

Effects of organic food consumption on health, with a particular emphasis on the Meerut Region (U.P.)

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ABSTRACT

Recent systematic reviews of the literature and meta-analyses have found significant and nutritionally important compositional differences between conventional or organic foods. It includes high amounts of organic sources of omega-3 fatty acids. Meat and dairy items are also as higher antioxidant and reduced cadmium and pesticide indices of organic vegetables. Additionally, findings from a small number of human cohort studies show a link between eating organic food and a lower risk of developing some acute disorders, such as pre-eclampsia and hypospadias, as well as obesity. Concerns regarding possible harmful health effects of eating organic foods have also been voiced, but there is currently no evidence from human cohort studies to support these claims (risks related, for example, to decreased iodine levels in organic milk). However, there are virtually no data from (1) controlled human dietary intervention trials comparing the effects of organic and conventional diets, nor (2) long-term cohort studies focusing on chronic diseases (such as cardiovascular disease, diabetes, cancer, and neurodegenerative disorders). Therefore, it is currently hard to assess how much consuming organic food may impair one's health.

Introduction

In the last 25 years, demand for organic food has increased. has significantly expanded in many advanced countries in Europe, America (North), and Oceania. Consumer beliefs demonstrating that organic farming is more enduring and offers advantages over intense conventional farming in terms of sustainability of the environment, biodiversity, animal welfare, food safety, and nutrition safety are the key drivers of demand.

Effects of organic versus conventional crop protection, organic versus conventional fertility control, protein, polyphenols, cadmium, and chlorm equat concentrations in 100 g of experimental animal feed, plasma insulin-like growth factor 1, testosterone, leptin, and spontaneous lymphocyte proliferation (sp-LP) in wistar rats fed these feeds. The results are shown as the means SEM of either (1) n = 24 animals or (2) n = 4 field replications; different letters above the bars indicate significant difference (P 0.05) as determined by the Tukey's HSD test. With their permission, information was extracted from a paper by Rednicka-Tober et al.

Although there is mounting evidence that organic farming helps to preserve biodiversity and the environment [Citation2-Citation6], there is still much disagreement among scientists as to whether and how much organic production techniques actually enhance food safety and quality as well as public health. As a result, here we critically evaluate the knowledge currently available about compositional variations and potential health impacts of consuming organic foods.

Comparative compositional meta-analyses

There are noticeable differences between foods grown organically and those produced conventionally in terms of the quantities of chemicals that are relevant to nutrition, according to several recently published systematic reviews and meta-analyses of published data particular, These comprehensive reviews showed that:

- Organic crops have increased antioxidant activity and between 18 to 69% more of a variety of particular nutrients in their systems antioxidants.

- Increased consumption of polyphenolics and antioxidants has been associated with a lower risk of various chronic diseases, including cancer and diseases of the heart and nervous system
- Conventional crops have greater quantities of the harmful microbial pesticide microbial endophyte
- Additionally, conventional crops include larger levels of protein, nitrogen, nitrate, and nitrite, which have been associated with both beneficial and negative health effects when consumed in greater quantities. (Discussed by Barański et al.)
- The concentrations of nutritionally beneficial omega-3 fatty acids in organic meat, milk, and dairy products are approximately higher; consumption of very long chain omega-3 fatty acids in Western diets is recommended to be at least doubled (discussed by Rednicka-Tober et al.)
- Although the majority of the evidence for the health benefits of CLA comes from in vitro and animal studies (discussed by Rednicka-Tober et al.), organic milk was reported to contain higher levels of total conjugated linoleic acid (CLA), higher iron, and higher concentrations of - tocopherol, which are all considered to be nutritionally desirable.
- There is concern that the lower iodine content in organic milk may result in iodine deficiency (especially during pregnancy and/or in individuals with low milk consumption) and associated detrimental health effects (such as impaired foetal development). Conventional milk was estimated to have and higher concentrations of iodine and selenium, respectively. Milk is not a major source for selenium, but may be the main source of iodine in countries where iodized salt is
- The saturated fatty acids myristic- and palmitic acid, which have been associated with an elevated risk of cardiovascular disease (reviewed by Rednicka-Tober et al.), are slightly, but significantly, more concentrated in conventional meat.

The GRADE assessment found that the overall strength of the evidence was good or moderate for many of the parameters listed above (for instance, total antioxidant activity, phenol acids, flavonoids, flavanones, flavanols, anthocyanins, stilbenes, and nitrite in crops; total PUFA in

milk and meat; n-3 PUFA, CLA, I, Fe, and Se in milk), but low for others (for example, total PUFA in milk).

