

Nutritional Defenses: The Role of Functional Foods in Combating Viral Diseases

Muhammad Akram¹, Muhammad Junaid²

¹Department of Eastern Medicine, Government College University Faisalabad-Pakistan

²Department of Biochemistry, Hazara University, Mansehra, Pakistan

RESEARCH

Please cite this paper as: Akram M, Junaid M. Nutritional Defenses: The Role of Functional Foods in Combating Viral Diseases. AMJ 2024;17(8):1232-12.

<https://doi.org/10.21767/AMJ.2024.4057>

Corresponding Author:

Muhammad Akram

Department of Eastern Medicine, Government College University,

Faisalabad-Pakistan

Email id: makram_0451@hotmail.com

Abstract

Preventive medicine over the last decade has gone to great extents; this is particularly so in developed countries. Various research studies have confirmed that nutrition has a great relationship with the prevention and control of long-term diseases mainly attributed to diet. Food is considered the best provider to ensure our healthiness. Food also prevents and cures several diseases and improves particular physiological functions. The components of diet are qualified as functional foods, providing the body not only with nutrients and energy but also helping its system regulate special functions by either improving physiological processes or reducing the potential of the disease. Since the FFC recommends research and usage of functional foods in the treatment of chronic diseases, this review will illustrate the use of functional meals in the treatment of various viral diseases. From this study, we shall expect to suggest an improvement to the present definition of functional foods to comprise this added use. It covers many influences of functional foods and minerals on immunological function, such as probiotics, dietary antioxidants that include vitamins C, A, and E, and selenium. However, the desirable intake level and quantities of consumption of functional foods are yet developed. Therefore, more research studies are needed that would eliminate controversy over functional food. And our works must be absolutely placed toward gaining the highest objective of a "functional diet".

Key Words: Viral diseases, Functional Food, Management, Natural Medicine, Nutrition, Health life

Introduction

According to current needs, functional foods are mainly used for the prevention and management of chronic infections because of the postulation regarding long-term applicability of practical foods; it develops the idea behind the continued presence of continued diseases along with its associated symptoms within our body¹.

The conceptual clarity of FFC through which commodity foods can be applied both in the prevention and cure of chronic diseases and symptoms, this definition fits the formation of "ideal" utilitarian food products and their examination along with the application in common health and ongoing, chronic diseases, and their symptoms².

Although the FFC has recommended useful foods should be read and used for the treatment of chronic diseases, this book will provide an insight into using useful food sources as a means of fighting viral diseases also³. Through this book, we would like to propose a development of the currently established definition of utilitarian foods to encompass this new use⁴.

The clarifications we have not used for the prevention and management of viral infections from practical foods were due to the previous knowledge, where long-term usage and consumption of the utilitarian foods was important to ensure effective action and impact⁵. The impact of utility foods was felt as the development of some minor or major count of entities, like nutrients and bioactive particles within our organism so that we get at least a minimal amount of biologically active substances that may be active but non-toxic apart from stimulating some naturally familiar and comprehensible cycles on different levels of organization such as atomic, cell and organ⁶. Popular infections however are short courses-not chronic illnesses-and they in most instances develop inside brief intervals-oscillating from days to weeks⁷. Accordingly it appeared to be the initial slowly and appropriate utilization of advantageous sustenance would be in therapy of chronic conditions and manifestations there of⁸. However, the coronaviruses discovery has brought about a drastic change

in our perspective regarding the association of viral infections with chronic diseases⁹. The majority of the coronavirus disease (COVID-19) victims who died were reported to have at least one chronic disease¹⁰. Furthermore, it was also proven that the people who have chronic infections were the weak safe systems and were easily attacked by COVID-19 disease. In this group many were old people whose immune system collapsed due to aging. This way, in the treatment of viral diseases we should be able to and be assisted by various useful foods and biologically active substances thus properly applying useful foods while battling infections caused by viruses as well as their proliferation. Some of the experiments clearly state that these potential useful food items can be used for improving our immune system and help in fighting diseases caused by viruses¹¹.

1. A good example of bioactive combination in the fight against infections is the strength of Zn in representing activities against viruses by inducing the interferon of body reaction to properly fight infections. Zinc not only shows direct antiviral activity but also acts of an extremely important role in transport of the natural and acquired antiviral reactions¹². Diet rich in Zn: pomegranate, blackberries, green peas.¹³

2. In another investigation, creators from the UK show that in more seasoned individuals there was a more noteworthy explicit immunizer reaction to the Pneumovax II immunization in subjects who burned-through 5 bits of leafy foods every day than in subjects who devoured 2 segments products of the soil every day.

