

## Immunity – The only way now, to Fight Corona

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**Abstract:** On December 31, 2019, a strange new pneumonia of unknown cause was reported to the Chinese WHO Country Office. COVID-19 is the name given by the World Health Organization (WHO) on February 11, 2020 for the disease caused by the novel coronavirus SARS-CoV-2. It started in Wuhan, China in late 2019 and has since spread worldwide. COVID-19 is an acronym that stands for coronavirus disease of 2019. Coronaviruses are common human and animal viruses. They were first discovered in domestic poultry in the 1930s. In animals, coronaviruses cause a range of respiratory, gastrointestinal, liver, and neurologic diseases. At this time, there are no specific vaccines or treatments for COVID-19. However, there are many ongoing clinical trials evaluating potential treatments. The best way to prevent and slow down transmission lies in being well informed about the COVID-19 virus, the disease it causes and how it spreads. Protect yourself and others from infection by washing your hands or using an alcohol based rub frequently and not touching your face. It's likely a vaccine will be developed for Covid-19, but the process is riddled with hurdles and may well take another nine to 12 months. Researchers are starting from scratch in the effort to create a vaccine against SARS-CoV-2. Even if one proves effective and safe in small tests — in rodents or humans — it will likely take months to scale production up because every vaccine requires a unique production technique. Till then, lock down at homes & adopting social distancing measures may reduce the spread of virus, but cannot eradicate the deadly pandemic and infact has a potential to unleash a second wave of outbreak. But few western countries have come under adverse criticism for their laxity in implementing the lock-down & consequent rapid rise in death toll. They were even alleged to rely on herd immunity and now paying a heavy price in severe fatalities. Given the complex & complicated situation created by pandemic Covid-19 creating havoc in the entire world and vaccine likely to be available in not less than a year, this paper advocates for awareness amongst the people for developing general immunity through food habits, physical exercises etc.

**Keywords:** Coronavirus, immune system, health, disease, vaccine.

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### Immune System

Immunity is our capability to resist harmful microorganisms from entering the human body. The immune system is made up of special organs, cells and chemicals that fight infection (microbes). The immune system keeps a record of every microbe it has ever defeated, in types of white blood cells (B & T lymphocytes) known as memory cells. This means it can recognise and destroy the microbe quickly if it enters the body again, before it can multiply and make you feel sick. The main parts of the immune system are as under [1-3]:

- **White blood cells** - White blood cells are the key players in our immune system. They are made in our bone marrow and are part of the lymphatic system. White blood cells move through blood and tissue throughout our body, looking for foreign invaders (microbes) such as bacteria, viruses, parasites and fungi. When they find them, they launch an immune attack. White blood cells include lymphocytes (such as B-cells, T-cells and natural killer cells), and many other types of immune cells [4].

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- **Antibodies** - Antibodies help the body to fight microbes or the toxins (poisons) they produce. They do this by recognising substances called antigens on the surface of the microbe, or in the chemicals they produce, which mark the microbe or toxin as being foreign. The antibodies then mark these antigens for destruction. There are many cells, proteins and chemicals involved in this attack [5].
- **Complement system** - The complement system is made up of proteins whose actions complement the work done by antibodies.
- **Lymphatic system** - The lymphatic system is a network of delicate tubes throughout the body. The lymphatic system is made up of lymph nodes (also called lymph glands) - which trap microbes; lymph vessels - tubes that carry lymph, the colourless fluid that bathes your body's tissues and contains infection-fighting white blood cells; and white blood cells (lymphocytes). The main roles of the lymphatic system are to [6]:
  - Manage the fluid levels in the body
  - React to bacteria
  - Deal with cancer cells
  - Deal with cell products that otherwise would result in disease or disorders
  - Absorb some of the fats in our diet from the intestine.
- **Spleen** - It is a blood-filtering organ that removes microbes and destroys old or damaged red blood cells. It also makes disease-fighting components of the immune system (including antibodies and lymphocytes).
- **Bone marrow** - It is the spongy tissue found inside your bones. It produces the red blood cells our bodies need to carry oxygen, the white blood cells we use to fight infection, and the platelets we need to help our blood clot.
- **Thymus** - The thymus filters and monitors our blood content. It produces the white blood cells called T-lymphocytes.

