

Disclosure of sugar reduction in food products



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MSc thesis

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Abstract

Background: Overweight and obesity rates have increased over the past decades, mainly because of systematic caloric overconsumption. Some companies take social responsibility by reducing the amount of sugar in products. Transparency of the company about their CSR efforts can both positively and negatively influence the consumer perception about the company and the product.

Objective: The aim of this study was to investigate the influence of disclosure about sugar reduction in food products on consumer perception, and how this eventually influences the attitude and purchase intention of the consumer.

Method: First, a study was done to find out which products consumers perceive as low and high in sugar. This is done with a survey. Based on the results of this study, a second study was set up. This study consisted of an experiment in which the separate and combined effect of type of disclosure and type of product on consumer perception was measured.

Results: Results of the first study showed that cola is significantly perceived as high in sugar and rusk is significantly perceived as low in sugar. Results of the second study showed that disclosure about sugar reduction did not influence consumer perception. The type of product significantly influenced perceived benefit and taste perception. Consumer attitude could partly be predicted from perceived benefit and perceived manipulative intent. Purchase intention could partly be predicted from taste perception and consumer attitude.

Discussion: It can be concluded that disclosure about sugar reduction in food products does not influence consumer perception towards the supermarket or the product. The type of product where sugar reduction takes place can influence consumer perception. Consumer perception does influence consumer attitude and subsequently purchase intention. The main limitations are the non-realistic character of this study and the design of the advertisement. The main recommendation for further research about consumer responses towards transparency of supermarkets is to conduct a qualitative study.

Key words: CSR, disclosure, product reformulation, sugar reduction, food products

Preface

This thesis 'Disclosure of sugar reduction in food products' is written as part of my master Management, Economics and Consumer studies. This thesis was conducted at the Marketing and Consumer Behaviour department at Wageningen University. Now this final report is here, and therefore I would like to use this preface to thank several people that helped me in the process of writing this thesis.

First of all, I would like to thank my supervisor Ellen van Kleef for her guidance and time to provide feedback. It was really helpful to discuss together the process of this study. Secondly, I would like to thank Hans van Trijp as second reader of this thesis, and for the feedback he gave on my research proposal.

Furthermore, I would like to thank the respondents that filled in the survey of my first study and the participants that participated in the experiment of my second study. Without them it would not have been possible to finish this research.

I hope you enjoy reading this thesis.

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1. Introduction

Overweight and obesity rates have increased over the past four decades. In 2016 around 40% of the adults worldwide were overweight (World Health Organisation, 2016). In the Netherlands overweight rates of adults increased from 43% in 2000 to 48.8% in 2017. In the same period, obesity rates of adults rose from 9.2% to 13.9% (Volksgezondheidszorg, 2018). Overweight and obesity can lead to serious health consequences such as heart disease and type 2 diabetes (World Health Organisation, 2016). Obesity is mainly caused by systematic caloric overconsumption (Shelley, 2012). The so-called 'Western diet' that can lead to obesity, is high in fat, cholesterol, protein, salt and sugar (Manzel, Muller, Hafler, Erdman, Linker & Kleinewietfeld, 2015).

In order to decrease the number of people with overweight and obesity, it is of great importance to reduce the systematic caloric overconsumption and help people to make healthier (food) choices. There are many ways in which people can be stimulated to make healthier food choices. Several countries have already taken policy measures in order to reduce obesity rates. Taxation policies are implemented to increase the price of products that are high in salt, sugar or fat. Another policy measure is food labelling, which is seen as an effective policy measure to help people to make healthier food choices (OECD, 2017). In addition to policy measures, people can also be stimulated to make healthier choices by nudging and marketing campaigns for healthier products organized by governments or foundations that are promoting a healthy lifestyle. In recent years, social influencers have also become more and more important in trying to motivate and stimulate people towards a healthier lifestyle (Byrne, Kearney & MacEvily, 2017).

Also companies can help to reduce obesity rates by providing information on the product packaging, the website and/or on the point of sale. Companies can also help by providing more healthy options and/or less unhealthy options and changing the default. Another approach is changing the composition of food (product reformulation), for example lowering the amount of salt, fat and sugar in products (Buttriss, 2013). The supermarket chain Albert Heijn is an example of a company changing the composition of food by reducing the amount of sugar in their products, and providing information by introducing new nutrition labels (Albert Heijn, 2018a). One of the goals of Albert Heijn with regard to corporate social responsibility is to help people to eat and live healthier. Therefore, they aim to reduce the amount of sugar in their products (Albert Heijn, 2017). In June 2018 the supermarket chain announced that they gradually reduced the sugar in their products in the past years. They

claim that they already have reduced the amount of sugar in their products by 300 million sugar cubes in total and that nobody noticed the sugar reduction in their products (Albert Heijn, 2018a; Albert Heijn, 2018b). Albert Heijn expressed the aim to further reduce the amount of sugar with one billion sugar cubes by the year 2020 (Albert Heijn, 2018a). In addition, the retailer developed new nutrition labels based on customer research. These labels provide the consumer more information about the added sugar and salt in the product and the percentage sugar, salt and fat per portion of the recommended daily intake (Rensen, 2018).

In the United Kingdom the British government took a similar approach to reduce the amount of salt in products. The salt reduction program of the British government showed that gradually reducing the amount of salt is effective. In the early stage of the reduction the flavour of the products did not change noticeable, there were no complaints about the taste and there was not a noticeable change in sales (Cappuccio, Capewell, Lincoln & McPherson, 2011). The salt reduction program successfully reduced salt intake and increased consumers' awareness about salt consumption (Wyness, Butriss & Stanner, 2012). In response to the successful salt reduction program, 'Action on Sugar' proposes to implement a similar program to reduce the sugar intake (MacGregor & Hashem, 2014). 'Action on Sugar' is a charity that consists of specialists aiming to reduce the sugar intake. They try to create more awareness among consumers and try to convince food processors to gradually reduce the amount of sugar in processed foods (Action on Sugar, n.d.).

In the Netherlands the foundation 'Diabetes Fonds' also aims to reduce the sugar intake of consumers. In 2018 they introduced 'Het nieuwe zoet', an initiative consisting of several parties to reduce the sugar intake and stimulate healthy food intake. Retailer Albert Heijn was the first party to join this initiative (Diabetes Fonds, 2018). Albert Heijn chose to not communicate the sugar reduction process to their customers explicitly. Instead, they launched a marketing campaign two years after they started to gradually reduce the amount of sugar in their products.

Companies can use the reformulation of their products to explicitly promote it and induce people to switch from competitors' products to their products (Mancino, Kuchler & Leibtag, 2008). This can for example be done through health claims. However, the use of health claims can lead to wrong inferences of consumers. A health claim can cause a halo-effect, which means that the health claim influences the overall perception of a consumer about a

product. Consumers then rate the product higher on other health attributes that are not mentioned in the health claim. A health claim can also cause a magic bullet effect, which means that the consumer attributes inappropriate health benefits to the product (Roe, Levy & Derby, 1999). In addition, product reformulation can also lead to negative publicity. Product reformulation can lead to media stories that consumers are misled because the reformulation took place without the knowing of the consumer (Butriss, 2013). Immediate disclosure through health claims may thus be fair towards consumers, but can lead to misinterpretation by the consumer and as a consequence be ineffective. On the other hand, non-immediate disclosure may be effective, but can lead to negative publicity and feelings of unfairness to the consumer.

The consumer perception about effectiveness and fairness of an intervention influences the consumer acceptance of the intervention (Bos, van der Lans, van Rijnsoever & van Trijp, 2015). The acceptance of an intervention influences the adoption of the intended behaviour. The higher the level of acceptance, the more likely people are to change their behaviour (Laurin, Kay & Fitzsimons, 2012). So far, it is unclear how the type of disclosure influences the perception of the consumer, and thus which type of disclosure is more accepted by the consumer. To successfully reduce the sugar intake of consumers, it would be relevant to know which approach consumers accept more and whether this differs for different products.

This research aims to provide insight in how the type of disclosure (immediate or non-immediate) influences consumer's response towards the measure to reduce sugar in products. In addition, this research aims to investigate whether the type of product is of influence on the consumer's response towards the intervention. More specifically, do consumers react differently on a type of disclosure when a product is perceived as high in sugar, or when a product is perceived as low in sugar.

2. Theoretical framework

Corporate Social Responsibility (CSR) has nowadays become a highly visible and common practice for companies. Companies perform CSR efforts to benefit society or to achieve their strategic goals (Skarmeas & Leonidou, 2013). The awareness and importance of CSR has increased in the food retail sector and companies in this sector started to engage in CSR activities. The rise of companies that engage in CSR can partly be explained by the fact that some companies view CSR as a way to build their image and build customer relationship (Lazibat, Baković & Damić, 2015). In the food and drink industry, the topic 'health' has gained more attention and has become part of the CSR strategy of companies within this industry (Herrick, 2009). As health has become a major topic, food reformulation (for example lowering the amount of sugar or salt in products) can be part of the CSR strategies of companies. Transparency of the company about sugar reduction in their products can positively and negatively influence the consumer perception about the company and the product.

2.1 Consumer perception about the company

Transparency of the company about their CSR efforts can positively influence the customer-company relationship. However, transparency can also lead to scepticism from the consumer and negatively influence the customer-company relationship.

2.1.1 Transparency influences customer-company relationship

Transparency can positively influence the relationship between the consumer and the company. The transparency of a company about their CSR efforts positively affects the trust and attitudes of consumers towards the company. This trust and attitudes directly and positively affects the intention of consumers to buy products from the company and to spread positive word of mouth about the company (Kang & Hustvedt, 2013). However, transparency of a company about their CSR efforts can also have negative consequences and can lead to scepticism of the consumer. Results of a survey among 504 US participants indicated that scepticism about the CSR efforts of companies reduces the consumer-based retailer equity. The name of the retailer devalues in the mind of consumers and as a consequence consumers are more receptive to negative information about the retailer and they are more likely to spread negative word of mouth. Therefore, it is important that a company

understands and meets the needs and wants of consumers, because then communicating about CSR efforts can positively influence the attitudes of consumers towards the company and its CSR efforts (Skarmeas & Leonidou, 2013). Thus, whether the transparency of a company about their CSR efforts is well received by the consumer might depend on the level of scepticism of the consumer.