This expanded reaction was kept to subjects who had never recently gotten the Pneumovax II inoculation. Hence, higher intakes of foods related to the soil might enhance the neutralizing response to Pneumovax II vaccine in elderly people. It is not known if specific products of the soil are particularly relevant, but the finding establishes a reasonable dietary aim and perhaps enhanced immunologic protection. This alone is an empowering underwriting of the 5-a-day message and could have huge general wellbeing bat infections or to help the invulnerable framework, they should figure out which bioactive compound(s) are effective how long the utilitarian food item should be consumed in order to enhance the immune system¹⁴. Implications: The particular diseases in respect to which nontoxic, potent measures of bioactive blends are to be selected and the role of utilitarian foods, in concert with bioactive blends, must be established by the use of specific biomarkers in clinical trials and by further epidemiological investigation-implications¹⁵. In the concept of new practical food plans to come and show the practical effects practical diets have on specific biomarkers for immunity that researchers are to.

Traditionally, human nature does seem to have a presiding hand in the choice that hurts the least when running business; as far as diseases are concerned, therefore most people prepare against viral diseases by being vaccinated against the disease then covering.

We are not saying, of course, that utilitarian nourishments will replace the vaccination but used as additional options to vaccinations to enhance the immune system to prevent viral and chronic infections. There exist following specific reasons for which we must develop specific utilitarian nourishments items for viral diseases¹⁶:

1. Functional foods will be particularly helpful in making the onset of infections wherein the vaccine is not available corona virus disease (COVID-19) or wherein the newly created vaccine is not actually effective (specific strains of flu). Any way if density of illness caused by viruses is found then the antibody will take so much time to be produced and the advantages of practical nourishments, which are consumed, will be helpful in this waiting time¹⁷.

2. Only after the disease had advanced to the point that the level of the generated antibody would be useless would it also be through use of utilitarian foods that is, at consumption where the immune system would peak as vaccines would have proven futile¹⁸.

3. We know the process of aging creates an inefficient immunity, and it's one of the major causes so that a group of people, older people get infected by corona virus disease (COVID-19).

Even evidence reflects that a person's vaccination is not fully effective because of their poor immune arrangement.

A few practical foodstuffs enhancing the immunity would be the better alternative to combat chronic infections as well as viral infections¹⁹.

4. It is less likely that these might contain harmful effects as natural foods are rated as standard or enriched diet by supplementation of biological active mixes, yet this useful food, and useful sources of food with drugs association must be radically researched nowadays. The elderly would significantly benefit with the help of useful foods in fighting viral infections because there has emerged as a growing section within the mainstream population. The average age and phenomenon of aging continue to rise globally. People live longer alive, as reported by²⁰.

That is to say, never before have there been more pressing needs for means of meeting safely, dependably, and profitably the needs of an aging population. Another classic result of aging and reason why the aged and immunocompromised are the most likely victims of the present corona virus disease (COVID-19) scourge is the breakdown of the immune system. For all these reasons, the antibodies also fail many times for the elderly, for the standard doses in vaccines are not enough for the weaker immune systems of the elderly²¹. Here, utilitarian foods would be highly effective to fortify the immune system in order to fight coronavirus disease and all other diseases caused by viruses.

1. There is just one model: Zn deficiency, which provokes illness caused by viruses weakness, also a common expression of mature age and as we have already mentioned, zinc-containing foods served to enhance the effectiveness of the immune system even with some viral

diseases. Various examples of wholesome foods that would work as effective as an immunological supporter which encompasses fish oil (rich in Omega-3 fatty acids), Mg enriched foods such as green beans and bananas, and Vitamin A enriched foodstuffs (spinach, broccoli, and so on)²². Practical foods are not to be the silver bullet on one day to wake the human immune system, thus the patient becomes normally immune for Corona virus disease or some illness caused by viruses but to be food sources which need a period of intake as some form of danger management measure to combat chronic diseases plus the pathogens from viruses.

