



P-ISSN: 2349-8528

E-ISSN: 2321-4902

IJCS 2019; 7(6): 1756-1760

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Received: 10-09-2019

Accepted: 12-10-2019

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International Journal of *Chemical Studies*

Organic food: One step towards healthy and nutritive nourishment

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Abstract

Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved. Increased use of chemicals under intensive cultivation has disturbed the harmony existing among soil, plant, animal and human health. The extensive use of chemicals and antibiotics in inorganic food production technology has compelled the health conscious people to explore and support organic farming. Compared to their conventionally-grown counterparts, organic products are lower in water content, reserving higher nutrient density, richer in iron, magnesium, vitamin C, and antioxidants, more balanced with essential amino acids. Organic produce has consistently been rated to have better flavor and texture than non-organic produce. Moreover, organic foods have enhanced nutritional quality; for example, increased amounts of vitamin C, increase the effect of vitamin E, folic acid and iron in our bodies. It is evident that, compared to conventional farming, the largest beneficial effect of organic farming is associated with the lack of pesticides leaching and soil biology (bacteria, fungi, springtails, mites, earthworms), the higher level of biological activity being driven by the use of versatile crop rotations and the reduced use of nutrients in the organic system. At the ecosystem level, organic farming also benefits arable land by promoting (a) greater densities and species diversity in the weed flora, (b) lower concentrations of aphids, (c) greater numbers of beneficial insects (ground beetles and spiders) and (d) bigger populations of birds (skylark and lapwing). The role of the Government is critical in motivating the farmers switching over from inorganic farming system to organic farming system where organic farming is economically viable in the country. Besides, the government has to take appropriate measures like the separate market for organic products, announcement of minimum support price, creation of demand by more awareness programme, organic inputs/subsidies for encouraging organic farmers, certification of farms and increase in investment on research and development activities in organic farming practices. Overall, although there is some knowledge and awareness about organic products, consumers are not consistent in their interpretation of what is organic. The aims of organic farming are not just to minimize environmental impact and optimize production, but to combine these two concerns.

Keywords: Organic agriculture, antioxidant, livestock and ecosystem

Introduction

What is Organic Farming?

Organic farming is a technique, which involves cultivation of plants and rearing of animals in natural ways. This process involves the use of biological materials, avoiding synthetic substances to maintain soil fertility and ecological balance thereby minimizing pollution and wastage. It relies on ecologically balanced agricultural principles like crop rotation, green manure, organic waste, biological pest control, mineral and rock additives. Organic farming may include pesticides and fertilizers if they are considered natural and avoids the use of various petrochemical fertilizers and pesticides.

International Federation of Organic Agriculture Movements (IFOAM), an international organization established in 1972 for organic farming organizations defines goal of organic farming as:

“Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved.”

Key features of Organic Farming

- Protecting soil quality using organic material and encouraging biological activity
- Indirect provision of crop nutrients using soil microorganisms
- Nitrogen fixation in soils using legumes
- Weed and pest control based on methods like crop rotation, biological diversity, natural predators, organic manures and suitable chemical, thermal and biological intervention
- Rearing of livestock, taking care of housing, nutrition, health, rearing and breeding
- Care for the larger environment and conservation of natural habitats and wild life

Four Principles of Organic Farming

- **Principle of Health:** Organic agriculture must contribute to the health and well being of soil, plants, animals,

humans and the earth. It is the sustenance of mental, physical, ecological and social well being. For instance, it provides pollution and chemical free, nutritious food items for humans.

- **Principle of Fairness:** Fairness is evident in maintaining equity and justice of the shared planet both among humans and other living beings. Organic farming provides good quality of life and helps in reducing poverty. Natural resources must be judiciously used and preserved for future generations.
- **Principle of Ecological Balance:** Organic farming must be modeled on living ecological systems. Organic farming methods must fit the ecological balances and cycles in nature.
- **Principle of Care:** Organic agriculture should be practiced in a careful and responsible manner to benefit the present and future generations and the environment.