2.1.2 Scepticism of consumers towards CSR activities

Consumers often question the motives of companies to engage in CSR activities. They believe that CSR activities of companies are exerted to help others, but also know that companies perform CSR efforts out of self-interest (Mohr, Webb & Harris, 2001). Forehand & Grier (2003) researched whether consumer scepticism about a firm's motive to engage in CSR can be decreased when companies acknowledge that they have firm-serving motives. In their experiment, there were four different scenarios in which they manipulated the salience of the firm-serving benefits and the presence of a statement about the firm-serving motive. Results of their study show that consumers negatively evaluate companies when they only express public-serving motives, but not when they acknowledge that the company also has firm-serving motives. Therefore, scepticism of consumers about the CSR efforts of a company can be inhibited if companies acknowledge that the firm may also benefit from their CSR activities (Forehand & Grier, 2003).

2.1.3 Benefit for society and intrinsic contribution of company

Van Herpen, Pennings & Meulenbergh (2003) examined the impact of CSR efforts of companies on consumers' store evaluation and trust in the company. They specifically focussed on retailers and first examined to what extent consumers perceive several activities of supermarkets as socially responsible behaviour. Participants evaluated a list of activities, among others 'the supermarket sells animal-friendly products', 'the supermarket provides clear information about the ingredients on the product labels' and 'the supermarket advertises environmentally friendly products'. The results of two studies confirmed their hypotheses that CSR efforts can be classified in terms of beneficiary; who benefits from the CSR activity (society versus retailer), and in terms of intrinsic contribution; how much does the retailer invest in the CSR activity. Furthermore, the results also show that consumers perceive more CSR when society benefits most from the CSR activity and when the perceived contribution of the retailer is high. This results in a higher overall evaluation of the store and particularly in more trust of the consumer in the retailer (Van Herpen, Pennings &

Meulenberg, 2003). Also Mohr, Webb & Harris (2001) conclude that companies should perform CSR activities that are meaningful to consumers; consumers should believe that the CSR efforts of the company are at least partly beneficial for society (Mohr, Webb & Harris, 2001). In addition, Alhouti, Johnson & Holloway (2016) state that companies can help consumers to think of their CSR activities as beneficial for society if companies emphasize their interest in helping the society through their CSR activities (Alhouti, Johnson & Holloway, 2016).

2.1.4 Honesty of company about product improvement

Sugar reduction in products as part of the CSR strategy of a company requires a product adjustment. Guèvremont & Grohmann (2014) state that brands should be careful when communicating product improvements to consumers. The communication strategy and level of commitment of consumers influences the consumer perception about the brand. Nowadays more and more brands use an honesty strategy for their communication. An honesty strategy means that the company communicates a product improvement to consumers, and thereby admits that the previous product was inferior (Guèvremont & Grohmann, 2014). Using this strategy can be positive for companies. Consumers may positively evaluate a company that uses an honesty strategy, because consumers then believe that the company is truthful. However, the use of this strategy can also have negative consequences. An honesty strategy can negatively influence the relationship between the company and high involvement consumers, because these consumers easily feel betrayed. Results of the study of Guèvremont and Grohmann (2014) show that when a brand uses an honesty strategy to communicate product reformulation, highly involved consumers perceive the brand as manipulative (Guèvremont & Grohmann, 2014).

2.2 Consumer perception about the product

Transparency of the company about product reformulation can influence the consumer perception about the product. A salt reduction program of the British government showed that, when gradually reducing the amount of sugar, the flavour did not change noticeably in the early stage of the reduction. Consumers did not complain about the taste of products and the sales did not change noticeably (Cappuccio, Capewell, Lincoln & McPherson, 2011). Although the actual taste may not change noticeably, the perception of taste by the consumer, as result of communicating about the product reformulation, can change. Consequently, a change in the perception of taste might lead to a lower purchase intention.

2.2.1 Role of information about product reformulation on taste perception

Bobowski, Rendahl & Vickers (2014) researched the consumer acceptability of salt reduction in tomato juices. In their study, they compared a gradual salt reduction to an abrupt salt reduction strategy. In their experiment, the researchers created two groups for a longitudinal study of 16 weeks and did not inform the participants of their study about the salt reduction. The first group received tomato juice where the salt concentration was abruptly reduced in the fourth week, the other group received tomato juice where the salt concentration was gradually reduced over time. At the end of the study they did not find an overall difference in liking. However, during the longitudinal study they noticed a large drop in liking immediately after the abrupt salt reduction, whereas the gradual salt reduction was better accepted throughout the weeks (Bobowski, Rendahl & Vickers, 2014).

A study of Liem, Miremadi, Zandstra & Keast (2012) among 50 participants showed that informing consumers about salt reduction through health labels negatively influences the taste perception of consumers. The researchers served the participants in their study nine soups and manipulated the amount of salt in the soup (regular, 15% less salt and 30% less salt) and the health label (no health label, a reduced-salt label and a Heart Foundation Tick). The participants were asked to indicate the expected and the perceived salt intensity and liking. The soups with a reduced salt label negatively influenced the taste expectation and the actual taste perception of the participants in terms of liking and perceived level of salt (Liem, Miremadi, Zandstra & Keast, 2012). Actively informing consumers about sugar reduction in products might lead to a similar outcome.

2.3 Hypotheses and conceptual framework

From the literature it can be derived that the transparency of a company about their CSR activities can have several consequences for the consumer perception about the company and the product.

In general, transparency about the CSR activities is well received by consumers. Only high-involved consumers may not react positive to transparency about product reformulation (Kang & Hustvedt, 2013; Guèvremont & Grohmann, 2014). Since shopping in the supermarket generally requires low involvement of consumers, it is expected that consumers will react positive towards immediate disclosure of the company about sugar reduction. In

addition, sugar reduction in products is meaningful for consumers because they benefit from it in terms of health. Therefore, it can be expected that consumers perceive sugar reduction in products as beneficiary for society rather than for the retailer. In addition, it is likely that the perceived contribution of the retailer is high; retailers need to invest in research and their production process to adjust their products and test new recipes with regard to shelf life and preservation of taste. According to the literature, this should then result in higher evaluation of the store and more trust in the retailer (Mohr, Webb & Harris, 2001; Van Herpen, Pennings & Meulenberg, 2003). Furthermore, transparency about product reformulation can negatively influence the taste perception of consumers (Liem, Miremadi, Zandstra & Keast, 2012).

2.3.1 Hypotheses

Based on the known literature described above, the question raises whether disclosure affects the purchase intention in a positive or negative way. Therefore, the following hypotheses are formulated.

First of all, the effect of disclosure will be discussed. Disclosure can be in two ways: immediate and non-immediate. Based on the literature, it is expected that immediate disclosure about sugar reduction increases the perceived benefit of consumers in terms of health more than non-immediate disclosure (H1a). In addition, it is expected that immediate disclosure does not have an effect on whether consumers perceive a company as manipulative, whereas non-immediate disclosure is expected to lead to perceived manipulative intent (H1b). Furthermore, it is expected that immediate disclosure about sugar reduction negatively influences the taste perception of consumers more than non-immediate disclosure (H1c).

H1a Immediate disclosure about sugar reduction increases the perceived benefit of consumers more than non-immediate disclosure.

H1b Non-immediate disclosure about sugar reduction positively influences the perceived manipulative intent by the consumer in comparison to immediate disclosure.

H1c Immediate disclosure about sugar reduction negatively influences the taste perception of consumers more than non-immediate disclosure.

There are several factors that can influence the scepticism of a consumer towards an advertisement. Source characteristics, message variables, prior knowledge and explanation of a claim can have an effect on scepticism (Obermiller & Spangenberg, 1998). Prior beliefs about the type of product and existing knowledge can for example affect the adoption of new information used in health claims (Sims, 1999; Urala, Arvola & Lähteenmäki, 2003). Therefore, it is expected that the type of product (perceived as high in sugar versus perceived as low in sugar) will have an effect on the way people perceive the communication. This is described in hypotheses 2.

As sugar reduction in products benefits the consumer in terms of health, it is expected that this will positively influence their perceived benefit. It is expected that this effect will be stronger for products that are generally perceived as high in sugar than for products that are generally perceived as low in sugar (H2a). For products that are perceived as high in sugar, consumers may not be surprised when companies reduce the amount of sugar in these products. Therefore, it is expected that the consumer does not perceive this kind of sugar reduction as manipulative. However, for products that are perceived as low in sugar, the opposite can apply. Consumers can feel betrayed, as they were not expecting that the product contains a lot of sugar. Therefore, the perceived manipulative intent by the consumer can be higher (H2b). As sugar is perceived as an ingredient that influences the taste of products, reduction of this ingredient will probably influence the taste perception by the consumer. It is expected that this effect will be stronger for products that are generally perceived as high in sugar, than for products that are generally perceived as low in sugar (H2c).

H2a Sugar reduction in a product that is generally perceived as high in sugar positively influences the perceived benefit by the consumer more than a product that is generally perceived as low in sugar.

H2b Sugar reduction in a product that is generally perceived as low in sugar will be perceived as manipulative in comparison to a product that is generally not perceived as high in sugar.

H2c Sugar reduction in a product that is generally perceived as high in sugar negatively influences the taste perception of consumers more than a product that is generally perceived as low in sugar.

As the disclosure about sugar reduction and the type of product can have a separate effect, there can also be an interaction effect. This effect is described in hypotheses 3.

H3a The type of product can strengthen or weaken the perceived benefit (see Table 1).

Table 1: Hypothesis 3a

	Immediate disclosure	Non-immediate disclosure
Product perceived as high in sugar	+ + +	+ +
Product perceived as low in sugar	+ +	+

H3b The type of product can strengthen or weaken the perceived manipulative intent (see Table 2).

Table 2: Hypothesis 3b

	Immediate disclosure	Non-immediate disclosure
Product perceived as high in sugar	- -	+
Product perceived as low in sugar	-	+ +

H3c The type of product can strengthen or weaken the taste perception (see Table 3).