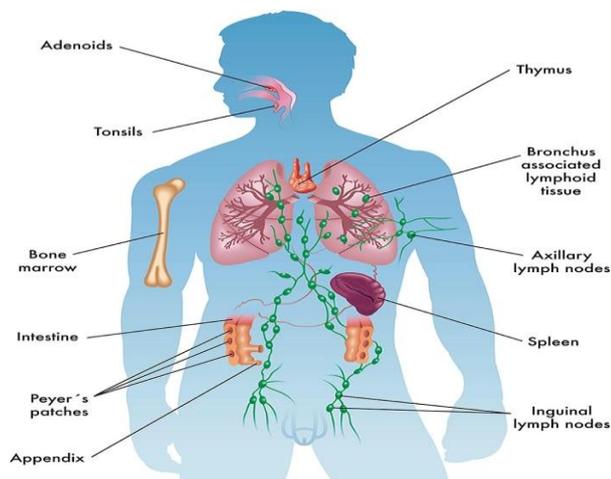
As well as the immune system, the body has several other ways to defend itself against microbes, including:

- **Skin** - a waterproof barrier that secretes sweat & oil with bacteria-killing properties
- **Lungs** - mucous in the lungs (phlegm) traps foreign particles, and small hairs (cilia) wave the mucous upwards so that it can be coughed out
- **Digestive tract** - the mucous lining contains antibodies, and the acid in the stomach can kill most microbes
- **Other defences** - body fluids like skin oil, saliva and tears contain anti-bacterial enzymes that help reduce the risk of infection. The constant flushing of the urinary tract and the bowel also help

### Balanced Diet

A balanced diet is one that focuses on providing all the nutrients required by our body. It comprises of macro-nutrients like carbohydrates, protein, & fat along with micronutrients which include vitamins and minerals. Each of them has a different role to play in maintaining various body functions. Recommended dietary allowance is around 2320 Kcal/day for adult males & 1900 Kcal/day for females. However, it should not be taken as hard & fast, but it varies with persons, area of living & type of occupation etc [7].

- **Carbohydrates** - These are the main source of energy and generally present in plant foods such as cereals, millets and pulses. Instead of refined foods in the form of breads, biscuits, white rice & wheat flour, awareness is now growing on the healthier carbohydrates like whole grains which include brown rice, millets and oats that have a higher nutritive value as well as great sources of fiber. Meal would be incomplete without fiber - both soluble (found in oat bran, barley, nuts, seeds, beans, lentils, peas, and some fruits & vegetables) and insoluble (wheat bran, vegetables, and whole grains). For a healthy diet of 2320 kcal/day, since 70-80% is from carbohydrates, this translates to about 225 to 325 grams of carbohydrates per day.
- **Proteins** - Proteins are made up of many building blocks, known as amino acids. Our body needs dietary protein to supply amino acids for the growth and maintenance of our cells and tissues. Wellness and Nutrition experts suggest about 30 to 35% of our diet should consist of proteins. This could be in the form of pulses, milk, leafy greens, eggs, white meat or sprouts." Increasing consumption of convenience foods that are high in carbohydrates and sugars and low in protein tend to cause protein deficiency. National Institute of Nutrition (NIN) recommends protein intake of 60 grams per day [8].