Comparison between Organic and Non organic food

Organic vs. Non-Organic	
Organic produce:	Conventionally-grown produce:
Grown with natural fertilizers (manure, compost).	Grown with synthetic or chemical fertilizers.
Weeds are controlled naturally (crop rotation, hand weeding, mulching, and tilling).	Weeds are controlled with chemical herbicides.
Pests are controlled using natural methods (birds, insects, traps) and naturally-derived pesticides.	Pests are controlled with synthetic pesticides
Organic meat, dairy, eggs:	Conventionally-raised meat, dairy, eggs
Livestock are given all organic, hormone- and GMO-free feed.	Livestock are given growth hormones for faster growth, as well as non-organic, GMO feed.
Disease is prevented with natural methods such as clean housing, rotational grazing, and healthy diet.	Antibiotics and medications are used to prevent livestock disease.
Livestock must have access to the outdoors.	Livestock may or may not have access to the outdoors.

Benefits of organic food: How your food is grown or raised can have a major impact on your mental and emotional health as well as the environment. Organic foods often have more beneficial nutrients, such as antioxidants, than their conventionally-grown counterparts and people with allergies to foods, chemicals, or preservatives often find their symptoms lessen or go away when they eat only organic foods.

Organic produce contains fewer pesticides: Chemicals such as fungicides, herbicides, and insecticides are widely used in conventional agriculture and residues remain on (and in) the food we eat.

Organic food is often fresher: Because it doesn't contain preservatives that make it last longer. Organic produce is often (but not always, so watch where it is from) produced on smaller farms near where it is sold.

Organic farming is better for the environment: Organic farming practices reduce pollution, conserve water, reduce soil erosion, increase soil fertility, and use less energy. Farming without pesticides is also better for nearby birds and animals as well as people who live close to farms.

Organically raised animals are NOT given antibiotics, growth hormones, or fed animal byproducts: Feeding livestock animal byproducts increases the risk of mad cow

disease (BSE) and the use of antibiotics can create antibiotic-resistant strains of bacteria. Organically-raised animals are given more space to move around and access to the outdoors, which help to keep them healthy.

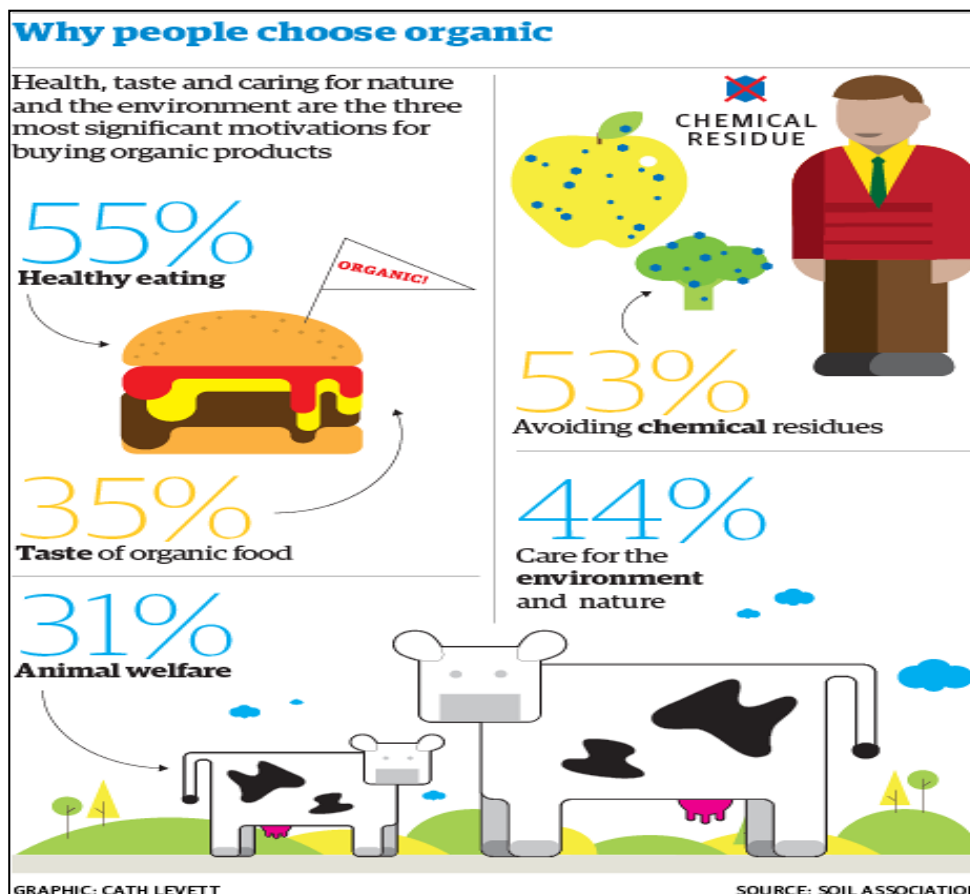
Organic meat and milk are richer in certain nutrients: Results of a 2016 European study show that levels of certain nutrients, including omega-3 fatty acids, were up to 50 percent higher in organic meat and milk than in conventionally raised versions.

