

IMPLICATIONS OF FRUIT AND VEGETABLE INTAKE FOR HUMAN HEALTH

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Abstract

The consumption of vegetables and fruits is a fundamental component of a balanced diet, being recognized for its beneficial effects on human health. The present study aims to analyze the implications of this consumption on the prevention of chronic diseases, on the functioning of the body and on well-being. The objective of the research is to identify the health implications of eating vegetables and fruits. The research question is: What are the implications of regular consumption of vegetables and fruits on human health? The working hypothesis states that an adequate daily consumption of at least 400 g of fruits and vegetables determines major health benefits, by reducing the risk of chronic diseases, maintaining metabolic balance and improving general condition. The paper is based on data from recent international literature and Romanian nutritional guides.

Key words: *vegetables, fruits, health, balanced diet, nutrition, prevention*

Introduction

Vegetables are vegetable products that are frequently used in the daily diet, regardless of the person's state of health. They provide essential nutrients and contribute to the diversification of culinary preparations. Depending on the species, the portion consumed can be the root, leaf, stem, bulb, fruit, flower, seeds or even the whole plant (Opopol et al., 2006).

Fruits are important plant products due to their rich content of water, natural sugars, fiber, minerals, vitamins and aromatic compounds that give them nutritional value and pleasant taste (Opopol et al., 2006).

According to the Guide to Healthy Eating (Graur, 2006), a balanced diet should include fresh vegetables and fruits from different categories on a daily basis, in order to cover the need for vitamins, minerals and fiber.

Food plays a decisive role in maintaining human health. Among the essential elements of a healthy diet are vegetables and fruits, due to their high content of fiber, vitamins, minerals and bioactive compounds. The World Health Organization recommends a daily consumption of at least 400 g of fruits and vegetables, the equivalent of five servings, to reduce the risk of chronic non-contagious diseases such as cardiovascular disease, type 2 diabetes, obesity and cancer (WHO, 2003).

In a global context marked by urbanization, sedentary lifestyle and unbalanced diet, the topic has a major relevance for public health. Vegetables and fruits are foods with low calorie density, but with a high concentration of essential nutrients.

In Romania, for 2019, Eurostat data show an average consumption of about 250 g of vegetables and fruits per day, well below international recommendations. Only 2.4% of Romanians consume 5 or more servings of fruits and vegetables daily, as is the recommended amount, 24% of them consume between 1 and 4 servings, and the remaining 73.6% do not consume at all. These percentages are very low compared to the European level, so that 12.2% of Europeans consume 5

or more servings daily, 54.6% consume between 1 and 4 servings of fruits and vegetables, and the population that does not consume at all is 33.2%.

This discrepancy reflects not only cultural and economic particularities, but also shortcomings in nutrition education and public policies to promote healthy eating (Eurostat, 2025).

Romania ranks among the European countries with the lowest consumption of fruits and vegetables. For example, in Ireland while 19.8% of the population does not consume fruit and vegetables at all daily, 48.4% consume between one and four servings, and the remaining 31.8% consume five or more servings. Italians, 65.8% consume between 1 and 4 servings of fruits and vegetables daily, approximately the same as Spaniards, 66.1% (Eurostat, 2025).

Drivers include low income, seasonality and reduced access to fresh produce in rural areas. The national guide recommends diversifying plant sources, local consumption and reducing food waste (Graur, 2006).

Implementing public health policies focused on nutrition education, subsidization of plant products and consumer information could increase the intake of fruits and vegetables and reduce the burden of chronic diseases.

The objective of the research is to identify the implications of the consumption of vegetables and fruits on health, by exemplifying the main benefits on the body. The research question concerns how regular consumption influences the general condition of the body. The hypothesis states that adequate daily consumption causes major beneficial effects on health, by reducing the risk of chronic diseases, regulating metabolism and supporting vital functions.

