

The Impact of Nutri-Score on Consumer Product Attitude and Purchase Intention: Insights from an Online Survey Experiment

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Abstract

This study examines the impact of the Nutri-Score front-of-pack (FOP) nutritional label on consumer product attitudes and purchase intentions, and explores whether health consciousness moderates these effects. Using an online survey experiment with a 2x2 between-subjects design, participants were exposed to products with and without Nutri-Score labels across healthy and unhealthy breakfast cereals (granola, oatmeal, and muesli). Results indicate that Nutri-Score labeling significantly enhances consumer attitudes towards oatmeal and increases purchase intentions for both oatmeal and muesli, while having no significant effect on granola. Health consciousness did not significantly moderate these relationships. This study enhances the understanding of how FOP labeling influences consumer behavior, particularly Nutri-Score, and underscores the need for further research to explore other factors. The findings show that the effectiveness of Nutri-Score may vary by product type. Insights from this study provide valuable information for policymakers and marketers aiming to promote healthier eating habits through FOP labeling. Implementing Nutri-Score can effectively guide consumers towards better nutritional choices and aid in designing impactful health promotion strategies and marketing campaigns. This research contributes to the limited literature on Nutri-Score by demonstrating its impact on consumer attitudes and purchase intentions in an online experimental setting, offering practical recommendations for its use in health promotion and marketing.

Keywords Nutri-Score, Front-of-Pack Labeling, Consumer Product Attitudes, Purchase Intention, Health Consciousness, Online Survey Experiment

1. Introduction

Globally, obesity remains a significant population health problem (Arroyo-Johnson & Mincey, 2016). According to the World Health Organization (Organization, 2021), at least 2.8 million people worldwide die each year as a result of being overweight or obese. This issue also has a significant impact in the Netherlands. In 2019, 35.4% of adults aged 18 and older were overweight, and 14.7% were diagnosed as obese (Koetsier et al., 2020). Choosing healthier foods can help overcome these health problems.

Food producers employ several strategies to communicate the nutritional value of their products to consumers. Food labels are seen as an integral strategy to improve nutrition by making available information that can lead to healthier purchases and choices (Anastasiou et al., 2019). A relatively new nutritional label on food products is the Nutri-Score: a front-of-pack (FOP) label that gives consumers a comprehensive overview of the nutritional quality of foods (Jürkenbeck et al., 2023). The calculation of the label is based on positive and negative factors. The total score of the food product results in one of five different letters and colors ranking from A (healthy) to E (unhealthy), with corresponding colors from dark green (healthy) to red (unhealthy) (Hagmann & Siegrist, 2020). By using the Nutri-Score, consumers can make healthier purchasing decisions (De Temmerman et al., 2021). Dutch retailers have already started implementing the label, both in-store and online. The Nutri-Score is legally the new food choice label in the Netherlands from 2024 to stimulate better decision making among consumers (Rijksoverheid, 2023).

Consumer product attitudes refer to the feelings, opinions and evaluations consumers have toward a specific product (Ajzen, 2018). These attitudes are influenced by several factors, including individual experiences, social influences, and marketing. The same author mentions that attitudes can be positive, negative, or neutral and play a crucial role in shaping consumer buying behavior. Purchase intention refers to the extent to which a consumer intends to buy a particular product or service (Spears & Singh, 2004). It is an important indicator for predicting actual purchasing behavior. Several factors can affect purchase intention, including price, brand reputation, consumer attitudes, product quality and marketing efforts (Mirabi et al., 2015).

So far, studies have explored the impact of FOP labels on food choices and purchase intention (Gorski Findling et al., 2018; Menger-Ogle & Graham, 2018). Furthermore, scholars already scrutinize the moderating effects of different socio-demographic groups such as gender and education (Egnell et al., 2018; Ikonen et al., 2020). Moreover, consumers who are motivated to eat healthy – ones who for example want to lose weight – are more likely to use information on FOP labels. Healthy products with nutritional information (such as health

claims) on the front of the package are appealing to people who are dieting (Lwin et al., 2014; Girz et al., 2012). Because individual differences such as health consciousness have often not been considered in previous studies on FOP labeling, these differences may explain some of the varied findings in previous studies (van den Akker et al., 2022). Therefore, health consciousness could potentially be a moderating factor in the relationship between Nutri-Score labeling and consumer product attitudes, as well as in the relationship between Nutri-Score labeling and purchase intention.

Nutri-Score is distinguished from other FOP labels by its comprehensive evaluation of both positive and negative nutritional attributes, resulting in a single, easy-to-understand color-coded letter. This allows consumers to quickly understand the overall nutritional value of a product (Egnell, Galan, et al., 2020). Nutri-Score is significantly more effective than all other FOP labels (Crosetto et al., 2018). Nevertheless, to our knowledge, little is known about the relationship between Nutri-Score and consumer product attitudes and purchase intention, with the potential effect of health consciousness on the relationship between these concepts. This is problematic for several reasons. First, Nutri-Score plays a crucial role in guiding consumers toward healthier food choices – for better informed customers (Egnell, Galan, et al., 2020). Furthermore, understanding Nutri-Score can increase differentiation in FOP labeling. Differentiation within FOP labels is essential, as it allows consumers to make healthier choices by quickly understanding the nutritional value of different products (Fialon et al., 2021). Overall, understanding the relationship is important to expand consumer behavior literature through strengthening product attitudes and purchase intention in relation to FOP labeling. Furthermore, understanding how Nutri-Score labeling affects consumer product attitudes and behavior is essential for effective implementation of the label (Folkvord et al., 2021).

In this regards, the objective of this study is to understand the effect of the Nutri-Score on consumer behavior, specifically focusing on their product attitudes and purchase intention. The following central research question has been formulated for this study: *“What is the effect of Nutri-Score labeling on consumers’ product attitudes and their purchase intention?”* In exploring this research question, we acknowledge that health consciousness can play a moderating role between Nutri-Score labeling and consumer product attitudes and purchase intention. So, the following sub-question has been formulated: *“What is the effect of Nutri-Score labeling on consumers’ product attitudes and their purchase intention, moderated by health consciousness?”*

This research uses a deductive approach to test a theory and increase knowledge about this topic (Hyde, 2000). Quantitative data is collected through an online survey experiment.

Convenience sampling is used to target adults. This experimental study consists of a 2x2 (with Nutri-Score vs. without Nutri-Score and healthy products vs. unhealthy products) between-subjects design. The survey taps into the participants' product attitudes, purchase intention, and health consciousness.

The findings show that Nutri-Score labeling significantly influences consumer product attitudes and purchase intentions depending on cereal type. Oatmeal received more positive consumer attitudes if it was associated with a higher Nutri-Score (A), indicating perceived health benefits. Both oatmeal and muesli showed higher purchase intention when associated with a higher Nutri-Score (A) rating. However, Nutri-Score had no significant influence on consumer attitudes or purchase intention toward granola. Surprisingly, consumer health consciousness did not significantly affect these relationships. These findings underscore the varied effects of Nutri-Score labeling on consumer behavior, influenced by specific cereal types and other factors that influence consumer perceptions and food choices.

This research makes three important contributions to the existing literature. First, we expand literature on how Nutri-Score labeling affects consumers' attitudes towards food products (De Temmerman et al., 2021; Folkvord et al., 2021). Our study shows the significant variation in influence among different product types by providing detailed insights into how Nutri-Score labels shape consumers' attitudes toward different breakfast cereals. Specifically, we show that Nutri-Score labeling improves attitudes toward oatmeal but has no significant effect on attitudes toward granola and muesli. This highlights the need to include product-specific factors in nutrition labeling studies. Second, we enrich the knowledge on how Nutri-Score labeling affects consumers' purchase intentions for food products (De Temmerman et al., 2021; Crosetto et al., 2018). Our research deepens the understanding of purchase intentions by examining how Nutri-Score labeling influences consumers' purchase decisions across different product types. Specifically, we show that Nutri-Score labeling increases purchase intentions for oatmeal and muesli but not for granola, emphasizing the role of for example perceived healthiness and consumer familiarity in guiding purchase decisions. Third, this study contributes to the literature on health consciousness and consumer behavior (Mai & Hoffmann, 2012), by evaluating the role of health consciousness as a moderating factor in the relationship between Nutri-Score labeling and consumer behavior. Contrary to previous studies (Mai & Hoffmann, 2012), our findings indicate that health consciousness does not significantly moderate the influence of Nutri-Score on consumers' product attitudes or purchase intentions. This suggests the need for a broader examination of potential moderators in future research.

Practically, this study helps policymakers and marketers understand how consumers respond to Nutri-Score as nutritional information, which is valuable for developing health promotions and effective marketing strategies.

The structure of this paper is as follows. First, the literature review covers the theoretical underpinnings of key concepts, formulating hypotheses, and concluding with the conceptual model. Next, the research methodology used in this study is laid out. The study then focuses on analyzing and presenting the research findings. Finally, the conclusion and discussion are described, addressing both theoretical and practical implications, acknowledging limitations, and offering insightful suggestions for future research.

2. Theory

2.1. Front-of-pack labels

Since 2016, nutrition labeling has been mandatory on all prepackaged foods (*Voedingswaarde Op Etiket - Eurowet*, 2021). Food labels are of great importance because they help people make healthier food choices (Temple, 2020). There are several types of food labels, including front-of-package (FOP) labels and back-of-package (BOP) labels. For many years, the only labels in common use were BOP labels. These usually took the form of a small chart with numerical information. Research shows that most consumers cannot interpret these BOP labels properly (Cowburn & Stockley, 2005). For this reason, among others, in recent years many countries have introduced much simpler FOP labels. FOP labels are placed on products to help consumers make healthier food choices in a simple and quick way (Kühne et al., 2022). FOP labels focus specifically on providing information that allows consumers to make quick decisions about the nutritional value or relative health of a product. The labels have a simple and understandable format and are primarily used by food manufacturers for marketing purposes, with the goal of highlighting the claimed benefits of their products (Folkvord et al., 2021). The use of FOP nutrition labels is recommended by the World Health Organization as a policy tool to address overweight and obesity (“Guiding Principles and Framework Manual for Front-of-Pack Labelling for Promoting Healthy Diet,” 2019).

2.1.1. Categorization of front-of-pack labels

Several FOP designs are now in use worldwide (Temple, 2020). FOP labels can be divided into two main categories (Ikonen et al., 2020). The first category includes reductive labels, which reduce the amount of nutritional information without adding any interpretation. An example of

such a reductive FOP label is the calorie label. The second category involves interpretive labels, which provide a more in-depth evaluation of information. These interpretive labels can be further divided into two sub types, depending on the nature of the information provided. The first subtype are interpretive nutrient-specific labels, such as the Multiple Traffic Light (MTL) label, which add an evaluation or interpretation of health value. The second subtype is the interpretive summary indicator label, which provides an overview of the overall nutritional information and also offers an evaluation. This summary helps in understanding the overall value of health. Labels such as health logos and rating labels are useful for consumers who want to compare different options and make the healthiest choice (Anderson & O'Connor, 2019). A recently developed summary rating label is the Nutri-Score, which is explained further in the next section (Egnell, Talati, et al., 2020).

2.1.2. Nutri-Score

This study is focused on one FOP label: the Nutri-Score. The Nutri-Score is a summary indicator, as noted above (Egnell et al., 2018). The label is a color-coded, rated FOP label from France. As *Figure 1* shows, the Nutri-Score is represented as a combination of a letter (A to E) and a color (from dark green to red), with A reflecting the highest nutritional quality and E the lowest. The central, category C (yellow) aims to discourage dichotomous thinking (De Temmerman et al., 2021). Noteworthy is that the Nutri-Score looks at each product group rather than the food in general. It indicates whether a product is healthier compared to the same type of product. The complete scale is shown on the front of the package, with the letters and combined colors corresponding to the product's nutritional quality. The final score of the product is enlarged, making it easily identifiable (Julia & Hercberg, 2017). The Nutri-Score does not serve as a replacement for the legally required BOP labels. Instead, the label provides an overview to help consumers understand the complex nutrition tables and guide them in making healthier food choices. The Nutri-Score is distinguished from other FOP labels by its comprehensive evaluation of both positive and negative nutritional attributes, resulting in a single, easy-to-understand color-coded letter. This allows consumers to quickly understand the overall nutritional value of a product (Egnell, Galan, et al., 2020). The Nutri-Score has been adopted by several European countries and several food companies are labeling their products on a voluntary basis (Gassler et al., 2023).



Figure 1. Nutri-Score label. Adapted from: (De Temmerman et al., 2021))

2.1.3. Nutri-Score calculation

The Nutri-Score is calculated by considering both positive and negative nutritional components of a product. Negative components are energy, sugars, saturated fat and salt. The higher these values are, the worse the score is. On the other hand, positive components such as vegetables, fruits, nuts, legumes, fiber, and proteins contribute to a better score (Julia & Hercberg, 2017). The algorithm weighs certain factors more heavily than the others. For example, saturated fats and sugars are rated more heavily. Products with more fiber and protein, on the other hand, are rewarded. Ultimately, the combination of these positive and negative factors leads to a Nutri-Score, which is translated into a letter rating: A, B, C, D or E. As described earlier, the letter A indicates a healthier product, while the letter E indicates that the product is less healthy (De Temmerman et al., 2021). The intent is to give consumers a clear, understandable perception of a product's nutritional quality, making it easier for consumers to make healthy choices while shopping.

2.2. Nutri-Score and Consumer product attitudes

This study examines the effect of Nutri-Score on consumer product attitudes. Consumer product attitudes refer to the feelings, opinions, evaluations, and beliefs consumers have toward a specific product (Ajzen, 2018). These attitudes are influenced by various factors, including individual experiences, social influences, and marketing. The same author mentions that attitudes can be positive, negative, or neutral and play a crucial role in shaping consumer buying behavior. Consumers are influenced by their attitudes and beliefs when making food choices. Beliefs about nutritional quality and its supposed impact on health may play a larger role than actual nutritional quality and health effects in determining a person's food choices (Folkvord et al., 2021). Research based on a consumer study involving three different food choice labels found that Nutri-Score was best understood by consumers (*Zo Koos de Overheid Nutri-Score / Voeding / Rijksoverheid.NL*, n.d.). Studies have also shown that simpler and more direct labels, like the Nutri-Score, are more effective in changing food choices toward healthier ones (Folkvord et al., 2021). Consumers look more at nutrition information on the front of the

package than on the back of the package and consumers also experience lower levels of effort in making healthier food choices when nutrition labels are present on the front of the package (Graham et al., 2015). Consumers are more likely to make healthier food choices when informed with the Nutri-Score nutrition label compared to situations where no FOB label is present. As a result, consumers are expected to have a more positive attitude toward the product with a favorable and higher Nutri-Score than when such a score is not available (Crosetto et al., 2018). Moreover, for unhealthy products (Nutri-Score D or E), product attitudes are expected to be lower compared to situations where no Nutri-Score is applied. This occurs when consumers become aware that the product is not beneficial to their health (Feunekes et al., 2008). Products with a higher Nutri-Score are expected to have a more positive attitude among consumers than the products with a lower Nutri-Score (Folkvord et al., 2021). Based on the expectations from previous literature, the following hypothesis (H1) have been formulated.

