Packaging of Novel Food
How Can Packaging Break Barriers through Influencing Consumer Perception?

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ABSTRACT
With a steadily increasing population follows a steadily growing demand for food. Novel ingredients such as seaweed and insects are good sources of nutritious food. In the West however, many show reluctance to including these ingredients in their everyday diet. Whether it be endless consumer choices and competition, unappetizing associations or strong food conventions and traditions causing this reluctance, the result is nevertheless that sustainable novel food sources are not utilized to its potential. Through design, we have the opportunity of shaping associations and behavior through packaging design and other marketing efforts. This review paper will discuss the importance of packaging of food products containing novel ingredients, and more specifically how color might influence behavior at point of purchase. The aim is to discover how colors on packaging can have an impact on the consumer's perception of a product containing one or more novel ingredients. Through researching color psychology and the importance of packaging at point of purchase, paired with an analysis of consumer barriers when it comes to trying novel food, it becomes evident that packaging plays a great role in customer decision-making processes at point of purchase. Moreover, color seems to be one of the most important building blocks to consider when designing packaging for food products containing novel ingredients.

KEYWORDS: Packaging, consumer decision-making, novel ingredients, color, perception.

1. INTRODUCTION
The world faces a growing and changing demand for food (Morgan and Sonnino 2010). Population growth and increased wealth cause a change in the global food system, which becomes evident in the increasing demand for farmland to produce resource-intensive foods (Swinburn, Sacks et al. 2011, Garnett 2014). The direction this is heading seems to be non-sustainable, impacting climate change and causing land-use conflicts (Lucia Reisch, Ulrike Eberle et al. 2013). Even if we are able to produce enough food with the available farmlands with improving technologies and production methods, the climate impact of the increased food production is a cause of concern. It is therefore imperative that we look for new solutions to meet this growing demand for nutritious food.

The information used in this literature review was gathered using the search engines and digital repositories oria.no, the International Journal of Design and google scholar. The most common search words used were design, color, packaging and novel food in various combinations. After selecting relevant review articles and studies, further literature was found in the reference lists of these articles. The literature selection was based on perceived relevance and peer reviews.
1.1 Novel Food
In order to meet the growing demand for nutritious and sustainable foodstuff, one possibility is to look for increased use of sustainable novel food sources. The term novel food is defined by the European Commission as “food that has not been consumed to a significant degree by humans in the EU prior to 1997” (Commission 2017). They differ between types of novelty in foods. Food produced using new production methods and processes, new ingredients and traditional food from other cultures that are introduced to a new market are all considered novel food. An increased use of novel and sustainable ingredients in the West will lead to a more sustainable diet through reducing the demand of resource-intensive foods. This does however not imply that eating some novel ingredients as supplements will lead to change. In order to reduce the climate impacts of food production of resource-intensive foods, sustainable and novel ingredients need to replace more resource-intensive foodstuff in people’s everyday diet. Herein lies the largest issue; how do we get people in the Western world to include novel and sustainable ingredients in their diet, if they have the opportunity and means to keep up a diet of resource-intensive foods?

In order to do this, consumers will need to gain personal benefits that are strong enough that they are willing to make a change in their dietary habits. As consumers base their in-store decision-making process upon an evaluation of personal benefits, the need to convey consumer benefits to the consumer becomes an important mission in order to nudge a more sustainable consumer behavior. In this article, I will discuss how the color on food packaging might influence the consumers in their decision-making process when they face the choice of buying a new product containing one or more novel ingredients.

1.2 Consumer Accept
Insects and seaweed are novel ingredients to the West that could potentially act as new sources of nutritious food (Radulovich, Umanzor et al. 2014). These sources are widely used in Asia, however, the Western world has yet to accept these ingredients and adopt them into the everyday diet (House 2016). Conveying consumer benefits of novel food sources that consumers do not associate with foodstuff is a challenging task.

Many dishes and ingredients that are accepted in the West today are adoptions of other culture’s traditional food. Sushi for one, was introduced to America in the 1960’s, and is by many considered a common dish today (Avery 2012, SushiRefAdmin 2016). Another example is spirulina; a microalgae that many today consider to be a superfood and use as a supplement due to its astonishing high protein content. It is interesting to note that even though both sushi and spirulina have been accepted as foodstuffs for years, seaweeds and algae are still considered novel foodstuffs. This indicates a reluctance to accept seaweed as an ingredient in the Western world.

