

**Doctoral (PhD) dissertation theses**

**THE IMPACT OF FOOD LABELLING ON CONSCIOUS CONSUMER  
BEHAVIOUR**

Tóth Ildikó

Supervisor:

Prof. Dr. Szakály Zoltán

Professor



UNIVERSITY OF DEBRECEN

Management and Organizational Sciences

Doctoral School

Debrecen, 2025

# **1. ANTECEDENTS AND OBJECTIVES OF THE RESEARCH AND PRESENTATION OF THE RESEARCH HYPOTHESES**

Health-conscious behaviour and the related diet supporting a health-conscious lifestyle are becoming an increasingly important trend. The transformed, fast-paced lifestyles of consumers and the rapid increase in the number of diseases in civilization provide shocking data that has an impact on consumers, prompting them to revise their lifestyles to take action to combat and prevent negative, harmful effects.

Choosing the right foods is an important part of health-conscious behavior. This is not only about eliminating harmful ingredients and choosing the right nutrient content, as consumers must also pay attention to how foods affect the functioning of the body in the long term.

In order for consumers to be able to choose from the extremely wide range of foods that they consider appropriate and healthy, it is important that they have credible knowledge and motivated and conscious consumer behaviour. All foods have important nutrients for the human body, and in order for consumers to be able to consciously shape their diet, it is necessary to know the nutrient content of foods. The nutrition label can show the exact content of a given food, while the FOP (Front of packaging) nutrition label on the front of the package helps the consumer to be able to judge the food at first glance.

From December 2016, most pre-packaged foods will have to carry nutrition labelling on the back of the packaging, which is a requirement of the Food Consumer Information Regulation. This marking can be supplemented and is therefore not mandatory, by repeating the most relevant information on the nutrient composition on the front of the pack, in the main field of vision. This so-called FOP nutrition label helps consumers to make the right decision at first glance. In addition to the standard designation, such as words and numbers, FOP nutrition labels may also include other forms of representation, such as various graphic shapes or symbols.

Particular attention is paid to the packaging of foodstuffs: both to the information on the packaging and to the use of mandatory and voluntary FOP nutrition labels. FOP nutrition labelling is intended to provide the consumer with appropriate information about the properties and nature of the food. The purpose of writing this article is to review the use of FOP nutrition labels in the important situation of changing the food consumer behavior of

the population in the right direction. This article examines four types of FOP nutrition labels and provides a brief overview of how they are interpreted and their impact on consumers. In my thesis, I aimed to examine an important and current trend. The range of goods that promote the protection of health and the prevention of diseases shows the development of a clearly visible trend in food consumption. As a result of deteriorating demographic indicators, the increasing spread of civilizational diseases, and the negative effects caused by a fast-paced lifestyle, a consumer segment has emerged and is constantly expanding, the aim of which is to change their lifestyle and eating habits in a way that can support the prevention of emerging health threats.

Based on what has been described, the basic hypothesis of the research can be formulated as follows: Food labelling, especially nutrition labelling, has a prominent impact on conscious consumer behavior and food choices, and is the most important tool in informing consumers about food.

### **Main objectives of the research**

In accordance with the basic hypothesis, I set a comprehensive and five specific research goals. The overall aim of the research is to examine the impact of food labelling on conscious consumer behaviour, to systematize the relationship between food labelling, especially nutrition labelling, and consumer behaviour in the literature, to explore the relationship between conscious consumer behaviour and food labelling using primary market research methods, and to develop a new model. The research specifically addresses the main motivational and limiting factors related to the readership of food labels.

Within this overarching goal, further sub-goals can be defined:

- C1:** Detailed analysis of the international and domestic literature on food consumer behaviour, food choice and food labelling.
- C2:** Exploring consumer attitudes and preferences regarding the information content of food packaging using qualitative market research methods (focus groups).
- C3:** Elaboration of the experimental model of the research based on the results of the literature analysis and qualitative market research, determination of hypotheses (presuppositions).

**C4:** Exploring the relationships between food consumer behaviour, food choices, informing consumers about food (mainly information on packaging) and the knowledge and interpretation of nutrition labels by applying quantitative market research methods.

**C5:** To develop a research model adapted to the Hungarian context, which has explanatory power regarding food consumer behaviour, and which facilitates the development of an effective communication strategy in order to achieve consumer behavioural change in relation to food and nutrition labelling.

**H1: Consumers have little time to spend on shopping, so they only take a closer look at the packaging of products they have not bought before, as well as the markings on them.**

In a fast-paced world, consumers do not have time to spend long time inspecting food packaging when shopping. In addition to buying the usual products, consumers get information in advance, from other sources, and they spend a minimum of time examining the packaging at the point of purchase.

**H2: Consumers are comfortable buying familiar products, but they are open to trying new products due to the nutrition labels on the front of the packaging.**

Consumers may be inclined to take the usual products off the shelves of stores, i.e. to stick to a solution that provides convenience. However, health-conscious consumers are constantly looking for information, prefer to be informed, and make their decisions with as much information as possible. It is important to explore how convenience, awareness and FOP nutrition labels on packaging influence consumers' food choices.

