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Does the superfood label influence consumers' product perceptions and willingness to pay?

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Abstract

Consumers have become more and more concerned about what they eat and the effects of these foods on their health. To communicate health benefits to their customers, producers and marketers make use of various health and nutrition claim. When consumers evaluate claims on product, health halo effects have been found to occur. This means that having a positive perception of one attribute of a product leads to a more positive view of other attributes. The superfood claim is a health or nutrition claim that has been used much in the last couple of years. The aim of this study is to understand the influence of a superfood claim on consumer perceptions of bread and their willingness to pay for the bread. Based on the available evidence in literature on other claims, we hypothesize the following: consumers perceive a bread with the superfood claim as more healthy, as delivering more nutrient value, as tasting worse, and consumers are willing to pay more for the bread with the claim, compared to exactly the same food without the superfood claim. An experiment was carried out using a 2x2 between subject experiment with two conditions (N=193). Participants were exposed to one of two pictures of bread adverts, one with the superfood claim, one without. Results show that all our hypotheses are rejected. In this study, the superfood claim only significantly (negatively) affected the perceived naturalness. This could be caused by the high familiarity Dutch consumers have with the product bread: they know the bread is not a superfood, so something must be added to it to make it a superfood. Further research is necessary to determine if the claim does influence the perception consumers have for another product, if the claim is shown more subtly or if the setting of the experiment is different, e.g. in real life instead of an online hypothetical context.

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1. Introduction

Consumer demands in the field of food have changed in the last decades. Consumers have become more concerned about what they eat, and the effects of these foods on their health (Lalor, Madden, McKenzie, Wall, 2011). Nowadays, the common assumption is that health must be achieved (Crawford, 2006). However, it is not always clear to consumers how to achieve this status of health. Consumers often lack the resources to accurately examine if a product is good for their health.

Books have been written based on different beliefs, like the 'Food Hourglass' by Kris Verburgh or 'Superfoods: the food and medicine of the future' by David Wolfe. The food hourglass describes why diets do not work and provides an hourglass shaped figure, containing foods you should or should not eat (Verburgh, n.d.), while the book 'Superfoods: the food and medicine of the future', describes the benefits of superfoods, focusing on their nutritional value and health benefits (Wolde, 2009). Not only authors, but also producers and marketers make use of the lack of clarity regarding healthy products. They try to convince consumers their products are healthy. Food marketers are able to influence food consumption through price, marketing communication, product (quality and quantity) and eating environment (Chandon & Wansink, 2011). Health benefits are often communicated through the package of a product, since this has proven to be effective. According to Tootelian and Ross (2000), 79% of consumers read labels on food products before purchasing them the first time, and 80% of their respondents declared that information on labels affects their purchase decision. In the absence of reliable information, consumers tend to rely on packaging-based marketing claims when forming judgements (Chandon, 2013).

When consumers evaluate health claims on food products, health halo effects have been found to occur (Williams, 2005). The halo effect is a bias wherein having a positive perception of one characteristic of a product leads to a more positive view of all characteristics of the product. So, if a product is claimed to be low in fat, it is likely to be perceived as healthy and thus nutrient rich. One specific health claim is often enough for the food to be categorized as healthy (Chandon & Wanisnk, 2011). This may lead to overvaluing of the product by expecting too much of it.

A recent food hype is the so called 'superfood'. Superfoods are products that are said to be nutrient rich and deliver health benefits, like curing cardiovascular diseases (Voedingscentrum, n.d.). The term 'superfoods' is widely used; it can be found in supermarkets, on the internet, and books have been written about it. However, there is no official definition of the term (Lunn, 2006). There are no requirements a company has to satisfy before labelling its products as superfoods. The most basic examples of superfoods are berries and seeds, but also everyday products like specific types of bread or fruits are now being labelled as superfoods.

This study focuses on how the superfood claim on the packaging of bread affects the perception consumers have of different attributes of this product. Does the health halo effect occur in this specific case, in other words: do consumers perceive products with the claim superfoods for example as more healthy or tasteful? This is relevant because there is no information regarding the effects of the superfood claim, while the claim is being used on a wide range of products. It is examined how persuasive the superfood claim really is. The product bread was chosen because it is an everyday product that people regularly purchase and it has a normal and potentially superfood version (for example, bread made from spelt wheat). The effect of the superfood claim is examined by the use of an experiment. In this experiment, participants were asked to score their perception of bread on

different items, namely: the perceived healthiness of the product, the amount they are willing to pay for the product, the perceived contribution to daily nutrient need, and perceived taste quality. The experimental group was asked to evaluate bread with a superfood label, and the control group bread without the label. The scores of the experimental and control group were then being compared, to determine the effect of the superfood claim.

This study aims to provide an understanding of the effects of the superfood claim on bread. There is much information available about the effects of other health or nutrition related claims (Williams, 2005), but effects of the superfoods claim are unknown. With these results, marketers will have information about how the claim influences the consumer's perception of a product. Marketers can then formulate marketing strategies regarding this claim. Also, results can provide an insight in the possible misleadingness of the superfood claim. If the claim affects the perception of product elements that it has no relation to, the claim could be misleading. This could make consumers or policy makers more aware of this process.

2. Theoretical framework

In this chapter, the term superfood will be explained and different studies regarding the health halo effect will be discussed. Furthermore, it is described how claims influence perception and consumption, and the conceptual model and hypotheses are given.

2.1 Superfoods

Superfoods are now present in almost all supermarkets and drug stores. Although there is no official definition of the term, supermarkets in the Netherlands, like Albert Heijn, use the word superfood as a product category. For example, there are special offers like '50% off, on all superfoods'. Generally speaking, the term superfoods refers to foods that have a higher nutrient content than other foods (EUFIC, 2012).

However, not everyone is so certain superfoods even exist. The Dutch nutrition centre (n.d.) is sceptical about the claim 'superfood'. They argue that the claimed positive effect on your health of superfoods are often not scientifically based and that, in contrast to what the name implies, there is not one food that can deliver all necessary nutrients the human body requires. In line with this, EUFIC (2012) states that we need to increase the range of nutritious foods in our diets, rather than focusing on a handful of foods claimed to be super. These views are in line with the 'total diet approach', where the emphasis is on the overall pattern of food consumption, rather than on one food or meal (Freeland-Graves and Nitzke, 2002). Also, the Dutch Consumers' association analysed some foods that were claimed to be 'superfoods', and found out that for half of the superfoods they analysed claims about the nutritional content were incorrect (Cammelbeeck, 2014). They found out that, for example, the vitamin A content of wheatgrass powder was 400 times lower than claimed.

