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# Nutrition and diet in breast cancer

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**Annotation:** Breast cancer is the second most common cancer in the world after lung cancer. The urgency of the problem of oncological diseases is determined by a set of social, economic and epidemiological indicators. Among the prevalent oncological diseases worldwide, breast cancer, which is prevalent among women, remains one of the most pressing problems.

**Keywords:** breast cancer, menopause, nutrition, nutrigenomics, protein, leucine, hormone therapy, tamoxifen, estrogen, metastasis, milk, soy, diet, puberty, phytochemicals, phytoestrogens, flavonols, flavonoids, carotenoids.

Breast cancer is a life-threatening disease that threatens the lives of thousands of people. Every year, thousands of women hear this horrible diagnosis. According to statistics, one in ten women worldwide is diagnosed with breast cancer. More than 1.5 million women die each year from the disease.

A number of risk factors have been identified in different countries to help explain the incidence of breast cancer. Interestingly, most of the risk factors are related to nutrition. For example, obesity, alcohol consumption, childbirth, weight gain, height, onset of puberty, and menopause are among them.

Nutrition is the process by which food is received and used by the body to grow, keep the body healthy, and replace tissues. A healthy diet includes adequate intake of foods and fluids that contain essential nutrients such as vitamins, minerals, proteins, carbohydrates, fats and water. Nutrition therapy helps cancer patients maintain a healthy body weight, maintain strength, keep body tissues healthy, and reduce side effects during and after treatment.

A growing field of research called Nutrigenomics summarizes all of the above: nutrition affects the genome to such an extent that a detailed understanding of this interaction is essential to help prevent health disorders and treat diseases. Nutrigenomics can determine how genetic changes and epigenetic changes, i.e., modifications not related to changes in DNA sequence at the gene level, affect the nutrient requirements that control gene expression, as well as the response to nutrients. Such an understanding is especially important for several types of cancer that are affected by nutrition for development or recurrence.

Breast cancer is one of the types of cancers that are related to diet, mainly due to the risk of overweight and alcohol consumption in postmenopausal women.

Cancer and cancer treatment affects taste, smell, appetite, and the ability to consume adequate amounts of food or absorb nutrients from food. This can lead to malnutrition, a condition that results from a lack of essential nutrients. Alcohol abuse and obesity can increase the risk of malnutrition.

Malnutrition can lead to the patient becoming weak, tired, and unable to fight infection, or not being able to complete cancer treatment. If the cancer grows or spreads, poor nutrition can make the patient's condition worse.

Consuming the right amount of protein and calories is beneficial and is important to fight infection and have enough energy. Animal proteins contain more amino acids leucine than plant proteins, and they support the beneficial effects of the drug used in basic hormone therapy.

Reducing consumption of meat, fish, and dairy products can help breast cancer adapt to basic hormone therapy medications and reduce the likelihood of recurrence or spread of the disease.

Researchers at Harvard Medical School have found an "unexpected" link between leucine and tamoxifen, a nutrient found in large amounts in animal protein, with cancer-resistant tumors. The results should be medically investigated, but they mainly indicate a continuation of the diet with plant proteins high in leucine, which may effectively maintain the effects of tamoxifen for a long time.

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Four out of five patients with breast cancer are sensitive to the growth signal of the female hormone - estrogen. Tamoxifen is used to block these signals and prevent the disease from spreading or metastasizing to other parts of the body. Life expectancy is naturally not long in patients who are resistant to tamoxifen, i.e., who have low exposure to tamoxifen. “Typically, they don’t live more than 5 years because they have limited treatment options,” said Dr. Sentil Mutuswami, one of the authors of the Israel Medical Center study.

“Studies show that a diet low in leucine levels may be beneficial for patients with breast cancer,” says Dr. Mutkhusvami. Such a diet could logically begin with a reduction in meat and dairy consumption, as “animal protein contains more leucine than vegetable protein,” he says.

It should also be noted that soy and nuts are also rich sources of leucine. Different forms of proteins, which can be rich sources of some leucine, are an integral part of a healthy diet, allowing our cells to perform their vital functions.

British scientists have stated that milk can significantly increase the risk of developing cancer. Women who consume milk are 80% more likely to develop breast cancer. Gary Fraser, MD, of the University of Loma, told the Express.

The researchers studied the medical data of more than 50,000 women over an eight-year period. The age of the patients, their reproductive functions, preferences of what they prefer in food, harmful habits, as well as physical activity were studied. Milk consumption was found to lead to the development of breast cancer in 1,057 women. Initially, doctors looked for a link between the onset of the disease and soy consumption, but research has shown that the cause of cancer is milk consumption. “Research has shown that daily consumption of milk, even in small amounts, can increase the risk of breast cancer by 80%,” said one scientist. According to experts, such an effect may be due to natural stimulants in milk that promote cell growth and division. The scientists noted that such findings require further research, and that there are conflicting data showing that, for example, consumption of milk yogurt reduces the risk of cancer, while consumption of cheder cheese, on the contrary, leads to an increase.

