



# Nutrition, Bioavailability and Food Safety Covid-19 Corona Crisis, Immunity and Novel Food Processing Technologies: A Review

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Spice and Flavour Science Department, CSIR-CFTRI, India

**\*Corresponding author:** Babasaheb Borase, Sr. Principal Scientist and Dy. Director, CSIR-CFTRI, Mysore-570 020, India & UNU-Kirin Fellow (Japan), Email: borsebb@cftri.res.in; bbborase@yahoo.com

The recent outbreak of novel Covid -19 worldwide has brought the world to a grinding halt by nationwide and global lockdowns ranging from days to months. This has provisioned the humanity as a blessing in disguise to sit back home in silence from the rat race and human beings have realised the vital role of our sweet home food, nutrition, safety and immunity emphasizing the hygiene, selection, preparation, processing and serving environment and the subtle vibrations of true love, care and purity of *satvik* food.

As known from several sources the bats and pangolins became the source of the contagion and Covid-19 Corona crisis, an indicator of the lack of thinking, forethought, inability to use available knowledge, lack of food security and safety on part of consuming population and enforcing agencies/economies who just talk of Food safety.

This Covid-19 crisis has come as an eye opener for all the so called developed, developing and under-developed economies that world not only need learn and talk but also practice the lessons of food safety, nutrition, nutraceuticals and use foods, beverages, spices and herbs wisely to boost the immune system underlying the age old saying attached to Hippocrates, let food be thy medicine.

This clearly indicates need for novel food processing and preservation techniques and technologies such as optimally spiced and minimally processed fruits, vegetables and allied food resources obviating use of chemicals. Therefore, it is well said than done prevention is better than cure. But how many modern men and women have truly brought this realization and application in day to-day lifestyles giving away the usual saying of busy life style and no time to eat wholesome healthy foods in place of junk unhealthy foods.

There is also a problem of unhealthy food lifestyles, eating habits and caloric nutrition. That is, some individuals

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overeat (a common problem in Americas and many other countries) and some individuals with great difficulty get only one square meal (800 million hungry worldwide) a day. The alarming rates of malnutrition in Africa's, Asia, Oceania and some other nations have indicated the system failures. Blame it on climatic change, draught, natural disasters, human apathy, governance, capitalism, disrespect for poor and marginalised.

May be this has answer in the food security systems (ensure sustained supply of quality, safe nutritious food and not just quantity of food to the consumer) need to be addressed at global level with necessary global cooperation and inclusion. This may require the universal wisdom that whole world and humanity is one family (*vasudhaiva kutumbakam*) children of one God. Let us work together, use our all light, might and science, technology to eradicate the malnutrition, global hunger, food insecurity and food safety issues.

The developments in the food sciences, engineering and technology of food in terms of nutrition, microbiology, bio-chemistry, bio-technology, infosystems-computation, communication, logistics, distribution and humanities including spirituality have enough to offer to solve these problems as rightly said where there is a will there is a way.

The food can act as medicine and immunity booster not only in the times of Corona crisis but all the time, if one knows the science, properties, processing, handling, storage and application of food as medicine not only scientifically, but also by the grandmothers way (cooking, spices, recipes passed from generations). Open minded people through experience, research and developments have not only realised but demonstrated and disseminated that a good wholesome food (*satvik*) can go a long way solving many health problems besides practising yoga, meditation and

AYUSH (Ayurveda, yoga, Unani, Siddha & Homeopathy) guidelines will help enhance the results.

There is now enough body of knowledge available that the lifestyle diseases such as obesity, viral infections, *diabetes mellitus*, cancers, cardiovascular vascular diseases, blood pressure, insomnia, anaemia, stress, cancers, AD, PD and psycho-somatic diseases can be prevented, managed, cured with judicious use of nutritious healthy food, spices, yoga and Rajyoga meditation. This is an integrated approach for the best time tested results over long time. It is not just like one molecular target drug approach in Alopathy (one chemical species/marker/molecule as target). The wholesome food holistically provides naturally integrated set (not just one target chemical species) of bio-available biochemical ingredients such as carbohydrates, proteins, fats, vitamins, minerals and nutraceuticals all in one go as medicine at affordable cost especially to poor. To boost the immunity against Covid-19 always sip hot warm water and to win over Corona, include in diet sprouted grains, nuts (amino acids),

fresh lemon (Vit. C), Green leafy vegetables and black raisins (iron) and melon seeds (zinc). Similarly plenty of knowledge and literature is available that which seasonal healthy wholesome foods (fruits, vegetables, grains etc.) beverages (tea, coffee, cocoa etc.) spices (pepper, chilli, turmeric, cumin, mustard, ginger, cinnamon, clove, cardamom, garlic etc.) and herbs (basil, pudina, rosemary, thyme, betel leaf, *triphala*, *isabgol*, *guduchi* etc.) to be consumed as preventive or curative medicine for certain specified health problems and stress, anxiety and reduced immunity levels.

The novel food processing and preservation technologies such as thermal/athermal, aseptic, high pressure technologies and bio-preservation technologies along with smart packaging have paved ways for number of products, processes and patents worldwide. This is evidenced by ever increasing range of science based nutritional, nutraceutical, healthy, hygienic convenience RTE, RTC foods and RTD beverages available on market shelves.

