

Article

# Nutrient Profiling of Romanian Traditional Dishes—Prerequisite for Supporting the Flexitarian Eating Style

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**Abstract:** Currently, most countries have to deal with multiple discrepancies that have arisen between the constraints of sustainable development and the return to traditions, involving food producers, as well as consumers, aspects that are also easily noticed in Romania. Thus, the main purpose of this study was to assess the nutritional quality of the Romanian traditional diet using a nutrient profiling method based on the Nutri-Score algorithm, applied to several representative Romanian traditional dishes. Because this algorithm has the capacity to highlight the amount (%) of fruits, vegetables, and nuts from a certain dish, it might be considered an indicator of the sustainable valences of the selected meals. The results showed that the traditional menus do not correspond to a balanced and sustainable eating behavior; thus, it is recommended to improve the Romanian pattern of food consumption and to ensure its sustainable basis. In order to achieve this goal, we propose the development of a new paradigm of the contemporary Romanian food style incorporating three main directions of action: acceptance, adaptation, and transformation.

**Keywords:** meat consumption habits; meat-based traditional dishes; Romania; nutrient profiling; Nutri-Score algorithm; flexitarianism; sustainability

## 1. Introduction

On the background of abundance and excessive consumption of industrial ultra-processed foods, specific to our contemporary consumer society, which has generated serious economic, environmental, and public health issues, sustainability has become a recurring theme of food system rhetoric and a challenge for food producers, as well as consumers.

If recycling, favoring locally sourced foods, and reducing food waste are already common practices among consumers, especially in developed countries, the ideas expressed in recent studies led to the conclusion that one of the most important consumer contributions could be the transition toward a plant-based and low-meat diet [1]. This demarche represents the core principle of the flexitarian style, which is considered a fundamental aspect of a sustainable diet.

Particularly when meat consumption is deeply rooted in a local food culture, being seen as a traditional habit and associated with the pleasure of taste, as is the case in Romanian culture [2], consumers tend to be more reluctant to make the switch to a plant-based diet [3].

This paper, with a main focus on the sustainability valences of the Romanian traditional diet, analyzes the nutritional profile of certain traditional Romanian menus, highlighting the relationship between meat and plant origin ingredients used to prepare them.

Since the ancient times, meat has been a part of human diets. At first, meat was obtained through both hunting and scavenging of animals killed by other species. The complex archaeological studies of

some bones from prehistoric animals revealed that the first hominids until Neanderthals were hunters, as well as necrophages, because traces of people's cuts appeared over the tooth traces of carnivorous animals [4].

Afterward, humans began to hunt in groups, which was a more efficient means of acquiring meat. Another pattern of meat consumption before the modern era can be associated with the shift from hunting and gathering to farming and animal husbandry. Thus, with the emergence of complex, stratified, and sedentary societies, who were practicing agriculture and animal husbandry, people adopted an omnivorous diet, which involved, alongside meat, the consumption of a wide variety of other foods of animal origin, as well as foods of plant origin [5,6].

Currently, the omnivorous diet is specific to the vast majority of the population living in developing and developed countries. The big problem with this diet is the overconsumption of highly processed foods, especially red meat, which has a negative impact on the environment and consumers' health [7,8].

It is widely accepted that food of animal origin has a greater impact on the environment than food of plant origin, as it emits higher amounts of greenhouse gases (GHGs), requires more soil and nitrogen, and affects terrestrial and aquatic biodiversity. From an environmental perspective, meat is considered the most harmful form of food consumption of all foods of animal origin [9,10]. Moreover, it has been proven that meat from ruminants (cattle and sheep) has a considerably higher environmental impact than eggs, fish, seafood, and even poultry and pork [11,12].

In addition, meat, alongside energy-dense foods (high in fat and sugar, but low in essential nutrients, such as vitamins and mineral substances), is an important factor in the proliferation of noncommunicable diet-related diseases (NCDs), such as type 2 diabetes, coronary diseases, obesity, and cancer [13–15]. Overconsumption of meat particularly affects the hormonal, immunity, and digestive systems, mainly because meat produced on a large scale, in industrial conditions, has, in most cases, hormones and antibiotics [16].

This is the reason why, for decades, experts have warned of the need to develop new strategies to meet the current needs of the population, without affecting the wellbeing of future generations [17,18]. In this context, switching to sustainable diets has become a priority, although this is not an easy task to accomplish.

