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Research on Food Behavior in Romania from the Perspective of Supporting Healthy Eating Habits

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Abstract: Today's human society provides to food consumers many options that involve difficult decisions. Disoriented and stressed by contradictory messages of mass media and by the warnings of being as slim as possible, a modern consumer gets confused and shows a tendency towards losing his traditional habits. Still, most experts suggest that the adoption of a healthy food behavior, based on minimally processed natural products, may contribute to the development of a sustainable food system. The study aims to design the food profile of Romanian consumers by presenting the underlying factors of a balanced diet. The conducted marketing study was of quantitative nature, in which, a face-to-face survey was used. The questionnaire was applied to individuals aged over 18 years old, and the tool used for collecting data was the structured questionnaire applied to a sample of 1185 Romanian respondents. In this study, the following methods of analysis were used: factor analysis, cluster analysis, and structural equation modeling. The research results present the main aspects underlying the food products classification, the clustering of Romanian consumers by their interest in healthy diet, and the relationships between specific variables influencing the healthy food habits. These results have shown the need for supporting educational campaigns targeted at Romanian consumers aimed to develop healthy food habits that could create conditions needed to reshape food supply, and implicitly, to contribute to the development of environmental sustainability.

Keywords: food behavior; eating habits; Romania; marketing research; sustainable food choice

1. Introduction

This study approaches an important and well debated research topic, especially nowadays when people are witnessing a reshaping and exponential multiplication of food universe due to the symbiosis between modern food technology and nutrition science, a phenomenon that has generated a predominance in supply of organoleptic and highly processed foods [1,2].

Although, consumer has, theoretically, the opportunity to choose from a wide range of food products, which are usually highly available and despite his sovereignty on the market (the syntagma "consumer king" appeared in the period of the maximum development of consumer society), he has always been under continuous attack of producers and sellers [3], becoming victim of the corporate sales tools, that has encouraged overconsumption and other unhealthy eating habits [4,5].

In this context, the occurrence of non-communicable diet-related diseases (NCDRDs) (mainly manifested by the inappropriate application of nutrition principles and the presence in the daily diet of a multitude of unbalanced food products) can be observed among modern consumers.

The leading dietary risk factors in the so-called "Western/North American diet" of modern consumers are high intake of sodium, red meat, fats, and sugar corroborated with low intake of healthy foods, such as whole grains, fruit, nuts and seeds, and vegetables [6].

Romanians have also adopted this type of diet since the fall of the communist regime. Citing the report of The National Institute of Statistics (2016), Spiridon [7] shows that the food profile of the majority of Romanian consumers can be summarized as follows: used to buy high amounts of cheap and poor-quality food products. Unhealthy products, sweets, margarine, street food pastry and bakery products, pork and poultry from industrial farms, as well as charcuterie and meat-based convenience foods are customary in the daily menu of Romanians.

There is clear evidence in the literature that the "Western/North American diet" is fueling the most common NCDRDs. Maillot et al. [8] showed that low-cost foods are both energy-dense (rich in fat and sugar) and nutrient-poor, generating nutritional deficiencies and overweight. Pieniak et al. [9] noticed that poor diet and obesity are linked with cardiovascular diseases, cancer, and diabetes. Besides, "Western/North American diet" was responsible for one in five deaths globally as warns the study funded by the Bill and Melinda Gates Foundation (2017) [6].

Another fact that should be considered when analyzing the eating behavior of modern consumers, is that the less healthy food products have the highest environmental impact and the most healthy ones have the lower impact as it is shown by the Double Food and Environmental Pyramid created by Barilla Center for Food and Nutrition [10].

It is obvious from the existing literature that current food consumption behavior of most consumers pose great negative impacts for their health and the environment, as they are mainly oriented towards unsustainable food products [11–13].

That is why, for several decades experts have warned about the need to develop new strategies to accommodate present and future population needs and well-being [14]. In this context, the need to shift to more sustainable diets and food systems has become extremely evident in the last decades, although this demarche is not at all simple to achieve [15].

However, a hope has been induced that producers will inevitably make a transfer to sustainable production if most consumers preponderantly focus on foods manufactured under sustainable conditions.

Obviously, this goal requested strategies and programs for consumer education. The first step was to define the concept of sustainable diet and to implement it in industrialized and developing countries all over the world.

After many attempts to determine what must be understood by "sustainable diets", in 2010, Food and Agriculture Organization of the United Nations (FAO) launched a consensus definition, as follows: "those diets with low environmental impacts that contribute to food and nutrition security and to healthy lives for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable, are nutritionally adequate, safe, and healthy, and optimize natural and human resources" [16].

Therefore, according to FAO, the sustainability of diets includes among its major determinants: agriculture, health, socio-cultural, environmental, and economic dimensions [17]. Of all, "healthy" has been considered the main characteristic of a sustainable diet as well as the degradation of the environment was the characteristic of an unsustainable diet [18].

A step forward in the demarche of consumer education could be considered the recent attempts of different countries to incorporate sustainability into their dietary guidelines. Therefore, it should be noticed and followed the example of Sweden, Germany, Brazil, and Qatar [15]. In addition, USA also tried to link sustainability to the healthy eating pattern of the 2015–2020 version of Dietary Guidelines for Americans, but as Blackstone et al. [19] claimed, the result remains unclear.

Regarding the Romanian Dietary Guidelines (entitled *Guidelines for a healthy diet*), which were developed in 2006 by The Ministry of Health in collaboration with some universities and nutrition institutes, even though they do not have a direct focus on the sustainability, the promoted eating

pattern might have different impacts on the environment, through some of its key messages, such as eat plenty of cereals, eat plenty of fruits and vegetables, choose foods that contain small amounts of fat, eat highly processed foods high in sugar sparingly [20]. The main principles of a healthy diet (variety, proportionality, moderation) are reflected by the graphic representation of the Romanian dietary guidelines in the form of a food pyramid, divided into many sections suggesting the seven foods groups with the number of recommended servings for each one along with the image of physical activity at the base [20].

To highlight the consumers' perception on sustainable diet and their willingness to adopt its principles, a lot of studies have been done lately. Although most of them focused mainly on the issue of diets and their impact on human health, the environment, and food systems [17], they show that the importance of the topic of healthy and sustainable diet for consumers is on the rise [21–24].

Although in Romania there is no research on consumers' perception of food sustainability, however, previous pieces of research show the desire of some Romanian consumers to make shift to a healthier diet and to consume daily product such as organic foods (especially fresh fruits and vegetables), more home cooked foods, healthy homemade sweets. For Romanians, the keywords associated with healthy eating are no added sugar, less fat, no food additives, unprocessed, natural, fresh, clean, right combinations, moderation, balance [25,26].

Thus, the general context shows the importance of an in-depth study of food consumption behavior in Romania, as well as the factors influencing it.

To summarize, it can be stated that literature in the field reports, on the one hand, some negative aspects in modern society, such as the encouragement of overconsumption and a set of unhealthy eating behaviors as it was discussed before and, on the other hand, it shows some positive aspects of present society, which, besides an increased interest for a healthy and sustainable diet, are the diversification of sources of information available to consumers [27], as well as the growing level of education of consumers [28] that will enable them to set scientifically-based criteria for healthy food choice.

Considering all these, the premise of the present study was that the mass of Romanian consumers could be divided in two categories, interested and not-interested, depending on the importance they give to a healthy diet and to the implications of their food behavior [29].

Aiming at studying the main features of food behavior among Romanian consumers, a quantitative marketing research was carried out on a sample of 1185 individuals aged over 18 years old. The data analysis methods were factor analysis, cluster analysis, and structural equation modeling.

To reach its aim, the study, divided into several sections, starts with a literature review identifying the most important aspects related to the eating behavior of modern consumers. Next sections present the data collection method and results. Finally, there is a section comprising the conclusions of the study, and its managerial implications.

