

Skretkowicz, Yvette; Perret, Jens K.

Working Paper

The Nutri-Score in the German perception: A qualitative expert-based study of front-of-pack visual nudging and consumer behaviour

ISM Working Paper, No. 24

Provided in Cooperation with:

International School of Management (ISM), Dortmund

Suggested Citation: Skretkowicz, Yvette; Perret, Jens K. (2024) : The Nutri-Score in the German perception: A qualitative expert-based study of front-of-pack visual nudging and consumer behaviour, ISM Working Paper, No. 24, ISBN 978-3-7583-6453-2, Books on Demand (BoD), Dortmund and Norderstedt

This Version is available at:

<https://hdl.handle.net/10419/313088>

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Yvette Skretkowicz;
Jens K. Perret

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Printing: BoD – Books on Demand, Norderstedt

ISBN 978-3-7583-6453-2

ISM – International School of Management GmbH

Otto-Hahn-Str. 19 · 44227 Dortmund

www.ism.de

Telephone: 0231 975139 0 · Fax: 0231 975139 39

ism.dortmund@ism.de

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Dortmund and Norderstedt, BoD, 2024 (Working Paper ; 24)

ISBN 978-3-7583-6453-2

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Abstract

The Nutri-Score is currently used in 7 countries in the EU and is part of the German reduction and innovation strategy to combat non-communicable diseases related to unhealthy eating. The Nutri-Score is intended to inform consumers and serves as a guide when buying packaged food.

The aim of this study is to investigate the significance, benefits, function and credibility of the Nutri-Score in Germany from the perspective of nutrition experts, business representatives from food companies, packaging experts and general consumers.

A qualitative method was selected for the evaluation and a survey was conducted with the help of expert interviews with 23 industry experts on their personal opinion of the Nutri-Score.

The qualitative method allowed the research questions to be considered from the perspective of different experts and two-sided responses showed that the answers varied depending on the professional background of the experts. In summary, it can be said that the Nutri-Score can be used as a guide for the average consumer, but there are still some suggestions for improvement, such as the consideration of additional ingredients, the controlling of the label and a fundamental holistic nutritional education.

Keywords: Nutri-Score, visual nudging, FMCG, nutrition policy, qualitative, expert interviews

1 Introduction

The Nutri-Score, as a front-of-package label (fopl), was introduced in France, Belgium, Spain, Luxembourg, Switzerland, the Netherlands and Germany on November 6, 2020, and is part of the German national reduction and innovation strategy since labeling can help governments implement health strategies (WHO 2021). Currently, German food manufacturers can introduce the Nutri-Score on a voluntary basis, but if they do so, they must use it on their entire product range (BMLE 2021). The EU Commission wants to achieve two important goals with the Nutri-Score. Firstly, consumers should be better informed about how healthy a product is, and secondly, manufacturers should be encouraged to improve the quality of their food.

While a broad number of studies, with participant numbers in the thousands or even millions, study the functionality of the Nutri-Score in practical situations and its signaling effect compared to other nutrition labels among consumers (Fialon et al. 2023; Dubois et al. 2021), rarely do studies consider the opinion of nutrition experts in more

detail. The last sentiment holds in particular for the case of Germany, where currently only one qualitative study on the perception of the Nutri-Score exists, which, however, displays some shortcomings detailed below.

Thus, the aim of this study is to find out in detail how important, useful, functional and credible the Nutri-Score is in Germany from the perspective of nutrition experts, economists, packaging experts and ordinary consumers. In particular, the aim is to obtain detailed and well-founded suggestions for improvement from experts in in-depth interviews. Experts with different professional backgrounds and consumers from different generations are considered to present a look at the Nutri-Score and its benefits and functions from different perspectives.

The second chapter of the study looks at the theoretical background and provides an overview of qualitative studies conducted to date on the Nutri-Score, motivating the research questions that will be examined. The third chapter then explains the research design in detail and discusses the conceptualization of the interviews conducted. In the fourth chapter, the results of the expert interviews are considered in relation to the research questions. Finally, in chapter five, the results are summarized and practical conclusions and recommendations are discussed, followed by a discussion of the limitations of the study and an outlook for the future.

2 Theory

2.1 Literature Review

Numerous quantitative studies have shown that nutritional labeling such as the Nutri-Score on the front of the package increases understanding and awareness of packaged foods (Marcos et al. 2023), makes the nutrient composition more transparent and understandable (Temmerman et al. 2021), and improves the overall quality of purchases (Egnell et al. 2019; Egnell et al. 2021). Similarly, numerous studies have shown that it is the most effective, simplest and most comprehensible form of food labeling for processed foods (Crosetto et al. 2020; Fialon et al. 2022b; Julia/Hercberg 2017). The majority of studies on the effectiveness of the Nutri-Score were conducted for the French market, showing that the presence of the Nutri-Score as a fopl leads to healthier consumption decisions by consumers (Ducrot et al. 2022; Dubois et al. 2021; Egnell et al. 2022). A general review of literature on the Nutri-Score can be found in Skretkiewicz/Perret (2024).

While there are more quantitative studies investigating the impact of the Nutri-Score on consumers' purchasing behavior Table 1 summarizes those studies that provide in-depth qualitative results. The synopsis table resulted from filtering a Scopus search for the expressions "Nutri" and "Score" by the implemented methodology. In addition, for

each resulting study the Google Scholar functions “Cited by” and “Similar articles” have been used to find more recent articles. The process yielded a total of five studies.

The study conducted by Zander (2022) in Germany does not consider suggestions for improving the design and communication of the Nutri-Score. In addition, the focus here was on young to middle-aged female participants.

