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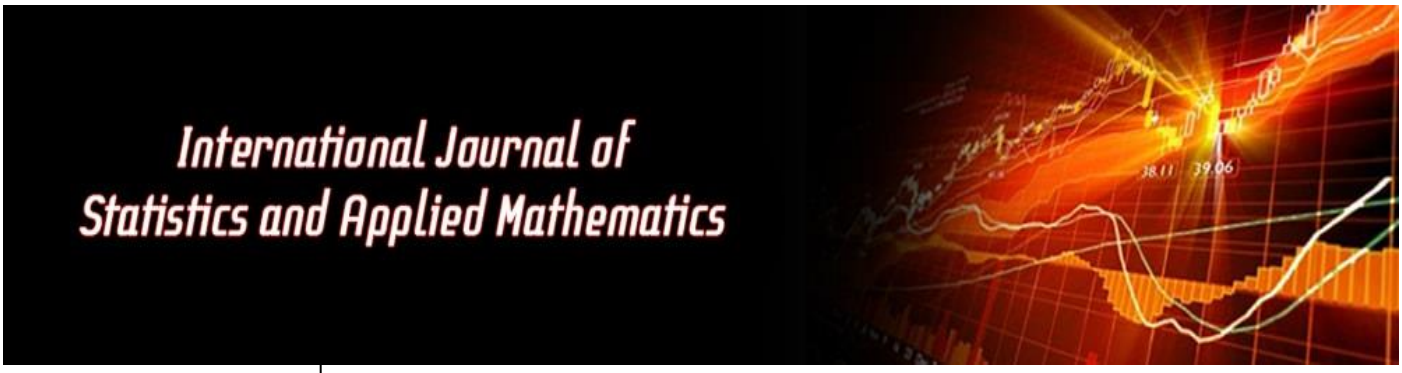

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A review on organic food: An emerging health standard

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Abstract
Our ancestors' view of healthy living was established where everyone will have a belly full of food. Later as our knowledge improved and it converts the above reasoning to; a proper balanced diet is an important factor for a healthy body. Now, there is a recent trend in our society which says Healthy Food will result in Healthy Body. This generation is focused only on health and fitness and is aware of their food consumption habits. Now their preference is more inclined towards safe, healthy, balanced and environmental friendly food products. It leads to the increasing demand of foods which are chemical free i.e. organic foods. These are known as foods which are grown without any chemical intervention during farming as well as processing practises and they provide wide health benefits. A systematic review was done to analyse this perception regarding health related aspects of organic foods. It was found that organic foods have higher nutritional quality; high level of anti-oxidants, PUFA and anti-inflammatory properties. Without chemical treatments they have higher chances of contamination and spoilage which makes them slightly costlier than conventional foods. There was also significant relationship between higher consumption of organic food and ones' higher living standards. Studies leads to believe that organic food consumption influence the cognitive development of children also. This leads to the unmistakable fact that our generation deviates more towards organic food rather than conventional food.

Keywords: Organic food, health, trend, nutritional quality, cognitive development

Introduction
Basic needs of mankind are Food, clothing and shelter. Food being the most innate need of all of them because, it provides much needed sustenance and energy to them. The concept of healthy or organic food hadn't existed for our ancestors. For them, having belly full of food was the best way to live. It can be due to lack of healthy food, economic conditions and poor climatic condition to grow food. After independence our country was in serious economic and food crisis. There was not adequate food for everyone. To maintain the stability in the country Dr. Rajendra Prasad had said "Jai Javan, Jai Kisan'. And to remove hunger in India Green Revolution was launched in 1968 in India. It was started by Dr. S. Swaminathan. During this time various methods of farming, hybrid seeds and Chemicals were introduced to our traditional farming. And we started using technology in agriculture. This started the era of conventional farming. Various kind of artificial manures, pesticides and insecticides were used. With the use of pesticides, insecticides and herbicides, the spoilage of food was decreased. It results in higher crop production. This was the golden era of agriculture in India. There was proper and adequate food for everyone. Then we started using preservatives to preserve our food for longer self-life. It solves the storage problem of the food and presents us with new recipes to increase the flavour in our palate. Chemical preservatives or treatments introduces to our food opens the new dimension to persevered food. This results in abundance of food and its variety to acquire in our diet. Constant usage of chemicals during farming affects the quality of food and soil as well as environment. To meet the growing demand of food higher doses of chemical fertilizers were applied by the farmers. Maximum quantity of these fertilizers are not used by the crops and remain in the environment via; volatisation, leaching, emission and runoff which results the loss in agriculture, economic concerns and environmental pollution. Nitrogenous fertilizers are highly used chemical fertilizers in conventional farming resulting in the increased level of N_2 in the environment.

