

Research Article

## **Panorama of Food and COVID – 19**

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### **Abstract:**

Healthy eating is very important, especially for developing youngsters. All of us are aware of the fact that malnutrition is bad for health. However overeating is also injurious to health. Research has revealed that consuming five portions of fruits and vegetables in a day is not followed by everyone, even in well developed countries like UK and US. Predominantly, everyone consumes only three portions of vegetables and fruits and one in five youngsters do without breakfast. On the other hand obesity and overweight have also increased among youngsters. Attractive packaging, easy availability and affordability allure youngsters to fast food and junk food. A quick-service restaurant cannot provide a balanced diet. Unimplemented knowledge of balanced food provides no result. An effective health promotion strategy to bring about affordable healthy food with ease of availability is an essential step for present-day living. Society has a right to grow, sell and eat healthy food.

Research studies have pointed out that there is a research gap in the area of nutrition, and have said that in spite of the availability of food, we still have not reached a point of sufficient nutrient supply to protect and to nurture our health. It is not because our hands cannot reach the food, but it is because we are ignorant of what is on our plate. Before understanding what one should have in everyday diet and the food components for potent immunity and unimpaired health, it is necessary to make meaning of how food is perceived. Sarah D Ohlhorst and Robert Russell et al have said that nutrition research needs specialists from various areas to form nutrient guidance and policies for safe and sound health for the global population. Food justice is to ensure access to healthy food that is fresh and nutrient rich. Now with Covid-19 posing a crisis situation, the lid has been blown off and has revealed the perspectives on food and the convincing reasons for eating.

### **Introduction**

The bounty of food supply along with the globalisation of food intake have given rise to good health and an increase in life expectancy. This has led to food being viewed from a different perspective. It is

no more just for the satisfaction of basic biological needs. In the luxurious society of today the place of food has changed from essential requirement to yearning. Food has different facets now, like health and nutrition, mood and emotions, delicacy and aestheticism, to mention a few.

Food has not only helped human beings survive but has also become a reflection of the culture one belongs to. The primitive means of living was fishing and hunting. On the path of civilization, the discovery of fire helped man to increase the nutritional value of food and made it easy to consume. Then started the culinary art which evolved with various aromas, colours and taste<sup>1</sup>. The ingredients of the cuisine were defined by the geographical area, climatic conditions and the seasonal changes. According to Tannahill in 2002<sup>1</sup>, culinary art is the paramount factor that guided the primitive human into a fully matured human. How do people perceive food, is it to satisfy the basic physiological need of hunger, to entertain the discerning palate, to uplift the mood, or is it to facilitate proper nutrition<sup>1</sup>?

#### Food and Nutrition

Everyone knows that nutrition is key to a healthy life<sup>2</sup>. Nutrition decreases the burden of many diseases and reduces the associated risk factors of disease. The field of nutrition borrows knowledge from the fields of molecular biology, biochemistry and genetics<sup>2</sup>. A study done in France showed that following a cardioprotective Mediterranean diet, which already exhibited evidence of reduced cardiovascular diseases, also provided protection against cancer<sup>3</sup>. The diet was composed of fruits, vegetables and cereals rich in fibre, vitamin C, vitamin E, high in omega 3 fatty acids, oleic acids and low in cholesterol, saturated and polyunsaturated fatty acids<sup>3</sup>. Omics research, which includes nutrigenetics and nutrigenomics, will help to establish how explicit nutrients collaborate with genes, proteins and metabolites to forecast an individual's health<sup>2</sup>. Omics contributes to information on individualised nutrient requirements, an individual's nutritional status, and the invention of new nutritional and disease biomarkers<sup>2</sup>.

#### Food and Aestheticism

The term food does not fit into the frame-work of an anchored meaning that says it is a propellant of the human body, that mitigates the prime need of hunger, it is more than that. As we turn the pages of history, we know that food is the fuel of mankind and that we had spent our time in search of it, but during the development of civilization, with the help of fire and time, we took it to a superior level. Food became the mirror of culture. Artisans of cooking have pushed it one step ahead. Culinary art has kindled the aesthetic sense of humankind.