2. Literature Review

The interest for a healthy life style linked with the desire to lower the risk of exposure to a series of NCDRDs may be considered one of the main motivations of modern consumers in choosing a healthy diet [9,30,31]. High level of nutritional education of consumers is translated in increased interest in the results of recent studies on nutrition, new food trends (slow food, ethno food, functional food, food supplements), keeping fit, which are other defining factors in the orientation towards a healthy diet [32].

Furthermore, the unhealthy eating style results from a set of reasons, among which it can be mentioned the primacy of gustatory pleasure over the nutritional balance in food choice, considering an ever growing pace of life style and lack of time for preparing healthy meals. Lack of interest for a healthy life style could be sometimes explained by lack of cognitive abilities needed to understand the main principles of a healthy diet. At the same time, some unhealthy eating habits may derive from local cuisine, while others may be adopted due to the social pressure of the group of belonging [33,34]. Additionally, one of the causes of unhealthy diet may be the fact that financially vulnerable people

may face scarcity of foods. In Romania, for example, the monthly budget for a healthy diet is around 128 euros for a single person and 499 for a family of two adults and two children. As in Romania the minimum net wage has a low level, an important part of the population does not afford the food basket. For a household which earns the average net wage, the food basket represents approximately 70% of the total income [35].

In addition to personal motivations presented above, the socio-cultural context may force an individual to adopt an unhealthy life style. So, in the last decades, the democratization of consumption and food abundance in highly-industrialized countries have encouraged over-consumption and a set of unhealthy food habits translated in a preference for fat-rich products, containing saturated or hydrogenated fats, and for sugar-rich products to the detriment of wholegrain cereals, fresh vegetables and fruits [2,36].

Consumer societies have been characterized by a high availability and accessibility of food, and also by a high pressure from food industry exercised through mass media for encouraging over-consumption [33,37]. Modern consumers have been more and more confused, starting to lose their nutritional landmarks from family-based education, due to contradictory messages of mass-media that, on the one hand, have been encouraging them to consume more and more, and, on the other hand, have been forcing them to be as slim as possible in order to fit into the standards imposed by the fashion industry [4] (p. 38). Many times, the hedonist criteria dominate in the selection of foods and this category of consumers oriented towards maximizing their personal pleasure in consumption could be referred to as gourmand consumers [38]. They do not have a lot of knowledge on food and diet, having no value for food, but mostly consuming it greedily.

Therefore, due to the repeated nutrition mistakes, consumers end up developing eating disorders that may be one of the favoring factors (along with genetic, physiological, environmental factors) in the onset of NCDRDs, such as coronary heart disease, stroke, hypertension, obesity, type 2 diabetes, osteoporosis, gallbladder disease, dementia, and nutritional anemias [39,40]. Lately, especially obesity has risen steadily, becoming an issue that affects people of all ages and incomes, everywhere [41,42]. As FAO [34] statistics show, 1.9 billion adults are overweight or obese.

Analyzing today's food landscape, it can be noted that the preponderant food offer has its origins in the period of highest development of food industry. The development of symbiotic formula between food science and modern food technologies and their widespread application, resulted in achievements in the global food supply, but also in a nutritional degradation in the modern diet [2,43]. Industrial techniques, refining, hydrogenation, and preservation have resulted in highly processed foods, lacking essential ingredients: vitamins, minerals, and fibers. Additionally, extensive use of food additives leads to highly organoleptic foods, the sensory characteristics of which are not always natural, industrial foods having artificial tastes, flavors, colors and textures, in the context of unbalanced nutritional profiles [44] (p. 30).

However, along with ultra processed food products, it can be noticed the presence in the global offer of some categories of foods, such as ecological food products, Slow Food products, or Novel Food products that have captured the public attention lately, because they can guarantee both individual health and environmental sustainability [45].

Regarding the food products with eco-friendly characteristics and certifications, many studies have proven a high interest of consumers, the main reason being the fact that they provide a high amount of nutrients with positive impact over health, first contributing to the fortification of the immune system and to the reducing of risk for food allergies or NCDRDs [46–49]. The consumers' awareness of the nutritional and sanogenetic benefits of the ecological foods lead to the consolidation of their favorable image and to the expanding of the eco trend [50].

Another trend that has captured the consumers' attention is Slow Food, a movement that has spread across the planet because it builds on the desire to eat authentic, tasty and healthy foods [51]. To obtain "good, clean, and fair" food products, Slow Food proposes a holistic approach, where the economic, socio-cultural, and environmental aspects are interlinked, being pursued as part of an overall

strategy [52]. Supporting the local communities and promoting vital traditions and locally sourced foods [53], Slow Food movement is fighting both for biodiversity and consumers' health protection. This idea was emphasized also by Brunori et al. (2016) [54], who claimed that the "local" has been frequently associated with healthy and sustainable food.

From the category of Novel Food, besides exotic fruits and vegetables, whose numerous benefits were demonstrated [55], edible insects are a new source of food entered in the attention of the EU lately, its status being covered by the Regulation 2015/2283. Having a great nutritional value (because they provide high amounts of proteins, fiber, unsaturated fatty acids, vitamins and mineral substances) [56,57], edible insects are equally a sustainable source of food, especially because their breeding has little impact on the environment [58]. Based mainly on these reasons, edible insects are considered by FAO a credible and healthy food alternative for the future.

The aspects mentioned above enable the development of the first hypothesis of the research:

H1: *The main dimensions of grouping the food products in consumption are the fulfilment of the daily recommended intake of nutrients, the degree of technological processing, and the hedonist valences.*

Regarding the classification of food consumers, previous research aimed at examining the general trends in food consumption that determine the food-related lifestyle, has allowed the identification of many types of consumers, each with different interests, goals, and perceptions about food, as follows: uninvolved, careless, conservative, rational, adventurous, hedonist, enthusiastic, moderate, eco-health, urban, traditional, etc. [59–63]. For example, the uninvolved consumers mainly appreciate the ready-to-eat foods and are not interested in quality and freshness. The same as the uninvolved consumers, the careless consumers manifest a low interest towards the quality of food, being mostly interested in convenience and in novelty. Conservative consumers pay attention to quality, locally sourced ingredients, and traditional recipes. Eco-healthy consumers are particularly interested in healthy and organic food products. The rationalists consider the price, the nutritional information and the cooking methods when make food choices. The adventurous consumers want quality and good taste in food products, being highly interested to cook the meals themselves.

Depending on the attitude towards complying with the principles of healthy eating, two typologies of consumers may be shaped, relatively antagonistic: interested and non-interested consumers [6,7,25,26].

Interested consumers are usually those with higher level of education, who use various sources of information, including social media. This category of consumers aim in their daily diet at ensuring a balanced intake of nutrients, namely, taking care of variety, proportionality, and moderation in food selection and consumption [64]. The direct consequence of this eating pattern is the maintenance of Body Mass Index or Quetelet Index within normal limits [29,65,66].

Non-interested consumers generally reject the idea that the issue of diet is related only to biochemistry and physiology, which means the consumption of nutrients and kilocalories, and give the highest importance to the sensory characteristics of foods. Therefore, these consumers interested in the hedonistic aspect of consumption, are mostly attracted by the desires and pleasures conferred by food, being more the creation of their desire than their need for consumption [67]. As, in case of these consumers, prevailing motivations of emotional nature shape their daily diet, the focus is on olfactory-gustatory characteristics of foods that stimulate strongly their appetite [68,69]. This food pattern results in constant imbalanced diet, with a high Body Mass Index as an immediate consequence [29].

Sensory seduction could be mostly observed among younger consumers as they have developed their food habits during the peak in the development of food industry, being accustomed to consume in general foods of modern food industry described by special sensory characteristics, but mostly with unbalanced nutritional profile [70,71]. As these images are stored in the memory of the new consumer, his possibilities to acquire knowledge that means comparing the perceived images with the ones that exist in his memory are obviously limited [72] (p. 53). This way, Popescu, Negrea, and Voinea [73]

explain the predilection of the new consumer for giving absolute value to sensory characteristics in selecting food and neglecting, or even disregarding the nutritional value. Moreover, George and McDuffie [74], investigating the main factors in the orientation of the food selection decision in the young, report that taste is the decisive characteristic.

