# Nutrition in Immunity



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Disclaimer- Viral Respiratory Tract Infections spread through droplets from infected persons. It is important to note that there is no single super food or foods in general which can help cure/prevent/treat the infection. An overall healthy diet will ensure better immunity and lesser chances of getting affected by this epidemic. One must follow all hygiene and food safety precautions published by WHO

#### A healthy balanced diet is the key for maintaining good healthy and immunity.

#### Diet should have a balance of:

#### √ Macronutrients

- Carbohydrates
- · Proteins
- · Fats

#### √ Micronutrients

- Vitamin A
- Vitamin E
- · Vitamin C
- · Selenium
- · Zinc
- Magnesium etc..



#### √ Water

### **Healthy Carbohydrates**

Carbohydrates form a bulk of the Indian Diet.

On an average one should consume at least 1-3 servings (roti, bhakri, thepla, rice, upma, poha etc)- of Carbohydrate in each meal

a total of 4-5 servings in a day.



Complex carbohydrates come from whole wheat flour, corn, red/brown rice, jowar, bajra, nachani, fruits and vegetables are a power house of micronutrients and fibre that help improve gut health and immunity.

Cut down intake of refined carbohydrates.

Limit intake of sugars, sweetened beverages, carbonated drinks, maida and bakery items etc

Ref 1. Riaz Rajoka M, Shi J, Mehwish H, Zhu J, Li Q, Shao D et al. Interaction between diet composition and gut microbiota and its impact on gastrointestinal tract health. Food Science and Human Wellness. 2017;6(3):121-130.

#### High Protein Sources

It is important to consume at least 3-4 servings (1 serving =100 ml or g) of milk and milk products (curd, buttermilk, cheese etc) each day.



1 cup (150 ml) Cows Milk

Protein per = 4.89 g 1 cup



1 cup (150 ml) Buffalo Milk

Protein per = 5.52 g 1 cup



1 cup Paneer (100 g)
Protein per = 18.86 g
1 cup

### High Protein Sources (Veg)

It is important to consume at least 1 serving of protein rich food in each meal/ at least 2-3 servings of protein rich foods per day.





Thick Dal/ Pulses like Chana, Moong, Matki, Rajmah, Chole

Protein per 100 g = 21 g

Protein per serving (30 g) = 6.3 g approx. 1 katori Dal/Pulse preparation





Soya Bean/ Soya Chunks

Protein per 100 g = 21 g

Protein per serving = 6.3 g
(30 g)

# High Protein Sources (Non-veg)

Protein from Non-vegetarian sources have high biological value.

It is important to consume at least 1 serving of protein rich food in each meal.







Chicken breast (palm size piece)/ Two palm size drumsticks without bone Protein per 100 g = 20 g serving of chicken (without skin and

bones)

Fgg
Protein per 100 g = 13.4 g
Protein per = 6.5 g
serving (approx.
50 g or
1 egg)

Protein per 100 g = 20 g

Protein per serving = 40 g
(approx. 200 g)
Big Piece

Protein per serving = 28 g
(approx. 140 g)
Medium Piece

Protein per serving = 14 g

(approx. 70 g) Small Piece

Meats high in fat such as organ meats, mutton etc should be consumed less frequently.

# **Healthy Fats**

Our bodies only need a certain amount of fat each day, any extra that is consumed is stored in fat tissue and contributes to weight gain. One must maintain

ideal SFA:MUFA:PUFA ratio of 1:1.3:1 (NCEP, AHA)

Moderate consumption MUFA rich fats may help reduce total cholesterol and LDL cholesterol and may be beneficial in management of blood pressure and heart disease.

Include MUFA rich oils like Groundnut oil, Rice Bran Oil, Canola oil which are considered to be healthy for cooking.

# **Healthy Fats**

Rotation of Oils (alternating between different oils) or using blend of oil available in the market may help achieve an ideal SFA:MUFA:PUFA Ratio. Consult a Registered Dietitian to obtain an ideal ratio in your diet.