Yet, this research does not focus on the actual physiological effects of superfoods, but on the effects of the superfood claim on consumer perception. Previous research has shown that the superfood claim does have an effect: foods associated with the term superfood have seen sales rise (Lunn, 2006). More specific: following superfood claims, sales of blueberries doubled in the period 2005-2007 (Weitkamp and Eidsvaag, 2015). However, the question remains how the superfood claim affects the perception consumers have of different product attributes.

2.2 Empirical evidence on the health halo effect

Consumers are known to make judgements based on limited information. Inference formation involves the generation of linkages between information and conclusions (Kardes et al., 2004). If there is information missing, consumers often use the available information to draw conclusions about the attributes or benefits which they have no information about. Halo effects are a type of inference processes, where a health or nutrition claim can lead to an effect where consumers generalise this positive perception to other (nutrient) attributes of the product (Van Trijp & Van der Lans, 2006). In this way, health or nutrition claims on products can affect the perception of the healthiness of a product in a way that may not correspond with reality.

Already existing literature regarding the effect of health or nutrition related claims points out that these claims can influence the perception consumers have of a wide range of product characteristics. Product with such claims are perceived to be more healthy (Roe, Levy and Derby, 1999; Gorton, Mhurchu, Bramley and Dixon, 2010), to contain less calories than regular products (Lee et al., 2013; Chandon, 2006), and are perceived to taste worse than regular products (Tuorila and Cardello, 1994;

Yeomans, Lartamo, Procter, Lee and Gray, 2001; Raghunathan, Walker Naylor and Hoyer, 2006). Furthermore, consumers seem to be willing to pay more for products with those claims (Wolf, 2002; Lee et al., 2013). In this paragraph, empirical proofs of the health halo effect are discussed, categorized by the key outcome variables that are measured in the studies.

In table 1, an overview of the design and results of the studies discussed in this paragraph is given.

PERCEIVED HEALTHINESS

Health or nutrition claims can affect the perceived healthiness of a product. Roe, Levy and Derby (1999) conducted a study where 1403 food shoppers in different cities across the USA were interviewed. They were asked questions about three different products; lasagne, cereal and yoghurt, and 10 label formats were used. Claims varied in lengths and their position on the label. The consumers' perception of the healthiness of the product and their purchase intent were measured. The results show that a product that features a health claim is indeed perceived as healthier.

In a study by Gorton, Mhurchu, Bramley and Dixon (2010), 1525 participants from New-Zealand completed a survey about nutrition claims. Results show that 36% of the participants perceived products with the claim '97% fat free' or 'no added sugar' to definitely be healthy products. However, when looking at the results for specific ethnic groups, for some ethnic groups up to 75% stated that products with the claim 'no added sugar' or '97% fat free' are healthy products. This study is, however, focused on ethnic groups living in New-Zealand and it is not known if these same differences would be found in Europe.

CALORIE ESTIMATION

Health or nutrition claims can also bias consumers' calorie estimations. Studies suggest that foods that are seen as 'healthy' foods, are perceived to contain fewer calories compared to less healthy foods, even if the portion of the healthy foods is bigger. In a study by Lee et al. (2013), participants were asked to evaluate three food samples, each consisting of two products; two cookies, two cups of yoghurt and two portions potato chips. The food items all had a label, and from each pair of similar foods one was labelled as 'organic' and the other as 'regular'. In reality, all food items were identical. The packages of the products were also available for the participants. The results show that foods that were labelled organic were estimated to be lower in calories than foods without this label. The organic labelled foods were perceived to have 20.1% (yoghurt), 23,1% (potato chips) and 24.1% (cookies) less calories than the same product without the label. Also, organic labelled foods were perceived to be more nutritious than foods without the label. Foods that were labelled as organic were perceived to taste lower in fat, higher in fibre and overall more nutritious.

This bias in calorie estimating does not only occur for organic labels. In a study by Chandon (2006), 269 participants were presented with a bowl of m&m's. The bowl had a label, either 'new colours of regular m&m's' or 'new 'low-fat' m&m's'. The participants were told they could take as much m&m's as they wanted. After that, the bowl was weighted and they were asked to estimate the amount of calories they consumed. The participants underestimated the number of calories they consumed on average with 48%. This underestimation was even bigger for participants who saw the low-fat label; they underestimated the calories on average with 132 calories, while the other participants underestimated it with only 81 calories.

In relation to this, Chandon and Wansink (2007) conducted a study regarding the estimation of calories in Subway and McDonald's meals. Subway is a restaurant claiming to be healthy; McDonald's does not make this claim. The study was conducted among 316 participants, who were asked to estimate the calories in two Subway sandwiches and two McDonald's burgers, containing the same amount of calories. However, the participants estimated that the Subway sandwiches contained significantly fewer calories than the McDonald's burgers.

WILLINGNESS TO PAY

Claims can also influence the perception of what consumers think is a good price for a product. Studies have shown that people are willing to pay more for organic labelled products. A study by Wolf (2002) also found that consumers were willing to pay price premiums for organic products. 342 respondents, who had all purchased grapes in the past year, were assigned to 4 groups. The four groups evaluated either normal or organic grapes at four different price levels. Results show that the prices \$1.99 for normal grapes and \$2.99 for organic grapes were rated similarly on a too low, just right or too high scale. This is a price premium of 50% for organic grapes.

The study by Lee et al. (2013), as discussed in the previous section, also found that their participants were willing to pay more for the organic versions of the products: 22.8% more for yoghurt, 23.4% more for potato chips and 16.1% more for cookies.

TASTE

In a study by Tuorila and Cardello (1994), 97 consumers were asked to rate fat-free and regular versions of a product (either cake, crackers or cheese). For all products, unlabelled, correctly labelled and mislabelled versions were tested. Results show that participants expected to like the regular-fat product better than the fat-free version. This suggests that people expect a full-fat product to taste better than its fat-free version.

Similarly, a study by Yeomans, Lartamo, Procter, Lee and Gray (2001) with 16 male respondents showed that regardless of the actual fat content, high-fat labelled soups were rated as more pleasant tasting than those with a low-fat label, when in reality there were no differences between the soups.