The fact that young consumers are palate slaves is a common finding of previous studies [75–77], proving that in the attempt to change their food behavior, the young consumers are less open to making compromises related to taste. An explanation for the preference of the young for industrial, refined foods, rich in saturated fats and sugar (this category including also fast-food) may be the mental association of this eating behavior with the idea of independence and fun with friends or one of the ways in which independence or rebellion may be expressed, while consumption of healthy foods is associated with the control exercised by parents.

Nevertheless, the above described behavior cannot be generalized, because, as recent studies show, there are segments of young consumers interested in healthy diet [78,79]. Moreover, the research of Żakowska-Biemans et al. [21] emphasized the positive image of sustainable food among young adults from Poland, who directly associate it with healthiness, balance, and varied eating behavior.

Starting from the features of typologies described above, the second hypothesis is formulated as follows:

H2: *The degree of interest towards healthy diet is a criterion for clustering the Romanian consumers.*

In the context of this food universe undergoing a deep process of reconfiguration by use of new technology for modifying the structure and content of foods, an assumption may be put forward that change of the unhealthy food habits for some consumers is rather difficult.

Still, compared to past decades, consumers now have at their disposal many sources of information—nutritional labels, radio and TV shows, Internet, scientific press, etc.—that may underlie changes in lifestyle through the adoption of healthy and sustainable eating habits [32].

Out of sources of information, the food label is the most available. Initially, although the labels provided a high volume of information about the nutritional value mainly aimed to guide consumers in food selection, there were numerous questions regarding the efficiency of nutritional information in guiding buying behavior [80]. Therefore, lack of basic knowledge on nutrition, as well as lack of cognitive abilities needed to make use of nutritional labels in order to compare products in terms of their nutritional profile could have been considered as main obstacles faced by consumers in using nutritional information [81].

Lately, there has been an increase in the level of nutritional education of consumers as a result of promotion in mass media of healthy diet principles through TV shows produced by experts in nutrition, publication of articles, and creation of web-sites and blogs with content provided by experts in the field. To this has also contributed the inclusion into the educational programs of topics related to developing knowledge and abilities in the area of healthy eating [82].

Having a higher level of nutritional education, consumers, especially those interested in healthy diet, are able to establish for themselves a set of scientifically-based criteria for proper selection of foods. In addition, they are more capable to interpret the information from the food label, including nutritional and health-related information and to understand correctly the role of nutrients in their overall diet. In this context, recently developed systems for signaling the nutritional profile, materialized in Front-of-Package labels (Traffic Light, Reference Intake, Nutriscore, etc.) that provide and summarize, in a simplified manner, relevant nutritional information, as many studies have shown [83–85], have additionally contributed to guiding consumers in rapid assessment of nutritional characteristics of foods. Moreover, consumers interested, both in individual and environmental health, will choose foods having a sustainable label (Fair Trade, Rainforest Alliance, Animal Welfare, Carbon Footprint), although some studies [86] reported that their use is still quite low in Europe.

The analysis of opinions found in the scientific literature on the importance of sources of information in adopting a healthy and sustainable eating style has enabled to put forward the third hypothesis:

H3: *The trust in marketing sources is positively related to the criteria for healthy food choice.*

These criteria applied consistently to real purchases have led to the adoption of healthy food habits.

Precisely, consumers interested in healthy diet may limit the consumption of highly processed foods with high content of nutrients and compounds with negative impact on health (such as added sugar, saturated fats, sodium or salt). Furthermore, these consumers increase the intake of foods rich in nutrients with positive impact on health (such as proteins, vitamins, minerals, fibers, omega-3 fatty acids) in their diet [87].

Based on these criteria, informed consumers tend to consume moderately or even avoid from their diet products such as red meat and processed meat products, sweets and refined cereals, fats of animal origin [88]. Highly processed foods, even if extremely attractive from a sensory perspective, are avoided in consumption, the main reason being the high level of food additives. Moreover, these consumers are concerned with including into their diet mainly less processed foods, recommended in any healthy eating pattern, such as whole cereals and derived products, fresh vegetables and fruits, unrefined oils, eggs, fish, and lean meat [34,89].

As for consumers with special nutritional needs, in establishing a customized diet, concerns were identified for the following: consulting nutritionists, use of software applications to identify chemical composition of foods or calculate kilocalories or the covering degree of the recommended daily allowance of nutrients, use of instruments for keeping under control the daily intake of food (food diary by weighing, food diary by estimation, etc.) [20].

Therefore, the fourth hypothesis is:

H4: *The criteria for healthy food choice are positively related to the healthy food habits.*

Nowadays, food consumer behavior should be analyzed in relation with social media, as information society has brought a series of opportunities generated by reduction of spatial and temporal constraints in terms of communication, and the development of information technology created a new reality, a virtual one [90] (p. 221). The Internet has had the highest impact in this process that lately has become more and more social, determining the appearance of a new concept, that of social media. From the business perspective, social media is focused on the idea of communicating and involving specific methods through which conversation may be initiated and promoted [91]. Social media refers therefore to all activities, practices, and behaviors of human communities that meet online to exchange information, knowledge, and opinions using web applications that make possible the creation and rapid transmission of content [92,93]. As it was pointed by Kozinets [27], individuals participating in virtual communities often share in-depth insight on their lifestyles and the reasons behind the choices they make as consumers (brands, products, etc.) The knowledge exchanged can help companies develop better marketing strategies, help identify industry trends or help improve their products [94,95].

Regarding the influence of social media, the results of some previous studies have shown the decreasing tendency of consumer's trust in brand message manifested simultaneously with the tendency of consumer's trust in online content generated by other consumers [28,96]. In this context, the consumer decision to purchase and include into his daily diet specific foods could be significantly influenced by the opinions and experiences of other consumers shared in virtual media (forums, chats, blogs, socialization sites, etc.) [44,73].

However, that information could not always lead to the adoption of a healthy food behavior, because, as it was pointed out by a previous study realized in Romania, some of the Internet users, especially the young ones, have a series of bad eating habits, being big consumers of chocolate, charcuterie, carbonated soft drinks, beer, and fast-food products, and all of these in the context of sedentariness [97].

Thus, it is obvious that this informational content referring to various aspects of food behavior shared in social media could be many times the result of a subjective perception of more or less informed consumers.

This is the reason why consumers interested in healthy eating, also having a high level of nutritional education, check the accuracy of information disseminated on social media from scientifically validated sources. In this regard, these consumers access official sites of governmental institutions and world organizations involved in food issues in order to find information on the newest scientific studies on topics such as food security, food safety, impact on health of different compounds from the composition of foods, healthy eating patterns [61]. In addition, they are interested in the results of applicative studies carried out by consumer protection non-governmental organizations which publish comparative studies on quality of foods and also launch public warnings on counterfeiting of food products. Therefore, those consumers educated and interested in healthy diet will be able to create and disseminate objective content on social media, contributing to the development of healthy food habits among others [98].

Considering the importance of social media for different aspects of food consumption behavior, the last two hypotheses of the research are formulated as follows:

H5: *The trust in marketing sources is positively related to the social media usage on healthy eating.*

H6: *The social media usage on healthy eating is positively related to the healthy food habits.*

To test hypotheses H3–H6, a conceptual model was developed that suggests a series of causality relationships between the research variables (Figure 1).