The success stories of spirulina and sushi seem to be largely based on successful marketing strategies conveying satisfactory consumer benefits and thus shaping consumer perceptions. Consumer perception is defined by the business dictionary as “a marketing concept that encompasses a customer’s impression, awareness and/or consciousness about a company or its offerings.” (Dictionary). Chris Blank defines three consumer perceptions that are important to consider in marketing strategies; self perception, price perception and benefit perception (Blank 2012). This review will mainly focus on the consumer benefit perception, as it is a perception that can be influenced by packaging design.

As the embodiment of the visual identity of a marketing strategy, packaging is an important consideration in introducing food products with novel ingredients to the Western world. The purpose of this research is to deduct the impact color can have on consumers in their purchase decisions, and whether design can lead to a change towards a more sustainable food consumption.
2. PACKAGING

When a user interacts with a product, there are several phases of exposure where the consumer values different sensory input (Fenko, Schifferstein et al. 2010). Fenko and Schifferstein studied how sensory dominance in consumer-product interaction changed over time and with different stages in the consumer-product interaction. Exposure to advertisements, purchase, use and disposal are four important stages in consumer-product interaction, and the most valued sensory input can change as the consumer experiences and uses the product. Their study reveals that the dominating sense upon purchase is sight, and that the sensory dominance varies over time. Subsequently, packaging is valued as one of the most important attributes upon purchase, as it is what first meets the eye of the consumer. Since most food products are nondurable consumer goods, the consumer-product interaction time throughout a products lifecycle is relatively short. Therefore, packaging remains a valued attribute for defining product identity, and is a driver when consumers face in-store purchase decisions.

2.1 Consumer Perception of Brand Identity

Frequent purchase and use of specific products over time can create associations attached to satisfaction or dissatisfaction of a product (Hoyer 1984). This influences the consumer decision-making process through creating brand associations. If a consumer is happy with a product, they are likely to gain good associations with the brand as well as the product. Moreover, they are more likely to buy other products in the same brand, since products are associated with their brand. On the other hand, if you have a bad experience with a product, the chance of buying products in the same brand lowers. Continuous purchases of products create brand loyalty, and the consumer will tend to stick to familiar brands when buying and assessing new products.

A brand can be defined as “a collection of perceptions held in the mind of the consumer.” (Fournier 1998). Similar to Fenko and Schifferstein, Fournier argues that consumer-brand relationships are created by the individual consumer through associations based on the projection of personal memories to brands. This affects consumer choices of non-durable goods where the individual consumer project personal associations. If your mother always used a certain washing fluid to clean up after a stomach flu, then the smell of that specific brand of washing fluid can create associations of sickness instead of a clean home. Similarly, if your grandmother always used one specific brand of pasta, then her cooking skills or your familiar relationship might affect your perception of that specific brand of pasta – for better or worse.

These kinds of personal associations are powerful, but hard to predict. Even so, when the consumer faces a brand new product or brand, then the packaging is the promoter of a positive brand experience. Brand creation is all about creating positive user experiences. Since the dominating sense used in the decision-making process of new products is sight, packaging becomes an important consideration in brand creation.

2.2 In-store Decision-Making Process

Packaging plays an important role in the customer decision-making process when assessing new products (McDaniel and Baker 1977, Underwood 2003). McDaniel and Baker state that “packaging serves as a vehicle of promotion”, which makes it an important element in the introduction of new products to the market. A packaging consists of several building blocks, typically color, material, texture, fonts, imagery, size, shape and labels, which are all contributing elements that play a role in the consumer decision-making process (Underwood 2003). These building blocks are put together to create the brand identity, which the consumer evaluates and makes their purchase decisions based on.

Similarities in the combination of building blocks of packaging of similar products create a
In the Nordic countries, popsicles come in colorful plastic bags, milk comes in cartons and jam comes in jars. Breaking the product category identity serves as a statement that can either make or break the product. We look for the visual identity of products, and if it fails to meet expectations, then products are easily overlooked. If done right, however, and the product packaging is different enough to stand out while conveying a desirable message, then category identity differentiation might be beneficial. When Lerum introduced the Klem jam in squeezing bottles in Norway, they deviated from the product category. It did however work as the consumer benefits of not needing any cutlery when eating jam was a benefit that consumers valued, and this was enhanced through the product packaging.

Another category of drivers in the decision-making process are consumer benefits (Wang 2017). As customers make their decisions based on personal benefits, market actors seek competitive advantage through delivering the most beneficial products (Fischer and Frewer 2009). As with brand associations discussed above, there is individuality and complexity connected to consumer perceptions of value and benefits.