Raghuathan, Walker Naylor and Hoyer (2006) conducted an experiment among 138 participants. The participants were asked to categorize stimuli. The stimuli consisted of pictures of healthy and unhealthy foods, and words associated with enjoyment of food or lack of enjoyment. Results show that participants that had to pair healthiness and enjoyment took significantly more time than participants that had to pair unhealthiness and enjoyment. This implies that participants have a stronger association between unhealthiness and tastiness than for healthiness and tastiness.

FOOD CONSUMPTION

Health halos created by health claims on products do not only influence perception, but can also influence consumption. The study by Chandon (2006) regarding m&m's that were either labelled as regular or low-fat, also measured the calorie consumption. Results show that participants consumed 28.4% more in the low-fat condition, although they were not aware of this.

In a study by Provencher, Polivy and Herman (2008), 99 female participants were asked to taste cookies. Participants were divided into two groups, one group tasting cookies described to them as healthy, and one group tasting cookies described to them as unhealthy. They were told they could

eat as much cookies as they needed to. Results show that participants belonging to the 'healthy' group ate about 35% more than participants of the unhealthy group.

Table 1. Overview of studies on the effects of different health or nutrition claims.

Dependent variable	Study done by	Claim	Study design	Results
Healthiness of product	Roe, Levy and Derby (1999)	Health claims	1403 participants were interviewed about different products (lasagne , cereal and yoghurt) with different labels and health claims.	Product that features a health claim is perceived as healthier
	Gorton, Mhurchu, Bramley and Dixon (2010)	97% fat free and no added sugar	1525 participants completed a survey on '97% fat free' and 'no added sugar' claims.	36% of the participants thought products with one of these claims were definitely healthy. For some ethnic groups this percentage was as high as 75%.
Calorie estimation	Lee et al. (2013)	Organic	115 participants. Asked to evaluate food samples (containing yoghurt , potato chips and cookies) in a survey. 3 combinations of 2 similar items: one labelled organic, the other labelled regular.	Foods that were labelled organic were perceived to have less calories.
	Chandon (2013)	Low-fat	269 participants were provided with a bowl of m&ms, either labelled normal or low-fat . They were told to eat as much as they wanted, and then asked to estimate the amount of calories they consumed.	Participants underestimated the calories they consumed. The underestimation was significantly bigger for people who saw the low-fat label than for those who saw the regular label.
	Chandon and Wansink (2007)	Healthy	316 participants were asked to estimate the calories in McDonald's and Subway meals.	Participants estimated that the Subway meals contained significantly fewer calories than the McDonald's meals.
Willingness to pay (WTP)	Lee et al. (2013)	Organic	115 participants. Asked to taste and evaluate food samples (containing yoghurt , potato chips and cookies), consisting of 3 combinations of 2 similar items: one labelled organic, the other labelled regular.	Participants were willing to pay up to 22.8% more for products that were labelled as organic than for products that were labelled as regular.
	Wolf (2002)	Organic	342 respondents are asked to evaluate either normal or organic grapes at 4 different price levels.	Participants rated \$1.99 for normal grapes and \$2.99 for organic grapes as similar on a 'too low, just right, too high' scale. This indicates a price premium of 50% for organic grapes.

Table 1 continued

Dependent variable	Study done by	Claim	Study design	Results
Taste	Tuorila and Cardello (1994)	Fat free	97 consumers were asked to rate fat free and regular versions of cake, crackers and cheese .	Participants expected to like the regular-fat product better than the fat-free version
	Yeomans, Lartamo, Procter, Lee and Gray (2001)	Fat-free	16 male respondents were asked to taste soups with different labels (fat free or regular) and rate them on tastiness.	Results show that regardless of the actual fat content, high-fat labelled soups were rated as more pleasant tasting than fat free soups.
	Raghunathan, Walker Naylor and Hoyer (2006)	Healthy	138 participants were asked to categorize stimuli based on rules. Stimuli consisted of pictures of healthy and unhealthy food, and words associated with enjoyment or lack of enjoyment.	Consumers who had to pair healthy and tastiness stimuli took significantly more time than participants who had to pair unhealthy and tastiness.
Calorie consumption	Chandon (2013)	Low-fat	269 participants were provided with a bowl of m&ms , either labelled normal or low-fat. They were told to take much as they wanted, and then the bowl was weighted to see how much they consumed.	Participants consumed 28.4% more m&m's when they were labelled as low-fat.
	Provencher, Polivy, Herman (2008)	Healthy/unhealthy	99 participants were divided into 2 groups: one group tasting cookies that were described as healthy, and the other group tasting cookies that were described as unhealthy. They could eat as many cookies as they wanted.	Participants of the 'healthy' group consumed about 35% more than participants of the unhealthy group.

2.3 How do claims influence perceptions and consumption?

As shown in the previous paragraph, health and nutrition claims on food products can influence perception and consumption. The superfood claim can be seen as either one of those claims: it is associated with both health benefits and great nutritional value. The claim superfoods could therefore trigger perceptions about the healthiness of a product. In this paragraph, two psychological mechanisms are discussed that may explain the effect of the superfood claim on consumer perception: inference processes and categorization.

Inference making and categorization processes

Already existing theories and studies suggest that people make inferences about product attributes they have no information about. This could partly be caused by the fact that products are hardly ever described completely, so to be able to make a judgement about a product consumers need to rely on the information that is available to them (Kardes et al., 2004). However, not only the lack of information leads people to make inferences about products. The cause of these inferences can also be found in our brain. The human brain has two different ways to form thoughts, the so called system I and system II thinking. System I thinking is automatic and is often based on emotions and associations, while system II thinking is logical, rational and conscious (Kahneman, 2003; Antonides, 2008). When using system II mechanisms to make a decision, all relevant information is taken into account and the optimal decision is calculated. However, this takes much time and is in many cases too complicated. People often rely on system I thinking because this is faster and takes less effort. When relying on system II thinking, people often make use of heuristics. Heuristics are rules of thumb, shortcuts, that people can use to make quick judgements (Antonides, 2008). The earlier discussed health halo effect is also an example of a system I thinking mechanism. Related to the health halo effect is the so called magic bullet effect; this effect occurs when a claim is generalized to the overall perceived healthiness of a product (Orquin and Scholderer, 2015). Examples of studies that found this effect are the studies by Roe, Levy and Derby (1999) and by Gorton, Mhurchu, Bramley and Dixon (2010), discussed in the previous paragraph.

