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The Nutritional Value of Vegetables and Greens (Aromatic Herbs)

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ABSTRACT

Vegetables and greens (aromatic herbs)- this group is considered the main source of vitamins and minerals (along with fruits), also contributing to the daily intake of carbohydrates and dietary fiber. Vegetables and greens also contain significant amounts of carotenoids and phytoprotective agents (substances that play a role in preventing neoplasia, cardiovascular diseases or age-related vision loss). Some vegetables contain proteins: beans (phaseolin), peas (legumelina) and soybeans (glycine). Vegetables are low in fat and cholesterol-free. They also have a high-water content. Proteins, carbohydrates, lipids, vitamins and minerals are not found as such in nature but are included, in variable quantities, in the composition of various foods. Search strategy: This study followed the Preferred Reporting Items for Systematic Reviews (PRISMA) guidelines. A thorough search was carried out across multiple electronic databases, including Embase, Scopus, PubMed, Google Scholar, and Web of Science, starting in March 2026. The specific keywords used in this search were: ''*Green vegetables and tomatoes*''; ''*Potatoes*''; ''*Root vegetables*''; ''*Mineral salts and vitamins*''; ''*Proteins*''; ''*lipids*''; ''*carbohydrates*'' etc. Additionally, the author reviewed the reference lists of selected articles to find more relevant studies. All gathered articles were then imported into EndNote software (X9), where duplicates were removed. No single food contains all the nutrients in the quantities we need. Under these conditions, in order to have a balanced diet, humans must consume a wide variety of foods. Vegetables are fundamental for a balanced diet, being rich in vitamins, minerals, fibers and antioxidants, the FAO/WHO confirming their crucial role in maintaining health.

Keywords: Vegetables, Aromatic Herbs, Nutrients.

INTRODUCTION

Nutritional assessment is a complex process, through which objective and subjective data are obtained regarding food intake, both quantitatively and qualitatively, in the general context of lifestyle and health status. Globally, the issue of a balanced and safe diet is a fundamental concern of the Food and Agriculture Organization (F.A.O.). Food security is the immediate access of all people to the food they need to satisfy their vital functions and to lead a healthy and active life (FAO/WHO, 1996). According to the European Union

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and the World Health Organization, food safety is everyone's responsibility, starting from their origin to the moment they reach the table. First of all, food safety involves controlling the harmlessness of food products and materials that come into contact with food products. Thus, by the quality of a food we assume the totality of characteristics that give it the ability to satisfy implicit and explicit needs. The quality of food products is conferred by the set of physical, chemical, organoleptic, technological and own (intrinsic) properties of the products and/or acquired through processing processes. Food products and materials that come into contact with food products that comply with food regulations are considered not to pose a risk to human health. The following types of food quality are distinguished according figure 1.

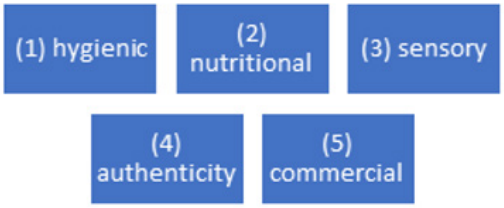

Figure 1. The types of food quality.

Vegetable is a generic culinary term that designates any part of a plant commonly consumed by humans as food, being a cultivated or uncultivated plant that is known and appreciated by the culture of the local population, but is not part of the following culinary categories: cereals, fruits, herbs or spices. These plants are appreciated due to their content in nutrients such as hydrocarbons, proteins, vegetable fats, vitamins, minerals, essential oils, the latter having an important role in digestion [1].

The complexity of the human-food relationship is highlighted in the multiple ways through which nutrition affects the human body. Whether it is metabolism, homeostasis, immunocompetence, energy and thermal balance, cellular development, motor activity and behavior, nutrition exerts a great influence on them and ultimately modifies behavior. The imbalance between the intake and the need for biologically active substances determines profound metabolic changes that mark the pathology of modern man. Under these conditions, the emergence and development of chronic diseases can be influenced by irrational and unbalanced eating behavior. It is characterized by a series of contemporary trends, such as the search for convenience in purchasing and preparing food products, increasing interest in foods in larger or more practical packaging, deviation from the daily diet, selection of foods with a high salt, sugar and fat content, reduced consumption of fruits and vegetables, etc. A balanced diet is of particular importance in maintaining health, the harmonious development of the human body, as well as the prevention of diseases related to diet, malnutrition and nutritional deficiencies. In general, a balanced diet involves moderation (avoiding excess food), variety (avoiding one-sided nutrition), quality (adequate content of essential nutrients) and quantity (controlled energy intake and adapted to individual metabolic needs). A balanced diet must meet three basic conditions: (1) to ensure harmonious growth and development of the human body; (2) to ensure normal physical and intellectual activity and (3) to ensure an adequate state of health. The amount of nutrients recommended for consumption varies depending on age, sex, and the physical activities performed by each person. Only an optimal amount of nutrients (proteins, lipids, carbohydrates, mineral salts, vitamins) will contribute to the proper functioning of the human body.