Another quantitative study by Fialon et al. (2022a) focuses on the comparison of Italian and French stakeholders on the issue of stakeholder disagreement with the introduction of the Nutri-Score. Italy questions the usefulness of the Nutri-Score because traditional products in Italy cannot be reformulated and are part of the Italian tradition and origin. This approach is a political view of the Nutri-Score. Here, the approach of the Nutri-Score as such is missing as a tool.

The study by Vyth et al. (2009) has a mixed approach with quantitative and qualitative methods and does not directly examine the Nutri-Score but fopls as a logo in general for use in the Netherlands. The qualitative study showed that consumers would refer to a foapl logo if it was clear that it was scientifically and statistically supported and researched.

Finally, Panczyk et al. (2023) provides a very broad qualitative study on the Nutri-Score but with the focus being primarily on the Polish market and the opinions of Polish experts. Thow et al. (2019), in contrast, focuses on foapl in a global context without considering national particularities.

Table 1: Synopsis: Qualitative Studies on the Nutri-Score

Authors	Results	Research Question	Survey Size & Scope
Zander (2022)	Nutri-Score usefull tool for product purchase decision, supports healthy diet and lifestyle. Comparison within a product group is given. Nutri-Score is not always clear and questionable classification.	“How do German food consumers perceive the Nutri-Score and how are these perceptions related to a healthy lifestyle?”	Semi-structured interviews, Skype, 18 young – middle aged female with Nutri-Score experience. Four categories were examined: sociodemographic characteristics, consumer variables, Nutri-Score perception, healthy lifestyle
Fialon et al. (2022a)	The impact of the debate led to different results in Italy than in France. The Nutri-Score attacks the Italian way of life and pragmatic legitimacy (algorithm, colors, format)	how and by whom the legitimacy of the Nutri-Score, recognized by several institutional authorities, could be deconstructed within a specific system of norms, values and beliefs among Italian stakeholders	Italy, 8 italian/french nutrition & public health experts

Vyth et al. (2009)	Exposure to the logo has increased significantly. Older and obese respondents more likely than young and normal-weight respondents. Quantitative study: Credibility of the logo would increase if consumers knew that they are supported by government and scientific bodies. Older people need a logo, those interested in health would also use the logo.	Evaluation of the introduction of the FoPL "Choice Logo" in the Netherlands.	Quantitative & qualitative (mixed) approach in the Netherlands qualitative: focus groups for more insight into the questionnaire responses.
Panczyk et al. (2023)	The most important features of an FoPL are: Simplicity, objective comparison within product group, clarity, healthy nutrition recommendation. Nutri-Score facilitates purchasing decisions but does not help in compiling a balanced diet. The degree of processing of products, nutrient and carbon footprint is questionable.	Polish experts' opinion on the Nutri-Score and its use for an ideal information system for consumers.	Expert interview N=75, average work experience 13-18 years. CAWI method
Thow et al. (2019)	Codes guidance has a high impact on FoP nutrition labelling, both positive and negative	How are decisions about FoP nutrition labelling made and influenced at the global level?	Semi-structured Interviews N=28, stakeholders internationally with knowledge about FoP nutrition labelling and Codex

Source: own table

2.2 Research Question

In light of the previous literature review, it is clear that there are an insufficient number of qualitative studies that deal with the overall consideration of the Nutri-Score topic, its effectiveness, successful implementation and improvement measures.

For this purpose, seven research questions were derived, the first two having a general focus on the purchasing behavior of packaged foods and the following five dealing directly with the Nutri-Score.

The first research question deals with the question of the factors influencing the purchase of packaged foods in Germany. Previous studies differentiated between product origin, price-performance ratio (Leitow 2005), as well as cognitive and normative influences (Henseleit et al. 2007). Packaging design and coloring also contribute to the purchase decision for packaged foods (Wozak 2003). The objective of this question lies in the reproduction of already existing insights on the topics. The related interview questions also prepare the experts for the following questions on the Nutri-Score.

RQ 1: Which factors influence the purchase of packaged foods in Germany?

Food packaging is a transmitter of the informational value of the content and thus acts as a silent salesperson, playing a large part in the purchase decision (Orth 2011). The design of packaging can trigger stimuli in the consumer, which lead to an impulse purchase (Kroeber-Riel/Gröppel-Klein 2019). The recognition value of a brand through the packaging design can also play a role in the purchase decision (Klein et al. 2013). The design factors of packaged food include the packaging material, the packaging area and the packaging effort. The focus on particular design factors can vary depending on the age, gender and professional background of the consumer (Rani 2014; Bakshi 2012). Numerous studies have looked at the design affinity of consumer groups for the packaging, color and shape of a product (Schulz 2009).

The study by Braun-Münker (2018) has shown that the ease of opening packages, the legibility of the best-before date, and the legibility of the informational content about the contents of the packaging have a positive effect on a purchase decision.

In conclusion, the second research question results in:

RQ 2: Which design factors regarding the package play a role in the purchasing decision for packaged foods?

In the work of Skretkowicz/Perret (2023), a literature review of previous studies on the Nutri-Score was presented. The most important statements and the effects of the Nutri-Score were summarized, and then a quantitative study was carried out. Here, the general influence of the Nutri-Score on the purchase decision, the purchase decision with a positive Nutri-Score and the effect of the Nutri-Score as a visual stimulus on the purchase decision were examined. Aside from Zander (2022), there has been no qualitative analysis of the influencing factors and the effects of the Nutri-Score in Germany. The study by Panczyk et al. (2023) is based on expert interviews with 75 Polish experts, focusing on the Nutri-Score and its use as an ideal information system for consumers. From the expert interviews, it emerged that the Nutri-Score facilitates the purchase decision, but does not help in putting together a balanced diet. The degree of food processing, nutrients, and the carbon footprint are not included in the Nutri-Score, so it remains a questionable indicator.