1. Literature review

Vegetables and fruits provide vitamins, minerals, dietary fiber, and antioxidants. Vitamin C, abundant in citrus fruits, peppers, cabbage and broccoli, boosts immunity and acts as an antioxidant. Vitamin A, present in carrots, pumpkin and apricots, supports skin and vision health. The vitamin B complex, especially folic acid (B9), plays an important role in DNA synthesis and the prevention of anemia (Yahia & Ornelas-Paz, 2010).

Essential minerals such as potassium, magnesium, iron and calcium regulate muscle and cardiovascular functions. Adequate potassium consumption reduces blood pressure, and magnesium participates in the enzymatic processes involved in energy metabolism (Graur, 2006).

Fruits and vegetables provide the body with important amounts of vitamins and minerals that support immunity and maintain the balance of vital functions. They also provide fiber necessary for effective digestion and to support intestinal health. Due to their high content of antioxidant compounds, these foods help lower the risk of chronic conditions. Regular consumption helps maintain an optimal weight and reduce the likelihood of cardiovascular disease and diabetes (Beceanu & Chira, 2003). However, worldwide, a large part of the population does not include sufficient amounts of fruits and vegetables in their diet.

Vegetables provide the body with water, fiber, vitamins and minerals essential for maintaining health. They contain between 75% and 95% water and variable amounts of carbohydrates, in the form of glucose, fructose, sucrose, starch and cellulose. Green vegetables, carrots, cabbage, peas and beets are important sources of vitamins C, A, K and B complex, but also minerals such as potassium, calcium, iron and phosphorus. Due to their diverse nutritional content, vegetables contribute to water balance, the proper functioning of metabolism and the strengthening of immunity (Popescu, 2010).

Legumes, such as beans, lentils, soybeans and chickpeas, provide quality vegetable proteins that are beneficial for the cardiovascular system. Combining them with cereals ensures a complete supply of essential amino acids. Vegetables also have therapeutic effects: they are depurative, diuretic, emollient and cholagogic, helping to detoxify the body and protect the liver. Through their high content of antioxidants and fiber, they reduce the risk of chronic diseases and support the maintenance of an optimal weight (Graur, 2006).

Fruits are plant foods rich in water, simple sugars, fiber, vitamins, and minerals. They provide quick energy and promote metabolic balance. The carbohydrate content differs depending on the species: fruits such as melon, strawberries and apples contain between 5% and 15%, and bananas and grapes can exceed 20%. Fruits have beneficial actions on the body: they are alkalizing, mineralizing, laxative and diuretic, supporting digestive and circulatory functions (Popescu, 2010).

The vitamins in the fruit contribute to the maintenance of overall health. Apricots, citrus fruits and pineapples are rich in vitamin A and carotene, kiwi and berries contain vitamin C, and walnuts and almonds provide vitamin E. By providing antioxidant compounds and essential nutrients, fruits support immunity, protect the cardiovascular system and reduce the risk of metabolic diseases. The daily consumption of various fruits and vegetables is essential for optimal health (Graur, 2006).

2. Methodology

The research was carried out through documentary analysis, with the objective of identifying and interpreting the implications of the consumption of vegetables and fruits on human health. Scientific articles published in internationally indexed journals, reports of the World Health Organization, as well as the Guide to Healthy Eating were consulted. The literature review aimed to identify the relationship between the consumption of vegetables and fruits and indicators of metabolic, cardiovascular, psychological and digestive health.

The chosen method is a qualitative one, descriptive-analytical, based on the synthesis of existing data. This approach allows for the integration of information from multiple sources, providing a coherent picture of the effects of eating vegetables and fruits on human health. The research did not involve own experiments, but aimed to validate the hypothesis formulated by correlating the conclusions from the literature with the available official data.

In addition to the theoretical analysis, official nutritional data provided by the U.S. Department of Agriculture were used to characterize the vitamin, mineral and fiber content of the main categories of vegetables and fruits. This information has been summarised in a comparative table to highlight variations in nutritional composition between different plant groups.