In this global picture, consumer attitudes toward meat seem to go in two directions: consumers who are resistant to giving up meat and who continue consuming it for hedonistic and cultural reasons and consumers who, aware of the meat paradox [19] and concerned about their own health and environmental sustainability, are willing to reduce their meat consumption or even give it up. In the latter category, there are also those with an extreme attitude who have given up meat and other products of animal origin, adopting veganism as eating style [20].

Although it tends to be fashionable, veganism is not a viable option, primarily because it deprives the body of certain essential nutrients (such as proteins, vitamins B12, iron, zinc), which are difficult to obtain in adequate levels from vegetal origin foods [21–23].

In this regard, researchers are criticizing this new attitude of doing away with meat and other animal origin products completely, advocating flexitarianism as the right choice from a health and environmental point of view [24].

The flexitarian style (derived from the combination of "flexible" and "vegetarian") means a less strict eating style compared to the vegetarian one, because it allows the occasional consumption of meat (including red meat). The flexitarian diet means to consume plenty of whole cereals and derived products, vegetables, and fruits, limited amounts of eggs, dairy products, and fish, and occasionally small amounts of red meat or poultry. However, the opinions expressed in the scientific literature do not show a consensus on the ideal frequency with which meat should be eaten. The flexitarian style recognizes meat as an important source of protein, fat, and micronutrients, while also taking into account ethical issues such as the need to reduce environmental impact and ensure animal welfare [25].

Because, in the first decade of the 21st century, the term flexitarian reached a considerable increase in use, both in scientific works and in public speech, in 2014, it was accepted as a new term and included in the Oxford Dictionary [26].

Scholars opinions converge on the idea that flexitarianism is the most appropriate choice, from a point of view of both consumers' health and environmental protection. In terms of potential health benefits, most evidence is related to weight loss and reducing the risk of type 2 diabetes and high blood pressure. At the same time, meat production is the best way of using the land, because agriculture dedicated exclusively to crop plants cannot ensure the optimal exploitation of natural resources [27,28]. Therefore, meat can be part of a sustainable world if it is consumed sparingly and produced in a sustainable manner [1].

The main purpose of the research conducted was to assess the nutritional quality and sustainability valences of the Romanian traditional diet. To do this, a nutrient profiling method based on the Nutri-Score algorithm was applied in the case of certain representative Romanian traditional dishes, which can help to formulate appropriate recommendations for improving the composition of traditional meals.

This paper is divided into five sections. Section 2 outlines the place of meat in Romanian food culture. Section 3 presents the data collection methods. Section 4 comprises the results and discussion, and Section 5 is dedicated to the conclusions.

## 2. The Place of Meat in Romanian Food Culture

Romanian cuisine can be metaphorically compared to a kaleidoscope made up of countless fragments, representing elements of originality and loans taken throughout history from different cultures (Dacians, Celts, Greeks, Romans, Byzantines, Slavs, Ottomans, Germans, Austrians, Hungarians, French, etc.). Many of these foods and dishes originating from other cultures were adapted, most often in a very creative way, and they have become over time local symbols of traditional Romanian cuisine.

The relief and the climate of Romania have contributed to the variety of cuisine since ancient times [29]. Regarding meat consumption, preferences have evolved over time. In the time of the Geto-Dacians, beef and sheep were preponderantly consumed. Subsequently, Romanians turned to pork (consumed mainly in cold periods) and poultry (consumed mainly during the summer). Hunting and fishing were a valuable source of protein. Sheep and goat meat were also consumed, but in significantly smaller quantities than pork, because their byproducts (wool or milk) were considered more important in the peasant household. In terms of the preparation method, in antiquity, boiling or baking predominated, while grilling became a common practice only in the Medieval period [30].

After crystallization of the constituent elements of the kitchen as a specialized activity, culinary differences begin to manifest, such that, regarding the gastronomic culture of Romania, one can also speak in terms of regional specificity. Generally, dishes composed of meat accompanied by different vegetables predominate in all historical regions, with slight differences in the preferred type of meat. While, in Muntenia and Oltenia, the dishes based on meat preponderantly include beef, in Transylvania and Banat, pork meat is favored. In Moldavia, poultry-based dishes are highly regarded. Lamb and sheep meat are more consumed in Dobrogea, and cuisine from the south of the country is characterized by fish-based dishes [31–34].