**H3: In today's health situation, there is no difference between the sexes, a healthy diet is important for both sexes, and for this purpose, special attention is paid to the packaging of foods and the information and markings placed on them.**

One of the biggest global problems of our time is the drastic increase in civilizational diseases, many of which are related to poor nutrition. Cardiovascular diseases and cancer are the leading causes of death in Europe, and the highest risk factors are closely related to daily nutrition. The biggest problems are high blood pressure, high cholesterol levels, obesity and excessive alcohol consumption.

**H4: Consumers with higher education are more likely to look for nutrition labels on the packaging, they interpret them more easily, it is essential for them to make**

**optimal food choices, and they can be persuaded primarily with authentic information and labels.**

To a certain extent, educational attainment determines the quantity and quality of information available to consumers. According to my hypothesis, the more informed consumer tries to absorb the widest possible range of information when making a purchase decision and make an informed decision based on it. This is closely related to the credibility of the information and its source, as well as the consumer's need for credibility.

**H5: Price plays a key role in the choice of health-conscious foods, which has a distorting effect on the optimal decision.**

Foods that have a beneficial effect on health through their ingredients are available at a higher price level thanks to production technology. Therefore, it is necessary to monitor consumers' price sensitivity and the extent to which this changes consumer choices.

**H6: FOP nutrition labels, in addition to their ability to influence the eating habits of the population, have the ability to encourage food businesses to improve the nutritional content of their products.**

FOP nutrition labels can help consumers understand information about the nutrient composition and encourage them to make healthier choices. In addition, they can have an incentive effect on the food industry to transform and rethink the composition of products, so that they can obtain a positive rating by producing foods such as FOP nutrition labels, and they can support healthy eating.

## **2. DATABASE AND DESCRIPTION OF THE METHODS USED**

In order to achieve the goals described in the previous chapter, I carried out a comprehensive data collection using a secondary and primary research procedure, which I divided into four phases. In the following, the data collection and data analysis methods used are described in detail.

### **2.1. Methodology of secondary research**

In order to cover all relevant factors of the research, I focused on the extensive study of the literature as a first phase. I started my research with a thorough secondary research, during which I reviewed the available domestic and international literature on the topic. The primary aim of the literature review was to lay the foundations for the primary research.

Keeping in mind the achievement of the objectives outlined at the beginning of the thesis, I tried to present the topic of my dissertation in a logical way. The main topics presented in the literature review are: consumer behaviour, nutrition, health behaviour, models related to food consumption.

I analyzed the Scopus, Science Direct, Web of Science, Research Gate and Google Scholar sites in detail, and I examined the data of the HCSO. I have tried to ensure that the national and international scientific databases and publications are in the right proportion in the dissertation. The collection of a large number of sources proves the comprehensive work I have done in the field of secondary data and information collection.

### **2.2. Methodology of primary research**

In the second phase, the primary data collection included two focus group interviews, which I conducted in March 2023. An important aspect in the selection of group members was to include both LOHAS consumers who are characterized by an environmentally and health-conscious lifestyle, as well as those who do not belong to this group, so pro- and con arguments may arise when arguing about certain decision-making aspects. During both interviews, we interviewed 8-8 consumers. The interviews covered consumer habits related to the use of product labels, the consumer perception of voluntary FOP nutrition labelling, the perception of healthy or perceived healthy foods, and the impact of labelling on consumer choice. As an introduction to the interview, the interviewees answered general

questions about food packaging and labeling. After that, they looked at all four nutrition labels and gave a general description of all four, i.e. they gave their first impression, their opinion on interpretability and placement on the packaging. After the general characterization, we shared more information with the interviewees about the four types of FOP nutrition labels. In both focus group interviews, 2 people were assigned to each to examine the markings, i.e. 2 people in both the health prevention and health risk groups commented on the Swedish Keyhole marking, the French Nutri Score marking, the Italian Nutrinform-Battery marking, and also 2 people commented on the British Traffic Light nutrition label. Finally, at the end of the focus group interviews, when you had more information about all four FOP nutrition labels, we asked general questions about the labels. For these questions, they could provide more than one nutritional indication in their answers. Qualitative content analysis was used to analyze what was said during the interviews.

In the third phase, during primary data collection, an online questionnaire was interviewed. During the survey, we also used five-point scale-type questions, as well as questions to be decided and provide several answer options. At the end of the questionnaire, there were questions about background variables, which related to the respondent's gender, age, place of residence, education, marital status, the number of people living in the same household, their monthly net income, and self-reported health awareness. The interview took place entirely online, using the Google Drive online form editing program, the link generated by which was published on a social media site (Facebook). The sample was not selected randomly, in the case of most of the fill-ins we used the snowball method, i.e. the respondents recommended each other, so we managed to reach the widest possible circle of respondents. Within the social media site, we shared the link to the questionnaire in groups with different themes, and we asked our friends to ask their own friends to fill out the questionnaire. The questionnaire could be completed between September 2023 and October 2023. The online questionnaire was filled out by 580 people. The results obtained were processed with the help of MS Excel and SPSS programs. From the statistical analyses, frequency distributions, cross-tabulation analyses (with Chi-squared tests), and mean and standard deviation calculations were applied.

