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## Role of diet in the reduction of coronavirus infection: A review

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### Abstract

In the present scenario, all people are worried about coronavirus and its infection. The coronavirus is mainly spreading from Wuhan city of central China. Now a days many countries are affected by this virus. People have to control the risk of infection by wearing a mask, using sanitizers and also have to maintain proper immunity. Because coronavirus effects on human immunity and decreases the immune power. Still now there is no medicine to prevent or cure the infected person. So this article provides some information about infection of coronavirus and its prevention of risk by diet.

**Keywords:** Coronavirus, immune-boosting foods, minimize the risk infections, anti-oxidant, human immunity, vitamin-C and  $\beta$ -carotene, diet

### Introduction

The coronavirus is mainly spreading from Wuhan city of central China. Now a days many countries are affected by this virus. Approximately 24.8 M cases of coronavirus disease (COVID-19) and 838K deaths were reported until 29/08/2020. India has Approximately 3.46 M cases of coronavirus disease (COVID-19) and 62,550 deaths were reported until 29/08/2020 [2] but it's unclear the future path of that virus. Still now there is no vaccine for this virus so, people have to reduce risk infection.

### Symptoms of coronavirus

The largest number of patients infected with the virus will suffer from common cold and flu although few will appear to be asymptomatic. 80 percent of patients may have mild symptoms of the disease. The adult has the best immune capacity to fight the infection but the demerit is that the infection is more likely to be spread.

Bendix (2020) studied on 144 cases at Wuhan University's Zhongnan Hospital reported different types of mild to severe symptoms, contributing to a disease known as coronavirus and found that 99% of cases are suffered from severe high-temperature fever, half of the cases are suffered from fatigue and dry cough and 1/3 cases are suffered from severe dry cough and breathing problems [3].

Data from the Chinese CDC shows that approximately 80% of cases of corona virus are mild, approximately 15% of patients have extreme cases and 5% have been severely ill. A regular examination of coronavirus symptoms shows how symptoms are improving among normal patients, and how symptoms are the among unusual patients. High fever, dry cough, chest pain or discomfort such as trouble breathing, confusion and bluish lips or face these are typical coronavirus symptoms [4]. The coronavirus is a group of coronavirus, which lead to a range of mild to severe symptoms [2].

### Infection control and other precaution

This virus is mainly spread from one people to another people by touching and close contact (3-6 feet) to infected person. Still now researchers are trying to learn precisely how this virus does spreads from person to person. So people have to control infection by maintaining some precaution.

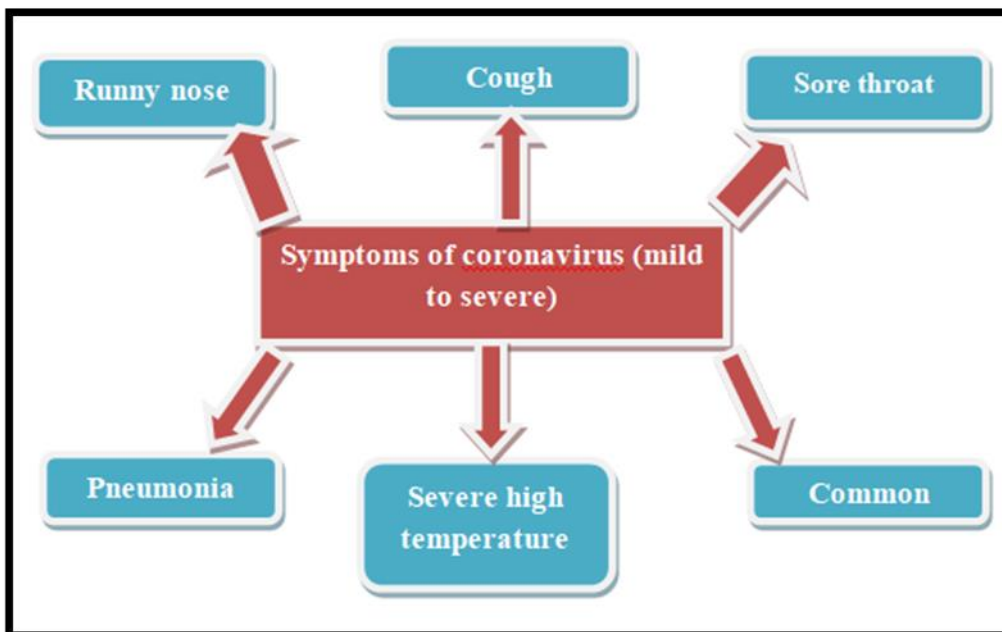
- All people have to practice respiratory hygiene by using a mask (covering the mouth and nose) during sneezing and coughing.
- After using mask, people should clean and wear clean mask.
- People have to avoid direct contact of infected person's body fluids, particularly oral or respiratory secretions and stool. People should use disposable gloves and eye protection to

