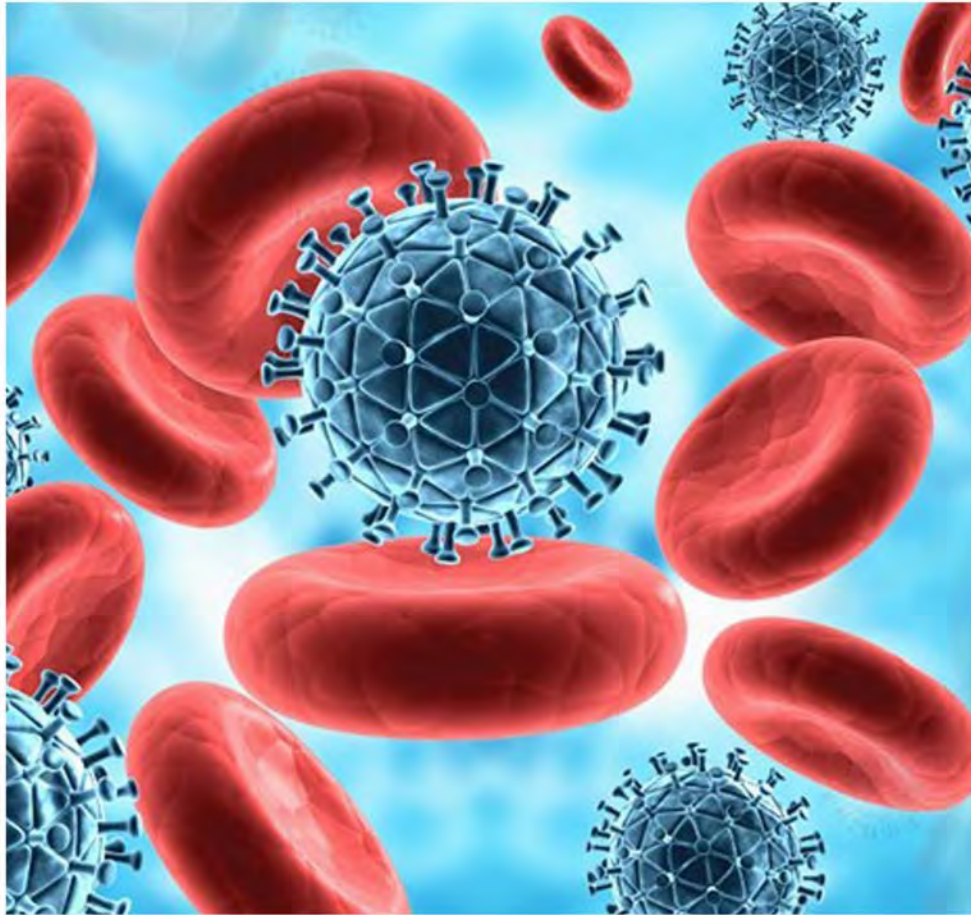




Nutrition and Immune System

Objectives

- A brief description about different types of immune systems in the human body
- The importance of nutrition to boost your immune system
- A list of key vitamins and minerals enhancing immunity
- A recipe



The Immune System

<https://gilbertlab.com/immune-system/>

The Immune System

- The Immune system protects the human body against different types of microbes such as bacteria, fungi, viruses and toxins. The immune system involves a variety of organs, cells, and proteins working together.
- And there are 2 types of immune system:
 1. Innate immune system
 2. Adaptive immune system

Innate Immune System

- It is like the first line of the protection against microbes. It is composed of skin, the cornea of the eye, and the mucous membrane that lines the respiratory, digestive, and genitourinary tracts
- This is a physical barrier that helps to protect the cells and organs against microbes
- The Immune system keeps the body safe against different types of microbes

Adaptive Immune System

- It assists the innate immune system and is responsible for creating specific proteins called antibodies that defend the body against certain types of microorganisms. After the first exposure of antibodies against microbes, it can help immune system to recognize the invader while its exposure in the body again.



https://www.flaticon.com/premium-icon/healthcare_4882985?related_id=4882985



The Role of Nutrition and Immune System

<https://khni.kerry.com/news/what-are-immunomodulators-how-do-they-work/>

Nutrition and Immune System

- Researchers show that having a balanced diet containing various types of nutrients can help to boost the immune system
- It is suggested that all people consume different types of nutrients which can boost the immune system; therefore, having a balanced diet is important as it can assist in preparing the body to fight different types of microbes

Nutrition and Immune System

- While westernized diets often contain high amounts of sugar, red meat, and processed food compounds, it is not surprising that these foods can harm the immune system. This can lead to a reduction in the immune system's ability to protect the body against microbes



https://www.flaticon.com/free-icon/diet_706195?term=nutrition&related_id=706195



Important Vitamins for Boosting Immune System

<https://www.eatright.org/food/vitamins-and-supplements/types-of-vitamins-and-nutrients/how-vitamin-c-supports-a-healthy-immune-system>