Green vegetables and tomatoes

Green vegetables contain varying amounts of vitamin C. Cabbage, cauliflower, broccoli, Brussels sprouts and tomatoes are important sources of vitamins. Also, tomatoes and green leafy vegetables such as cabbage or spinach have a significant content of beta carotene, a precursor to vitamin A. Green vegetables also contribute to the intake of folic acid, iron and calcium. The mineral content of vegetables varies depending on the mineral content of the soil in which they grow. Members of this group have a low energy value, hence the indication for consumption in hypocaloric diets [2].

Potatoes

When consumed in considerable quantities, they have a significant energy value. A small potato has about the same energy value as a thin slice of bread. Like white bread, potatoes are characterized by a high glycemic index, current nutritional recommendations showing that they should not exceed 3 servings per week. The amount of vitamin C contained in potatoes decreases with storage time. Potatoes can be important sources of vitamins (C and B) depending on the quantity and regularity with which they are consumed. They also contain small amounts of protein and iron [3].

Root vegetables

Root vegetables such as carrots, parsnips and beets contain vitamin C, but are not as good sources of vitamins as green vegetables. They have a slightly higher energy value compared to green vegetables, due to the presence of a higher amount of starch. Beets and parsnips contain higher amounts of carbohydrates compared to carrots or turnips. However, their contribution to the total energy intake is not particularly important [4].

Legumes

Peas, beans and lentils contain the highest amount of carbohydrates and proteins of all vegetables. However, their proteins have a low biological value. They also contain considerable amounts of iron and B vitamins, especially thiamine, making them very important in a vegetarian diet. Green beans and peas are important sources of vitamin C. Soy is rich in isoflavones, compounds structurally and functionally similar to estrogens. Isoflavones have a favorable effect on total cholesterol and LDL-cholesterol levels [5]. Vegetables and legumes should represent 3-4 servings of the daily menu. However, as long as the energy balance is maintained, there is no risk in exceeding this amount. This food group provides a considerable amount of dietary fiber, micronutrients (potassium, calcium, vitamin C, vitamin B6, carotenoids, vitamin E, folates), as well as other products with antioxidant functions. They can be consumed both prepared in olive oil and fresh, in the form of salads [6]. Carbohydrates, lipids and proteins represent the material that supplies energy to the body, but they can also perform plastic functions of restoring or renewing worn tissues (Table 1).

Mineral salts and vitamins intervene in a series of biochemical reactions as biocatalysts. Vegetables are part of the group of foods with catalytic action, which have a high content of vitamins, mineral salts, organic acids, cellulose, essential oils, etc. They must be present daily in the diet to release the potential energy from energy foods and for the normal development and maintenance of the body [7]. In their chemical composition, an important percentage is occupied by water 80-95%, and the dry matter is mainly made up of carbohydrates. Due to their rich content in mineral salts and vitamins, as well as the fact that vegetables and fruits contain carbohydrates, proteins and even lipids, they represent, from a physiological point of view, main and irreplaceable foods in the diet.

Proteins, through the functions they have in the body, are indispensable for life. They are the components of tissues, enter the structure of all cells and also take part in their growth and restoration, having a plastic role [8]. They also participate in the formation of enzymes, enter the structure of hormones and intervene in the body's defense process, etc. Vegetables and fruits contribute about 20% of proteins to complete the food ration. Beans, lentils, soybeans and, in general, all vegetables from the legume group have a rich content in protein substances.

Lipids are energy substances. They have the advantage that a small volume provides a significant amount of energy. In addition, they have an important role in maintaining the permeability of cell membranes, are structural constituents of the body's cells and participate in the formation of complex proteins. Vegetables and fruits, for the most part, have a low-fat content, with the exception of fruits from the nut group and legumes, where the fat content can reach up to 60% in some varieties [9].

Carbohydrates are found in fruits and vegetables in the form of glucose, fructose, sucrose, starch and cellulose. They represent an important source of energy for the body. In addition to their energetic role, carbohydrates are indispensable for the metabolism of lipids and proteins. The percentage of carbohydrates varies depending on the species as follows: greens, lettuce, cucumbers, zucchini, green beans, eggplants, tomatoes 1-5%; onions, okra, carrots, leeks, beetroot, celery, Brussels sprouts 5-10%; potatoes, peas and dried beans 10-15%. Depending on these components, the energy potential of vegetables and fruits varies between 40 and 2950 kj/100 g edible part [6].

The mineral salts of potassium, sodium, calcium, magnesium, iron, manganese, aluminum, sulfur, phosphorus, etc., which are found in quite large quantities in fruits and vegetables, have a very important role in the body. They participate in the structure of cells, are part of the constitution of enzymes and vitamins, as well as hormones or: promote their functioning in the body. For example, potassium and sodium salts are irreplaceable in the changes of substances that take place between cells, retain water in the body and promote the synthesis of complex proteins. Increased potassium intake is provided by carrots, radishes, potatoes, tomatoes, lettuce, etc. [10].

Calcium and phosphorus salts are necessary for the formation and strengthening of the bone skeleton, enter the composition of the blood, help regulate the nervous system.