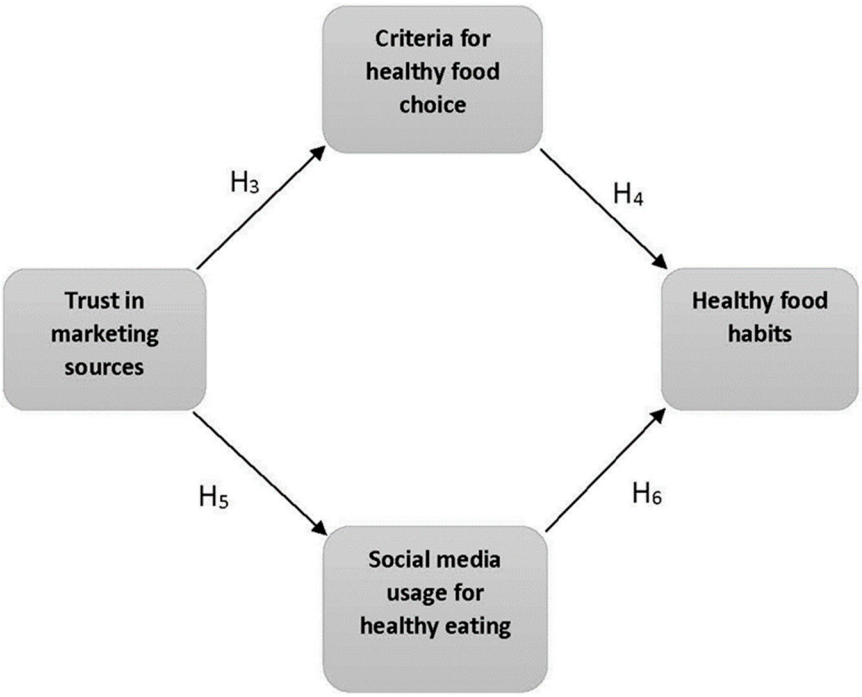

Figure 1. The conceptual model.

The model will be tested in the analysis of results section.

Based on the above mentioned aspects, it is observed that a healthy diet may contribute to social sustainability through reduced social cost of food, which is reflected in lower share of expenses required for the treatment of NCDRDs [99,100].

Besides, consumers are allocated with a large share of the responsibility for environmental sustainability, having a major role in making food chains more sustainable [101]. That is why, in the context of food, one of the most important contributions of consumers to the reducing climate change, as Austgulen et al. [102] claims, could be the transition towards a plant-based and low-meat diet, what means a flexitarian food style. Although most consumers are still not ready to make food choices based

on what is best for the climate or environment, they are expected to be more aware of this responsibility in the near future.

Moreover, healthy eating promoted the tendency to reduce waste, a positive consequence being the decrease of food waste [103]. It is worth noting that the reduction of food waste in the households is one of the sustainable diet rules. In addition, this is even more relevant when statistical data of the European Parliament show an alarming situation, the European Union generates annually 88 million tons of food waste and 173 kilograms of food waste per capita [104]. This amount of food waste per person accounts for the equivalent of around 20% of all food produced in the EU. About 50% of the above mentioned amount is household food waste, according to the estimates from the FUSION project [105].

Adoption of healthy food behavior on a large scale has as a consequence the increase of demand for natural less processed foods that may contribute to the development of a sustainable economic system as suppliers in food industry would be forced to reshape their products offered in compliance with the new demands [106].

3. Data Collection Methods

The aim of this marketing research is to study the main characteristics of food behavior and eating patterns among Romanian consumers. Data was collected through a face-to-face survey, based on a structured questionnaire. It comprises closed-ended, open-ended, and mixed questions. The scales used for defining various questions were semantic differential and Likert scale. In order to adapt to the Romanian market, the list of products included into the questionnaire was defined from authors' experience in the field of Food Science. In developing this list, it has been used as reference the Commodity Science Classification of Foods [44,55,107,108]. According to this classification (which consider criteria such as the chemical composition, the origin, the destination in consumption, the degree of technological processing, the stability), the food products can be classified into 10 main groups, as follows: cereals and derived products; vegetables, fruits, and products obtained through the processing of fruits and vegetables; sugar, glucose, honey, and confectionery; gustatory products (tea, coffee, spices, alcoholic drinks, soft drinks); fats (plant, animal, mixed); milk and dairy; eggs and egg processed products; meat and meat processed products; fish and fish processed products; concentrated foods and mixed foods.

A pilot survey on 30 persons was conducted in order to validate the questionnaire and the research methodology. The process of data collection lasted for three months, with field interviewers being employed. The number of people contacted was 2000, whereas the number of questionnaires taken into account for data analysis was 1185. The sample size was determined by taking into account a margin of sampling error of ±2.98% and a confidence level of 96%. For selecting the respondents, convenience sampling method was used which is a non-probability sampling technique [109]. The target population of the research included individuals aged over 18 years old from Romania. The sample comprised 35.7% men and 64.3% women. Out of total investigated individuals, 35.7% fell into age group between 18 and 25 years, 21.8% were 26–35 years, 19.4% were 36–45 years, 15% were 46–55 years, 5.3% were 56–65 years, and 2.7% over 65 years. Regarding the sample structure by level of education, 44.1% of respondents had high-school education, 39.2% had higher education, 13.6% had post-graduate education, and only 3.1% had secondary education. A total of 88.6% of study participants were from the traditional urban area, 8.8% from traditional rural area, and 2.6% were from the new districts of the rural area having urban facilities. To analyze the collected data, three methods were applied: factor analysis, cluster analysis, and structural equation modeling, performed by using software such as SPSS 20 (IBM) and WarpPLS 5.0 (ScriptWarp Systems, Laredo, TX, USA) [110,111].

4. Data Analysis, Results and Discussion

4.1. Factor Analysis

The factor analysis was used in order to group the food products (measured according to the frequency of consumption ranging from 1—less than one time a month to 7—more than three times a day) in factors containing the initial information. A factor "explains the correlations among a set of variables" [112] (p. 604). For the present paper, a variant of factor analysis, principal component method, was used. The first step in performing the analysis was represented by obtaining a correlation matrix between items. The matrix contains values above 0.3 that proves the appropriateness of method application [113]. The correlation between variables is also demonstrated by the large value of Bartlett's test of sphericity ($\chi 2 = 16510.7$, for 741 degrees of freedom and a significance level $p < 0.01$) and by the value of the Kaiser–Meyer–Olkin test, that is 0.908, above the minimum accepted of 0.5 [112]. After applying the factors rotation method varimax, the number of extracted factors was 3, calculated considering the eigenvalues that exceeded 1.0 and by analyzing the scree plot [112]. The eigenvalue shows "the total variance explained by each factor", whereas the factor loadings evaluate "the correlations between the variables and the factors" [109] (p. 712). In Table 1 factor loadings and communalities are displayed, the products eliminated from the analysis were those with the loadings below 0.4 [113]. Six products were eliminated: pasta, white bread, poultry meat, sunflower oil and/or other refined oil, butter, and coffee.

The first factor accounts for 18.91% of the variance of consumption frequency of the considered food products, the second factor accounts for 11.06% of the variance, whereas the last factor has a smaller contribution of 3.51%. Factor 1 was interpreted as the nutritional profile of the food consumed, factor 2 as the degree of food processing, and factor 3 as the sensory attractiveness of the food consumed.

The residuals proportion was determined in order to assess the model fit for factorial analysis. The residuals are "the differences between the observed correlations [...] and the reproduced correlations" [109] (p. 721). The proportion of nonredundant residuals with absolute values greater than 0.05 is 42%, proportion lower than the maximum accepted threshold of 50% [113].

In order to group foods underlying eating patterns development into factors containing the initial information, factor analysis method based on principal component analysis was used.

The factor 1 resulting from the analysis of food behavior of Romanians is the nutritional profile of consumed foods. Within this factor, a group of foods with unbalanced nutritional profile was identified. This category of foods includes a range of products that are highly accessible and available in supermarket chains, generally highly processed foods rich in saturated fats, sugars, and food additives, having a negative impact on health and sustainability of the Romanian food system.

Products having these features are listed in the descending order of factor loadings, foods consumed by Romanians being mentioned depending on strength of correlation with the degree of nutritional imbalance: pastry (pies, puff pastry, croissant etc.), confectionery products, sweet biscuits/or wafers, chips, salty biscuits, candy (drops or jellies, etc.), chocolate and/or chocolate candy, carbonated soft drinks with added sugar, ice-cream (in warm season), fast-food products, fries, melted cheese, pretzels, cereal for breakfast with added sugar, carbonated soft drinks "zero calories", fruit yoghurt, charcuterie and other processed meat products, margarine.