In the fourth phase, two focus group interviews were conducted with the aim of determining the imagined types of consumers using the FOP nutrition labels included in the

research. Within the framework of the creation of personality types, the participants of the focus group had to agree on the following aspects: gender, age, body shape, skin color, tattoo and body jewelry, hair color, length and type, eye color, nose and ear size. In addition to external factors, the highest level of education and marital status were also determined for each imagined type of consumer. Intrinsic properties were determined using a ten-point Likert scale according to the following characteristics, where 1 meant a positive opinion and 10 meant a negative opinion:

- healthy eating;
- the amount of time spent on shopping;
- information about food;
- to judge the information on the packaging as a credible and reliable source;
- whether he is a conscious customer;
- whether sustainability is important to them;
- whether it is important for him to buy healthy food;
- how much nutrition labelling helps in decision-making;
- whether he likes to shop;
- how optimistic, optimistic, kind you are;
- what a sympathetic buyer he is.

The participants of the focus group could also give other observations and observations about the imaginary consumer. At this opportunity, they were able to define the personality even more precisely and describe the life situation of the given imaginary consumer. During the two interviews, I interviewed 8-8 consumers. The participants of both focus groups were randomly selected, so there is a mix of health-conscious and non-health-conscious participants among the focus group members.

### **3. MAIN FINDINGS OF THE DISSERTATION**

#### **3.1. Conclusions of the first focus group survey**

Based on existing evidence, countries should introduce well-designed, mandatory front-of-pack food labels to inform consumers. Such labelling schemes are widely supported by the public as a way of informing consumers. There is now sufficient evidence from real-world studies using objective results that a well-designed labelling system can encourage the purchase of 'healthier' food and reduce the purchase of 'less healthy' food. In addition, a small but growing body of evidence shows that front-of-pack labels can encourage a positive redesign of products in the industry. There is clear evidence that GDA labels (Guideline Daily Amounts), such as the British Traffic Light System, are not well known and are therefore unlikely to affect consumers, and real-world data shows zero impact. Although early evidence casts doubt on the multi-traffic light approach, a larger, real-world study suggests it could affect consumers. However, psychological and communication theories suggest that a single-traffic light summary label is likely more effective, as multiple traffic lights can confuse consumers. The Nutri-Score system is promising, but more real-world ratings are needed and is likely to have a stronger impact if it included warning messages. A critical and often overlooked benefit of making a front-of-pack labelling system mandatory is that it can facilitate the implementation of other policies and regulations. For example, marketing restrictions may prohibit manufacturers from making nutrition or health claims on packaging, or from marketing to children on foods that are labelled as rich in certain nutrients. Finally, the introduction of a front-of-pack labelling system should be accompanied by a large-scale consumer education campaign to inform the public about how to understand and use labels. The focus group interviews revealed that consumers with different health behaviours have very different views on healthy eating and food packaging and labelling. For the two focus groups, it was observed that consumers with health-promoting behaviours were more likely to examine food packaging containing FOP nutrition labelling and the nutrition label on the back of the packaging, spend more time viewing them and were more familiar with FOP nutrition labelling.

On the other hand, consumers with health-risk behaviors do not show such conscious behavior, they are not familiar with FOP nutrition labels, and they spend significantly less time observing and interpreting the information on the packaging. However, in the case of

both groups, it can be observed that in accordance with consumer megatrends, they know and acknowledge the labels of organic, vegan and various exemptions as important and credible sources of information.

The 2023. The main purpose of the focus group interviews organized in March April was to explore consumer attitudes and the factors that can influence consumers to make healthier choices. The primary data collection method is a focus group interview: two consumer focus groups with different health attitudes. One group included health-preserving consumers, and the other group consisted of people with health risks. The primary research shows how differently consumers with different health behaviors have different opinions on the same issues. The limitation of the study is that it is exploratory in nature, so in order to provide qualitative information, I conducted a focus group study on a small sample. The results cannot be generalized to the entire population, but they can provide a good basis for further quantitative studies in the future, where the identified correlations can be quantified with the help of questionnaires.

### 3.2. Conclusions of the online questionnaire

Based on the literature review, the packaging of foodstuffs and the information on them play a key role in providing consumers with information. I asked the people who filled in the food whether they would look at the packaging of the food and the markings on it when they made purchases. 26.2% of respondents consider it very typical to examine packaging and markings. When buying a brand new product, 23.4% of respondents are most likely to look at the packaging, while 37.9% do not study it when buying a previously purchased food, i.e. a well-known food.

I conducted the online questionnaire with the involvement of 580 people. The questionnaire was closed by the so-called socio-demographic background variables, these personal characteristics are included in Table 1. The sample is not representative, i.e. the structure of the sample does not reflect the composition of the population.