Vitamin C

- It is a water-soluble vitamin
- It can act as an antioxidant in the body
- Vitamin C is a crucial vitamin for growth and it can play a crucial role in the immune system
- Sources of vitamin C: In citrus fruits and in vegetables such as green pepper, tomato juice, strawberries, kiwi, oranges and grape fruits, papaya and cantaloupe



<https://www.wellcurve.in/blog/vitamin-c-rich-foods-fruits-vegetables/>

Vitamin A

- It is a kind of lipid-soluble vitamin
- Vitamin A is a key component of the immune system, which influences the host's ability to fight off infection. Therefore, it is recommended to include a variety of nutrients in your diet
- Sources of vitamin A: liver, milk, sardines, egg, cheese, tune, cod liver oil, cooked spinach, carrots, collards, raw carrot, cantaloupe



<https://holistickenko.com/vitamin-a-benefits-sources-toxicity/>

Vitamin D

- It is a kind of fat-soluble vitamin
- There are various articles which demonstrate vitamin D's role in immune function, infections and autoimmune diseases
- Sources of vitamin D: salmon, cod liver oil, fortified milk and yogurt, egg yolk, cheese and tuna fish
- The skin exposed to the sun can also assist in the production of vitamin D from cholesterol in the body

Fun Facts about Vitamin D

- Nowadays, some of fruit juices, breads and breakfast cereals are fortified with vitamin D
- Vitamin D is heat stable, so it does not lose its effectiveness during processing, storage, or cooking



<https://zinzino.blog/why-is-vitamin-d-necessary/>

Vitamin E

- It is a kind of fat-soluble vitamin
- It is a kind of significant lipid-soluble antioxidant that keeps the body safe against the free radicals
- The sources of vitamin E: It can be found mainly in plant food products such as nuts, food made from nuts, plant oils such as sunflower oil, wheat germ oil, canola oil, corn oil, etc. and seeds



<https://www.healthifyme.com/blog/vitamin-e-benefits/>

Zinc

- It is an important mineral which plays a key role for the immune system, cellular growth and differentiation, and in antioxidant defense
- Sources of zinc: Red meats (especially organ meat), seafood (especially oysters and mollusks); however, other sources of zin can be poultry, pork and dairy products
- Whole grains and legumes can be a moderate source of zinc



<https://lepivits.be/en/blog/health-wellness/7-signs-that-you-are-zinc-deficient>

Selenium

- It is a kind of important mineral
- It can be involved in the function of different types of enzymes involved in antioxidant defenses
- It can play a fundamental role as a defense against the oxidative stress and it can help to improve the effectiveness of the immune system. The amount of selenium can be dependent on its soil concentration in different parts of the world



<https://www.hsph.harvard.edu/nutritionsource/selenium/>

Selenium cont'd

- The richest sources of selenium can be found in the organ meats (like muscle meats) and seafood
- Fruits and most vegetables are typically poor sources of the element; however, some plants, such as wheat, broccoli, onions, asparagus, cabbage, and garlic, hyperaccumulate selenium from the soil, and thus may provide significant amounts
- The selenium content of cereals varies from less than 10 μg to over 80 $\mu\text{g}/100\text{ g}$ based on the selenium content of the soil in which the cereals were grown



<https://depositphotos.com/47311605/stock-photo-fresh-ingredients-for-cooking.html>

The Recipe



<https://food-guide.canada.ca/en/recipes/red-lentil-mushroom-soup/>

Red Lentil and Mushroom soup

- Prep Time: 15 minutes
- Cook Time: 30 minutes
- Servings: 6
- The ingredient list is on the next slides

The Ingredients:

- 10 mL (2 tsp) extra virgin olive oil
- 250 mL (1 cup) red lentils, rinsed
- 750 mL (3 cups) sodium reduced vegetable broth
- 500 mL (2 cups) water
- 2 mL (1/2 tsp) grated lemon rind
- 30 mL (2 tbsp) fresh lemon juice
- 75 mL (1/3 cup) crumbled light feta cheese (optional)
- 1 pkg (227 g/8 oz) mushrooms, chopped
- 1 onion, chopped
- 1 carrot, chopped
- 60 mL (1/4 cup) chopped fresh parsley
- 15 mL (1 tbsp) dried oregano leaves
- 10 mL (2 tsp) dried thyme leaves
- 1 mL (1/4 tsp) hot pepper flakes

Direction

- In a large pot, heat oil over medium-high heat and cook mushrooms, onion and carrot for about 5 minutes or until liquid evaporates from the mushrooms. Stir in parsley, oregano, thyme and hot pepper flakes and cook for 1 minute.
- Add lentils and stir to combine. Add broth and water; bring to the boil. Reduce heat, cover partially and cook stirring occasionally, for about 20 minutes or until lentils are soft and falling apart.
- Stir in lemon rind and juice. Ladle into bowls and sprinkle with feta cheese, if using.

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