Attributes such as price, taste, health and origin are valued differently from one consumer to another. For some, the promise of milk from local farmers is the most important attribute of the product choice, while other consumers are more concerned with the price. The individual assessment of personal consumer benefits is an overall evaluation of the product attributes.

Packaging conveys emotions, creates associations and gives the consumer a promise of the product inside. A milk carton can present the picture of cows grassing on a local field and promise fresh milk from local farmers, and a popsicle that comes in a compostable box might promise something organic and sustainable. In order to reach your target audience, it becomes important to look at which attributes conveyed through the packaging that has the biggest impact on in-store product evaluation, while considering interpersonal differences in valued benefits. Among the packaging building blocks, color influences the consumer in the decision-making process more than format (Ares and Deliza 2010, Rebollar, Lidón et al. 2012). Color has the useful properties of drawing attention to itself, and can be used as a means of communication (Kauppinen 2004). Therefore, it is important to consider color when designing packaging.
Figure 2: A selection of common fast-food logos using the color red (1000logos.net. 2017, New Hope Ministries 2013, Nrn. (2017).)

2.3 How can Color Influence Consumer Behavior?
Color can impact psychological function, and thus influence consumer behavior (Elliot and Maier 2014). This is regularly seen in branding and marketing. Red, for example, is often used in clearance sales because it creates a sense of urgency. At the same time, red encourages appetite, which is a reason why it is the most common color in fast-food chain branding, such as McDonalds, Chipotle, Chick-fil-á and Pizza Hut (Figure 2). Colors also affect the customers’ emotional experiences, and carry different meanings in different contexts. Blue can create a sense of security, while green can represent balance and create comfort. Through careful consideration of the way color affects consumer choices, marketers can develop marketing strategies designed to trigger the desired emotional responses in consumers.

Moreover, color on food products set consumer expectations of taste, and evoke emotional responses that impact the consumers decisions and product acceptability (Clydesdale 1993, Spence 2015). There are certain associations linked to specific colors when it comes to the taste of food products. Green, yellow and orange for example, are colors often associated with citrus flavors. Thus, if a food product is marketed to taste of lime, but the color of the product is purple, this mismatch in expectations and reality will affect the customer’s decision at point of purchase. Additionally, consumers often have an expectation of the taste of a food product based on its color, which in turn affects the actual taste (Garber, Hyatt et al. 2000). This relates to synesthesia, which is a condition where an individual has a subjective sensation of a sense other than the one stimulated. Considering these findings, it is clear that the color of the product itself matters greatly upon purchase.

Much like the color of the food itself, packaging color also affect consumer buying decisions through triggering emotional responses (Huang and Lu 2016). At point of purchase, the packaging represents the food product, and has to convey the attributes of the food product in a way that highlights consumer benefits, while at the same time staying true to the food product. A mismatch in packaging and product creates negative consumer experience at consumption – the use stage of food product interaction – if it fails to meet consumer expectations. The convention with color on food product packaging is that the colors often represent the taste of the food product. As illustrated in figure 3, colors are used to represent taste of food products. Dairy products, if not flavored, are often associated with blue colors. A lemon-flavored yogurt, however, has yellow accentuating colors, orange flavors have orange accentuating colors, while brown often represents chocolate-flavored products.
2.4 Color Associations
Consumers develop color associations with different products and product categories through lived experience (Grossman and Wisenblit 1999). Conforming to a product category’s color expression can be beneficial in some contexts, while differentiation can be beneficial in other cases. As discussed above, consumers choose products that give them the greatest benefits. If the benefits seem best expressed through differentiation from the product category identity and color norms, then differentiation from color conventions of packaging from the same product category can be the way to go.

Similarly to taste, healthiness and naturalness can be perceived through the color of the packaging (Schuldt 2013, Huang and Lu 2016, Binninger 2017). Binninger’s studies reveals that blue-colored packaging is perceived as healthier than red-colored packaging, while Huang and Lu concludes that green colored packaging represents naturalness in a food product. In the West, green colors are often used for organic products. It is however important to consider cross-cultural color conventions in order to target the appropriate markets. Color perception differs between cultures (Aslam 2006). Thus, thorough market investigations are important in order to tailor products to different cultures and markets (Van ‘t Riet, Onwezen et al. 2016).