**1. Table:** Composition of the sample of the online questionnaire (n=580)

Description	Sample Distribution	
	Main	%
<b>Yes</b>		
Men's	100	17,24

Female	480	80,76
<b>Marital status</b>		
Married	316	54,48
Cohabitation	108	18,62
Widow	4	0,69
Unmarried/Unmarried	120	20,69
Divorced	32	5,52
<b>Age Group</b>		
18-29 years	196	33,79
30-49 years	216	37,24
40-59 years	140	24,14
60 years or older	28	4,83
<b>Education</b>		
Vocational school, vocational school	36	6,21
Graduation	192	33,10
Higher education degree	352	60,69
<b>Type of settlement</b>		
Capital	124	21,38
Metropolis, county seat	116	20,00
Small town	188	32,41
Village, village	148	25,52
Tanya	4	0,69
<b>Monthly Net Income</b>		
They make a very good living from it and can also save	112	19,31
They make a living from it, but they can save little	264	45,52
It's just enough for them to make a living from it, but they can't save it anymore	140	24,13
Sometimes it's not even enough to make a living from it	44	7,58

Can't Answer	Answer/Doesn't	20	3,44
<b>Degree of health awareness</b>			
Not at all health-conscious		8	1,38
Mostly health-conscious		52	8,97
Health-conscious and not		216	37,24
Mostly health-conscious		248	42,76
Very health-conscious		56	9,65

Source: own edit

I started the online questionnaire with a screening question about food purchases, in order to get the answers of consumers who actually buy food with any frequency. 2% of the respondents do not buy food, so I further processed the questions of 98% (568 people) of the respondents who buy food.

The four FOP nutrition labels in the study were placed on food packaging, using a five-point Likert scale, on which 1 meant that the label on the packaging was not conspicuous at all, and 5 meant that the label on the packaging was completely conspicuous. I placed the FOP nutrition labels on the same packaging, all four in the lower right corner, in the same size, the purpose of which was to prevent the food itself and any different information, colors, labels and other marketing tools from influencing the perception of the label. The data on the assessment of the FOP nutrition label on the packaging are given in Table 1.

**2. Table:** Nutrition labelling on packaging (%) (n=568)

Likert scale response	Traffic light	Nutri-Score	Keyhole	Nutrinform Battery
1 – Not at all conspicuous	2	4	31	40
2	11	7	18	30
3	38	18	20	17
4	27	40	14	6
5 – Totally Striking	23	32	17	8

Source: own edit

The result of the factor analysis was three factors, which were given the following names: customer awareness, packaging examination, and simplicity of packaging. There is a significant difference between the values of the three group factors, except for the packaging analysis in the comparison of Passive and Conscious Consumers. The results are consistent because factor values are also higher in higher quality consumer groups.

With the help of the questions in the questionnaire, in the second question block, I formed consumer groups with the help of the dendrogram, based on the questions, three clusters can be formed. Next, the K-Medium cluster produces the desired 3 clusters. The three clusters were created, which were named "committed consumers", "conscious consumers" and "passive consumers".

In my opinion, the most interesting result is in the case of the simplicity of packaging, when the simplicity of packaging is not at all as important for Committed Consumers as it is for Conscious Consumers, because the Committed Consumer will go through the complicated labeling, while the Conscious Consumer will care about simplicity. At the same time, the simplicity of the packaging is not important to the Passive Consumer, as they do not pay attention to it, they do not look at it anyway.

As a next step, it is advisable to examine the assessment of the four types of nutrition labelling in a consolidated manner. To do this, I add up the scores given to questions 9-17 by pictogram type, thus forming a kind of index. So there will be a liking index linked to each of the four FOP nutrition labels included in the research.

The results consistently point in the same direction: on the one hand, Passive and Conscious Consumers cannot be significantly distinguished from each other when it comes to the assessment of nutrition labels, but Committed Consumers stand out in all respects in terms of averages and standard deviations, it can be seen that the Nutri-Score average is minimally higher and the standard deviation is minimally lower than that of the Traffic Light nutrition label, in the case of Committed Consumers. Based on this, it can be stated that these two nutrition labels are relevant, and based on the results, the Nutri-Score FOP nutrition label received more favorable reviews than the Traffic Light nutrition label.

The current questionnaire and the analysis did not address the information that consumers would need to become a Conscious Consumer or a Passive Consumer to a Conscious Consumer.

Overall, it can be said that Committed consumers are much more willing to deal with nutrition labelling, healthy nutrition is important to them, they can devote a lot of emphasis to this topic, and the group opposing them is less interested in the topic of healthy eating and nutrition labeling, they do not take the time for it, it is not important to them.

### **3.3. Conclusions of the second focus group interview**

The primary data collection included two focus group interviews, which I conducted in August 2024. The sample is not representative in accordance with the exploratory nature of the study. During the two interviews, I interviewed 8-8 consumers. The participants of both focus groups were randomly selected, so there is a mix of health-conscious and non-health-conscious participants among the focus group members. Women's participation was higher, with 6 women (75%) and 2 men (25%) in the first focus group, and 7 women (88%) and 1 male (12%) participants in the second focus group. All participants easily understood the FOP nutrition labels and their essence, and even those who were not familiar with the labels before could easily identify with the topic.

The interview concerned the topic of creating a personality type related to FOP nutrition labels. After the introduction, the participants got to know the FOP nutritional labels (Keyhole, Traffic Light, Nutri-Score, Nutrinform Battery) one by one, and then they created a consumer personality for each of them, which was done according to given criteria: gender, age, hair color, marital status. The participants had the opportunity to make other observations and comments about the created consumers, based on which they were able to assign entire personalities and life situations to each type. Based on the predefined aspects, the images of the consumers were created with the help of artificial intelligence.