(H1). *Consumers exposed to food products with a higher (lower) Nutri-score label will have a more (less) positive attitude towards these food products, compared to consumers exposed to food products without the Nutri-Score.*

2.3. Nutri-Score and Purchase intention

This study examines the effect of Nutri-Score on purchase intention. Purchase intention refers to the extent to which a consumer intends to buy a particular product or service (Spears & Singh, 2004). It is an important indicator for predicting actual purchasing behavior. Several factors can affect purchase intention, including price, brand reputation, consumer attitudes, product quality and marketing efforts (Mirabi et al., 2015). Consumers view the nutritional quality of food products as an important factor influencing purchase intention. Nutrition information encourages consumers to process nutrition information before making a choice and influences consumers at the time of purchase (Folkvord et al., 2021). As stated before, consumers are more likely to make healthier food choices when informed with the Nutri-Score nutrition label compared to situations where no FOB label is present. As a result, consumers are expected to show a greater propensity to purchase products with a favorable Nutri-Score compared to cases where such a score is not present (Crosetto et al., 2018). So, this effect is expected to be stronger for healthier products (Nutri-Score A or B). Moreover, for unhealthy products (Nutri-Score D or E), purchase intention is expected to be lower compared to situations where no Nutri-Score is applied. This is because consumers become aware that the product is unhealthy (Feunekes et al., 2008). Products with a higher Nutri-Score are expected to have a higher purchase intention

than those with a lower Nutri-Score (Crosetto et al., 2018). Based on the expectations from previous literature, the following hypothesis (H2) have been formulated.

(H2). *Consumers exposed to food products with a higher (lower) Nutri-score label will have a more (less) positive purchase intention towards these food products, compared to consumers exposed to food products without the Nutri-Score.*

2.4. Moderating role of Health consciousness

The focus of this paper is on the effectiveness of health consciousness in the relationship between Nutri-Score labeling and consumer product attitudes and purchase intention. Health consciousness could potentially be a moderating factor in the relationship between Nutri-Score labeling and consumer product attitudes, as well as in the relationship between Nutri-Score labeling and purchase intention. In recent years, people have become more health-conscious (Hernandez-Fernandez et al., 2022). The global food industry is undergoing a significant shift in consumer preference for healthier food choices. Recent decades have shown that consumers' concern for healthier lifestyles and their concern for the environment are driving changes in food purchasing intentions (Petrescu et al., 2019). When choosing food, health is often considered important (Puska & Luomala, 2016). Consumers who are highly motivated to eat healthy are more interested in information on the front of packages. For people who are dieting and want to lose weight, products with clear nutritional information on the FOP label are particularly attractive (Lwin et al., 2014; Girz et al., 2012). However, previous studies of FOP labeling have often failed to take sufficient account of individual differences, such as consumer health consciousness. This may partly explain the differences in the results of previous studies (van den Akker et al., 2022). Health-conscious consumers are expected to be more sensitive to the health-related aspects of food products (Mai & Hoffmann, 2012). As a result, the impact of Nutri-Score on their product attitude and purchase intention increases more relative to consumers with higher health consciousness. Consumers who pay attention to their health consciousness tend to buy healthier products (Singhal, 2017). Therefore, product attitudes and purchase intention are expected to be higher for products with higher Nutri-Score (Nutri-Score A or B). Based on the expectations from previous literature, the following hypotheses (H3a, H3b) have been formulated.

(H3a). *Consumers with higher health consciousness exposed to food products with higher (lower) Nutri-Score label will have a more (less) positive attitude toward these food products.*

(H3b). Consumers with higher health consciousness exposed to food products with higher (lower) Nutri-Score label will have a more (less) positive purchase intention toward these food products.

2.5. Conceptual model

This research is about consumer product attitudes and purchase intention regarding food products, specifically looking at the presence of the Nutri-Score label. The underlying concepts of the study are incorporated into a conceptual model (Figure 2), which visualizes the previously formulated hypotheses. The model shows the expected effect of the Nutri-Score on consumer product attitudes and purchase intention, including the moderating role of health consciousness.

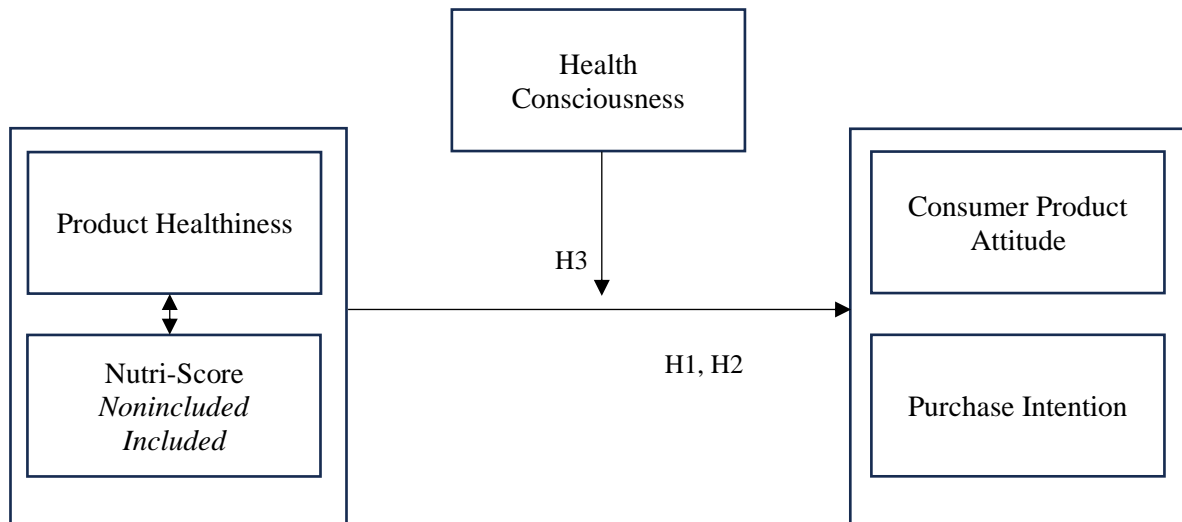


Figure 2. Conceptual Model including hypotheses

3. Method

3.1. Research Design

The purpose of this study is to test theory and expand knowledge about the effect of the Nutri-Score on consumer product attitudes and purchase intention, with health consciousness serving as a potential moderator. Therefore, the study is conducted from a deductive approach (Hyde, 2000).

A quantitative research method is used within this study because this method allows for larger samples, which improves reliability and generalizability (Tipton, 2014). When conducting quantitative research, various methods can be used to collect data. One of the most

common approaches is to use (online) surveys. Advantages of online surveys include absence of interviewer bias, cost reduction and convenience for participants (Van Selm & Jankowski, 2006). Another advantage of a survey is the ease of analyzing differences between groups, which is very useful for testing the different effects of the Nutri-Score on consumer product attitudes and purchase intention (Choy, 2014). This study is cross-sectional because it collects data from the population at one specific point in time to identify variation between cases (Field, 2005).

To test the hypotheses, this study uses an online survey experiment. The survey taps into the participant's product attitudes, purchase intention and health consciousness. The survey is a self-administered questionnaire. A SAQ has several advantages such as flexibility for participants, maintaining anonymity, cost reduction and wide reach because the questionnaire is available online (Donsbach & W.Traugott, 2008). To analyze the causal influence of the Nutri-Score on consumer product attitudes and purchase intention, the use of an online survey experiment is useful. This experiment consists of a 2x2 (with Nutri-Score vs. without Nutri-Score and healthy products vs. unhealthy products) between-subjects design. The between-subjects design means that different groups of people are exposed to only one specific treatment or condition (Charness et al., 2012). In this study, the treatment is the absence or presence of the Nutri-Score label on food products and the categorization as healthy or unhealthy. Participants are randomly assigned to one of the four scenarios to increase external validity. Each participant then answers the same questions about their consumer product attitudes, purchase intention and health consciousness. The product category chosen for this research is breakfast cereals. Breakfast cereals are popular and for many consumers in the Netherlands a regular part of breakfast (*Ontbijtgranen | Consumentenbond*, 2019). The three breakfast cereal products chosen for this study are granola, oatmeal and muesli. The products are self-created with Canva. The outcome of the designs created are presented in *Appendix 1*. To increase realism, participants can also see the nutritional information on the back of the product.

3.2. Pre-test for designed breakfast cereals

To investigate the effect of the Nutri-Score on consumer product attitudes and purchase intention, stimuli products have to be designed. The products are different breakfast cereals: granola, oatmeal, and muesli. For each type of breakfast cereal, there are four variations as stimuli: healthy breakfast cereals with Nutri-Score A, healthy breakfast cereals without Nutri-Score, unhealthy breakfast cereals with Nutri-Score D, and unhealthy breakfast cereals without Nutri-Score (*Table 1*). To discover participants' perceptions for the displayed products, a pre-

test is conducted. Since the pre-test is intended to test the authenticity of both healthy and unhealthy breakfast cereals, only those without Nutri-Score (scenarios 2 and 4) are examined. The visual products used in the main study (*Appendix 1*) are created using the findings from the pre-test.

<i>Scenario</i>	<i>Healthiness cereals</i>	<i>Nutri-Score</i>
Scenario 1	Healthy	Present
Scenario 2	Healthy	Absent
Scenario 3	Unhealthy	Present
Scenario 4	Unhealthy	Absent

Table 1. Overview of the experimental conditions

3.2.1. Pre-test procedure

The participants for this pre-test are selected personally. Each participant received assurances about the security and confidentiality of their information. In addition, it was mentioned that completing the questionnaire was optional and that they could leave the study at any time. The questionnaire is created with the online survey tool Qualtrics. First, the purpose of the study as well as the stimuli that would be tested in the questionnaire is clarified to the participants.

Participants are asked to fill in their preferences for different breakfast cereals based on credibility and healthiness (*Table 2*). Credibility is measured with a three-item scale and the items are measured on a seven-point Likert scale ranging from 1 [not at all] to 7 [very much] (Williams & Drolet, 2005). The original scale items are focused on advertisements but have been changed to products. The modified items include: “This product is believable”, “This product is credible” and “This product is realistic”. Perceived healthiness, a four-item scale, is used and measured on a seven-point Likert scale ranging from 1 to 7 (Kozup et al., 2003). Participants have to answer the following questions: “I think the nutrition level of this product is:” [poor/good], “Based on the information provided, how important would this product be as a part of a healthy diet?” [not important at all/very important], “This product is: [bad for your heart/good for your heart], “Overall, how would you rate the level of nutritiousness suggested by the information provided?” [not nutritious at all/very nutritious].

Construct	Operationalization	Source	Items
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Credibility	The perceived credibility and realism of a product	(Williams & Drolet, 2005)	This product is believable. This product is credible. This product is realistic.
Healthiness	The perceived healthiness of a product	(Kozup et al., 2003)	I think the nutrition level of this product is: <i>[poor/good]</i> Based on the information provided, how important would this product be as a part of a healthy diet? <i>[not important at all/very important]</i> This product is: <i>[bad for your heart/good for your heart]</i> Overall, how would you rate the level of nutritiousness suggested by the information provided? <i>[not nutritious at all/very nutritious]</i>

Table 2. Operationalization of pre-test constructs

3.2.2. Pre-test results

The questionnaire is completed by a total of 16 participants. The participants' responses are exported and analyzed by descriptive statistics using SPSS. *Table 3* summarizes the results of scenario 2: healthy breakfast cereals without Nutri-Score, and *Table 4* presents the results of scenario 4: unhealthy breakfast cereals without Nutri-Score. The full summary of the results can be found in *Appendix 3*.

Construct	Granola (healthy)	Oatmeal (healthy)	Muesli (healthy)
<i>Credibility</i>	M= 4.52, SD= 1.36	M= 4.90, SD= 1.29	M= 4.06, SD= 1.43
<i>Healthiness</i>	M= 4.25, SD= 1.06	M= 4.91, SD= 1.29	M= 4.36, SD= 1.13

Table 3. Results of scenario 2

Construct	Granola (unhealthy)	Oatmeal (unhealthy)	Muesli (unhealthy)
<i>Credibility</i>	M= 4.75, SD= 1.21	M= 4.38, SD= 1.28	M= 4.48, SD= .99
<i>Healthiness</i>	M= 3.38, SD= 1.21	M= 3.39, SD= .94	M= 3.31, SD= .83

Table 4. Results of scenario 4

Participants reported that healthy granola was perceived as somewhere between neutral and somewhat credible ($M= 4.52, SD= 1.36$), similarly for healthy oatmeal ($M= 4.90, SD= 1.29$) and healthy muesli ($M= 4.06, SD= 1.43$). Additionally, participants reported that they perceived healthy granola as somewhere between neutral and somewhat healthy ($M= 4.25, SD= 1.06$), similar to healthy oatmeal ($M= 4.91, SD= 1.29$) and healthy muesli ($M= 4.36, SD= 1.13$).

Regarding unhealthy breakfast cereals, participants also indicated that they perceived unhealthy granola as somewhere between neutral and somewhat credible ($M= 4.75, SD= 1.21$), similar to unhealthy oatmeal ($M= 4.38, SD= 1.28$) and unhealthy muesli ($M= 4.48, SD= .99$). Participants reported that they perceived unhealthy granola as somewhere between bad and neutral ($M= 3.38, SD= 1.21$), the same as for unhealthy oatmeal ($M= 3.39, SD= .94$) and healthy granola ($M= 3.31, SD= .83$).