It would set the routine consumption of healthy foods to prepare the growing elderly population in the next decades for another epidemic²³. Practical foods are offering increasingly longer periods of immunologic protection, becoming increasingly easier and more convenient to eat, to ever greater percentages of the world's population, and thus then they should be consumed as a necessity then seek means to prevent viral disease. Therefore, it is claimed that utility food items are also helping in the disease occurring with the viruses, like corona virus disease²⁴. We further explained the set-up meaning of the utility food products along with their flow use and developed the meaning by exploring utilization for the utility foods-using effective food material for the battling viruses, along with a slight brightening and controlling the chronic diseases²⁵. We can find tangible evidence of how utility foods and bioactive constituents may play a cornerstone role in reinforcing the immune system against viral infections effectively along with inherent diseases²⁶.

The practical use of foodstuff in the prevention of viral infections will be an enormous general advancement for it will soon prove to become of great importance when the next pandemic comes and especially when cases are based on characteristics for the vaccine²⁷. Considering the scale of its possessions, then, use of useful foods as a resource against viral diseases must be seen as part of the definition of useful food resources too²⁸. Functional Food Center defines "practical nourishments" as "Regular or prepared food sources that contain naturally dynamic mixes; which, in characterized, compelling, nontoxic sums, give a clinically demonstrated and archived medical advantage using explicit biomarkers, for refining general wellbeing, for anticipating, the executives and therapy of Long term and illness caused by viruses or its side effects²⁹.

Conclusion

Development of functional foods in the European region is an important factor and at the same time scientific provocation to explore possible modulation of physiological processes by dietary components. Functional foods do not, however constitutes a total range; with food being such an important issue, local factors are important. Functional foods, like 'regular' foods have to be fitted into both society

and long-term eating habits. On the other hand, excessive functional food may cause nutritional inequality; hence a healthy balance has to be achieved between all diet factors and the functional factors. Therefore, biological markers have to be determined so as to ascertain real effects; also proper bioaccumulation of these nutrients into the functional foods and also the target beneficiary of its intake.

References

1. Pence GE, editor. *The ethics of food: a reader for the twenty-first century*. 2001.
2. Brock D. *Quality of life measures in health care and medical ethics*. 1993;1:95-133. DOI: <https://doi.org/10.1017/CBO9780511625350.011>
3. Ladkin D. *When deontology and utilitarianism aren't enough: How Heidegger's notion of "dwelling" might help organisational leaders resolve ethical issues*. *J Bus Ethics*. 2006;65:87-98. DOI: <https://doi.org/10.1007/S10551-006-0019-0>
4. Kassinger R. *Slime: How algae created us, plague us, and just might save us*. 2019.
5. Martirosyan DM, Singh J. *A new definition of functional food by FFC: what makes a new definition unique?*. *Funct food health dis*. 2015;5(6):209-23. DOI: <https://doi.org/10.31989/FFHD.V5I6.183>
6. Helkar PB, Sahoo AK, Patil NJ. *Review: Food industry by-products used as a functional food ingredients*. *Int J Waste Resour*. 2016;6(3):1-6. DOI: <https://doi.org/10.4172/2252-5211.1000248>
7. McEvoy M, Chang J, Coupey SM. *Common menstrual disorders in adolescence: nursing interventions*. *Am J Matern-Chil*. 2004;29(1):41-9. DOI: <https://doi.org/10.1097/00005721-200401000-00011>
8. Donner CF, Howard P. *Pulmonary rehabilitation in chronic obstructive pulmonary disease (COPD) with recommendations for its use. Report of the European Respiratory Society Rehabilitation and Chronic Care Scientific Group (SEPCR Rehabilitation Working Group)*. *Eur Respir J*. 1992;5(2):266-75. DOI: <https://doi.org/10.1183/09031936.93.05020266>
9. Béné C. *Resilience of local food systems and links to food security—A review of some important concepts in the context of COVID-19 and other shocks*. *Food Secur*. 2020;12(4):805-22. DOI: <https://doi.org/10.1007/s12571-020-01076-1>
10. Kobayashi T, Jung SM, Linton NM, et al. *Communicating the risk of death from novel coronavirus disease (COVID-19)*. *J Clin Med*. 2020;9(2):580. DOI: <https://doi.org/10.3390/jcm9020580>
11. Krenn BM, Gaudernak E, Holzer B, et al. *Antiviral activity of the zinc ionophores pyrrhione and*