This may cause the nitrate pollution in the water bodies and emission of ammonia and nitrous oxide in the atmosphere.

The uses of pesticides in farming provide protection to the plants by eliminating pests, disease and weeds. They are categorised in fungicides, insecticides, herbicides and rodenticides. Higher usages of pescticides culminate into food borne health diseases in humans. The health issues can be caused via; exposure through skin contact, inhalation or ingestion of pesticides. It also depends upon the type of pesticides, duration of exposure and the current health status of the consumer. The channel of contact of pesticides also determines the possibility of various health outcomes. According to WHO (1990) [30], it can be metabolised, stored in body fat and excreted within human and animals. The traces of these chemicals can cause negative health effect which includes; gastro-intestinal, neurological, respiratory, dermatological, reproductive and carcinogenic diseases. Furthermore, higher exposure of these pesticides can be fatal to both animals and humans. Resdiue of these chemicals are found in food, water, animal feed and fresh fruit juices (Mcgill and Robinson, 1968; Cabras and Angioni, 2000; Nag and Raikwar, 2011) [19, 6, 22]. Excessive use of these chemicals may provide higher yield but it can also results in exceeding the safe level of residual concentration found in the foods. Kortenkamp (2007) [15], also found that consumption of these chemicals can cause endocrine-disruption in the long run. This research reflects that residue of pesticides have been found in the human breast milk, which can cause the serious health impact in children. Some side effects caused by various types of pesticides:

DDT and its metabolite DDE may cause endocrine-disruption and carcinogenic effects (Baylis, 2000) [3] as well as its in-vitro exposure results in neural defects in children (Eskenazi *et al*, 2006) [8].

- Glyphosate, malathion, parathione and dimethoate can also cause serious endocrine-disruption (Mckinlay *et al*, 2008) [20] resulting in lower insulin secretion (Soloneski *et al*, 2015) [26] and induce necrosis in human immune cells (Li *et al*, 2011) [17].
- Carbamate pesticides can cause higher risk factor for dementia (Lin *et al*, 2015) [18] and neurobehavioral effects in humans (Wesseling *et al*, 2002) [28].
- Traces of triazines pesticides in food can cause reproductive toxicity (Mnif *et al*, 2011) [21] and higher incidence of breast cancer (Kettels *et al*, 1997) [14].

These researches provide us the evidence that we are in need of new farming techniques which require less use of chemicals or prohibit it completely. The reduction in agrochemical usage in farming can lead us environmental health and economic benefits. This starts the new era of not only balanced diet but of quality food. Now our generation only focuses of healthy diet and healthy living. Our main concern revolves around our health. Conventional food may provide the food for the population but it also has its side effects. Due to enormous health benefits of food which have less or no amount of residue of pesticides we started to deviate towards the organic food.

This opens the new concept of food production i.e. organic farming. Lord North Bourn had coined the term 'Organic Farming" in 1939 (Paul, 2014) [23]. It is an agricultural system that is based on using biological fertilizers devised from plant and animal wastes to reduce the ecological harm. In contrast with conventional farming it requires less amount of pesticides. Organic foods are known as foods which are grown without the uses of pesticides, artificial fertilizers. These foods are grown in the soil which has been conditioned with organic manures to increase the organic matter of the soil. These foods have not been treated by the any type of preservatives and chemical treatments to increase their self-life. This results in the higher spoilage rate as compared to conventional food. Conventional farming have 25% higher yield than organic farming, which reflects in their higher cost as compared to conventional foods. The usage of organic farming not only leads to higher health benefits but it also maintains our environment.