After evaluating the results of the pre-test, some participants were asked to provide feedback. This feedback was collected from randomly selected participants who participated in the pre-test. Participants were aware that the pre-test covered different breakfast cereals, but some found it difficult to distinguish between the breakfast cereals because granola, oatmeal, and muesli are very similar in appearance. Therefore, an area for improvement is to give each breakfast cereal product a different color instead of giving them all the same beige color. It was also noted that due to the presence of natural sugars in the healthy breakfast cereals, it was not clear that the product can be considered healthy. Additionally, the amount of fat (7 grams) was considered unhealthy by some participants. A possible improvement would be to reduce both sugars and fats. Regarding the nutritional value list, the pre-test showed that the healthy breakfast cereals were considered healthier than the unhealthy varieties, so no adjustment will be made to the nutritional value list of the unhealthy breakfast cereals. The adapted visual products and nutritional information created using the findings from the pre-test can be found in *Appendix 1*.

3.3. Research Sample

Nutri-Score has one recently been introduced in the Netherlands and little research has been conducted on this topic in the Dutch context. Therefore, this research is conducted in the Netherlands.

For this study, convenience sampling is applied to target adults. This method is a non-probability sampling technique, meaning that not every individual has an equal chance of participating in the study (Acharya et al., 2013). Convenience sampling is used because there were no specific selection criteria that participants had to meet. Anyone over the age of 18 is

considered suitable, because it is assumed that all adults have experience with supermarkets and their products. However, it is important to note that the effect of the Nutri-Score on consumer product attitudes and purchase intention may vary between different consumer groups. Future research is needed on different groups of consumers who use FOP labels, including Nutri-Score, when making a food product choice (van den Akker et al., 2022). Although this study focuses on health-conscious consumers, control variables are also considered. To consider possible variations, an analysis is conducted in which the results were divided and discussed based on different demographic groups, such as gender, age and education level. In this way, a better understanding of how different consumer groups respond to the Nutri-Score can be obtained. The use of convenience sampling makes data collection easy and efficient because a lot of information can be collected quickly (Taherdoost, 2016). In addition, the snowball technique is used, which is seamless with convenience sampling and falls also under non-probability sampling technique (Taherdoost, 2016). The survey is distributed online via WhatsApp and various social media channels, asking personal and professional connections to participate and further share the survey.

3.4. Procedure

Data for this study is collected using the online survey tool Qualtrics. The survey can be found in *Appendix 2*. To ensure that each participant understands the questions, the language of the survey is Dutch. At the start of the survey, participants are given an introduction briefly explaining the purpose of the study. Participants are also informed about the estimated duration of the study and are assured that the results remain anonymous and are not shared with third parties. After reading and agreeing to the introduction, all Participants are randomly assigned to one of the four conditions: healthy breakfast cereals with Nutri-Score label A, healthy breakfast cereals without Nutri-Score label, unhealthy breakfast cereals with Nutri-Score label D or unhealthy breakfast cereals without Nutri-Score label. In each scenario, participants were shown three different breakfast cereals: granola, oatmeal and muesli. Nutritional value of the breakfast cereals were shown to make the shopping experience seem as real as possible. The four conditions were asked the same questions about consumer product attitudes, purchase intention and health consciousness. The survey also addressed some manipulation control questions. Finally, the survey ended with demographic questions about gender, age and education.

3.5. Measures

Three constructs are developed to measure the effect of the Nutri-Score label, namely consumer attitude towards the product, purchase intention of the product and health consciousness of the consumer (Table 5). To ensure internal validity, measurement scales from academic literature are used. The scales used – originally designed in English – have been translated into Dutch in the survey.

For the first dependent variable, product attitude, a five-item scale is used and measured on a seven-point Likert scale ranging from 1 to 7 (Kozup et al., 2003; Spears & Singh, 2004). Participants have to answer the following questions: “Based on the information shown for this food product, what is your overall attitude toward the product?” [unfavorable/favorable], “Based on the information shown for this food product, what is your overall attitude toward the product?” [bad/good], “Based on the information shown for this food product, what is your overall attitude toward the product?” [negative/positive], “Based on the information shown for this food product, what is your overall attitude toward the product?” [unlikable/likable] and “Based on the information shown for this food product, what is your overall attitude toward the product?” [unappealing/appealing].

The second dependent variable, purchase intention, is measured with a three-item scale developed by Mai and Hoffmann (Mai & Hoffmann, 2015). The items are measured on a seven-point Likert scale ranging from 1 [strongly disagree] to 7 [strongly agree]. The three items are: “I will buy this product”, “Next time I am buying breakfast cereals, I will choose this product” and “I prefer this product to other breakfast cereals.”

The moderator, health consciousness, is measured with a nine-item scale and the items are also measured on a seven-point Likert scale ranging from 1 [strongly disagree] to 7 [strongly agree] (Espinosa & Kadić-Maglajlić, 2018). The items include: “I reflect about my health a lot”, “I am very self-conscious about my health”, “I know my inner feelings about my health”, “I am constantly examining my health”, “I am alert to changes in my health”, “I am usually aware of my health”, “I am frequently aware of the state of my health”, “I notice how I feel physically through the day” and “I am very involved with my health.”

Finally, manipulation checks are conducted to ensure the effectiveness of exposure to the manipulation of the Nutri-Score, participants' ability to assess the healthiness of the product and whether participants viewed the nutritional information on the back of the package. The first item included to check whether participants had seen the Nutri-Score is: "The Nutri-Score label for the products I just saw was." Participants were able to answer “Nutri-Score (A-D)” or “No Nutri-Score was shown.” The second item included to check whether participants have

seen the BOP label is: "I have seen the back-of-pack nutritional information." Participants were able to answer "yes" or "no" to this item. The final item regarding the perceived health of the product was measured using a seven-point Likert scale ranging from 1 [strongly disagree] to 7 [strongly agree]: "I could easily assess how healthy the product was."

Construct	Operationalization	Source	Items
Product attitude	The general attitude toward the product	(Kozup et al., 2003; Spears & Singh, 2004)	Based on the information shown for this food product, what is your overall attitude toward the product? [unfavorable, favorable] [bad, good] [negative, positive] [unlikable, likable] [unappealing, appealing]
Purchase intention	The purchase intention for the product	(Mai, R., & Hoffmann, S., 2015)	I will buy this product. Next time I am buying breakfast cereals, I will choose this product. I prefer this product to other breakfast cereals.
Health consciousness	Consumer health consciousness	(Espinosa & Kadić-Maglajlić, 2018)	I reflect about my health a lot. I am very self-conscious about my health. I know my inner feelings about my health. I am constantly examining my health. I am alert to changes in my health. I am usually aware of my health. I am frequently aware of the state of my health. I notice how I feel physically through the day. I am very involved with my health.

Table 5. Operationalization of constructs

4. Results

4.1. Sample description

The sample for this study consists of participants who completed the online questionnaire. Initially, 271 participants started the questionnaire. After excluding empty and unusable cases with missing values, 227 participants remained. Of these participants, 114 participated in the experimental condition: 57 people saw healthy breakfast cereals with a high Nutri-Score, and 57 people saw unhealthy breakfast cereals with a low Nutri-Score. The remaining 113 people participated in the control group: 59 people saw healthy breakfast cereals without Nutri-Score, and 54 people saw unhealthy breakfast cereals without Nutri-Score.

Appendix 4 shows the demographics of the participants. Of the 227 participants, the majority were female (61.2%) and 38.3% were men. One participant identified themselves as other. Most participants were between the ages of 21 and 30 (60.4%). Finally, the majority of respondents were college or university educated (81.1%).

4.2. Reliability analysis

Since the measurement scales used in this study have been previously validated and applied in previous research, their validity has been proven. To assess the internal consistency of these scales, reliability analyses were conducted. A Cronbach's alpha value greater than 0.7 is generally considered acceptable (Field, 2017). In this study, all scales significantly exceeded this threshold. As shown in *Table 6*, the scale for product attitude, purchase intention and health consciousness all have Cronbach's alpha value above 0.90, indicating very high reliability.

Construct	Items	M	SD
Product attitude			
Granola ($\alpha = .963$)	PA 1	4.16	1.63
	PA 2	4.23	1.58
	PA 3	4.31	1.52
	PA 4	4.41	1.43
	PA 5	4.09	1.49
Oatmeal ($\alpha = .970$)	PA 1	4.20	1.65
	PA 2	4.30	1.53
	PA 3	4.28	1.53
	PA 4	4.33	1.48
	PA 5	4.22	1.45
Muesli ($\alpha = .974$)		4.11	1.60

	PA 1	4.15	1.57
	PA 2	4.20	1.54
	PA 3	4.24	1.52
	PA 4	4.22	1.54
	PA 5		
Purchase intention			
Granola ($\alpha = .934$)	PI 1	3.43	1.67
	PI 2	3.27	1.63
	PI 3	3.18	1.63
Oatmeal ($\alpha = .951$)	PI 1	3.63	1.66
	PI 2	3.58	1.66
	PI 3	3.46	1.75
Muesli ($\alpha = .964$)	PI 1	3.63	1.67
	PI 2	3.53	1.70
	PI 3	3.52	1.72
Health consciousness			
($\alpha = .905$)	HC 1	5.45	1.09
	HC 2	5.41	1.06
	HC 3	5.36	1.05
	HC 4	4.15	1.43
	HC 5	5.10	1.22
	HC 6	5.40	.94
	HC 7	5.34	.95
	HC 8	5.48	.95
	HC 9	5.31	1.09

Table 6. Reliability statistics of the constructs

4.3. Correlation analysis

To understand the relationships between the variables, a correlation analysis (Spearman's rho) was conducted. The results of this analysis, described in *Appendix 5*, reveal several significant findings. In particular, there were strong positive correlations between product healthiness and both attitudes toward the product and purchase intention for granola, oatmeal and granola ($p < .001$). Moreover, while Nutri-Score showed no significant correlations with other variables ($p > .05$), positive attitudes toward one breakfast cereal type were strongly associated with positive attitudes and purchase intentions for other breakfast cereals ($p < .001$). Interestingly, there was also no significant correlation between health consciousness and other measured variables (p

>.05), indicating that in this setting it may not directly influence consumer perception or behavior.

4.4. Manipulation checks

Three manipulation checks were considered, an overview of which is shown in *Appendix 6*. The first check assessed whether the main manipulation - the presence or absence of the Nutri-Score - was effective. In the control condition, in which no Nutri-Score was shown, 113 people participated. Of these, 44 participants (74.6%) in the healthy breakfast cereals reported that they had not seen the Nutri-Score, while 15 participants (25.4%) reported that they had seen the label even though it was not shown to them. In addition, in the unhealthy breakfast cereals, 42 participants (77.8%) reported that they had not seen the Nutri-Score, while 12 participants (22.2%) reported that they had seen the label even though it was not shown to them.

In the experimental condition, where 114 participants were exposed to the Nutri-Score label on the packages, 42 people (73.7%) in the healthy breakfast cereals reported that they had seen the Nutri-Score label A, while 15 participants (26.3%) had seen a different Nutri-Score letter or no Nutri-Score at all. In addition, for the unhealthy breakfast cereals, 39 people (68.4%) reported that they had seen the Nutri-Score label D, while 18 participants (31.6%) had seen a different Nutri-Score letter or no Nutri-Score at all.

The manipulation is successful, as more participants reported seeing the label in the experimental condition. Despite reports of not seeing the Nutri-Score not negating its effectiveness, it would have been better if a greater number of participants in the experimental condition had reported seeing the correct Nutri-Score label.

The second manipulation check was conducted to evaluate how well participants could assess the health of breakfast cereals both with and without Nutri-Score. An independent t-test compared the reported ability to assess the health of breakfast cereals between these two conditions. Results indicated an insignificant difference in scores for the presence of the Nutri-Score ($M = 4.69$, $SD = 1.42$) and the absence of the Nutri-Score ($M = 4.4$, $SD = 1.49$) conditions; $t(225) = -1.524$, $p = .129$. This finding suggests that the presence of the Nutri-Score had no significant effect on the participants' reported ability to assess the health of breakfast cereals.

The final manipulation check was conducted to evaluate whether participants noticed the nutritional information on the back of the package, both with and without Nutri-Score. 191 of 227 participants (84.1%) reported seeing the nutritional values on the back of the package. An independent t-test was conducted to determine if the presence of the Nutri-Score had an

impact on seeing the nutritional values on the back of the package. The results indicated no significant differences between the presence of the Nutri-Score ($M = 1.85, SD = .36$) and the absence of the Nutri-Score ($M = 1.83, SD = .38$) conditions; $t(225) = -.391, p = .696$.

4.5. Hypotheses testing

A regression analysis was conducted to study the effect of the Nutri-Score label on consumer product attitudes and purchase intention. *Table 7* shows the analyses for the different breakfast cereals (granola, oatmeal and muesli) for the variable product attitude and *Table 8* shows the analyses for the variable purchase intention.

4.5.1. Results relationship Nutri-Score and Consumer product attitudes

The first hypothesis is the following: **(H1)**. *Consumers exposed to food products with a higher (lower) Nutri-score label will have a more (less) positive attitude towards these food products, compared to consumers exposed to food products without the Nutri-Score.*

For granola, the coefficients for HealthyNutriScore in Model 2 (.514, $p > .05$) are statistically insignificant, indicating that the healthy Nutri-Score (A) label does not significantly affect consumer attitudes toward granola. Also, for muesli, the HealthyNutriScore is not significant in Model 2 (.541, $p > .05$). This suggests that the Nutri-Score also does not affect consumers' attitudes toward muesli. In contrast, for oatmeal, the HealthyNutriScore is positively significant in Model 2 (1.105, $p < .01$), indicating that a higher Nutri-Score positively influences consumers' attitudes toward oatmeal. Hypothesis 1 is therefore not supported for granola and muesli but is supported for oatmeal. These findings imply that the effect of Nutri-Score labeling on consumer attitudes varies by product type. While the Nutri-Score label improves attitudes toward oatmeal, it has no significant effect on attitudes toward granola and muesli. This indicates that the effectiveness of Nutri-Score labeling is product-specific.

4.5.2. Results relationship Nutri-Score and Purchase intention

The second hypothesis is the following: **(H2)**. *Consumers exposed to food products with a higher (lower) Nutri-score label will have a more (less) positive purchase intention towards these food products, compared to consumers exposed to food products without the Nutri-Score.*

For granola, the coefficients for HealthyNutriScore in Model 2 (.609, $p > .05$) are statistically insignificant, indicating that the healthy Nutri-Score (A) label does not significantly affect purchase intention for granola. For oatmeal, the HealthyNutriScore is positively significant in Model 2 (1.620, $p < .001$), indicating that a higher Nutri-Score positively

influences consumers' purchase intention for oatmeal. Also, for muesli the HealthyNutriScore is positively significant in Model 2 (.959, $p < .05$), indicating that a higher Nutri-Score positively influences consumers' purchase intention for muesli. Hypothesis 2 is therefore not supported for granola, but it supported for oatmeal and muesli. These findings imply that the effect of the Nutri-Score labeling on purchase intention varies by product type. It significantly increases purchase intention for oatmeal and muesli, but not for granola.