3. NOVELTY

At the base of human food consumption lay the theory of the omnivore paradox (Rozin 1976). This encompass the thought that human and other omnivores need to consume food sources that cover all nutritious needs through simultaneously seeking novelty, yet have a need to act with caution in order to avoid consumption of poisonous foods. This results in contrasting tendencies in humans when it comes to food consumption in encounters with novel food (Veeck 2010). Sung, Vanman et al. propose that the emotions of liking and interest are the main drivers for consumers, stating that consumers show tendencies to like the traditional products, yet show interest for novel products (Sung, Vanman et al. 2016). In order to increase the acceptance of novel foods, it is therefore imperative that advertising and marketing strategies emphasize the sparking of interest in the consumers, substantiating these tendencies.

Throughout this section, novelty will be defined as an unknown ingredient, or known resources that has not been used as foodstuff before.

3.1 Consumer Barriers
With the introduction of a product to a new market, there will always be some consumer barriers to overcome. For one, following the omnivore’s paradox, it is important for the consumer to feel a sufficient level of security and control when purchasing and consuming novel food products. When compared with traditional products, a consumers desire of control can act as a barrier for trying novel products (Faraji-Rad, Melumad et al. 2017). There are, however, interpersonal differences in the desire of control in the consumer decision-making process, and thus personal barriers differ. Using Sung, Vanman et al.’s distinction between liking and interest as juxtaposed emotions determining consumer decisions upon purchase, the consumer choice is determined by individual preferences and emphasis between these two emotions.

Due to the newness and a consumer’s lack of experience with novel food products, risks are often perceived as relatively high in novel products compared to traditional products. The perceived risk of buying a traditional protein bar juxtaposed to buying a protein bar made with insect flour will for most people be higher for the product containing the novel ingredient insect flour. Throughout the consumer decision-making process, consumers continuously make an evaluation of the risks and benefits with each food product, and in general, people tend to be risk averse (Fischer and Frewer 2009). In the risk/benefit evaluation, there is however a negative correlation between a consumer’s
analysis of risks and benefits of a product. If the consumer perceives a product as beneficial, they will consider the risks of trying that product as lower, and vice versa. Thus, the risk of buying a protein bar with insect flour seem lower if the consumer perceive the product as a much healthier alternative than the regular protein bar.

The huge variety in commodities make for endless consumer choices. This can act as a barrier to trying novel food, as consumers have the choice of buying other alternatives. When faced with a protein bar made with insect flour, there will be several available alternatives of protein bars without insect flour. Choosing the traditional alternative over the novel one is the most comfortable choice.

There are cross-cultural differences in the perception of novelty. As the definition by the European Committee of novel food states that novelty can be traditional foods in other cultures introduced to new markets, this becomes evident. Through their explorative study, van Trijp and van der Lans found that consumer perceptions differ substantially between cultures (van Trijp and van der Lans 2007). A sufficient emphasis on consumer benefits, paired with an understanding of cultural and interpersonal differences is needed in order to successfully introduce a novel product to a new market.

3.2 Social Context
Neophobia is by definition the fear of the new, and a food neophobic is a person with a specific fear of trying new foods. All humans possess some food neophobic tendencies, as an instinctive defense mechanism from eating something poisonous, but the extent varies greatly. Seen in relation to individual risk and benefit evaluations, a person with strong food neophobic tendencies lay greater emphasis on liking products and feeling a sense of control in purchase decisions rather than emphasizing interest in the new and novel. Social context however, seems to lessen neophobia in humans (Addessi, Galloway et al. 2005). Thus, through introducing novel food in a social context such as at restaurants, people are more likely to try the novel food product. Sushi is an example of a food that is often enjoyed in social contexts with friends and close family in the Western world (Altintzoglou, Heide et al. 2016).

3.3 Trends
A trend is defined as a fashion, or as a “general direction in which something is developing or changing.” (Press 2002). Trends in food consumption can arise from various reasons. Changing foodscapes and prices, public policies and regulations, climate change on agri-food systems, land conflicts and globalization all change behavior patterns and thus create trends (Morgan and Sonnino 2010).

Examples are the long ongoing social movements in veganism and functional foods (Cherry 2006). The term functional food covers a natural foodstuff that can be consumed as a regular part of a diet, with scientifically proven health
benefits (van Kleef, van Trijp et al. 2005, Siró, Kápolna et al. 2008). There has also been an increase in locavores, who are people who purchase local products. The common denominator of these trends are the naturalness and added health benefits that the trending foodstuff gives the consumer. This overall tendency towards eating healthier is part of something David Burch defines as an emerging third food regime (Burch and Lawrence 2009). Burch claims that this shift is financialized, and consists of an increasing influence of non-financial institutions such as supermarkets behaving like finance companies, and finance institutions involving themselves in the agri-food system.