Table 3: Hypothesis 3c

	Immediate disclosure	Non-immediate disclosure
Product perceived as high in sugar	- - -	- -
Product perceived as low in sugar	- -	-

If the consumer negatively perceives the product reformulation, it is likely that this will negatively influence the consumers' attitude towards the company and the product. On the other hand, if the consumer positively perceives the product reformulation, this will probably lead to a positive attitude towards the company and the product. This effect is described in hypotheses 4 and 5.

H4 Perceived benefit by the consumer positively influences the attitude towards the supermarket.

H5 Perceived manipulative intent negatively influences the attitude towards the supermarket.

Informing consumers about product reformulation can influence the perceived taste by the consumer and consequently impact the purchase intention of the consumer. When

consumers expect that the product reformulation negatively influence the taste, it is likely that consumers are less likely to buy the product.

H6 A change in taste perception negatively influences the purchase intention of the consumer.

The attitude towards a company has impact on consumers' purchase intention. When a consumer has a positive attitude, the consumer is probably more likely to buy the product. When a consumer has a negative attitude, the consumer is probably less likely to buy the product.

H7 Consumers' attitude towards the supermarket positively relates to consumers' purchase intention.

The above described hypotheses imply an indirect effect of the disclosure and type of product on the purchase intention. However, there may also be a direct effect. These effects are describes in hypotheses 8 and 9.

H8 Disclosure about sugar reduction in products positively influences the purchase intention of consumers (immediate disclosure has a stronger effect than non-immediate disclosure).

H9 Knowledge about sugar in products negatively influences the purchase intention of consumers (a product perceived as high in sugar has a stronger effect than a product perceived as low in sugar).

2.3.2 Conceptual framework

Based on the literature a conceptual framework is created that visualises how disclosure about sugar reduction, the type of product and the interaction between these two components can influence the purchase intention of the consumer. The conceptual framework and hypotheses are presented in Figure 1.

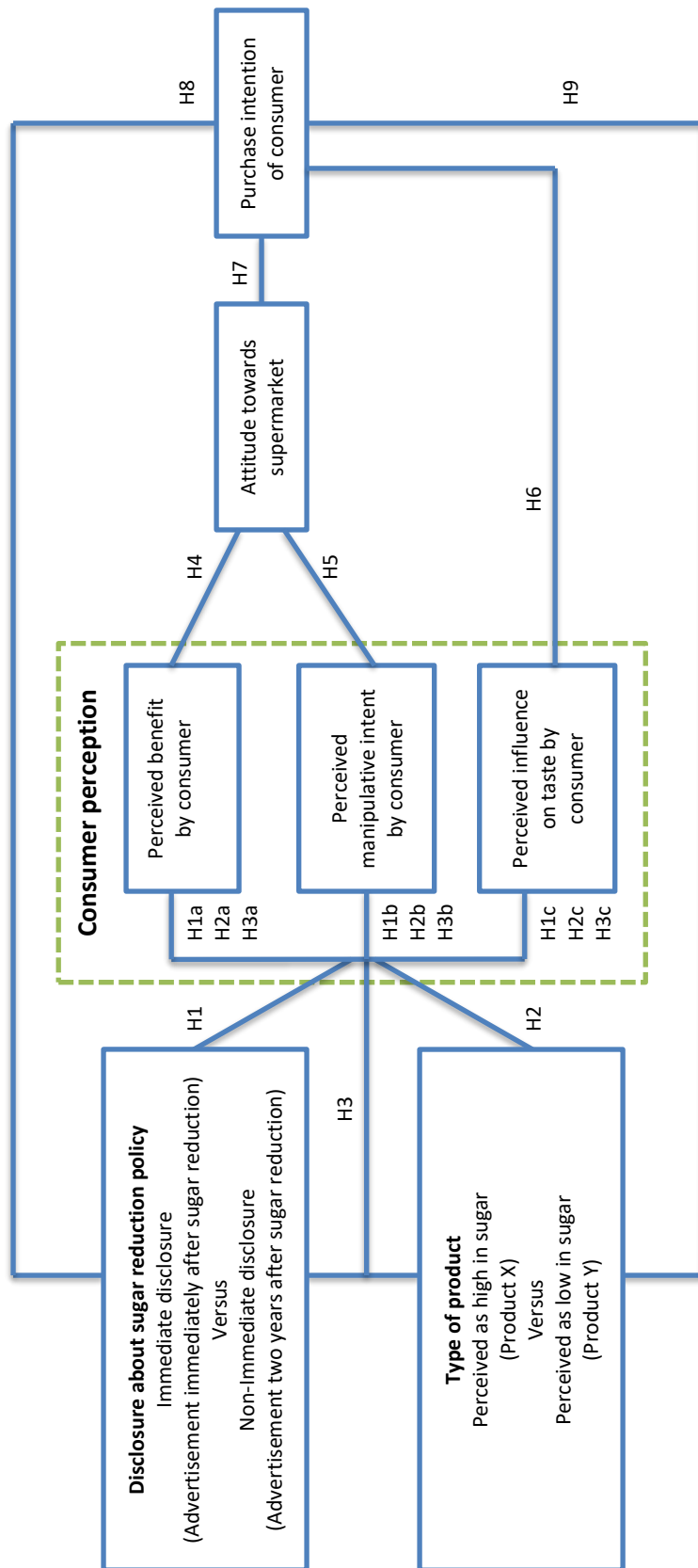


Figure 1: Conceptual framework and hypotheses

3. Study 1

In order to set up a study to measure the separate and interaction effect of type of disclosure and type of product on consumer perception, it must first be clear which products are perceived as low in sugar and high in sugar by consumers. Therefore, a study was done to determine the consumer perception about the level of sugar in products. Based on the results of this study, two products were chosen to perform the second study.

3.1 Method

3.1.1 Study design

A survey was set up to discover which products consumers perceive as low in sugar and which products consumers perceive as high in sugar. In the survey, respondents were asked to indicate the perceived level of sugar for several products. The products that were selected for the survey contained at least around 10% of sugar. This study was meant to indicate the consumer perception about sugar levels of products; therefore this study was a descriptive study. The survey language was in Dutch, as this study was focussed on the Dutch market.

3.1.2 Respondents

The target group for this study consisted of Dutch speaking people who were 16 years and older. The aim was to reach at least 50 respondents for this study. The survey was executed in week 15 & 16 of 2019 and distributed via social media channels. There was no reward for filling in the survey. In total there were 74 respondents that started the survey and 70 of them completed the survey (N=70). The male-female distribution was respectively 12 (17.1%) and 58 (82.9%). The age of respondents varied between 18 and 63 years, the average age of the sample was 36.8 years.

3.1.3 Procedure

First, respondents needed to give informed consent before they could continue with the survey. Hereafter, respondents were asked to indicate on a slider bar the perceived level of sugar for several products. There were five product categories: drinks, sauces, breakfast products, dairy products and bread spreads. Each product category consisted of four products. So in total, respondents were asked to indicate the sugar level for 20 products. When respondents had indicated the perceived level of sugar for all the products, they were

asked to answer some demographical questions (i.e. age and gender). The survey is included in Annex I.

3.1.4 Measures

Respondents could indicate the perceived level of sugar on a slider bar that ranged from 'low in sugar' to 'high in sugar'. The slider bar represented an underlying score from 0-10. The score was not visible for the respondents. This was done to prevent the respondents to attach a numerical score to the level of sugar in products. At the end of the survey, respondents were asked to indicate their gender (male or female) and age (open text box).

3.1.5 Analysis

The gathered data was analysed with the statistical program SPSS. First, descriptive statistics was used to extract numbers, percentages, means and standard deviations from the data. In addition paired sample t-tests were done in order to determine whether the scores for products were significantly different. The two products that were perceived as highest in sugar and the two products that were perceived as lowest in sugar were compared with the scores of the other products.

3.2 Results

3.2.1 Descriptive statistics

The results were based on the N=70 respondents that completed the survey. The male-female distribution was respectively 17.1% and 82.9%. The age of respondents varied between 18 and 63 years, the average age of the sample was 36.8 years (SD=14.8). Table 4 gives an overview of the age (in categories) and gender of the respondents.

Table 4: Age and gender of respondents of Study 1

Age	Gender		Total
	Male	Female	
16-25	4	23	27 (38.6%)
26-35	3	9	12 (17.1%)
36-45	1	5	6 (8.6%)
46-55	2	12	14 (20%)
56-65	2	9	11 (15.7%)
Total	12 (17.1%)	58 (82.9%)	70 (100%)

3.2.2 Consumer perception of level of sugar

The two products that were perceived as highest in sugar were cola and sports drink. The mean (SD) of these products was respectively 9.3 (1.0) and 9.0 (1.7). The two products that were perceived as lowest in sugar were rusk and sandwich spread. The mean (SD) of these products was respectively 3.6 (2.5) and 5.1 (2.2). The two products that were perceived as highest in sugar (cola and sports drink) and the two products that were perceived as lowest in sugar (rusk and sandwich spread) were compared with all products to find out whether the means of these products were significantly different ($p < 0.05$) from the means of the other products.

The paired sample t-tests showed that the score of cola was significantly different from the scores of the other products, except for sports drink ($p = 0.09$). The score of sports drink was significantly different from other products, except for cola ($p = 0.09$). The score of rusk was significantly different from the scores of all the other products. The score of sandwich spread was significantly different from other products, except for peanut butter ($p = 0.16$). Table 5 gives an overview of the mean and standard deviation of the perceived level of sugar per product and the p-values of the paired sample t-tests for cola, sports drink, rusk and sandwich spread.