Organic food is GMO-free: Genetically Modified Organisms (GMOs) or genetically engineered (GE) foods are plants whose DNA has been altered in ways that cannot occur in nature or in traditional crossbreeding, most commonly in order to be resistant to pesticides or produce an insecticide.

Organic food and nutrition content

Several studies have compared the nutritional content of organic and conventionally grown plants, and most have shown no significant differences in key vitamin and mineral content. However, although the differences are small, research has shown that some organic food has:

- Lower nitrate levels
- Higher vitamin C levels
- Higher levels of selenium.



Organic food and ethics

Organic foods promote more humane treatment of animals, as well as providing meat that is free from hormones and antibiotics. Also, some people worry about the long-term health, economic and environmental consequences of GM foods and choose organic foods in support of an industry that does not use GM techniques.

Organic food is better for the environment

Organic foods promote healthier and more sustainable use of natural resources. Modern farming methods, including excessive use of chemicals, have led to a decline in soil fertility, and an increase in salinity and blue-green algae in waterways over many years. Organic farmers try to minimize damage to the environment by using physical weed control, and animal and green manure.

Organic food outlets

You can buy organic food from:

- Some supermarkets
- Some green grocers
- Health food shops
- Some fresh food markets
- The internet
- Certified organic retailers.

Organic food is often more expensive than conventionally-produced food. This is because organic farming generally operates on a smaller scale, production is more labour intensive and, without herbicides, pesticides and other chemicals, yields are generally smaller.

Organic food certification

Organic farms are only certified after they have been

operating according to organic principles for three years. However, the use of the word 'organic' is not regulated in Australia, so it is important to make sure that products you buy come from certified growers and producers.

Before 2009, a standard (guidelines and rules) did not exist for domestic and imported organic foods. This led to a misrepresentation of the word 'organic' in the Australian domestic food market.

Two key standards now govern the production, processing and labeling of organic food in Australia. These are:

- The National Standard for Organic and Biodynamic Produce (for exported foods)
- The Australian Standard for Organic and Biodynamic Products (for domestic and imported foods).
- These standards provide an agreed set of procedures to be followed in organic food production. This helps to ensure the integrity and traceability of an organic food product from 'paddock to plate'. The standards include requirements for production, preparation, transportation, marketing and labeling of organic products in Australia. While it is mandatory for exported organic produce to be certified and meet the National Standard for Organic and Biodynamic Produce, the Australian standard (for domestic and imported foods) is not

mandated, and certification is voluntary. Its purpose is to assist the Australian Competition and Consumer Commission (ACCC – the national consumer regulatory authority) to ensure that claims made about organic and biodynamic products are not false or misleading. 'Organic-certified produce' means the food was grown, harvested, stored and transported without the use of synthetic chemicals, irradiation or fumigants.