Since Polish experts were interviewed here and the Nutri-Score has not yet been introduced in Poland, the research question can be derived from this.

RQ 3: What significance does the Nutri-Score have for German consumers when purchasing packaged food?

The study by Fialon et al. (2022a) discussed the Nutri-Score as a seal of quality for the French and Italian markets. An expert interview with stakeholders revealed that the Nutri-Score is not an effective seal of quality for traditional products in Italy and therefore fails to fulfill its purpose as an informational seal. This leads to the next research question:

RQ 4: How credible is the Nutri-Score as a quality label for Germany?

Numerous quantitative studies have shown that the Nutri-Score is successful as a label for comparison within a product group and can lead to healthier purchasing behavior. van den Akker et al. (2022) compared purchasing decisions within a product group with different Nutri-Scores. The result of the study showed that positively rated labels can contribute to a purchase decision without increasing the portion size.

Temmerman et al. (2021) also carried out a comparison within the same product groups and found that the intention to buy healthier food increased with a good NS. In the study by Skretkiewicz/Perret (2023), frozen pizzas with three different Nutri-Score ratings were compared, and the purchasing decisions of consumers were examined in a quantitative study. From this, the next research question regarding a comparison within a product group can be derived:

RQ 5: Is the Nutri-Score an efficient tool for comparing products within a product group?

The next research question can be derived from the fact that there are no current studies that examine the Nutri-Score in the context of greenwashing, as shown in Skretkiewicz/Perret (2024).

RQ 6: What significance does the Nutri-Score have as a seal of quality in the area of corporate greenwashing in Germany?

Basically, the qualitative and quantitative literature lacks a focus on how the Nutri-Score could be improved as a seal of quality for consumers in general. Previous studies have looked at influencing factors, moderators, comparisons with other fopls and health effects. Therefore, the final research question can be derived:

RQ 7: How can the Nutri-Score be improved in its function as a quality label for the German consumer?

3 Methodology

3.1 Research Design

As part of this scientific study, the expert interview was selected as a qualitative research method in order to objectively answer the research questions with the help of experts from the fields of nutrition, fast-moving consumer goods (FMCG) and packaging design. Throughout the expert interview, the study participants were given the opportunity to refer to their professional experience and express personal opinions in detail on the questions posed.

To attain a holistic view of the Nutri-Score from an expert perspective, a guide for semi-structured interviews was prepared, in which nine questions were set in a predetermined order. The interviewees were able to answer these questions freely, and no follow-up questions were asked.

A total of 19 experts from the fields of nutrition, FMCG and packaging design and four consumers were interviewed. The interviews were conducted either face-to-face, by telephone or by e-mail. This depended on the experts' allowance for time and distance. With face-to-face and telephone interviews, answers were transcribed verbatim following the transcription rules by Mayring (2022). Experts who participated via e-mail provided their answers in text form without requiring transcription. Subsequently, the transcripts were analyzed following the process established by Mayring and detailed in Mayring (2022). Since categories were already predefined via the research questions, a deductive design of content analysis has been adopted. All interviews were conducted in German.

3.2 Expert Sampling

During sampling, care was taken to ensure that there were a multitude of opinions from different experts. No implicit attention was paid to the gender or age of the experts, but rather to their general competence as experts. The participants were aware of the central research topic of this study. In order to reduce response biases, all participants were informed that their answers would be evaluated and published completely anonymously. To reduce acquisition bias, open and neutral questions were asked. Interviewer effects were prevented in the self-transcribed interviews by e-mail. In a personal and telephone survey, care was taken to ensure that there was clear and consistent communication without evaluation or approval on the part of the interviewer (Bogner/Landrock 2016). Additionally, care was taken to ensure that the interviewer was not distracted by another person. In order to avoid a halo effect when answering consecutive questions, the questions were formulated in such a way that the topic was further developed from question to question and asked in a more targeted manner.

Socio-demographic factors such as age, gender and the experts' level of education are not decisive in the context of this study and were therefore not surveyed.

To classify the experts better, in the first question, they were asked about their private or professional relationship to the thematic background of the study. Table 2 shows the distribution of the experts surveyed.

Table 2: Background of Interviewed Experts

Field of Expertise	Experts
Nutrition specialist	8
Baby Boomer	1
Generation X	1
Generation Y	1
Generation Z	1
Fitness trainer & nutrition specialist	1
Online supermarket sales assistant	1
Label development for food products	1
Nutrition counseling in pharmacy/pharmacist	1
Marketing/packaging design in a food company, diabetics	1
Food technology. Business development for product development and optimization	1
Cook	1
Managing director of a medium-sized food companyLecturer in packaging design, FMCG	1
Lecturer in packaging design, FMCG	1
Health & nutrition coach according to Medical Medium	1
Health consultant	1

Source: own table

A total of ten experts from the field of nutritional advice, a health advisor and a health & nutrition coach were interviewed according to the medical medium principle, which accounts for 52.17% of respondents. This also includes a fitness trainer and a pharmacist who also deal with the topic of nutrition. Another participant is a chef who deals with the practical side of nutrition. Consequently, over half of the participants are experts in the field of nutrition.