Regarding the composition of meals, previous research has shown an evident preference of Romanian consumers for traditional products and dishes based on animal origin ingredients, which are found to be much more widely used in the daily diet compared to those of vegetable origin. Furthermore, the preference for the consumption of meat and meat-based products at all three main meals of the day should be noted, a habit that is in obvious contradiction with the principles of healthy eating [31–33]. For example, at breakfast, meat-based products such as ham, sausages, smoked lard, and deli ham are consumed alongside eggs (fried, boiled, or omelet), fresh or fermented cheeses, butter, sour cream,

sour milk, carp roe caviar, fish (smoked, marinated or salted), or fresh vegetables (in particular, tomatoes, onions, peppers, cucumbers) [34]. A Romanian traditional lunch includes meat-based entrées, such as aspic meat, sausages, deli ham, etc., followed by a soup or a broth, usually with meat and vegetables. The main course can include a variety of dishes, in which meat is the main ingredient, such as force-meat rolls in cabbage leaves, meatballs, peppers stuffed with minced meat and rice, stew (meat and pork organs roasted in lard), meat and vegetable stew, and steaks with a garnish of sautéed vegetables, French fries, rice, or pulses [34,35]. Dishes which include meat and fish, such as poultry steak with garnish (potatoes, rice, or vegetables), grilled minced meat rolls, and fish-based dishes are usually eaten at dinner.

As for festive meals, Radu Anton Roman (2009) [36] showed that the Christmas meal starts with various pork meat-based entrées, which can be meat loaf, blood pudding, pork jelly, smoked lard, or deli ham. The entrées are followed by force-meat rolls in cabbage leaves with polenta and sour cream. Sometimes, a pork meat broth can be consumed between the entrées and the force-meat rolls. The main dish is composed of roast pork with vegetable garnish and pickles. As the Easter meal, the entrées and the main course are based on lamb meat: “drob”, lamb soup, lamb steak, and lamb stew [37,38].

Looking at the composition of traditional meals, it can be clearly seen that the traditional pattern of food consumption in Romania is characterized by a high consumption of meat and fat. Meat appears to be deeply embedded in Romanian food culture, as it has always been the main ingredient in most traditional food products and dishes [2,39]. As long as research continues to highlight that meat is the most environmentally harmful form of food consumption, having substantial effects on people’s health [13,15,40], it is quite obvious that the Romanian cultural pattern of food consumption does not meet the principles of sustainability.

### 3. Data Collection Methods

In this study, a nutrient profiling method based on the Nutri-Score algorithm was applied for assessing the nutritional quality of a few Romanian traditional dishes. The reason for choosing the Nutri-Score algorithm lies in its capacity to highlight, along with a synthetic expression of nutritional quality, the amount (%) of fruits, vegetables, and nuts which might be considered an indicator of the sustainable valences of the selected dishes, although the evidence found in the literature does not absolutely advocate this claim. On one hand, Dettling et al. [41] provided evidence that meatless options are, on average, less environmentally impacting than meat-containing options, pointing out that the main driver for environmental impacts takes place in the production of raw materials. One of the main findings of this study was that feeding animals with plant matter to later consume the animals requires a larger amount of plant matter production than direct consumption of the plant. Moreover, the study of Hallström et al. [42] suggested that dietary change toward a low-meat diet could play an important role in reaching environmental goals, with up to a 50% potential to reduce greenhouse gas emissions (GHGEs) and land-use demand associated with the current diet. On the other hand, the study of Vieux et al. [43] showed that replacing meat (especially processed meat) with plant-based sources may be desirable for health but is not necessarily the best solution to reduce the environmental impact of the diet (especially in terms of decreasing diet-associated GHGEs).

However, as the focus of our study was to assess the nutritional quality of Romanian traditional diet, the Nutri-Score algorithm was used with the main purpose of carrying out the nutrient profiling of several representative Romanian traditional dishes.

The Nutri-Score algorithm, derived from the United Kingdom Food Standards Agency nutrient profiling system (FSA score) [44,45], was created by the French Public Health Agency in 2013. It has been selected by several countries (France, Belgium, Spain) as a voluntary front-of-package (FOP) labeling system, because it is considered by consumers comparatively more efficient than other systems available in the world, such as the Modified Reference Intake (MRI), Multiple Traffic Light (MTL), or The Simplified Nutrition Labelling System (SNLS) [46–48]. The Nutri-Score indicates the overall

nutritional quality of a given food product, through a color-coded scale from green to red (green indicating the highest nutritional quality and red indicating the lowest nutritional quality), with each color having a corresponding letter from A (dark green) to E (dark orange), meant to increase the label's readability [49,50].