Table 5: Mean (SD) of perceived level of sugar per product, *p*-value of cola, sports drink, rusk and sandwich spread

Product	Mean (SD)	<i>p</i> cola	<i>p</i> sports drink	<i>p</i> rusk	<i>p</i> sandwich spread
<u><i>Drinks</i></u>					
Cola	9.3 (1.0)	-	0.09	<0.001	<0.001
Orange juice	8.1 (1.8)	<0.001	.001	<0.001	<0.001
Smoothie	7.1 (2.3)	<0.001	<0.001	<0.001	<0.001
Sports drink	9.0 (1.7)	0.09	-	<0.001	<0.001
<u><i>Sauces</i></u>					
BBQ sauce	7.6 (2.0)	<0.001	<0.001	<0.001	<0.001
Curry	6.3 (2.4)	<0.001	<0.001	<0.001	<0.001
Ketchup	6.7 (2.7)	<0.001	<0.001	<0.001	<0.001
Satay sauce	6.5 (2.3)	<0.001	<0.001	<0.001	<0.001
<u><i>Breakfast products</i></u>					
Rusk	3.6 (2.5)	<0.001	<0.001	-	<0.001
Muesli bar	7.5 (2.1)	<0.001	<0.001	<0.001	<0.001
Breakfast cereals	6.1 (2.6)	<0.001	<0.001	<0.001	0.01
Gingerbread	7.3 (2.3)	<0.001	<0.001	<0.001	<0.001
<u><i>Dairy products</i></u>					
Fruit Yogurt	7.2 (2.0)	<0.001	<0.001	<0.001	<0.001
Vanilla Quark	6.1 (2.5)	<0.001	<0.001	<0.001	0.01
Vanilla custard	7.7 (1.8)	<0.001	<0.001	<0.001	<0.001
Drink yogurt peach	7.8 (1.8)	<0.001	<0.001	<0.001	<0.001
<u><i>Bread spreads</i></u>					
Apple syrup	7.4 (2.4)	<0.001	<0.001	<0.001	<0.001
Chocolate sprinkles	8.2 (1.5)	<0.001	0.001	<0.001	<0.001
Peanut butter	5.5 (2.5)	<0.001	<0.001	<0.001	0.16
Sandwich spread	5.1 (2.2)	<0.001	<0.001	<0.001	-

3.3 Discussion

The aim of this first study was to investigate which products consumers perceive as high in sugar and which products consumers perceive as low in sugar. The underlying aim was to use the outcome of this study as input for the second study. Results showed that cola and sports drink were perceived as high in sugar. The paired sample t-tests showed that both products were significantly perceived as high in sugar compared to the other products that were evaluated, except for sports drink or cola. The products rusk and sandwich spread were perceived as low in sugar. The paired sample t-test showed that sandwich spread was significantly perceived as low in sugar compared to most other products, except for peanut butter and rusk. Rusk was perceived as significantly low in sugar compared to all the other products that were evaluated. Based on the results of this study, the products cola and rusk were chosen to use in the advertisements of the second study; cola as product that is perceived as high in sugar by consumers and rusk as product that is perceived as low in sugar by consumers.

Limitations and further research

This study contains a few limitations. A first limitation is that the products that were evaluated by the respondents did not have the same level of sugar, but at least around 10% of sugar. Also portion sizes were not taken into account, but the amount of sugar per 100 grams was chosen as reference. So, for example one glass of cola does not equal one piece of rusk. Another limitation of this study is that, as respondents rated five products of one category per page, respondents might have based their answers on a comparison between the products that were on the same page. Furthermore, the familiarity of respondents with the product was not taken into account. Although regular products were chosen, it was not verified in the survey whether the respondents were familiar with all the products they evaluated. Further research could take into account the portion sizes of products, the total amount of sugar per portion, familiarity with products and the way products are presented in a survey.

4. Study 2

In study 2, an experiment was conducted to discover differences in consumer perception regarding advertisements that differed in type of disclosure and type of product. After analysing the results of the first study, the products cola and rusk were chosen to use in the advertisements of the second study.

4.1 Method

4.1.1 Study design

For this study, an experiment was set up to investigate whether the type of disclosure about sugar reduction in certain products influences the consumer perception about the company and/or the product. In addition, the consequences regarding the attitude and the purchase intention of the consumer are investigated. In this experiment, the type of product (perceived as high in sugar versus perceived as low in sugar) and type of disclosure (immediate versus non-immediate) were manipulated. Therefore, this research was a two by two design and had four conditions (see Table 6). The advertisement contained a text about the sugar reduction in products of the fictional supermarket Supera. The text was the same for all conditions except for the name of the product; 'cola' versus 'rusk' and the indication about when the sugar reduction took place; 'from now on' versus 'two years ago'. The time indication as well as the amount of sugar reduction was stated multiple times in the text. In addition, the advertisements contained a visual about the product including a visual representation of the sugar reduction in amount of sugar cubes. The four advertisements are presented in Figure 2. The experiment was conducted as an online survey. Respondents were randomly assigned to one of the four conditions. Therefore, this research was a between subject design. This study was focused on the Dutch market and therefore, the target group consisted of Dutch speaking people. To create a realistic setting for the participants, the language of the experimental survey was in Dutch.

Table 6: Experimental conditions

		Type of Disclosure	
		Immediate	Non-immediate
Type of product	Perceived as high in sugar (Cola)	Condition 1	Condition 2
	Not perceived as high in sugar (Rusk)	Condition 3	Condition 4

Condition 1

Vanaf nu minder suiker in onze cola!

We hebben nu de hoeveelheid suiker in onze cola verminderd. In totaal hebben we de hoeveelheid suiker met 30% verlaagd. Dat zijn 10 suikerklontjes per fles! Onze productmanager legt uit waarom we dit hebben gedaan.

"Nederlanders krijgen te veel suiker binnen en dat willen we veranderen. Suiker zit bijna overal in, ook in producten waarvan je het misschien niet verwacht. We weten nu dat suiker slechte gevolgen voor de gezondheid kan hebben. Daarom willen we het gemakkelijker maken voor onze klanten om minder suiker te eten. We proberen steeds meer producten gezonder te maken. Dit doen we onder andere door het verlagen van suiker in onze producten. Daar zijn we nu mee begonnen. Onze cola bevat daarom vanaf nu 30% minder suiker!"



Condition 2

Al twee jaar minder suiker in onze cola!

Twee jaar geleden hebben we de hoeveelheid suiker in onze cola verminderd. In totaal hebben we de hoeveelheid suiker met 30% verlaagd. Dat zijn 10 suikerklontjes per fles! Onze productmanager legt uit waarom we dit hebben gedaan.

"Nederlanders krijgen te veel suiker binnen en dat willen we veranderen. Suiker zit bijna overal in, ook in producten waarvan je het misschien niet verwacht. We weten al jaren dat suiker slechte gevolgen voor de gezondheid kan hebben. Daarom willen we het gemakkelijker maken voor onze klanten om minder suiker te eten. We proberen steeds meer producten gezonder te maken. Dit doen we onder andere door het verlagen van suiker in onze producten. We zijn hier twee jaar geleden mee begonnen. Onze cola bevat daarom al twee jaar 30% minder suiker!"



Condition 3

Vanaf nu minder suiker in onze beschuit!

We hebben nu de hoeveelheid suiker in onze beschuit verminderd. In totaal hebben we de hoeveelheid suiker met 30% verlaagd. Dat is 1 suikerklontje per pak! Onze productmanager legt uit waarom we dit hebben gedaan.

"Nederlanders krijgen te veel suiker binnen en dat willen we veranderen. Suiker zit bijna overal in, ook in producten waarvan je het misschien niet verwacht. We weten nu dat suiker slechte gevolgen voor de gezondheid kan hebben. Daarom willen we het gemakkelijker maken voor onze klanten om minder suiker te eten. We proberen steeds meer producten gezonder te maken. Dit doen we onder andere door het verlagen van suiker in onze producten. Daar zijn we nu mee begonnen. Onze beschuit bevat daarom vanaf nu 30% minder suiker!"



Condition 4

Al twee jaar minder suiker in onze beschuit!

Twee jaar geleden hebben we de hoeveelheid suiker in onze beschuit verminderd. In totaal hebben we de hoeveelheid suiker met 30% verlaagd. Dat is 1 suikerklontje per pak! Onze productmanager legt uit waarom we dit hebben gedaan.

"Nederlanders krijgen te veel suiker binnen en dat willen we veranderen. Suiker zit bijna overal in, ook in producten waarvan je het misschien niet verwacht. We weten al jaren dat suiker slechte gevolgen voor de gezondheid kan hebben. Daarom willen we het gemakkelijker maken voor onze klanten om minder suiker te eten. We proberen steeds meer producten gezonder te maken. Dit doen we onder andere door het verlagen van suiker in onze producten. We zijn hier twee jaar geleden mee begonnen. Onze beschuit bevat daarom al twee jaar 30% minder suiker!"



Figure 2: Advertisements of the four conditions in Study 2

4.1.2 Participants

The target group of this study consisted of Dutch speaking people who were 16 years and older and doing groceries regularly or sometimes. Therefore, questions about age and frequency of doing grocery shopping were included in the demographical questions. The aim was to reach at least 200 participants for this study; 50 participants per condition. The survey was conducted from week 19 to week 22. The survey was distributed via social media channels and mailing lists. There was no reward for participating in the study. 372 participants started the survey, 309 of them completed the survey (83.1%). 37 participants indicated that they never do groceries; these participants were excluded from the dataset. The final dataset consisted of N=272 participants. The male-female distribution was respectively 64 (23.5%) and 208 (76.5%). The age of the respondents varied between 18 and 86; the average age was 40.4 years.

4.1.3 Procedure

First, participants needed to give informed consent before they could continue with the experimental survey. Hereafter, participants were asked some general questions like gender, age, shopping frequency and interest in product category. After the general questions, the participants were asked to carefully read a short text with some general information about a fictional supermarket, named 'Supera'. Hereafter, there were some questions to measure the attitude of the participants towards this supermarket. After participants had answered these questions, the participants were shown an advertisement of the supermarket 'Supera' about sugar reduction in one of their products. There were four different advertisements encompassing immediate or non-immediate disclosure and a product that was perceived as high in sugar (cola) or a product that was perceived as low in sugar (rusk), as measured in Study 1. After the participants read the advertisement they were asked to give a short reaction on what they have read in the advertisement. This was asked to get an impression of the initial reaction of consumers about the disclosure of sugar reduction in products by supermarkets, for example whether this is perceived as positive or negative. Hereafter, some questions were asked to measure perceived benefit, perceived manipulative intent and perceived influence on taste. In addition, participants were again asked about their attitude towards the supermarket 'Supera' and their purchase intention. At the end of the survey, participants were asked a control question to test whether they could remember when the sugar reduction took place. The survey ended with a possibility to receive an email with a debriefing. The survey is included in Annex II.

