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FUNCTIONAL FOODS COLORFUL

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Abstract: Functional foods and functional seasonings are those that have beneficial bioactives to our body, strengthening and making it protected against various types of diseases, especially non-communicable chronic diseases (NCDs). So let's evaluate why functional foods are colorful and why the more colorful the dish, the healthier it is. The bioactives present in functional foods are responsible for their color and with that we already know which bioactives are present in greater proportion in each type of food and thus be able to combine them in the references. This type of evaluation will provide combinations of everyday functional foods that are delicious, easy to prepare and low or not high cost. Bringing as a fundamental benefit the rapid increase in the body's immunity; which will certainly help in the fight against diseases.

INTRODUCTION

Why are foods colorful? Functional foods are colored according to the types of bioactives present in them and therefore can also be classified by their color. Information about the type of bioactive present in funicon foods will allow their use and therefore contribute to human health and society's well-being; especially with the natural aging of the population. A healthy diet will greatly contribute to the absorption of bioactives, nutrients and consequently the medications that are being used, whether for continuous use such as for blood pressure, cholesterol, triglycerides and diabetes, for example, in addition to others normally used in people by have non-communicable chronic diseases (NCDs).

Flavonoids are a class of bioactives that are extremely beneficial to our health, as they contribute to maintaining proper brain function and better blood flow.

In addition to bioactives, functional foods also have in their composition extremely important metals in our health, such as: Iron, Manganese, Magnesium, Calcium and Zinc, among others that have fantastic properties in our body.

Functional foods are classified as those that nourish and can also help prevent or postpone the onset of diseases by having specific bioactives that are highly beneficial to our health. These compounds are able to act in our organism in a positive and beneficial way according to their specific actions. As an example, there are the actions of antioxidants present in fruits such as tomatoes, which is lycopene; in the grape that resveratrol and in cinnamon, which is the cinnamic aldehyde, among others. These antioxidants, when ingested regularly, help to reduce the oxidative stress normally generated in our body and, consequently, the generation of free radicals, as free radicals are responsible for triggering a series of diseases and disorders in our body, ranging from small inflammatory processes in the veins, such as diabetes and even cancer.

So understanding a little why functional foods are colorful. Functional foods can be classified by their color, which will be exemplified below:

A) WHITE

This color includes garlic, onion, leek, cucumber, mushrooms, cauliflower, apple and melon, white cabbage. White foods contain photochemicals like **inulin**. This natural bioactive is associated with the prevention of cardiovascular accidents and strokes. Despite these different characteristics, these foods are also depurative due to the amount of sulfurous compounds that are natural anti-inflammatories. In addition, they have a low amount of sodium and a high water content, which favors diuresis. And, thanks to dietary fiber, they help regulate bowel function, blood sugar and cholesterol. These foods also contain

B vitamins and flavonoids that act to protect our body's cells and improve its immunity.

Exemplifying:

Garlic: It has antioxidants that can boost the immune system, improving flu, for example. In addition, it also contains Allicin, an important bioactive for memory. It has antifungal and anti-inflammatory properties.

Onion: It has anti-inflammatory action due to the presence of **quercetin**, as this bioactive relieves the discomfort of arthritis, reduces the risks associated with cancer, heart disease, diabetes, and increases immunity.

Mushrooms: they are low in calories, contain no fat or cholesterol, and are gluten-free, in addition to having a very low sodium content, almost zero. In addition, they are rich in selenium, potassium, riboflavin, niacin and vitamin D.

Cauliflower: Contains sulfur compounds that are associated with protecting against cancer, strengthening bone tissue, and maintaining healthy blood vessels.

B) YELLOW

When you think of yellow foods, fat may not be the first thing that comes to mind. However, certain types of unsaturated fats, such as fatty acids: **omega 3 and omega 6,** they are essential for life and must be consumed, as they have extremely beneficial actions for the body in general and for the brain. These fats are important for proper growth in children, healthy skin, and helping to regulate cholesterol and glucose levels.

