

## Research protocol. The use of food swaps to encourage healthier online food choices

### CONTEXT

Study title	The use of food swaps to encourage healthier online food choices: a randomized control trial
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Description research	<p>This study assessed the effect of a swap offer, Nutri-Score labeling, and a descriptive norm message on the nutrient profiling (NP) score of food choices in an online food basket. Additionally explored was whether these interventions made it more motivating and easier for consumers to select healthier foods and whether potential effects were moderated by consumer health interest. Hypotheses were tested with a randomized controlled trial (RCT) in a simulated online supermarket. Swap offer significantly improved the combined NP score compared to the control condition, whereas a norm message did not have a significant effect. No evidence was found that interventions made it more motivating or easier for consumers to select healthier food, but situational motivation significantly influenced the healthiness score of food choices for both swap offer and Nutri-Score. Consumer health interest only significantly moderated the influence of Nutri-Score on ease of identifying the healthy food option. Swap offer and Nutri-Score labeling were effective in enhancing healthy purchase behavior in the online store environment.</p>
Study design	<p>A 2 (Nutri-Score: present, not present) X 2 (swap offer: present, not present) X 2 (norm message: present, not present) between subject design.</p> <p>A randomized controlled trial (RCT) will be conducted in a simulated online supermarket where participants will be evenly allocated to eight conditions in a 2 (swap offer: yes versus no) x 2 (Nutri-Score: yes versus no) x 2</p>

	<p>(descriptive norm message: yes versus no) between subject design. At a simulated point-of-purchase of an online supermarket, each respondent individually is exposed to one of the eight conditions where swap offer, Nutri-Score label and a descriptive norm message is present or not.</p> <p>Data will be collected from the Qualtrics environment used during the intervention and from follow-up question in a Qualtrics survey.</p>	
Study participants	<p>Study participants: Dutch consumers, representative sample based on age and gender.</p> <p>Inclusion criteria:</p> <ul style="list-style-type: none"> <li>• Aged &gt;18 years</li> <li>• Living in the Netherlands</li> <li>• Able to read Dutch</li> <li>• Willing and able to give informed consent for participation in the study</li> <li>• Having access to a computer and Internet</li> </ul>	
Planned sample size	<p>550 participants</p> <p>Participants will be recruited by a market agency.</p>	
Planned study Period	<p>May 2020</p>	
Spatial coverage	<p>The Netherlands</p>	
	<b>Objectives</b>	<b>Outcome measures</b>
Primary	<p>To investigate whether interventions (swap offer, Nutri-Score, and norm message) increase the healthiness score of the online grocery store basket.</p>	<p>The difference in combined NP score of product choices, for which a lower score represents a healthier product.</p>
Secondary	<p>Explore the effect of mediators (ease of identifying the healthy food options and situational motivation to choose healthy) and moderators (health interest and situational motivation to choose healthy) on the influence of interventions on the healthiness score of the grocery basket.</p>	<p>Ease of identifying the healthy food option is measured by asking how easy it was to identify the healthy product during grocery shopping.</p> <p>Items to measure situational motivation to choose healthily are adopted from Siemsen, Roth and Balasubramanian [52] and are translated into health-related items. The following four items are used: "When being presented with the product choices in this particular version of an online store", "I had the intention to choose a healthy product", "I was motivated to choose a healthy product", "I really wanted to choose a healthy product" and "I meant to choose a healthy product".</p>

		Health interest is measured with four items developed by Pieniak, Verbeke, Olsen, Hansen and Brunso [53]: In general in my daily life... “health is very important to me”, “I care a lot about my health”, “health means a lot to me” and “I am very concerned about the health-related consequences of what I do”.
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## INTERVENTIONS

During the simulation, all participants are exposed to the same products. Participants are shown a product assortment of four different product categories: breakfast cereals, muesli bars, crackers and pizza (Additional file 3). Each product category consists of six products with different nutrient profiling (NP) score levels based on Nutri-Score. Participants were exposed to one of the four product categories at a time and were asked to indicate their choice.

Participants are exposed to one of the eight conditions: control, swap offer, Nutri-Score, descriptive norm message, swap offer + Nutri-score, swap offer + norm message, Nutri-Score + norm message or a combination of all the three interventions. At a simulated point-of-purchase of an online supermarket, each respondent individually is exposed to one of the eight conditions where swap offer, Nutri-Score label and a descriptive norm message is present or not. A swap offer is presented if the original products is not the healthiest option in the assortment. The product with the lowest NP score for the specific category will be shown. The effect of Nutri-Score is tested by displaying a Nutri-Score label alongside products in intervention conditions. Nutri-Score label is based on the NP system of the UK Food Standards Agency. In the descriptive norm message condition, the norm *“Dutch consumers more often choose healthy products”* is shown.

## PROCEDURES

After providing informed consent, participants are shown questions to screen for age (older than 18), gender and country of living (The Netherlands). After that, eligible participants will read a scenario about grocery shopping and they will be randomly assigned to one of eight study conditions. Randomization was on a 1:1:1:1:1:1:1:1 basis, using computerized random number generation.

For each condition, four separate questions are shown with the text: “Imagine you need to buy [breakfast cereals, crackers, muesli bars, pizza] in an online supermarket. Which product would you choose?” and the different product options were shown. Participants can choose one product for each question. After that, questions regarding mediators, moderators and background variables will be asked.

## STATISTICS AND ANALYSIS

Power analysis (G\*Power version 3.1.9.4) will be used to calculate the required sample size with a power of 0.8 and an alpha of 0.05 to detect small to medium effect size (result 550).

## Methods and software

Qualtrics to collect data (WUR license)

SPSS to analyze data (version 26)

**Explanation of variables**

Leeftijd – age in years

Geslacht – gender (male / female / other)

Land van herkomst – list of countries

Ease of identifying – whether it is easy to identify the healthier food choices

Situational Motivation – whether people feel motivated to choose healthy at that moment

Credibility – whether offered alternative is perceived as credible

Health interest - whether people are interested in health

Credibility store – whether the online store is perceived as realistic

Frequency of shopping – how often people shop online

Education - highest education achieved

Household – people in their household

**Analysis methods**

To analyze the differences in combined NP score across conditions, a one-way ANOVA with Tukey post hoc will be conducted for NP values for products combined across conditions. Also, a 3-way ANOVA will be performed to test the direct and interaction effects of the three interventions on the combined NP score. To explore the mediating effect of ease of identifying the healthy food option and situational motivation to choose a healthy product, while also taking into account the moderating effect of health interest and situational motivation, PROCESS by Hayes was used.

**DATA MANAGEMENT**

The anonymized data set supporting the conclusions of this article will be available in the Zenodo repository

**Data access**

Direct access will be granted to authorized representatives from Wageningen University for monitoring and/or audit of the study to ensure compliance with regulations.

**Data anonymity**

Participants will be identified by a unique study specific number and/or code in any database. Personal data will not be collected in this study.

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