Experts with an economic background in FMCG or packaging design form the second-largest group, with approximately 29%. Among the expert participants are one employee in the sales department of an online supermarket, the managing director of a medium-sized food company, a marketing manager and a person responsible for packaging design at a food company, an employee of a leading food label manufacturer, a food technologist responsible for product development and optimization in the area of business development, and a lecturer at a university with a lecture focus on packaging design and FMCG. All of these experts have a different professional economic background, which makes it possible to obtain a broad spectrum of economic perspectives on the research question.

Last but not least, four people from the currently most prevalent four generations (Z, Y, X, and Baby Boomers) were consulted who have no professional connection with the topic of the study but represent the demand side.

4 Results of the Interview Study

In this chapter, the results of the expert interviews are discussed against the background of the research questions.

RQ 1: Which factors influence the purchase of packaged foods in Germany?

In response to the first research, three main answer categories can be identified. On the one hand, the packaging of the food plays a role, especially the packaging design; on the other hand, the color, and finally, the product brand. But one expert emphasizes that products presented in advertising campaigns should be avoided in order not to be subject to the manipulation strategies of marketing. Another interviewer, with an economic background, emphasized that the degree of familiarity and the brand of a packaged product could consciously accelerate the purchase decision.

In addition, the experts prefer unpackaged food to packaged food, especially fresh fruit and vegetables, as these do not require additional packaging.

When looking at processed animal products, the external appearance of the product is often more important than the actual packaging. A significant focus among experts with a nutritional science background is on the list of ingredients in packaged foods.

This involves taking a closer look at the individual nutrients and paying attention to ingredients such as preservatives, flavor enhancers, aspartame and other artificial ingredients. A long list of ingredients could indicate that undesirable ingredients are included. In addition, product quality is also taken into account, as is the organic cultivation of the ingredients contained. Some of the experts attach more importance to product quality than price.

The food technologist among the experts emphasized the importance of the overall concept of a meal and placed less value on individual foods. The latter gave an exact order that plays a role in his purchasing decision:

Quote 1: “As a food specialist, I pay attention to: First, what kind of product it is. Second, what the main ingredients are. Third Nutri-Score when comparing foods in a product range. Fourth, taste. However, taste before Nutri-Score and before the list of ingredients. I pay attention to the overall meal as an overall concept, so a product can also have a poor Nutri-Score.”

It was observed that the influencing factors change depending on the type of product. When it comes to luxury items, the list of ingredients is rated less critically, as taste is the most important factor. This was confirmed by experts from the various professional categories.

Furthermore, labels such as organic labels, the Nutri-Score and fair trade can have a positive influence on purchasing decisions. Consumers trust these seals, which help them in their decision-making.

In addition to the factors already mentioned, individual purchasing habits also play a role. These habits can be independent of the aforementioned factors and can be deeply rooted and therefore difficult to break (Ramya/Ali 2016).

In summary, packaging (design, color, and brand), presentation in advertising media and the unconscious influence of brand awareness play a role in the purchase decision. Unpackaged food is predominantly preferred. Nutrition experts focus on undesirable ingredients instead of the external appearance and the list of ingredients, and attach importance to product quality. In addition, the influencing factors can differ depending on the type of product, and seals such as organic, Nutri-Score or Fair Trade can have a positive influence on the purchasing decision. Nevertheless, personal purchasing habits can also play a role.

RQ 2: Which design factors regarding the package play a role in the purchasing decision for packaged foods?

For the second research question, the following three specifications emerged that play a role in the design factors: Packaging material, the packaging effort, and the packaging surface.

A consumer from Generation Z emphasized that high-quality looking packaging serves as an eye-catcher and has a positive influence on his purchasing decision. In contrast, a nutrition expert expressed his preference for environmentally friendly packaging, particularly packaging that is plastic-free and recyclable. Packaging with an organic look and a matte surface was perceived as particularly appealing, as it conveys a natural character.

An expert from the packaging industry in the FMCG sector specifically stated that packaging design is product-dependent and that different requirements must be met in order to optimally appeal to different consumers:

Quote 2: "For baked goods, there is a packaging design or the packaging is transparent so that the product can be seen. It is more appealing to see the baked goods in order to recognize the freshness. For vegetables: transparent, not fully packed product packaging. Products such as potato chips are fully packaged with a lot of pressure.

Bagels experiment: simple packaging, not fully printed and in a transparent bag. In the case of cheap toast, it is a transparent film with only the text printed on it. Little print and transparent indicates the cheaper product. It depends on the product and the design. Products that are presented in an Americanized way with a transparent film on an originally American product such as bagels can have an attractive effect. This does not work positively with toast. Transparent film has a more favorable effect on the consumer. Normally, the more attractive the print, the higher the quality of the packaging, with the design and materials playing a role. In the case of organic products, matt, brown packaging is preferred to achieve a natural look. For expensive olive oil, high-gloss packaging is more important. Brand recognition is not about design but recognition value, e.g. Milka and the color purple. Artisan cookies, on the other hand, need a small label with a logo with artisan quality.”

Depending on the product category, e.g., potato chips vs. toast, different packaging strategies were highlighted. For products such as potato chips, complete packaging is preferred and for toast, transparent packaging is preferred, in order to recognize the freshness and therefore the quality of the product.

Film thickness and modified atmosphere packaging were cited by the packaging experts as key criteria for assessing product quality and shelf life. Some products required specific packaging measures to extend their shelf life.

Packaging costs were also considered relevant. It was stated that, as a rule, packaging that has a practical, resealable packaging glass is preferred over elaborate, plastic-intensive packaging.

