THE ROLE OF THE NUTRITION LABEL IN SHAPING STUDENTS' EATING BEHAVIOUR

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Abstract
Both researchers and business specialists are trying to find a common ground on the definition and use of nutrition labeling for food products. Especially after December 2014, European legislation stipulates as an obligation for companies to introduce a nutrition declaration in food labeling. Under the consumers' right to be properly informed about food, manufacturers developed several voluntary systems of nutrition declaration on food labels to facilitate understanding of information. The paper aims to highlight theoretical and practical developments in nutrition labeling, with focus on those that enhanced the informational role of nutrition label in shaping consumers' eating behavior. The research involved identifying students' perception on the opportunity, content, complexity and authenticity of nutrition labels and their impact on consumer decision. Thus, a qualitative research was performed using a focus group as main technique. The investigated group was formed by students in the master program Quality Management, Expertise and Consumer Protection - Faculty of Business and Tourism in The Bucharest University of Economic Studies. Motives, beliefs, attitudes in different acquisition scenarios were studied to help understand how respondents perceive nutritional information. Several data and publications were used, as: academic literature, legislation, reports and recommendations from the European Commission, websites of organizations in this field, and data collected during the focus group debates. The results reveals clues on the most well-known and appreciated system of nutrition labeling - Front Of Pack (FOP) – required to choose the most effective model for companies to improve their nutrition labeling of food.

Keywords
nutrition labeling, nutrition declaration, voluntary nutrition labeling systems FOP, perception, food behavior.

JEL Classification
L15, I 12, L66, P 46

Introduction

The need of information for consumers and particularly the differences in their perception requires a high level of consumer protection in the field of information offered by the food industry. The ways in which information is provided must be flexible enough to respond to new labeling requirements in order to guarantee consumers' right to information.

Fair labeling of food products guarantees that consumers are properly informed about the food they eat, but also influences their choices, based on health, economic, social, environmental or ethical considerations. Nutrition labeling is an important way to inform consumers about food composition, helping them to make a valuable judgment and to take an informed and appropriate choice. In providing nutrition information companies should take into account the relationship between diet and health, as well as the concern of choosing an appropriate nutrition to suit individual needs (U.E., 2011).
The paper aims to highlighting the multitude of current nutrition labeling systems Front Of Pack (FOP) used on the market along with the mandatory nutrition declaration and to identify students' perception about the effectiveness of nutrition labels in terms of its understanding, utility and impact on consumer decision. The current research also identifies the extent in which the objectives and strategies of companies in nutritional labeling are consumer-oriented. The utility of the paper derives from the importance of adopting effective nutrition labeling models which can set out general conditions that can subsequently shape an ethical behavior of producers, and also a balanced eating behavior for consumers.
The paper is structured in several sections: in the beginning the current evolution and state of knowledge regarding the concept of nutrition labeling is described, the following sections present the methodology of the qualitative research carried out, the obtained results and their utility from an operational and managerial point of view, and in the end the main conclusions are presented.

Literature review

The new labeling requirements aim at improving the level of information and protection of European consumers and stipulate the obligation for all producers from Member States to include a nutrition declaration in food labeling. Therefore, it should be noted that in the authors' perspective the concept of nutrition labeling includes a mandatory nutrition declaration and perhaps a voluntary FOP labeling system that may or may not accompany it. In current legislation there is also uses the notion of nutrition claim, which is different from that of nutrition declaration.
The *nutrition declaration* for a food product refers to information about its energy value and the presence of certain nutrients. Starting from 13 December 2014, Regulation (EU) no. 1169/2011 regarding the provision of food information to consumers replaces earlier regulations. Directive 90/496/EEC on nutrition labeling of foodstuffs and Directive 2000/13/EC on the alignment of Member States laws relating to labeling and presentation of food products and their advertising were repealed (EU, 2011).
The *nutrition declaration* should include the following information: (1) energy value and (2) the amount of fat, saturated fats, carbohydrates, sugars, proteins and salt.
Mandatory information may be supplemented by indicating the quantities of one or more of the following components: monounsaturated fat acids, polyunsaturated fat acids, polyols, starch, dietary fibers, vitamins and mineral substances present in the product in significant quantities (15% of the reference nutrient value, provided by 100 g/100 ml of food or 7.5% of the nutrient reference value, supplied by 100 ml for beverages).
The *nutrition claim* is any statement that indicates, suggests or implies that a food product has special beneficial nutritional properties because of the caloric value, nutrients or other substances it contains, in accordance with Regulation (EC) No. 1924/2006 on nutrition and health claims made on foods (EU, 2006). These explanations were necessary because the use of these two concepts close as meaning in the current legislation may create confusion among less well-informed consumers.
Nutrition labels of food products which are made in a clear and easy way to understand may help consumers to make appropriate choices of food and diet. The methods to declare the