**Fig-1: Immune System**

- **Fats** - Fats provide energy, store vitamins and synthesize hormones. According to NIN, about 1/5th of our diet should be devoted to fats all three kinds -polyunsaturated, mono-saturated and omega-3 fatty acids viz., 44 to 77 grams per day. A diet too high in fat can lead to heart disease, diabetes, cancer and weight gain. At the same time, low fat consumption too has its share of problems such as low vitamin absorption, depression, increased cancer risk, high cholesterol & heart ailments, imbalance of nutrients and one may end up in over eating. Vegetable oil used in day to day cooking is a major source of visible fat in our diet. It is suggested to have a good blend of various types of oils for a balanced diet by juggling between butter, ghee, olive oil, mustard oil, soyabean, sesame or even groundnut oil for different meals [9].
- **Vitamins and Minerals** - These micronutrients support metabolism, nerve & muscle function, bone maintenance, and cell production. Minerals are inorganic and so minerals from plants, meat and fish easily find their way into body. Vitamins are fragile compounds and it's difficult to shuttle them as they may be destroyed during cooking or storing. They can be derived from nuts, oilseeds, fruits and green leafy vegetables. Vitamin A, E, B12 & D are vital and so is calcium and iron. Consuming Vitamin D supplements can be beneficial for health especially when fighting against respiratory infections including cold & flu. Vitamin D is abundant in the sunlight & exposing bare skin to sunlight helps in obtaining the same. Vitamin D is also available in milk, fatty fish, orange juice and fortified food such as cereals. The National Institute of Nutrition recommends the consumption of 100 grams of greens and 100 grams of fruits each day.

In India, iron deficiency or anaemia affects about 50% of the population, more so, in women. Since women go through several hormonal changes from pregnancy to menstrual and menopause, they need to maintain a steady dose of calcium, Vitamin D, folic acid, iron and biotin. 100 grams milk and milk products would take care of calcium requirement. Another crucial aspect is the need to drink adequate water. Lack of it can lead to acidity and water retention. Anywhere between six to eight glasses of water is needed to keep our body hydrated [10].

### Ways to boost Immunity

Healthy life style is always the first line of defence against any illness. Every part of the human body, including one's immune system, functions better when protected from environmental assaults and bolstered by healthy-living strategies such as :

- Always 'No' to smoking & alcohol, and stick to home made food.
- Diet high in fruits & vegetables and avoid adulterated food.
- Regular Exercises - Jogging/walking, Yoga, Pranayaam & Meditation.
- Maintaining a healthy weight & avoid outside eatables.
- Even alcohol on an occasion, drink only in moderation.
- Adequate sleep & try to minimize stress.
- Hygiene living viz., bath, washing hands & brushing teeth frequently.

Compared with younger people, the elderly are more likely to contract infectious diseases and, even more importantly, more likely to die from them. Worldwide, aged people of above 65 years are more prone to respiratory infections, influenza, COVID-19 virus & particularly pneumonia. The possible reasons may be due to decrease in T cells, possibly from the thymus atrophying with age. Another explanation for decreased immunity is bone marrow becoming less efficient at producing the stem cells [11].

### Immunity Boosters

Like any fighting force, the immune system army marches on its stomach. Healthy immune system warriors need good & regular nourishment. It is a well established fact that people who live in poverty are generally malnourished and more vulnerable to infectious diseases. Certain food items when consumed will increase the immunity enormously as explained below [12]:

- Watermelon contains glutathione, an antioxidant which helps in strengthening the immune system. The pulpy red flesh near the rind contains the most glutathione from the watermelon. Wheat germ can also be consumed to increase immunity. It is a great source of antioxidants, B vitamins and zinc.
- Wheat 'germ' (germination, in short) is the part of wheat that sprouts and grows into a new plant. Despite being the most vitamin & mineral rich part of the wheat kernel, it's left out when wheat is processed into white flour. It contains a great combination of protein, fibre and some healthy fat.
- Low fat Yogurt contains pro-biotics, which may help in easing the severity of colds.
- Spinach is a natural immune booster and is considered as a super food due to its ability to increase immunity in the body. Spinach contains folate [Folate is one of the B-vitamins and is needed to make red & white blood cells in the bone marrow, convert carbohydrates into energy, and produce DNA and RNA] which is highly beneficial in helping the body make new

cells and repair DNA. It also contains fiber and antioxidants such as vitamin C.

