

# Food and Immunity: Correlation to combat against COVID-19

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The outbreak of the current pandemic has affected the lives of people, their health, and wellbeing. The sudden disruption of daily routine, undesired laws of social distancing, and receiving a flood of information puts all of us at risk of mental stress and dilemma. Persistent fear, anxious mood, irritability, feelings of guilt, pessimism and worthlessness, insomnia, loss of appetite or weight gain, poor concentration and, worsening of chronic health problems may be an indication that stress is affecting our health and immunity. During the lockdown period, our existing underlying diseases may also trigger in the absence of adequate physical activities and fear of the pandemic. So, there is a need to strengthen our physical strength and immunity system even if we do not have any lifestyle disease.

In the absence of any prescribed treatment, vaccine and therapeutic recommendations being available against COVID-19, governments of most countries and several authorised international health agencies like the World Health Organisation, the British Dietetic Association, and the UD Food and Administration are emphasizing on maximum use of raw vegetables and fruits, nuts, and seeds; pulses and wholegrain foods; unsaturated oils; limit the intake of soda, salt, sugar, and trans fats; and stop eating junk and sugary food. Apart from food, guidelines also recommend physical exercises, meditation and adequate sleep, and good exposure to sunlight.

These recommendations and guidelines have already been a part of the ancient healing system of India, i.e. Ayurveda, which suggests that life is standing on four pillars, namely, Aahar (diet), Vihar (lifestyle), Achar (conduct of individual with the external world) and Vichar (mental health). According to this, food is like a medicine that can recuperate an individual by establishing the connection between elements of life, food, and body. Individuals' temperament, physical and emotional states can be determined and regulated by their food choices, quantities, and lifestyle. It is well known that there is a close relationship among genes, environment, food, and emotional factors that lead to a bidirectional vicious cycle of mood, food, and lifestyle diseases. Ayurveda recommends the intervention of healthy lifestyles, meditation, pranayama, adequate sleep, and Satvik food to live a healthy, peaceful life and fight against various diseases including COVID-19.

Ayurveda considers that proper food selection and dietary schedule help to maintain holistic health with a calm mind. Bhagwad Gita and Yoga Shastras divided food into three types based on their qualities (termed as gunas). They are Sathva (satoguna), Rajasa (rajoguna), and Thamasa (tamoguna). Sathva means goodness, whereas Rajasa means aggressive/active, and ordered from "best" to "worst". Thamasa means inactive. A Satvik diet is meant to include foods and eating habits that are natural, vital and energy-containing and provides calmness, purity and promote longevity, intelligence, strength, health and delight. Examples of *Satvik* food items are fruits, vegetables, sprouted grains, cereals, nuts and seeds, low fat milk and milk products, pure fruit juices, and cooked food that is consumed within 3-4 hours of cooking, etc.

**A Rajasic diet, the mode of passion**, is one that is overly spicy, hot, or fried with pungent, sour, and salty taste. Rajasic food possesses attributes of negativity, passion, and restlessness. Examples of Rajasic food are caffeinated drinks (like coffee, fizzy soft drinks, tea), sugary foods (chocolate, cake, biscuits, chips, etc), or spicy food. As these foods are rich in glucose, they may provide immediate energy but eventually destroys the mind-body equilibrium, feeding the body at the expense of the mind.

A Tamsik diet, the mode of ignorance, is one that consists of overcooked, stale, fast, reheated, microwaved, or frozen food; dead food such as meat, fish, poultry, eggs; alcohol, cigarettes, and drugs of addiction. Tamsik

foods are hard to digest and gift inertia, dullness, and induce sleep. All these are an important cause of obesity, diabetes, heart, and liver disease.

Rajasic and Tamsik foods, available as processed and junk foods, are full of carbohydrates, sugar, and trans-fat in high proportions. The combination of high-fructose corn syrup (HFCS) and table sugar has become a primary choice of food industries as a sweetener due to its better shelf-life, more palatability and competitive price. This resulted in an additional 30% increase in overall sweetener intake and inability to regulate the hormones insulin and leptin and to inhibit the production of ghrelin, all factors that are known to affect the satiety centre in our brain, regulate blood glucose levels and appetite. Fast foods and fried foods like French fries, doughnuts, cakes, pie crusts, biscuits, frozen pizza, cookies, crackers, and stick margarines are made up by using hydrogenated or artificial trans-fats (or trans-fatty acids) which meets their food processing needs, easy to use, inexpensive and can be used many times in the commercial fryers. High sugar, high-fat and animal protein diets lead to disruption in the regulation of blood glucose levels, fat build-up in the liver, high uric acid concentrations, reduced kidney function and increase in arteriolar thickening, and fat deposition.