nutritional value on food labels range from simple shapes (tables with or without color coded strips widely accepted - red, red-orange or pink for protides, yellow for lipids, green color for carbohydrates and white background for energy, indicating the content of protides, lipid and carbohydrate - in grams per 100 g of product and/or for a recommended portion and the energy value expressed in kJ or kcal for 100g of product and/or a recommended portion) to more complex forms (indicating the energy value of the product, the trophin content with an energy and biological role, but also the coverage degree of the daily average requirement of nutrients for a reference consumer).

Currently, on a voluntary basis, there are also other nutritional labeling methods and systems, such as the Front of Pack (FOP), where nutrition information is marked on the front of the packages, using different symbols to be more visible and thus more easily perceived by consumers as shown in Fig. no. 1:

A. The Traffic Light (TL) model - uses the chromatic coding of traffic lights to warn consumers of the high (red), moderate (yellow) or low (green) nutrient content in food with a negative impact on their health (total fats, saturated fats, sugars and salt);
B. The Guideline Daily Amounts (GDA) model provides information on the amount of energy and nutrients in a food portion, indicating at the same time the percentage of the recommended daily intake that is covered by the consumption of that food product;
C. A combined system of these two models, TL and GDA is the Multiple Traffic Light (MTL), which combines the color coding of the traffic light with the information on the amount of energy and nutrients in a food portion and the percentage of the recommended daily intake covered by food consumption;
D. Another model based on scores and colors, called Nutri-Score, classifies food by giving a score ranging from -15 for "healthy" products to +40 for those which are "less healthy". Based on this score, the product receives a letter with an appropriate color code: from dark green (A) to dark red (F). The algorithm used in determining the score takes into account both positive and negative elements. For example, the content of sugars, saturated fatty acids, salt and calories has a negative influence on the score, while the existence of fruits, vegetables, fibers or proteins has a positive impact;
E. The Health Star Rating (HSR) system use a star-based algorithm taking into account the amount of energy (kilojoules), saturated fats, total sugars, sodium, proteins, dietary fiber, fruits, vegetables, nuts and legumes.

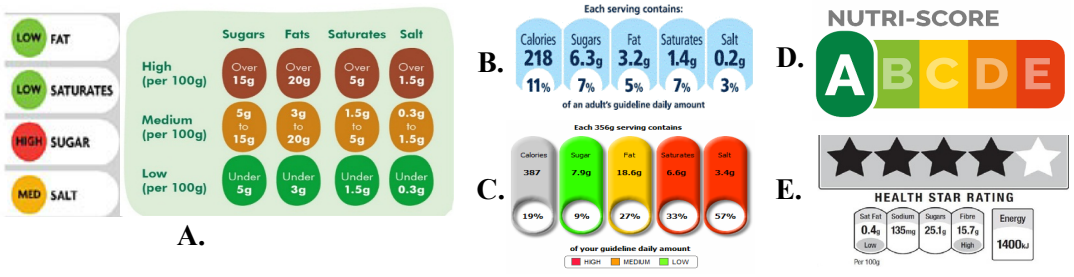

Fig. no. 1 Nutrition labeling systems

Source: http://news.bbc.co.uk/2/ hi/health/4788704.stm; https://www.macmillan.org.uk/information-and-support/coping/maintaining-a-healthy-lifestyle/managing-weight-gain/weight-loss.html#5434; http://www.tinuvielsoftware.co.uk/wisppages/wisp33a.asp; https://www.roaliment.ro/ambalaje/ etichetare/belgia-lanseaza-etichetarea-nutriscore/; https://www.news.com.au/lifestyle/health/diet/why-the-health-star-rating-system-is-flawed/news-story/1cbe4887a9ff832a4e03af496a580705