Categorization of food products makes it easier for people to form judgements about products. People use categorization to organize foods in their environment. These categories are often based on opposing characteristics, like: expensive/cheap or healthy/unhealthy (Furst, Connors, Sobal, Bisogni and Falk, 2010). Consumers often categorize foods as good or bad. This categorization influences the perception consumers have of different aspects of the products. A study by Oakes (2005) had 182 participants complete a survey about snacks. In the survey participants were asked to rate 22 snacks and explain their ratings. Snacks were, based on previous research, categorized as either reputable or disreputable and 11 reputable/disreputable snack pairs were made. The study found that small portions of bad foods (disreputable snacks) were perceived to lead to bigger weight gain than much bigger portions of good foods (reputable snacks). This was, however, not the reality. Rozin, Ashmore and Markwith (1996) also found that people have the tendency to dichotomize foods into foods that are good for one's health and foods that are not, and that people tend to assign good qualities to the good foods while assigning bad qualities to bad foods. In these cases, a general belief about a product (that it is healthy or unhealthy) influences the perception of specific characteristics (e.g. calorie amount).

Categorization of foods often happens based on intuition. Raghunathan, Walker Naylor and Hoyer (2006) found that people implicitly associate unhealthy food with better taste quality; they even

found this effect for people who stated not to think that unhealthy products taste better. They explain this *unhealthy = tasty intuition* as a more specific example of a general principle that demonstrates a tendency to categorize things as either fun or wholesome. This implies that activities or objects fall in one category, and rarely in both. In this case, it means that food is often perceived as being healthy or tasty, and not both.

2.4 Conceptual model and hypotheses

From existing literature it appears that health or nutrition claims can affect the perceptions of various aspects of a product. A product with a health claim, low-fat claim or no added sugar claim is perceived as being more healthy in general (Roe, Levy and Derby, 1999; Gorton, Mhurchu, Bramley and Dixon, 2010). Also, the taste of products with fat-free or organic labels are perceived to be worse than the taste of regular products due to the unhealthy = tasty intuition (Tuorila and Cardello, 1994; Yeomans, Lartamo, Procter, Lee and Gray, 2001; Raghunathan, Walker Naylor and Hoyer, 2006). Furthermore, consumers are willing to pay more for products with the organic label (Lee et al, 2013; Wolf, 2002).

Since there is no specific data on the effects of the superfood claim, we rely on the effects of other health- and nutrition related claims to form hypotheses. This all leads to the conceptual model represented in figure 1. The superfood claim is expected to positively trigger health expectations for the bread. The taste expectations for a bread with the superfood claim are expected to be worse than for normal breads. Lastly, consumers are expected to be willing to pay more for the bread with the superfood claim because they perceive the bread with the claim to be more healthy and contribute more to daily nutrient need.

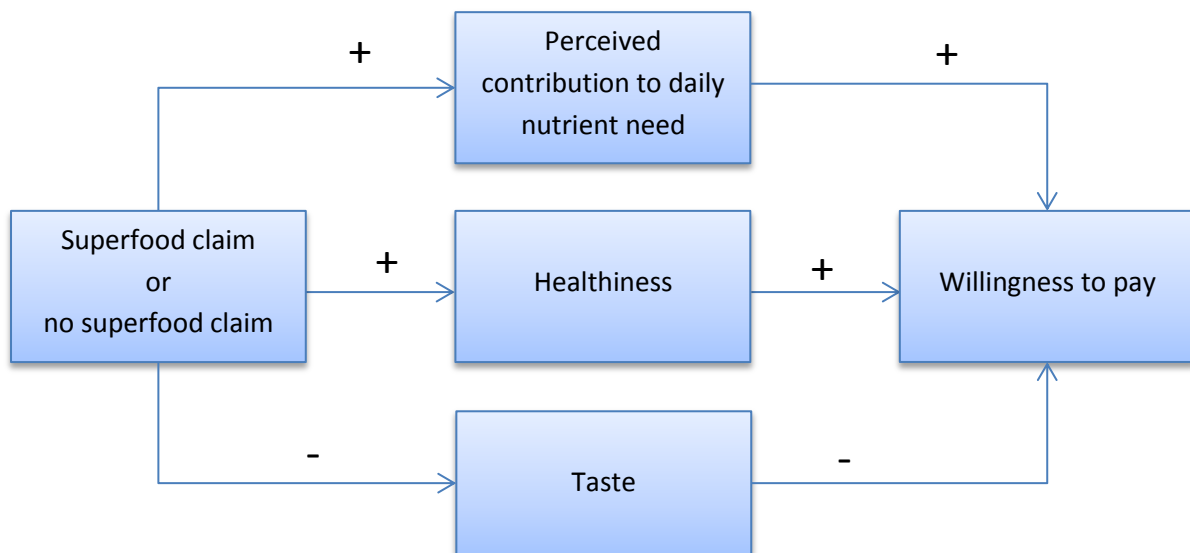


Figure 1. Conceptual model

This all leads to the following hypotheses:

- *Hypothesis 1:* The bread with the superfood claim will be perceived as being more healthy than the product without the superfood claim.
- *Hypothesis 2:* Consumers are willing to pay more for the bread with the 'superfood' claim than for the product without the superfood claim.

- *Hypothesis 3:* The perceived taste of the bread with the superfood claim will be worse than the perceived taste of the product without the superfood claim.
- *Hypothesis 4:* The bread with the superfood claim will be perceived to deliver more nutrient value than the product without the superfood claim.

3. Methodology

To examine the effect of the superfood claim, an experiment with a between subjects design was conducted. In this chapter, the sample and the design of the questionnaire will be described. Also, procedures for approaching the data are discussed.

3.1 Participants and recruitment

Participants were approached by e-mail or via social media. In this e-mail or message on social media they were asked to complete the questionnaire and share the link with others. The target group consisted of Dutch consumers above the age of 16. The aim was to have at least 40 participants for both conditions.

The actual sample consisted of 193 participants. 94 participants were randomly assigned to the experimental (superfood) condition and 99 to the control condition. The sample consisted of 132 females and 61 males with an average age of 32.6 (SD: 14.9). 126 participants (66%) were enrolled or had completed a bachelor or master's programme at a university.