In both focus groups, it can be observed that in connection with the four FOP nutrition labels described, common aspects appeared in the creation of personality types, despite the fact that the participants defined completely different personalities. A common aspect was the awareness shown when eating and buying food, healthy eating, or at least striving for it, and lifestyle changes and weight loss were also common aspects. In addition, sports and sports opportunities were discussed in the case of each personality type created. The personality types imagined and created by the two focus groups for nutritional labelling differ significantly from each other based on several aspects.

After getting acquainted with FOP nutrition labels, the participants of the focus group easily identified with it, and based on the given criteria, they defined complete personalities, their main characteristics, as well as their current life situation, family background, and plans for the future.

From the focus group interview, it can be seen that the participants learned about the FOP nutrition labels and were able to identify the people and actors who they think observe and use the four nutrition labels in the research. Four different personalities were defined for the four nutrition labels, but the common factor of a healthy lifestyle appeared in all four imagined consumers: they exercise and try to eat as healthy as possible.

The primary goal of the study was for participants to determine personality for nutrition labels on the front of the package, called FOPs. The primary data collection method is the focus group interview, during which the four FOP nutrition labels included in the research were presented to 8 people, and then a consumer had to be created for each of them based on given and freely defined options, so it was possible to develop a complete personality and family background.

The limitation of the study is that it is exploratory in nature, so in order to provide qualitative information, a focus group study was conducted. The results cannot be generalized to the entire population, but they can serve as a good basis for further quantitative studies in the future, where the identified associations can be quantified with the help of questionnaires.

#### **4. NEW AND NOVEL RESULTS OF THE DISSERTATION**

The overall aim of the research was to examine the relationship between food labelling, specifically nutrition labelling, and consumer behaviour. As a result of the continuous increase in the incidence of civilization diseases, obesity and overweight, more and more attention is paid to food and its packaging as one of the basic conditions of a healthy lifestyle. The most important nutritional risk factors include sugar and salt intake, as well as the amount of energy, saturated fatty acids and fatty acids in food, as well as dietary fibre and the consumption of vegetables and fruits.

FOP nutrition labels on the packaging can provide summary information, not only with figures, but also with other symbols. With the help of these markings, the consumer can quickly make an informed decision with which they can support a healthy diet and a healthy lifestyle. FOP nutrition labels on packaging have become more widely known to consumers in the past year, despite the fact that there are also labels that have been on the market for several decades. The growth of this consumer group is undeniable, so it is important that the relevant actors, such as manufacturers, traders and authorities, are prepared to serve consumers and provide them with reliable information.

In order for the consumer to be able to make the right decision that is considered healthy for him/her, it is important that the supply side gets to know the factors influencing the consumer's decision. It is important to know the so-called preventive events, on the basis of which consumers make a decision. A preventive event may be the presence or fear of previous experience with the product or a nutritional disease, such as a family history. The fear of the disease triggers the same decision-making attitudes as the concrete presence of the disease, differing only in intensity. Experience can be the result of a positive change in health, or the effect of the information received, in which beliefs and trust play a significant role.

1. A new result of the research is that I determined the types of consumers who would prefer the FOP nutrition labels in the research. Based on the definitions of the two focus groups, each of the four FOP nutrition labels has two personality types. In connection with the FOP nutrition labels described, common aspects appeared in the creation of personality types, despite the fact that the participants defined completely different personalities. A common aspect was the awareness shown when eating and buying

food, a healthy diet, or at least striving to eat it, and lifestyle changes and weight loss were also common aspects. In addition, sports and sports opportunities were discussed in the case of each personality type created.

2. Research results have shown that graphic and colour FOP markings (e.g. Nutri-Score, Traffic Light system) are more effective in helping customers choose healthier products than traditional nutrition charts. For example, the Nutri-Score system has led to faster decision-making and greater health awareness in different social and cultural groups.

Based on the primary research, two FOP nutrition labels can be defined that consumers can easily recognize and interpret effectively in order to make the right decision that they consider healthy:

- Nutri-Score FOP nutrition label
- Traffic Light FOP Nutrition Label

3. From the point of view of consumers, it is important to carry out a marketing communication that provides them with the right information so that they have the information they need to make the right decision. Incomplete information provision is manifested by the fact that not all the necessary information is available, or consumers are unable to process the information and take it into account in decision-making, or some decisions are based on future changes or assumptions and are therefore not deterministic, but only probabilistic information. Important criteria for designing marketing communication tools can be:

- providing credible, trust-building, well-referenced information;
- providing information that can be understood, processed, memorized and recalled;
- providing easily and quickly accessible information;
- avoiding or minimizing impulse buying devices;
- development of high-tech solutions, content available online and validable;
- filtering and personalizing relevant content, reducing information that is irrelevant to the consumer.

4. Recent studies have shown that visually simpler and color-coded FOP systems (e.g., red-yellow-green scales) help reduce information disadvantages for low-educated or low-income groups.