4.5.3. Results moderating effect of Health consciousness

The final hypotheses addressed the potential moderating effect of health consciousness in the relationship between Nutri-Score labelling and the consumers' product attitudes. Hypothesis 3a is the following: **(H3a)**. *Consumers with higher health consciousness exposed to food products with higher (lower) Nutri-Score label will have a more (less) positive attitude toward these food products.*

For granola, the interaction term between HealthyNutriScore and Health Consciousness (HealthyNutriScore*HC) is not significant in Model 4 (.226, $p > .05$). For oatmeal, the interaction term is also not significant in Model 4 (-.036 $p > .05$). And finally, for muesli, the interaction term is also insignificant in Model 4 (.453, $p > .05$). Therefore, hypothesis 3a is not supported for both granola, oatmeal and muesli. The results indicate that health consciousness does not significantly affect the relationship between high Nutri-Score label (A) and product attitude toward any of the breakfast cereals.

Hypothesis 3b is: **(H3b)**. *Consumers with higher health consciousness exposed to food products with higher (lower) Nutri-Score label will have a more (less) positive purchase intention toward these food products.*

For granola, the interaction term between HealthyNutriScore and Health Consciousness (HealthyNutriScore*HC) is not significant in Model 4 (-.110, $p > .05$). The interaction term is also not significant for oatmeal in Model 4 (-.074, $p > .05$). For muesli, the interaction term is also insignificant in Model 4 (.806, $p > .05$). Therefore, hypothesis 3b is not supported for both granola, oatmeal and muesli. The results indicate that health-conscious consumers do not significantly affect the relationship between high Nutri-Score label (A) and purchase intention for any of the breakfast cereals.

4.6. Control variables

The analysis of the control variables provides the following insights for the variable product attitude. For granola, the coefficients for both men and women are negative and not significant

in Model 2 ($p >.05$). This indicates that there is no significant difference in attitudes toward granola between men and those who identify as other, or between women and those who identify as other. Regarding age, the coefficients vary for different age groups, but none of them are statistically significant ($p >.05$). This indicates that there is no significant difference in attitudes toward granola between the 60+ age group and the rest of the groups. Secondary education has a significant negative effect on product attitude in Model 2 ($p <.05$). This suggests that individuals with a secondary education have a significantly lower product attitude toward granola compared to individuals with a WO master's degree. For oatmeal, the coefficients for both men and women are negative and significant in Model 2 ($p <.05$). This indicates that there is a significant difference in attitude toward oatmeal between men, and those who identify as other, and between women and those who identify as other. There are no significant effects for age and educational level ($p >.05$), meaning that there is no significant difference in the age and educational level of individuals. For muesli, there is no significant effects for gender and age ($p >.05$) in Model 2, meaning that there is no significant difference in the gender and age of individuals. The coefficients for secondary education, vocational education and HBO master are negatively significant in Model 2 ($p <.05$), meaning that individuals with a secondary education, vocational education and HBO master have a significantly lower product attitude toward muesli compared to individuals with a WO master's degree.

In addition, the analysis of the control variables provides the following insights for the variable purchase intention. For granola, the coefficients for both men and women are negative and significant in Model 2 ($p <.05$). This indicates that there is a significant difference in purchase intention for granola between men and those who identify as other, and between women and those who identify as other. Regarding age, the coefficients in Model 2 for individuals aged 40-49 are negatively significant ($p <.05$), meaning that individuals aged between 40-49 have a lower purchase intention for granola than individuals aged 60+. Secondary education has a significant negative effect on product attitude in Model 2 ($p <.01$). This suggests that individuals with a secondary education have a significantly lower purchase intention for granola compared to individuals with a WO master's degree. For oatmeal, the coefficients for women are negative and significant in Model 2 ($p <.05$). This indicates that there is a significant difference in purchase intention for oatmeal between women and those who identify as other. Regarding age, the coefficients in Model 2 for individuals aged 21-39 and 50-59 are negatively significant ($p <.05$), meaning that individuals aged between 21-39 and 50-59 have a lower purchase intention for granola than individuals aged 60+. There are no

significant coefficients for educational level ($p >.05$), meaning that there is no significant difference in the educational level of individuals. For muesli, the coefficients for women are negative and significant in Model 2 ($p <.05$). This indicates that there is a significant difference in purchase intention for muesli between women and those who identify as other. Regarding age, the coefficients vary for different age groups, but none of them are statistically significant ($p >.05$). This indicates that there is no significant difference in purchase intention for muesli between the 60+ age group and the rest of the groups. Secondary education has a significant negative effect on purchase intention in Model 2 ($p <.001$), meaning that individuals with a secondary education have a significantly lower purchase intention for muesli compared to individuals with a WO master's degree.

GRANOLA

Construct	(1) Controls	(2) Controls + IVS	(3) Controls + IVS + Moderation	(4) Controls + IVS + Moderation Int.
Intercept	5.929(1.567)***	6.111(1.370)***	6.999(1.553)***	6.089(1.341)***
IV				
Healthiness		1.154(.243)***	1.160(.243)***	-.582(.962)
NutriScore		-.258(.246)	-.270(.246)	2.774(1.046)**
HealthyNutriScore		.514(.349)	.519(.349)	-.616(1.813)
Moderation				
Health Consciousness			-.124(.103)	
Healthiness*HC				.329(.176)
NutriScore*HC				-.588(.197)**
HealthyNutriScore*HC				.226(.341)
Control variables				
Gender				
<i>Man</i>	-1.353(1.508)	-1.716(1.324)	-1.911(1.332)	-1.717(1.296)
<i>Woman</i>	-1.508(1.502)	-1.698(1.317)	-1.893(1.326)	-1.737(1.290)
Age				
<i>18-20</i>	.297(.856)	.094(.757)	.082(.756)	.213(.744)
<i>21-29</i>	-.027(.586)	-.467(.522)	-.507(.522)	-.434(.513)
<i>30-39</i>	-.330(.624)	-.692(.552)	-.729(.552)	-.694(.541)
<i>40-49</i>	.060(.702)	-.388(.620)	-.394(.619)	-.429(.607)
<i>50-59</i>	-.129(.615)	-.311(.543)	-.329(.542)	-.289(.532)

Educational level				
<i>Secondary Education</i>	-1.041(.516)*	-1.095(.454)*	-1.126(.454)*	-.1.172(.446)*
<i>Vocational Education</i>	-.256(.408)	-.670(.361)	-.689(.361)	-.647(.356)
<i>HBO Bachelor</i>	-.171(.257)	-.294(.226)	-.306(.226)	-.249(.224)
<i>HBO Master</i>	-.250(.387)	-.564(.341)	-.573(.341)	-.484(.338)
<i>WO Bachelor</i>	.047(.368)	.017(.322)	.017(.322)	-.019(.316)
OATMEAL				
Construct	(1) Controls	(2) Controls + IVS	(3) Controls + IVS + Moderation	(4) Controls + IVS + Moderation Int.
Intercept	7.316(1.579)***	7.638(1.389)***	8.065(1.580)***	7.636(1.384)***
IV				
Healthiness		.750(.246)**	.753(.247)**	-.533(.993)
NutriScore		-.702(.250)**	-.708(.250)**	.960(1.080)
HealthyNutriScore		1.105(.354)**	1.108(.355)**	1.328(1.872)
Moderation				
Health Consciousness			-.060(.105)	
Healthiness*HC				.243(.182)
NutriScore*HC				-.323(.204)
HealthyNutriScore*HC				-.036(.352)
Control variables				
Gender				
<i>Man</i>	-2.700(1.520)	-2.791(1.342)*	-2.884(1.354)*	-2.782(1.338)*
<i>Woman</i>	-2.859(1.514)	-2.780(1.336)*	-2.874(1.348)*	-2.793(1.331)*
Age				
<i>18-20</i>	.719(.863)	.285(.768)	.279(.769)	.337(.768)
<i>21-29</i>	-.050(.590)	-.647(.529)	-.667(.531)	-.644(.530)
<i>30-39</i>	-.349(.629)	-.850(.560)	-.869(.562)	-.853(.559)
<i>40-49</i>	.186(.708)	-.382(.629)	-.385(.630)	-.406(.626)
<i>50-59</i>	-.316(.620)	-.638(.550)	-.646(.551)	-.636(.549)
Educational level				
<i>Secondary Education</i>	-.811(.520)	-.745(.461)	-.760(.462)	-.786(.461)
<i>Vocational Education</i>	-.254(.411)	-.678(.366)	-.687(.367)	-.681(.367)
<i>HBO Bachelor</i>	-.126(.259)	-.212(.229)	-.217(.230)	-.194(.231)
<i>HBO Master</i>	-.328(.390)	-.680(.346)	-.685(.347)	-.649(.349)
<i>WO Bachelor</i>	-.083(.371)	-.073(.327)	-.073(.327)	-.097(.326)

MUESLI

Construct	(1) Controls	(2) Controls + IVS	(3) Controls + IVS + Moderation	(4) Controls + IVS + Moderation Int.
Intercept	6.825(1.601)***	6.970(1.428)***	8.106(1.617)***	6.940(1.392)***
IV				
Healthiness		1.073(.253)***	1.082(.252)***	-.444(.998)
NutriScore		-.154(.257)	-.170(.256)	3.478(1.086)**
HealthyNutriScore		.541(.364)	.548(.363)	-1.775(1.882)
Moderation				
Health Consciousness			-.159(.107)	
Healthiness*HC				.288(.183)
NutriScore*HC				-.704(.2055)***
HealthyNutriScore*HC				.453(.354)
Control variables				
Gender				
<i>Man</i>	-2.172(1.541)	-2.544(1.380)	-2.794(1.386)*	-2.547(1.345)
<i>Woman</i>	-2.408(1.534)	-2.610(1.374)	-2.860(1.380)*	-2.657(1.339)*
Age				
<i>18-20</i>	.714(.875)	.528(.789)	.514(.787)	.671(.772)
<i>21-29</i>	-.033(.599)	-.450(.544)	-.501(.544)	-.406(.533)
<i>30-39</i>	-.344(.637)	-.692(.576)	-.740(.575)	-.701(.562)
<i>40-49</i>	-.173(.718)	-.223(.646)	-.231(.645)	-.270(.630)
<i>50-59</i>	-.225(.628)	-.370(.566)	-.393(.564)	-.340(.552)
Educational level				
<i>Secondary Education</i>	-1.371(.527)*	-1.435(.473)**	-1.474(.473)**	-1.535(.463)**
<i>Vocational Education</i>	-.346(.416)	-.761(.376)*	-.786(.375)*	-.726(.370)
<i>HBO Bachelor</i>	-.204(.263)	-.313(.236)	-.328(.235)	-.258(.232)
<i>HBO Master</i>	-.490(.395)	-.801(.356)*	-.813(.355)*	-.701(.351)*
<i>WO Bachelor</i>	-.138(.376)	-.158(.336)	-.158(.335)	-.198(.328)

Table 7. Regression analysis; dependent variable *Product Attitude*

Notes: *significant at $p < .05$; **significant at $p < .01$; ***significant at $p < .001$

GRANOLA

Construct	(1) Controls	(2) Controls + IVS	(3) Controls + IVS + Moderation	(4) Controls + IVS + Moderation Int.
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Intercept	7.252(1.642)***	7.495(1.498)***	7.336(1.705)***	7.461(1.470)***
IV				
Healthiness		.927(.266)***	.926(.266)***	-1.786(1.054)
NutriScore		-.482(.269)	-.479(.270)	1.814(1.147)
HealthyNutriScore		.609(.382)	.608(.383)	1.235(1.988)
Moderation				
Health Consciousness			.022(.113)	
Healthiness*HC				.514(.193)**
NutriScore*HC				-.445(.217)*
HealthyNutriScore*HC				-.110(.374)
Control variables				
Gender				
<i>Man</i>	-3.414(1.581)*	-3.619(1.448)*	-3.584(1.462)*	-.3.641(1.421)*
<i>Woman</i>	-3.520(1.574)*	-3.576(1.441)*	-3.541(1.455)*	-3.628(1.414)*
Age				
<i>18-20</i>	-.193(.897)	-.464(.828)	-.462(.830)	-.331(.816)
<i>21-29</i>	-.239(.614)	-.692(.571)	-.685(.573)	-.638(.563)
<i>30-39</i>	-.599(.654)	-.968(.604)	-.961(.606)	-.936(.594)
<i>40-49</i>	-1.106(.736)	-1.583(.678)*	-1.582(.680)*	-1.618(.665)*
<i>50-59</i>	-.252(.644)	-.495(.594)	-.492(.595)	-.461(.584)
Educational level				
<i>Secondary Education</i>	-1.482(.540)**	-1.476(.497)**	-1.470(.499)**	-1.511(.489)**
<i>Vocational Education</i>	-.034(.427)	-.388(.395)	-.384(.396)	-.354(.390)
<i>HBO Bachelor</i>	-.247(.270)	-.355(.247)	-.353(.248)	-.301(.245)
<i>HBO Master</i>	-.091(.405)	-.374(.373)	-.372(.374)	-.288(.370)
<i>WO Bachelor</i>	.162(.386)	.140(.353)	.140(.353)	.115(.346)
OATMEAL				
Construct	(1) Controls	(2) Controls + IVS	(3) Controls + IVS + Moderation	(4) Controls + IVS + Moderation Int.
Intercept	8.147(1.748)***	8.567(1.614)***	8.881(1.836)***	8.577(1.618)***
IV				
Healthiness		.183(.286)	.186(.287)	-.657(1.161)
NutriScore		-1.062(.290)***	-1.067(.291)***	.167(1.262)
HealthyNutriScore		1.620(.412)***	1.622(.413)***	2.030(2.188)
Moderation				