The richest vegetables and fruits in calcium and phosphorus are cabbage, cauliflower, spinach, red beets, green peas, strawberries, oranges and nuts. Iron salts are indispensable in the composition of the blood, more precisely in the structure of hemoglobin that transports oxygen in the body. The intake of iron in the body is brought by beans and green peas, nettles, parsley, spinach, as well as grapes. Equally important for the human body are copper, iodine, fluorine and sulfur, which are found in mushrooms, nuts, onions, garlic, spinach, tomatoes [11].

Vitamins that are found in vegetables in very small quantities, on the order of milligrams or fractions of a milligram, nevertheless have particularly important functions in the body. Vitamins are classified according to whether they are soluble in fat or water: fat-soluble and water-soluble. In the body, they participate in the processes of formation of various substances, development of the body, and cell multiplication.

Vitamin C (L-ascorbic acid) is a 6-carbon lactone (C6H8O6) is consumed in the largest quantity by the human body out of all of them, in an average amount of 50 mg daily. The action of vitamin C is complex, it intervenes in cellular metabolism and participates in the body's defense mechanism. It is found mainly in vegetables and fruits and varies within very wide limits depending on the species and cultivation conditions. It is a vitamin that is easily soluble in water and decomposes in contact with air. As such, to maintain it in products, they should not be left in water for a long-time during washing [12].

Vitamin B1 (thiamine) [$C_{12}H_{17}N_4OS$ or 2-[3-[(4-amino-2-methylpyrimidin-5-yl)methyl]-4-methyl-1,3-thiazol-3-ium-5-yl]ethanol] helps burn carbohydrates, proteins, participates in water metabolism and intervenes in maintaining the normal function of the nervous system. Dried legumes and some greens such as lettuce, cabbage, cauliflower and spinach, nuts and hazelnuts, apples, plums have a rich content of this vitamin.

Vitamin B2 [$C_{17}H_{20}N_4O$] (Riboflavin is D-Ribitol in which the hydroxy group at position 5 is substituted by a 7,8-dimethyl-2,4-dioxo-3,4-dihydrobenzo[g]pteridin-10(2H)-yl moiety) consists of a heterocyclic isoalloxazine ring system (7,8-dimethylisoalloxazine) attached to a ribityl side chain, specifically 7,8-dimethyl-10-ribitylisoalloxazine; favorably influences the growth of the body and strengthens resistance to infections. It is found in larger quantities in beans, peas, cauliflower, tomatoes, carrots, grapes, apricots, nuts, apples, pears.

Vitamin B6 [$C_8H_{11}NO_3$] (pyridoxine) is a hydroxymethylpyridine with hydroxymethyl groups at positions 4 and 5, a hydroxy group at position 3 and a methyl group at position 2; consists of a heterocyclic isoalloxazine ring system (7,8-dimethylisoalloxazine) attached to a ribityl side chain, specifically 7,8-dimethyl-10-ribitylisoalloxazine; participates in the metabolism of amino acids, in the synthesis of hemoglobin, contributes to the normal functioning of nerve cells. It is found in larger quantities in peas, pumpkin and beets, cabbage, apples, grapes [13].

Vitamin B12 [$C_{62}H_{88}CoN_{13}O_{14}P$] cyanocobalamin or (cobalamin) is the most chemically complex vitamin, featuring a macrocyclic corrin ring with a central cobalt (Co) ion coordinated to four nitrogen atoms.) takes part in the synthesis of hemoglobin and has the role of protecting the liver cell. It is found in appreciable quantities in beets, apples, peaches, cherries.

Vitamin A (retinol) [$C_{20}H_{30}O$] ensures the proper functioning of the eyes in the body and maintains the integrity of tissues, skin, mucous membranes, skeleton, etc. Chemically, retinoids exhibit a cyclohexenyl ring structure with methyl substitutions (β-ionone ring) and a conjugated polyene chain with a C15 terminus that exhibits a distinct function. It is brought into the body in the form of provitamin A carotene. The richest vegetables and fruits in vitamin A are carrots, spinach, red cabbage, loboda, gooseberries, tomatoes, cherries, peaches, apricots, strawberries, raspberries, etc. [14].

Vitamin D consists of secosteroids, where one of the steroid rings is broken; (9,10-seco(5Z,7E)-5,7,10(19)-cholestatriene-3β-ol/ $C_{27}H_{44}O_3$) intervenes in the body in the absorption of calcium and phosphorus, contributing to the deposition of these elements in the skeleton and teeth and helps the proper functioning of some glands with internal secretion. It can be formed in the skin from provitamin D under the action of sunlight (ultraviolet). Mushrooms, lettuce and green beans have a rich content of this vitamin.

Vitamin E is (R,R,R)-alpha-tocopherol is an alpha-tocopherol that has R,R,R configuration ($C_{29}H_{50}O_2$) plays an important role in the development of the embryo and in the proper functioning of muscle and nervous tissues. It is found in nuts and legumes, as well as in brightly colored vegetables and fruits.

Vitamin K (phytoquinone) a common 2-methyl-1,4-naphthoquinone ring structure [$C_{31}H_{46}O_2$] intervenes in the blood clotting process and is found in most green vegetables, spinach, lettuce, nettles, green peas [15].