prevent or control spreading during handling infected body fluid.

- Infected gloves, mask, tissues should be disposed carefully. Before disposed should be stored with lined container.
- Avoid other forms of potential exposure in their immediate environment to sick people or infected products (e.g., avoid sharing of toothbrushes, eating utensils, cigarettes, plates, towels, beverages, washcloths

or bed linen). Eating utensils and dishes should be washed after use with either soap or detergent and water, and should be reused rather than discarded.

- Frequently touched surfaces such as bedside tables, bed frames and other bedroom furniture are washed and disinfected regularly with standard household disinfectant containing a diluted bleach solution (1part bleach to 99 part water).
- Infected person should not travel anywhere<sup>[5]</sup>.

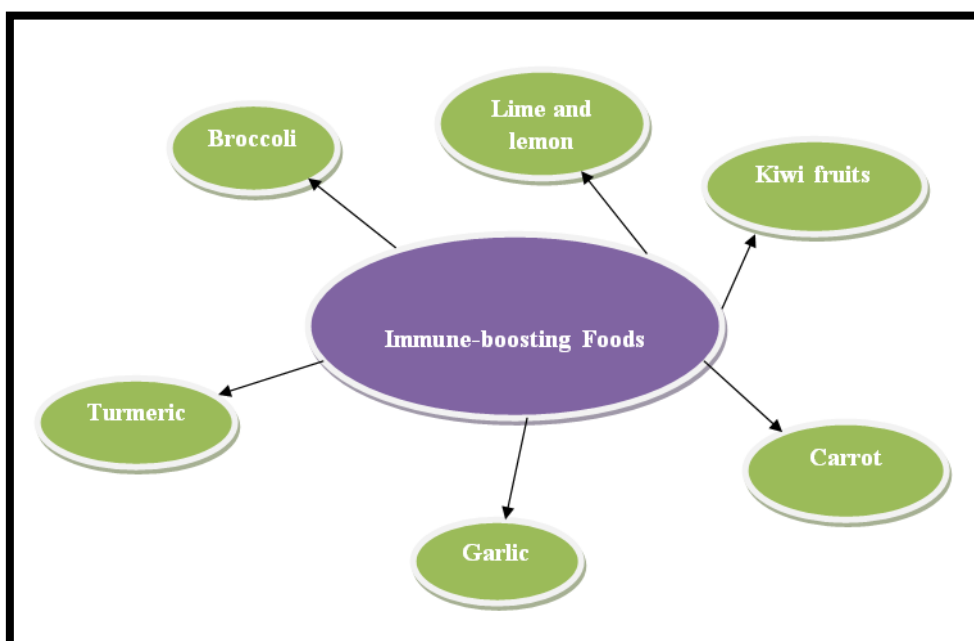


**Fig 1:** Mild to severe symptoms of coronavirus

**Corona virus and Human Immunity**

Patient who are suffering from coronavirus, doesn't able to fight against this virus due to imbalance of immunity in the body. In the human body, the immune system helps to protect

our body from viruses and diseases. Immunity produces an antibody, which helps to kill pathogen. So in this pandemic situation, people have to take modified diet with immune-booster natural food items<sup>[6]</sup>.