In fact, on the basis of a scientific calculation algorithm, any food product can be awarded a score (the Nutri-Score) synthetically expressing its nutritional quality, which can be further converted into a simple code consisting of five letters, each written using its own color.

The calculation formula for the score takes into account the nutrient content per 100 g/100 mL. Points *N*, from 0 to 10, are allocated for each amount of the following compounds with a negative impact: energy (kJ), simple sugars (g), saturated fatty acids (g), and sodium (mg). Points *P*, from 0 to 5, are allocated for each amount of the following elements with a positive impact: fruits, vegetables, and nuts (%), fiber (g), and proteins (g) These points are assigned on the basis of the reference intake for each nutrient (Table 1) [51].

**Table 1.** Calculation algorithm for the final score [52].

Points	Compounds with a Negative Impact				Compounds with a Positive Impact		
	Energy (kJ/100 g)	Saturated Fats (g/100 g)	Sugars (g/100 g)	Sodium (g/100 g)	Fruits, Vegetables and Nuts (g/100 g)	Fiber (g/100 g)	Proteins (g/100 g)
0	<335	<1	<4.5	<90	<40	<0.9	<1.6
1	>335	>1	>4.5	>90	>40	>0.9	>1.6
2	>670	>2	>9	>180	>60	>1.9	>3.2
3	>1005	>3	>13.5	>270	-	>2.8	>4.8
4	>1340	>4	>18	>360	-	>3.7	>6.4
5	>1675	>5	>22.5	>450	80	>4.7	>8
6	>2010	>6	>27	>540	-	-	-
7	>2345	>7	>31	>630	-	-	-
8	>2860	>8	>36	>720	-	-	-
9	>3015	>9	>40	>810	-	-	-
10	>3350	>10	>45	>900	-	-	-

To generate the overall score, from the total of “negative” points (a maximum of 40 points *N*) is subtracted the total of “positive” points (a maximum of 15 points *P*), with the calculation formula being final score = total *N* points – total *P* points [51]. From this global score, which can range from –15 for the healthiest foods to +40 for the least healthy foods, five categories of nutritional quality can be derived, defining the categories for the Nutri-Score ranging from “A, dark green” to “E, dark orange” (Table 2) [52–54].

**Table 2.** Nutritional quality class according final score [51].

Final Score for Solid Food	Final Score for Beverages	Nutritional Quality
–15 to –1	Water	
0 to 2	1	
3 to 10	2 to 5	
11 to 18	6 to 9	
19 to 40	10 to 40	

With the support of Excel, the method based on the Nutri-Score algorithm was applied in the case of some of the most popular Romanian traditional dishes, included in a breakfast, lunch, and dinner menu, as resulting from prior research [55], to assess their nutritional balance and sustainability valences.

#### 4. Data Analysis, Results, and Discussion

Before applying the nutrient profiling method based on the Nutri-Score algorithm, three menus were configured, corresponding to the main meals of the day, breakfast, lunch, and dinner. The three menus were set up including products and dishes highlighted by previous research [55] as the favorites of Romanian traditional food consumers for the three main meals of the day.

The breakfast menu was represented by a so-called “Romanian cold platter”, which included carp roe caviar, bacon, cheese, tomato, young green onion, and bread. The lunch menu consisted of dish 1 (pork soup with vegetables and sour cream), dish 2 (pork stew with fried egg, cheese, and polenta), and dessert (cheese dumplings with sour cream and blueberry jam). The dinner menu included pork meatballs with mashed potatoes and cabbage salad. The recipes used for the three menus were taken from the book of a famous Romanian author, Sanda Marin [56].