Fernandez – Armesto<sup>4</sup> when writing about food in 2001 said that artisanal skills were getting polished . People had started appreciating normalised taste which energises traditional cuisine. There will be a shift from inexpensiveness to standard ones<sup>4</sup>. So appreciation and respect for artisanal cooking will rise in the future. Parasecoli<sup>4</sup> says that when one eats and appreciates a dish, it involves all the five senses. First of all, the looks of a dish and the way it is arranged invigorates the desire to taste a food. The smell excretes saliva which helps in digestion. The texture and temperature of the food are relished when the tongue touches it. The crunchy and slurping sounds increases the appetite. Enjoying the harmony between these elements is indeed an intellectual act, which indicates the cultural background of the cuisine<sup>4</sup>. In the same year, a similar opinion was stated by Schiffer Stein,<sup>5</sup> in 2006, who said that food products when interacted with involved all the five senses; which includes vision, smell audition, touch and taste<sup>5</sup>. Callon et al<sup>4</sup> in 2002 stated that there are two aspects in a food i.e the intrinsic and the extrinsic aspect. Intrinsic refers to the composition of food which comprises the appearance, edibility and taste of the food, whereas extrinsic means how a human evaluates and judges the food<sup>4</sup>. The interaction between the intrinsic and extrinsic factor brings about the quality of the food<sup>4</sup>. Brakus

Schmitt<sup>5</sup> in 2009 stated that a food experience is based on the sensory information relayed to the brain, whether it is delightful, the meaning it gives, the action it brings about, the cognitive association and the emotional responses<sup>5</sup>. It would be apt to summarise in terms of “aestheticism” and food, by borrowing the words of the famous eighteenth century philosopher Baumgarten<sup>5</sup> who mentioned that food is not only a feast to the eyes but also a “gratification of the senses” and a “sensuous delight”<sup>5</sup>.

### Psychology and Food

Brain behaviour and food are strongly connected. Food that gives good health allows you to have a strong and clear mind. Being mindful of healthy food and being careful of what we eat are very important. Even when we are asleep the brain works constantly and it needs fuel uninterruptedly. The source of fuel is food and for the better function of the brain, it needs healthy food<sup>6,7</sup>. There are foods that bring a better mood instantly but it does not reduce depression<sup>6,7</sup>. Based on the diet one eats, the brain’s structure chemically and physiologically changes and hence, this change affects behaviour<sup>6,7</sup>.

Having a check on what we eat and what we include in our everyday diet is essential. A diet with vitamins and minerals and sufficient food supply is necessary for well-being<sup>6,7</sup>. For an improved function of the brain, the diet should be a healthy balanced diet. Food rich in protein, vitamin B and vitamin D stimulates serotonin production<sup>6,7</sup>. This neurotransmitter serotonin is a mood regulator. Ninety five percent of serotonin production happens in the gastrointestinal tract, which is lined by millions of nerve cells<sup>6,7</sup>. Studies have proved that the inner working of the digestive system not only helps to digest food but also regulates emotions. The synthesis of serotonin is influenced by the billions of good bacteria constituting the intestinal microbiome. This makeup protects against toxins and bad bacteria<sup>6,7</sup>. These good bacteria activate the neural pathways that run between the gut and the brain tying up brain and gut.. Traditional fermented foods that serve as a natural probiotic, Mediterranean diet, and traditional Japanese diet which contains vegetables, fruits, unprocessed grains, fish and sea food, and only include limited amounts of lean meat and dairy and are devoid of processed foods, refined foods and sugars unlike the Western diet, promote the presence of good bacteria in the gut<sup>6,7</sup>.

Research shows that foods with high dietary glycaemic index increase the occurrence of depressive symptoms<sup>8</sup>. A western diet containing more of saturated fat and high in calories has adverse effects on brain health, comprising of cognitive decline, hippocampal dysfunction, and impairs the blood brain barrier<sup>8</sup>.