- Sweet potatoes help in removing the damaging free radicals with the help of beta-carotene that converts to vitamin A. This results in increasing immunity in the body and might even improve the aging process.
- Broccoli is a great immune boosting food that is very beneficial to the body. It contains vitamin A, C and glutathione which help in increasing the immunity.
- Raw garlic is very effective against skin infections. With its ability to fight fungi, bacteria and viruses it is considered a very good immune boosting food. A garlic supplement can also be consumed to reduce body cholesterol.
- Amla, also known as gooseberry, has long been used in Indian households to prepare dishes and achar/murabba. But it is equally well-known for combating common ailments such as cold, sore throat, digestive issues etc. Apart from being rich in antioxidants, Amla is enriched with micronutrients which help in increasing the immunity. It acts as a detoxifying agent for the body and is great for eyesight, hair, heart and diabetes as well. Amla also has high fibre content that can aid in weight loss. It can be consumed in various forms like juice, candy or even the raw fruit.
- Honey can keep respiratory ailments like colds and cough at bay. Nature's sweetening agent, honey is rich in minerals such as iron, calcium and magnesium. Organic raw honey contains numerous medicinal properties. Its rich antibacterial properties soothe the throat and protect the body against bacteria and fungi, and also boost gut immunity. Honey can be used as a substitute for refined sugar, which is unhealthy and void of nutrients. It is also an energy-boosting food as the fructose and glucose in honey combine to give a sustained boost. Mix honey in warm water and drink it regularly for weight loss, increased immunity and to cleanse the digestive system.
- Green tea is full of antioxidants. Well-known for being an abundant source of antioxidants, drinking green tea on a regular basis flushes out the toxins from the body. Coupled with polyphenols, catechins in green tea help in boosting the immunity. Although most of us are accustomed to drinking milk tea/coffee, and might find the taste of green tea bitter and bland, it is known to be one of the healthiest beverages one can consume. Besides, green tea has been known to assist with weight loss too. A warm cup of freshly brewed green tea in the morning will leave you feeling refreshed. Also, aside from improving your immunity by cleaning your body, green tea is a rich source of

essential nutrients for glowing skin. It contains healthy bioactive compounds & antioxidants which help in functioning of the brain, burns fats, and prevent type 2 diabetes & cardiovascular diseases.

- Spirulina, a blue-green algae, that is available in the form of powder, capsule and tonic, can help regulate blood sugar, blood pressure and cholesterol. While vitamins and antioxidants are key to a healthy body, proteins and fatty acids are equally important. One can even try aloe vera, tulasi leaves, etc for increasing one's immunity.
- Turmeric is a must-have spice. Commonly found in most Indian households, turmeric is treasured for its antibacterial properties and medicinal value. Organic turmeric, which has high curcumin content (naturally-occurring chemical compound found in the spice turmeric) is an anti-inflammatory ingredient. These healing properties of turmeric help strengthen your immunity and ward off illnesses.

Apart from consuming these foods to build your immunity, one should always remember to have a balanced diet, drink plenty of water and get adequate sleep for a long-lasting good health. Therefore, consuming immunity boosting foods is a great way to increase immunity power.

### Healthy Snacks

World Health Organisation's (WHO) East Mediterranean Regional Office says in its official website: "People who eat a well-balanced diet tend to have healthier with stronger immune systems and at lower risk of chronic illnesses and infectious diseases." When it comes to healthy eating, snacking is usually the Achilles heel for most of us. Having three healthy meals is pretty easy, but we miserably falter while we snack. Healthy snacking might sound like an oxymoron as the majority of people still see a snack as a food that is eaten in addition to three standard meals a day and is often less healthy. With nutrition experts recommending small, frequent meals through the day, snacking imperatively becomes indispensable. Snacking when considered as a part of daily diet, helps in mitigating the digestive and metabolic overload of full heavy meals. One would be surprised to know that snacking contributes a sizeable percentage of our daily energy, vitamin and mineral intake. It would be wise if healthy snacking becomes an integral part of one's immunity-building habit. Nuts & seeds are conveniently available, easy to store and are ready to eat, thus making nuts and seeds a great snacking option. While nuts & seeds are smart ways to snack, there are certain things to keep in mind. Nuts may be consumed raw, but seeds should be dry roasted before consumption to destroy anti-nutrients like

phytates. They are calorie-dense and concentrated sources of nutrients, thus not to have more than a handful. They also contain appreciable amounts of protein and potassium. One should make sure about one's uric acid levels & kidney health parameters to be normal before regularly snack on nuts and seeds. In such cases, seeking professional consultation from qualified dieticians is advisable.