Health Consciousness			-0.044(.122)	
Healthiness*HC				.159(.213)
NutriScore*HC				-.239(.238)
HealthyNutriScore*HC				-.074(.411)
Control variables				
Gender				
<i>Man</i>	-3.268(1.683)	-3.051(1.560)	-3.120(1.574)*	-3.033(1.564)
<i>Woman</i>	-3.560(1.676)*	-3.200(1.552)*	-.3.269(1.567)*	-3.199(1.557)*
Age				
<i>18-20</i>	-.622(.955)	-1.246(.892)	-1.250(.894)	-1.228(.898)
<i>21-29</i>	-.857(.654)	-1.540(.615)*	-1.555(.617)*	-1.557(.620)*
<i>30-39</i>	-1.242(.696)	-1.826(.651)**	-1.840(.653)**	-1.838(.654)**
<i>40-49</i>	-.726(.784)	-1.334(.730)	-1.336(.732)	-1.351(.732)
<i>50-59</i>	-1.147(.686)	-1.567(.639)*	-1.573(.641)*	-1.577(.642)*
Educational level				
<i>Secondary Education</i>	-.642(.576)	-.458(.535)	-.469(.537)	-.493(.539)
<i>Vocational Education</i>	-.350(.455)	-.729(.425)	-.736(.426)	-.747(.430)
<i>HBO Bachelor</i>	-.222(.287)	-.252(.267)	-.256(.267)	-.249(.270)
<i>HBO Master</i>	-.411(.431)	-.758(.402)	-.762(.403)	-.751(.408)
<i>WO Bachelor</i>	-.336(.411)	-.281(.380)	-.281(.381)	-.303(.381)
MUESLI				
Construct	(1) Controls	(2) Controls + IVS	(3) Controls + IVS + Moderation	(4) Controls + IVS + Moderation Int.
Intercept	7.241(1.726)***	7.528(1.601)***	9.459(1.801)***	7.522(1.575)***
IV				
Healthiness		.664(.284)*	.679(.281)*	.868(1.130)
NutriScore		-.629(.288)*	-.656(.285)*	3.192(1.228)*
HealthyNutriScore		.959(.409)*	.971(.405)*	-3.213(2.129)
Moderation				
Health Consciousness			-.271(.119)*	
Healthiness*HC				-.038(.207)
NutriScore*HC				-.741(.232)**
HealthyNutriScore*HC				.806(.400)
Control variables				
Gender				
<i>Man</i>	-2.761(1.662)	-2.837(1.547)	-3.262(1.544)*	-2.808(1.522)

<i>Woman</i>	-3.148(1.655)	-3.076(1.540)*	-3.501(1.537)*	-3.091(1.515)*
Age				
<i>18-20</i>	1.176(.943)	.795(.885)	.770(.877)	.882(.874)
<i>21-29</i>	-.276(.646)	-.799(.610)	-.887(.605)	-.798(.603)
<i>30-39</i>	-.789(.687)	-1.227(.645)	-1.309(.640)*	-1.284(.636)*
<i>40-49</i>	-.863(.774)	-1.366(.725)	-1.380(.718)	-1.412(.713)*
<i>50-59</i>	-.341(.678)	-.528(.634)	-.566(.629)	-.522(.625)
Educational level				
<i>Secondary Education</i>	-2.101(.568)***	-2.042(.531)***	-2.109(.527)***	-2.178(.524)***
<i>Vocational Education</i>	-.377(.449)	-.746(.422)	-.788(.418)	-.738(.418)
<i>HBO Bachelor</i>	-.321(.284)	-.398(.265)	-.422(.262)	-.368(.263)
<i>HBO Master</i>	-.353(.426)	-.660(.399)	-.680(.395)	-.594(.397)
<i>WO Bachelor</i>	-.446(.406)	-.439(.377)	-.439(.373)	-.485(.371)

Table 8. Regression analysis; dependent variable *Purchase Intention*

Notes: *significant at $p < .05$; **significant at $p < .01$; ***significant at $p < .001$

5. Discussion

5.1 Discussion and reflection on the results

The purpose of this study was to investigate the effect of the Nutri-Score label on consumers' attitudes toward different breakfast cereals and their purchase intentions. Health consciousness was included as a moderator, as it may influence the relationship between Nutri-Score labeling and consumer behavior. The hypotheses were that consumers' attitudes toward the product and their purchase intentions would be positively influenced by a higher Nutri-Score label (A), and that people with higher health consciousness would strengthen this relationship. The results of this study showed different effects.

First, the results of the experiment showed that the effect of Nutri-Score labeling on consumer product attitudes varied significantly depending on the type of breakfast cereal. Specifically, oatmeal showed a notable positive association between a higher Nutri-Score label (A) and more positive product attitudes. This finding suggests that consumers view oatmeal products with a higher Nutri-Score as healthier or more beneficial, which likely improves their overall attitudes toward these products. This finding is in line with existing research, which claims that products with a higher Nutri-Score are expected to have a more positive attitude among consumers than those with a lower Nutri-Score (Folkvord et al., 2021). However,

granola and muesli showed no statistically significant changes in consumer attitudes due to the higher Nutri-Score label. This indicates that the impact of Nutri-Score labeling on consumer perceptions is not consistent across different types of breakfast cereals.

When examining purchase intentions, a similar pattern emerged. For both oatmeal and muesli, a significant positive relationship was observed between a higher Nutri-Score label (A) and increased purchase intention among consumers. This implies that consumers are more likely to purchase oatmeal and muesli products when they are considered healthier based on Nutri-Score labeling. These results are consistent with previous research, which claims that products with a higher Nutri-Score are expected to have a higher purchase intention than products with a lower Nutri-Score (Crosetto et al., 2018). However, granola showed no significant effect of Nutri-Score labeling on purchase intentions, in line with findings regarding consumer product attitudes.

The varying influence of Nutri-Score labeling on product attitudes purchase intentions suggests that consumers' attitudes toward breakfast cereals and their purchase decisions are influenced by more factors than just the Nutri-Score. The results highlight the product-specific nature of the effects of Nutri-Score labeling on attitudes toward the product and purchase intentions. As previous studies have shown, consumer attitudes toward a product and purchase intention depend on multiple factors (Ajzen, 2018; Mirabi et al., 2015). The observed differences between oatmeal, granola and muesli suggest that factors beyond the demonstrated nutritional values - such as taste preferences, health claims and packaging design - are likely factors that may contribute to how consumers interpret and respond to Nutri-Score labeling.

Additionally, this study examined the moderating role of health consciousness in these relationships. Health consciousness was not found to have a significant moderating effect on the effect of Nutri-Score labeling on consumer attitudes and purchase intentions. This finding suggests that consumers with higher health consciousness do not significantly differ in their attitudes and purchase intentions toward products with higher Nutri-Score label (A) compared to those with lower health consciousness. The results contrast with previous study claiming that health-conscious consumers are expected to be more sensitive to the health-related aspects of food products (Mai & Hoffmann, 2012).

Finally, in addition to the main findings, control variables such as gender, age, and education level were also considered. These variables showed different levels of effect on consumer attitudes and purchase intentions for the different types of breakfast cereals. This highlights the complexity of consumer behavior regarding food products.

5.2. Theoretical contributions

Although numerous researchers have studied the effects of FOP labeling on consumer behavior (Gorski Findling et al., 2018; Menger-Ogle & Graham, 2018), there is little research on the specific impact of Nutri-Score labeling on product attitudes and purchase intentions, as well as the role of individual differences like health consciousness (van den Akker et al., 2022). This study contributes to the literature on consumer behavior and nutritional labeling with the following three contributions.

First, this research enhances our understanding of the influence of the Nutri-Score on consumer product attitudes (De Temmerman et al., 2021; Folkvord et al., 2021) by showing that the Nutri-Score labeling effects vary significantly by product type. While previous studies have shown that simpler and more direct labels like Nutri-Score can positively influence food choices (Folkvord et al., 2021), they have not addressed the variability in consumer response across different product types. In response, this study presents unique findings that demonstrate that Nutri-Score labeling significantly enhances consumer attitudes towards oatmeal, but not for granola and muesli. These findings are important to theory because they highlight the necessity of considering product-specific factors in studies of nutritional labeling and provide detailed insights into how consumer attitudes towards different types of breakfast cereals are shaped by Nutri-Score labels.

Second, this study contributes to the literature on purchase intentions (De Temmerman et al., 2021; Crosetto et al., 2018) by showing the Nutri-Score labeling effects on consumer purchase decisions across different product types. While previous research has indicated that FOP labels can influence purchase intentions (Crosetto et al., 2018), it has not sufficiently explored the differential effects across various food products. In response, this study presents unique findings that demonstrate that Nutri-Score labeling increases purchase intentions for oatmeal and muesli, but not for granola. These findings are important to theory because they underscore the importance of considering product-specific characteristics and suggest that the ability of the Nutri-Score to drive purchase decisions is influenced by factors such as perceived healthiness and consumer familiarity with the product.

Third, this study contributes to the literature on health consciousness and consumer behavior (Mai & Hoffmann, 2012), by evaluating the role of health consciousness as a moderating factor in the relationship between Nutri-Score labeling and consumer behavior. While previous studies have suggested that health-conscious consumers are more responsive to health-related product information (Mai & Hoffmann, 2012), our findings indicate that health consciousness does not significantly moderate the impact of Nutri-Score on consumer product

attitudes or purchase intentions. These findings are important to theory because they challenge existing assumptions and suggest that other individual differences or contextual factors might be more influential in moderating these effects. This contribution calls for a broader examination of potential moderators in future research to better understand the diverse influences on consumer responses to FOP labels.

5.3. Practical implications

In addition to the research's theoretical contributions, the findings also offer several practical implications. This study provides policymakers and marketers with valuable insights into how consumers respond to Nutri-Score as nutritional information, which is essential for developing health promotions and effective marketing strategies.

First, this study offers detailed insights into how the Nutri-Score label influences consumer behavior when considering breakfast cereals. Manufacturers can leverage these insights to enhance their marketing strategies by promoting products with a favorable Nutri-Score, such as oatmeal and muesli. By emphasizing the nutritional benefits of these products in advertising campaigns, manufacturers can potentially increase consumer preference and sales. Although promoting the nutritional benefits of products is not a new concept, the specific focus on Nutri-Score as a marketing tool offers a fresh perspective on how to effectively communicate nutritional value to consumers.

Second, there is still considerable confusion about the meaning and interpretation of the Nutri-Score label (WNL, 2024). This study also revealed that the presence of the Nutri-Score had no significant effects on the participants' reported ability to assess the healthiness of breakfast cereals. To address this, the government has launched campaigns aimed at providing consumers with clear and accessible information about how the Nutri-Score works and how it should be interpreted. It is crucial for these campaigns to continue and be expanded. For example, educational materials could be integrated into school programs, social media platforms, and community health programs. These efforts can help consumers make informed choices and adopt healthier eating habits over time.

Third, policymakers might consider making Nutri-Score labeling mandatory on all foods to standardize nutritional information and simplify product comparisons for consumers. While many brands already use the Nutri-Score, it is not yet applied to all universally. To achieve consistency and transparency, policymakers should establish clear guidelines for how Nutri-Score values are calculated and displayed. Ensuring the accuracy and reliability of this information is essential for building consumer trust. Additionally, regular updates to the Nutri-

Score system can help maintain its relevance and effectiveness, ensuring it continues to reflect current nutritional science.

Finally, collaboration with retailers is essential to ensure that Nutri-Score labels are prominently displayed and effectively communicated to consumers both in store and online. Retailers can integrate Nutri-Score information into their marketing strategies and loyalty programs by highlighting product with higher Nutri-Scores in promotional materials, offering discounts, or creating dedicated sections for healthier options. For example, loyalty programs could reward customers with points for purchasing higher Nutri-Score products, or stores could use signage and shelf labels to draw attention to these items. Such initiatives can significantly influence consumer behavior towards healthier food choices.

5.4. Limitations and suggestions for further research

Besides the theoretical and practical implications, there are also some limitations and suggestions for future research.

First, the study focused exclusively on breakfast cereals, so the results cannot be directly applied to other product categories. Additionally, only three types of breakfast cereals were included, which may not represent the full variety of breakfast cereals available. Future research should therefore examine a broader range of products and a wider variety of foods. This is crucial because consumer behavior may vary significantly across different types of products, and a more comprehensive study could provide a deeper understanding of the overall impact of the Nutri-Score.

Another limitation is the use of a convenience sample, which is not representative of the entire Dutch population. This makes it difficult to generalize the results. Future research should use a representative sample to accurately test the effects of the Nutri-Score across different demographic groups. Representative sampling is essential for ensuring the findings are applicable to the broader population, enhancing the validity and reliability of the results.

This research was conducted as an online experiment where participants were shown images of different breakfast cereals and had the option to view the nutrition label on the back of the package. This setup is not ideal for mimicking a realistic shopping experience, as most people do their shopping in physical supermarkets. Future research should focus on better simulating a real shopping environment. One possible approach is to apply Nutri-Score labels to the entire breakfast cereal section of a supermarket, allowing researchers to measure actual shopping behavior in a realistic setting. This is important because consumer choices in a controlled online environment may differ from those made in a physical store where various

external factors come into play. Additionally, a pilot study in online supermarkets could provide valuable insights. By including Nutri-Score labels in online product listings, researchers can evaluate their influence on consumer choices. This approach is important as online shopping is becoming increasingly popular (Hanus, 2016), and understanding how Nutri-Score affects online purchasing decisions can help in designing better online nutrition interventions.

Some participants in the current study indicated that they did not see Nutri-Score on product or even listed the wrong Nutri-Score. A useful adaptation for future online research would be to enlarge the Nutri-Score label to make it more noticeable. Ensuring that participants correctly perceive the Nutri-Score is vital for obtaining accurate results and understanding its true impact on consumer behavior.

Finally, the Nutri-Score has been officially implemented since 2024, which means that consumers are not yet very familiar with this label. There is still a lot of confusion about the Nutri-Score (WNL, 2024). The government already started promoting the Nutri-Score to counter this problem. Future research is needed to continue examining the effects of the Nutri-Score, especially as consumers become more familiar with its purpose and benefits. Understanding how familiarity and awareness of Nutri-Score evolve over time will be crucial for evaluating its long-term effectiveness and for developing strategies to enhance consumer engagement.

