

## Importance of Available Low Cost Seasonal Immunity Booster Winter Foods: A Mini Review

Dr. Kiran\*

Assistant Professor (Senior Scale), Home science Department, Rohtas Mahila College, Sasaram (V.K.S.U., Ara, Bihar), India.

\*Corresponding Author: kiranmrmlnmu@gmail.com

**Citation:** Kiran, K. (2025). *Importance of Available Low Cost Seasonal Immunity Booster Winter Foods: A Mini Review*. *International Journal of Advanced Research in Commerce, Management & Social Science*, 08(04(II)), 29–33. [https://doi.org/10.62823/ijarcmss.8.4\(ii\).8318](https://doi.org/10.62823/ijarcmss.8.4(ii).8318)

### ABSTRACT

*Nutrient-dense foods offer certain vitamins and antioxidants that are required to battle common seasonal diseases such as colds and flu. Inexpensive seasonal winter foods are crucial for strengthening the immune system. In addition to being more affordable, these bountiful local delicacies guarantee optimal freshness and nutrition. Seasonal winter foods that are inexpensive and readily available in local markets are highly regarded by medical professionals for their ability to naturally increase immunity against typical seasonal illnesses, such as the flu and colds. These foods are nutrient-rich, reasonably priced, and supported by both conventional knowledge and contemporary nutritional research. Seasonal meals provide the body with the nutrients required to remain robust and healthy during the colder months when infections are more common and the immune system may be compromised. These foods are rich in vital minerals (iron and zinc), vitamins (A, C, and E), antioxidants, and anti-inflammatory substances that boost immune cell performance and aid in the battle against infections. Numerous ancient winter staples, such as amla, ginger, and jaggery, have long been employed in Ayurvedic treatments for their inherent healing and warming qualities, which are now supported by scientific research on their bioactive compounds. A robust immune system is closely associated with healthy gut flora, which is supported by fiber and probiotics found in many suggested foods, including leafy greens, millets, and fermented items. Generally, eating local and seasonal produce is less expensive than eating imported or out-of-season food.*

**Keywords:** Nutrient-Dense Foods, Probiotics, Immune System, Gut Flora, Winter Staples, Antioxidants.

### Introduction

"Immunity is vital for general health and day-to-day function because it is the body's defence mechanism, shielding it from dangerous invaders like bacteria, viruses, and toxins, preventing disease, and even fending off cancerous cells. It ensures survival by distinguishing "self" from "non-self" and neutralizing threats. Its function as the body's main defence is highlighted by the fact that minor illnesses could become deadly without it. A diet high in nutrients, such as vitamin C, vitamin D, and antioxidants, along with a healthy lifestyle, can boost the immune system and speed up recovery from disease, even if no single "booster" is a cure-all. Increased resistance to infections, quicker wound healing, and decreased fatigue are some of its main advantages".

### Types of Immunity

- **Innate Immunity:** Your initial, non-specific defence that is present from birth and includes the skin, mucous, stomach acid, and fever.
- **Adaptive Immunity:** This type of immunity develops over time as a result of vaccination or disease exposure, producing long-lasting targeted memory.

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- **Passive Immunity:** short-term defence, such as antibodies transferred from the mother to the child through breast milk.

### Advantages of a Powerful Immune System

- **Combats infections:** White blood cells, which are vital for fending off bacteria and viruses, are produced by a healthy immune system.
- **Lowers inflammation:** Anti-inflammatory compounds, such as those in garlic and ginger, may aid in the healing process after illness.
- **Promotes wound healing:** A robust immune system aids in the recuperation of injured skin by delivering immune cells to the site to eradicate infection and encourage healing.
- **Boosts energy levels:** A healthy immune system uses less energy to combat illnesses, which may result in less weariness.
- **Enhanced skin health:** The immune system is responsible for bacterial defense and skin restoration, both of which can lead to clearer skin.

### How to Strengthen Immune System

"While all necessary vitamins are important, vitamin D, vitamin C, and B vitamins (such as B6, B12, and folate) are frequently emphasized for their critical roles in immunity, energy, bone health, and cellular function. Vitamin D is important for immunity and bones, vitamin C is important for immunity and antioxidants, and vitamin B is important for metabolism and nerve health. These and other essential nutrients, such as A, E, and K, are provided by a balanced diet that includes a variety of foods (fruits, vegetables, whole grains, and dairy)".

