



INTERNATIONAL RESEARCH JOURNAL ON ADVANCED SCIENCE HUB

e-ISSN : 2582 - 4376
Open Access

RSP SCIENCE HUB

(The Hub of Research Ideas)

Available online at www.rspsciencehub.com

Special Issue of First International Conference on Advancements in Management, Engineering and Technology (ICAMET 2020)

Green Chemistry of Organic Farming and Organic Food: A Review

Mrs.Keya Adak¹, Dr.Shilpi Shrivastava²

Research Scholar, Department of Chemistry, Kalinga University, Naya Raipur, Chhattisgarh, India

Associate Professor, Department of Chemistry, Kalinga University, Naya Raipur, Chhattisgarh, India

keyaadak5672@gmail.com¹

Abstract

The organic farming system follows various principles of natural ecosystem which is based on the structural and functional relationships of natural ecosystems. The food production history presume that organic farming was the predominant cultivation method practiced for last decade, but in the beginning of the twentieth century we observed the advanced biochemistry and bio-engineering immensely changed cultivation system by uses synthetic fertilizers and pesticides (Fabiansson, 2014). But the consumption of organic food has seen a marked increment around the globe in the past decade. The common reports suggested that organic foods have a better taste as compared to the other conventional kinds, primarily because the crops have been given more time to develop and mature, in addition to usage of environment friendly agricultural techniques. As organic foods and conventional products are close substitutes, consumers conveniently choose the cheaper, conventional category and thus, limiting the demand for organic food. It is difficult to justify the price premium to the consumers as health benefits from organic food consumption cannot be particularly quantified. Organic farming and its coordination and administration enhance the environment as well as human health which have an important objective for all credible economic food production and growth.

Keywords: Organic farming, Conventional farming, Organic food, Human welfare, Biodiversity

1. Introduction

The word organic agriculture was originated by Lord North Bourne in the book, "Look to the Land" which was issued in 1940. He described it as abiological agriculture which must have anecological completeness. It is farming system that provides fresh original food (organic food) which esteem the natural ontogeny systems which contributes to biodiversity and animal welfare as well as the development of rural areas (Ernst, 2010).

Organic food, in general includes foods with higher superiority in nutritional value mainly, due to prohibition of usage of preservatives, synthetic pesticides and fertilizers during their processing as well as their production. Furthermore, the organic

production is apparently supposed to keep animal welfare and energy conservation under consideration and also, see to it that the packaging for the foods remain environment friendly (Popa et al., 2019).

1.1 Key notes of Organic Farming

The input materials of industrial processes should be steer clear of the regulation of pathogens and weeds which has to be provided by biological operation (e.g. nitrogen obsession, marshalling of minerals). The assortment schemes in crop/food production were premeditated to endowment to the regulatory cycles of pathogens cycle and weed and livestock farming can also be used as a safeguard process. This described principles of organic farming were executed for utilization of ecosystems and the potency of the natural

economic support fund(Reents et al., 2008). Overall, it is observed that human health welfareco-related with organic farming and organic food production methods are more beneficial than conventional agriculture process.

1.2 Impact of Organic Farming and Organic Food on Human Welfare

The fruits and vegetables grown by organic farming contain exorbitant levels of health promoting phytochemicals and rhizo sphere communities. In all probability, the reason behind this choice of consumers is health consciousness and concern for food safety. As these set of foods have to be compulsorily labelled about the organic status of the food and also possess a certification or a quality assurance mark assuring that the food has been produced/processed by abiding the regulations set up by dignitaries concerned about the quality of the organic foods, the consumers find it easier to trust the authenticity of these foods. On the contrary, conventional edibles which might be produced with the aid of harmful synthetic growth hormones, not only have an inferior taste quality, but also increase chances of bio-magnification of toxic chemicals when consumed by human beings. The requisite of prevention of usage of preservatives in organic foods also assures that they are supposedly fresh and full of flavor. Genetically-modified foods usually possess a lot of ethical concerns such as; they are altering the nature, unlike organic foods which are known to preserve the “naturalness” of the environment. Organic foods are also assured to prevent any kind of antibiotic resistance as their production procedure is supposed to be devoid of usage of antibiotics. Because of less exposure to pesticides and fertilizers during organic production, organic fruits and vegetables have higher biochemical energy to produce beneficial secondary plant metabolites like polyphenolic anti-oxidants which are also known to be enriched in vitamins. The consumption of organic food can be reduced the risk factor of overweight or obesity and allergic diseasebut the attestation is uncontroversial because clients of organic food tend to have healthier way of life.

1.3 Comparison between organic and conventional farming

The use of pesticides in organic farming, is constricted while residue of traditional fruits and vegetables are comprise of pesticide hazards(Pereira & Alves, 2013). The resemblances of supplements content between organic and traditional foods have been unpredictable. The comparisons in the composition between organic and traditional crops are limited,e.g. relatively moderate quantity of phenolic and cadmium compounds in organic cereal crops, fruits and vegetables(De Ponti et al., 2012). Organic creamery products also contain anexcessive amount of omega-3 fatty acids contrast to traditional fruits and vegetables and these comparisons are very minor nutritional significance of the widespread use of antibiotics in conventional animal product. (Suciu et al., 2019) The consumers demand natural products, including nutritional supplements, which require a large and continuous supply of organic compounds at a reasonable price. The consumers perceive the organic food more valued even if relatively higher prices and poorer availability of organic products and the quality perception(Quintin et al., 2019).