**Fig 2:** Some immune-boosting foods

**Immune-boosting foods**

Food rich in flavonoids and carotenoids are beneficial to maintain the immune system, fruits and vegetables are good

sources of flavonoids and carotenoids. Kaur and Kapoor, (2001) noted that daily consumption of an adequate amount of fruits and vegetables help to provides good health<sup>[9]</sup>.

Fruits mainly berry fruits like raspberry, blackberry and blueberry etc are crucial sources of antioxidant that helps to boost immunity. These fruits are good source of vitamin C, which helps to increase the immunity power<sup>[10]</sup>.

Arreola, *et al.*, (2015) noted that garlic has recently been considered an immunomodulatory spice. Immunomodulators are medicines used to regulate the immune system or to normalise it. In animal models, several research studies have been conducted to examine the effects of garlic compound as an immunomodulator<sup>[7]</sup>.

According to Zorofchian Moghadamtousi (2014), turmeric has potential inhibitory activities against various viral infections. Virus such as stomatitis virus, type-3 parainfluenza virus, respiratory syncytial virus and simplex virus<sup>[8]</sup>.

Eating a diet that is low in fat and based on plants will help improve the immune system. The immune system depends on white blood cells developing antibodies to protect off bacteria, viruses, and other invasions. Vegetarians have been shown to have more efficient white blood cells compared to non-vegetarians, due to high vitamin intake and low fat intake<sup>[11]</sup>.

Eating a diet which is low in fat can also be safe. Studies have shown that reducing dietary fat helps improve immune defences. Research also shows that oil can impair the function of white blood cells, and that high-fat diets can alter the intestinal microbiota that helps with immunity<sup>[12]</sup>.

Also, the immune system can benefit from maintaining a healthy weight. Obesity has been associated with an increased risk of influenza and other infections like pneumonia.<sup>13</sup> Fibre can also reduce Body Mass Index which is associated with improved immunity. It has also been shown a plant-based diet that reduces inflammatory biomarkers<sup>[14]</sup>.

### Minerals, vitamins and antioxidants

Different studies have shown that vegetables and fruits have beneficial nutrients that can improve immune function. Nutrients like beta-carotene, vitamin C and vitamin E. Because many vegetables, fruits, and other plant-based foods are also rich in antioxidants, they also helpful for reducing oxidative stress<sup>[15]</sup>.

- **Beta-carotene:** Beta-carotene is an effective antioxidant that can minimise inflammation by increasing disease-fighting cells in the body and improve immune function. Sweet potatoes, onions, and green leafy vegetables are also excellent sources.
- **Vitamins C and E:** Vitamins C and E are important antioxidants that aid in the destruction of free radicals and promote the normal immune response of the body. Vitamin C sources include red peppers, bananas, strawberries, broccoli, mangoes, lemons and other vegetables and fruits. The sources of vitamin E include nuts, beans, spinach, and broccoli.
- **Vitamin D:** Research indicates that supplementation with vitamin D can reduce the risk of viral infections, including infections in the respiratory tract, by reducing the development of pro-inflammatory compounds in the body. Increased blood vitamin D has been related to other chronic disease prevention including tuberculosis, hepatitis and cardiovascular disease. Food sources of vitamin D include fortified cereals and milks and supplements based on plants<sup>[16]</sup>.
- **Zinc:** Zinc is a mineral capable of helping to raise white blood cells that protect against invaders. Beans, nuts, pumpkin seeds, lentils and sesame seeds are among the

sources<sup>[17]</sup>.

### Conclusion

Coronavirus basically effects on human immunity and decreases immune power. Due to decreased immune power, people should take immune-boosting foods to maintain immunity and good health. Different research studies suggested that food rich in flavonoids and carotenoids are beneficial to maintain the immune system. Different studies have shown that vegetables and fruits have beneficial nutrients that can improve immune function. Nutrients like beta-carotene, vitamin C and vitamin E. Because many vegetables, fruits, and other plant-based foods are also rich in antioxidants, they also helpful for reducing oxidative stress.

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