As can be seen from Tables A1–A6 (Appendix A), the Nutri-Score was calculated for 100 g of each dish included in the three menus on the basis of the following chemical composition data: energy (kJ), simple sugars (g), saturated fatty acids (g), sodium (mg), fiber (g), proteins (g), and fruits, vegetables, and nuts (%). In this regard, the following steps were taken:

- Adjusting the quantities of the ingredients in each preparation included in the menus to reflect a portion of consumption (in the recipe, the quantities were indicated for 6–8 portions of consumption);
- Identification of the chemical composition of each ingredient in the United States Department for Agriculture (USDA) online database (available through the following link: <https://fdc.nal.usda.gov/>);
- Total calculation for each of the compounds with negative impact and those with a positive impact for the whole portion of consumption and for 100 g of portion;
- Awarding points for compounds with a negative impact and for those with a positive impact for 100 g of portion, according to the algorithm of the method;
- Calculation of the overall score, by taking the difference between the total of “negative” points (*N*) and the total of “positive” points (*P*).

The table below (Table 3) presents the synthesis of the results obtained from an evaluation of the nutritional quality of the dishes included in the three menus analyzed on the basis of the Nutri-Score algorithm.

As indicated by the data in the table above, on a scale of nutritional quality from very high (corresponding to letter A in the algorithm) to very low (corresponding to letter E in the algorithm), the vast majority of dishes analyzed were located in the middle, having an average nutritional quality (corresponding to letter C in the algorithm). An exception was the cabbage salad from the dinner menu, whose nutritional quality was very high, corresponding to letter A.

In order to assess the sustainability of the dishes included in the three menus, the share of the animal origin ingredients compared to that of the vegetable origin ingredients was analyzed. According to the table above, it is obvious that cabbage salad, where the share of vegetables is 85.84%, was the most sustainable dish. Of the preparations that entered the composition of the menus, the most unsustainable was “stew”, because, with the exception of polenta which is of vegetable origin, the rest of the ingredients contained were of animal origin. In Table A3 (Appendix A), it can be observed that this dish does not contain vegetables at all, having as main ingredients meat and pork organs, and the portion size of consumption, which reflects a traditional Romanian consumption habit, is quite large. None of the other dishes could be considered sustainable either, since vegetables made up less than one-third of the total ingredients (32.69% in the case of meatballs with mashed potatoes, 29.63% in the case of the breakfast plate, and 17.76% in the case of pork soup).

**Table 3.** Summary results of the Nutri-Score calculation.

Menus	Dishes	Elements for Nutri-Score Calculation	Total Points	Chemical Composition						
				Energy (KJ)	Sugars (g)	AGS (g)	Sodium (mg)	Proteins (g)	Fibers (g)	Fruits and Veg (%)
Breakfast	Breakfast plate	Value per 100 g		835.4	2.44	6.14	801.9	14	1.207	29.63
		Points <i>N</i>	14	2	0	4	8			
		Points <i>P</i>	6					5	1	0
		Nutri-Score		(14 – 6 = 8) C						
	Pork soup	Value per 100 g		503.5	0.8	4.38	10.55	2.3	0.41	17.76
		Points <i>N</i>	5	1	0	4	0			
		Points <i>P</i>	1					1	0	0
		Nutri-Score		(5 – 1 = 4) C						
Lunch	Stew	Value per 100 g	0.00	637.27	0.38	5.06	250.17	9.58	0.28	0.00
		Points <i>N</i>	8	1	0	5	2	0	0	0
		Points <i>P</i>	5	0	0	0	0	5	0	0
		Nutri-Score		(8 – 5 = 3) C						
	Cheese dumplings	Value per 100 g		1397	19	4.33	181.1	5.7	1.714	9.93
		Points <i>N</i>	14	4	4	4	2			
		Points <i>P</i>	6					5	1	0
		Nutri-Score		(14 – 6 = 8) C						
Dinner	Meatballs	Value per 100 g		1540	1.4	9.12	424.3	5.5	1.093	32.69
		Points <i>N</i>	12	4	0	4	4			
		Points <i>P</i>	6					5	1	0
		Nutri-Score		(14 – 6 = 8) C						
	Salad	Value per 100 g		190.1	3.3	0.31	590.8	1.7	2.718	85.84
		Points <i>N</i>	10	0	0	4	6			
		Points <i>P</i>	12					5	2	5
		Nutri-Score		(10 – 12 = –2) A						

In conclusion, it can be stated that the traditional menus analyzed do not reflect balanced and sustainable eating behavior, which is an additional argument for the need to reshape the Romanian traditional pattern of food consumption.