6. Conclusion

This study aimed to evaluate the impact of the Nutri-Score label on consumers' attitudes toward a product and their purchase intentions. Using a 2x2 experimental research design, the study addresses the primary research question: *“What is the effect of Nutri-Score labeling on consumers' product attitudes and their purchase intention?”* Additionally, recognizing that health consciousness may moderate the relationship between Nutri-Score labeling and consumer responses, the following sub-question was formulated: *“What is the effect of Nutri-Score labeling on consumers' product attitudes and their purchase intention, moderated by health consciousness?”*

The results showed that oatmeal received significantly more positive consumer attitudes when associated with a higher Nutri-Score label (A), suggesting consumers perceived it as offering health benefits. Purchase intentions for oatmeal and muesli also increased with higher Nutri-Score (A) ratings. In contrast, Nutri-Score had no significant impact on consumer attitudes or purchase intentions towards granola. Despite expectations, health consciousness did not appear to significantly moderate the relationship between Nutri-Score labeling and

consumer behavior. These findings highlight the varied effects of Nutri-Score labeling on consumer behavior, influenced by product type and other factors shaping consumer perceptions and food choices. Further research and practical efforts are essential to fully utilize the benefits of Nutri-Score labeling to promote healthier eating habits and improve public health.

References

- Acharya, A. S., Prakash, A., Saxena, P., & Nigam, A. (2013). Sampling: why and how of it? *Indian Journal of Medical Specialities*, 4(2). <https://doi.org/10.7713/ijms.2013.0032>
- Ajzen, I. (2018). Consumer Attitudes and Behavior. *Handbook of Consumer Psychology*, January 2008, 525–548. <https://doi.org/10.4324/9780203809570-29>
- Anastasiou, K., Miller, M., & Dickinson, K. (2019). The relationship between food label use and dietary intake in adults: A systematic review. *Appetite*, 138(April), 280–291. <https://doi.org/10.1016/j.appet.2019.03.025>
- Anderson, C. L., & O'Connor, E. L. (2019). The effect of the health star rating on consumer decision-making. *Food Quality and Preference*, 73(February 2018), 215–225. <https://doi.org/10.1016/j.foodqual.2018.11.005>
- Arroyo-Johnson, C., & Mincey, K. D. (2016). Obesity Epidemiology Worldwide. *Gastroenterology Clinics of North America*, 45(4), 571–579. <https://doi.org/10.1016/j.gtc.2016.07.012>
- Charness, G., Gneezy, U., & Kuhn, M. A. (2012). Experimental methods: Between-subject and within-subject design. *Journal of Economic Behavior & Organization*, 81(1), 1–8. <https://doi.org/10.1016/j.jebo.2011.08.009>
- Choy, L. T. (2014). The Strengths and Weaknesses of Research Methodology: Comparison and Complimentary between Qualitative and Quantitative Approaches. *IOSR Journal Of Humanities And Social Science (IOSR-JHSS)*, 19(4).
- Cowburn, G., & Stockley, L. (2005). Consumer understanding and use of nutrition labelling: a systematic review. *Public Health Nutrition*, 8(1), 21–28. <https://doi.org/10.1079/PHN2004666>
- Crosetto, P., Lacroix, A., Muller, L., & Ruffieux, B. (2018). *front-of-pack nutritional labels : experimental evidence To cite this version :* <https://doi.org/https://hal.science/hal-01805431/file/gael2018-11.pdf>
- De Temmerman, J., Heeremans, E., Slabbinck, H., & Vermeir, I. (2021). The impact of the Nutri-Score nutrition label on perceived healthiness and purchase intentions. *Appetite*, 157(October 2020), 104995. <https://doi.org/10.1016/j.appet.2020.104995>
- Donsbach, W., & W. Traugott, M. (2008). The SAGE Handbook of Public Opinion Research. *The SAGE Handbook of Public Opinion Research*. <https://doi.org/10.4135/9781848607910>
- Egnell, M., Ducrot, P., Touvier, M., Allès, B., Hercberg, S., Kesse-Guyot, E., & Julia, C. (2018). Objective understanding of Nutri-Score Front-Of-Package nutrition label according to individual characteristics of subjects: Comparisons with other format labels. *PLOS ONE*, 13(8), e0202095. <https://doi.org/10.1371/journal.pone.0202095>
- Egnell, M., Galan, P., Farpour-Lambert, N. J., Talati, Z., Pettigrew, S., Hercberg, S., & Julia, C. (2020). Compared to other front-of-pack nutrition labels, the Nutri-Score emerged as the most efficient to inform Swiss consumers on the nutritional quality of food products. *PLOS ONE*, 15(2), e0228179. <https://doi.org/10.1371/journal.pone.0228179>
- Egnell, M., Talati, Z., Galan, P., Andreeva, V. A., Vandevijvere, S., Gombaud, M., Dréano-Trécant, L., Hercberg, S., Pettigrew, S., & Julia, C. (2020). Objective understanding of the Nutri-score front-of-pack label by European consumers and its effect on food choices: an online experimental study. *International Journal of Behavioral Nutrition and Physical Activity*, 17(1), 164. <https://doi.org/10.1186/s12966-020-01069-5>
- Espinosa, A., & Kadić-Maglajlić, S. (2018). The Mediating Role of Health Consciousness in the Relation Between Emotional Intelligence and Health Behaviors. *Frontiers in Psychology*, 9(NOV), 1–11. <https://doi.org/10.3389/fpsyg.2018.02161>

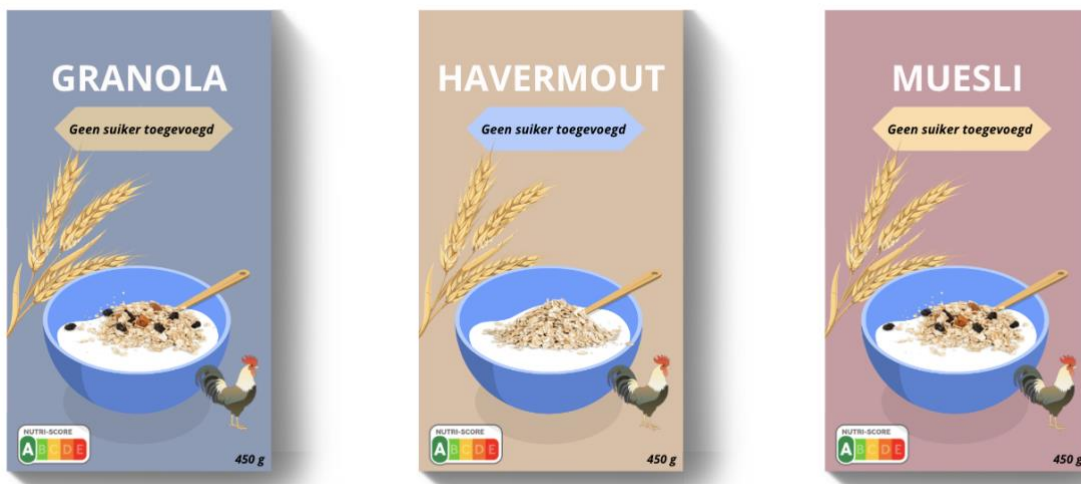
- Feunekes, G. I. J., Gortemaker, I. A., Willems, A. A., Lion, R., & van den Kommer, M. (2008). Front-of-pack nutrition labelling: Testing effectiveness of different nutrition labelling formats front-of-pack in four European countries. *Appetite*, *50*(1), 57–70. <https://doi.org/10.1016/j.appet.2007.05.009>
- Fialon, M., Salas-Salvadó, J., Babio, N., Touvier, M., Hercberg, S., & Galan, P. (2021). Is FOP Nutrition Label Nutri-Score Well Understood by Consumers When Comparing the Nutritional Quality of Added Fats, and Does It Negatively Impact the Image of Olive Oil? *Foods*, *10*(9), 2209. <https://doi.org/10.3390/foods10092209>
- Field, A. (2017). Discovering Statistic Using IBM SPSS Statistic 5th. *Dk*, *53*(9), 1689–1699.
- Field, A. P. (2005). *Discovering statistics using SPSS*.
- Folkvord, F., Bergmans, N., & Pabian, S. (2021). *The effect of the nutri-score label on consumer's attitudes, taste perception and purchase intention: An experimental pilot study*. <https://doi.org/10.1016/j.foodqual.2021.104303>
- Gassler, B., Faesel, C. K., & Moeser, A. (2023). Toward a differentiated understanding of the effect of Nutri-Score nutrition labeling on healthier food choices. *Agribusiness*, *39*(1), 28–50. <https://doi.org/10.1002/agr.21762>
- Girz, L., Polivy, J., Herman, C. P., & Lee, H. (2012). The effects of calorie information on food selection and intake. *International Journal of Obesity*, *36*(10), 1340–1345. <https://doi.org/10.1038/ijo.2011.135>
- Gorski Findling, M. T., Werth, P. M., Musicus, A. A., Bragg, M. A., Graham, D. J., Elbel, B., & Roberto, C. A. (2018). Comparing five front-of-pack nutrition labels' influence on consumers' perceptions and purchase intentions. *Preventive Medicine*, *106*(October 2017), 114–121. <https://doi.org/10.1016/j.ypmed.2017.10.022>
- Graham, D. J., Heidrick, C., & Hodgins, K. (2015). Nutrition Label Viewing during a Food-Selection Task: Front-of-Package Labels vs Nutrition Facts Labels. *Journal of the Academy of Nutrition and Dietetics*, *115*(10), 1636–1646. <https://doi.org/10.1016/j.jand.2015.02.019>
- Guiding principles and framework manual for front-of-pack labelling for promoting healthy diet. (2019). *World Health Organization*.
- Hagmann, D., & Siegrist, M. (2020). Nutri-Score, multiple traffic light and incomplete nutrition labelling on food packages: Effects on consumers' accuracy in identifying healthier snack options. *Food Quality and Preference*, *83*(December 2019), 103894. <https://doi.org/10.1016/j.foodqual.2020.103894>
- Hanus, G. (2016). CONSUMER BEHAVIOUR DURING ONLINE GROCERY SHOPPING. *CBU International Conference Proceedings*, *4*, 010–013. <https://doi.org/10.12955/cbup.v4.737>
- Hernandez-Fernandez, A., Kuster-Boluda, I., & Vila-Lopez, N. (2022). Nutritional information labels and health claims to promote healthy consumption. *Journal of Business & Industrial Marketing*, *37*(8), 1650–1661. <https://doi.org/10.1108/JBIM-09-2020-0426>
- Hyde, K. F. (2000). Recognising deductive processes in qualitative research. *Qualitative Market Research: An International Journal*, *3*(2), 82–90. <https://doi.org/10.1108/13522750010322089>
- Ikonen, I., Sotgiu, F., Aydinli, A., & Verlegh, P. W. J. (2020). Consumer effects of front-of-package nutrition labeling: an interdisciplinary meta-analysis. *Journal of the Academy of Marketing Science*, *48*(3), 360–383. <https://doi.org/10.1007/s11747-019-00663-9>
- Julia, C., & Hercberg, S. (2017). Nutri-Score: evidence of the effective-ness of the French front-of-pack nutrition label. *Ernahrungs Umschau*, *64*(12), 181–187. <https://doi.org/10.4455/eu.2017.048>

- Jürkenbeck, K., Hölker, S., & Spiller, A. (2023). New label, new target group? The case of the organic label and the Nutri-Score. *Organic Agriculture*, 13(2), 221–235. <https://doi.org/10.1007/s13165-023-00423-8>
- Koetsier, L., Jacobs, M., Halberstadt, J., Sijben, M., Zonneveld, N., & Minkman, M. (2020). The development of a tool to monitor integrated care for childhood overweight and obesity in the Netherlands. *Journal of Integrated Care*, 29(2), 99–110. <https://doi.org/10.1108/JICA-05-2020-0028>
- Kozup, J. C., Creyer, E. H., & Burton, S. (2003). Making Healthful Food Choices: The Influence of Health Claims and Nutrition Information on Consumers' Evaluations of Packaged Food Products and Restaurant Menu Items. *Journal of Marketing*, 67(2), 19–34. <https://doi.org/10.1509/jmkg.67.2.19.18608>
- Kühne, S. J., Reijnen, E., Granja, G., & Hansen, R. S. (2022). Labels Affect Food Choices, but in What Ways? *Nutrients*, 14(15), 3204. <https://doi.org/10.3390/nu14153204>
- Lwin, M. O., Morrin, M., Tang, S. W. H., Low, J. Y., Nguyen, T., & Lee, W. X. (2014). See the Seal? Understanding Restrained Eaters' Responses to Nutritional Messages on Food Packaging. *Health Communication*, 29(8), 745–761. <https://doi.org/10.1080/10410236.2013.789131>
- Mai, R., & Hoffmann, S. (2012). Taste lovers versus nutrition fact seekers: How health consciousness and self-efficacy determine the way consumers choose food products. *Journal of Consumer Behaviour*, 11(4), 316–328. <https://doi.org/10.1002/cb.1390>
- Mai, R., & Hoffmann, S. (2015). How to Combat the Unhealthy = Tasty Intuition: The Influencing Role of Health Consciousness. *Journal of Public Policy & Marketing*, 34(1), 63–83. <https://doi.org/10.1509/jppm.14.006>
- Menger-Ogle, A. D., & Graham, D. J. (2018). The influence of front-of-package nutrition claims on food perceptions and purchase intentions among Nepali consumers. *Food Quality and Preference*, 66(April 2017), 160–170. <https://doi.org/10.1016/j.foodqual.2017.12.017>
- Mirabi, V., Akbariyeh, H., & Tahmasebifard, H. (2015). A Study of Factors Affecting on Customers Purchase Intention Case Study : the Agencies of Bono Brand Tile in Tehran. *Journal of Multidisciplinary Engineering Science and Technology (JMEST)*, 2(1), 267–273.
- Ontbijtgranen / Consumentenbond. (2019). <https://www.consumentenbond.nl/voedingstests/ontbijtgranen>
- Organization, W. H. (2021). Obesity. *World Health Organization*.
- Petrescu, D. C., Vermeir, I., & Petrescu-Mag, R. M. (2019). Consumer Understanding of Food Quality, Healthiness, and Environmental Impact: A Cross-National Perspective. *International Journal of Environmental Research and Public Health*, 17(1), 169. <https://doi.org/10.3390/ijerph17010169>
- Puska, P., & Luomala, H. T. (2016). Capturing qualitatively different healthfulness images of food products. *Marketing Intelligence & Planning*, 34(5), 605–622. <https://doi.org/10.1108/MIP-06-2015-0119>
- Rijksoverheid. (2023). Invoering Nutri-Score om betere voedingskeuzes te stimuleren. *Rijksoverheid*.
- Singhal, N. (2017). A Study of Consumer Behavior Towards Organic Food and the Moderating Effects of Health Consciousness. *The IUP Journal of Marketing Management*, 16(3), 45–79.
- Snap jij de Nutri-Score? “Kies nou vaker voor die gezondere keuze.” (n.d.). Retrieved June 14, 2024, from <https://wnl.tv/2024/04/02/snap-jij-de-nutri-score-kies-nou-vaker-voor-die-gezondere-keuze/>