Vitamin PP (nicotinamide) [$C_6H_5NO_2$] participates in some metabolic processes that provide energy and in cell respiration; mushrooms, nuts, parsley, apricots and peaches contain larger amounts. The drying process produces changes in the vegetables and fruits intended for this purpose. Thus, in addition to the fact that the volume of fresh vegetables and fruits is reduced by losing water, it also influences the chemical components of the respective products, because any product loses part of its initial quality through heating, boiling and drying.

These changes consist of the partial loss of a quantity of water and carbon dioxide, the partial degradation of others, such as proteins, the reduction of the quantity of some vitamins, but the carbohydrates and organic acids in the form of salts, fats and mineral salts are preserved in their entirety and even concentrated.

However, by reducing the volume of water, the concentration of the substances existing in the product is made 4-10 times, depending on the product [16].

For example, fresh green peas contain 75% water, 7% protein, 17% carbohydrates and 1% other elements, while dehydrated peas contain 5% water, 26% protein, 62% carbohydrates and 7% other nutrients. Regarding the losses that occur through drying, it is very necessary to know that they can be greater or lesser, depending on the drying process used. Thus, when drying apricots, sulfite contributes to maintaining and improving their quality. Sulfur dioxide (SO_2) reacts with the various chemical substances that make up the cellular content and has a positive effect on maintaining ascorbic acid. It is considered that for more complete preservation of ascorbic acid, the initial SO_2 content in sulfidated fruits must be at least 0.15%. Sulfurous acid (formed during sulfite) also protects the carotene in fresh apricots from the oxidizing action of oxygen. Sulfurous acid partially inactivates the function of vitamin B1 [17].

Sulfur dioxide (SO_2) is a strong reducing agent and therefore slows down the action of oxidizing enzymes in the presence of SO_2 the absorption of oxygen by oxidases is interrupted and therefore the color change (browning), due to enzymatic activity, is stopped. Also, through the action of sulfur dioxide on fruit cells, the loss of water through evaporation is facilitated. Drying vegetables or fruits without being subjected to the scalding operation leads to the loss of a significant amount of provitamin A, up to 50% in peas and green beans, while the same variety of peas and beans scalded loses only 20%.

This is explained by the fact that together with the water, the soluble substances in it change their place. So together with the water that evaporates, the soluble substances that migrated with it are concentrated in the outer layers of the raw material. The more intense the cells of the respective tissues have undergone the scalding action, the more the permeability of the cell membranes has increased and as such allows the movement of soluble substances. It can be concluded that drying should not be done anyway, but only according to certain technologies specific to each group of vegetables [18].

CALORIE AND MACRONUTRIENT CONTENT OF THE MAIN VEGETABLES AND LEGUMES

Calorie and macronutrient content of the main vegetables (content per 100 g):

1. Endive – Calories: 17 kcal; Carbohydrates: 3.35 g; Sugars: 0.25 g; Fiber: 3.1 g; Glycemic index: 15;
2. Artichoke – Calories: 47 kcal; Carbohydrates: 10.5 g; Sugars: 1; Fiber: 5.4 g; Glycemic index: 20;
3. Green bell pepper – Calories: 20 kcal; Carbohydrates: 4.64 g; Sugars: 2.4 g; Fiber: 1.7 g; Glycemic index: 10;
4. Red bell pepper – Calories: 31 kcal; Carbohydrates: 6 g; Sugars: 4.2 g; Fiber: 2.1 g; Glycemic index: 10;
5. Broccoli – Calories: 34 kcal; Carbohydrates: 6.64 g; Sugars: 1.7 g; Fiber: 2.6 g; Glycemic index: 10;
6. Raw sweet potato – Calories: 86 kcal; Carbohydrates: 20.12 g; Sugars: 4.18 g; Fiber: 3 g; Glycemic index: approximately 30 *; 1 sweet potato weighs approximately 130 g;
7. Baked sweet potato with skin – Calories: 90 kcal; Carbohydrates: 20.7 g; Sugars: 6.5 g; Fiber: 3.3 g;
8. Potato – Calories: 77 kcal; Carbohydrates: 17.49 g; Sugars: 0.82 g; Fiber: 2.1 g; 1 medium potato weighs approximately 210 g;
9. Baked Potato with Skin – Calories: 93 kcal; Carbohydrates: 21.15 g; Sugars: 1.18 g; Fiber: 2.2 g; Glycemic Index: 111