Regardless of the chosen labeling method, the nutrition information presented must be simple and easy to understand, to attract normal consumers and to fulfill its informative purpose, given that the current level of nutrition knowledge is quite low.
Therefore, placing partial nutrition information in the main field of vision, known as the "front of the package" and partial information on the other side of the packaging, such as the "back of the pack" could create confusion among consumers (EU, 2011). Therefore, the entier nutrition declaration should be in the same visual field to help consumers easily observe essential nutritional information when purchasing food. Additional forms of expression and presentation can help consumers to better understand the nutrition declaration. However, there is not enough scientific evidence on how consumers understand and use alternative forms of expression and presentation of information. This is why, lately, different studies have been conducted to identify the influence of nutrition labeling on food behavior.
Egnell et al. (2018) tried to assess the ability of consumers from 12 different countries to understand different nutrition labeling systems. Results showed that all these voluntary systems have increased consumer perceptions on the nutritional value of food. The study showed that the Nutri-Score model was more effective in transmitting information on the nutritional qualities of food, helping consumers to differentiate between products. Moreover, this model was clearly understood in various socio-cultural contexts and has become familiar to consumers compared to other labeling systems.
Considering that reading nutrition labels requires time, and understanding nutritional information requires knowledge and skills, a study performed by the East Anglia University (EAU) examined the motivational role of the theory called "regulatory focus on consumer involvement in nutrition", which reflects consumers involvement expressed as time and effort they invest to get informed about the nutrition and to choose healthy food. The study has also analyzed the effect that food involvement has in influencing the level of nutrition and nutritional behavior of consumers (Pillai et al., 2019).
Nevertheless of the chosen labeling system, including in the same visual field the quantity of nutrients and comparative indicators in an easily and identifiable form that allows an assessment of the nutritional value of food is part of the nutrition declaration and should be treated as a whole and not as a group of individual remarks.

Research methodology

Considering that qualitative studies are working better with a smaller number of participants, allowing in depth study, exploration of details and far more data collected compared with bigger groups. Even if this method has a less rigorous sampling approach it is far more time and effort efficient and also less expensive (Farrugia, 2019). The research was based on a form of purposive sampling (Robinson, 2014) respectively on a homogeneous (Jager et al. 2017) and rational sampling.
Thus, a group of participants was formed from the same environment (university - master students in the program Management of Quality, Expertise and Consumer Protection of the Faculty of Business and Tourism), with similar experience (graduates of the Faculty of Business and Tourism, who studied specialized topics on Food products and Consumer Safety in the 2nd year of the bachelor program and Quality and Food Safety, in the 1st year of the master program) sharing common interests (preparing dissertation thesis on food-related topics). All these conditions give them the ability to debate on the proposed topic and to express pertinent opinions, simplifying thus the analysis and facilitating the group interview.
The current study used a focus group interview, as an effective method to obtain information from a small group formed of 10 master students (8 female and 2 male) in the second year of the master program mentioned above - by debating a specific topic, the participation being on a voluntary basis. In a qualitative research what matters is the