Another influencing factor is the aesthetic appearance of the packaging surface. The experts state different preferences here. Some of the experts prefer matte, natural designs, without garish colors, while the others prefer eye-catching and garish colors or glossy surfaces, especially for high-quality food products. One Generation Y consumer in particular emphasized that bright colors and high-quality packaging designs are highly visible and tempting.

It became clear that opinions differed between consumers of different generations, the nutrition experts, and the experts with a background in economics. One CEO of an FMCG company has no design affinity at all and believes that brand image has a major impact. Nutrition experts, on the other hand, value an authentic appearance that corresponds to the truth and organic labels.

Some experts prioritize the nutritional properties of food over packaging design. One of the nutritionists stated that the taste and ingredients are more important for a decision than the packaging design.

Summarizing the experts' answers, Generation Z prefers appealing packaging as an eye-catcher, while environmentally conscious consumers prefer a plastic-free, natural design. The packaging design also depends on the product, as with potato chips vs. toast. The opinion on the external appearance. Color and materials differ between consumer groups and experts. Experts with a nutritional background rate the nutritional properties of the products higher than the packaging design.

RQ 3: What significance does the Nutri-Score have for German consumers when purchasing packaged food?

The next research question deals with the significance of the Nutri-Score in the context of purchasing decisions. A significant majority of the experts stated that the Nutri-Score has no significance for a purchase decision. The reasons given for this were that the Nutri-Score is not helpful or meaningful enough, and that a positive score is not necessarily beneficial to health. The Nutri-Score could provide misleading information. The experts interviewed stated that the lack of information on the production process and origin of ingredients, particularly in the case of meat, means that a holistic view of the food is missing. The Nutri-Score algorithm only includes macronutrients and neglects micronutrients, which could subconsciously promote undesirable nutrient compositions, despite a positive Nutri-Score. In addition, it was criticized that food manufacturers calculate the Nutri-Score independently, without an official review.

Experts with a nutritional science background generally did not give the Nutri-Score a high rating, while experts from the industry and consumers of different generations see the Nutri-Score as a useful orientation tool. Especially in the case of unfavorable scores (D, E), the Nutri-Score could deter consumers.

A board member of a medium-sized food company emphasized that the Nutri-Score is highly visible and can therefore have significance for consumers.

The Nutri-Score can be seen as a tool to simplify the nutrient complexity of processed products and thus bring a positive benefit, especially for the average consumer, as they can better understand the nutrient composition, which can lead to a faster and better purchase decision.

The packaging design, including the Nutri-Score seal, can also lead to a subconscious purchasing decision.

In addition, the taste was also specified, which can be higher than the Nutri-Score. A positive Nutri-Score cannot be maintained for luxury foods in particular, such as sweet or salty baked goods, as otherwise the taste, which is the top priority here, cannot be maintained. In such cases, the Nutri-Score loses its significance. However, it has also

been criticized that the Nutri-Score also has questionable ratings. If you compare olive oil and sweets, olive oil, with its valuable nutrients, has a lower score than some sweets.

It was also emphasized that for some consumers, personal experience and taste preferences take precedence over the Nutri-Score rating. Especially for experts with a nutritional background, the ingredients list and the organic label play a much greater role than the Nutri-Score itself.

Overall, the majority of experts consider the Nutri-Score to be irrelevant for their purchasing decisions. The lack of informative value, the lack of information on the manufacturing process, and the neglect of micronutrients were criticized. While experts with a nutritional science background give the Nutri-Score a low priority, economic and consumer experts see the Nutri-Score as a good orientation tool. They also emphasize personal preference and taste, especially when it comes to luxury foods.

RQ 4: How credible is the Nutri-Score as a quality label for Germany?

The question of the credibility of the Nutri-Score as a seal of quality was assessed differently by the experts surveyed. Twenty of the experts stated that the Nutri-Score appears untrustworthy as a seal of quality. The experts stated that the evaluation of the algorithm appears questionable, as not all relevant ingredients are taken into account in the algorithm and the entire life cycle of a product is not adequately mapped.

Food processing and animal husbandry are not taken into account in the algorithm.

For example, a frozen pizza with a positive Nutri-Score could be presented as better than it actually is, even though it is not considered to be healthy. In this case, a positive score could mislead the consumer.

A board member of the food industry and an investor in the nutrition sector commented:

Quote 3: “Nutri-Score discredited as a seal of quality. Golden cream puffs can be created by giving unhealthy products a good score. The Nutri-Score makes sense on a meta level, but is questionable for special foods such as olive oil.”

Another reason for the limited credibility of the Nutri-Score is that sugary foods with preservatives receive a better Nutri-Score rating than olive oil. One nutrition expert described this as problematic and said that the Nutri-Score is a “label of lies”.

Another statement from a nutrition expert read:

Quote 4: “Not a high value. The Nutri-Score is without a rating, because the developers of the Nutri-Score have paid too little attention to the ingredients and origin of the

food. Foods with Nutri-Scores A are questionable. The product may appear healthier than it is. Companies choose ingredients to make food look healthier, e.g., if fat is a flavor enhancer, if a product is fat-reduced, other ingredients such as sugar, flavors, preservatives, and maltodextrin are used. The consumer receives a distorted result and is manipulated.”

Here it is clearly pointed out that the Nutri-Score does not take all ingredients into account and can therefore lead to a distorted representation.

Another shortcoming of the Nutri-Score is the lack of toxic substance labels in foods. Some of the experts see the need to revise the entire nutritional theory or pyramid.