- hinokitiol against picornavirus infections. *Virology*. 2009;83(1):58-64.
DOI: <https://doi.org/10.1128/JVI.01543-08>
12. Laborde D, Martin W, Swinnen J, et al. COVID-19 risks to global food security. *Science*. 2020;369(6503):500-2.
DOI: <https://doi.org/10.1126/science.abc4765>
 13. Lal R. Home gardening and urban agriculture for advancing food and nutritional security in response to the COVID-19 pandemic. *Food Secur*. 2020;12(4):871-6.
DOI: <https://doi.org/10.1007/s12571-020-01058-3>
 14. Maier BF, Brockmann D. Effective containment explains subexponential growth in recent confirmed COVID-19 cases in China. *Science*. 2020;368(6492):742-6.
DOI: <https://doi.org/10.1126/science.abb4557>
 15. Martirosyan D. The emerging potential of functional foods in viral disease prevention. *Bioact. Compd. Health Dis*. 2020;3(6):95-9.
DOI: <https://doi.org/10.31989/bchd.v3i6.726>
 16. Matheson BE, Bohon C, Lock J. Family-based treatment via videoconference: Clinical recommendations for treatment providers during COVID-19 and beyond. *Int J Eat Disord*. 2020;53(7):1142-54.
DOI: <https://doi.org/10.1002/eat.23326>
 17. Monahan C, Macdonald J, Lytle A, et al. COVID-19 and ageism: How positive and negative responses impact older adults and society. *Am Psychol*. 2020;75(7):887.
DOI: <https://doi.org/10.1037/amp0000699>
 18. Monahan KC, Steinberg L, Cauffman E, et al. Psychosocial (im) maturity from adolescence to early adulthood: Distinguishing between adolescence-limited and persisting antisocial behavior. *Dev Psychopathol*. 2013;25(4pt1):1093-105. DOI: <https://doi.org/10.1017/S0954579413000394>
 19. Nielsen KE. Health beneficial consumer products—status and trends. 2016:15-42.
DOI: <https://doi.org/10.1016/B978-0-08-100329-9.00002-5>
 20. O’Kane G. COVID-19 puts the spotlight on food insecurity in rural and remote Australia. *Aust J Rural Health*. 2020;28(3):319. DOI: <https://doi.org/10.1111/ajr.12648>
 21. Pendyala B, Patras A. In silico screening of food bioactive compounds to predict potential inhibitors of COVID-19 main protease (Mpro) and RNA-dependent RNA polymerase (RdRp).
 22. Pulighe G, Lupia F. Food first: COVID-19 outbreak and cities lockdown a booster for a wider vision on urban agriculture. *Sustainability*. 2020;12(12):5012. DOI: <https://doi.org/10.3390/su12125012>
 23. Randolph HE, Barreiro LB. Herd immunity: understanding COVID-19. *Immunity*. 2020;52(5):737-4.
DOI: <https://doi.org/10.1016/j.immuni.2020.04.012>
 24. Read SA, Obeid S, Ahlenstiel C, et al. The role of zinc in antiviral immunity. *Adv Nutr*. 2019;10(4):696-710. DOI: <https://doi.org/10.1093/advances/nfz013>
 25. Rizou M, Galanakis IM, Aldawoud TM, et al. Safety of foods, food supply chain and environment within the COVID-19 pandemic. *Trends Food Sci Tech*. 2020;102:293-9.
DOI: <https://doi.org/10.1016/j.tifs.2020.06.008>
 26. Sanders ME, Huis in’t Veld J. Bringing a probiotic-containing functional food to the market: microbiological, product, regulatory and labeling issues. 1999;76:293-315.
DOI: <https://doi.org/10.1023/A%3A1002029204834>
 27. Stafleu FR, Tramper R, Vorstenbosch J. The ethical acceptability of animal experiments: a proposal for a system to support decision-making. *Lab Anim*. 1999;33(3):295-303.
DOI: <https://doi.org/10.1258/002367799780578255>
 28. Stržinar T. Practical approaches towards determining the nourishment state of the elderly in a residential home. *Clin Nutr ESPEN*. 2016;14:52-3. DOI: <https://doi.org/10.1016/j.clnesp.2016.04.021>
 29. Tao G, Balunas MJ. Current therapeutic role and medicinal potential of *Scutellaria barbata* in Traditional Chinese Medicine and Western research. *J Ethnopharmacol*. 2016;182:170-80.