relevance of the sample in relation to the proposed topic and no emphasis is placed on its representativeness. That is why a rational sample was created, students being elected by the researchers depending on their estimated relevance in relation to the research topic (Popa, 2016).
Considering that the subjects passed through an almost identical curriculum (Voinea et al., 2016) and have a good nutrition education and information, our research aims to highlight students' views on the importance of the information role of the nutrition label in adapting their eating behavior. The research was conducted in the second semester of the academic year 2018-2019, in March 2019, and intended to assess students' attitude towards the complexity, variety, accuracy and opportunity of nutrition information written on food labels and their influence on their eating behavior.
The organization of the focus group had a classical structure, the debate last 80 minutes and was led by a moderator, the professor of the two previously mentioned topics, as scientific coordinator of dissertation papers and coauthor of the current research. In the beginning the moderator made an introduction and a brief presentation of the subject by reviewing the main objectives of nutrition labeling as well as the current state of knowledge on this concept, which were accompanied by a written material containing a comparative presentation of FOP nutrition labels systems and models for the same product to make a purchase scenario.
In this context, the focus group was held based on a conversation guide through specific interactions between moderator and participants (questions and answers) and, on the other hand, between participants (as debates, questions and answers) (Kitzinger, 1995; Popa, 2016).
Using a structured approach, the conversation guide consisted in some carefully formulated questions so that clear responses can be obtained and also to avoid leading discussions in a particular direction. For accuracy and relevance of results, the moderator noticed the behavior and gestures of participants and noted their answers.
The study was based on the dimensions of the investigated subject: understanding the information included in a nutrition declaration; content opportunity of the nutrition declaration; the utility of adding a voluntary FOP labeling model or system for an easier assessment of the nutritional profile of food products; the level of suggestion for various FOP nutritional labeling models and systems through the comparative analysis presented in the acquisition scenario; highlighting the link between nutrition information and eating habits in general and in students case; the need to improve nutrition labels in terms of content and graphic representation.

Results and discussion

The research is mainly focused on exploratory-descriptive objectives and on generation of hypotheses based on the gathered data (Popa, 2016). The research results are presented in close relation with the objectives defined in the methodology and specific questions included in the conversation guide in the attempt to determine main factors that influence consumers' intention to identify healthier choices about the foods they consume:

- discussion revealed that 9 out of 10 participants read the nutrition label according to their statements: 4 always read, 4 sometimes, 1 very rare and 1 never; so most of them are interested in the nutritional profile of the foods they buy, which leads to the *hypothesis 1 - that most consumers feel the need to be informed about the nutritional profile of the food they buy*;
- considering the sufficient level of knowledge of participants regarding the requirements for food traded on the market, their nutrition value and the relationship between diet and health, they unanimously declared they understand most of the compulsory information contained in a nutrition declaration, interpretation difficulties

occurring in the differentiation of saturated fat acids from total fat and sugars from total carbohydrates; these findings may give rise to the *hypothesis 2 - nutrition information is not entirely simple and easy to understand for an uninformed consumer and can be misleading*;

- in terms of appropriateness of the nutrition declaration content, the energy value is considered to be the most important, followed by the amount of sugar and fat; discussions focused mainly on quantitative versus qualitative aspect of food intake and the necessity of dimensioning daily menus; this discussion direction may be motivated by the higher number of females compared to males; thus, *hypothesis 3* can be formulated as follows - *women are generally more careful to daily diet and assign a greater importance to fat and sugar content of products they consume*;
- unanimously, participants in the debate agreed that it is very important for the nutrition declaration to be made in relation to the daily needs of a reference consumer in the form of Recommended Dietary Allowance (RDA) or, in other words, as % of Daily Recommended Intake (DRI); *hypothesis 4* which results is that – *a simple quantitative declaration of energy (expressed in kilocalories or kilojoules) and trophies with energy and biological role (in grams or milligrams) is not enough to be understood by consumers in terms of reporting to their needed daily energy and essential nutrients*;
- in the above situation, students that were interviewed were opened to the use of a voluntary FOP nutrition labeling model/system; thus the need to implement such an additional labeling method is justified, and the combined MTL system presented in the acquisition scenario was considered to be the most graphically suggestive but also in terms of its effectiveness – through usefulness of information and ease to be understood; an explanation for this conclusion could be also not knowing the Nutri-Score and HSR systems, which are not used in Romania. Two other hypotheses can be drawn from this part of the debate: *Hypotheses 5 - consumers consider a FOP voluntary labeling model / system to be necessary; and Hypotheses 6 - the combined MTL system is the most suggestive one;*
- the participants in the debate consider that the nutrition label is not a major factor in the decision making process in the consumption choice (7 out of 10 students responded in this way), indicating the economic and socio-cultural context of the food market in our country and adjusting their responses according to the influence of exogenous factors (e.g. purchasing power, brand confidence) and endogenous factors (e.g. consumer habits, lifestyles) on their consumption behavior; thus, it results *Hypothesis 7 - the nutrition label does not decisively influence the consumption decision*;
- however, students recognize that the nutrition label is necessary and is the only way of information about the energy and biological value of food, on condition that the information is true; from this it can be deduced *hypothesis 8 - nutrition labels improve consumers' perception on the nutritional profile of foods*;
- all participants in the focus group generally recommend the need to improve nutrition labeling by: adding information about trans fatty acids and the amount of refined sugar; increasing the size of nutrition labels, especially on small packs, by attaching "accordion"/harmonic labels attached, with a reclosing system; the existence of smartphone apps that can detail and explain nutritional information; combining the HSR and TL systems to link their benefits; the use of an unique FOP system at EU level to facilitate recognition and understanding of information; to indicate, in addition to the reference intake of an average adult, the reference intake for other specific population groups. On the other hand, the need to increase the level of