However, there are also experts who disagree and consider the Nutri-Score to be a reliable seal of quality. One food technologist emphasized:

Quote 5: “Nutri-Score is a credible seal with strict guidelines, not in comparison to other products such as cosmetics. The food sector is controlled, just as the Nutri-Score algorithm is controlled. The Nutri-Score is based on measurable values.”

This positive assessment of the Nutri-Score is due to the fact that this participant deals with the Nutri-Score on a daily basis and has practical experience with the strict guidelines on which it is based.

One participant from Generation X does not feel able to express a meaningful opinion on the subject due to a lack of background knowledge. Another respondent feels insufficiently informed on the subject and confirms that he has too little background knowledge to be able to make a statement. One of the nutrition experts considers the Nutri-Score to be more of a marketing tool than a seal of quality. Another participant from Generation Y rates the Nutri-Score as a better seal than conventional seals, due to the better basic understanding of food through the Nutri-Score. Finally, the Generation Y consumer was positive about the Nutri-Score and stated that he had no reason to question it.

Finally, a differentiation in opinions can be recognized depending on generation and expertise. Some of those surveyed felt that they were not sufficiently informed, while others expressed different views on the credibility and usefulness of the Nutri-Score.

The opinions of the experts are strongly divided. On the one hand, it is argued that the Nutri-Score is not a specific sustainability seal and that it is seen more as a marketing tool than a nutritional seal. It was also emphasized that the algorithm is fixed and, therefore, cannot be falsified.

On the other hand, the experts argue that companies can use the Nutri-Score as an incentive to maximize profits and can manipulate the purchasing decisions of consumers with a falsified positive Nutri-Score. Another point of criticism is the lack of government control, as the Nutri-Score is not verified.

RQ 5: Is the Nutri-Score an efficient tool for comparing products within a product group?

When asked about comparability within a product group, the experts did not express a uniform opinion regarding comparability. Nevertheless, they said that the Nutri-Score could serve as a quick guide.

The ingredients of the processed products are often difficult to recognize and incomprehensible on the back of the packaging, which is why some of the experts are of the opinion that the Nutri-Score is better than none.

The discrepancy in the experts' views is equally divided between nutrition experts and economists. The respondents from the different generations confirmed that the Nutri-Score can serve as a sound decision-making aid.

An expert from Generation Z emphasized that comparability is not always possible, as the Nutri-Score is not available on all foods. For the average consumer, the Nutri-Score is a valuable aid and motivates them to think more consciously about the health aspects of the food they consume. A poor score can encourage consumers to critically scrutinize the ingredients.

There is also the possibility that the Nutri-Score will motivate food manufacturers to optimize the list of ingredients in the food they produce and, ideally, to make it more health-promoting. Some of the experts interviewed warned that by adding certain ingredients, such as vitamins, which do not necessarily contribute to a healthier diet, food manufacturers could influence the scoring for the better.

However, manufacturers can deceptively improve their foods by adding ingredients such as vitamins to artificially boost the overall scoring of the product.

Some experts criticize the Nutri-Score as an inadequate comparison tool that is not meaningful enough.

Due to the absence of certain but potentially problematic ingredients such as E-labels, aspartame, flavorings, maltodextrin and other chemical ingredients, a holistic comparison between products cannot be made. A positive Nutri-Score is not necessarily a healthy one. This could lead the consumer to make the wrong decision.

Finally, the managing director of a medium-sized food company emphasizes the importance of taste in product evaluation within a product group, which is often given a higher weighting than the Nutri-Score.

To summarize, the experts do not share the same opinion. Many see the Nutri-Score as a quick guide, especially if the ingredients on the packaging are incomprehensible. The generations also confirm that the Nutri-Score is a help, but criticize the fact that potential problematic ingredients are not taken into account. A positive score does not

necessarily mean a healthy product, and this can lead consumers to make the wrong decisions. Some of the experts warned against manipulation by food manufacturers and an artificial improvement of the score by adding ingredients.

RQ 6: What significance does the Nutri-Score have as a seal of quality in the area of corporate greenwashing in Germany?

The experts' opinions on the Nutri-Score and the possibility of greenwashing differ greatly. Some of the respondents were of the opinion that the Nutri-Score cannot be used for greenwashing. They emphasize that the Nutri-Score is not a special sustainability label and does not include any nutritional aspects. They also stipulated that if a company decides to use the Nutri-Score, the entire product range of a brand must contain the seal. This means that healthy and unhealthy foods contain a Nutri-Score and companies are not necessarily better presented if they also have negative Nutri-Score ratings in their product range. Furthermore, the Nutri-Score is seen as a marketing decision rather than a nutritional label.

Experts suggest that the Nutri-Score algorithm is fixed and cannot be falsified, even if there are still gaps and possible improvements, such as the inclusion of certain micro-nutrients such as fiber. The experts interviewed agree that the Nutri-Score is not a greenwashing tool.

Looking at the opinions of the other experts, they argue that the Nutri-Score can be used as an instrument for greenwashing. Some of the respondents are of the opinion that companies could have an incentive to maximize profits through a positive Nutri-Score. They claim that a positive Nutri-Score can contribute to a positive feeling among consumers and thus manipulate purchasing decisions.

In this case, products may be presented as healthier and more sustainable, leading consumers to make poor decisions. It was also pointed out that companies can achieve a better Nutri-Score by adding certain ingredients, such as vitamins, but that this is not healthier overall. One example of this is the company Ferrero and Nestle, according to one of the experts. Such companies use the Nutri-Score as a marketing strategy to improve their brand image and engage in lobbying. Another argument for greenwashing is that a positive Nutri-Score, despite poor product quality, can also create a positive sustainable image among consumers.