A solution which is consistent with the flexitarian approach to the diet could be to replace one-third of the amount of meat from each meat-based dish with a vegetal origin ingredient [28]. This could solve the issue of the high level of meat; however, that of the oversized servings still remains. Therefore, simply eliminating at least one-third of the amount of meat from the meat-based dishes appears to be the most appropriate solution to cope with the issues highlighted by the analyzed traditional meals.

In addition to these direct methods of reshaping the traditional eating habits, literature suggests other sustainable alternative solutions. On the basis of this new attitude of rejecting meat, a new trend of industrial meat alternatives has emerged, such as plant-based meat substitutes or lab-grown meat/cultured meat [57]. Although the meat substitutes mimic the texture, flavor, and umami shades of real meat, numerous issues can be identified. For example, the plant-based meat substitutes developed lately, made from mixtures of vegetal origin isolated proteins (such as pea, rice, bean, or soy) and having an animal-like texture, cannot be the best alternative for meat from a nutritional point of view, as they are ultra-processed, incorporating many artificial ingredients [58]. Lab-grown meat (cultured meat), obtained from stem cells taken from animals and placed in a growing medium in a bioreactor, which is promoted as being better for the environment and animal welfare [59], is still very expensive. It is expected to be available on the market in the near future.

Beyond these industrial meat substitutes, a nutritionally valuable and sustainable alternative offered by nature is represented by edible insects. Research to date [60–64] describes edible insects as a

highly nutritious source of food for the future, as, e.g., they represent an excellent source of highly digestible proteins (the average content ranges from about 35% to over 60%) and an important source of fibers, they provide a small amount of total fats and sodium, and they provide high amounts of vitamins (vitamin B2, vitamin B5, vitamin B7, and vitamin B9) and mineral substances (iron, magnesium, zinc, phosphorous, selenium, and copper). Edible insects are equally a sustainable source of food, a fact supported by numerous advantages of their breeding, which prove their little environmental impact. One of the main advantages is that insect breeding costs and pollutes less than traditional breeding, as it needs a very small space and requires fewer resources (water, feed, etc.). Unlike cattle, insects do not produce gases causing global warming. Additionally, many edible insects can consume agricultural waste or plants that humans and farm animals cannot [65].

However, despite all their advantages, similar to meat substitutes, there is the issue of food safety that can arise in connection with edible insects. For example, toxic, allergenic, or antinutrient substances could be incorporated into the insects [66]. Moreover, the aflatoxin contamination of edible insects can cause botulism, parasitosis, or food poisoning [61]. It was also reported that insects harvested in the wild could contain pesticides if they feed in pesticide-treated areas [67].

## 5. Conclusions

The nutrient profiling method based on the Nutri-Score algorithm was applied to certain representative Romanian traditional dishes, in order to assess their nutritional quality and sustainability valences. The results highlight that the analyzed menus do not represent good options for a balanced and sustainable eating style.

This research proposes the development of a new paradigm of the contemporary Romanian food style on the basis of three main pillars or directions of action: acceptance, adaptation, and transformation.

Acceptance refers to the awareness of the Romanian consumers regarding changes occurring in the world's economic system in the last decades, characterized today by globalism (economic, technological, informational) and increasingly fast cultural interference, which have led to a pronounced uniformity, on a planetary scale, of eating habits, not always being of the healthiest ones.

Adaptation involves a large effort, in terms of knowledge and will, on the part of consumers to cope with the new economic realities and challenges of a food nature, related to the production and distribution of agri-food resources, including unconventional ones (genetic modification of raw materials), high industrial food processing, and persuasive sales techniques, while also considering the online environment, often misleading nutritional information, food falsification, and the increasing incidence of nutrition diseases [68].

Transformation aims at the adoption by the Romanian consumers of a new eating behavior model, according to a flexitarian food style, which preserves certain features of Romanian ancestral food culture, but which has a greater propensity for the consumption of local seasonal vegetables and fruits, a reduction in meat, fish, and fat consumption, and greater attention paid to the sustainable way of obtaining food, which will lead to better environmental preservation.

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## Appendix A. Nutri-Score

Table A1. Nutri-Score for breakfast menu.