4.1.4 Measures

The experimental survey consisted of 15 questions. First, respondents were asked to indicate their gender (male or female) and age (open text box). Hereafter, respondents were asked to indicate their shopping frequency; 'multiple times per week', 'once per week', 'less than once per week' or 'never'. Product interest was measured by asking respondents to indicate from a list of eleven products, among which cola and rusk, which products they had bought in the past three months. The attitude towards the supermarket was measured on three semantic differential scales from 'good to bad', 'pleasant to unpleasant' and 'favourable to unfavourable' (MacKenzie & Lutz, 1989). The scales had an underlying value from 0-7. The Cronbach's alpha showed a high reliability for the statements of attitude towards the supermarket Supera before reading the advertisement; $\alpha=.922$. The average score of the three scores was used to analyse the attitude towards Supera before disclosure. After participants read the advertisement, they were asked to write down in a few words their first reaction on what they had read in the advertisement in an open text box.

The perceived benefit was measured through five statements:

- 'I benefit from the supermarket reducing the amount of sugar in products'
- 'The supermarket cares about their consumers'
- 'I think the supermarket needed to invest a lot to reduce the amount of sugar in products'
- 'I think the supermarket reduced the amount of sugar to improve their image'
- 'I think the supermarket reduced the amount of sugar because they care about the health of the consumers'

The statements were measured on a Likert scale items 1-7 ranging from 'completely disagree to completely agree'. Cronbach's alpha showed that the reliability of the perceived benefit statements was $\alpha=.641$. The statement 'I think the supermarket reduced the amount of sugar to improve their image' was removed to increase the reliability; $\alpha=.676$. The average score of the four statements was used to analyse perceived benefit.

The measurement scale 'inferences of manipulative intent' by Campbell (1995) was used to measure the perceived manipulative intent. This scale consisted of the following six statements:

- 'The way this ad tries to persuade people seems acceptable to me'
- 'The advertiser tried to manipulate the audience in ways I do not like'

- 'I was annoyed by this ad because the advertiser seemed to be trying to inappropriately manage or control the consumer audience'
- 'I didn't mind this ad; the advertiser tried to be persuasive without being excessively manipulative'
- 'The ad was fair in what was said and shown'
- 'I think that this advertisement is unfair/fair'

The first five statements were measured on a Likert scale items 1-7 ranging from 'completely disagree' to 'completely agree'. The last statement was measured on a 7-point semantic differential scale ranging from unfair to fair (Campbell, 1995). The Cronbach's alpha showed a high reliability for the statements of perceived manipulative intent; $\alpha=.923$. The average score of the statements was used to analyse perceived manipulative intent.

The perceived influence on taste was measured on a 7-point semantic differential scale ranging from 'not tasty at all' to 'very tasty'. Attitude towards Supera after participants saw the advertisement was again measured with the semantic differential scales of MacKenzie & Lutz (1989). The scales had an underlying value of 1-7. The Cronbach's alpha also showed a high reliability for the statements of attitude towards the supermarket Supera after reading the advertisement; $\alpha=.960$. The average score of these statements was used to analyse attitude towards Supera after disclosure. Purchase intention was measured on a 7-point semantic differential scale ranging from 'absolutely not' to 'absolutely'. At the end of the survey a manipulation check was done on disclosure. Participants were asked to write down in an open text box when the sugar reduction, of the product in the advertisement they had read, took place.

4.1.5 Analysis

Data of this study was analysed with the statistical program SPSS. Several statistical analyses were performed to analyse the gathered data. First, descriptive statistics was used to extract numbers, percentages, means and standard deviations from the data. Cronbach's Alpha is measured to find out whether the measurement scales of attitude towards the supermarket, perceived benefit and perceived manipulative intent could be treated as one. In addition, two-way ANOVA analyses were performed to compare differences in means of consumer perception between the conditions. Multiple regression analyses were performed to predict attitude from consumer perception and to predict purchase intention from consumer perception and attitude.

A small explorative analysis was done on the first reaction of participants after reading the advertisement. A thematic analysis was done through inductive coding of the answers (Boyatzis, 1998). Hereafter, numbers and percentages of the occurrence of the codes were extracted with SPSS.

4.2 Results

4.2.1 Descriptive statistics

Results were based on the N=275 participants who completed the survey and doing groceries regularly or sometimes. The male-female distribution was respectively 23.5% and 76.5%. The age of the respondents varied between 18 and 86; the average age was 40.4 years (SD=19.0). Table 7 gives an overview of the distribution of age (in categories) and gender of the participants. The distribution of the participants across the four conditions was respectively 25.4%, 25.4%, 25.4% and 23.9%. The chi-square test indicated that there was no significant association between conditions and gender $\chi^2(3)=2.686$, $p=0.44$. The F-test indicated that there was no significant association between condition and age $F(3)=0.314$; $p=0.82$.

Table 7: Age and gender of participants

Age	Gender		Total
	Male	Female	
18-27	16	100	116 (42.6%)
28-37	2	24	26 (9.6%)
38-47	4	17	21 (7.7%)
48-57	12	29	41 (15.1%)
58-67	12	27	39 (14.3%)
68 and older	18	11	29 (10.7%)
Total	64 (23.5%)	208 (76.5%)	272 (100%)

The chi-square test indicated that there was a significant difference between the type of disclosure people saw in the advertisement and whether they could recall this correctly in the control question, $\chi^2(1)=70.719$, $p<0.001$. 35.7% of the respondents answered the control question correctly, within this group 16.5% had seen an advertisement with immediate disclosure and 83.5% had seen an advertisement with non-immediate disclosure.

The results for perceived benefit, perceived manipulative intent and attitude towards Supera were based on average scores of the statements. Results of the average scores are

presented in Table 8. An overview of the results per statement can be found in Table 10 in annex III.

4.2.2 Perceived benefit

Regarding the perceived benefit of consumers it was hypothesized that immediate disclosure about sugar reduction increases the perceived benefit of consumers more than non-immediate disclosure (H1a). In addition, that sugar reduction in a product that is generally perceived as high in sugar positively influences the perceived benefit by the consumer more than a product that is generally perceived as low in sugar (H2a). Furthermore, that the interaction of these two can strengthen or weaken the perceived benefit (H3a). The mean scores for perceived benefit varied between 4.4 and 4.7. The two-way ANOVA analysis indicated that the type of disclosure did not significantly influenced the perceived benefit ($F(1,268)=0.059$; $p=0.81$). The type of product did significantly influenced the perceived benefit ($F(1,268)=3.870$; $p=0.05$). It was hypothesized that sugar reduction in cola would have a stronger effect than sugar reduction in rusk, however the perceived benefit of sugar reduction in rusk was significantly higher than the perceived benefit of sugar reduction in cola. There was no significant interaction effect ($F(1,268)=0.002$; $p=0.97$). H1a and H3a are not accepted, H2a is partly accepted.

4.2.3 Perceived manipulative intent

Regarding the perceived manipulative intent it was hypothesized that non-immediate disclosure about sugar reduction positively influences the perceived manipulative intent by the consumer in comparison to immediate disclosure (H1b). Furthermore, that sugar reduction in a product that is perceived as low in sugar will be perceived as manipulative in comparison to a product that is generally not perceived as high in sugar (H2b). In addition, it was hypothesized that the interaction of disclosure and product could strengthen or weaken the perceived manipulative intent (H3b). The mean scores for perceived manipulative intent varied between 3.2 and 3.6. There was no significant effect of disclosure ($F(1,268)=1.809$; $p=0.18$), no significant effect of product ($F(1,268)=0.943$; $p=0.33$) and no significant interaction effect ($F(1,268)=1.553$; $p=0.21$). H1b, H2b and H3b are not accepted.

4.2.4 Perceived influence on taste

Regarding the perceived influence on taste it was hypothesized that immediate disclosure about sugar reduction negatively influences the taste perception of consumers more than

non-immediate disclosure (H1c). Furthermore, that sugar reduction in a product that is generally perceived as high in sugar negatively influences the taste perception of consumers more than a product that is generally perceived as low in sugar. In addition, it was hypothesized that the interaction of these two can strengthen or weaken the taste perception (H3c). The mean scores for taste perception before sugar reduction varied between 3.7 and 4.6. The mean scores for taste perception after sugar reduction varied between 3.4 and 4.4. In every condition taste perception was evaluated lower after sugar reduction. There was no significant effect of disclosure ($F(1,268)=0.931$; $p=0.34$) or interaction effect ($F(1,268)=0.024$; $p=0.88$) on perceived influence on taste. There was a significant effect of product ($F(1,268)=26.134$; $p<0.001$). It was hypothesized that a product generally perceived as high in sugar would have a stronger effect on the taste perception than a product that is generally perceived as low in sugar. Cola scored significantly lower on taste perception than rusk. H1c and H3c are not accepted, H2c is accepted.

4.2.5 Attitude towards Supera

Regarding the attitude towards supermarkets it was hypothesized that perceived benefit positively influences the attitude towards the supermarket (H4) and that perceived manipulative intent negatively influences the attitude towards the supermarket (H5). A multiple regression analysis was done to predict attitude towards Supera from perceived benefit and perceived manipulative intent. The multiple regression analysis showed that perceived benefit and perceived manipulative intent significantly influenced the attitude towards Supera ($F(2,269)=145.594$; $p<0.001$; $R^2=0.520$). Perceived benefit ($\beta=.225$, $p<0.001$) and perceived manipulative intent ($\beta=-.568$, $p<0.001$) significantly predicted attitude towards Supera. H4 and H5 are accepted.

4.2.6 Purchase intention

Regarding purchase intention it was hypothesized that a change in taste perception negatively influences purchase intention (H6) and that consumers' attitude towards the supermarket positively influences purchase intention (H7). A multiple regression analysis was done to predict purchase intention from taste perception and attitude towards Supera. The multiple regression analysis showed that taste perception and attitude towards Supera significantly influenced purchase intention ($F(2,269)=68.449$; $p<0.001$; $R^2=0.337$). Taste perception ($\beta=.260$, $p<0.001$) and attitude towards Supera ($\beta=.415$, $p<0.001$) significantly predicted purchase intention. H6 and H7 are accepted.