The long-term consequence of frequent consumption of products with unbalanced nutritional profile is the development of unhealthy food habits and unsustainable eating patterns among Romanians. These food choices and consumer preferences for unsustainable products have been influenced by the sensory marketing communications of many companies in the Romanian food industry. Therefore, it is not surprising that selection of products for their daily diet for many consumers is based on exclusive and repeated use of sensory characteristics, such as pleasant taste.

Table 1. Factorial loadings for rotated factors.

Product	Factor 1	Factor 2	Factor 3	Communalities
Pastries (pies, pastry, croissant, etc.)	0.790	0.037	0.108	0.637
Confectionery	0.781	0.081	0.131	0.634
Sweet biscuits and/or wafer	0.764	0.108	0.096	0.604
Chips	0.730	−0.052	0.190	0.572
Salted biscuits	0.726	0.141	0.110	0.560
Candies (drops, jellies, etc.)	0.723	0.044	0.095	0.533
Chocolate and/or chocolate candy	0.710	0.041	0.006	0.505
Carbonated soft drinks with added sugar	0.587	−0.188	0.276	0.455
Ice cream (in warm season)	0.580	0.112	−0.005	0.349
Fast food products	0.574	−0.153	0.362	0.484
Fries	0.501	−0.038	0.437	0.443
Melted cheese	0.494	0.247	0.295	0.392
Bagels	0.483	0.065	0.220	0.286
Breakfast cereals with added sugar	0.475	0.258	0.080	0.299
Carbonated soft drinks ”zero sugar”/“zero calories”	0.457	0.187	0.189	0.280
Fruit Yogurt	0.454	0.260	0.109	0.286
Charcuterie and other industrial processed meat products	0.440	−0.025	0.430	0.379
Margarine	0.413	0.116	0.375	0.325
Fresh fruits	0.004	0.678	−0.064	0.464
Fresh vegetables	−0.050	0.634	−0.021	0.405
Natural yoghurt	0.149	0.633	−0.014	0.423
Extra virgin olive oiland/or other type of cold pressed oils	−0.019	0.578	0.019	0.335
Whole cereals	0.183	0.576	−0.090	0.373
Milk and/or skimmed milk products	0.157	0.534	−0.061	0.313
Tea	0.000	0.525	−0.026	0.276
Fish	0.177	0.520	0.211	0.346
Pulses (peas, beans, lentils, soya, etc.)	0.149	0.494	0.301	0.357
Whole bread	−0.097	0.489	0.079	0.255
Milk and/or whole milk products	0.151	0.413	0.234	0.248
Wine (one glass of 150–200 mL)	0.076	0.090	0.760	0.592
Beer (one bottle/500 mL)	0.128	−0.071	0.755	0.592
Strong alcoholic beverages (50 mL)	0.165	−0.009	0.687	0.499
Red meat (pig, beef, sheep)	0.290	0.267	0.423	0.334
Eigenvalues	7.38	4.31	3.51	
Variance explained after rotation (%)	18.91	11.06	9	

The factor 2 identified in terms of products consumed by Romanians is the degree of food processing. For this factor, a group of products with low degree of processing was identified. In the descending order of factor loadings, which is the correlation between foods and the low level of industrial processing, the following products have been included into this category: fresh fruits, fresh vegetables, natural yoghurt, extra virgin olive oil and/or other cold pressed oil, whole breakfast cereals, milk and/or dairy products, tea, fish, pulses (peas, beans, lentils, soybeans, etc.), whole bread, whole milk and/or dairy products.

The products described above have a balanced nutritional profile and are consumed by Romanians with healthy food habits and sustainable food choices. These food patterns have been developed based on the use of mainly rational food selection criteria with a focus on positive nutrients mentioned on the product labels, such as proteins, vitamins, mineral substances or fibers. In other cases, the development of healthy eating patterns started from objective needs or constraining factors related to health worsening, and therefore, it is obvious the concern of a large number of individuals for the limitation or elimination of daily food imbalance through selection of products with the lowest quantity of both food additives and negative nutrients.

The factor 3 resulting from the analysis of Romanian consumers' behavior is high sensory attractiveness. Products from this segment highlight the food habits specific to Romanian gourmand consumers and are listed in descending order of factor loadings: wine (one glass of 150–200 mL), beer (one bottle/can of 500 mL), strong alcoholic beverages (50 mL), and red meat (pork, beef, mutton). Correlated with a series of specific features of the Romanian socio-cultural environment, it could be noted that these products are consumed frequently in traditional Romanian families, so Romanian food traditions favor more gourmand behavior and to a lesser degree rational food consumption.

Development of these behavior patterns are due to hedonist criteria underling product selection, some consumers being mostly interested in maximizing their personal pleasures by food consumption, without considering the recommendations of experts regarding quantity and quality of products that should be included into the daily diet.

The results of factor analysis by identification of the three factors and grouping of food products enable to accept hypothesis H1, according to which the main dimensions of grouping the food products in consumption are the fulfilment of the daily recommended intake of nutrients, the degree of technological processing, and the hedonist valences.

4.2. Cluster Analysis

Cluster analysis examines interdependent relationships in order to classify objects into relatively homogenous groups based on some variables [109] (p. 736). Cluster analysis classifies individuals into several groups that are mutually exclusive and exhaustive [114] (p. 612). The clustering procedures can be hierarchical, non-hierarchical, and others [112] (p. 634). The procedure used for the present research, K-means clustering, is a non-hierarchical method. K-means clustering produces a partition of data into a number of clusters set by the researcher [115]. In the present research, the clustering variables were the interest in a healthy diet (1—very low, 5—very high), the importance of taste and other sensory characteristics in choosing consumed foods (1—least important, 5—very important), the importance of the nutritional value of the diet (1—least important, 5—very important), the degree of blog use (regularly check out blogs and/or forums that contain topics about healthy eating, 1—totally disagree, 5—totally agree), the Body Mass Index, calculated as a ratio between weight and height squared [20] (p. 115). After applying the Ward's procedure [109], the identified number of clusters was two. As the variables had different scales to be measured, they were standardized, each variable being rescaled, as "to have a mean of zero and a standard deviation of unity" [112] (p. 634).

The identification of the two clusters is useful for the segmentation of Romanian consumers by food behavior. The first cluster comprises Romanian consumers interested in healthy food called "Interested", and the second segment is composed of Romanian consumers with a lower interest in healthy food, which were labelled "Eclectics". The values of the two clusters are relatively similar, with a slightly higher share of the first group, amounting 57.45% of the total sample compared to the percentage of 42.55% held by the second group. Certainly, in interpreting differences in the size of clusters, it is useful to bear in mind, on the one hand, the fact that there is a certain degree of social sensibility towards questions related to the sustainability of individuals' food behavior, and on the other hand there is subjective perception of population regarding healthy diet due to heterogeneity of demographic characteristics of respondents.

According to Table 2, cluster 1, the so-called "Interested" includes consumers whose behavior is characterized by high level of interest in healthy eating (mean 4.14). This interest was confirmed by another characteristic of these consumers, the importance they give to the nutritional value of the diet (mean 4.46). In other words, these consumers are interested in the nutritive value of products they select for consumption, and they could be inclined towards consuming a variety and moderate quantity of foods in order to have a balanced diet. In fact, the positive consequences of this food behavior are reflected in the normal values of Body Mass Index (mean 22.64) [66] (p. 43) for those respondents included into the first segment. The importance of taste and other sensory characteristics is high (mean 4.72), leading to the conclusion that although rational motivations generally prevail in

choosing foods, however these consumers do not neglect the sensory value of food. For instance, in the case of "Interested" consumers, the sensory characteristics of foods may be correlated to freshness and naturalness, characteristics stressed in the study of Werle, Trendel, and Ardito [116]. In addition, they could show an interest for authenticity and "terroir" if they understand the risks of food standardization and uniformity of taste [51,117]. The purchasing decision may be influenced, as reported by Grunert and Aachmann [89], also by an EU quality label on the product, such as Protected Designation of Origin (PDO), Protected Geographical Indication (PGI), or Traditional Specialty Guaranteed (TSG). Consumers' concern for healthy diet is correlated with their proneness for using social media and specialized blogs (mean 3.16) in order to search for specific information on healthy food.