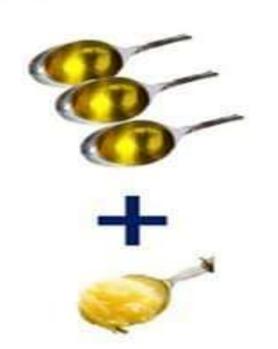
It is important to reduce intake of saturated fats (desi ghee, butter cheese, organ meats) and avoid trans fat (margarine and vanaspati ghee) which is usually found in large quantities in bakery items, fried foods esp the ones that are fried in used oils.

Recommended Amount of Oil/Fat Intake-500 ml per person per month

This amounts to 3 tsp (15 ml) of oil per day per person and 1 tsp (5ml) of ghee per day per person or

4 tsp of oil per day per person.

This includes oil in the visible form i.e. oil added to cook the food. It does not include hidden fats in groundnut, coconut and oil seeds used in cooking.



# Healthy Fats- Omega-3- Fatty Acid (ALA)

Omega-3 fatty acids are essential fats since the body can't make them from scratch but must get them from food. Foods high in Omega-3 include fish, vegetable oils, nuts (especially walnuts), flax seeds, flaxseed oil, and leafy vegetables.

Alpha-linolenic acid (ALA) is found in vegetable oils and nuts (especially walnuts), flax seeds and flaxseed oil, leafy vegetables, and some animal fat.

The human body generally uses ALA for energy, and conversion into EPA and DHA is very limited.



1 thep (13.6 g) gives 7.23 g of ALA



Chia Seeds

1 oz (28 g) gives 5 g of



Walnuts
52 cup (63 g) gives 1.67
g of ALA



1 thep (13.6 g) gives 0.94 g of ALA

# Healthy Fats- Omega-3- Fatty Acid (EPA & DHA)

Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) come mainly from fish, so they are sometimes called marine omega-3s.



Mackerel/

Bangda

100 g gives 1.4 g of DHA and 0.9 g of EPA



Salmon

100 g gives 1.1 g of DHA and 0.9 g of EPA



Tuna

100 g gives 0.89 g of DHA and 0.28 g of EPA



Sardine

100 g 0.92 g of DHA and 0.48 g of EPA

#### Vitamin A

Vitamin A is involved in the development of the immune system and plays regulatory roles in cellular immune responses and humoral immune processes.

#### RDA for Vitamin A

Adults 600 mcg of Retinol or 4800 mcg of Beta Carotene



100 g gives 5012 meg of Beta Carotene



Pumpkin 100 g gives 2558 meg of Beta Carotene



Dark Green Leafy Veg 100 g gives 2800 meg Beta Carotene



Chicken Liver

25 g gives 872 meg of Beta Carotene



1 egg gives 228 meg of Beta Carotene



100 g gives 16 meg of Beta Carotene



Chicken Breast

100 g gives 8.52 meg of Beta Carotene

#### Vitamin E

Vitamin E is a potent antioxidant and has an ability to modulate host immune functions esp. in elderly populations. RDA for Vitamin E 7.5-10 mg alpha-tocopherol/day

Ref: FSSAI



Sunflower Seeds
5 g gives 1.07 mg Vit E



15 g gives 4.7 mg Vit E

Pistachios Nuts



5 g gives 1.6 mg Vit E

Safflower Seeds



5 g gives 15 mg of Vit E



Almonds 15 g gives 3.73 mg of Vit E



Flanseeds
5 g gives 0.39 mg Vit E

#### Vitamin C

Vitamin C contributes to immune defense by supporting various cellular functions of both the innate and adaptive immune system..

Vitamin C deficiency results in impaired immunity and higher susceptibility to infections.

RDA for Vitamin C

Adults 40 mg/ day



Amla

100 g gives 252 mg Vit C



Guava

100 g gives 214 mg Vit C



Capsium

100 g gives 122 mg Vit C



Orange

100 g gives 42.72 mg Vit C



Raw Mango

100 g gives 90 mg Vit C



**Red Amaranth Leaves** 

100 g gives 86 mg Vit C



Lemon Juice

100 ml gives 48 mg Vit C

### Selenium (Se)

Selenium plays a role in regulating oxidative stress in the body. Deficiency of selenium may alter host responses to viral infections.