Research done by Noble et al shows that the consumption of a high calorie Western diet has a detrimental effect on the mnemonic processes that depend on the integrity of the hippocampus<sup>9</sup>. Their research also associates altered gut bacteria to disrupted intestinal permeability and blood brain barrier integrity causing the inrush of calamitous substances from the circulation<sup>9</sup>. Insulin protects against endotoxin<sup>9</sup>. Modification in gut bacteria also affects peripheral insulin sensitivity<sup>9</sup>.

O’Keefe et al in their research show that the consumption of a calorie dense, highly processed and nutrient-poor Western diet promotes postprandial dysmetabolism<sup>10</sup>. In postprandial dysmetabolism, there is intermittent increase in free radicals which stimulates atherosclerosis, which in turn involves endothelial dysfunction, inflammation, sympathetic hyperactivity and increased coagulability<sup>10</sup>. It may bring about cardiovascular events even in non- diabetic individuals<sup>10</sup>. Eventually, it ends in memory loss, anxiety and depression.

### Food and Emotion+

According to Van Strien T et al, overeating could be because of three reasons. One type is when a person overeats after a duration of slimming, that is when the cognitive determination to eat less than

desired is dropped, called “restrained eating”<sup>11</sup>. Second is when a person overeats on the sight or smell of pleasing, tasty food called “external eating”<sup>11</sup>. Third is when a person overeats as a result of negative emotions called “emotional eating”<sup>11</sup>. Some of the interventions for treating overeating is “Dialectical behavioural therapy”,<sup>11,12</sup> where-in emotional eating can be reduced by inspiring alternative emotion regulation skills that do not include eating<sup>12</sup>. Cognitive behavioural therapy can be used to treat eating disorders such as Anorexia nervosa and Bulimia nervosa that result because of maladaptive cognitions<sup>12</sup>. Binge eating and emotional eating could also be treated using mindfulness,<sup>11,12</sup> where-in one pays attention to the current moment purposefully and non judgementally<sup>12</sup>. Yet another intervention is the “Acceptance and Commitment therapy”(ACT). ACT inspires resilience to internal signals like emotions and external signals like food<sup>12</sup>.

There are several studies done on mood and emotional eating. Whether hungry or satiated, food signals and sensory provocation elevate food cravings<sup>13</sup>. It is also suggested that mood and food imagery are predecessors to food cravings<sup>13</sup>. Whether an increase in food craving predisposes to obesity is not known<sup>13</sup>. Craved foods were chiefly carbohydrate and fat<sup>13</sup>. However, successful weight losers experienced a reduced rate of giving in to the longing to eat craved food<sup>13</sup>. This highlights the fact that food works concomitant with emotions.

#### Food and COVID:

The COVID pandemic period has put the world in a crisis situation where knowledge is not only required from the field of medical and biological sciences, but also of all human sciences relevant to social and behavioural studies, lifestyle and dietary habits<sup>14</sup>. Various studies were conducted all over the world to understand the food preferences of people during this time.

One such study done among Spanish consumers<sup>15</sup> during the lockdown showed that while there was increased consumption of healthy foods like vegetables and fruits, there was also increase in consumption of nuts, cheese and chocolates to better the mood and for better mental health<sup>15</sup>.

Similarly, a study conducted among the Italian population to investigate the impact of the COVID-19 pandemic on eating habits showed that overall, the study samples preferred eating healthy foods, despite the difficulty in the agricultural supply chain. The consumption of organic foods like fruits and vegetables were on the rise. At the same time, around half the population had been eating more and gaining weight with an observable increase in junk food consumption<sup>14</sup>.

Information from the Danish population study on eating habits and lifestyle showed that during lockdown, the amount of time spent at home was higher leading to higher frequency of cooking, and higher rate of emotional eating<sup>16</sup>. The result of the study indicated that apart from the consciousness of eating healthy foods, there was also a considerable proportion of the population who adhered to eating more and snacking more, leading to an increase in weight gain<sup>16</sup>.

Different research studies were conducted to study the influence of the COVID-19 pandemic on food habits and lifestyle among the UK population<sup>17</sup>. One showed that people with higher body mass index (BMI) reported lack of motivation and control around food and the overall scenario was characterised by overeating<sup>17</sup>.