Healthy eating is closely linked to civilization diseases, and the WHO has recommended the introduction of nutrition information on foods on the front of packaging as a comprehensive policy response to prevent these diseases. These labels are clear to consumers, provide immediate information and are summarised as key information on calories, saturated fat, salt and sugar. Consumers with the right information can choose the right food for their health status, expectations, diet and principles, thus supporting the prevention or fight against the disease. Based on the results of the primary research, the British Traffic Light and the French Nutri-Score markings are the ones that can support consumers in making a healthy decision in the most and easiest way.

Using the results of the present research, further research directions are outlined. One direction is to propose specialized marketing tools for segments, as I consider it necessary to develop marketing tools and develop marketing campaigns, as well as to examine their effectiveness, which are specialized for segments, i.e. apply the mechanisms, interfaces and tools that affect the given segment.

The other line of research is research focusing on the food industry, which affects consumer habits, segments and higher consumer expectations on the change, transformation and redesign of the product range. The results of the research available so far confirm the positive effects of nutrition labelling, such as the policy instrument for the treatment of diseases of civilization, including the obesity epidemic.

## 5. PRACTICAL APPLICABILITY OF RESULTS

The main goal of my thesis was to examine a current and important trend. In connection with this, I summarized the theoretical models related to food choices, as well as consumer attitudes, habits, the consumer's decision-making aspects, and the factors influencing the consumer.

To achieve the goals, I prepared a summary of the relationship between conscious consumer behaviour and food labelling, with special regard to nutrition labelling and consumer behaviour, based on the literature, which can be considered as the starting point of my primary research.

The primary research consisted of three phases. In the first part, two focus group interviews were conducted. The aim of this was to assess consumer habits related to the use of product labels, the consumer perception of voluntary FOP nutrition labelling, the perception of healthy or perceived healthy foods, and the impact of labelling on consumer choice. In the two focus groups, 8-8 people were interviewed. When selecting the participants, it was important to include several types of consumers, i.e. to include LOHAS consumers who are characterized by an environmentally and health-conscious lifestyle, and to include those who represent opposing views to LOHAS consumers, as it was expected that pro- and con arguments could arise in certain situations. At the beginning of the interview, I asked general questions about food packaging and labelling. They then looked at all four nutrition labels in the study and gave a general description of them, such as the first impression, the interpretability of the label, and the placement of the packaging. After the general characterization, I shared more information about the labels, and then we distributed the examination of the labels to 2 people in each focus group, i.e. 2 people in both the health prevention and health risk groups commented on the nutrition labels. At the end of the interviews, when you already had more information about all four FOP nutrition labels, I asked general questions about the labels. For these questions, they could provide more than one nutritional indication in their answers. I used qualitative content analysis to analyze what was said during the interviews.

In the second phase of the primary data collection, an online survey was conducted. During the survey, we also used five-point scale-type questions, as well as questions to be decided and provide several answer options. At the end of the questionnaire, there were questions

about background variables, which related to the respondent's gender, age, place of residence, education, marital status, the number of people living in the same household, their monthly net income, and self-reported health awareness. The sample was not selected randomly, in the case of most of the fill-ins we used the snowball method, i.e. the respondents recommended each other, so we managed to reach the widest possible circle of respondents. A total of 580 people filled out the questionnaire.

In the third part of the primary study, two focus group interviews were organized with the aim of identifying the types of consumers using the four FOP nutrition labels included in the research. They were able to determine the imagined types of consumers with the help of given criteria, and with other observations, it was possible to share further information, with the help of which they could clarify the life situation of the imagined consumer.

Keeping in mind the limitations of the dissertation, this research can be interpreted as a complex proposal for domestic consumers, according to which they can make a faster and more informed decision in the purchase situation by using the FOP nutrition labels on the front side of the packaging. Furthermore, the markings have an impact on the food industry, the more precise and detailed effects of which I have defined as a further direction of research.

The general conclusions of the thesis are supported by the results of secondary and primary information, which are primarily aimed at justifying the research topic and predicting further research.

**T1: Consumers spend little time on purchases, so they only take a closer look at the packaging of products they have not bought before, as well as the markings on them.**

I accepted the H1 hypothesis based on the answers to the online questionnaire. 27.46% of respondents do not say that they are happy to spend more time shopping. 19.72% indicated the option that is not typical at all, and 16.20% who are very typical of the statement. Based on the online questionnaire, 23.4% of respondents are characterized by checking the packaging of a new product, and a further 15.9% are very typical of this statement. And in the case of known, previously purchased products, most respondents (37.9%) do not typically examine the packaging of food products and the markings placed on them.

**T2: The effect of FOP nutrition labels is to increase the willingness to try new products rather than the convenience of choosing familiar products.**

I accepted the H2 hypothesis based on the answers of the questionnaire. However, based on the online questionnaire, in the case of the usual, i.e. previously purchased, well-known product, most of the respondents indicated the rather untypical option, a total of 37.9%. Only 9% indicated the very typical choice, i.e. that the packaging of known products and the markings placed are examined. However, nutrition labelling can have an incentive effect that can help consumers make quick and informed decisions. The Traffic Light and the Nutri-Score nominations received the most positive responses, i.e. whether it is more likely or very likely that these two markings would make them change their food shopping habits. The Nutrinform Battery and Keyhole markings, on the other hand, fall under a negative rating, and would rather not affect shopping habits. In the case of an incentive to choose healthier foods, the respondents also chose the Traffic Light (26.06%) and Nutri-Score (21.13%) nutrition labels.