Fat in foods (which are fat-soluble) is also required for the transport and absorption of fat-soluble vitamins A, D, E, and K, as well as carotenoids. Omega 3 and 6 fatty acids help reduce the risk of heart disease and promote brain and vision health. Thus, the more frequent consumption of fish such as salmon, mackerel, tuna, cod and trout are especially rich in these beneficial fats and have the correct EPA and DHA ratio for the benefits in our body.

Flaxseed and oilseeds are great sources of omega fatty acids, in addition to lime and Sicilian lemon, which also have these nutrients. Corn is also part of this food color and has **zein** which is a corn gluten protein and is rich in fiber. Eggs contain lutein and zeaxanthin, and betacryptoxanthin in papaya, mango and tangerine These bioactives have anti-inflammatory action and are important in controlling blood pressure. Other examples are pineapple, which has a diuretic action, melon, carambola, yellow pepper and lime orange. They have excellent antioxidants and help control various diseases.

C) ORANGE

Fruits and vegetables that are orange in color have bioactives that, among many benefits, help maintain healthy skin in addition to strengthening the immune system. Examples include carrots, pumpkins, mangoes, citrus fruits, peaches, among others. All these types of food contain a powerful antioxidant called **beta carotene,** which is known to nourish and protect the skin, so much so that it is used in the cosmetic area in tanning products. It also contains potassium, folic acid and vitamin C, which is a powerful antioxidant that helps with iron absorption and the immune system. Thus, an orange juice, a salad with carrots are important for health benefits and also help to carry iron into the blood, and act beneficially when the patient has iron deficiency anemia. Orange foods are also rich in vitamin A, this vitamin plays an important role in helping vision, preventing diseases such as cataracts and muscle degeneration.

D) RED

This group is composed of foods such as

tomatoes, a great source of **lycopene**, this bioactive is a powerful antioxidant that acts in the body's defense against prostate and cervical cancer, in addition to tomatoes, there is red pepper, Strawberries, watermelon, raspberries, among other red fruits such as plums, are essential for good nutrition. These foods also contain in their composition vitamin C, magnesium and other types of phytochemicals, which prevent various types of cancer and help reduce the risk of diseases of the urinary system. Red foods also act to protect against various diseases and stress.

Red Apples: This fruit is extremely rich in vitamin C and potassium. In addition to having a high content of soluble fiber, pectin, which fights cholesterol. And therefore, it acts strongly in protecting the heart, preventing the development of cardiovascular diseases and clogging of the arteries.

Strawberry: This fruit is an excellent source of antioxidants. In addition to anthocyanin, ellagic acid and lycopene, this fruit has catechin and delphinidin, which are two phenolic compounds that enhance action against free radicals. Due to this antioxidant, strawberry is one of the fruits that most favors skin rejuvenation. Catechin still assists in strengthening the body's immunity. It is rich in soluble fibers, which help reduce cholesterol. This is because when digested, these fibers form a gel that binds to fats and which are eliminated in the fecal cake.

E) PURPLE

Foods that have this color are rich in ellagic acid, which fights aging and lowers the risk of various types of cancer. To this group belong: red onion, red cabbage, beet, eggplant, blueberry, plum, fig, blackberry or black grape. Its main bioactives besides ellagic acid are **anthocyanins**, are rich in this component in addition to the **antioxidants and phytochemicals**. As an example of strong antioxidants there is the **beta carotene** which assists in improving vision; **resveratrol** present in grapes and red wine, and the **anthocyanins**, that can act both in glycemic control and in the improvement of insulin resistance, in addition this class of compounds have antioxidant effects, **anti-inflammatories** and still act in weight control, which can facilitate the regulation of fatty cells. Some foods for daily use are specified below:

Purple lettuce: purple leaves help in the prevention and treatment of various types of cancer, and also act in improving the health of the skin and hair.

Plum: It is rich in minerals and vitamins C and E, helps control blood sugar, triglycerides and cholesterol. Plum juice is a powerful antioxidant and, combating premature aging, acts on the respiratory system, improving it and on the digestive system..