On the other hand, food rich in Prana ('life-force') is a combination of carbohydrates, fats, rich in dietary fibre, vitamins, minerals, and antioxidants with a limited amount of sugar, salt and oil, and no animal fat. It can be digested easily and utilize the six tastes in Ayurveda (sweet, sour, salty, pungent, bitter, astringent). Satvik food with recommended physical exercise, adequate rest, and a positive mindset is a source of energy and can reduce the risk of high body mass index, coronary artery disease, obesity, hypertension, type 2 diabetes, and osteoporosis. Satvik food is pure, natural, strong, wise, and full of energy to provide calmness and peace to the mind, thereby resulting in longevity of life in an individual.

On the other hand, Rajasic and Tamsik food like onion, garlic, asafoetida, caffeinated tea, and coffee; fried, spicy, high in sugar, and junk foods induce restlessness, lethargy, and sleep. Food like garlic and onion may be good as medicine but not for daily consumption. The daily consumption of food, which stimulates the nervous system, may lower the possibilities of experiencing life.

### Food choices during the current pandemic

Recommended Food	Avoid (but could be taken rarely to satisfy taste buds)	Not Recommended
Fibrous food in the form of raw or freshly cooked colourful vegetables and fruits (good sources of vitamins A, C and E, as well as antioxidants, folate, and fibre)  (opt steaming, grilling or sautéing cooking methods)	Less spicy and oily food  Garlic, onion, unseasonal veggies in a limited amount	Fried, over spicy and overcooked, or stale food
Pulses and wholegrain foods (oats, brown pasta, millet, and rice, quinoa and whole-wheat fresh chapatis and wraps)	Brown bread	Refined, processed grain foods (white pasta and rice, and white bread), <b>deep-frozen foods</b>
Low-fat or reduced-fat versions of milk and dairy products like curd, yoghurt (rich in probiotics that strengthen the digestive tract).	White meats like poultry and fish that are generally lower in fats than red meat; processed meat (though it is not a part of Satvik food)	Red meat
Unsalted nuts and seeds (like pumpkin, sunflower, and flax). They are great	Homemade low fat/sugar snacks like	Snacks that are high in salt and sugar (cookies, samosa, cakes,

sources of vitamin E, niacin, riboflavin, protein, healthy fat, antioxidants, and fibre.	idli, dosa, dhokla, upma, daliya, brown bread with pea-nut butter	and chocolate); <b>pickles, jams</b>
Egg yolks, and fortified breakfast cereals	Canned food, used after washing it to remove extra salt or sugar	
Unsaturated fats (e.g., found in fish, avocado, nuts, olive oil, soy, canola, sunflower and corn oils). The fat intake is recommended less than 30% of total energy intake, of which no more than 10% should come from saturated fat.	Saturated fats (e.g., found in fatty meat, butter, coconut oil, cream, cheese, and lard)	Trans-fats (processed food, fast and fried food, snacks, frozen pizza, pies, cookies, margarines, and spreads)
Fresh fruit juices, low fat lassi, chaaz, lemon water, coconut water/ hot water, herbal tea (packs a big punch of polyphenols, flavonoids, and antioxidants that destroy free radicals)	Soft drinks or sodas and other drinks that are high in sugar (e.g., packed fruit juices; fruit juice concentrates and syrups; flavoured milks and water; energy and sports drinks; and yogurt drinks, caffeinated tea, coffee, ready-to-drink tea, and coffee	Alcohol, tobacco, drugs
Honey and jaggery	Brown sugar	White sugar
Indian herbs: Coriander (Dhaniya), turmeric (contain <i>Curcumin</i> ), fenugreek ( <i>methi</i> ), tulsi (Basil), cumin (jeera), fennel (sonph), cloves, black pepper (Kalimirsch, contain <i>Piperine</i> ), cinnamon (dalchini), ginger and curry leaves.  These spices have antioxidant, antibacterial and anti-inflammatory properties, act as immune booster and may help to flush out any sinuses from the body. Rock salt (limit salt intake to 5 grams (equivalent to a teaspoon) a day.	Iodised salt	Non-iodised salt

The current guidelines of the Ministry of AYUSH, Government of India, recommend self-care guidelines for preventive health measures and boosting immunity. These guidelines recommend herbal tea and decoction (Kadha) made from Tulsi, Dalchini, Kalimirsch, Shunthi (Dry Ginger) and Munakka (Raisin) with jaggery and/or fresh lemon juice to enhance the taste as immunity promoting measures against COVID-19. Guidelines also recommend avoiding cold, frozen, and heavy foods, which is a clear indication to avoid Rajasic and Tamsik food. Recommendations such as to take appropriate rest, timely sleep, exposure to sunlight, and practice of Yogasana and Pranayama also help to balance our body, mind, and lifestyle.

It is recommended that in this time of uncertainties and non-availability of treatment, it is important to remain healthy and peaceful. Good food with other recommendations, as explained in the above table, would help in

building up our immunity as well as burst the stress while combating against COVID-19.

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*The views expressed in the article are those of the authors and not of the organisation they belong to.)*

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