3.2 Design

The experiment had a between subject design with one experimental and one control condition. Participants in the experimental condition were exposed to the superfood claim, and participants in the control condition were not. The pictures shown to participants in the experimental and control condition are shown in figure 1. A questionnaire was used to collect the data needed to examine the influence of the superfood claim. A questionnaire was chosen because it is rather easy to obtain a large amount of data and the costs are low (Steenbekkers, 2001). The questionnaire was published online. If the experiment would have been conducted at the University instead, chances would be high almost all participants would be students and it would take too much time to find a sufficient number of participants. It was decided to publish the questionnaire online so other people (non-students) could participate as well. The questionnaire was created by using the online survey software programme Qualtrics.

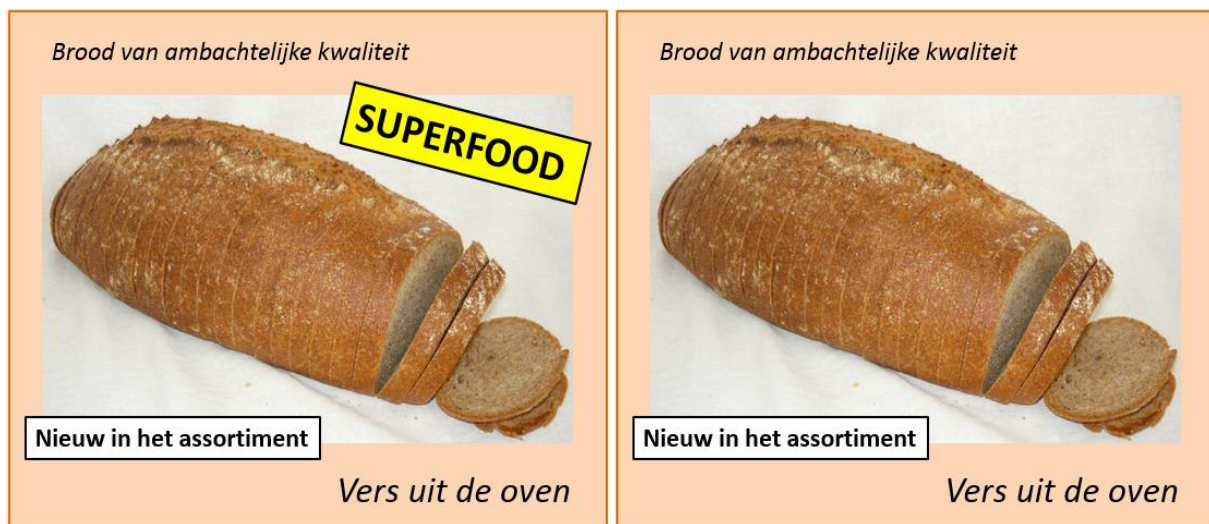


Figure 1. Bread advert with and without superfood claim.

Procedure

All questions and pictures used in the questionnaire can be found in appendix I. After the informed consent page, participants were immediately exposed to the superfood claim (experimental condition) or not (control condition). They were then asked to evaluate the bread on different aspects and finally they were asked to answer some questions regarding demographic information. The full procedure is described below.

When participants clicked the link to the questionnaire, they first saw an informed consent page. In this introduction, participants were provided with some practical information about the task ahead, the estimated time filling in the questionnaire would take and they were thanked for their participation. Furthermore, participants were informed they could win a Hema gift-card by participating.

On the next page, participants were showed an advert for bread. Participants were randomly assigned to either the experimental condition or the control condition. In both conditions, participants saw an advert of a bread with the quotes 'just out of the oven', 'new' and 'handmade ensured quality'. In the experimental condition, the advert also contained a large box with the word 'superfood'. There was no superfood claim visible in the advert of the control group. Participants were told to take a good look at the picture, because on the next page they would have to answer questions about the product displayed in the advert. The adverts for both conditions are shown in figure 1.

In the first set of questions participants were asked to judge the bread they had just seen in matrix form on a seven point scale on several characteristics: healthy/unhealthy, natural/unnatural, heavy/light, high-calorie/low-calorie, tasty/not tasty and fattening/not fattening. They were then asked to estimate what percentage (%) of their daily nutrient needs four slices of the product contained. Lastly, participants were asked how many euros (€) they were willing to pay for the product.

The second set of questions regarded demographic characteristics and interests of the respondents. Respondents were asked to indicate their gender, level of education, age, length and weight. Lastly, they were asked how important they find it to buy a healthy kind of bread.

At the last page, participants were asked if they would like to leave their e-mail address, so they could be contacted by the university to participate in other studies. After that, participants were asked if they wanted to leave their e-mail address to compete for the gift card. If participants had any questions or comments, there was a box where they could write those down.

After completing the questionnaire, participants were again thanked for their participation.

Measures

The independent variable in this experiment was the superfood claim; respondents were either exposed to the claim or not. The experiment contained several dependent variables, some based on findings in already existing literature and others to control for other factors.

Dependent variables

The dependent variables in this experiment were the healthiness of the bread, taste of the bread, willingness to pay for the bread and the perceived nutrient value of the bread.

Participants were asked to rate the bread on a seven point scale for healthiness and taste (e.g. 1 = unhealthy/not tasty, 7 = healthy/tasty). The questions regarding willingness to pay and the nutrient value of the bread could be answered by using a slider to select the desired value; for willingness to pay it was possible to choose any price between €0 to €8, for nutrient value it was possible to choose any percentage between 0% and 100%.

Control variables

In addition, a set of control variables were included: the perceived naturalness of the bread, the perceived heavy- or lightness of the bread, the perceived caloric content of the bread and if the bread was perceived to be fattening or not fattening. By including this variables, we aim to examine whether these variables contribute to a possible effect of the claim. We also want to check if these characteristics correlate with others. It could be the case that consumers perceive the superfood bread as being more healthy because they think it is natural (or the other way around).

Participants were asked to rate the bread on a seven point scale for naturalness, light- or heaviness, caloric content and fattening (e.g. 1 = not natural, light, low calorie, not fattening; 7 = natural, heavy, high calorie, fattening).