nutrition education of population has also been considered to improve eating behavior, including the use of nutrition labeling. These findings lead to the following assumptions: *Hypothesis 9 - consumers consider that nutrition labeling should be improved; Hypothesis 10 - an unique FOP labeling model/system at EU level is needed; Hypothesis 11 - measures are needed to increase the level of nutritional education of population to correct imbalances in food consumption and eating behavior.*

Research is relevant and has implications both in the economic and social environment: on one hand, manufacturers/traders are interested in identifying consumer labeling and information requirements to create innovative labels for food products, and on the other hand, consumers are interested in receiving correct and fair nutrition information to allow them to make informed choices, to offer them a high level of protection and to guarantee adequate eating behavior.

This qualitative research is useful for a future quantitative one which can be statistically representative, starting from the 11 generated hypotheses, considering the fact that at the European level it is recommended that new ways of expressing and presenting nutrition labels to be based on scientific reliable and relevant research.

Conclusions

Proper functioning of the food market has an important role in achieving a high level of information for consumers, allowing them to make informed choices as essential prerequisites for both the principles of fair competition and for a real protection of consumers. The obligation to declare nutrition information on the packaging is an important support for nutrition actions as part of food and nutrition policies in the public health domain. The expected results become increasingly better by including scientific advice for nutritional education of consumers, allowing them to make healthy choices, to reconfigure their food consumption and reconsider their eating behavior.

The development of different forms of expression and presentation should be based on criteria aiming to facilitate and inform the consumer and helping him to understand the nutritional profile of foods and to allow him a rapid global assessment of a product. Ensuring a consistency in the development of additional forms of expression and presentation of the nutrition declaration is needed in order not to cause confusion among consumers.

The assessment of students' perception on the nutrition label highlighted the utility of the information included in food nutrition declarations which are mandatory as well as the effectiveness of using voluntary FOP labeling models/systems.

The study highlighted the impact of the nutrition label as an appropriate mean of establishing a properly dimensioned diet that includes healthier foods but also as an efficient way to provide information on the nutritional value of products and its influence in shaping their eating behavior. According to the study results, the importance of the informational role of the nutrition label is increasing, even though it is not always a decisive factor in changing the consumption decision.

The results of this research are reflected in a number of new and useful directions for the management of nutrition labeling, indicating new ways to improve the forms of declaration. Consumers' requirements regarding the nutrition labeling of food need a responsible approach from the producers to increase consumer satisfaction. A responsible approach suppose compliance with legislative requirements regarding the scientific relevance and accuracy of information, but also its veracity so that it does not mislead the consumer.

Using a qualitative research made possible to identify perceptions and demands of consumers that are hard to detect by carrying out a quantitative research, but had also certain

limits: first of all, the results representativeness is not ensured; secondly, the results are influenced by the focus group structure, which included a larger number of females.
New research directions should start with the proposals to improve nutrition labeling, resulted from the focus group discussions, and to address the impact of different voluntary FOP labeling models/systems on consumers and on the internal market. At the same time a further harmonization of these forms of expression and presentation is needed, and decision-makers involved have to carry out comparative studies to establish the most efficient system.
Thus, in order to strengthen the informational role of the nutrition label, there is a need for a constant exchange of best practices and experience between economic actors, as well as the involvement of all stakeholders, including policymakers.

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