Finally, it was also argued that the Nutri-Score is not subject to state control, and therefore the scoring of companies is not subsequently monitored.

RQ 7: How can the Nutri-Score be improved in its function as a quality label for the German consumer?

Experts with a nutritional background stated that various ingredients, such as vitamins, chemical fillers, sweeteners such as aspartame, various preservatives, including natural and chemical variants, as well as pesticides and other additives, should be added. Micronutrients, amino acid chains and special food combinations, such as protein bread with chia seeds, should also be taken into account in the Nutri-Score. It was also suggested that food groups with healthy fats, such as oils and nuts, should be taken into account and given a positive score, as these are beneficial to health despite their high fat content.

In addition, several general suggestions for improvement were made, such as: Reviewing the sustainability and food cycle of the product; revising the current Nutri-Score algorithm; involving experts rather than politicians in algorithm development, taking a holistic nutritional view; and more rigorous scrutiny of manufacturers when awarding the Nutri-Score. In addition, several respondents suggested that companies' scoring claims should be verified by an independent authority to create better transparency for shoppers.

A medical-medium nutrition expert, who was the only one of the participants who was not previously aware of the Nutri-Score, suggested that portion sizes should be labeled.

A managing director of a medium-sized food company also made a rather holistic suggestion for improvement based on his professional business experience. Daily rations would be more effective than a poor Nutri-Score, especially for luxury foods such as salt products, which require a high salt content for a desired taste. This is because consumers will consume luxury foods despite a poor Nutri-Score.

Quote 6: "Set up the Nutri-Score differently. The Nutri-Score is politically influenced differently by certain countries, so it is not neutral; see the olive oil example. Previously, olive oil had bad Nutri-Scores, now it is being adapted again. Instead of politicians for Nutri-Score positioning, better experts. For example, salted pretzels continue to gain popularity in Germany despite their high salt content. The Nutri-Score is not asked about salt products. Nutri-Score is superfluous. The consumer should be made aware of the total calories rather than the overall healthiness of the product. A reference to the daily ration is more effective, e.g., one salted pretzel for two days. The average consumer does not understand the ingredients on the back, e.g., is sodium bicarbonate the same as baking powder? Even experts have to look up ingredients."

Furthermore, the introduction of an additional label containing warnings for artificial ingredients, sustainability and climate neutrality aspects, daily rations, calorie content

and harmful ingredients was proposed. Poorly rated products could be labeled with an additional label, such as “more sugar”.

In order to increase awareness of the Nutri-Score, it was suggested that consumers be educated through information and advertising materials and that a greater understanding and awareness of the Nutri-Score be developed. By making the label mandatory for all food companies, comparability can be created.

One of the label development experts suggested a barcode to provide more information about the respective processed foods. A similar suggestion from an expert with a food technology background suggested the development of an app to classify total meals in order to not only look at a single product individually when purchasing a meal but also the sum of the products consumed. This suggests that a product in a meal can have a poor Nutri-Score, but the meal consumed can still be healthy overall.

Finally, instead of investing further in the Nutri-Score, it was suggested that it would be better to integrate nutrition education and prevention in schools so that children and young people get a feel for a healthy and balanced diet at an early age.

In summary, the nutrition experts suggested expanding the score with additional ingredients, revising the algorithm, introducing warning signals for artificial ingredients, and having the Nutri-Score reviewed by an independent authority. Daily rations were also proposed, especially for luxury foods. Further labels for more comprehensive information were advocated, as well as comprehensive information and education on the Nutri-Score and holistic healthy eating.

Additional Comments by the Experts

The last question in the expert interview does not specifically address a research question, but asks whether the interviewees would like to share any yet unmentioned points about their perception of the Nutri-Score.

The Generation Y consumer responded positively, saying that previous labels on food were not particularly helpful, and that he sees the Nutri-Score as a helpful comparison tool that provides a better understanding of the overall quality of a product.

Other experts, however, discussed the possibility of adding other ingredients, such as vitamins, minerals and unsaturated fatty acids, to the Nutri-Score. It was suggested that the Nutri-Score could be expanded to include aspects such as regionality, fair trade and an eco-score, and that a warning signal for harmful ingredients and a seal for animal husbandry could be added to the packaging alongside the Nutri-Score. One of the nutrition experts suggested using chilling photos of sick people and animals from factory farming.

Another suggestion was to convert the complicated chemical language into an understandable language so that a normal consumer could understand the contents of the product.

Some of the suggestions for improving the Nutri-Score were repeated. Some experts mentioned previously mentioned points again, such as the consideration of daily rations for children and adults. Another expert from the FMCG industry expressed the need for a standardized global solution with a uniform algorithm calibration and the introduction of mandatory criteria catalogs that take actual health factors into account.

Further suggestions for improvement from the other experts were to adapt the existing algorithm and make the Nutri-Score mandatory for all foods in order to ensure comparability within a product group. They also emphasized the importance of educating consumers as a whole about healthy eating and encouraging them to cook fresh food.

In summary, the experts agree that the Nutri-Score is not yet perfect and that it should be further improved. However, the Nutri-Score is seen as having sufficient potential for improvement, so it is important to work on its further development in order to successfully establish it as a holistic seal on the German market.

5 Conclusion

This study looked at the benefits of and feedback on the Nutri-Score as an information label in Germany. With the help of expert interviews, sourcing experts from various relevant fields such as nutrition, FMCG, packaging design and consumers were surveyed in order to critically assess the Nutri-Score and work out the benefits of the Nutri-Score for Germany. The study is intended to contribute to improving the Nutri-Score in Germany so that the average consumer can also derive maximum benefit from the label. With the insights gained and suggestions for improvement derived, companies and, above all, the scientific committee can benefit from this and thus be more helpful to consumers in the future.