Another study in UK on adults with mixed eating disorder, showed that lockdown served as a catalyst for significant aggravation of disordered eating behaviours<sup>18</sup>. Social isolation and lack of scrutiny present during lockdown resulted in participants engaging in binge eating<sup>18</sup>.

In Netherlands, researchers investigated the eating behaviour and food purchases during this period. It was seen that there was no change in the eating habits of the older population but among the younger

population there was more of eating unhealthy foods<sup>19</sup>. Among the overweight and obese individuals, they ate more food which comprised of less healthy food and purchased more savoury snacks and alcoholic beverages<sup>19</sup>. Surprisingly, individuals with higher education levels ate more unhealthy foods during lockdown<sup>19</sup>.

Research on eating frequency, eating habits and weight in the Saudi Arabian population was done and this showed that eating frequency among the food – secure participants was increased for fruits, savoury snacks, sweets and candies. However, the eating frequency did not change with respect to consumption of vegetables, milk, dairy products, cereals, bread, meat and eggs among all groups<sup>20</sup>. In general, there was an elevated consumption of snacks by food – secure participants which led to increased weight<sup>20</sup>. Negative eating behaviour and attitudes during the lockdown could have led to overeating which placed them at an increased risk of obesity, micronutrient deficiency and viral infection<sup>20</sup>.

Matsungo. T.M et al studied the effect of the lockdown due to COVID-19 pandemic on nutrition, health and lifestyle in the Zimbabwe population<sup>21</sup>. The results showed that lockdown resulted in stress and anxiety which led to compensatory hyperphagia, particularly “carbohydrate cravings”, giving rise to elevated energy consumption and the start of the hazardous vicious cycle contributing to “lockdown associated obesity”<sup>21</sup>. There was a decrease in consumption of fruits and vegetables except dark green leafy vegetables. There was predominant overeating of sugary foods or “comfort foods”<sup>21</sup>.

A study was conducted by Huber.BC et al among the young adults of Bavarian University, Germany, to investigate the impact of lockdown on nutrition behaviour<sup>22</sup>. Around one third of the study subjects ate more. The elevated risk for increased food intake was attributed to mental stress due to the lockdown<sup>22</sup>. With respect to food composition, results indicated increased consumption of specifically, bread and confectionary<sup>22</sup>. No relevant changes in the consumption of fruits, vegetables and dairy was noted before and after lockdown<sup>22</sup>. The study results showed weight gain in individuals with high body mass index, who also increased their food consumption substantially<sup>22</sup>.

Marty.L et al did a research among the French population to investigate the changes in food choice motives related to nutritional changes at the time of lockdown in France<sup>23</sup>. Results showed an increased intake of both healthy and unhealthy foods. Healthy foods include fruits, vegetables, pulses, fish and seafood<sup>23</sup>. Unhealthy foods include sugary foods, sweet tasting beverages and alcoholic beverages<sup>23</sup>. This mainly led to a reduction in the nutritional quality of their diet in general<sup>23</sup>. Boredom, feeling of emptiness and stress during lockdown were managed by eating<sup>23</sup>. Rare emotion regulation by eating was related to the intake of sweet foods<sup>23</sup>. Thus, there was a negative association between nutritional quality of food and changes in mood food choice motives<sup>23</sup>.

#### Conclusion:

Abraham Maslow, in 1943, put forward a theory based on human motivation, shaped like a pyramid and having a bottom to top approach. According to this hierarchy, there are five levels of human needs. Needs lower down in the hierarchy must be satisfied before individuals can attend to needs higher up. So one of the basic physiological needs is thirst and hunger, next to that is the need for safety. There is no doubt that food will satisfy hunger. Health can be categorised under the safety need as we are safe when we are healthy ; where we are in need of just not any food but a balanced diet. Nutritionists all over the world are advising people to follow diets such as the Mediterranean diet and the Japanese traditional diet which are very good for health. Once these basic motives are satisfied, then one can climb the Maslow’s ladder of hierarchy. Creative activity and aesthetic taste comes under the higher level. When culinary art started developing, there was a refinement in the aesthetic perspective of food, people started realising that food is not only for the palate but it is also a feast to the eyes. The current