The nutritional composition differs depending on the type and color of the product. Green vegetables, such as broccoli and spinach, are rich in iron and folic acid, orange vegetables, such as carrots and pumpkin, provide carotenoids, and acidic fruits, such as citrus fruits and kiwi, provide a high intake of vitamin C (WHO, 2003). This diversity of nutrients justifies the recommendation of varied daily consumption, which ensures the body the optimal intake of vitamins and minerals. The following table shows the nutritional composition of the main vegetables and fruits.

2.1 Nutritional composition of vegetables and fruits

Table 1. Nutritional composition of the main fruits and vegetables (per 100g)

Product	Proteins g	Lipids g	Carbohydrates g	Ca mg	P mg	Fe mg	A mg	B1 mg	B2 mg	C mg
Tomato	1.1	0.30	4.0	0.050	0.040	1.5	0.35	0.07	0.05	30.00
Potatoes	2.0	0.10	19.7	0.010	0.058	0.9	0.003	0.12	0.05	20.00
Carrots	1.2	0.30	9.3	0.060	0.040	0.49	3.6	0.08	0.08	5.00
Cucumbers	0.3	-	3.0	0.023	0.042	0.90	0.01	0.03	0.04	10.00
Cabbage	1.8	-	5.4	0.048	0.031	1.0	0.003	0.06	0.05	50.00
Apples	0.4	0.4	15.0	0.01	0.01	0.01	0.03	0.06	0.05	5.0
Apricots	1.0	0.1	15.9	0.02	0.49	0.49	0.75	0.05	0.03	3.0
Peaches	0.7	0.1	13.6	0.04	0.03	0.50	0.24	0.02	0.06	5.0
Cherries	1.0	0.3	14.4	0.03	0.05	0.84	0.22	0.02	0.03	5.0

Grapes	0.8	0.4	20.0	0.03	0.07	0.70	0.01	0.04	0.01	2.0
Raspberry	0.8	0.9	9.0	0.04	0.037	1.6	0.03	0.02	0.05	25.0
Lemons	0.9	0.7	6.2	0.036	0.022	0.5	0.20	0.06	0.01	50.0
Oranges	0.8	0.2	9.1	0.044	0.020	0.6	0.25	0.07	0.04	50.0

Source: U.S. Department of agriculture, 2025

3. Results and discussions

The data in (Table 1) highlight significant variations in the nutritional composition of different fruits and vegetables. In terms of protein content, vegetables such as potatoes (2.0 g/100 g) and cabbage (1.8 g/100 g) offer higher values compared to fruits, which contain less than 1 g of protein. This confirms that vegetables contribute more to vegetable protein intake, although the main sources remain legumes.

The carbohydrate content is higher in fruits, especially grapes (20 g/100 g) and apricots (15.9 g/100 g), compared to vegetables, where values vary between 3–9 g. These differences explain the higher energy density of fruits and justify the recommendation of moderate consumption for people with diabetes or weight control.

In terms of minerals, cabbage and raspberries have an appreciable iron content (1–1.6 mg/100 g), while potatoes provide phosphorus and potassium, important elements for energy metabolism and muscle function. Carrots are distinguished by their high concentration of vitamin A (3.6 mg/100 g), which makes them essential for eye health and antioxidant processes.

Vitamin C reaches maximum values in cabbage, lemons and oranges (≈ 50 mg/100 g), confirming the role of these foods in boosting immunity and protecting cells against oxidative stress. Tomatoes and raspberries offer a moderate intake (25–30 mg/100 g), enough to cover a significant part of the daily requirement.

Analyzing the differences between fruits and vegetables, it is observed that vegetables are better sources of water-soluble vitamins (C, B1, B2) and minerals, while fruits provide easily assimilated carbohydrates and valuable phytonutrients. Overall, these data confirm the importance of diversifying consumption, combining fruits and vegetables allows the complete coverage of the micronutrient needs, ensuring the optimal functioning of the body and preventing nutritional deficiencies.

The consumption of vegetables and fruits has complex implications on human health, and the literature confirms the beneficial effects observed in our study.