Table 2. Means for the two clusters.

Clustering Variable	Cluster 1 (Mean)	Cluster 2 (Mean)
Interest in healthy diet	4.14	3.22
Importance of taste and other sensory characteristics	4.72	4.24
Importance of the nutritional value of the diet	4.46	3.27
Use of blogs	3.16	1.93
Body Mass Index	22.64	25.08

Cluster 2 comprises consumers lacking well-founded principles of healthy eating, who might set their daily diet more in terms of their immediate pleasure and desires than following a consistent food consumption pattern. Based on the results of the study, these were labelled "Eclectics", stating a moderate interest for healthy eating (mean 3.22). In assessing food selection criteria, these consumers give higher importance to taste and other sensory characteristics of products (mean 4.24), and lower importance to the nutritional value of the diet (mean 3.27). In other words, selection of food products could be influenced by emotional, subjective, and psychological factors, to the detriment of objective needs of consumption. This pattern of food choice often leads to overconsumption of nutritionally unbalanced foods, the so-called HFSS (high in fat, sugar, and salt), that may be observed in higher values of Body Mass Indexes (mean 25.08), comparing with the normal limits. Within this cluster, the research results show low usage of specialized blogs (mean 1.93). Therefore, it might be concluded that the decreased interest for healthy eating is also associated with lower level of consumers' education on the nutritive value of products.

Regarding the demographic profile of consumers, there were statistically significant differences identified between the two clusters (Table 3). The analysis by gender ($\chi 2 = 68.150$; df = 1; $p < 0.01$) shows that individuals interested in healthy eating are mainly women, representing 73.9% of consumers included in the first cluster. Within the second cluster, comprising consumers with no special concern for healthy food, the share of men (50.2%) is almost equal to that of women (49.8%).

Statistically significant differences between the two clusters were also identified by the level of education ($\chi 2 = 26.84$; df = 3; $p < 0.01$). As a general trend, a higher level of education of consumers included into the first cluster is noticed, 40.3% having university studies, and 17.2% holding a post-graduate degree compared to the level of education of consumers in the second cluster, where 37.5% graduated university and 8.6% have a post-graduate degree.

Age is another demographic variable generating statistically significant differences between the two clusters ($\chi 2 = 22.94$; df = 5; $p < 0.01$). The share of the young aged between 18 and 25 years old (38.4%) and 26–35 years old (24%) is slightly higher in the first cluster, showing a greater openness of young consumers for adopting the principles of a healthy diet, considering their higher exposure to a wider range of information and marketing sources. Although young consumers prevail in the second cluster, the share of older people is higher than in the first cluster. Therefore, it might be noticed that some traditional Romanian food habits are not consistent with the principles of healthy diet, considering that people focused on complying with national traditions are mainly mid-aged or older individuals.

Table 3. Socio-demographic structure of groups.

Socio-Demographic Variables		Cluster 1 (%)	Cluster 2 (%)	Chi Square (χ^2)	*p* Value
Age	18–25 years	38.4	33.5	22.94	$p < 0.01$
	26–35 years	24	19.4		
	36–45 years	18.4	20.2		
	46–55 years	14.5	15.6		
	56–65 years	3.4	6.7		
	over 65 years	1.2	4.6		
Gender	Male	26.1	50.2	68.150	$p < 0.01$
	Female	73.9	49.8		
Education	Elementary school	2.1	4.9	26.84	$p < 0.01$
	High school	40.3	49		
	University	40.3	37.5		
	Postgraduate studies	17.2	8.6		
Milieu	Urban classic	91.8	84.5	20.86	$p < 0.01$
	Rural classic	5.3	13.1		
	New pre-urban neighborhoods	2.8	2.3		

Other statistically significant differences between the two clusters are determined by milieu ($\chi 2 = 20.86$; df= 2; $p < 0.01$). It might be observed that most individuals from traditional rural areas (13.1%) do not exhibit a specific interest for healthy food, which confirms the earlier conclusion that the orientation towards mainly traditional Romanian food may predispose to nutritional imbalance.

The results of cluster analysis support hypothesis H2. The degree of interest towards healthy diet is an important criterion for clustering the Romanian consumers, together with the importance of taste and other sensory characteristics, the importance of the nutritional value of the diet, the use of blogs for informing on healthy diet, and the value of Body Mass Index.

4.3. Model

To evaluate the relationships among specific variables influencing sustainable food choices and healthy food habits, structural equation modeling was used. Structural equation modeling (SEM) operates with latent factors that are represented by multiple observed variables [112]. The latent factors "are unobserved variables implied by the covariance between two or more indicators" [118] (p. 3). In the present paper partial least squares structural equation modeling (PLS-SEM) approach was used. In order to perform the data analysis, the software used was Warp-PLS 5.0 [111], which offers a wide variety of functions regarding SEM [119]. For assessing the model fit, the construct reliability and validity were evaluated.

4.3.1. Construct Reliability

There were four latent variables defined that are presented in Table A1: the trust in marketing sources, criteria for healthy food choice, the social media usage for healthy eating, healthy food habits. These variables were defined by the authors, based on their experience in food science, literature review, and qualitative insights resulted from discussions with Romanian nutritionists. The composite reliability is consistent with the term of reliability in classical test theory [112], and the scores obtained in the present study exceed the threshold of 0.7 [109], proving that constructs are reliable (Table 4). This idea is also supported by the Cronbach's Alpha scores, that assess the internal reliability for each

latent variable [120]. From Table 4 results that the values for two Cronbach's Alpha coefficients are over 0.75 proving a high reliability [121] and at the same time for the other two variables the scores are between 0.5 and 0.75 showing a moderate reliability [121]. However, Hair et al. [120] sustain in PLS-SEM it is more appropriate to use composite reliability than Cronbach's Alpha, taking into account the limitations of the latter.

Table 4. Reliability and validity for the latent variables.

Variable	Cronbach's Alpha	Composite Reliability	AVE	Correlations among Latent Variables with Square Roots of AVE *			
				Sources	Criteria	Social Media	Habits
Trust in marketing sources (Sources)	**0.676**	**0.805**	0.509	(0.714)	0.172	0.258	0.151
Criteria for healthy food choice (Criteria)	0.847	0.908	0.767	0.172	(0.876)	0.250	0.265
Social media usage for healthy eating (Social media)	0.767	0.896	0.811	0.258	0.250	(0.901)	0.103
Healthy food habits (Habits)	0.661	0.798	0.500	0.151	0.265	0.103	(0.707)

* Note: The square roots of AVE are displayed in brackets on the main diagonal.

4.3.2. Construct Validity

The construct validity can be assessed by evaluating convergent and discriminant validity. The convergent validity represents the degree in which a variable correlates positively with other measures of that specific construct [120]. In order to assure the convergent validity, all factor loadings for the same variable have to exceed the level 0.5 [109]. As can be seen from Table 5, this condition was accomplished.

Table 5. Combined loadings and cross-loadings *.