Randomization variables

The questions regarding demographic information (gender, level of education, age, length and weight) were included because it is necessary to make sure the possible effect found is not caused by other factors than the claim. Length and weight were used to calculate the participant's BMI, BMI is calculated by dividing weight in kilograms by the square of the height in meters. Finally, the question regarding how important it is to buy a healthy bread was included to examine if based on this variable different groups of consumers (concerned with buying a healthy bread and not concerned with buying a healthy bread) could be distinguished.

The demographic questions were either multiple choice (for education level and gender) or a slider could be used (for length, age, weight and importance of buying a healthy bread). For educational level, the possible answers were primary school, high school, mbo, hbo-wo bachelor or WO masters. For gender, the answers that could be chosen were man and woman. For age, all values between 16 and 90 could be selected, for height all values between 140cm and 220cm and for weight all values between 40kg and 160kg. Height and weight were asked so the BMI of the participants could be calculated.

Analysis

The data was analysed by using the program SPSS. First, a randomization check was done to ensure the differences between the groups did not cause the results. To check this, a one way ANOVA was performed. To check for the differences in gender across conditions, a chi square test was used. An ANOVA was also performed to examine if there were significant differences between the bread scores across groups. Lastly, correlations between key variables were examined by running a bivariate Pearson correlation test.

4. Results

In this chapter, the results of the study will be discussed. First, a randomization check was done to ensure the similarity of both conditions. Then, the results of the study regarding the effects of the superfood claim will be discussed. Lastly, the correlations between the different variables are discussed.

4.1 Randomization check

A randomization check is done to check whether the participants were assigned to the conditions in a random way. This is necessary, because it would be possible that, for example, more men were in the control condition potentially biasing results. The randomization check showed that based on demographics and how important participants think buying a healthy bread is, there were no significant differences between the two groups. Hence, randomization was successful.

An overview of the results of the randomization check can be found in table 2.

Table 2. Randomization check and results

	Control condition <i>mean(sd)</i>	Experimental condition <i>mean(sd)</i>	P value
Randomization check			
<i>Gender</i>	29,3% male 70,7% female	34% male 66% female	0.48
<i>Level of education</i>	15,2% primary school 15,2% MBO 51,5% HBO/WO bachelor 18,2% WO master	27,7% primary school 11,7% MBO 41,5% HBO/WO bachelor 19,1% WO master	0.17
<i>Age</i>	32.6 (15.2)	32.6 (14.7)	0.99
<i>BMI</i>	23.4 (3.3)	24.0 (4.7)	0.27
<i>Importance of buying a healthy bread</i>	6.4 (2.2)	6.2 (2.0)	0.48
Dependent variables			
<i>Healthiness</i>	5.1 (1.3)	5.1 (1.3)	0.81
<i>Taste</i>	4.8 (1.5)	4.5 (1.4)	0.17
<i>Nutrient value</i>	26.8 (15.4)	29.1 (13.1)	0.28
<i>Willingness to pay</i>	1.8 (0.8)	1.8 (0.7)	0.74
Control variables			
<i>Naturalness</i>	4.9 (1.4)	4.5 (1.4)	0.05
<i>Fattening</i>	4.0 (1.2)	3.9 (1.3)	0.72
<i>Light/heavy</i>	4.2 (1.3)	4.4 (1.5)	0.29
<i>Caloric content</i>	4.4 (1.5)	4.3 (1.2)	0.62

Gender. 70 women and 29 men were assigned to the control condition and 32 men and 62 women were assigned to the experimental condition. A chi square test showed that the conditions did not differ in terms of gender, $\chi^2 = (1, N = 193) = 0.5, p = 0.48$.

Level of education. In both conditions, the biggest group of participants was highly educated (69,7% in the control condition, 60,6% in the experimental condition). The experimental condition contained

slightly lower educated people. A chi square test showed that the conditions did not differ in terms of level of education, $\chi^2 = (3, N = 193) = 5.04, p = 0.17$.

Age. The average age in both conditions was 32.6 (SD control: 15.2, SD experimental: 14.7) years. A one-way ANOVA with dependent variable age and independent variable condition yielded no significant difference for the two conditions [$F(1, 191) = 0.00, p = 0.99$].

Body Mass Index (BMI). The reported values for length and weights were used to calculate the participant's body mass index. The average BMI for the control condition was 23.4 (SD: 3.3) and 24.01 (sd: 4.7) for the experimental condition. A one-way ANOVA with dependent variable BMI and independent variable condition yielded no significant difference for the two conditions [$F(1, 191) = 1.25, p = 0.27$].

Importance of buying a healthy bread. Participants in respectively the control and experimental condition valued the importance of buying a healthy bread on average with 6.4 (SD: 2.2) and 6.2 (SD: 2.0) on a seven point scale. A one-way ANOVA with dependent variable importance of buying a healthy bread and independent variable condition yielded no significant difference for the two conditions [$F(1, 191) = 0.5, p = 0.48$].

4.2 Effects of the superfood claim

The scores of the participants from the control and experimental group on the questions regarding the bread were compared. A summary of the results can be found in table 2.

Hypothesis 1. *“The bread with the superfood claim will be perceived as being more healthy than the bread without the superfood claim*

The mean scores of healthiness for the control and experimental condition were respectively 5.05 and 5.10 on a seven point scale (1= unhealthy, 7= healthy). A one way ANOVA with dependent variable the perceived healthiness of the bread and independent variable condition, showed no significant difference in perceived healthiness for the two conditions [$F(1, 191) = 0.06, p = 0.81$]. This means that hypothesis “the bread with the superfood claim will be perceived as being more healthy than the bread without the superfood claim” (hypothesis 1), is rejected.

Hypothesis 2. *Consumers are willing to pay more for the bread with the superfood claim than for the product without the superfood claim*

The mean scores for WTP for the control and experimental group were respectively €1.80 and €1.84. A one-way ANOVA with dependent variable WTP and independent variable condition showed no significant difference in WTP for both conditions [$F(1, 191) = 0.11, p = 0.74$]. This means that the hypothesis “Consumers are willing to pay more for the bread with the ‘superfood’ claim than for the product without the superfood claim” (hypothesis 2) is rejected.

Hypothesis 3. *The perceived taste of the bread with the superfood claim will be worse than the perceived taste of the product without the superfood claim*

The mean scores for taste for the control and experimental condition were respectively 4.8 and 4.5. A one-way ANOVA with dependent variable taste and independent variable condition showed no significant difference for the perceived tastiness in both conditions [$F(1, 191) = 1.87, p = 0.17$]. This means that the hypothesis “the perceived taste of the bread with the superfood claim will be worse than the perceived taste of the product without the superfood claim” (hypothesis 3) is rejected.