How to identify food certified as organic

Suggestions for making sure the food you are buying is organically grown include:

- If you are buying from an organic retailer, check for the Organic Retailers' and Growers' Association of Australia (ORGAA) notice, which should be prominently displayed
- Choose foods with the label 'certified organic' from one of the Department of Agriculture, Fisheries and Forestry (DAFF) accredited certifying organizations
- Check packaging for the grower's name and certification number
- Do not be fooled by packaging that claims the produce is 'natural' or 'chemical free' if the proper certification labeling is not displayed.

Organic Retailers' and Growers'

100% Organic	Made entirely from organic materials
Organic	At least 95% organic materials, with remaining ingredients that are approved by USDA.
Made With Organic Ingredients	At least 70% organic ingredients and can display 3 organic ingredients on the label. Cannot use the organic seal.
Non-Organic	If less than 70% organic ingredients, cannot be labeled as organic or use the USDA organic seal.

Reference: Mayo Foundation for Medical Education and Research.

Case studies

1. Mendoza *et al.*, 2001^[3] found that

- Agrochemical inputs (fertilizers and pesticides) are not used; organic farming is more than 80% less cash-expensive or less capital-requiring. There is no need for farmers to borrow money, especially from usurers.
- The organic farmer devotes more time for caring and managing his crop. It is a full time job for the farmer and more labor is required in hand weeding and pushing the rotary weeder to suppress weed growth. But he knows that weed management in his farm becomes less intensive over time. According to Reganald *et al.*, 1987^[4] as the soil accumulates organic matter, it becomes more friable and loose as the soil accumulates organic matter and it becomes more friable and loose.
- Organic farming not only minimizes CO₂ emission through zero-use of agrochemical inputs but also sequesters C in the soil through organic matter recycling, i.e., non-burning of rice straw and application of animal manure. Burning of rice straw is rampant in the Philippines and CO₂ loading has been estimated at about 12 Mt CO₂ per year (Mendoza & Samson 2001)^[3].

2. Hansen *et al.*, 2001^[1] conducted an experiment on "Approaches to assess the environmental impact of organic farming with particular regard to Denmark" and observed that over the last few decades, consumer pressures and Governments policy initiatives have stimulated a rapid growth in organic farming throughout Western Europe. Organic farming is now being challenged by the need for further expansion and development to meet the increase in demand for organic food and growing concerns for the environment.

To satisfy the consumer, therefore, the relationships between production and environmental concern must be balanced. The aims of organic farming are not just to minimize environmental impact and optimize production, but to combine these two concerns. In general, the risk of harmful environmental effects is lower with organic than with conventional farming practices.

1. Thippeswamy, 2013^[5] concluded that Agriculture is a critical sector of the Indian economy. Increased use of chemicals, under intensive cultivation has disturbed the harmony existing among soil, plant and animal and human health. The extensive use of chemicals and antibiotics in inorganic food production technology has compelled the health conscious people to explore and support organic farming. World organic food consumption has grown at a rate of 25 percent per annum in the last decade and it is expected to grow more than 15 percent of total food consumption in future. Moreover, the findings of the literature-reviewed reveals the fact that food produced using organic methods are taste better and contain a better balance of vitamins and minerals than inorganically grown food. The eating of organic food considerably reduces the heart attacks, strokes, cancer, bowel cancer and many other diseases. Hence, importance of organic farming has increased due to its environmental friendly methods and growing consumer awareness of food safety. The role of the Government is critical in motivating the farmers switching over from inorganic farming system to organic farming system where organic farming is economically viable in the country. Besides, the government has to take appropriate measures like the separate market for organic products; announcement of support price, creation of demand by more awareness programmes, organic inputs/subsidies for encouraging organic farmers; certification of farms and

increase in investment on research and development activities in organic farming practices.

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