1.4 Merits

1. Minimize the farming cost:

By ignoring the application of synthetic manure and insecticides.

2. Efficient use of resources:

The organic farming is used to refine the quality of soilby crop rotation, the application of organicfertilizer and humus to recycle resources.

3. Good Soil management:

Organic farming provides a long-term impact on soil quality by using organic fertilizer whereas conventional cultivation methods are graduallydestroying the soil quality. To increase fertility of soil,organic cultivation systems take advantage ofcarbon-based amendments, diversity in crop rotations and cover crops(Quintin et al., 2019). Those processes improve physical properties of soil by increasing biologically soil organic matter which improve plant health and reduce disease potential. This farming is also reduced soil erosion compared to the conventional(Lupatini et al.).

4. Healthier food:

Organic fruits and vegetables grown in rich fertile organic soils which has rich level of micronutrients

such as magnesium, zinc, phosphorus, and potassium (Reents et al., 2008).

5. Potential profits:

The developing economies raise the demand for organic food. Organic farming generally produces very lower the soil and water pollution. It also lowers the emission of greenhouse gas (CO₂) and associated with significant biodiversity of plants, animals, insects and microbes, as well as genetic assortment (Reents et al., 2008).

1.5 Limitations

1. Time constraint:

The process of organic cultivation takes long time (minimum three years) and also requires very costly survey to regulate all criteria for organic agriculture. During this period, the farmers are not ready to sell goods as organic.

1. labour intensive:

The outlook of organic cultivation are high labour-intensive like handling the process of weeding, less compact methods of cattle farming.

2. Potential loss of crops:

The loss of crops by pest/disease cannot be dealt with by organic methods

3. Organic pesticides:

Organic farming involves some organic pesticides which including copper and sulfur (Yu et al., 2016). For organic cultivation the quantity of pesticide is not monitored properly as per its prescribed parameters. These organic herbicides are not hundred percent safe, it can destroy healthy environment.

4. Super-market profits more than farmers:

The price marked on organic food is mostly earned by the large self-service market. The gross financial gain for super-market on organic food is compared to the 96% greater than all traditional food products. While organic products are more costly than traditional products, the price differences never lead to higher revenue for organic agronomist.

5. Decline in crop yields:

The crop yields by organic farming may be up to 20% less than traditional farming. It is proved that if all farmland will be converted to organic it may decrease the food supply according to world population and raise prices (De Ponti et al., 2012) too.

Conclusion

However, organic foods possess an additional price premium and this forms a major reason behind lesser consumption of organic foods. Nevertheless, as these foods are of high price range and are usually made available in super-markets instead of local markets, only the wealthy strata of the society are able to afford for it. Gradually, as markets mature, transport and processing happen on a larger scale, the prices of organic foods are expected to come down. Further public awareness as well as greater availability of good quality organic foods at a reasonable price might influence the consumer perception about these foods and will certainly lead to maturation of these markets in future.

References

- [1] De Ponti, T., Rijk, B., & Van Ittersum, M. K. (2012). The crop yield gap between organic and conventional agriculture. *Agricultural Systems*. <https://doi.org/10.1016/j.agsy.2011.12.004>
- [2] Ernst, E. (2010). The Clinician's Handbook of Natural Medicine. *Focus on Alternative and Complementary Therapies*. <https://doi.org/10.1111/j.2042-7166.2001.tb03171.x>
- [3] Fabiansson, S. U. (2014). Encyclopedia of Food Safety. In *Encyclopedia of Food Safety*. <https://doi.org/10.1016/B978-0-12-378612-8.00302-4>
- [4] Lupatini, M., Korthals, G. W., de Hollander, M., Janssens, T. K. S., & Kuramae, E. E. (2017). Soil microbiome is more heterogeneous in organic than in conventional farming system. *Frontiers in Microbiology*. <https://doi.org/10.3389/fmicb.2016.02064>
- [5] Pereira, L. S., & Alves, I. (2013). Reference Module in Earth Systems and Environmental Sciences. In *Reference Module in Earth Systems and Environmental Sciences*. <https://doi.org/10.1016/B978-0-12-409548-9.05129-0>
- [6] Popa, M. E., Mitelut, A. C., Popa, E. E., Stan, A., & Popa, V. I. (2019). Organic foods contribution to nutritional quality and value. In *Trends in Food Science and Technology*. <https://doi.org/10.1016/j.tif>

s.2018.01.003

- [7] Quintin, D., Garcia-Gomez, P., Ayuso, M., & Sanmartin, A. M. (2019). Active biocompounds to improve food nutritional value. In *Trends in Food Science and Technology*.<https://doi.org/10.1016/j.tifs.2018.03.024>
- [8] Reents, H. J., Küstermann, B., & Kainz, M. (2008). Sustainable Land Use by Organic and Integrated Farming Systems. In *Perspectives for Agroecosystem Management: Balancing Environmental and Socio-Economic Demands*.<https://doi.org/10.1016/B978-044451905-4.50004-0>
- [9] Suci, N. A., Ferrari, F., & Trevisan, M. (2019). Organic and conventional food: Comparison and future research. In *Trends in Food Science and Technology*.<https://doi.org/10.1016/j.tifs.2018.12.008>
- [10] Yu, H. Y., Li, F. B., Liu, C. S., Huang, W., Liu, T. X., & Yu, W. M. (2016). Iron redox cycling coupled to transformation and immobilization of heavy metals: Implications for paddy rice safety in the red soil of South China. In *Advances in Agronomy*.
<https://doi.org/10.1016/bs.agron.2015.12.006>