**T3: There is a difference between the sexes in the perception of the information on the packaging, and it is more typical for women to look at the packaging of foods and the nutrition labels on them when shopping.**

Obesity is one of the prominent diseases of civilization and serves as an independent risk factor for many health problems, including high blood pressure, high cholesterol, diabetes, cardiovascular disease, and certain types of cancer. Popkin's (2009) research indicates that unhealthy lifestyle choices and changed dietary habits, coupled with insufficient physical activity, have resulted in three to four times higher obesity rates on some continents since the 1980s (Popkin, 2009). In addition, more than half of the adult population in the European Union is now considered obese, reflecting a steadily increasing trend. Various environmental and behavioural elements, especially in industrialised cities, contribute to a sustained increase in obesity rates. These factors include the widespread availability of calorie-dense foods, larger portions, and increased time spent on sedentary activities. As a result of urbanization, the number of people consuming processed foods has increased, and more and more foods that have undergone some kind of physical or chemical processing are on the table worldwide.

According to body mass index (BMI) measurements, about 62% of the adult population in Hungary is overweight or obese. This trend shows that the prevalence of overweight and obesity increases with age for both sexes. 41% of young men aged 18-34 have a BMI above 25, while this proportion rises to 76% among those over 65. For young women, the combined rate of overweight and obesity is 30%, which is lower than that of their male counterparts in the same age group; However, this number rises to 83% among older women, surpassing that of older men. The obesity rate among men is 63%, which is more than double the data of the last comparative study conducted between 1985 and 1988. Women also show a 50% increase based on the measured data (www.oeti.hu). These statistics are alarming because they indicate that higher levels of obesity are associated with a risk of cardiovascular disease, high blood pressure, type 2 diabetes, certain metabolic disorders, certain cancers, and overall mortality.

To make health-conscious decisions, which is essential in controlling obesity, the time spent observing markings is a key factor. In terms of gender distribution, it is not at all typical for the majority of male respondents (5.63%), and rather not at all for women (24.65%). And the acknowledged level of health awareness is divided almost equally between the health-conscious and non-health-conscious groups in terms of gender. Among women, 41.55% declare themselves to be health-conscious and 40.85% do not consider themselves health-conscious. In the case of men, the proportion of health-conscious respondents is 10.56% and 7.04% is non-health-conscious.

Based on the results obtained, I rejected the H3 hypothesis.

**T4: More educated or informed consumers are more likely to look for the information needed to make informed and optimal product choices, as well as reliable nutrition labelling on food packaging, so they can be persuaded primarily by real information and use labels.**

According to a study by Liu et al. (2015), educational attainment and diet are not related to the use of labels, one of the reasons why more educated consumers do not consider information about products to be a reliable source (Liu et al. 2015). However, it is worth noting that distrust of advertisements increases with education (SZAKÁLY, 2011). Interestingly, however, more educated consumers are looking for information more

often, but at the same time they are less convinced of its claims, which is a paradox. Ensuring reliability and credibility is vital for these consumers.

According to the results of the online questionnaire research, 15.49% of respondents with higher education typically consider the information on the packaging to be a reliable and credible source, while only 3.52% do not make the statement at all. I performed a chi-square test between the educational attainment and the statement considered reliable by the information on the packaging, the result of which is 0.09343, based on which it can be stated that there is a correlation between the two factors. I kept the H4 hypothesis based on this.

**T5: Based on online questionnaire research, FOP nutrition labelling on packaging can have an incentive effect on consumers to choose the food they consider to be healthier.**

It mostly affects those consumers who, based on their own opinions, live on their salary and can also save little. The most positive effect is the Nutri-Score marking, which has an incentive effect in a total of 28.17%. Respondents who, according to their own statements, do not have enough income to live on it, are usually not encouraged at all by the nutrition label on the front of the package to choose the food they consider to be healthier. According to the study of TARKI and GfK, income is the main determinant of an individual's eating behavior, especially healthy eating habits (BERNÁT, 2012). Kearney (2010) also states that high-income earners are the most conscious of healthy eating habits (KEARNEY, 2010). Based on the results obtained, I kept the H5 hypothesis.

**T6: FOP nutrition labels have a positive impact on the food industry, positively influencing the composition of foods.**

According to the research of Barahona et al. (2023), manufacturers have modified the composition of their products so that the values are below the specified limit, thus avoiding negative classification (BARAHONA ET AL., 2023). The research of Pietinen et al. also proves that the sodium content of food was reduced in order to avoid negative classification (PIETINEN ET AL., 2008). The research of Van der Bend et al. (2020) supports the fact that food industry players are willing to redesign their products not only to avoid negative classification, but also to ensure positive approval (VAN DER

BEND ET AL., 2020). A systematic review by Ganderats-Fuentes and Morgan (2023) finds that the most common reshaped nutrients were sugar and sodium. And reducing the amount of sugar resulted in a significant reduction in the calorie content of the food (GANDERATS-FUENTES AND MORGAN, 2023).