- Spears, N., & Singh, S. N. (2004). Measuring Attitude toward the Brand and Purchase Intentions. *Journal of Current Issues & Research in Advertising*, 26(2), 53–66. <https://doi.org/10.1080/10641734.2004.10505164>
- Taherdoost, H. (2016). Sampling Methods in Research Methodology; How to Choose a Sampling Technique for Research. *SSRN Electronic Journal*, 5(2), 18–27. <https://doi.org/10.2139/ssrn.3205035>
- Temple, N. J. (2020). Front-of-package food labels: A narrative review. *Appetite*, 144(March 2019), 104485. <https://doi.org/10.1016/j.appet.2019.104485>
- Tipton, E. (2014). How Generalizable Is Your Experiment? An Index for Comparing Experimental Samples and Populations. *Journal of Educational and Behavioral Statistics*, 39(6), 478–501. <https://doi.org/10.3102/1076998614558486>
- van den Akker, K., Bartelet, D., Brouwer, L., Luijpers, S., Nap, T., & Havermans, R. (2022). The impact of the nutri-score on food choice: A choice experiment in a Dutch supermarket. *Appetite*, 168(January 2021), 105664. <https://doi.org/10.1016/j.appet.2021.105664>
- Van Selm, M., & Jankowski, N. W. (2006). Conducting Online Surveys. *Quality and Quantity*, 40(3), 435–456. <https://doi.org/10.1007/s11135-005-8081-8>
- Voedingswaarde op etiket - Eurowet. (2021). <https://www.eurowet.nl/etikettering-levensmiddelen/voedingswaarde.html>
- Williams, P., & Drolet, A. (2005). Age-Related Differences in Responses to Emotional Advertisements. *Journal of Consumer Research*, 32(3), 343–354. <https://doi.org/10.1086/497545>
- Zo koos de overheid Nutri-Score | Voeding | Rijksoverheid.nl. (n.d.). Retrieved December 1, 2023, from <https://www.rijksoverheid.nl/onderwerpen/voeding/gezonde-voeding/nieuw-voedselkeuzelogo-nutri-score/zo-koos-de-overheid-nutri-score>

Appendix 1

Scenario 1: Healthy breakfast cereals with Nutri-Score



Scenario 2: Healthy breakfast cereals without Nutri-Score



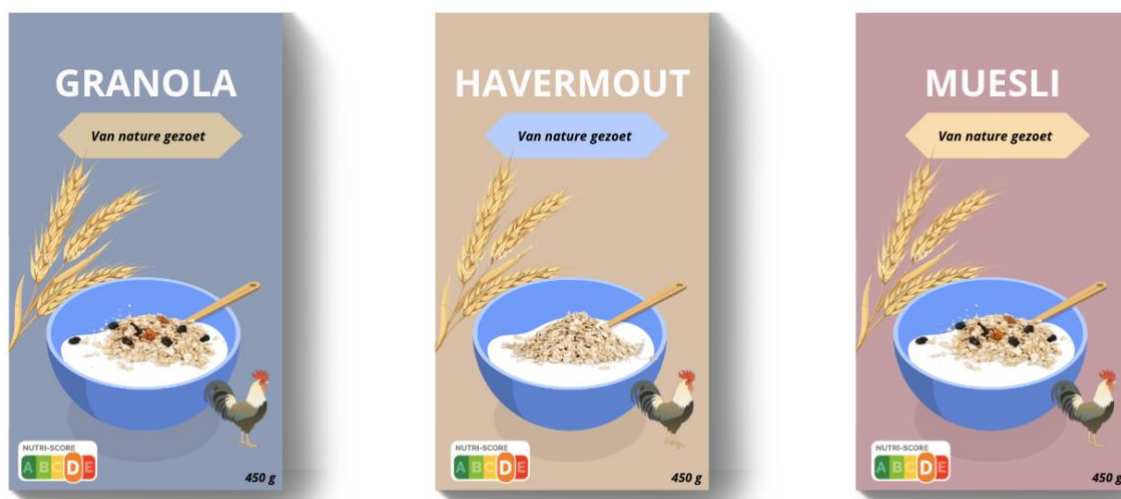
Nutritional information healthy breakfast cereals

Voedingswaarden

Deze waarden gelden voor het onbereide product.

Soort	Per 100 Gram
Energie	1452 kJ (347 kcal)
Vet	1.9 g
waarvan verzadigd	0.4 g
Koolhydraten	59 g
waarvan suikers	0.0 g
Voedingsvezel	10 g
Eiwitten	14 g
Zout	0.03 g

Scenario 3: Unhealthy breakfast cereals with Nutri-Score



Scenario 4: Unhealthy breakfast cereals without Nutri-Score



Nutritional information unhealthy breakfast cereals

Voedingswaarden

Deze waarden gelden voor het onbereide product.

Soort	Per 100 Gram
Energie	1941 kJ (463 kcal)
Vet	20 g
waarvan verzadigd	5.7 g
waarvan onverzadigd	14 g
Koolhydraten	55 g
waarvan suikers	20 g
Voedingsvezel	7.7 g
Eiwitten	12 g
Zout	0.05 g

Appendix 2

Survey – English

Introduction

Dear participant,

Thank you for your participation in this study. My name is Iris Berg, and I am a master's student in Business Administration at the University of Twente. Your answers will help me better understand consumer behavior related to breakfast cereals. This survey will take about 5-10 minutes of your time.

The data collected from this survey will be used exclusively for scientific research and will remain completely anonymous. They will be used only for this research and will not be shared with third parties. Please note that there are no wrong answers, and you are free to quit the survey at any time.

By going to the next page, you confirm that you are 18 years of age or older and agree to the use of the data collected for this study.

For questions, please contact: i.a.s.berg@student.utwente.nl

Thank you in advance for your time!

Iris Berg

Introduction

Imagine you are in the supermarket and looking for breakfast cereals. You are shown three different breakfast cereals next. Indicate the extent to which you agree with each statement. In addition, the nutritional information of each product is displayed on the back of the package to fully inform you about nutritional value.

To what extent do you agree with the following statements?

Product attitude

Based on the information shown for this food product, what is your overall attitude toward the product?

- Very unfavorable
- Unfavorable
- Somewhat unfavorable
- Neutral
- Somewhat favorable
- Favorable
- Very favorable

Based on the information shown for this food product, what is your overall attitude toward the product?

- Very bad
- Bad
- Somewhat bad
- Neutral
- Somewhat good

- Good
- Very good

Based on the information shown for this food product, what is your overall attitude toward the product?

- Very negative
- Negative
- Somewhat negative
- Neutral
- Somewhat positive
- Positive
- Very positive

Based on the information shown for this food product, what is your overall attitude toward the product?

- Very unlikable
- Unlikable
- Somewhat unlikable
- Neutral
- Somewhat likable
- Likable
- Very likable

Based on the information shown for this food product, what is your overall attitude toward the product?

- Very unappealing
- Unappealing
- Somewhat unappealing
- Neutral
- Somewhat appealing
- Appealing
- Very appealing

Purchase intention

I will buy this product.

- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

Next time I am buying breakfast cereals, I will choose this product.

- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

I prefer this product to other breakfast cereals.

- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree

- Strongly agree

You have just indicated your thought towards three different breakfast cereals and your purchase intention. I would like to ask you a few more questions about these breakfast cereals.

To what extent do you agree with the following statements?

Manipulation checks

The Nutri-Score label for the products I just saw was:

- Nutri-Score A
- Nutri-Score B
- Nutri-Score C
- Nutri-Score D
- Nutri-Score E
- No Nutri-Score was shown

I have seen the back-of-pack nutritional information.

- No
- Yes

I could easily assess how healthy the product was.

- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

To what extent do you agree with the following statements?

Health Consciousness

I reflect about my health a lot.

- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

I am very self-conscious about my health.

- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

I know my inner feelings about my health.

- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral

- Somewhat agree
- Agree
- Strongly agree

I am constantly examining my health.

- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

I am alert to changes in my health.

- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

I am usually aware of my health.

- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

I am frequently aware of the state of my health.

- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

I notice how I feel physically through the day.

- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

I am very involved with my health.

- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

Demographics

What gender do you identify as?

- Man
- Woman
- Other
- I prefer not to say that

What is your age?

- 17 or younger
- 18-20
- 21-29
- 30-39
- 40-49
- 50-59
- 60 or older

What is your highest level of education?

- Primary Education
- Secondary Education
- Vocational Education
- Higher Professional Education, bachelor's degree
- Higher Professional Education, master's degree
- Academic Education, bachelor's degree
- Academic Education, master's degree
- Doctor of Philosophy (PhD)

These were the questions. Thanks again for your participation in the survey!

Do you have any questions or are you curious about the study results? If so, please contact: i.a.s.berg@student.utwente.nl

INFORM: true nature research (participated in online survey experiment).

Survey – Dutch

Introductie

Beste deelnemer,

Bedankt voor je deelname aan dit onderzoek. Mijn naam is Iris Berg, en ik ben een masterstudent in Business Administration aan de Universiteit van Twente. Je antwoorden zullen mij helpen om het consumentengedrag met betrekking tot ontbijtgranen beter te begrijpen. Deze enquête zal ongeveer 5-10 minuten van je tijd in beslag nemen.

De verzamelde gegevens van deze enquête worden uitsluitend gebruikt voor wetenschappelijk onderzoek en zullen volledig anoniem blijven. Ze worden alleen ingezet voor dit onderzoek en zullen niet met derden worden gedeeld. Houd er rekening mee dat er geen foute antwoorden zijn, en je vrij bent om op elk moment te stoppen met de enquête.

Door naar de volgende pagina te gaan, bevestig je dat je 18 jaar of ouder bent en akkoord gaat met het gebruik van de verzamelde gegevens voor dit onderzoek.

Voor vragen kun je contact opnemen met: i.a.s.berg@student.utwente.nl

Alvast bedankt voor je tijd!
Iris Berg

Introductie

Stel je voor dat je in de supermarkt bevindt en op zoek bent naar ontbijtgranen. Je krijgt hierna drie verschillende ontbijtgranen te zien. Geef aan in hoeverre je het eens bent met elke stelling. Daarnaast wordt de voedingsinformatie op de achterkant van de verpakking bij elk product weergegeven om je volledig te informeren over de voedingswaarde.

In hoeverre ben je het eens met de volgende stellingen?

Product houding

Wat is je algemene houding ten opzichte van dit voedingsproduct op basis van de getoonde informatie?

- Zeer ongunstig
- Ongunstig
- Enigszins ongunstig
- Neutraal
- Enigszins gunstig
- Gunstig
- Zeer gunstig

Wat is je algemene houding ten opzichte van dit voedingsproduct op basis van de getoonde informatie?

- Zeer slecht
- Slecht
- Enigszins slecht
- Neutraal
- Enigszins goed
- Goed
- Zeer goed

Wat is je algemene houding ten opzichte van dit voedingsproduct op basis van de getoonde informatie?

- Zeer negatief
- Negatief
- Enigszins negatief
- Neutraal
- Enigszins positief
- Positief
- Zeer positief

Wat is je algemene houding ten opzichte van dit voedingsproduct op basis van de getoonde informatie?

- Zeer onaangenaam
- Onaangenaam
- Enigszins onaangenaam
- Neutraal
- Enigszins aangenaam
- Aangenaam
- Zeer aangenaam

Wat is je algemene houding ten opzichte van dit voedingsproduct op basis van de getoonde informatie?

- Zeer onaantrekkelijk
- Onaantrekkelijk
- Enigszins onaantrekkelijk
- Neutraal
- Enigszins aantrekkelijk
- Aantrekkelijk
- Zeer aantrekkelijk

Aankoopintentie

Ik ben van plan dit product te kopen.

- Zeer mee oneens
- Oneens
- Enigszins mee oneens
- Neutraal
- Enigszins mee eens
- Mee eens
- Helemaal mee eens

De volgende keer dat ik ontbijtgranen koop, zal ik dit product kiezen.

- Zeer mee oneens
- Oneens
- Enigszins mee oneens
- Neutraal
- Enigszins mee eens
- Mee eens
- Helemaal mee eens

Ik verkies dit product boven andere ontbijtgranen.

- Zeer mee oneens
- Oneens
- Enigszins mee oneens
- Neutraal
- Enigszins mee eens
- Mee eens
- Helemaal mee eens

Je hebt zojuist van drie verschillende ontbijtgranen je gedachte tegenover deze ontbijtgranen en de aankoopintentie aangegeven. Graag stel ik je nog een paar vragen over deze ontbijtgranen.

In hoeverre ben je het eens met de volgende stellingen?

Manipulatiecontroles

De Nutri-Score label voor de producten die ik net heb gezien was:

- Nutri-Score A
- Nutri-Score B
- Nutri-Score C
- Nutri-Score D
- Nutri-Score E
- Er werd geen Nutri-Score getoond

Ik heb de voedingsinformatie op de achterkant van de verpakking gezien.

- Nee
- Ja

Ik kon gemakkelijk inschatten hoe gezond het product was.

- Zeer mee oneens
- Oneens
- Enigszins mee oneens
- Neutraal
- Enigszins mee eens
- Helemaal mee eens
- Zeer mee eens

In hoeverre ben je het eens met de volgende stellingen?

Gezondheidsbewustzijn

Ik denk veel na over mijn gezondheid.

- Zeer mee oneens
- Oneens
- Enigszins mee oneens
- Neutraal
- Enigszins mee eens
- Mee eens
- Helemaal mee eens

Ik ben erg zelfbewust over mijn gezondheid.

- Zeer mee oneens
- Oneens
- Enigszins mee oneens
- Neutraal
- Enigszins mee eens
- Mee eens
- Helemaal mee eens

Ik ken mijn innerlijke gevoelens over mijn gezondheid.

- Zeer mee oneens
- Oneens
- Enigszins mee oneens
- Neutraal
- Enigszins mee eens
- Mee eens
- Helemaal mee eens

Ik onderzoek mijn gezondheid voortdurend.