Table 8: Mean (SD), main- and interaction effects of consumer perception

	Cola		Rusk				
	Immediate disclosure	Non-immediate disclosure	Immediate disclosure	Non-immediate disclosure	Main effect disclosure	Main effect product	<i>P</i> -value for interaction effect
Perceived benefit¹	4.4 (1.3)	4.4 (1.0)	4.7 (1.1)	4.7 (0.8)	0.81	0.05	0.97
Perceived Manipulative intent^{1,2}	3.5 (1.2)	3.5 (1.2)	3.2 (1.3)	3.6 (1.2)	0.18	0.33	0.24
Perceived influence on taste²							
Before sugar reduction	3.7 (1.6)	3.9 (1.8)	4.6 (1.1)	4.4 (0.9)	0.81	<0.001	0.25
After sugar reduction	3.5 (1.5)	3.4 (1.7)	4.4 (1.2)	4.2 (1.0)	0.34	<0.001	0.88

¹ Measured on a Likert scale items 1-7

² Measured on a 7-point semantic differential scale

4.2.7 Extra explorative analysis: first reaction after reading the advertisement

After the participants read the advertisement, they were asked to give a first reaction on what they had read. Based on the answers several codes were created through inductive coding: positive about supermarket/initiative, negative about supermarket/initiative, scepticism, time reference, purchase intention, taste, astonishment, still too much sugar, no result, textual/irrelevant. In Table 9 the results per condition are presented.

Results showed that more than 40% of the participants were positive about the supermarket or the initiative and 12.2% of the participants were negative about the supermarket or the initiative. Responses included statements such as *“Good that they (Supera) are concerned with consumer health”* and *“Good initiative to reduce sugar in products”*, but also *“It is not unique, since it is partly requested by society. Every manufacturer tries to lower the sugar content, so this advertisement is ‘not that great’”*. Sceptic reactions mainly occurred for participants that saw an advertisement about cola. Participants wondered what the supermarket added to the product when sugar was taken out. For example: *“Then sugar is replaced by something else, because the taste should not change. What is that? And is the sugar substitute healthy?”* and *“I don’t believe anything of this. Less sugar is more sweetener”*.

Four participants from the non-immediate disclosure conditions said something about the time reference. For example: *“It’s a bit strange that they advertise with something that is already a fact for two years”* and *“Why are you telling this now? After two years? You could have told it immediately. That disappoints me”*. Especially participants who saw an advertisement about rusk indicated that they were surprised about the sugar reduction. They were surprised about the fact that rusk contains sugar and wondering why rusk contains sugar. Furthermore, seven participants who saw an advertisement about rusk indicated that the sugar reduction barely leads to any result where eleven other participants who saw an advertisement about cola indicated that there is still too much sugar in cola.

Table 9: Coding results of extra explorative analysis

	Cola		Rusk		Total
	Immediate disclosure	Non-immediate disclosure	Immediate disclosure	Non-immediate disclosure	
Positive about supermarket	11	12	8	14	45 (16.7%)
Positive about initiative	16	17	21	11	65 (24.2%)
Negative about supermarket	4	2	1	2	9 (3.3%)
Negative about initiative	9	4	5	6	24 (8.9%)
Scepticism	9	3	3	5	20 (7.4%)
Time reference	0	3	0	1	4 (1.5%)
Purchase intention	5	5	5	0	15 (5.6%)
Taste	0	4	0	1	5 (1.9%)
Astonishment	1	1	6	2	10 (3.7%)
Still to much sugar	5	6	3	1	15 (5.6%)
No result	0	0	3	4	7 (2.6%)
Textual/irrelevant	8	11	14	17	50 (18.6%)

4.3 Discussion

The aim of this main study was to investigate the separate and combined effect of the type of disclosure of a supermarket about sugar reduction (immediate versus non-immediate) and the type of product where the sugar reduction took place (perceived as high in sugar versus perceived as low in sugar) on consumer perception. In addition, the consequences regarding consumer attitude towards the supermarket and purchase intention of the consumer were investigated. Based on the results of this main study, it can be stated that transparency about sugar reduction in food products does not influence consumer perception towards the supermarket or the product. However, results of this study indicate that the type of product can influence consumer perception about the supermarket or the product. Furthermore, results show that consumer perception towards the supermarket influences their attitude towards the supermarket. In addition, consumer perception about the product and the attitude of the consumer towards the supermarket influences the purchase intention of the consumer.

There may be multiple reasons why the type of disclosure and disclosure in combination with a particular type of product did not influence the perception of the consumer. First of all, a manipulation check was done to measure whether the participants could recall from the advertisement when the sugar reduction took place. Although the time reference was given four times in each advertisement, only 35.7% of the participants could recall this correctly. Most of the participants that could recall this correctly had seen an advertisement with non-immediate disclosure. The reason for this difference between conditions may have something to do with the fact that in the non-immediate disclosure conditions a number was mentioned; namely 'two years ago', whereas in the immediate condition no number was mentioned; namely 'from now on'. Furthermore, it can be that the participants could recall the time reference of 'two years ago', because they found it remarkable. However, only four participants mentioned the time reference spontaneously in their first reactions directly after reading the advertisement.

Furthermore, the type of company and type of product that was examined in this research may partly explain the outcome of this study. This study examined the disclosure of a 'supermarket', about sugar reduction in 'food products'. Existing literature on (CSR) disclosure is mainly based on companies other than supermarkets, or products other than food products (Forehand & Grier, 2003; Guèvremont & Grohmann, 2014; Kang & Hustvedt, 2014). Therefore, it may be that for other companies or other products disclosure has a

stronger effect than disclosure of supermarkets about food products, for example because of a difference in consumer involvement with the supermarket and/or product. In the reactions participants gave after reading the advertisement, some of them stated that they were not that much interested in the advertisement, as they did not use or buy this type of product. This may have caused that respondents were indifferent and evaluated the advertisement and the subsequent questions in a different way than they would have done when they were genuinely interested in the product or the company.

Also, some of the hypotheses in this research were based on literature about salt reduction in food products (Bobowski, Rendahl & Vickers, 2014, Cappuccio, Capewell, Lincoln & McPherson, 2011; Liem, Miremadi, Zandstra & Keast, 2012), as no relevant literature about sugar reduction in food products was found. In formulating the hypotheses, the assumption was made that sugar reduction in food products could have the same effect on consumer perception as salt reduction in food products. However, it may be that consumers respond differently towards salt reduction in food products than towards sugar reduction in food products.

Limitations and further research

This study contains some limitations. The first limitation is about the type of research design that is used in this study. The experiment in this study was a non-realistic setting (online survey) and about a fictional supermarket. It may have been hard for participants to empathize with the situation and therefore the results of this study may not be a sound reflection of reality. Quantitative research may not reflect the personal subjective reactions and feelings of consumers. Instead, qualitative research may better explain individual behaviour than quantitative research (Swan & Bowers, 1998; Milliken, 2001). The extra explorative analysis of initial responses towards the advertisement that is performed in this study gives rise to further (qualitative) research. From the open answers of the participants after reading the advertisement, it was clear that a lot of consumers reacted positively towards the supermarket and/or the initiative. However, it also led to negative and sceptical reactions of consumers. Therefore, it might be interesting to conduct a qualitative study about consumer perception as a result of disclosure about sugar reduction in food products. For example, a focus group can be used as method to talk with participants that react positively towards disclosure about sugar reduction and participants that react negatively towards disclosure about sugar reduction in food products.

Another limitation is about the statements of perceived benefit. In this study the four statements about perceived benefit were combined, however the Cronbach's alpha had a questionable score of .676. Therefore it is likely that the statements and the related scores did not represent a convincing value of the perceived benefit of consumers. Therefore, it is recommended to do research about a good measurement scale to measure the perceived benefit of disclosure in advertisements by consumers.

Another limitation of this research could be the design of the advertisement. First of all, some participants quitted the survey when they were asked to read the advertisement. In addition, in the comments of the second study some people indicated that the advertisement contained a lot of text and some of them therefore honestly said that they did not read the full advertisements. This could have influenced their answers on the subsequent questions that were asked. For further research, it is recommended to take into account or even pre-test the design of the advertisements.

This study adds to the existing literature in terms of transparency of supermarkets about product reformulation. When the discussion points described above are taken into account, this study could be a relevant addition to future studies about consumer reaction towards transparency of supermarkets about product reformulation.

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Annexes

Annex I - Survey study 1

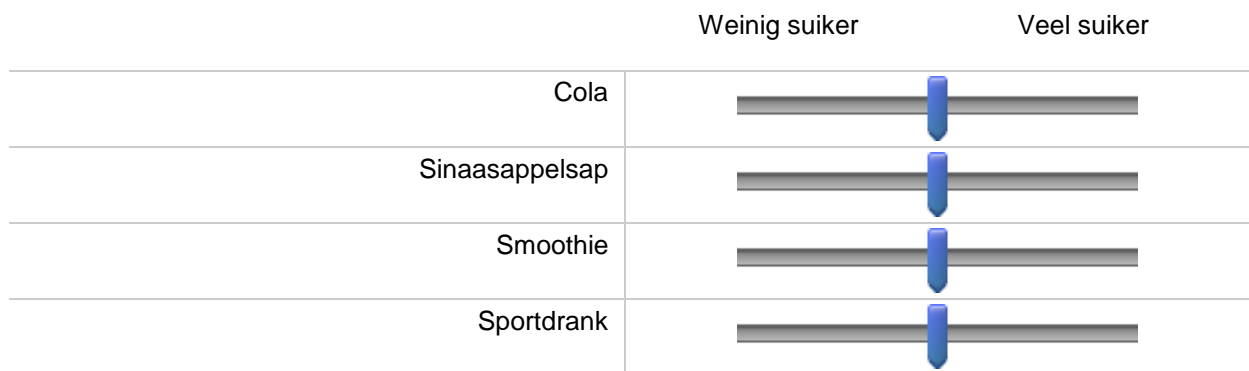
Fijn dat u mee wilt doen aan dit onderzoek van Wageningen Universiteit! Deze vragenlijst gaat over suiker in producten.