pandemic situation has posed a dangerous circumstance which calls for immunity. Everybody is aware of the requirement of healthy eating. In spite of that, emotional eating rates have increased all over the world. The pandemic period has thrown light on one aspect, human beings not only view food as an answer to satisfy hunger and for health and to appreciate the taste and aesthetic values of a cuisine, but they also hinge on food for mood elevation. Studies done in various parts of the world during this Covid period show some common findings: there is no observable change in the older population's diet and they stick to a healthy diet. This could be interpreted as confinement not having affected them. Their experience and weakened digestive system have taught them not to deviate from their regular balanced diet. On the other hand, obese people and the younger population were more inclined towards emotional eating as they have the tendency to eat more and the pandemic situation has taken its toll on them. As for the youngsters who have the luxury of good health and the nature to explore anything, they have sided with snacking more during the lockdown when they are stressed. As strenuous work and physical effort have decreased and sedentary work and stressful situations have increased, it has led us to ginger up by snacking. The food industry should take better steps to nutritionise snacks because snacks have taken an indispensable place in our everyday diet. WHO in 2008 reported that diet related diseases are extremely prevalent, leading to morbidity and mortality. WHO advised that toxicological characteristics, digestibility of food, the ecology of production and the nutritional value have to be taken care of.

Food provides vitality for growing organisms and helps in development. Panchenko in 2005<sup>24</sup> stated that youngsters should be guided to have a balanced diet with the necessary amount of nutrients. The mortality among youngsters during the Covid pandemic proved, their lack of immunity for which one of the causes could be unbalanced food. According to Simson and Oja's<sup>24</sup> point of view, the suitability of food differs from person to person. Globalisation has launched new foods into our diet but the body's immune system is already a programmed one and it will react to anything that is alien to the body. Food should be considered on an individual basis and, the organism, gastrointestinal reaction etc should be contemplated. The physiological state of the individual, age, sex, the proportions of physical and mental work all play a role when we talk about the broad term nutrition, says Pappel. and Kuiv in 2001<sup>24</sup> and Teesalu in 2006<sup>24</sup>. Omics research done in the field of nutrigenetics and nutrigenomics emphasises the same idea that there are individual differences with respect to nutrition and nutrition related disorders, this difference could be explained in terms of genetic variation. The Omics research will boost our principle knowledge of the interaction between our biorhythm and diet. This may promote the development of nutraceutical foods to improve our health and to personalize our diet, thereby accomplishing tailor-made nutrition for genetically inclined people to prevent the commencement of nutrition associated disorders.

Relationship between food and behaviour was debated as early as the Ancient Egyptian period, where they believed that the characteristics of human beings are inherent properties of food. In 1825 French philosopher 'Jean Anthelme Brillat-Savarin' wrote in his book 'The Philosophy of Taste' - "Tell me what you eat and I will tell you what you are"<sup>25</sup>. He too believed that there is a strong relationship between food and one's behavior. In USA, the health reform movement also insisted that diet affects spirituality, mental health, intelligence and sexual prowess.

The distinguished personality of this movement John Harvey Kellogg<sup>25</sup> stood his ground of promoting the use of natural food and denouncing meat-eating saying that it would lead to the degeneration of mental functioning, while arousing animal passion<sup>25</sup>.

We all believe that an adequate balanced diet is necessary for better performance and activity. We also understand the strong bond between good food and health but we fail to implement it, the recrimination could be made against a fast-paced life style. In olden days, people ate natural and near-natural food,

but today's life has deviated to a great extent and most of our food contains processed food with excess salt, saturated fat and fast sugar resulting in health problems.

The learnings from this Covid crisis is that food from the aesthetic perspective is inconceivable during a crisis. Food as a mood elevator is proved to be true in spite of the fact that we want to eat healthy food. We are unable to resist snacking to pep ourselves up. This is especially the case with youngsters.

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