- **Vitamin D** also known as "**The Sunshine Vitamin**," is essential for healthy bones, immune system support, and calcium absorption.
- **Ascorbic acid (vitamin C)** is a potent antioxidant necessary for wound healing, collagen synthesis, and immunological protection.
- **B vitamins (B6, B12, and folate):** Essential for brain activity, red blood cell production, energy metabolism and nerve health; folate is particularly crucial during pregnancy.

### Other Important Vitamins

- **Vitamin A:** Boosts skin, immunity, and vision.
- **Vitamin E:** A cell-protecting antioxidant crucial for strong muscles.
- **Vitamin K:** Vital for healthy bones and blood coagulation

Some foods that can increase immunity include:

- **Vitamin C:** Found in amla, spinach, and citrus fruits, it increases the development of blood cells.
- **Vitamin D:** Found in certain mushrooms, fortified dairy products, and fatty fish, it can strengthen the immune system.
- **Antioxidants:** Found in turmeric, spinach, and ginger, they reduce inflammation and oxidative stress.
- **Omega-3 fatty acids:** These fatty acids, which are present in oily seafood such as salmon, can help treat illnesses caused by the immune system targeting healthy cells.
- **Maintain a healthy lifestyle:** Frequent exercise increases blood flow and helps reduce the frequency of illnesses and colds.

"Low-cost, seasonal winter foods are widely and easily accessible at local markets and are crucial for boosting the immune system, supplying vital nutrients, and providing warmth. Seasonal produce is plentiful and has the highest nutritional value; therefore, eating it is economical".

### Significance of Seasonal Winter Foods

- **Nutrient Density:** "Winter food is rich in vitamins, minerals, and antioxidants (such as iron, zinc, vitamin C, A, and E) that the body needs to fend off typical seasonal illnesses such as the flu and colds".

- **Warming Properties:** "A Many traditional winter meals, such as root vegetables, millets, and jaggery, are slow to digest and produce internal body heat through thermogenesis, which helps maintain a comfortable body temperature in cold weather".
- **Digestive Health:** "Fiber-rich root vegetables, millets, and warming spices help with digestion, which can slow down in winter".
- **Cost-effectiveness:** "These items are usually less expensive than imported or off-season options because they are farmed nearby and in season".
- **Promotes Local Economy:** "Buying seasonal produce from nearby markets guarantees freshness and helps support local farmers'.

### Easily Available Low-Cost Winter Foods

These products are typically offered at affordable costs at nearby grocery stores, farmer's markets and fresh produce markets.

- **Indian gooseberry or Amla:** "A great source of antioxidants and vitamin C, which are essential for immunological defence, can be consumed raw, as pickles and chutneys, or as juice". The fruit of the aonla has been shown to have immunomodulatory and anti-inflammatory properties. It is rich in vitamin C, flavonoids, and antioxidants. Aonla contains ellagic acid, a strong antioxidant (Kulkarni & Ghurghure 2018). Rich in antioxidants, flavonoids, and vitamin C, aonla exhibits anti-inflammatory and immunomodulatory properties. Aonla contains ellagic acid, a potent antioxidant (Dasaraju & Gottumukkala, 2014).
- **Mustard leaves, spinach, fenugreek, sarson ka saag, and leafy greens:** These greens, which are high in iron, folate, and vitamins A, K, and C, help produce immune cells. They can be added to soups, parathas, and curries.
- **Root vegetables, such as beetroot, sweet potatoes, and carrots:** These are rich in fiber, potassium, and beta-carotene, which the body uses to make vitamin A. They protect the mucosal linings, the body's first line of defence against infections. They can be used in soups and stews, roasted, or steamed.
- **Herbs and Spices (Ginger, Garlic, Turmeric, Black Pepper):** These everyday kitchen essentials have potent antiviral, antibacterial, and anti-inflammatory properties. To relieve sore throats and promote respiratory health, they can be added to regular cooking, drinks, or heated milk (such as haldi doodh or "golden milk").