Various factors responsible for Organic Food consumption:

1. Health
2. Lifestyle Product
3. Quality

Health Factor

Various health factors are responsible for persuasion of using organic food products. Health researches motivates consumer to purchase it. According to Hutchins and Greenhalgh (1995) [12] determines that health and children were the critical indicators to influence the consumers to deviate towards the organic food consumption. Bradbury *et al*, (2014) [4] studied the relation between the organic food consumption and incidence of cancer among the 6,23,080 middle aged UK women in the follow-up duration of 9 years. It was concluded that there was no association between risk of cancer with organic food consumption. But they found that participants who consumes only organic food have lower risk of non-hodgkin lymphoma as compared to those who do not consume it. It was also found that people who consume organic food regularly or occasionally have lower risk of hypertention, hypercholesterolemia, cardio-vascular diseases and type-2 diabetes (Nutrinet-Santé study, 2015) [2]. This study also concludes that participant who were strict organic food consumer have lower obesity risk factors compared to non- regular consumers.

During pregnancy women who reported higher consumption of organic food have reduced risk rate of pre-eclampsia (Torjusen *et al*, 2014) [27]. In the cohort study on mothers and babies of Netherlands (Kummeling *et al*, 2008) [16] found that strict dietary consumption of organic dairy products during pregnancy results in reduction of 36% incidence of eczema in babies at 2 years. A cohort study (Rist *et al*, 2007) [25] also concluded that if during and after pregnancy a mother consumes organic food then her breast milk will have higher concentration of ruminant fatty acids. A positive correlation was also found between organic food intake during childhood and higher cognitive function. 1298 mother and their children participated in this study. Jordi *et al*, (2021) [13], observed that the children who had higher intake of organic food have higher fluid intelligence and working memory. Fast food intakes of children were linked to lower fluid intelligence. This demonstrates the importance of food during childhood development. But all these health effects culminate only on longer and steady consumption of organic food.

Lifestyle Product

Now a day people also started to perceive the organic food products as a status symbol. The studies based on consumer life style and their buying pattern reflects it. This shows that for some consumer it is a lifestyle only affordable by some special economic strata. Clique (2009) [7] found that for some

people organic food reflects a way of life rather than an essential commodity for good health. A survey concluded that organic foods and goods are perceived as fashionable merchandise due to its higher media coverage (Hill and Lynchehaun, 2002) [10]. These researches provide the evidence that there is a significant relation between the organic foods and consumer's lifestyle.

Quality

Organic foods are superior in quality as compared to the conventional foods due to the absence of pesticides and fertilizers. They are totally natural food free of any external chemical intervention. There are various paremeters which reflects the higher quality of the organic foods such as-Higher fatty acids, lutein content (Hussain *et al*, 2015) [11] and increased level of anti-oxidents (Baraski *et al*, 2014) [1]. It was also found that organic milk have higher level of PUFA, a-tocopherol, linoleic acid, linolenic acid and iron whereas, lower level of iodine and selenium (Butler *et al*, 2011; Florence *et al*, 2012; Rednica *et al*, 2016) [5, 9, 24]. Studies reflect that organic vegetables have higher level of carotenoids and vitamin C compared to conventional foods. Increased serum lutein was found in organically produced eggs (Whitemore *et al*, 2010) [29].

Conclusion

In recent years the belief about healthy and nutritious quality of organic food compared to conventional food is increased among the population. This influences the farmers to deviate towards the organic farm practices to beat the overdose of chemical substances responsible for causing health problems. Due to the decreased production and higher pest attack without using any artificial fertilizers and pesticides results in lower organic food production. This leads to negative impact on both economic and inadequate food supply. That is why organic foods have lower availability and are costly as compared to conventional foods. But having higher health benefits makes it more popular among the population.

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