



# NUTRITION, LIFESTYLE & IMMUNITY



**icmr** | **NIN**  
INDIAN COUNCIL OF MEDICAL RESEARCH | NATIONAL INSTITUTE OF NUTRITION

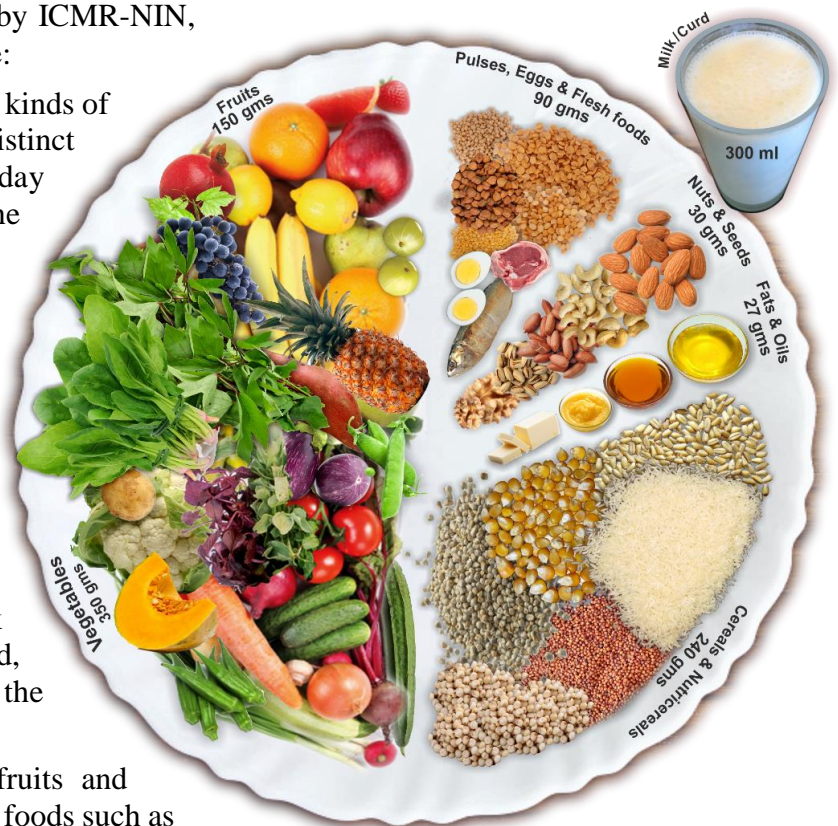
**ICMR-National Institute of Nutrition**  
Tarnaka, Hyderabad – 500 007  
Telangana, INDIA

In the wake of the COVID19 pandemic, people are increasingly becoming aware of the importance of good hygiene, healthy food for ensuring optimal immune function to keep viral/ other infections (communicable diseases) at bay. As for diet, ‘diversity and variety’ is the magic bullet. Although, there is no specific evidence on the benefits of a particular diet related to prevention of COVID-19, some simple suggestions on diet may help.

## MY PLATE FOR THE DAY – BALANCED AND HEALTHY DIET

A good way to proceed is to look at the healthy “My Plate for the Day” formulated by ICMR-NIN, the premier nutrition research institute:

- My plate advocates eight different kinds of foods (as exchanges) from four distinct food groups, to be consumed in a day by an individual. One half of the plate should comprise fruits and vegetables, leafy vegetables, roots and tubers and other vegetables. A quarter plate should be cereals and the remaining quarter plate should consist of protein rich foods such as pulses, legumes, eggs, flesh foods and nuts; followed by moderate amounts of varieties of vegetable oils/ fats. A glass of milk or milk products such as curd, paneer etc. should accompany the plate.
- It is critical to have adequate fruits and vegetables, as well as high-quality foods such as milk, nuts, eggs, legumes and fatty fish.



More information is available from: [http://nin.res.in/downloads/My\\_plate\\_for\\_the\\_day.pdf](http://nin.res.in/downloads/My_plate_for_the_day.pdf).

## ROLE OF SPECIFIC NUTRIENTS IN MAINTAINING OPTIMAL IMMUNE FUNCTION

- Vitamins A, E and D - the three fat soluble vitamins; C & B vitamins, and minerals such as zinc, selenium, iron, copper etc. and phytonutrients, amino acids, fatty acids are necessary for optimal immune function (to prevent establishment of viral infection) and immune regulation (to check uncontrolled proliferation of immune cells that may cause more harm than good to the body).
- These nutrients are critical for the function of T cells, B cells, killer cells, macrophages, neutrophils/granulocytes that are involved in the killing and elimination of infectious microbes.
- In addition, there are many other immune related functions that are carried out by these nutrients and phytonutrients. For instance, vitamin A maintains structure and function of the mucosal epithelial cells of the respiratory tract and enhances mucosal immunity (critical for prevention of respiratory infection), vitamin E, beta-carotene, vitamins C & B, Zinc, Selenium act as potent antioxidants and reduce oxidative stress in the body.