5.1 General Insights and Practical Recommendations

The aim of this study was to examine the benefits, function and credibility of the Nutri-Score from the perspective of industry experts and consumers of different generations. The study focused on seven research questions, which were answered with the help of experts.

The first two general research questions on the purchase-influencing and design factors of packaged foods were first examined. These were also confirmed by existing literature, i.e., the packaging design, with color and material, plays a major role in the purchase decision. The answers to the first two research questions are reflected in the opinion on the Nutri-Score. When asked about the significance of the Nutri-Score, it was seen as an orientation tool, despite points of criticism such as a lack of informative value and a lack of information on micronutrients and the manufacturing process. The subsequent research question on the comparison within a product group showed that the lack of important micronutrients in the Nutri-Score algorithm means that no comparability can be created, and thus the significance generally decreases. According to the BMEL (2023a), companies can introduce the Nutri-Score on a voluntary basis, but then it must be applied to the entire product range. The fact that the Nutri-Score is not mandatory for companies due to a lack of regulation (BMLE 2023a) means that comparability within product groups cannot always be guaranteed. The shortcomings of the Nutri-Score can also be seen in the research question regarding the credibility of the Nutri-Score as a seal of quality. The experts have a differentiated opinion on credibility. It became clear that nutrition experts do not regard it as credible, but consumers of different generations do. The Nutri-score is not checked individually on the food by any independent authority, which is why skepticism was observed among the respondents. This not only leads to a questioning of the Nutri-Score as a seal of quality as such, but also raises the question of the possibility of greenwashing. This also led to a closer look at the research question of corporate greenwashing. Even if greenwashing tends to be addressed in the sustainability environment, it is nevertheless also associated with the Nutri-Score.

This is because the lack of official regulation means that food can be misrepresented, which could lead to consumer manipulation. In principle, not all participants are of this opinion; nevertheless, this aspect should be examined more closely by the economic bodies and investigated for possible gaps.

The next research question looked more closely at the experts' suggestions for improvement. Due to the broad level of expertise of the different expert opinions of the interviewees, it was possible to list suggestions for improvement in addition to the points of criticism in the previous research questions. In summary, it was suggested that further ingredients be added to the algorithm and that the algorithm be fundamentally revised. As the algorithm was repeatedly criticized, e.g., in the evaluation of olive oil or fats from avocados, it was adapted on January 1st, 2024, after consultation with the international Nutri-Score committee. This was also the wish of some respondents in the expert interview (BMLE 2023b). In order to increase the benefits of the Nutri-Score, it was emphasized that the introduction of the Nutri-Score should be man-

datory for all food manufacturers. Furthermore, a daily ration could reduce consumption of luxury foods in particular, rather than poor Nutri-Score ratings.

After all, when it comes to luxury foods, it is not the degree of healthiness that matters, but the taste of the product.

As an overall policy measure for Germany, it was proposed to invest further in holistic nutritional education and to educate consumers, e.g., in schools, about a healthy and balanced diet. As part of its nutrition policy, Germany launched the “National Reduction and Innovation Strategy for Sugar, Fats and Salt in Finished Products” and provides information on healthy eating in all areas of life (BMEL 2021). This strategy should also include information about the Nutri-Score.

5.2 Limitations and Outlook

While the current study has provided valuable insights into the comparison between subjective and objective understandings of front-of-pack nutritional labels, there are several avenues for future research to expand upon these findings and further enhance our understanding of the topic. Adopting a longitudinal research design would be beneficial to examine the stability of subjective and objective understanding over time. By following participants’ understanding of front-of-pack labels over an extended period, researchers can assess whether any changes occur in their perceptions and preferences. This would provide insights into the long-term effectiveness and impact of different labeling systems on consumers’ understanding and decision-making. Supplementing the quantitative data with qualitative research methods, such as focus groups or interviews, can provide a deeper understanding of consumers’ perceptions and experiences regarding front-of-pack labels. Qualitative research allows for the exploration of the underlying reasons and motivations behind consumers’ subjective and objective understandings. It can uncover rich insights into the factors that influence their preferences, decision-making processes, and the contextual nuances associated with their understanding of front-of-pack labels. Future research could delve into comparative analyses of different front-of-pack labeling systems, beyond the Nutri-Score and the NutrInform Battery. Conducting research in real-world settings, such as supermarkets or online shopping platforms, can provide valuable insights into how consumers interact with front-of-pack labels in their natural decision-making environment. By observing consumers’ actual behaviors and choices, researchers can gain a deeper understanding of the practical implications of subjective and objective understanding on purchasing decisions and overall dietary patterns.

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The Authors

Yvette **Skretkowitz** is a doctoral candidate at the Univerzita Jana Evangelisty Purkyně v Ústí nad Labem (Czech Republic). She completed her bachelor's degree in economics and master's programs in management and marketing as well as entrepreneurship and innovation management at the University of Wuppertal. Her research focuses on the effects of visual nudging in the FMCG sector, especially in the food industry.



Prof. Dr. Jens K. **Perret** studied business mathematics and economics and holds a doctorate in economics from the University of Wuppertal. Between 2009 and 2016, he worked at the European Institute for International Economic Relations in Wuppertal. Since 2016, he has been Professor of Economics and Statistics at the ISM in Cologne. His research interests include quantitative data analysis in marketing and developments in the knowledge society.



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