#### RDA for Selenium

40 mcg/day

Ref: FSSAI



Egg 50 g gives 30 mcg Se



Toor Dal

30 g gives 16.8 mcg of Se



30 g gives 15 mcg Se

Chana Dal



Mackerel/ Bangda 100 g gives 64 mcg of Se



Whole Wheat Flour 30 g gives 15.39 mcg of Se



Chana
30 g gives 12.37 meg of
Se



Moong Dal

30 g gives 15 meg of Se



Chicken 100 g gives 20 mcg of Se

#### Zinc (Zn)

Zinc is crucial for normal development and function of immune cells. Deficiency of zinc is associated with immune dysfunctions. RDA for Zine

Adult Male- 12 mg/ day Adult Female 10 mg/ day



Cereals 30 g gives 0.5 mg of Zn



Dals and Pulses
30 g gives 1 mg of Zn



Soyabean 30 g gives 1.2 mg of Zn



Black Til 5 g gives 0.5 mg of Zn



5 g gives 0.24 mg of Zn



Nuts and Oilseeds 15 g gives 0.6 mg of Zn



Chicken 100 g gives 1.36 mg of Zn



Egg 1 egg gives 1.8 mg of Zn

### Magnesium (Mg)

Magnesium acts as a cofactor for the immunoglobulin synthesis which are the immune cells of the body and plays a role in innate as well as acquired immunity.

#### RDA for Magnesium

Adult Male- 350 mg/ day Adult Female 310 mg/ day



Ragi/Nachani 30 g gives 44 mg of Mg



30 g gives 40 mg of Mg

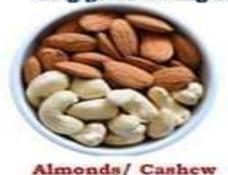
Jowar



Pulses and Legumes 30 g gives 48 mg of Mg



Green Leafy Veg 100 g gives 97 mg of Mg



15 g gives 46 mg of Mg



5 g gives 15 mg of Mg



Sunflower Seeds
5 g gives 20 mg of Mg



Black Til 5 g gives 20 mg of Mg



#### Water/ Fluids

It is important to maintain hydration during any viral infection.

Drink plain, boiled and cooled or warm water. Aim to consume 2.5-3 litres of fluids per day.

Consult a Dietitian if you are suffering from any clinical conditions that may have fluid restrictions.



Avoid drinking sweetened, sugary and carbonated beverages.



Coconut water, nimbu pani, kokum sherbet are good options to hydrate yourself.

#### Antivirals from your kitchen

No single food is a super food!
Using these ingredients in your daily cooking or as tea/concoction
may help improve immunity over a period of time.



Ginger Rich in Gingerol



Garlie Rich in Allicin



Turmeric Rich in Curcumin



Tulsi Rich in Eugenol



Neem Rich in Azadirachtin



Lemon grass
Rich in Triterpenoids

# General Guidelines NO SINGLE FOOD IS A SUPER FOOD.

Do not fall prey to whatsapp forwards that claim that consumption or application of certain foods will help prevent or cure certain respiratory tract infection.

Although garlic, ginger, turmeric are known to have antiviral properties, there is no evidence on their role in preventing/ treating infections from respiratory tract viruses.

You may use these antioxidant rich ingredients in your daily cooking. For eg in the form of marinade or tempering or you can add them to milk/ tea preparations.

#### Food Safety Guidelines

Avoid roadside foods, water and beverages.



Prefer home cooked meals.

Eat well cooked foods only. Avoid consumption of raw foods.

Salads can be lightly steamed.



Wash your hands thoroughly with soap before eating and drinking as well as cooking/handling food.



Wash fruits and vegetables thoroughly.



Buy non-veg items like chicken, meat and eggs from clean authorised outlets only.



BACK OF HANDS

FOCUS ON THUMBS.

FOCUS ON WRISTS



Ensure that food is cooked well (esp. fish, meat and meat products).

Wash food packets (like milk etc) with soap and water thoroughly.