**It is prudent to obtain these nutrients through a good balanced diet. But two important points are to be noted.**

- Firstly, though deficiency of one or more of these nutrients can increase the frequency and severity of infections, supplementation of nutrients among healthy (not deficient) population does **not** confer any additional benefit
- Secondly, some of these nutrients in excess can increase susceptibility to infections. Therefore, a balanced healthy diet is the key!

## SOME USEFUL DIETARY AND LIFESTYLE GUIDELINES TO FOLLOW

Micronutrients (vitamins and minerals) and phytonutrients that are primarily available in fruits, vegetables, greens, nuts, and whole grains play crucial role in several metabolic pathways that aid in optimal immune function. These nutrients



-  enhance both native and adaptive immune function and prevent infection
-  regulate immune function, keep inflammation under control and prevent tissue damage
-  aid immune memory formation that helps prevent reinfection with the same pathogen
-  help clear/scavenge oxidant species (toxins) that are produced in large quantities in the body during infection and immune response, and
-  increase beneficial probiotic bacteria in the intestine, that favour good immune function and reduce inflammation.

Therefore, ensure substantial servings of fresh fruits and vegetables (as much as 450 to 500gm per day per person) and prefer whole grains. These can be easily drawn from what is locally produced, seasonal, available and accessible.

Limit consumption of highly processed foods, avoid fruit juices & carbonated drinks - these are high in fat, salt and sugar, and poor in nutrients (vitamins, minerals and phytonutrients).



Consuming meat, poultry and eggs is not risky, but hand wash hygiene must be followed after handling raw meat, eggs or even vegetables. Thoroughly cooked meat/ poultry may be included in moderation.



Avoid too much fat (no more than 30 gm/person/day - preferably more than 2 varieties of oils), salt (no more than 5gm/person/day), and sugar is just calories with no nutrients, hence, keep it to bare minimum.



Maintain ideal body weight (less than 18.5 BMI is undernourished, and more than 25 is overweight for Indians) being underweight or overweight/obese – impairs immunity and increases inflammation.



Moderate physical activity/yoga will reduce stress and build immunity.



Keep your body hydrated with adequate water intake for good immune response to any infection.



Smoking & alcohol adversely affect immunity and increase the risk and severity of infections, hence must be avoided.



## FOR THOSE SUFFERING FROM DIABETES AND OTHER CHRONIC ILLNESSES

Most infections can be prevented by practicing good personal hygiene such as washing hands before preparing or eating food; Washing hands after cleaning vegetables or meat; stroking pet/ animals; covering mouth with a tissue or cloth while coughing or sneezing. People with diabetes or other chronic illnesses should continue their regular medication and prescribed healthy dietary patterns along with adequate physical activity and keep themselves stress free. Diabetics and patients with chronic kidney disease and hypertension are more vulnerable and should strictly follow social distancing and hand hygiene.

## SOME LOCALLY AVAILABLE FOODS THAT ARE RICH SOURCES OF ABOVE-MENTIONED NUTRIENTS

**Papaya, guava, apple, grapes, mango and many other fruits** are rich in beta carotene, vitamin C, potassium and B vitamins which help in overall maintenance of health and immunity



**Citrus fruits** like oranges, tangerines, lemons, goose berries, and red bell pepper are good source of Vitamin C



**Green leafy vegetables** are rich sources of beta carotene (precursor of Vitamin A), vitamins C and E, anti-oxidants and fibre



**All seasonal vegetables** are rich sources of multiple micronutrients and antioxidants that aid in immune function, improve gut microbiota and reduce inflammation



**Condiments, spices and herbs** such as turmeric, cinnamon, ginger, dry pepper, mint, coriander, basil leaves, drumstick (moringa) leaves etc., should be included in regular diets as they are good sources of bioactive elements that help build good immune function



**Curd** is a source of many nutrients, improves gut health by favouring healthy gut bacteria; aids immune function and reduces inflammation



**Legumes** (chickpea, green gram, black gram, lentils, and beans) provide many nutrients including iron and Zinc



**Millet**s are good sources of many micronutrients and fibre



**Flesh foods** provide nutrients including iron, zinc and essential amino acids



**Fish** is a rich source of protein, vitamin A, Vitamin E and essential fatty acids



## RECOVERY FROM INFECTION

- Nutritional needs increase during infection and recovery phase, due to the immune response and the ongoing inflammatory processes.
- A major problem will be that there is a loss of appetite in the acute or immediate phase after infection. This is more relevant in COVID-19 due to the loss of smell and taste. Hence, consume 6-8 small, light and micronutrient dense foods at regular intervals throughout the day.
- Infections also induce oxidative stress in the body, which can damage tissues. Hence, nutrient dense foods are recommended during infection and recovery phase.
- Intake of vitamin and mineral supplements should be taken only under medical supervision.