10. Boiled Potato without Skin – Calories: 86 kcal; Carbohydrates: 20 g; Sugars: 0.89 g; Fiber: 1.8 g; Glycemic Index: 82;
11. Fried Potatoes in Oil – Calories: 312 kcal; Carbohydrates: 41.44 g; Fiber: 3.8 g; Sugars: 0.3 g; Glycemic Index: 73;
12. Mashed Potatoes with Whole Milk and Butter – Calories: 113 kcal; Carbohydrates: 16.8 g; Fiber: 1.5 g; Sugars: 1.4 g; Glycemic Index: 87;
13. Potato Chips – Calories: 536 kcal; Carbohydrates: 52.9 g; Fiber: 4.8 g; Sugars: 0.2 g; Fat: 34.6 g; Saturated Fat: 11 g; Protein: 7 g; Glycemic Index: 70;
14. Cucumber – Calories: 12 kcal; Carbohydrates: 2.16 g; Fiber: 0.7 g; Sugars: 1.38 g; Glycemic Index: 15;
15. Onion – Calories: 40 kcal; Carbohydrates: 9.34 g; Fiber: 1.7 g; Sugars: 4.24 g; Glycemic Index: 10;
16. Mushrooms – Calories: 22 kcal; Carbohydrates: 3.26 g; Fiber: 1 g; Sugars: 1.98 g; Glycemic Index: 10;
17. Raw Cauliflower – Calories: 25 kcal; Carbohydrates: 5.3 g; Fiber: 2.5 g; Sugars: 2.4 g; Glycemic Index: 15;
18. Raw Butternut Squash – Calories: 45 kcal; Carbohydrates: 11.7 g; Fiber: 2 g; Sugars: 2.2 g; Glycemic Index: 75;
19. Cooked Butternut Squash – Calories: 20 kcal; Carbohydrates: 4.9 g; Fiber: 1.1 g; Sugars: 1 g; High Glycemic Index: 70;
20. Cooked Butternut Squash – Calories: 40 kcal; Carbohydrates: 10.5 g; Fiber: 3.2 g; Sugars: 2 g; High Glycemic Index
21. Zucchini – Calories: 16 kcal; carbohydrates: 3.35 g; fiber: 1.1 g; sugars: 2.2 g; glycemic index: 15;
22. Green beans – Calories: 31 kcal; carbohydrates: 6.97 g; fiber: 2.7 g; sugars: 3.26 g; glycemic index: 15;
23. Gogosar – Calories: 31 kcal; carbohydrates: 6.3 g; fiber: 2.1 g; sugars: 4.2 g; glycemic index: 15;
24. Raw carrots – Calories: 41 kcal; carbohydrates: 9.58 g; fiber: 2.8 g; sugars: 4.74 g; glycemic index: 16 – 35 (whole / sliced);
25. Boiled carrots – Calories: 35 kcal; carbohydrates: 3.8 g; fiber: 1.4 g; sugars: 1.6 g; glycemic index: 33 – 49 (whole / sliced);
26. Parsnip – Calories: 75 kcal; Carbohydrates: 18 g; Fiber: 4.9 g; Sugars: 4.8 g; Glycemic Index: 97 (in the case of boiled parsnip, the glycemic index: 52);
27. Cooked Leek – Calories: 31 kcal; Carbohydrates: 7.6 g; Fiber: 1 g; Sugars: 2.1 g; Glycemic Index: 15;
28. Radish – Calories: 16 kcal; Carbohydrates: 3.5 g; Fiber: 1.6 g; Sugars: 1.9 g; Glycemic Index: 15;
29. Tomatoes – Calories: 18 kcal; Carbohydrates: 3.9 g; Fiber: 1.2 g; Sugars: 2.6 g; Glycemic Index: 15;
30. Lettuce – Calories: 15 kcal; carbohydrates: 2.87 g; fiber: 1.3 g; sugars: 0.78 g; glycemic index: 15;
31. Beetroot – calories: 43 kcal; carbohydrates: 9.56 g; fiber: 2.8 g; sugars: 6.76 g; glycemic index: 64;
32. Spinach – Calories: 23 kcal; carbohydrates: 3.75 g; fiber: 2.4 g; sugars: 0.43 g; glycemic index: 15;
33. Asparagus – Calories: 20 kcal; carbohydrates: 4 g; fiber: 2.1 g; sugars: 1.9 g; glycemic index: 15;
34. Celery – Calories: 16 kcal; carbohydrates: 2.97 g; fiber: 1.6 g; sugars: 1.34 g; glycemic index: 15;
35. Boiled nettles – Calories: 42 kcal; carbohydrates: 7.5 g; fiber: 6.9 g; sugars: 0.25 g; low glycemic index;
36. Garlic – Calories: 149 kcal; carbohydrates: 33.1 g; fiber: 2.1 g; sugars: 1 g; glycemic index: 30;
37. Cabbage – Calories: 25 kcal; carbohydrates: 5.8 g; fiber: 2.5 g; sugars: 3.2 g; glycemic index: 10;
38. Red cabbage – Calories: 31 kcal; carbohydrates: 7.37 g; fiber: 2.1 g; sugars: 3.83 g; glycemic index: 10;
39. Brussels sprouts – Calories: 36 kcal; carbs: 7.1 g; fiber: 2.6 g; sugars: 1.7 g; glycemic index: 15;
40. Kale – Calories: 49 kcal; carbs: 8.75 g; fiber: 3.6 g; sugars: 2.26 g; glycemic index: 15;
41. Eggplant – Calories: 25 kcal; carbs: 5.88 g; fiber: 3 g; sugars: 3.53 g; glycemic index: 15; [19]

Calorie and macronutrient content of the main legumes (content per 100 g):

