



## Influence of Food Intake and its Impact on Immune System

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### DESCRIPTION

People frequently look for specialized meals or vitamin supplements that are thought to strengthen immunity during flu season or times of illness. Citrus fruits, chicken soup and tea with honey are a few examples of common foods that include vitamin C. However, not simply nutrition and especially not any one particular food or vitamin can have a significant impact on the design of our immune system. But the best way to prepare the body to fight infection and disease is with a balanced diet rich in a variety of vitamins and minerals together with healthy lifestyle choices like getting enough sleep, exercising regularly and reducing stress.

A system called adaptive or acquired immunity develops the ability to identify pathogens. Our body's cells and organs including the lymph nodes, spleen, thymus and bone marrow control it. When a foreign substance enters the body these cells and organs produce antibodies, which trigger the growth of immune cells that are tailored to target and eliminate the dangerous substance. When a foreign substance enters again our immune system adapts by memorizing it so that the antibodies and cells are significantly more effective and swift to annihilate it.

Antigens are substances that the body recognizes as alien and dangerous and that do so by activating immune cells. One category of antigen is an allergen, which includes things like pet hair, dust and grass pollen. Antigens can trigger a hyper-reactive reaction that releases an excessive number of white blood cells. Antigen sensitivity varies greatly across individuals. For instance, a sensitive person with a mild allergy experiences wheezing and coughing symptoms, whereas other people do not experience these symptoms.

### Things that can weaken our immune system

**Age:** The thymus and bone marrow, which create immune cells necessary to combat infections, become less active. Micronutrient deficits are sometimes linked to ageing, which could make a decline in immune function worse.

**Weight gain:** Low-grade chronic inflammation is linked to obesity. Adipocytokines which are produced by fat tissue can encourage inflammatory processes. However, obesity has also been linked to an increased chance of contracting the flu, probably because it affects the way T-cells a kind of white blood cell function.

**Poor diet:** The development and function of immune cells and antibodies can be hampered by malnutrition or a diet deficient in one or more nutrients.

### Food intake to boost the immune cells

All cells including immune cells depend on adequate food intake as part of a balanced diet for health and function. It's conceivable that certain dietary habits can better prepare the body for microbial assaults and excessive inflammation but specific foods are unlikely to provide more defense. Numerous micronutrients are necessary for each stage of the body's immunological response. Vitamin C, vitamin D, zinc, selenium, iron and protein are some examples of nutrients that have been found to be essential for the development and operation of immune cells. They can be discovered in a wide range of plant and animal diets.

A healthy immune system can be adversely affected by diets that lack diversity and are lower in nutrients, such as those that are predominantly made up of ultra-processed meals and lack minimally processed foods. In addition, it is thought that a Western diet heavy in red meat, refined sugar and low in fruits and vegetables might cause beneficial intestinal microbes to become disrupted leading to chronic gut inflammation and the ensuing suppression of immunity.

Probiotic foods include kefir, yoghurt containing live, active cultures, fermented vegetables, sauerkraut, tempeh, kombucha tea, kimchi and miso.

Examples of prebiotic foods include garlic, onions, leeks, asparagus, Jerusalem artichokes, dandelion greens, bananas and seaweed. To obtain dietary prebiotics one should consume a range of fruits, vegetables, legumes and whole grains.

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**Received:** 02-Aug-2022, Manuscript No. JNDT-22-17994; **Editor assigned:** 05-Aug-2022, PreQC No. JNDT-22-17994 (PQ); **Reviewed:** 19-Aug-2022, QC No JNDT-22-17994; **Revised:** 26-Aug-2022, Manuscript No. JNDT-22-17994 (R); **Published:** 2-Sep-2022 DOI: 10.35248/2161-0509.22.12.197.

**Citation:** Chuey C (2022) Influence of Food Intake and its Impact on Immune System. J Nutr Disorders Ther. 12:197.

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Zinc, selenium, iron, copper, folic acid and vitamins A, B6, C, D and E deficiencies can affect immunological responses. These nutrients assist the growth and function of immune cells as well as the production of antibodies which all work to strengthen the immune system. They also act as antioxidants to safeguard healthy cells. Poor nutrition increases the likelihood of bacterial, viral and other infections. Deficits in essential nutrients can be avoided by eating a high-quality diet as suggested by the Healthy Eating Plate. However, there are some groups and circumstances

where it is impossible to consistently eat a range of nutrient-dense foods or when nutrient needs are higher. A vitamin and mineral supplement may help replace dietary deficits in these situations. Vitamin supplementation can enhance immunological responses in these groups. Groups at risk include low-income households, pregnant and lactating mothers, young children, the critically ill and babies and toddlers.