### Seasonal Winter Foods' Significance

- **Targeted Nutrition:** "The body requires certain nutrients (such as iron, vitamin C, A, and E) to promote immunological function in colder climates, and seasonal winter produce is naturally rich in these nutrients".
- **Cost-effective:** "Purchasing locally sourced, in-season foods is typically less expensive than purchasing imported or off-season items".
- **Enhanced Immunity:** "The body's first line of defence against infections is strengthened by nutrients found in these foods, such as beta-carotene in carrots and vitamin C in amla, which support mucosal health and aid in the production of white blood cells".
- **Natural Warmth and Energy:** "Many traditional winter foods, such as millets, jaggery, and ghee, offer warming qualities and provide the body with long-lasting energy through complex carbohydrates and healthy fats".
- **Digestive and General Health:** "Foods high in fiber, such as leafy greens and root vegetables, facilitate digestion, which is associated with a robust gut microbiome essential for general immunity".

"Body's natural defences against winter illnesses can be enhanced by incorporating these foods into your regular diet, such as adding spinach to dal, snacking on a handful of almonds, or consuming turmeric milk, among others".

### Supporting Reviews

Popular citrus fruits include grapefruits, oranges, clementines, tangerines, lemons, and limes. Citrus fruits contain vitamin C, a crucial element that strengthens the immune system by enhancing both

innate and adaptive immune cell function. According to **Boretti and Banik (2020)**, this supports the function of the epithelial barrier against infection. Additionally, vitamin C is known to act as an antioxidant, supporting the fight against free radicals, which harm and hinder the immune system's capacity to function properly (**Carr & Maggini 2017**).

Zingiber officinale Roscoe (ginger) is a common dietary condiment used in many cuisines worldwide. Oleoresin, derived from ginger rhizomes, contains several bioactive components, including gingerol, which is believed to have notable physiological and pharmacological effects. According to **Fatima et al. (2020)**, ginger increases hunger, aids digestion, functions as an anticold agent, and has analgesic and anti-inflammatory properties.

Increased intake of foods and drinks high in antioxidants, including ginger shots, may help prevent inflammation and preserve a strong immune system (**Renuka & Muralidharan 2017**). When eaten or crushed, the sulfoxide alliin found in garlic is transformed into allicin. Furthermore, reactive oxygen species (ROS), nuclear factor kappa-light-chain-enhancer of activated B cells (NF- $\kappa$ B), and cyclooxygenase-2 production can all be inhibited by garlic's bioactive component diallyl sulfide (DAS) through the NF- $\kappa$ B pathway (**Elengoe 2020**). Onions (*Allium cepa* L.) are one of the most widely grown and consumed vegetables worldwide and are frequently used in Indian cooking. It has been used since ancient Egypt because of its antimicrobial, anti-inflammatory, and other therapeutic properties (**Marefat et al., 2021**).

Turmeric's major ingredient, curcumin, regulates several biological processes, including signal transducers, transcription factors, mitogen-activated protein kinase, cytokine production, and receptors on numerous immune cell types (**Srivastava et al., 2011**). Osteoarthritis and rheumatoid arthritis have been treated with turmeric, a bright yellow and bitter spice that is frequently found in curries. Due to its high concentration of yellow pigment, its active ingredient, curcumin, has been discovered to help lessen exercise-induced muscle injury. Curcumin has antiviral and immune-boosting qualities, according to animal studies (**McFarlin et al., 2016**).

### Conclusion

People may maintain optimal health, strengthen their immune systems, and stay energized throughout winter without breaking the bank by giving priority to these easily accessible, whole-food options. A balanced diet high in fruits, vegetables, lean protein (such as fish, nuts, and seeds), whole grains, and probiotics is the best way to strengthen the immune system. One should also prioritize getting enough sleep (7–9 hours), engaging in regular moderate exercise, reducing stress, and abstaining from smoking and excessive alcohol. Body fight against infections is also greatly strengthened by being hydrated, practicing proper hygiene (handwashing), keeping vaccinations up to date, and ensuring that essential nutrients (Zinc, C, D, and E) are present.

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