1. Boiled chickpeas – Calories: 164 kcal; Carbohydrates: 27 g; Fiber: 7.6 g; Sugars: 4.8 g; Fat: 2.6 g; Protein: 8.9 g; Glycemic index: 36;
2. Hummus (given the fat content, there are significant differences in terms of calories between different commercial hummus products) – Calories: 166 kcal; Carbohydrates: 14.3 g; Fiber: 6 g; glycemic index: 25;
3. Chickpea flour – Calories: 386 kcal; carbohydrates: 58 g; fiber: 11g; sugars: 11 g; glycemic index: 44;
4. Boiled lentils – Calories: 116 kcal; Carbohydrates: 20 g; Fiber: 7.9 g; Sugars: 1.8 g; Fat: 0.4 g; Protein: 9 g; Glycemic index: 35;
5. Boiled soybeans – Calories: 173 kcal; carbohydrates: 9.9 g; fiber: 6 g; sugars: 3 g; Fat: 9 g; saturated fat: 1.3 g; monounsaturated fat: 2 g; polyunsaturated fat: 5.1 g; Protein: 16.6 g; Glycemic index: 35;
6. Soy milk – Calories: 54 kcal; Carbohydrates: 5.68 g; Sugars: 4 g; Fat: 1.8 g: Protein: 3.3 g; Glycemic index: 30;
7. Tofu – Calories: 70 kcal; Carbohydrates: 1.7 g; Fiber: 0.9 g; Sugars: 0.6 g; Fat: 4.8 g; Saturated fat: 0.7 g; Monounsaturated fat: 1.1 g; Polyunsaturated fat: 2.7 g; Protein: 8 g; Glycemic index: 15;
8. Boiled kidney beans – Calories: 127 kcal; Carbohydrates: 22.8 g; Fiber: 6.4 g; Sugars: 0.3 g; Fat: 0.5 g; Protein:8.7 g; Glycemic index: 35;
9. Boiled peas – Calories: 84 kcal; Carbohydrates: 15.6 g; Fiber: 5.5 g; Sugars: 5.9 g; Fat: 0.4 g; Protein: 5.4 g; Glycemic index: 35;
10. Peanuts – nutritional composition per 28 g (approximately 28 pcs.) – Calories: 164 kcal; Carbohydrates: 6 g; Fiber: 2.2 g; Sugars: 1.2 g; Fat: 13.96 g; Saturated fat: 1.78 g; Monounsaturated fat: 6.9 g; Polyunsaturated fat: 4.41 g; Protein: 7.3 g; Glycemic index: 14
11. Smooth peanut butter (no added sugar, salt) – nutritional composition per 32 g (2 teaspoon serving): Calories: 188 kcal; Carbohydrates: 6.4 g; Fiber: 1.9 g; Sugars: 3 g; Fat: 16.12 g; Saturated fat: 3.29 g; Monounsaturated fat: 7.59 g; polyunsaturated fats: 4.44 g; Glycemic index: 14 [20].

Table 1. Nutritional values of vegetables and technical plants/100g

Name	Lipids (g)	Proteins (g)	Carbohydrates (g)	Calories	Vit. A* (UI)	Vit. C(mg)	Vit. E (mg)	Ca (mg)	Fe (mg)	K (mg)	Zn (mg)	Mg (mg)	Se (mcg)
Endive	0.1	0.9	4	18	5	2.8	–	19	0.24	26	0.16	10	0.1
Artichoke	0.15	3.2	10.5	52	2	12.5	0.15	44	1.25	90	0.48	60	0.25
Red pepper	0.3	1	6	29	**516**	**128**	**1.58**	7	0.43	26	0.25	12	0.1
Green pepper	0.17	0.8	4.64	21	62	**80.4**	0.37	10	0.34	20	0.13	10	–
Broccoli	0.4	2.8	6.6	37	104	**89**	0.8	47	0.7	66	0.4	21	2.5
Potato	0.1	2	17.5	76	–	20	0.01	12	0.78	57	0.3	23	0.3
Sweet potato	0.05	1.6	20.1	82	**2.3kUI**	2.4	0.26	30	0.6	47	0.3	25	0.6
Cucumber	0.16	0.6	2.16	12	12	3.2	0.03	14	0.22	21	0.17	12	0.1
Onion	0.1	1.1	9.3	41	–	7.4	0.02	23	0.2	29	0.17	10	0.5
Green onion	0.5	1g	5.7	28	**667**	13.4	0.21	52	0.51	25	0.2	16	0.5
Green thyme	1.68	5.6	24.4	128	**783**	**160**	–	**405**	**17.4**	106	1.8	**160**	–
Mushrooms	0.35	3.1	3.25	22	–	2.1	0.01	3	0.5	86	0.52	9	**10**
Cauliflower	0.3	1.9	5	28	–	**48**	0.08	22	0.42	44	0.27	15	0.6
Pumpkin	0.1	1	6.5	29	**1.2kUI**	9	**1.06**	21	0.8	44	0.32	12	0.3
Zucchini	0.4	2.7	3.1	25	82	34.1	–	21	0.8	93	0.83	33	–

