the product, and consequently a potentially different categorisation of the ingredient or association or attitude towards the ingredient. For example, in accordance with the reasoning of framing theory, naturalness claims on foods have been found to be more favourably received when presented at points of purchase which are in line with 'naturalness', e.g. in a farmer's market (Lunardo & Saintives, 2013). Health claims have been found to be preferred more when embedded in information that underlines the product's naturalness (Aschemann-Witzel & Grunert, 2015). Our study applies framing in terms of different product concepts, communicating the product as either more sustainable, healthier or with a focus on the new substitute ingredient, potato protein.

1.3. Consumer perception and categorisation of ingredients

Given 'clean label' is among other things defined by 'free from', consumer perception of ingredients regarded as 'added' are of particular interest. Moreover, the perception of protein ingredients is of particular interest in this study due to the focus on plant-based products with a new alternative protein.

Additives are defined as substances added to the food for functional-technological or sensory purposes, and they can be of either natural or synthetic origin (Bearth, Cousin, & Siegrist, 2014). Food additives, or any ingredient interpreted and perceived as such, tend to be ingredient consumers strive to avoid (Aoki, Shen, & Saijo, 2010). Such a consumer focus on avoidance reaction has also been called a 'negativity bias' (Rozin & Royzman, 2001) in consumer behaviour. Expert assessments and consumer perception have been found to differ, given that experts assess the increased food safety due to the use of additives, while consumer attitude is also influenced by their personal values and affective evaluation (Hansen, Holm, Frewer, Robinson, & Sandøe, 2003). Additives can be categorised according to either their application (e.g. preservation, colour, taste) or their origin (natural or synthetic) (Bearth et al., 2014).

An important influencing factor on the perception of ingredients overall and of synthetic food additives in particular is the perception of risk (Bearth et al., 2014), and further, the experience of food scandals related to such additives (Chen, 2017). Consequently, also the trust in processors has shown to be relevant (Szucs, Szabó, & Bánáti, 2014). The role of trust is not surprising given that consumers neither have sufficient knowledge about the ingredients nor would they notice whether they are correctly displayed (Cheung et al., 2016). Song and Schwarz (2009) found that consumers perceived additives as more harmful when the additives had names that were difficult to pronounce, which means that there is a lack of familiarity: this creates a greater risk perception. In line with the general tendency of consumers to prefer 'naturalness' (Román et al., 2017), a research review has shown that consumers prefer natural food additives as compared to synthetic additives (Carocho, Morales, & Ferreira, 2015). The avoidance of artificial ingredients can be understood on the background of the fact that consumers are found to be sceptical towards new technologies in food processing overall (Hung, Kok, & Verbeke, 2016). In addition, that consumers seek naturalness and avoid the opposite can also be understood as the application of a simplified heuristic in reading and

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