- **Almonds (Badam)** - Packed with essential immune-boosting nutrients like vitamin E, magnesium, manganese, B vitamins like riboflavin (vitamin B2) and niacin (vitamin B3), almonds make a great option for a healthy snack. Research has also indicated that almonds possess prebiotic properties that help in increasing immune-boosting probiotic bacteria. Another interesting research finding published in immunology journals is about the potential anti-viral properties of natural almond skins, hence munching on a handful of raw almonds do make a healthy as well as the filling snack option.
- **Walnuts (Acrot)** - Punched with the goodness of protein, anti-inflammatory omega-3 fats, antioxidant vitamin E, immune-strengthening vitamin B6 and copper, walnut can also be considered a healthy snack alternative. All these nutrients are essential for a healthy immune system. Either have them raw or make your own trail mix or a healthy granola bar. Walnuts would surely add a crunch to your daily diet.
- **Sunflower seeds** - Loaded with vital immune-supporting nutrients, sunflower seeds also make an excellent healthy snack choice. Being rich in healthy fats along with micronutrients like vitamin E, B vitamins like B3, B5 and B9 and minerals like copper, zinc, magnesium, manganese and selenium, roasted sunflower seeds should be on everybody's snack list.
- **Pumpkin seeds** - Bioactive components of pumpkin seeds make it an easy health-promoting snack solution. Containing a fairly good amount of protein, pumpkin seeds are a powerhouse of nutrients like B vitamins, vitamin E, copper, iron, magnesium and zinc. They also possess anti-microbial and immunomodulatory properties.

Apart from nuts & seeds, snacks made from boiled grams such as chana, lobhiya etc oil fried with onion & chillies also offer a healthy food high in proteins.

### Regular Exercises

Regular exercise such as walking, jogging, yoga, pranayam, gym work-outs, cycling, swimming, outdoor games etc is one of the pillars of healthy living. It improves cardiovascular health, lowers blood pressure, helps control body weight,

and protects against a variety of diseases. But does it help to boost your immune system naturally and keep it healthy? Just like a healthy diet, exercise can contribute to general good health and therefore to a healthy immune system. It may contribute even more directly by promoting good circulation, which allows the cells and substances of the immune system to move through the body freely and do their job efficiently.

In the fast paced world with busy schedules & no free time, one may try acupressure (simple technique using one's fingers, palms, elbows, feet, or special devices to apply pressure to acupoints on the body's meridians) for improving the immunity. A meridian is an 'energy highway' in the human body. Meridians can be mapped throughout the body. As per the acupressure principles, meridians flow within the body & not on the surface. Meridians exist in corresponding pairs and each meridian has many acupuncture points along its path. Apart from exercises, laughing improves the immunity system as well as mental health. Therefore, one should spend fun time with family & friends to lead a healthy life. Laughter is the best medicine and therefore a great way to increase immunity.

### Omissions & Commissions

Some common nutritional mistakes that most people make are to be avoided for building a strong immune system. Following a healthy diet is very important for this. You need to eat a balanced diet and include foods that contain all the essential minerals and vitamins. But this is not enough. We also need to avoid some common mistakes that most of us make. Following are to be kept in mind to avoid nutritional mistakes that can affect our immune system.