4. DISCUSSION

The designer has the opportunity to influence the consumer decision-making process with packaging design. Through careful considerations and assembly of the different building blocks that make up a packaging, designers have the power to influence consumer choices at point of purchase. For novel food products, this can be especially important in order to lower consumer barriers to eating new products.

4.1 Enhancing Consumer Benefits in Packaging Design

For novel food products, the consumers perceived risks are relatively high. In a risk/benefit evaluation, it is therefore imperative that the consumers perceive the added benefits of a novel product as more valuable than the fear of trying a novelty. Packaging acts as the conveyer of a message for consumers in their point of purchase decision-making process. Packaging design could therefore be a means to influence consumer behavior. Colors are here especially important, as they have the power of influencing consumer perceptions more than other building blocks of a packaging. Considering the power of color associations as well as the impact colors have on psychological function, a conscious color choice enhancing the benefits of the novel food product and the chosen concept, is important to ensure the desired consumer behavior. In a design process, it is therefore important to involve the consumers when designing packaging in several stages of the design process. At the early stages, after mapping out product benefits, a co-creation session could be useful for the designer to gain insight to which benefits the consumers value the most. Later in the design process, consumer involvement in assessing different packaging alternatives will be valuable in uncovering any underlying negative associations consumers may get to different packaging alternatives.

It is important to consider how to best convey the benefits of a novel food product. Looking to ongoing trends or social movements, and enhancing benefits of novel food products with these trends in mind, could be a way of discovering valued benefits among a group of consumers. Through generating concepts enhancing these benefits, and designing a packaging with this in mind, consumers within this group will be more likely to perceive the product as beneficial. Spiking interest through the enhanced benefits of the product should in turn lessen the perception of risk, and thus lower the barriers to trying the novel product.

4.2 Differences in consumer accept

Different people have different thresholds for trying novel foods. As neophobic tendencies lessen in social contexts, successfully introduced novelties can start with an introduction to a social arena, such as restaurants where trying new food is encouraged.

As novel foods are generally perceived as a higher risk option than traditional food, packaging design should seek to ensure consumers of the safety of the food product. Visible certification from trusted organizations could lead to a feeling of security. The visibility of these labels could therefore be an important visual element to consider generating a sense of security.
There are cross-cultural and interpersonal differences in both color perception and risk/benefit evaluation. When introducing a novel product to a new market, these differences should be taken into consideration. Age differences, cultural traditions, and social and financial status all affect consumer barriers towards novel ingredients. With the general definition of novel food covering *traditional foods from other countries*, it becomes clear that cultural differences have a huge impact on risk perception to the individual consumer. When sushi first got introduced to the West, consumers with Japanese heritage would most likely not consider it a novelty. Consumers without personal cultural associations to the food product however, would be more averse encountering it.

4.3 How to Perceive Novelty
Novel food products that have caught on can often be categorized as functional foods. Chia seeds and spirulina are novel ingredients where health benefits have been the primary focus in marketing strategies. Naturalness and health benefits are conveyed through color, once again exemplifying the importance of conscious color choices in packaging design.

In order to let the consumer experience control in a purchase decision, the packaging needs to express the content accurately. If there is too big of a mismatch between the actual product and the product the packaging promises, the consumer lose the feeling of control upon purchasing the product, and it might affect the whole brand experience and influence later buyer decisions. Novelty has to be expressed with honesty and accuracy, while at the same time enhancing consumer benefits. The designer should strive to find the ethical balance between conveying a product’s benefits, while giving a wholesome and truthful representation of the product.

5. CONCLUSION
Packaging design can influence the consumer in their in-store decision-making process. When designing packaging for food products containing novel ingredients, food packaging becomes the conveyer of consumer benefits in which the consumers largely base their purchase decision on.

Making conscious design choices throughout the design process and involving consumers in order to gain insight to their perceptions is especially important when designing packaging for novel products. Colors should be used actively, as they trigger psychological and emotional responses and associations. It is however important to keep in mind that cultural and interpersonal differences affect consumer perceptions of color, risk evaluation and novelty. The designer should aim to generate a sense of trust and safety with the novel product, while enhancing benefits and spiking interest.


IMAGES