Green beans	0.8	23.6	60	328	–	4.5	0.22	**143**	**8.20**	**407**	**2.8**	**140**	**5.9**
Sunflower	51.46	20.78	20	584	8	1.4	**35.2**	78	5.25	**660**	**5**	**325**	**53**
Fresh ginger	0.75	1.8	17.77	80	–	5	0.26	16	0.6	34	0.34	43	0.7
Kohlrabi	0.1	1.7	6.2	30	6	**62**	0.48	24	0.4	46	0.03	19	0.9
Horseradish	0.7	1.2	11.3	51	–	25	0.01	56	0.42	31	0.83	27	2.8
Lentils	1	25.8	61	345	6	4.4	0.49	56	**7.5**	**451**	**4.8**	**122**	**8.3**
Poppy seeds	41.56	17.99	28.13	525	–	1	**1.77**	**1.4g**	**9.76**	**870**	**7.9**	**347**	**13.5**
Green dill	1.12	3.46g	7	50	**1.3kUI**	**85**	–	**208**	**6.6**	66	0.91	55	–
Green peas	0.4	5.4	14.4	80	127	**40**	0.13	25	1.47	108	1.24	33	1.8
Carrot	0.24	0.9g	12.2g	50	**2.8kUI**	6	0.66	33	0.3	35	0.24	12	0.1
Mustard beans	36.24	26.08	28.09	508	5	7.1	**5.07**	**266**	**9.21**	**828**	**6.08**	**370**	**134**
Chickpeas	6	19.3	60.6	356	11	4	0.82	105	**6.2**	**366**	**3.43**	115	**8.2**
Parsley	0.3	1.2	18	74	–	17	**1.49**	36	0.6	71	0.6	29	1.8m
Eggplant	0.2	1.2	5.1	23	107	23.4	0.38	13	0.51	28	0.07	10	0.4
Green parsley	0.8	3	6.3	41	**1.4kUI**	**133**	0.75	**138**	**6.2**	58	1.07	50	0.1
Cantaloup	0.14	0.54	9.1	36	9	18	0.02	6	0.17	11	0.09	10	1.2
Watermelon	0.15	0.6	7.5	31	95	8.1	0.05	7	0.24	11	0.1	10	0.4
Leek	0.3	1.5	14.5	61	283	12	**0.92**	59	2.1	35	0.12	28	1
Radish	0.1	0.7	3.4	16	1	14.8	–	25	0.34	20	0.28	10	0.6
Tomato	0.2	0.88	3.9	20	139	13.7	0.54	10	0.27	24	0.17	11	–
Lettuce	0.3	1.2	3.2	18	**1.5kUI**	4	0.13	33	0.97	30	0.23	14	0.4
Pumpkin seeds	49.05	30.23	10.71	559	2	1.9	**2.18**	46	**8.82**	**1.23**	**7.81**	**592**	5.6
Flax seeds	42.16	18.29	28.88	534	–	0.6	0.31	**255**	5.73	**642**	**4.34**	**392**	**25.4**
Beetroot	0.17	1.6	9.6	42	5	4.9	0.04	16	0.8	40	0.35	23	0.7
Soybeans	20	36.5	30.2	438	3	6	0.85	**277**	**15.7**	**704**	**4.9**	**280**	**17.8**
Asparagus	0.12	2.2	3.88	22	126	5.6	**1.13**	24	2.1	52	0.54	14	2.3
Spinach	0.4	2.85	3.6	24	**1.6kUI**	28	**2**	99	2.7	49	0.53	79	0.3
Sesame	49.67	17.73	23.45	573	1	–	0.25	**975**	**14.5**	**629**	**7.75**	**351**	5.7
Celery leaves	0.17	0.7	3	16	74	3.1	0.27	40	0.2	24	0.13	11	0.4
Celery root	0.3	1.5	9.2	42	–	8	0.36	43	0.7	115	0.33	20	0.7
Garlic	0.5	6.36	33	155	1	31.2	0.08	**181**	1.7	153	1.16	25	**14.2**
Green cabbage	0.1	1.3	5.8	26	16	36.6	0.15	40	0.47	26	0.18	12	0.3
Red cabbage	0.16	1.4	7.37	32	20	**57**	0.11	45	0.8	30	0.22	16	0.5
Eggplant	0.2	1	5.7	26	4	2.2	0.3	9	0.24	25	0.16	14	0.3

*) The values written in green in the table represent a Top 10 of the products, depending on their importance in the respective column.

* Contain only carotenoids, but to facilitate comparison between foods and to make it easier to calculate the RDA, the carotenoid content has been converted to IU of retinol (preformed vitamin A).

Bold values are the highest

Source of data in the table: USDA report no. 24/September 2011 [19,20]

In addition to vitamins and minerals, carbohydrates and protein, many vegetables contain phytonutrients. Phytonutrients contain compounds that provide essential nutrients to protect the body against disease. Nutrition guidelines recommend consuming two servings of fruits and vegetables daily to maintain good health. There are six essential phytonutrients that are commonly found in plant foods.

Carotenoids [linear tetraterpenes (C_{40}) {$C_{40}H_{54}O_5$}] are yellow and orange pigments. They are powerful antioxidants that fight free radicals and prevent tissue damage in the body. Fruits such as apricots, cantaloupe, nectarines, peaches, oranges and vegetables such as pumpkin, carrots, bell peppers and orange tomatoes are good sources of vitamin A, which is necessary for eye, bone and immune health [21].