- **Not having breakfast** - This is the most important meal of the day. One needs to have a hearty breakfast that will fuel us for the rest of the day. Moreover, if we skip breakfast, we may overeat later during the day or snack in between the meals, and this can cause weight gain. Obesity can have an adverse effect on immunity.
- **Not having enough water** - Dehydration can make us weak and this can lower our immunity. At least 8 to 10 glasses of water every day is required to be consumed. This will aid in digestion and absorption of essential nutrients. It will also ensure the kidneys to work properly in expelling the harmful waste from the body efficiently. It will facilitate smooth bowel movement which is so essential for a strong immune system. But this does not mean that drink a lot of water at one go and be done with it for the rest of the day.

One must distribute our water consumption throughout the day for better immunity.

- Not adding protein to our dinner plate - This is a very common nutritional mistake that most people make. This nutrient is very important when it comes to our immune system. It helps our body repair tissues and fight off invading viruses and bacteria. If we do not have enough protein, our immunity will go down and this is dangerous given the current situation prevailing due to coronavirus. Proteins are abundant in lentils, beans, tofu and cottage cheese.
- Not cooking food properly - Food needs to be cooked properly for pathogens to die. This is especially true in the case of meat. The COVID-19 virus is said to have jumped from animals to humans. Experts say that eating contaminated and undercooked meat can help diseases to enter the body. Even eggs need to be cooked properly. By taking this safety measure, we will be getting all the vital nutrients from your food and also keeps the diseases away.

### Ayurveda on Immunity

There is a theory of immunity in ayurveda called the beej-bhumi theory, which means "seed and land." In this case, the body is analogous to the bhumi (land), and infection or "bugs" are like beej (seeds). If the body is filled with ama (toxins) and lacking in ojas (internal antidote to aging), the infection will find it to be the fertile ground for spreading, just as land that is fertile will sprout many seeds. If digestion is strong, and ojas rather than ama predominates in the body, then the seeds of infection will not be able to take hold, just as seeds will not take root in land that is infertile.

Everyone is more susceptible to respiratory problems such as common cold & flu in the transitional period during season changes, such as in the fall and early spring. This is because the body functions differently in each season, and in the transition between the hot and cold seasons the agni, or digestive fire, can start to fluctuate dramatically. Ayurvedic therapy recommends the gentle purification treatments called panchakarma (natural detoxification) such as ayurvedic massage, steam baths and intestinal cleansing treatments, to rid your body of ama (toxins) accumulated during the previous season. In case, panchakarma treatments under the supervision of an ayurvedic physician not feasible, one can still follow an ayurvedic regimen at home to cleanse the body of ama (toxins) by sticking to soups, or light meals of mildly-spiced vegetables with grains such as quinoa (sabudana), couscous (semiya) and millet. Eating a lighter diet for a few weeks while the weather is

changing will help burn away ama (toxins) rather than accumulate it. This should be followed by proper rest, drinking plenty of warm fluids, and daily walks or exercises.

According to Ayurveda, drinking the Panchamrit prevents infection. Panchamrit means five nectar, which is made of five sacred objects. This mixture is a beverage made by mixing milk, curd, ghee, sugar & honey, which become the food of the gods. It also has great importance in the form of prashad offered to God. Following are the few tips suggested in Ayurveda for raising the immunity levels:

- Pomegranate (Anardana) chutney as a condiment in the meal for enhancing digestion & to overcome the less hungry symptoms.
- Cooking food with immune enhancing spices such as cumin (jeera), fennel (saunph), coriander, turmeric, ginger & black pepper is also an important way to enhance digestion and reduce toxins.
- Stay away from leftovers, processed foods, ice-cold foods and drinks, and heavy foods such as fried foods.
- Vegetables from the nightshade family (potatoes, tomatoes, eggplant (brinjal), and sweet peppers (shimla mirch) should also be avoided, as these create toxins.
- Eat nourishing, warm food, and avoid any fasting in winter.
- Avoid heavy sweets, as these are difficult to digest.
- Light & easily digestible proteins such as panir (a freshly-made cheese), lassi (a yogurt drink that aids digestion) and vegetable proteins such as moong dhal boosts immunity.
- A warm bath each day is very necessary to warm the body, open the pores, and regulate your body's internal thermostat.
- Daily massage is very important for opening the channels, stimulating the digestion & removing toxins from the body. But the same should be refrained during cold/cough & menstrual cycles.
- Exercise is another important aspect of the ayurvedic routine, because it helps enhance agni (digestion) and burns away toxins.