Hypothesis 4. *The bread with the superfood claim will be perceived to deliver more nutrient value than the product without the superfood claim*

The mean percentages for nutrient value for the control and experimental condition were respectively 26.8% and 29.1%. A one-way ANOVA with dependent variable nutrient value and independent variable condition yielded no significant difference in nutrient value for both conditions [$F(1, 191) = 1.19, p = 0.28$]. This means that the hypothesis “the bread with the superfood claim will be perceived to deliver more nutrient value than the product without the superfood claim” (hypothesis 4) is rejected.

Naturalness

The mean scores of naturalness for the control and experimental group were respectively 4.9 and 4.5 (1=natural, 7=not natural). A one-way ANOVA with dependent variable the perceived naturalness of the bread and independent variable condition, showed a significant difference in perceived naturalness for the two conditions [$F(1, 191) = 3.83, p = 0.05$]. This means that the bread with the superfood claim is perceived as being *less* natural than the bread without the superfood claim.

Light/Heavy

The mean scores of lightness/heaviness for the control and experimental condition were respectively 4.2 and 4.4 (1 = light, 4 = heavy). This implies that participants perceive bread as not being particularly light or heavy. A one-way ANOVA with dependent variable the light- or heaviness of the bread and independent variable condition, showed no significant difference for light- or heaviness of the bread for the two conditions [$F(1, 191) = 1.11, p = 0.29$].

Caloric content

The mean scores of caloric content for the control and experimental group were respectively 4.4 and 4.3. A one-way ANOVA with dependent variable caloric content and independent variable condition, yielded no significant difference for the caloric content for both conditions [$F(1, 191) = 0.25, p = 0.62$].

Fattening

The mean scores for fattening for the control and experimental condition were respectively 4.0 and 3.9. A one-way ANOVA with dependent variable fattening and independent variable condition yielded no significant difference for both conditions [$F(1, 191) = 0.13, p = 0.72$].

4.3 Additional explorative analysis: correlations between key variables

As described in the previous section, the only variable that differed significantly between conditions was the perceived naturalness of the bread. Participants perceived the bread with the superfood claim to be *less* natural. In order to find out where this might come from, we look at the correlations of naturalness with other variables. Four of those correlations are significantly different from zero (see table 3).

The variable naturalness is significantly correlated with healthiness ($r = 0.67, p < 0.001$), taste ($r = 0.62, p < 0.001$), WTP ($r = 0.28, p < 0.001$) and fattening ($r = -0.22, p < 0.001$). This implies that if participants perceive the bread to be more natural, they also tend to perceive it to be more healthy and tasty, they would be willing to pay more for the bread and expect it to be less fattening.

The variable healthiness is significantly correlated with naturalness ($r = 0.67, p < 0.001$), light/heavy ($r = 0.14, p = 0.05$), taste ($r = 0.57, p < 0.001$), fattening ($r = -0.23, p < 0.001$) and WTP ($r = 0.27, p < 0.001$). If the bread is considered to be healthier, participants perceive the bread to be more natural, heavier, tastier, less fattening and are willing to pay more for the bread.

The variable light/heavy is significantly correlated with healthiness ($r = 0.14, p = 0.05$), caloric content ($r = 0.39, p < 0.001$), fattening ($r = 0.14, p = 0.05$) and contribution to daily nutrient need ($r = 0.16, p = 0.03$). If a bread is perceived to be heavier, participants also tend to perceive it as being higher in calories, contribute more to the daily nutrient needs, being more fattening and being healthier.

The variable caloric content correlates significantly with light/heavy ($r = 0.39, p < 0.001$), fattening ($r = 0.38, p < 0.001$) and contribution to daily nutrient needs ($r = 0.16, p = 0.02$). If the bread is perceived as containing more calories, participants tend to perceive the bread as being heavier, more fattening and contributing more to daily nutrient needs.

The variable fattening significantly correlates with the variables healthiness ($r = -0.23, p < 0.001$), naturalness ($r = -0.22, p < 0.001$), light/heavy ($r = 0.14, p = 0.05$), caloric content ($r = 0.38, p < 0.001$), taste ($r = -0.14, p = 0.05$) and WTP ($r = -0.16, p = 0.02$). If the bread is perceived to be more fattening, participants also tend to perceive it as being less healthy, less natural, less fattening, heavier, as containing more calories and participants are willing to pay less for the bread.

The variable contribution to daily nutrient needs is significantly correlated with light/heavy ($r = 0.16, p = 0.03$), caloric content ($r = 0.16, p = 0.02$) and WTP ($r = 0.18, p = 0.01$). This implies that if participants perceived the bread as contributing more to daily nutrient needs, they also tend to perceive it as heavier, containing more calories and are willing to pay more for the bread.

The variable WTP is significantly correlated with the variables healthiness ($r = 0.27, p < 0.001$), naturalness ($r = 0.28, p < 0.001$), taste ($r = 0.36, p < 0.001$), fattening ($r = -0.16, p = 0.02$) and contribution to daily nutrient need ($r = 0.18, p = 0.01$). This implies that if participants are willing to pay more for a bread, they perceive it as being more natural, more tasty, less fattening and contributing more to daily nutrient needs.

Table 3. Correlations between naturalness and other perceived aspects of the bread

	Unhealthy - healthy	Not natural – natural	Light - heavy	Low calorie – high calorie	Not tasty - tasty	Not fattening - fattening	% daily nutrient need	WTP
	Correlation <i>P value</i>							
Unhealthy - healthy	1 -	0.67 < 0.001	0.14 0.05	-0.01 0.947	0.57 < 0.001	-0.23 < 0.001	0.11 0.13	0.27 < 0.001
Not natural – natural		1 -	0.11 0.14	0.07 0.36	0.62 < 0.001	-0.22 < 0.001	0.08 0.28	0.28 < 0.001
Light - heavy			1 -	0.39 0.00	0.03 0.73	0.14 0.05	0.16 0.03	-0.35 0.63
Low calorie – high calorie				1 -	0.04 0.56	0.38 < 0.001	0.16 0.02	0.07 0.35
Not tasty - tasty					1 -	-0.14 0.05	0.06 0.40	0.36 < 0.001
Not fattening - fattening						1 -	-0.39 0.59	-0.16 0.02
% daily nutrient need							1 -	0.18 0.01

5. Discussion

In this chapter, the conclusions will be discussed and possible explanations for the results that were found will be given. Furthermore, the weak and strong points of the study will be mentioned and recommendations for further research will be given.