Ellagic acid [$C_{14}H_6O_8$] is found in red fruits and vegetables, such as strawberries, raspberries, watermelon, cranberries, pomegranates, beets, red cabbage, radishes. It acts as a cancer prevention tool, stopping the development of cancer cells [22].

Flavonoids [polyphenolic compounds with a 15-carbon skeleton (C6-C3-C6) characterized by two benzene rings (A and B) linked by a heterocyclic oxygen-containing ring (C); structure: 2-phenylchromen-4-one skeleton (3-phenyl-1,4-benzopyrone)] are of three types. Catechin [(2R,3S)-2-(3,4-Dihydroxyphenyl)-3,4-dihydro-2H-chromene-3,5,7-triol or $C_{15}H_{14}O_6$] is present in green tea. Hesperidin [$C_{28}H_{34}O_{15}$] is found in Wild garlic, scientifically called *Allium ursinum*. Flavonoids are found in apples, berries, pears, yellow peppers, turnips, beans, potatoes. These are antioxidants that reduce inflammation, to prevent chronic diseases, especially cancer [23].

Resveratrol (3,5,4′-trihydroxy-trans-stilbene or $C_{14}H_{12}O_3$) is a stilbenol that is stilbene in which the phenyl groups are substituted at positions 3, 5, and 4' by hydroxy groups; a polyphenolic dye, mentioned by specialists as the most powerful known anti-oxidant, anti-cancer and anti-inflammatory. It is found in eggplants, beets, red cabbage, black beans. Resveratrol, as studies have shown, has a positive effect on health and increases longevity [24].

Glucosinolates (GLSs) are (Z)-N-hydroxyminosulfate esters, having a sulfur-linked β-d-glucopyranose moiety and an amino acid-derived side chain and isothiocyanates (ITCs) common isomers of thiocyanates, which have the formula R−S−C≡N, are chemicals that act like antibiotics in the fight against bacteria, inhibiting the growth of cancer cells. These phytonutrients are found in cabbage, turnips, broccoli. The main benefit of glucosinolates is cancer prevention. Phytoestrogens are weak hormones that have an effect similar to estrogen. They are found in some foods, such as soy and its derivatives. Phytoestrogens reduce the risk of bone density loss and endometrial cancer. Phytonutrients are natural compounds produced by plants for protection that provide major benefits to human health, including antioxidant, anti-inflammatory, and anticancer effects. The richest vegetables are brightly colored ones, such as broccoli, carrots, spinach, and tomatoes. The main types include carotenoids (carrots), flavonoids (onions), sulforaphane (broccoli), and lycopene (tomatoes) [25].

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, vegetables are foods with high nutritional value. The assessment of nutritional status is the first, mandatory step in all situations where nutritional intervention is aimed, both for maintaining health and for obtaining it. Vegetables subjected to boiling increase their digestibility, due to the partial hydrolysis of cellulose structures. Raw, they contain simple natural sugars, in a matrix of dietary fiber, minerals, vitamins, phytonutrients, they quickly travel the digestive tract to the small intestine, where the simple sugars are directly absorbed, and the dietary fiber passes into the colon with beneficial effects. If they are associated with fats or starches (doughs, puddings, creams, etc.), this combination causes them to enter fermentation and putrefaction, also involving other foods in these processes. Vegetable products preserved by freezing have a very good quality compared to the same products preserved by other processes. In their case, the qualitative changes can be of a physico-chemical and microbiological nature. The physical changes are: structuro – texture, which becomes looser as a result of ice crystals that can break cell membranes in the case of the migratory recrystallization phenomenon, an increase in volume by 10 – 15% upon freezing and a reduction by 20 – 40% upon thawing. In terms of chemical content, during freezing, vegetable products lose a number of nutrients, especially vitamin C. Thus, the oxidation of vitamin C is more intense in green beans and cauliflower and slower in peas and broccoli. For mineral substances, the greatest losses are recorded in the preparation operations, during freezing and storage. Comparative studies have shown that, in the case of freezing, 2 – 3 times more niacin, thiamine, riboflavin and vitamin C are preserved.

Nutritional status management is aimed at the objective assessment of a person's nutritional status, as well as the early identification of pathological conditions influenced by eating behavior. It is important to note that any impairment of nutritional status is accompanied by increased morbidity and the appearance of complications that can lead to the aggravation of existing diseases. Most often, the alteration of nutritional status occurs due to the imbalance between the intake and the need for nutrients (proteins, lipids, carbohydrates, etc.). This can favor the appearance of malnutrition (insufficiency) or overweight/obesity (excess). In this sense, the assessment of nutritional status is an important condition that is used when necessary (as often as necessary) to prevent the appearance of diseases, as well as to objectively assess the effectiveness of measures taken

to remedy nutrition-related diseases. Nutritional status assessment involves the objective assessment of nutritional status, as well as the early detection of diet-related diseases, undernutrition, and nutritional deficiencies.

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CONFLICT OF INTEREST

The authors confirm that there are no competing interests or conflicts of interest to disclose.

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