### CONCLUSION

Immunisation can be active (natural) with body developing immunity in a natural process from the antibodies developed to fight micro-organisms such as virus, bacteria, fungus etc when people become sick. The passive (acquired) immunity is one by injecting the less virulent micro-organisms into human body such as DPT vaccine. DPT is a class of combination vaccines against three infectious diseases in humans viz., Diphtheria, Pertussis

(whooping cough), and Tetanus. Pulse polio programme also was implemented on war footing to eradicate the polio from the world. Immunisation should be commenced immediately after birth through these recommended vaccines. For infants till 9 to 12 months from their birth, breast feeding of mother's milk which contains colostrums helps immensely in improving their natural immunity.

Snacks as such are not bad if one trades the junk food for fresh fruits, crudités (Crudités are raw vegetables which can be cut into small pieces, sticks, or thinly sliced. They are usually served with some sort of dip) with hung curd dip, nuts or a salad. Don't give up on snacking as it supplies the quick 'pick-me-up' one needs. Eating small yet frequent meals is the ideal way. This doesn't license us to eat more, but spread our daily requirements throughout the day. Also, one should be conscious of not only what to eat, but when to eat what. The key to smooth digestion lies in the timing of the meals. The first meal of the day should be taken about one and a half hours after waking up. Further, there should at least be a three-hour gap between breakfast and lunch and the same between lunch and teatime. Dinner is best enjoyed two hours before we sleep so as to allow the body to wrap up the digestion process.

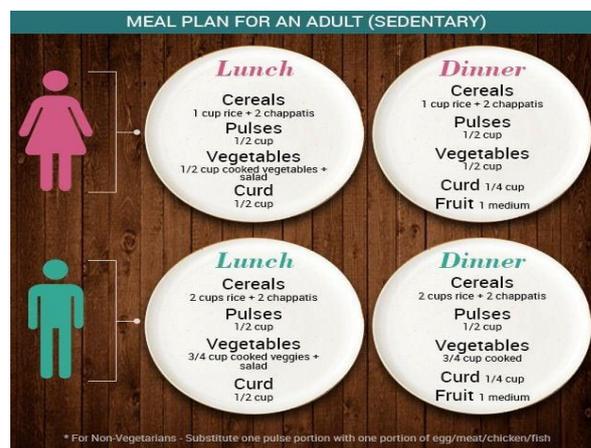
**Breakfast:** A good morning meal should comprise of three things. These are dietary fiber or carbohydrates (whole-grain bread, oatmeal, white oats, wheat flakes), proteins (eggs and egg whites, yoghurt, milk and sprouts) and nuts (almonds, walnuts, apricots and figs). This way we will eat fewer calories the rest of the day.

**Lunch:** Make it a mix of high-fibre whole grains like brown rice, barley or jowar, starchy carbohydrates and some good source of proteins like cottage cheese, pulses, chicken or fish. One should include some probiotics like yoghurt or buttermilk and fibre from fresh salads to complete the meal.

**Dinner:** To maintain a healthy balanced diet, pick foods with a high satiety value that keep you full for longer and curb midnight bingeing. Load the plate with greens for vitamins & minerals. Limit carbohydrates but don't cut them off. Combine them with some healthy fats like fish, nuts and seed oils. Your body can use these for regeneration and repair overnight.

It will now be easier for diabetics, heart patients and those who are on diet to figure out how much calories they are consuming while eating Indian food. The Indian Council of Medical Research's Hyderabad-based National Institute of Nutrition has launched a mobile App that offers comprehensive nutrition related information on a

wide range of Indian food articles. A major plus point of the App named 'Nutrify India Now' is that it is based on authentic and well researched India-specific databases and uses guidelines prescribed by ICMR, the apex medical research body of the country. It also provides information on several parameters such as protein, vitamin and mineral content of the food items, besides their calorific value.



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