- Zeer mee oneens
- Oneens
- Enigszins mee oneens
- Neutraal
- Enigszins mee eens
- Mee eens
- Helemaal mee eens

Ik ben alert op veranderingen in mijn gezondheid.

- Zeer mee oneens
- Oneens
- Enigszins mee oneens
- Neutraal
- Enigszins mee eens
- Mee eens
- Helemaal mee eens

Ik ben me meestal bewust van mijn gezondheid.

- Zeer mee oneens
- Oneens
- Enigszins mee oneens
- Neutraal
- Enigszins mee eens
- Mee eens
- Helemaal mee eens

Ik ben me vaak bewust van mijn gezondheidstoestand.

- Zeer mee oneens
- Oneens

- Enigszins mee oneens
- Neutraal
- Enigszins mee eens
- Mee eens
- Helemaal mee eens

Ik merk hoe ik me gedurende de dag lichamelijk voel.

- Zeer mee oneens
- Oneens
- Enigszins mee oneens
- Neutraal
- Enigszins mee eens
- Mee eens
- Helemaal mee eens

Ik ben erg betrokken bij mijn gezondheid.

- Zeer mee oneens
- Oneens
- Enigszins mee oneens
- Neutraal
- Enigszins mee eens
- Mee eens
- Helemaal mee eens

Demografische gegevens

Wat is je geslacht?

- Man
- Vrouw
- Anders
- Dat zeg ik liever niet

Wat is je leeftijd?

- 17 of jonger
- 18-20
- 21-29
- 30-39
- 40-49
- 50-59
- 60 jaar of ouder

Wat is je hoogste opleidingsniveau?

- Basisonderwijs
- Voortgezet onderwijs
- Middelbaar Beroepsonderwijs (MBO)
- Hoger Beroepsonderwijs (HBO) Bachelor
- Hoger Beroepsonderwijs (HBO) Master
- Wetenschappelijk Onderwijs (WO) Bachelor
- Wetenschappelijk Onderwijs (WO) Master
- Dokter in de Filosofie (PhD)

Dit waren de vragen. Nogmaals bedankt voor je deelname aan het onderzoek!

Heb je vragen of ben je benieuwd naar de resultaten van het onderzoek? Neem dan contact op met: i.a.s.berg@student.utwente.nl

INFORMEREN: onderzoek naar ware natuur (nam deel aan online enquête-experiment).

Appendix 3

Scenario 2: Healthy breakfast cereals without Nutri-Score

Credibility - Granola

Item	Minimum	Maximum	Mean	Std deviation	Variance
This product is believable	2	6	4.31	1.662	2.763
This product is credible	2	6	4.63	1.258	1.583
This product is realistic	2	7	4.63	1.586	2.517

Healthiness - Granola

Item	Minimum	Maximum	Mean	Std deviation	Variance
I think the nutrition level of this product is [poor/good]	2	6	4.38	1.310	1.717
Based on the information provided, how important would this product be as a part of a healthy diet? [not important at all/very important]	2	6	4.19	1.109	1.229
This product is [bad/good for your heart]	2	5	3.87	.885	.783
Overall, how would you rate the level of nutritiousness suggested by the information provided? [not nutritious at all/very nutritious]	2	6	4.56	1.459	2.129

Credibility - Oatmeal

Item	Minimum	Maximum	Mean	Std deviation	Variance
This product is believable	2	6	4.75	1.342	1.800
This product is credible	2	6	4.94	1.340	1.796
This product is realistic	2	7	5.00	1.414	2.000

Healthiness - Oatmeal

Item	Minimum	Maximum	Mean	Std deviation	Variance
I think the nutrition level of this product is [poor/good]	3	6	4.94	1.181	1.396
Based on the information provided, how important	2	6	4.69	1.138	1.296

would this product be as a part of a healthy diet?
[*not important at all/very important*]

This product is [*bad/good for your heart*]

Overall, how would you rate the level of nutritiousness suggested by the information provided? [*not nutritious at all/very nutritious*]

3	6	4.69	.873	.762
3	7	5.31	1.014	1.029

Credibility - Muesli

Item	Minimum	Maximum	Mean	Std deviation	Variance
This product is believable	2	6	4.00	1.633	2.667
This product is credible	2	6	3.87	1.455	2.117
This product is realistic	2	6	4.31	1.401	1.962

Healthiness - Muesli

Item	Minimum	Maximum	Mean	Std deviation	Variance
I think the nutrition level of this product is [<i>poor/good</i>]	2	6	4.37	1.310	1.717
Based on the information provided, how important would this product be as a part of a healthy diet? [<i>not important at all/very important</i>]	2	6	4.31	1.448	2.096
This product is [<i>bad/good for your heart</i>]	2	5	4.19	.911	.829
Overall, how would you rate the level of nutritiousness suggested by the information provided? [<i>not nutritious at all/very nutritious</i>]	2	6	4.56	1.263	1.596

Scenario 4: Unhealthy breakfast cereals without Nutri-Score

Credibility - Granola

Item	Minimum	Maximum	Mean	Std deviation	Variance
This product is believable	2	6	4.88	1.500	2.250
This product is credible	2	6	4.50	1.211	1.467
This product is realistic	2	6	4.88	1.204	1.450

Healthiness - Granola

Item	Minimum	Maximum	Mean	Std deviation	Variance
I think the nutrition level of this product is [poor/good]	1	6	3.38	1.544	2.383
Based on the information provided, how important would this product be as a part of a healthy diet? [not important at all/very important]	1	6	2.94	1.436	2.062
This product is [bad/good for your heart]	1	6	3.31	1.302	1.696
Overall, how would you rate the level of nutritiousness suggested by the information provided? [not nutritious at all/very nutritious]	1	6	3.88	1.500	2.250

Credibility - Oatmeal

Item	Minimum	Maximum	Mean	Std deviation	Variance
This product is believable	2	6	4.50	1.414	2.000
This product is credible	2	6	4.38	1.408	1.983
This product is realistic	2	6	4.25	1.238	1.533

Healthiness - Oatmeal

Item	Minimum	Maximum	Mean	Std deviation	Variance
I think the nutrition level of this product is [poor/good]	2	6	3.25	1.238	1.533
Based on the information provided, how important would this product be as a part of a healthy diet? [not important at all/very important]	1	6	3.19	1.276	1.629
This product is [bad/good for your heart]	2	5	3.38	.957	.917
Overall, how would you rate the level of nutritiousness suggested by the information provided? [not nutritious at all/very nutritious]	2	6	3.75	1.390	1.933

Credibility - Muesli

Item	Minimum	Maximum	Mean	Std deviation	Variance
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This product is believable	1	6	4.31	1.448	2.096
This product is credible	2	6	4.38	1.147	1.317
This product is realistic	2	6	4.65	1.000	1.000

Healthiness - Muesli

Item	Minimum	Maximum	Mean	Std deviation	Variance
I think the nutrition level of this product is [poor/good]	2	6	3.31	1.138	1.296
Based on the information provided, how important would this product be as a part of a healthy diet? [not important at all/very important]	1	5	2.94	1.063	1.129
This product is [bad/good for your heart]	1	5	3.25	1.183	1.400
Overall, how would you rate the level of nutritiousness suggested by the information provided? [not nutritious at all/very nutritious]	1	6	3.75	1.342	1.800

Appendix 4

Demographics of the participants

Demographics	Frequency	Percent
Gender		
Man	87	38.3
Woman	139	61.2
Other	1	.4
<i>Total</i>	<i>N= 227</i>	<i>100</i>
Age		
18-20	6	2.6
21-29	137	60.4
30-39	37	16.3
40-49	11	4.8
50-59	29	12.8
60+	7	3.1
<i>Total</i>	<i>N= 227</i>	<i>100</i>

Education level		
Secondary Education	11	4.8
Vocational Education	32	14.1
Higher Professional Education	108	47.6
Academic Education	76	33.5
<i>Total</i>	<i>N= 227</i>	<i>100</i>

Appendix 5

Spearman's rho correlation between the variables

		<i>Correlation</i>								
		PH	NS	PAG	PAO	PAM	PIG	PIO	PIM	HC
PH	Cor. Coef.	1.000	-.022	.470**	.242**	.440*	.359**	.290**	.328**	.054
	Sig. (2-t.)	.	.740	<.001	<.001	<.001	<.001	<.001	<.001	.418
	N	227	227	227	227	227	227	227	227	227
NS	Cor. Coef.	-.022	1.000	-.022	-.074	.002	-.086	-.087	-.075	-.070
	Sig. (2-t.)	.740	.	.739	.268	.981	.198	.190	.259	.296
	N	227	227	227	227	227	227	227	227	227
PAG	Cor. Coef.	.470**	-.022	1.000	.772**	.801**	.812**	.543**	.584**	-.009
	Sig. (2-t.)	<.001	.739	.	<.001	<.001	<.001	<.001	<.001	.897
	N	227	227	227	227	227	227	227	227	227
PAO	Cor. Coef.	.424**	-.074	.772**	1.000	.712**	.633**	.819**	.546**	.046
	Sig. (2-t.)	<.001	.268	<.001	.	<.001	<.001	<.001	<.001	.489
	N	227	227	227	227	227	227	227	227	227
PAM	Cor. Coef.	.440**	.002	.801**	.712**	1.000	.643**	.506**	.814**	-.040
	Sig. (2-t.)	<.001	.981	<.001	<.001	.	<.001	<.001	<.001	.550
	N	227	227	227	227	227	227	227	227	227
PIG	Cor. Coef.	.359**	-.086	.812**	.633**	.643**	1.000	.567**	.622**	.001
	Sig. (2-t.)	<.001	.198	<.001	<.001	<.001	.	<.001	<.001	.987
	N	227	227	227	227	227	227	227	227	227
PIO	Cor. Coef.	.290**	-.087	.543**	.819**	.506**	.567**	1.000	.518**	.006
	Sig. (2-t.)	<.001	.190	<.001	<.001	<.001	<.001	.	<.001	.933
	N	227	227	227	227	227	227	227	227	227
PIM	Cor. Coef.	.328**	-.075	.584**	.546**	.814**	.622**	.518**	1.000	-.111
	Sig. (2-t.)	<.001	.259	<.001	<.001	<.001	<.001	<.001	.	.094
	N	227	227	227	227	227	227	227	227	227
HC	Cor. Coef.	.054	-.070	-.009	.046	-.040	.001	.006	-.111	1.000
	Sig. (2-t.)	.418	.296	.897	.489	.550	.987	.933	.094	.
	N	227	227	227	227	227	227	227	227	227

***. Correlation is significant at the 0.01 level (2-tailed).*

Product Healthiness = PH

Nutri-Score = NS

Product Attitude Granola = PAG

Product Attitude Oatmeal = PAO
Product Attitude Muesli = PAM
Purchase Intention Granola = PIG
Purchase Intention Oatmeal = PIO
Purchase Intention Muesli = PIM
Health Consciousness = HC

Appendix 6

Manipulation check 1: Presence of the Nutri-Score (healthy breakfast cereals)

The Nutri-Score label for the products I just saw was:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Nutri-Score A	42	73.7	73.7	73.7
	Nutri-Score B	1	1.8	1.8	75.4
	Nutri-Score C	1	1.8	1.8	77.2
	Nutri-Score D	2	3.5	3.5	80.7
	No Nutri-Score	11	19.3	19.3	100
	was shown				
	<i>Total</i>	<i>N= 57</i>	<i>100</i>	<i>100</i>	

Manipulation check 1: Absence of the Nutri-Score (healthy breakfast cereals)

The Nutri-Score label for the products I just saw was:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Nutri-Score A	2	3.4	3.4	3.4
	Nutri-Score B	6	10.2	10.2	13.6
	Nutri-Score C	4	6.8	6.8	20.3
	Nutri-Score D	3	5.1	5.1	25.4
	No Nutri-Score	44	74.6	74.6	100
	was shown				
	<i>Total</i>	<i>N= 59</i>	<i>100</i>	<i>100</i>	

Manipulation check 1: Presence of the Nutri-Score (unhealthy breakfast cereals)

The Nutri-Score label for the products I just saw was:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Nutri-Score A	1	1.8	1.8	1.8
	Nutri-Score B	1	1.8	1.8	3.5
	Nutri-Score C	5	8.8	8.8	12.3
	Nutri-Score D	39	68.4	68.4	80.7
	Nutri-Score E	1	1.8	1.8	82.5
	No Nutri-Score was shown	10	17.5	17.5	100
<i>Total</i>		<i>N= 57</i>	<i>100</i>	<i>100</i>	

Manipulation check 1: Absence of the Nutri-Score (unhealthy breakfast cereals)

The Nutri-Score label for the products I just saw was:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Nutri-Score B	6	11.1	11.1	11.1
	Nutri-Score C	4	7.4	7.4	18.5
	Nutri-Score D	1	1.9	1.9	20.4
	Nutri-Score E	1	1.9	1.9	22.2
	No Nutri-Score was shown	42	77.8	77.8	100
<i>Total</i>		<i>N= 54</i>	<i>100</i>	<i>100</i>	

Manipulation check 2: Healthiness of the breakfast cereals

Group Statistics

	Nutri-Score	N	Mean	Std. Deviation	Std. Error Mean
Perceived Healthiness	Included	114	4.69	1.421	.133
	Not included	113	4.40	1.491	.140
Products	<i>Total</i>	<i>N= 227</i>			

Independent Samples Test

	Levene's Test for Equality of Variances			T-test for Equality of Means			95% Confidence Interval of the Difference		
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.943	.333	-1.524	225	.129	-.295	.193	-.676	.086
Equal variances not assumed			-1.524	224.27	.129	-.295	.193	-.676	.086

Manipulation check 3: The nutritional information on the back of the package

I have seen the back-of-pack nutritional information.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	36	15.9	15.9	15.9
	Yes	191	84.1	84.1	100
	<i>Total</i>	<i>N= 227</i>	<i>100</i>	<i>100</i>	

Group Statistics

	Nutri-Score	N	Mean	Std. Deviation	Std. Error Mean
BOPNutritional ValueSeen	Included	114	1.85	.358	.034
	Not included	113	1.83	.376	.035
	<i>Total</i>	<i>N= 227</i>			

Independent Samples Test

	Levene's Test for Equality of Variances			T-test for Equality of Means			95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower

Equal	.611	.435	-.391	225	.696	-.019	.049	.115	-.077
variances									
assumed									
Equal			-.391	224.26	.697	-.019	.049	.115	-.077
variances									
not assumed									