There are also antique methods that allow you to avoid certain types of cancer. Here, for example, adolescent girls are advised to eat more cabbage: then they will not have breast cancer. At the age of 12-13 years, sexual maturation occurs in the body of girls and breasts are formed. Cabbage contains a substance that programs the work of sex hormones. As a result, the development of breast cancer is reduced. This cancer is due to sex hormones. However, cabbage is considered a useful product throughout human life. In the process of preparation and grinding, cabbage forms indole and isothiocyanates - powerful anti-cancer agents. In addition, not only ordinary cabbage is useful, but also its relatives in the family - radish, turnip, radish. They protect not only breast cancer, but all hormone-dependent tumors.

The product consumed in breast cancer affects weight, and obesity increases the likelihood of breast cancer. If you already have the disease, being overweight can also increase your chances of having it again. If you choose a healthy diet rich in vegetables, whole grains, chicken and fish, you may increase your chances of living longer after breast cancer.

Soy-based products — tofu, soy milk, and edamame — contain chemicals called estrogen-like phytoestrogens. This has raised concerns that estrogen, once used as a fuel for growth, has become a problem for women with breast cancer. However, recent research shows that soy does not increase the risk of cancer — it may reduce the chance of the disease coming back. However, beware of shadow additives, scientists have not studied their action enough.

The idea that sweets “feed cancer” has been around for a long time. The truth is more difficult. Removing the edge of coffee does not lead to accelerated growth of cancer cells. But it's a wise move to watch how much sugar you add to your diet. Eating too much sugar on a regular basis can lead to obesity and other cancer-aggravating conditions.

If you eat more plant-based foods, you can reduce your chances of getting breast cancer. The researchers note that this strategy helps protect against the most aggressive types of tumors in particular. Fruits and vegetables are also an important part of the diet, which helps you control your weight and prevents the recurrence of breast cancer.

If you add unprocessed wheat, rye, oats, corn, bell peppers, rice and barley to your diet, you will be less likely to get breast cancer. These foods contain nutrients called phytochemicals that reduce the chance of the disease recurring.

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The best diet for breast cancer is to limit saturated and trans fats found in foods such as beef, butter, cheese, ice cream, fried foods, and industrial baked goods.

If you eat a lot of whole grains, fruits, vegetables and legumes, it is good for your health, especially for your blood sugar, heart and digestive system. Some studies show that such a diet reduces the chances of breast cancer. In particular, it helps protect against the aggressive type of tumor.

Add salmon, oysters, herring, mackerel, and sardines to your diet in addition to fruits and vegetables, grains, and legumes. You can also add yogurt, orange and beet juice to the diet.

Chemicals found in some plants may reduce the risk of breast cancer. The evidence relates to two specific chemicals, flavonols and flavonoids, which are the most potent chemicals, especially for postmenopausal women. Flavonols can be found in onions, broccoli, and green tea. This is another type of phytochemical in plant foods that has been linked to a reduced risk of breast cancer. You can get it from orange, yellow, and dark green vegetables and fruits.

Fruit consumption is associated with a lower risk of breast cancer. A meta-analysis combining the results of 15 studies found that women who ate the most fruit had a slightly lower risk of breast cancer than women who ate less fruit.

A pooled analysis of data from 20 studies found that women who ate the most vegetables had a lower risk of estrogen receptor-negative breast cancer (but not estrogen receptor-positive breast cancer) than women who ate fewer vegetables.

Carotenoids are natural orange-red food pigments found in fruits and vegetables, melons, carrots and sweet potatoes.

Dietary foods containing carotenoids may reduce the risk of breast cancer. A pooled analysis of data from 18 studies showed that a diet rich in carotenoids was associated with a reduced risk of estrogen receptor-negative breast cancer (but not estrogen receptor-positive breast cancer).

Add more carrots, zucchini, squash, spinach, kale, sweet potatoes, and melons to your diet. All nutrients must be in the form of food. Carotenoids in supplement form can be hazardous to health.

Исследования показывают, что каротиноиды снижают риск рака молочной железы и в некоторых случаях замедляют рост опухоли.

Add more garlic, green tea, soy and flaxseeds, fruits and vegetables, broccoli, cabbage, tomatoes, eggplant, cucumbers, and watermelons to your diet.

All breast cancer patients are advised to eat a healthy and balanced diet during and after their illness. Activity, a balanced diet, and healthy lifestyle choices can be beneficial physically and mentally at any point in life.

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