A systematic review by Ganderats-Fuentes and Morgan (2023) found that research related to industry behavior can be considered incomplete, as more than 30 countries included in the research approved at least one FOP nutrition label, but only 10 countries have results on the industry's responses. According to their results, after the introduction of FOP nutrition labels, there is a significant reduction in trans fatty acids, sugars, calories and sodium (GANDERATS-FUENTES AND MORGAN, 2023). The studies also provide valuable information for policymakers, supporting the arguments that the introduction of FOP nutrition labels could reshape food products and lead to good industry practice. However, food manufacturers are selective about which products to label and prefer healthier products, and the impact on consumers is uncertain. Based on these findings, it is recommended to make FOP nutrition labelling mandatory and to develop an interpretative approach in order to make the most of the policy, promoting the reformulation of products and providing consumers with all the information they need to make informed choices (ROBERTO ET AL., 2021). These results confirm the available evidence of the positive effects of markings as a policy tool to tackle the obesity epidemic. FOP nutrition labelling not only helps consumers make healthier choices, but it can also create a healthier food environment.

As a result of the online questionnaire research, 28.52% of the four nutrition labels included in the study are very likely to encourage businesses to improve the nutritional aspects of their products, a further 17.61% consider a positive effect to be more likely, and 10.21% are very likely that the nutrition label on the front of the packaging will encourage industry participants to improve the nutritional aspects of their products. 19.72% said negatively, meaning that they think it is highly unlikely that nutrition labels could have an impact on the industry.

The literature review clearly supports the fact that FOP nutrition labels influence the reformulation of food products and lead to good industry practice.

Future directions of research may include further research into the impact on the food industry, and thus policy support, which would be successful if manufacturers were to continuously redesign and innovate after five years.

## **6. PUBLICATIONS ON THE TOPIC OF THE DISSERTATION**

### **Scientific Journal**

1. Tóth Ildikó, Szakály Zoltán (2023): A frontoldali tápértékjelölések fogyasztói megítélése, *Gazdálkodás*
2. Tóth Ildikó, Szakály Zoltán (2023): Az ételminőségjelölések szerepe a fogyasztók ételminőségválasztásában, *Táplálkozásmarketing* (2064-8839 2631-1380)
3. Tóth Ildikó, Szakály Zoltán (2024): A Nutri-Score és Nutrinform Battery frontoldali tápértékjelölések fogyasztói megítélése, *Ételminőségvizsgálati Követelmények*

### **Foreign language scientific journal**

4. Ildikó Tóth, Zoltán Szakály (2025): Determining Types Of Conscious Consumers Who Prefer Nutrition Labeling, *APSTRACT - Applied Studies in Agribusiness and Commerce*, 18(2). <https://doi.org/10.19041/APSTRACT/2024/2/8>



Nyilvántartási szám: DEENK/3/2026.PL  
Tárgy: PhD Publikációs Lista

Jelölt: Tóth Ildikó

Doktori Iskola: Gazdálkodás- és Szervezéstudományok Doktori Iskola

MTMT azonosító: 10081133

### A PhD értekezés alapjául szolgáló közlemények

#### Folyóiratcikkek, tanulmányok (4)

1. **Tóth, I., Szakály, Z.:** Determining types of conscious consumers who prefer nutrition labeling.  
*Apstract.* 18 (2), 73-82, 2024. ISSN: 1789-221X.  
DOI: <http://dx.doi.org/10.19041/APSTRACT/2024/2/8>
2. **Tóth, I., Szakály, Z.:** A frontoldali tápértékjelölések fogyasztói megítélése.  
*Gazdálkodás.* 67 (4), 325-337, 2023. ISSN: 0046-5518.  
DOI: [http://dx.doi.org/10.53079/GAZDALKODAS.67.4.t.pp\\_325-337](http://dx.doi.org/10.53079/GAZDALKODAS.67.4.t.pp_325-337)
3. **Tóth, I., Szakály, Z.:** Az élelmiszerjelölések szerepe a fogyasztók élelmiszerválasztásában.  
*Táplálkozásmarketing.* 10 (2), 39-53, 2023. ISSN: 2064-8839.  
DOI: <http://dx.doi.org/10.20494/TM/10/2/4>
4. **Tóth, I., Danyi-Boll, A.:** Hungarian traditional clothing, as on- and offline marketing.  
*Apstract.* 15 (3-4), 33-36, 2022. ISSN: 1789-221X.  
DOI: <http://dx.doi.org/10.19041/APSTRACT/2021/3-4/4>





### További közlemények

Folyóiratcikkek, tanulmányok (1)

5. **Tóth, I., Szakály, Z.:** A Nutri-Score és Nutrinform Battery frontoldali tápértékelések fogyasztói megítélése.

*Élelmiszervizsgálati Közlemények.* 70 (3), 3-14, 2024. ISSN: 0422-9576.

DOI: <http://dx.doi.org/10.52091/EVIK-2024/3-1>

A DEENK a Jelölt által a Tudóstérbe feltöltött adatok bibliográfiai és tudományometriai ellenőrzését a tudományos adatbázisok és a Journal Citation Reports Impact Factor lista alapján elvégezte.

Debrecen, 2026.01.07.