	Criteria	Social Media	Habits	Sources	SE	*p* Value
Crit 1	0.825	0.001	0.053	0.040	0.027	<0.001
Crit 2	0.907	−0.010	−0.001	−0.012	0.027	<0.001
Crit 3	0.893	0.009	−0.048	−0.024	0.027	<0.001
Social 1	0.062	0.901	0.018	0.025	0.027	<0.001
Social 2	−0.062	0.901	−0.018	−0.025	0.027	<0.001
Habit 1	−0.077	0.080	0.770	0.025	0.027	<0.001
Habit 2	0.171	0.012	0.781	0.042	0.027	<0.001
Habit 3	−0.139	−0.096	0.679	−0.089	0.028	<0.001
Habit 4	0.034	−0.010	0.581	0.014	0.028	<0.001
Source 1	−0.027	0.257	−0.039	0.710	0.027	<0.001
Source 2	0.061	−0.055	0.001	0.767	0.027	<0.001
Source 3	−0.038	−0.078	0.051	0.625	0.028	<0.001
Source 4	−0.005	−0.123	−0.006	0.744	0.027	<0.001

* Note: The factor loadings for the same variable are displayed in shaded background.

Another indicator considered in evaluating the convergent validity is represented by the average variance extracted (AVE). It should be higher than 0.5, that the construct explains at least 50% of the variance of its indicators [120]. As can be seen from Table 4, the values of average variance extracted for all latent variables are 0.5 or higher.

Discriminant validity is the degree to which a construct is distinct from other constructs and it is unique [109]. One important indicator for assessing discriminant validity is Fornell–Larcker criterion [122]. From Table 4 results that this criterion is accomplished as the square root of the average variance extracted (AVE) for each latent construct, displayed on the main diagonal, is higher than any correlation with other latent constructs [120].

Considering the evaluation of convergent and discriminant validity, it results in the validity of the construct.

The model designed based on structural equation modeling proves the existence of a set of direct influences among the latent variables (Figure 2) .Therefore, it may be noticed that between the trust in marketing sources and criteria for healthy food choice there is a positive relationship of rather moderate intensity ($\beta = 0.19$, $p < 0.01$) leading the acceptance of the H3 hypothesis. In other words, trust of Romanian consumers in information on food labels, in ideas presented by various nutritionists in TV or radio shows, as well as in the content of different blogs, forums, socializing web sites, and publications determines the growth of consumer nutritional education, as well as their awareness of recent studies and tendencies in the area of nutrition and sustainable eating patterns. The acquired knowledge on nutrition helps consumers concerned with this issue to assimilate new food principles, to establish clear criteria for healthy food selection that should provide a proper intake of nutrients, and also a low content of substances with negative impact on health (salt/added sugar/saturated fats, as well as of food additives).

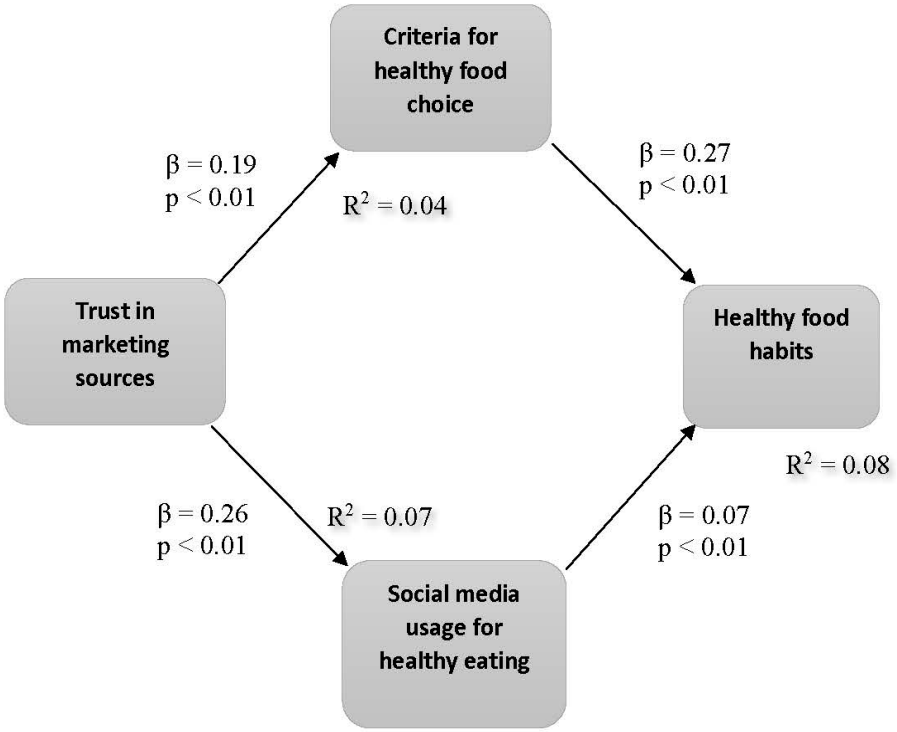

Figure 2. The resulted model.

The results of the study show that the criteria used by consumers for healthy food selection has a positive influence on the development of healthy eating habits, and the strength of the relationship between these variables is rather moderate ($\beta = 0.27$, $p < 0.01$) which enables acceptance of hypothesis H4. Therefore, the concern of certain consumers for reducing consumption of industrialized and highly caloric food, together with their orientation towards less processed foods, positively influence the adoption of responsible food behavior and the development of healthy food habits, such as having three meals a day, daily consumption of a variety of foods covering the recommended daily intakes of nutrients, and daily drinking of at least 1.5 liters of water.

The study also identified a positive relationship between the trust in marketing sources and the social media usage for healthy eating, leading to the acceptance of hypothesis H5. The strength of relationship between the two variables is quite moderate ($\beta = 0.26$, $p < 0.01$), being placed in the second position in terms of intensity between the variables included into the model. Consequently, trust of Romanian consumers in marketing sources determines them to regularly consult blogs and/or forums containing news related to healthy diet, being accustomed to comment on articles about food on specific social media in order to share their experience and influence the opinions of other consumers. Therefore, it could be noticed that among consumers oriented towards healthy eating, there is a high level of involvement in developing their own knowledge on nutrition, and in influencing the decision-making processes of other consumers.

Finally, the model shows the existence of a positive relationship between the social media usage for healthy eating and healthy food habits. Although the strength of relationship is lower in this case ($\beta = 0.07$, $p < 0.01$), hypothesis H6 was accepted. In conclusion, the interaction and exchange of opinions among consumers on blogs and forums discussing healthy food principles and rules influence the individuals' behavior for developing desirable food habits, and in the long-term, a healthy and sustainable diet.

5. Conclusions and Managerial Implications

5.1. Theoretical Implications

In terms of consumption habits, foods consumed by Romanians have been grouped by three dimensions: nutritional profile, degree of processing, and sensory attractiveness. The nutritional profile mostly contributes to explaining variance of food frequency consumption. According to this criterion, it might be noted foods with unbalanced nutritional profile, rich in saturated fats, sugar and food additives, which are intensely promoted by suppliers, and are largely available.

Thus, it is evident among Romanian consumers the tendency to borrow unhealthy eating habits from the highly industrialized societies, especially that of the over consumption of unbalanced food products, the so-called HFSS (high in fat, sugar and salt) [6,8,36].

Degree of processing holds the second position in explaining variance of food frequency consumption of Romanian consumers for products included into the analysis. This dimension contributes to the identification of a group of products with low degree of processing, leading to the development of healthy food consumption patterns. This finding is in line with the recent occurrence of the tendency of some segments of consumers worldwide to orient towards healthy and sustainable food options.

Sensory attractiveness of foods has less weight in explaining variance of food frequency consumption but consumption of foods with high sensory attractiveness is explained by features of Romanian socio-cultural environment. These features led to the development of hedonistic food habits for certain consumers, who pay more attention to sensory characteristics of food to the detriment of its benefits for health.

Romanian consumers may be divided into two groups: interested and eclectic consumers. The results of the cluster analysis show that Romanian interested consumers are concerned with healthy food, pay attention to high intake of nutrients in food choice, use social media for research, and have lower Body Mass Index. These results are in line with those of Heerman et al. [29] and Vartanian, Herman and Polivy [65]. For these consumers, it is also observed the importance paid to taste and sensory characteristics of foods that could be associated with the presence of natural ingredients in the composition of products and use of organic farming products.