Het invullen van de vragenlijst zal een paar minuten duren. Als deelnemer aan dit onderzoek blijft u geheel anoniem. Er zijn geen risico's of voordelen verbonden aan het invullen van de vragenlijst. U kunt op ieder moment beslissen om te stoppen met invullen. Voor eventuele vragen kunt u contact opnemen met Franca Seijdel (franca.seijdel@wur.nl).

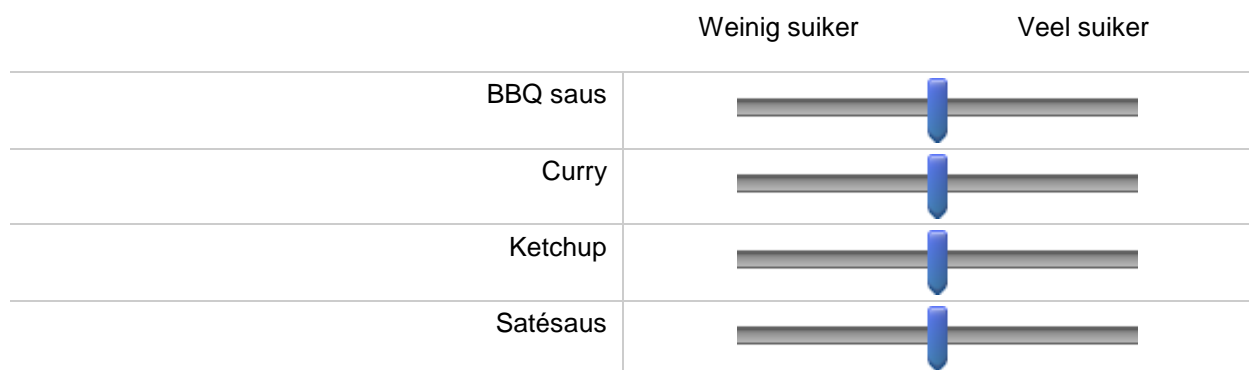
Door op 'ja' te klikken geeft u aan dat u bovenstaande heeft gelezen en ermee instemt:

☐ **ja**, ik doe mee aan dit onderzoek

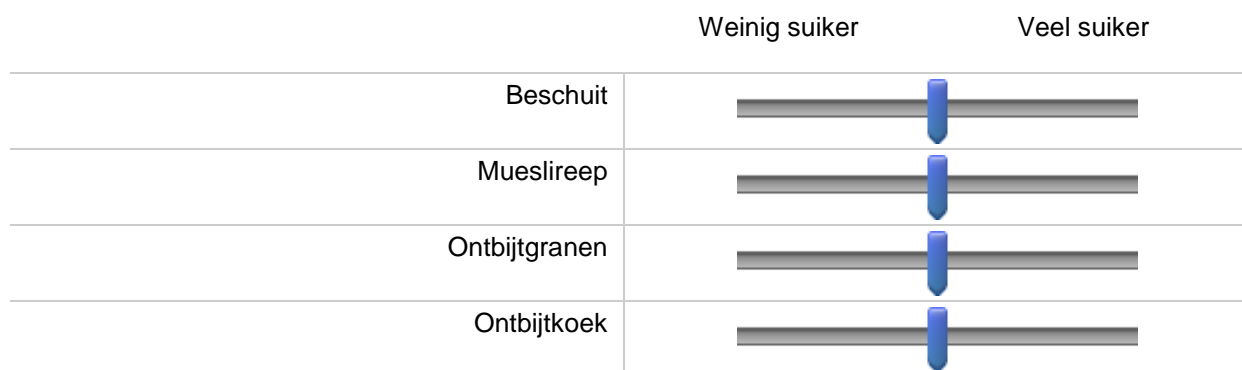
Geef aan in hoeverre u denkt dat onderstaande dranken weinig of veel suiker bevatten



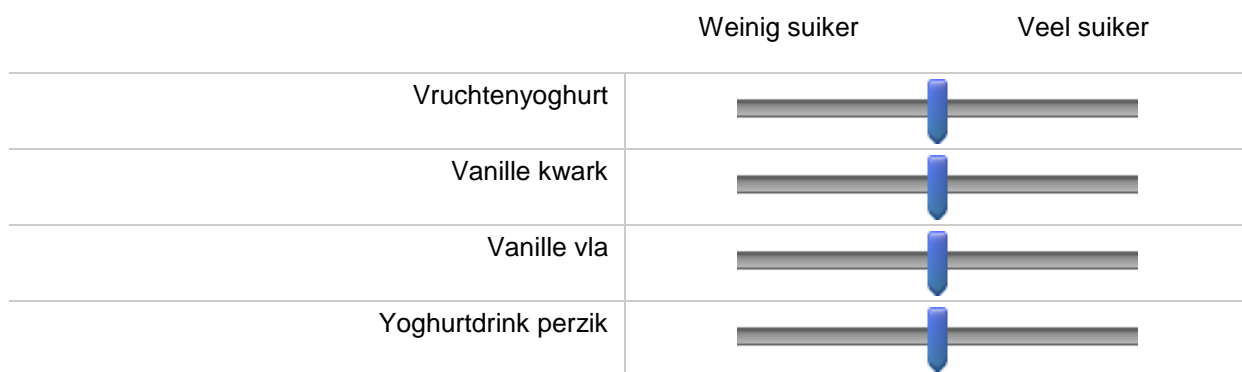
Geef aan in hoeverre u denkt dat onderstaande sauzen weinig of veel suiker bevatten



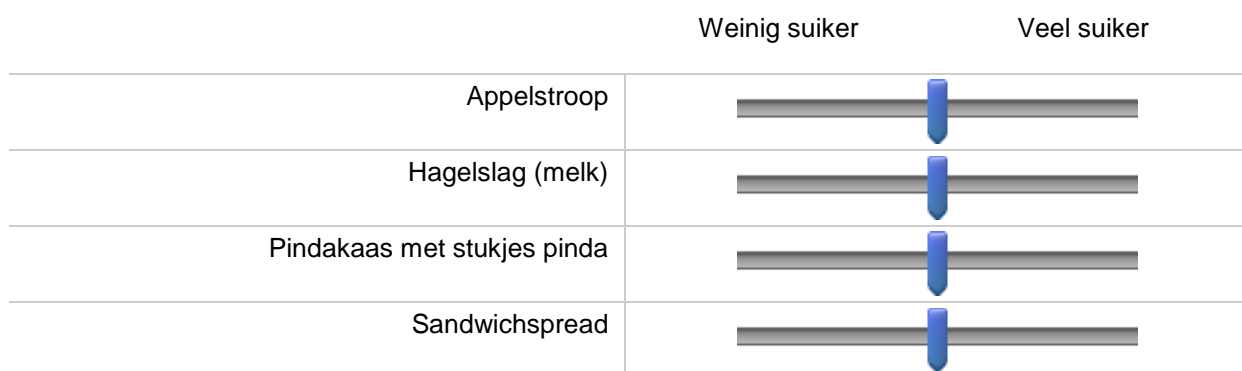
Geef aan in hoeverre u denkt dat onderstaande ontbijtproducten weinig of veel suiker bevatten



Geef aan in hoeverre u denkt dat onderstaande zuivelproducten weinig of veel suiker bevatten



Geef aan in hoeverre u denkt dat onderstaande soorten broodbeleg weinig of veel suiker bevatten



Wat is uw geslacht?

☐ Man

☐ Vrouw

Wat is uw leeftijd?

Aan Wageningen Universiteit worden vaker studies verricht waarvoor wij op zoek zijn naar deelnemers. Mogen wij je hiervoor af en toe (maximaal 1 keer per maand) benaderen per e-mail? Zo ja, schrijf hieronder je e-mailadres (niet nodig als je al op deze lijst staat):

Bedankt voor je bijdrage aan het onderzoek!

Klik op het pijltje naar rechts om de vragenlijst in te sturen.

Annex II – Experimental survey study 2

Fijn dat u mee wilt doen aan dit onderzoek van Wageningen Universiteit!

Het invullen van de vragenlijst zal ongeveer 5 minuten duren. Als deelnemer aan dit onderzoek blijft u geheel anoniem. Er zijn geen risico's of voordelen verbonden aan het invullen van de vragenlijst. U kunt op ieder moment beslissen om te stoppen met invullen. Voor eventuele vragen kunt u contact opnemen met Franca Seijdel (franca.seijdel@wur.nl).

Door op 'ja' te klikken geeft u aan dat u bovenstaande heeft gelezen en ermee instemt:

☐ **ja**, ik doe mee aan dit onderzoek

Wat is uw geslacht?

☐ Man

☐ Vrouw

Wat is uw leeftijd?

Hoe vaak doet u boodschappen bij een (online) supermarkt?

☐ Meerdere keren per week

☐ 1 keer per week

☐ Minder dan 1 keer per week

☐ Nooit

Welke van onderstaande producten heeft u in de afgelopen drie maanden tenminste één keer gekocht?

- ☐ Appelstroop
- ☐ Beschuit
- ☐ Chocola
- ☐ Cola
- ☐ Melk
- ☐ Pastasaus
- ☐ Pindakaas
- ☐ Rijstwafels
- ☐ Satésaus
- ☐ Sinaasappelsap
- ☐ Vanille vla
- ☐ ⊗ Geen van deze producten

Hieronder staat een stukje tekst over een supermarkt. Daarna volgen een paar vragen. Lees de tekst rustig door en klik daarna op het pijltje naar rechts om de vragen te beantwoorden.

"Supera is een grote supermarktketen met winkels verspreid door heel het land. Van klein dorp tot de grote stad, er is altijd wel een Supera in de buurt. Naast de fysieke winkels heeft Supera ook een website waar je online boodschappen kunt bestellen die vervolgens worden thuisbezorgd. Van food tot non-food, Supera heeft een ruim aanbod en verkoopt zowel producten van hun eigen huismerk als producten van andere merken. Supera bestaat al sinds jaar en dag in Nederland en heeft altijd bekend gestaan als een goede supermarkt. Het leveren van kwaliteit staat bij Supera dan ook nog steeds voorop. Gezien de landelijke bekendheid van Supera wordt er ook op landelijk niveau geadverteerd. Bijvoorbeeld door middel van reclamefolders, televisiereclames en advertenties in tijdschriften."