Ingredients	Quantity (g)	Negative Compounds				Positive Compounds		
		Energy (KJ)	Sugars (g)	Saturated Fats (g)	Sodium (mg)	Proteins (g)	Fiber (g)	Fruits and Veg (%)
Tarama carp roe caviar	50.00	968.00	0.00	3.00	1200.00	20.00	0.00	0.00
Bacon	100.00	2326.30	0.00	16.67	1833.00	33.33	0.00	0.00
Cheese	150.00	1660.50	0.00	19.95	1708.50	21.32	0.00	0.00
Tomato	100.00	74.00	5.26	0.03	5.00	0.88	1.20	100.00
Onion, young green	75.00	24.00	1.75	0.02	12.00	1.37	1.95	100.00
White bread	200.00	586.00	9.48	1.78	654.00	18.02	5.00	0.00
Total serving	675.00	5638.80	16.49	41.45	5412.50	94.92	8.15	200.00
100 g of serving	100.00	835.38	2.44	6.14	801.85	14.06	1.21	29.63
Nutri-Score	Total Points	Points corresponding to negative compounds				Points corresponding to positive compounds		
Points <i>N</i>	14	2	0	4	8			
Points <i>P</i>	6					5	1	0
Final Score = <i>N</i> – <i>P</i>	8 (C)							

Table A2. Nutri-Score for pork soup of the lunch menu.

Ingredients	Quantity (g)	Negative Compounds				Positive Compounds		
		Energy (KJ)	Sugars (g)	Saturated Fats (g)	Sodium (mg)	Proteins (g)	Fiber (g)	Fruits and Veg (%)
Pork meat	100.00	2167.00	0.00	19.33	32.00	9.34	0.00	0.00
Potatoes	20.00	61.92	0.14	0.00	0.00	0.41	0.28	100.00
Carrot	15.00	25.73	0.71	0.00	10.35	0.14	0.42	100.00
Onion	10.00	16.74	0.42	0.04	0.40	0.11	0.17	100.00
Pepper	10.00	10.04	0.30	0.00	0.30	0.09	0.18	100.00
Tomato	20.00	14.80	0.53	0.01	1.00	0.18	0.24	100.00
Green peas	20.00	66.11	0.90	0.00	0.00	0.90	0.90	100.00
Water	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sour cream	40.00	331.37	1.36	4.06	12.40	0.98	0.00	0.00
Total serving	535.00	2693.71	4.36	23.44	56.45	12.14	2.19	17.76
100 g of serving		503.50	0.82	4.38	10.55	2.27	0.41	17.76
Nutri-Score	Total Points	Points corresponding to negative compounds				Points corresponding to positive compounds		
Points <i>N</i>	5	1	0	4	0			
Points <i>P</i>	1					1	0	0
Final Score = <i>N</i> – <i>P</i>	4 (C)							

Table A3. Nutri-Score for stew of the lunch menu.

Ingredients	Quantity (g)	Negative Compounds				Positive Compounds		
		Energy (KJ)	Sugars (g)	Saturated Fats (g)	Sodium (mg)	Proteins (g)	Fiber (g)	Fruits and Veg (%)
Pork meat	166.67	863.33	0.00	4.00	70.00	23.33	0.00	0.00
Liver	50.00	280.50	0.00	0.59	43.50	10.70	0.00	0.00
Kidney	25.00	104.50	0.00	0.26	30.25	4.12	0.00	0.00
Tongue	16.67	156.83	0.00	0.99	18.33	2.72	0.00	0.00
Heart	25.00	123.50	0.00	0.29	14.00	4.32	0.00	0.00
Smoked sausages	50.00	734.29	0.00	5.27	359.50	6.14	0.00	0.00
Animal fat	16.67	627.67	0.00	16.63	0.00	0.00	0.00	0.00
Wine	66.67	228.73	0.64	0.00	3.33	0.05	0.00	0.00
Polenta	200.00	585.76	2.00	0.00	620.00	4.00	2.00	0.00

Table A3. Cont.

Ingredients	Quantity (g)	Negative Compounds				Positive Compounds		
		Energy (KJ)	Sugars (g)	Saturated Fats (g)	Sodium (mg)	Proteins (g)	Fiber (g)	Fruits and Veg (%)
Egg	50.00	308.50	0.10	1.60	64.50	6.20	0.00	0.00
Cheese	50.00	553.50	0.00	6.65	569.50	7.11	0.00	0.00
Total serving	716.67	4567.11	2.74	36.28	1792.92	68.67	2.00	0.00
100 g of serving		637.27	0.38	5.06	250.17	9.58	0.28	0.00
Nutri-Score	Total Points	Points corresponding to negative compounds				Points corresponding to positive compounds		
Points N	8	1	0	5	2			
Points P	5					5	0	0
Final Score = N – P	3 (C)							

Table A4. Nutri-Score for cheese dumplings of the lunch menu.