The aim of this research was to examine the effect of the superfood claim on the perception consumers have of different attributes of the bread. The results show that the superfood claim had no significant effect on the perceived healthiness, perceived nutrient value or perceived taste for bread. There was also no significant difference regarding the amount participants were willing to pay for the bread. The only effect found was that the bread with the superfood claim was perceived to be *less* natural. This means that all the hypotheses are rejected.

Studies regarding low fat claims (Chandon, 2013), organic claims (Lee et al., 2013; Wolf, 2002), 'healthy' claims (Chandon and Wansink, 2007; Raghunathan, Walker Naylor and Hoyer, 2006; Provencher, Polivy, Herman, 2008) and fat-free claims (Yeomans, Lartamo, Procter, Lee and Gray, 2001; Tuorila and Cardello, 1994) did find effects on perceived healthiness, WTP, perceived caloric content and taste. What is so different about the superfood claim that it does not have similar effects?

One explanation could be that the superfood claim is too vague for consumers, because there is no clear definition of the term (Lunn, 2006). Consumers might have no idea what to expect of the claim and thus the claim has no effect. The meaning of claims as 'low-fat' 'organic' or 'healthy' is more clear to consumers because the name of the claim clearly states the benefits consumers could expect. For superfoods this is less obvious: it does not say anything specific about the ingredients or benefits.

The lack of effect of the claim found could also be caused by the type of product that was chosen. Bread might not be the best product for the claim, because the familiarity with this product is very high for the participants in this study: the Dutch eat approximately 60 kilograms bread per person a year (CBS, 2004). This might make the claim less believable, because the participants know that bread is not a superfood. This could also explain the lower score on naturalness for the bread: participants could have assumed that something was added to the bread to make it a superfood, which would make the bread less natural.

A large-scale study (4612 respondents) by Lähteenmäki et al., (2010) regarding health claims on three different products (bread, pork chops and yoghurt) had similar findings as this study: health claims had a negative impact on perceived naturalness, suggesting that consumers perceived added functional components as being unnatural. They explain this by stating that consumers do not believe health claims just like that: the claimed health benefits should be confirmed by the knowledge and beliefs consumers already have. This study further found that health claims had a moderate and mostly negative impact on the perception of other product attributes.

However, we could also be dealing with the publication bias. The publication bias states that journals have a tendency to favour studies that do find significant results over studies that do not have significant results. In this way, more studies are published that find effects of claims than studies that do not find effects (Dickersin and Min, 1993). The available literature could have caused us to make hypotheses that are not very realistic.

What we can conclude from this research is that the superfood claim does not magically change the perception consumers have of different product characteristics. Just putting the word 'superfood' on a bread does not affect the perception consumers have of the bread. It seems that for the claim to have an effect, the claim should be in line with the knowledge people already have of a product

Limitations and recommendations

There are some limitations of the study that have to be acknowledged. The advert for the bread that was shown to the participants contained (in the experimental condition) a big yellow box with 'superfood!' in it (figure 1). . It could be so that this drew too much attention to the claim, and because of that the effect did not occur. The claim was very obvious, when it might have been better if the superfood claim was shown more subtle. What could have happened is that participants immediately saw the superfood banner, and guessed what the aim of the research was and therefore were not influenced by the claim. It could be that the claim would have a greater impact if it would be positioned a little more subtle. Future studies should try to show the claim in a more subtle way. The claim can also be shown in other ways than just verbal: the claim could be supported by pictures of the healthy ingredients it contains. However, it would then be more difficult to determine what causes the effect.

Although this research has found no effects of the superfood claim, it does not mean there is no effect. Future studies regarding the superfood claim should focus on a broad range of products, since it is possible that the claim only has effect for specific products. For example, the claim might be more believable for products that are generally believed to be healthy and contain great nutrient value. When choosing a product, attention should be given to the familiarity of the product since it is possible that this has an effect.

Lastly, it would be useful to research this topic in another way than through an online survey. Providing consumers with a real life setting where they can see the bread and the superfood label could give different results.

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Appendix

I. Questionnaire

Introduction text

Thank you for participating in this research for my bachelor thesis!

It will take approximately 5 minutes to complete this questionnaire. Between all participants, a gift card of the store Hema is raffled. There are no right or wrong answers, please answer what comes first to mind. As participant of this research you will remain completely anonymous.

There are no risks or benefits attached to the completion of the questionnaire. You can decide to quit at any moment. If you have questions, you can contact Cecile Starrenburg (cecile.starrenburg@wur.nl).

By clicking 'yes', you declare that you have read and agree with the text above.

Pictures

Please take a good look at the picture below. If you are ready, please press the next (>>) button to go the next page. You will then be asked some questions about the product shown below.

Experimental condition



Control condition



Question block 1.

Please answer the following questions about the bread that is displayed on the previous page. This bread is..

[scale 1-7], 1 = unhealthy, 7 = healthy

[scale 1-7], 1 = not natural, 7 = natural

[scale 1-7], 1 = light, 7 = heavy

[scale 1-7], 1 = low calorie, 7 = high calorie

[scale 1-7], 1 = tasty, 7 = not tasty

[scale 1-7], 1 = not fattening, 7 = fattening

How many percent (%) of your daily nutrient needs do you think four slices of the displayed bread contains?

[scale, 0 to 100], 0 = 0 percent, 100 = 100 percent.

How many EURO'S would you be willing to pay for the bread?

[scale, 0-8], 0 = 0 euro, 8 = 8 euro's

Question block 2

What is your gender?

[man – woman]

What is your highest level of education?

[primary school, high school, mbo, hbo-wo bachelor, wo masters]

What is your age?

[text box]

What is your age in years?

[scale 16-90], 16 = 16 years, 90 = 90 years.

What is your length in centimetres?

[scale 140-220], 140 = 140 centimetres, 220 = 220 centimetres.

What is your weight in kilograms?

[scale 40-160], 40 = 40 kilograms, 160 = 160 kilograms.