U heeft zojuist een stukje tekst gelezen over Supera. Wat vindt u van deze supermarkt?

Slecht

Goed



Onaangenaam

Aangenaam



Niet aantrekkelijk

Aantrekkelijk



Straks ziet u een advertentie van Supera. Lees de advertentie rustig door en klik daarna op het pijltje naar rechts om de vragen te beantwoorden.

Vanaf nu minder suiker in onze cola!

We hebben nu de hoeveelheid suiker in onze cola verminderd. In totaal hebben we de hoeveelheid suiker met 30% verlaagd. Dat zijn 10 suikerklontjes per fles! Onze productmanager legt uit waarom we dit hebben gedaan.

"Nederlanders krijgen te veel suiker binnen en dat willen we veranderen. Suiker zit bijna overal in, ook in producten waarvan je het misschien niet verwacht. We weten nu dat suiker slechte gevolgen voor de gezondheid kan hebben. Daarom willen we het gemakkelijker maken voor onze klanten om minder suiker te eten. We proberen steeds meer producten gezonder te maken. Dit doen we onder andere door het verlagen van suiker in onze producten. Daar zijn we nu mee begonnen. Onze cola bevat daarom vanaf nu 30% minder suiker!"



Al twee jaar minder suiker in onze cola!

Twee jaar geleden hebben we de hoeveelheid suiker in onze cola verminderd. In totaal hebben we de hoeveelheid suiker met 30% verlaagd. Dat zijn 10 suikerklontjes per fles! Onze productmanager legt uit waarom we dit hebben gedaan.

"Nederlanders krijgen te veel suiker binnen en dat willen we veranderen. Suiker zit bijna overal in, ook in producten waarvan je het misschien niet verwacht. We weten al jaren dat suiker slechte gevolgen voor de gezondheid kan hebben. Daarom willen we het gemakkelijker maken voor onze klanten om minder suiker te eten. We proberen steeds meer producten gezonder te maken. Dit doen we onder andere door het verlagen van suiker in onze producten. We zijn hier twee jaar geleden mee begonnen. Onze cola bevat daarom al twee jaar 30% minder suiker!"



Vanaf nu minder suiker in onze beschuit!

We hebben nu de hoeveelheid suiker in onze beschuit verminderd. In totaal hebben we de hoeveelheid suiker met 30% verlaagd. Dat is 1 suikerklontje per pak! Onze productmanager legt uit waarom we dit hebben gedaan.

"Nederlanders krijgen te veel suiker binnen en dat willen we veranderen. Suiker zit bijna overal in, ook in producten waarvan je het misschien niet verwacht. We weten nu dat suiker slechte gevolgen voor de gezondheid kan hebben. Daarom willen we het gemakkelijker maken voor onze klanten om minder suiker te eten. We proberen steeds meer producten gezonder te maken. Dit doen we onder andere door het verlagen van suiker in onze producten. Daar zijn we nu mee begonnen. Onze beschuit bevat daarom vanaf nu 30% minder suiker!"



Al twee jaar minder suiker in onze beschuit!

Twee jaar geleden hebben we de hoeveelheid suiker in onze beschuit verminderd. In totaal hebben we de hoeveelheid suiker met 30% verlaagd. Dat is 1 suikerklontje per pak! Onze productmanager legt uit waarom we dit hebben gedaan.

"Nederlanders krijgen te veel suiker binnen en dat willen we veranderen. Suiker zit bijna overal in, ook in producten waarvan je het misschien niet verwacht. We weten al jaren dat suiker slechte gevolgen voor de gezondheid kan hebben. Daarom willen we het gemakkelijker maken voor onze klanten om minder suiker te eten. We proberen steeds meer producten gezonder te maken. Dit doen we onder andere door het verlagen van suiker in onze producten. We zijn hier twee jaar geleden mee begonnen. Onze beschuit bevat daarom al twee jaar 30% minder suiker!"



U heeft zojuist een advertentie van Supera gezien. Schrijf hieronder in een paar woorden uw eerste reactie na het zien van deze advertentie.

Geef hieronder aan in hoeverre u het eens of oneens bent met de volgende stellingen

	Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet eens, niet oneens	Beetje mee eens	Mee eens	Helemaal mee eens
Ik heb er baat bij dat de supermarkt de hoeveelheid suiker in producten verminderd	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
De supermarkt is betrokken bij haar consumenten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik denk dat de supermarkt veel heeft moeten investeren om de hoeveelheid suiker in producten te verlagen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik denk dat de supermarkt de hoeveelheid suiker heeft verminderd om hun imago te verbeteren	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik denk dat de supermarkt de hoeveelheid suiker heeft verminderd, omdat ze de gezondheid van consumenten belangrijk vinden	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Geef hieronder aan in hoeverre u het eens of oneens bent met de volgende stellingen

	Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet eens, niet oneens	Beetje mee eens	Mee eens	Helemaal mee eens
Ik vind de manier waarop deze advertentie mensen probeert te overtuigen acceptabel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
De supermarkt probeert mensen te manipuleren op een manier die ik niet prettig vind	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik vind de advertentie vervelend, omdat de supermarkt op een ongepaste manier de consument probeert te beïnvloeden	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik vind deze advertentie niet erg; de supermarkt probeert consumenten over te halen zonder erg manipulatief te zijn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
De advertentie is eerlijk in wat er wordt gezegd	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Ik vind deze advertentie...

	Oneerlijk	Eerlijk
()		

Geef hieronder aan hoe u denkt dat de smaak van dit product was voor de suikervermindering

	Helemaal niet lekker	Heel erg lekker
()		

Geef hieronder aan hoe u denkt dat de smaak van dit product is na de suikervermindering

	Helemaal niet lekker	Heel erg lekker
()		

Wat vindt u van supermarkt Supera na het zien van de advertentie?


Slecht

Goed

()	
-----	--

Onaangenaam

Aangenaam

()	
-----	--

Niet aantrekkelijk


Aantrekkelijk

()	
-----	--

Stel u bent in de supermarkt en wilt cola kopen. Zou u dan de cola uit de advertentie kopen?

Zeker niet


Zeker wel

()	
-----	--

Stel u bent in de supermarkt en wilt beschuit kopen. Zou u dan de beschuit uit de advertentie kopen?

Zeker niet

Zeker wel

()	
-----	--

In de advertentie die u heeft gezien staat vermeld wanneer de suikervermindering plaats vond.
Wanneer was dit?

Bedankt voor uw deelname aan het onderzoek!

Bent u nieuwsgierig naar de resultaten van het onderzoek, vul dan hieronder uw e-mailadres in.

Aan Wageningen Universiteit worden vaker studies verricht waarvoor wij op zoek zijn naar deelnemers. Mogen wij je hiervoor af en toe (maximaal 1 keer per maand) benaderen per e-mail? Zo ja, schrijf hieronder je e-mailadres (niet nodig als je al op deze lijst staat):

Klik op het pijltje naar rechts om uw antwoorden te versturen.

Annex III – Table with scores for all statements on consumer perception

Table 10 on the next page presents the scores – Mean (SD), main- and interaction effects - for all statements on consumer perception.

Table 10: Mean (SD), main- and interaction effects for all statements on consumer perception

	Cola		Rusk				
	Immediate disclosure	Non-immediate disclosure	Immediate disclosure	Non-immediate disclosure	Main effect disclosure	Main effect product	P-value for interaction effect
Perceived benefit ¹							
I benefit from the supermarket reducing the amount of sugar in products	5.3 (1.7)	5.6 (1.6)	5.8 (1.3)	5.9 (1.0)	0.28	0.02	0.86
The supermarket cares about their consumers	4.7 (1.5)	4.8 (1.4)	5.0 (1.4)	5.1 (1.2)	0.57	0.08	0.82
I think the supermarket needed to invest a lot to reduce the amount of sugar in products	3.9 (1.8)	3.6 (1.4)	3.9 (1.6)	3.9 (1.6)	0.40	0.56	0.38
I think the supermarket reduced the amount of sugar to improve their image	5.5 (1.5)	5.7 (1.0)	5.5 (1.0)	5.7 (1.0)	0.14	0.96	0.87
I think the supermarket reduced the amount of sugar because they care about the health of the consumers	3.7 (1.7)	3.8 (1.5)	4.0 (1.4)	3.9 (1.4)	0.99	0.33	0.40
Perceived Manipulative intent ^{1,2}							
The way this ad tries to persuade people seems acceptable to me ²	4.6 (1.5)	4.5 (1.5)	5.0 (1.5)	4.6 (1.5)	0.14	0.20	0.54
The advertiser tried to manipulate the audience in ways I do not like ²	3.6 (1.5)	3.6 (1.6)	3.1 (1.5)	3.5 (1.5)	0.24	0.12	0.31
I was annoyed by this ad because the advertiser seemed to be trying to inappropriately manage or control the consumer audience ²	3.5 (1.5)	3.2 (1.5)	2.9 (1.5)	3.2 (1.4)	0.85	0.07	0.12
I didn't mind this ad; the advertiser tried to be persuasive without being excessively manipulative ²	4.7 (1.4)	4.7 (1.4)	5.0 (1.5)	4.6 (1.5)	0.31	0.47	0.27
The ad was fair in what was said and shown ²	4.6 (1.4)	4.5 (1.4)	4.7 (1.3)	4.2 (1.4)	0.07	0.66	0.34
I think that this advertisement is unfair/fair ¹	4.1 (1.4)	4.0 (1.5)	4.2 (1.6)	3.8 (1.4)	0.23	0.90	0.27
Perceived influence on taste ²							
Before sugar reduction	3.7 (1.6)	3.9 (1.8)	4.6 (1.1)	4.4 (0.9)	0.81	<0.001	0.25
After sugar reduction	3.5 (1.5)	3.4 (1.7)	4.4 (1.2)	4.2 (1.0)	0.34	<0.001	0.88

¹ Measured on a Likert scale items 1-7

² Measured on a 7-point semantic differential scale