The importance of the topic is supported by the scientific evidence accumulated in recent decades. International studies show a clear inverse relationship between fruit and vegetable intake and *overall mortality* (Devirgiliis et al., 2024; Wallace et al., 2020).

In a context marked by the increase in the incidence of *cardiovascular diseases*, *diabetes* and *obesity*, this topic is relevant for public health. Vegetables and fruits provide an important intake of vitamins, minerals, fiber and phytonutrients, indispensable elements for the optimal functioning of the body (Slavin & Lloyd, 2012). A significant reduction in the risk of *cardiovascular disease* has been observed in people who frequently consume large amounts of fruits and vegetables, due to the beneficial effects of antioxidants, fiber, and minerals on the circulatory system (Hung et al., 2004).

A daily consumption of 800 g of fruits and vegetables reduces the risk of *cardiovascular disease* by 31% and the risk of stroke by 33% (Aune et al., 2017). People who consume more than seven servings of vegetables and fruits per day have significantly reduced overall mortality (Oyebode et al., 2014).

Globally, studies from the Global Burden of Disease highlight that diets low in fruits and vegetables are one of the main modifiable risk factors for *premature mortality* and *loss of years of healthy life*. The impact of these dietary deficiencies is profound, having implications not only on individual health, but also on public health systems, by increasing the burden of chronic diseases and the costs associated with their treatment (Naghavi et al., 2023).

A high consumption of fruits and vegetables is correlated with a decrease in the risk of *cancer*, an effect due to the high content of dietary fiber, carotenoids and phytoestrogens, compounds with protective action on cells (Steinmetz & Potter, 1996).

There has also been an approximately 14% decrease in the risk of developing *type 2 diabetes* in people who frequently include leafy greens in their diet, due to their high magnesium, fiber, and antioxidant content (Carter et al., 2010).

The results of this research support the recommendation to include fruits and vegetables in all dietary guidelines. It is estimated that if people introduced five daily servings of fruits and vegetables into their diet, they would have a 20–30% reduction in the risk of cardiovascular disease and cancer. Also, this increase in the number of daily servings of vegetables and fruits is also supported by another study, which brings a psychological perspective, showing that an increase of two daily servings of vegetables and fruits leads to a significant improvement in well-being and self-reported happiness levels (Mujcic & Oswald, 2016).

At the same time, dietary fiber reduces the glycemic index of meals, favoring better blood sugar control, so that each additional serving of green vegetables decreases the risk of type 2 diabetes by 13%. (Wallace et al., 2020).

4. Conclusions

The results of the research confirm the validity of the hypothesis formulated. Regular consumption of vegetables and fruits has significant positive implications for human health. A daily intake of at least 400 g contributes to the prevention of cardiovascular, metabolic and neoplastic diseases, supports immunity, maintains digestive health and supports psychological balance. These foods, rich in vitamins, minerals and natural antioxidants, are essential for the optimal functioning of the body and for maintaining general well-being.

Research question: What are the implications of regular consumption of vegetables and fruits on human health? finds its answer in the analyzed scientific data. The constant and varied consumption of plant products determines a significant reduction in the risk of disease, contributes to extending the life span and increasing its quality. The benefits are cumulative and manifest themselves on all levels: physiological, metabolic, immunological and psychological.

To harness these effects, a coherent public policy framework is needed to support the production and consumption of healthy food. The government, the private sector, and educational institutions must work together to ensure access to fresh fruits and vegetables, limit the promotion of ultra-processed foods, and introduce nutritional standards in schools and public institutions.

Nutrition education must be strengthened through programs that develop knowledge and correct eating behaviors from childhood. Informing the population, clear labelling of products, nutritional counselling and support for local producers are key measures to improve eating habits. In Romania, increasing the consumption of vegetables and fruits represents a strategic investment in public health, capable of reducing the incidence of chronic diseases and contributing to a healthier and more active society.

Future research will look at the link between the consumption of vegetables and fruits and the incidence of diseases mentioned in the literature.

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5. References

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