

## Organic Food and Human Health

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Organic farming is a holistic system promoting agroecosystem health, biodiversity, and soil activity while avoiding synthetic fertilizers, pesticides, growth regulators, and additives. Since chemical pesticides and fertilizers are not used in the production of organic foods such as fruits, vegetables, grains, and animal products, are often regarded as safer, healthier, and more environmentally friendly than conventional options. Organic products reduce public health risks to farm workers, their families, and consumers by minimizing their exposure to toxic and persistent chemicals on the farm and in food, the soil in which they work and play, the air they breathe, and the water they drink. The food grown organically is also rich in nutrients, such as vitamin C, iron, magnesium, and phosphorus, with less exposure to nitrates and pesticide residues in organically grown food products when compared to conventionally grown products. The demand for organic products in the market is increasing with rising health consciousness and more inclination towards organic farming.

### Status of organic farming in India:

#### Area

As of March 31, 2024, India has 7.3 million hectares (mha) under organic certification, including 4.48 mha of cultivable land and 2.85 mha for wild harvest collection. Madhya Pradesh leads in the certified organic area, followed by Maharashtra, Rajasthan, Gujarat, Odisha, Sikkim, Uttar Pradesh, Uttarakhand, Kerala, Karnataka, and Andhra Pradesh. Production: In 2023–24, India produced 3.6 million metric tonnes (MT) of certified organic products, including fruits, vegetables, tea, coffee, oilseeds, cotton, cereals, pulses, and medicinal plants. Maharashtra leads in production, followed by Gujarat, Madhya Pradesh, Rajasthan, and Karnataka. Fibre crops dominate, followed by sugar crops, cereals, millets, oilseeds, and spices. Exports: India exported 2,61,029 MT of organic products in 2023–24, valued at ₹4007.91 crore (\$494.80 million USD). Major export destinations include the USA, UK, Canada, Sri Lanka, Switzerland, Vietnam, Australia, Thailand, Japan, and South Korea.

**Benefits on organic farming:** The demand for organic foods is primarily driven by consumer perceptions that

organic farming is more sustainable and offers benefits such as:

- Reduces pollution:** Organic farming eliminates synthetic pesticides and fertilizers, preventing runoff into water bodies that can cause environmental issues like biomagnification and eutrophication.
- Promotes better health:** By avoiding chemical accumulation in the food chain, organic farming helps reduce risks of health problems like lead poisoning and Minamata disease.
- Minimizes exposure to artificial medications:** Organic farming avoids using antibiotics in livestock, reducing the risk of antibiotic residues in meat, eggs, and milk.
- Enhances taste:** Organic food often tastes better due to natural cultivation methods and the absence of artificial enhancers or preservatives.
- Provides fresh products:** Organic food is typically sold fresh, free from preservatives making it a healthier and more natural option.
- Reduces agricultural costs:** Organic fertilizers and locally-made pesticides are cost-effective alternatives to synthetic ones helping reduce farming expenses and benefiting farmers.

**Organic market in India:** Various companies are producing organic products in India including Organic Mandya, Mother Earth, Madhav Ashram Trust, Art of Living, Farm 2 Kitchen, Big Basket, Pro-nature Organic, Originnel Organic Food, Nature's Hub, Nisraga Organic, ISKCON Organic Outlet, Karnataka Organic Farming centre and others. Primary organic produce in India includes cereals, pulses, oil seeds, spices, fruits and vegetables, nuts and dry fruits, sugar, honey, milk and milk products, poultry and other animal products.

### Health benefits of organic foods

**Overall health benefits:** Organic foods have higher bioactive compound levels and lower harmful substances such as cadmium, pesticides, reducing the risks of chronic diseases like hypertension, type 2 diabetes and cardiovascular disease.

**Anticancer potential:** Organic foods show anti-mutagenic activity and reduce cancer risks, including lymphoma and breast cancer, due to higher antioxidant and anti-proliferative properties.

**Reproductive health:** Consuming organic food reduces risks of hypospadias in boys and improves fertility markers like sperm density and hormone levels in organic farmers.

**Pregnancy outcomes:** Organic food consumption lowers the risk of pre-eclampsia and offers potential benefits for fetal development.

**Obesity reduction:** High organic food consumption is associated with a lower BMI and reduced obesity risk.

**Allergy protection:** Organic animal products rich in specific fatty acids, mildly reduce eczema and allergic sensitization risks in children.

**Cardiovascular health:** Organic diets lower cardiovascular risk factors in both healthy individuals and patients.

**Synthetic pesticide-free:** Organic farming minimizes pesticide residues in food reducing exposure-related risks of diseases like Parkinson's, type 2 diabetes and cancers.

### Compositional differences between organic food and conventional food

Parameters	Food sources	Organic versus conventional
Vitamins like vitamin C, vitamin E, and carotenoids	Fruit, vegetables	Higher
Minerals like calcium, potassium, phosphorous, magnesium, iron	Fruit, vegetables, cereals	Higher
Nitrate	Fruit, vegetables, cereals	Lower
Antioxidant activity	Fruit, vegetables, cereals	Higher
Phenolic compounds	Fruit, vegetables, cereals	Higher
Protein, amino acids, nitrogen	Fruit, vegetables, cereals	Lower
Beneficial fatty acids, i.e., eicosapentaenoic acid, docosapentaenoic acid, docosahexaenoic acid, $\alpha$ -linolenic acid, and conjugated linoleic acid	Milk, meat	Higher
Iodine and selenium	Milk	Lower
Cadmium	Fruit, vegetables, cereals	Lower in cereals
Pesticide residues	Fruit, vegetables, and grains	Lower risk for contamination

### Conclusion

Organic farming in India is expanding with significant production, exports, and consumer demand driven by health and environmental concerns. It enhances soil health, reduces pollution, and minimizes exposure to synthetic chemicals promoting safer food and sustainable agriculture. Organic foods are nutritionally superior, containing higher vitamins,

antioxidants, and beneficial fatty acids while reducing harmful substances like pesticides and heavy metals. Potential health benefits include lower risks of chronic diseases, cancer, obesity, and allergies, though more research is needed for conclusive evidence. With rising awareness and support, organic farming offers a viable alternative to conventional agriculture benefiting both human health and the environment.

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