The eclectic consumers pay high importance to taste and other organoleptic features, and less importance to nutritive value, are not concerned with healthy food and have a higher Body Mass Index. The existence of a segment of consumers whose primary interest mainly concerns the sensory

characteristics, with decisive impact on appetite, that inevitably leads to unbalanced diets is a fact emphasized also by the previous study of Bobe, Procopie, and Bucur [13].

Segmentation of Romanian consumers into two categories may lead to the conclusion that food consumption decisions of individuals are influenced by several factors, whether of rational or emotional nature. Influence of psychological factors may be noticed just by the simple fact that Romanians avoid declaring that they are not interested in a healthy diet, even when their actual consumption behavior indicates a specific propensity towards highly sensory foods as shown in the description of the second cluster.

The model developed in this study underlines that the trust in marketing sources influences the usage of specific criteria in healthy food selection. Therefore, buyers trusting more information written on the product labels or presented through different communication channels (TV, mass media, Internet) become more knowledgeable about food consumption and use criteria for healthy food selection to a higher degree.

Using criteria for healthy food selection has a rather moderate influence on the development of healthy food consumption. Therefore, consumers selecting products depending on specific criteria focused on products with a high intake of nutrients and low amount of substances with negative impact on health are more willing to adopt healthy food habits related to having main daily meals, eating daily foods covering the need for nutrients or drinking daily a specific quantity of water.

Recent studies have shown that health is a growing concern for consumers, especially if the incidence of chronic diseases in the population of the globe is considered. According to World Health Organization (WHO) [123], the NCDRDs kill annually about 41 million people, that is more than 71% of all deaths worldwide. These figures lead many consumers to adopt healthier diets, which contributes to increasing social sustainability by reducing the expenditures needed to treat these chronic diseases, fact emphasized by the research of Dee et al. [99]. Of course, in this way consumers also show an increasing interest for the sustainability of the environment, contributing both to the decrease of the effect of the climatic changes generated by the pressure exerted by the food production on the environment as Poli [10] and Grunert [101] reveal, and the decrease of the amount of household waste as the findings of FUSION project [105] and is stressed in the study of Aktas et al. [103].

The model also highlights that the trust in marketing sources influences the level of social media usage for getting information or sharing experiences. Thus, it is obvious that Romanian consumers have understood the advantages brought by the information society, especially the fact that virtual reality has opened up for them new possibilities of communication and information, faster than the classical ones, as was pointed out by Kozinets [27].

Using social media for getting informed about healthy food influences the adoption of healthy food habits, although the intensity of influence is weak. However, it is assumed that information on healthy and sustainable diet principles disseminated on social media may over time contribute to the adoption of sustainable food habits, the spreading of which shapes balanced and responsible food behavior. As Tarabella and Voinea [106] advocate, this behavior will be reflected in a higher demand for less processed products with a balanced nutritional profile that will exert pressure on the food market for supply adaptation to new requirements. This way, the vicious circle of imbalanced food behavior may be transformed into a really virtuous circle of sustainable behavior.

5.2. Practical Implications

Socially, the study results stress out the need for consistent campaigns aimed at educating Romanian consumers to develop healthy eating habits and make sustainable food choices. As it was claimed that the concept of sustainable diet represents an opportunity for the elimination of poverty, food insecurity, and poor health outcomes [17], a wise initiative in this demarche would be to incorporate sustainability in the Romanian Dietary Guidelines. Messages such as ”Eat more vegetables, fruits, nuts and seeds”, ”Switch to wholegrain, vegetable oils, low-fat dairy products, lean proteins”,

"Eat less red and processed meat, saturated fats, salt and sugar", "Drink less alcohol" or "Be active, do more exercise" must be promoted to the general public through all channels, inclusive social media.

The results of the study show the usefulness of an extensive promotion of nutrition courses which make consumers become more objective in evaluating their own food behavior, and in analyzing foods that they consider as being healthy. Consumers with special nutrition needs (e.g., overweight) can use the services of nutritionists that could recommend a proper type of diet. To monitor the diet, one can use software applications, such as food diaries allowing the calculation of the daily intake of calories and nutrients, as well as their covering degree.

Additionally, the inclusion in education curricula at all levels with more topics aimed at acquiring knowledge and skills in the field of healthy and sustainable eating could make an important contribution in consumer education. Having now a deeper knowledge of the particularities of the food behavior of Romanians, the curriculum of the academic disciplines (Foodstuff and Consumer's Security, Food Science, Food Quality and Safety) can be updated with theory and case studies aiming at a better understanding by the students of all aspects related to a healthy and sustainable diet.

In addition, Non-Governmental Organizations (NGOs) working in the area of consumer protection and education, could get involved more in the process of regulation of food manufacturing and processing.

In terms of economic impact, the results of the study converge towards the need for significant reshaping of industrial food supply which could provide a nutritional balance in the daily diet of consumers, an idea supported by [50,70,71]. In the European Union, there have been a series of initiatives aimed at improving the nutritional profile of foods by lowering the content of added sugar and trans fats [124,125]. Along the same line a set of tax regulations could be placed, supporting the extension of production and consumption of bio foods (such as reduction of VAT up to 5%). In addition, there have been measures for avoiding double standard in food processing adopted in the European Union. These positive initiatives should be also extended to other areas of industrial food processing targeting products with high nutritional value. An example in this regard could be the adoption of regulations aimed at decreasing the content of food additives.

The process of supply reshaping will also have a strong impact on sustainability of the environment as stated by Pamfilie et al. [126], mainly through the reduction of the content of synthesis chemicals added in foods, most of them originating from polluting industries. Lastly, reshaping of supply will be translated also in using a wide scale of packaging from biodegradable materials resulting in waste decrease [127]. The same positive impact on environmental sustainability also includes the reduction of the household food waste.

In terms of macro-marketing policies, there is a need for increasing the availability of healthy and less processed food products provided by Romanian farmers. In order to achieve a greater share in large retailers' offering, currently dominated by import products, the Ministry of Agriculture and the Ministry of European Funds from Romania should design and implement complex programs. These measures are aimed at supporting the development of Romanian farmers' production through investment in modern agricultural technologies, through education for a better financial budget planning, and for increasing producers' negotiation skills within the supply chain. At microeconomic level, the marketing policy should include a sustainable dimension, especially in designing healthy products, which may have an impact on corporate image and customer loyalty.

The research limitations concern the low number of variables included in the tested model, which reduced its explanatory power. Future studies may consider other variables influencing healthy food behavior, such as personality traits, income, contextual factors, and marital status. Additionally, because most of the studies have been focused on the "healthy" dimension of sustainable diets, considering it the most important, future research must consider broader dimensions, such as social, cultural, or economic dimensions.

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Appendix A

Table A1. Latent variable operational descriptions.

Latent Variable	Item	Measurement Scale	Adapted From
Trust in marketing sources (Sources)	Source 1: Information on food labels	1—Very low 2—Low 3—Medium 4—High 5—Very high	[128,129]
	Source 2: Specialized TV or radio shows		
	Source 3: Internet (sites, blogs, forums, socializing web sites)		
	Source 4: Various publications		
Criteria for healthy food choice (Criteria)	Crit 1: Intake of nutrients	1—Very unimportant 2—Unimportant 3—Medium importance 4—Important 5—Very important	[130,131]
	Crit 2: Low content of substances with negative impact on health (salt/added sugar/saturated fats)		
	Crit 3: Low content of food additives		
Social media usage for healthy eating (Social media)	Social 1: I regularly read blogs and/or forums dealing with healthy food	1—Totally disagree 2—Disagree 3—Neutral 4—Agree 5—Totally agree	[132,133]
	Social 2: I have a habit of commenting on articles about food on blogs and/or forums		
Healthy food habits (Habits)	Habit 1: I have three main meals a day	1—Very rarely 2—Rarely 3—Neither rarely, nor often 4—Often 5—Very often	[129,134,135]
	Habit 2: I have at least one warm meal a day		
	Habit 3: I eat daily a variety of foods to cover my recommended daily intake of nutrients		
	Habit 4: I drink on average 1.5 liters of water a day		

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