Ingredients	Quantity (g)	Negative Compounds				Positive Compounds		
		Energy (KJ)	Sugars (g)	Saturated Fats (g)	Sodium (mg)	Proteins (g)	Fiber (g)	Fruits and Veg (%)
Cream cheese	80.00	395.20	2.40	2.64	0.16	10.40	0.00	0.00
Wheat flour	60.00	1172.36	4.00	2.00	480.00	4.00	4.00	0.00
Vanilla sugar	2.00	32.54	1.96	0.00	0.04	0.00	0.00	0.00
Sunflower oil	30.00	1109.60	0.00	3.09	0.00	0.00	0.00	0.00
Sour cream	40.00	331.37	1.36	4.06	12.40	0.98	0.00	0.00
Blueberry	60.00	757.80	43.02	0.00	0.00	0.18	0.66	45.00
Total serving	272.00	3798.87	52.74	11.78	492.60	15.56	4.66	9.93
100 g of serving		1396.64	19.39	4.33	181.10	5.72	1.71	9.93
Nutri-Score	Total Points	Points corresponding to negative compounds				Points corresponding to positive compounds		
Points N	14	2	0	4	8			
Points P	6					5	1	0
Final Score = N – P	8 (C)							

Table A5. Nutri-Score for meatballs with mashed potatoes of the dinner menu.

Ingredients	Quantity (g)	Negative Compounds				Positive Compounds		
		Energy (KJ)	Sugars (g)	Saturated Fats (g)	Sodium (mg)	Proteins (g)	Fiber (g)	Fruits and Veg (%)
Pork meat	300.00	6501.00	0.00	57.99	96.00	28.02	0.00	0
Bread	75.00	219.75	3.56	0.67	245.25	6.76	1.88	0
Egg	50.00	308.50	0.10	1.60	64.50	6.20	0.00	0
Salt	2.50	0.01	0.00	0.00	1966.65	0.00	0.00	0
Garlic	15.00	22.35	0.15	0.01	2.55	0.95	0.32	100
Onion	25.00	83.68	2.12	0.22	2.00	0.55	0.85	100
Wheat flour	25.00	976.96	3.34	1.67	400.00	3.34	3.34	0
Sunflower oil	60.00	5547.98	0.00	15.45	0.00	0.00	0.00	0
Potatoes	250.00	2.50	2.50	2.50	2.50	2.50	2.50	100
Butter	45.00	0.45	0.45	0.45	0.45	0.45	0.45	0
Milk	37.00	0.37	0.37	0.37	0.37	0.37	0.37	0
Salt	2.50	0.00	0.00	0.00	983.33	0.00	0.00	0
Total serving	887.00	13,663.56	12.58	80.93	3763.60	49.14	9.70	32.69
100 g of serving		1540.42	1.42	9.12	424.31	5.54	1.09	32.69
Nutri-Score	Total Points	Points corresponding to negative compounds				Points corresponding to positive compounds		
Points N	12	4	0	4	4			
Points P	6					5	1	0
Final Score = N – P	6 (C)							

**Table A6.** Nutri-Score for cabbage salad of the dinner menu.

Ingredients	Quantity (g)	Negative Compounds			Positive Compounds			
		Energy (KJ)	Sugars (g)	Saturated Fats (g)	Sodium (mg)	Proteins (g)	Fiber (g)	Fruits and Veg (%)
Cabbage	200.00	50.00	6.40	0.07	36.00	2.56	5.00	100.00
Sunflower oil	20.00	390.79	1.33	0.67	160.00	1.33	1.33	0.00
Salt	3.00	0.00	0.00	0.00	1179.99	0.00	0.00	0.00
Vinegar	10.00	2.10	0.04	0.00	0.50	0.01	0.00	0.00
Total serving	233.00	442.89	7.77	0.73	1376.49	3.90	6.33	85.84
100 g of serving		190.08	3.34	0.32	590.77	1.68	2.72	85.84
Nutri-Score	Total Points	Points corresponding to negative compounds			Points corresponding to positive compounds			
Points N	10	0	0	4	6			
Points P	12					5	2	5
Final Score = N – P	–2 (A)							

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