Sweet potato: Rich in fiber, sweet potato helps both digestion and cholesterol control. It's great to be consumed before physical exercises. And because it has a low glycemic index, it does not generate glucose spikes.

Eggplant: It is rich in anthocyanins and very important in weight loss diets because in addition to containing saponin (helps to break down fat molecules) it also prevents its absorption by the body. It is also important for reducing blood glucose.

Purple Onion: The purple onionhelps increase the production of allicin and alliin, enzymes that fight cholesterol.

Jabuticaba: It is a fruit that has fiber and vitamins in its skin, such as vitamin C and B complex vitamins, phenolic compounds that are essential for health and also help to combat blood glucose.

Blueberry: It is a fruit that contains vitamins A, B, C, E and K, minerals such as potassium, calcium, magnesium and

phosphorus. It is also rich in antioxidants, such as anthocyanin, which is very important in controlling blood glucose and prevents various types of cancer.

Purple cabbage: low in calories, great source of vitamin C and rich in fiber. It helps to strengthen the immune system and, because it contains selenium, favors healthy skin. It is also healing and fights flu and colds. Red cabbage is high in vitamin C and phosphorus.

Grape: It has a great antioxidant that is resveratrol and is rich in vitamins C and complex B, it also has potassium and carotenes. Helps prevent and improve uric acid, constipation, bronchitis and high blood pressure.

GREEN

Green is the most abundant color in nature. This color is present in artichokes, chard, watercress, arugula, lettuce, broccoli, kale, spinach, asparagus, kiwi, avocado, green peppers, etc. They are foods rich in magnesium, which favors muscle relaxation and decreases the feeling of fatigue; folic acid, important during pregnancy for the baby to grow properly; also have **lutein** and the **terpenoids** that are **antioxidants** strong and very beneficial to the body in general; still have dietary fiber and **potassium** and the **vitamins A, E and C**, that improve digestion, prevent constipation and cardiovascular diseases and have a very strong antioxidant action, helping to prevent various diseases. Especially kale, which has several fibers, iron, potassium, magnesium, manganese, calcium, beta-carotene, and several vitamins such as vitamin C. The large amount of oxidants present in green foods has the power to minimize the effects of free radicals that exist freely in our organism and can injure or kill our cells, causing their oxidation. The result of this process can be both premature aging and the onset of various diseases such as heart disease, atherosclerosis, diabetes and even cancer. Also considering the phytonutrient properties, these foods have the power to strengthen our immune system and fight damage from radiation and ultraviolet light.

F) BROWN

Brown colored foods are rich in fiber, good fats and B vitamins, and vitamin E. These constituents are found in whole wheat bread, cereals and whole pasta, these foods are richer in fiber which is usually this color. The insoluble fiber found in wheat bran, corn bran, fruit and vegetable skins and whole grains can help maintain a healthy digestive tract and reduce the risk of some types of cancer. In addition, they promote a good intestinal flow and health for the microbiota, which is very important considering that the intestine is our second brain, and therefore it must function properly to avoid various types of diseases.

Another type of dietary fiber is called betaglucan. This component can also be found in foods such as cinnamon, oat bran, oat flour, linseed, chia, barley and rye and yacon potatoes. Foods containing beta-glucan may reduce the risk of heart and coronary disease and lower blood glucose.

With special attention on Nuts - this spice has anti-inflammatory, anti-fungal actions and has several important bioactives for glycemic control.

FINAL CONSIDERATIONS

For a complete and healthy diet we must pay attention to the color of the FOODS we eat.

Grouping foods has been done for centuries, so group foods of red, green, purple and brown colors, as they have various types of flavonoids; which are very beneficial to health. How to combine, example: red fruits, oregano, grapes or red wine, nuts, almonds,

are excellent sources of flavanoids.

The more color there is on your plate, the more types of bioactives, which help fight free radicals, will be ingested, as each food offers us at least one different type of antioxidant. The ideal is to achieve at least 3 to 4 different colors in the main meals such as breakfast, lunch and dinner. Not forgetting hydration and exercise whenever possible, if it's daily, it will be excellent.

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