Additionally For a number of traits (especially in meat) for which meta-analyses identified significant differences, GRADE assessment demonstrated high inconsistency, low precision, and/or publication bias. This demonstrates that the amount of data currently available for a number of parameters is still insufficient for accurate meta-analyses and/or that confounding variables, such as variations in agronomic and/or pedoclimatic conditions between study countries, contributed to high variability (further limitations of the currently available evidence base for composition differences are described below Prior to 2014, there were a number of meta-analyses conducted that all relied on a lesser body of evidence (number of publications/data), but when they all examined the same factors, they yielded conclusions that were largely comparable. There are more antioxidants in organic crops, according to Brandt et al. According to Smith-Spangler et al., organic crops have a higher risk of pesticide residues, higher concentrations of omega-3 fatty acids are present in milk, and most published studies have found higher cadmium concentrations in conventional crops. Phenolic compounds are the main class of antioxidants present in crop plants. All milk composition studies published between March 2008 and April 2011 was examined by Palupi et al. who found that organic milk had considerably greater levels of omega-3 fatty acids, CLA, and to copherol. Using data from milk, meat, and eggs, Dangour et al. Discovered a tendency towards higher omega-3 polyunsaturated fatty acid (PUFA) concentrations in organic animal products, but they did not incorporate these findings in the publication that was published. Based on these findings, it is tempting to draw the conclusion that eating organic foods leads to higher dietary intakes of a variety of nutrients such as antioxidants, specific vitamins, and With the exception of iodine consumption from milk, there are higher intakes of omega-3 fatty acids but decreased intakes of nutrients including pesticides, cadmium, and saturated fatty acids.

It is practically impossible to accurately predict changes in dietary intakes because there are still large knowledge gaps about how the composition of organic and conventionally produced foods differs. For instance, (1) there is a need to carefully review my cotoxin levels in crops (especially cereals) and/or composition variations in eggs from organic and conventional farms, (2) there is

a dearth of data to precisely estimate the magnitude of variations for particular crops and meat products from various livestock species, (3) there is a need to thoroughly review mycotoxin levels in crops (especially cereals) and/or composition variations in eggs from organic and conventional farms, and (4) This makes it difficult to assess variations in food intakes of the most desirable and unfavorable chemicals from In addition, a number of methodological issues relating to systematic assessments of composition data have been discovered and need to be addressed.

Human group research

A small number of human cohort studies and animal dietary intervention studies have discovered associations between organic food consumption and specific physiological and health-related outcomes. In the majority of mother-and-child cohort studies, it was discovered that organic vegetable and dairy consumption was associated with lower rates of (1) pre-eclampsia in women, (2) hypospadias in male infants, and (3) infant eczema.

According to a sub-study of the French-Belgian NutriNet-Sainté cohort, which included roughly 54 000 adults, regular organic food consumers had a significantly decreased chance of being overweight or obese When data were controlled for factors like age, level of physical activity, education, smoking status, energy intake, restricted diet, and adherence to dietary Nevertheless, the association between organic food consumption and a decreased risk of being overweight or obese remained. The authors of the paper issue a warning that these data should be interpreted with caution due to the study's severe limitations.

A subgroup of a major UK cohort study focused on cancer incidence in middle-aged women discovered a weak relationship between organic food consumption and a reduced risk of non-Hodgkin's lymphoma, despite the fact that the study was based on an observation period of only seven years.

There are a number of methods that can be used to properly account for the fact that organic and conventional consumers differ in a variety of other lifestyle factors, which are frequently difficult to properly account for in cohort studies. These factors include diet composition, use of

medications, health supplements, and vaccinations, as well as levels of exercise, alcohol consumption, and smoking. confounding factors that may have influenced the results of all cohort studies.

Study on nutritional interventions in animals

Additionally, in a small number of published animal feeding studies, the effects of consuming organic versus conventional food were evaluated. intervention trials (reviewed by Velimirov et al. and rednicka-Tober et al.). All investigations found that switching from conventional to organic feed had a substantial impact on physiological aspects of animals, such as body composition, and/or their development, plasma antioxidant and hormone levels, immunoglobulin concentrations, or responsiveness of the immune system). It is difficult to identify recurring patterns. among analysis due to differences in the factors being examined, research methodologies, animal species, and/or experimental designs used (reviewed by Velimirov et al. and rednicka-Tober et al.

gaps between knowledge and the future research requirements

Human cohort studies have offered some evidence in support of the potential that consuming organic foods may have benefits, and there may be nutritionally significant compositional variations between conventional and organic foods. The extent to which these compositional changes have an effect on people's health is still up for debate.

In order to reduce the present meta-analyses of composition data and dietary cohort studies both need to address a number of methodological difficulties in order to properly account for this uncertainty. To accurately compare dietary intakes of nutritionally significant substances with organic and conventional meals, well-designed food composition comparisons for specific crops and animal kinds are also required. Studies that help us understand how eating organic food affects our health more mechanistically are also required. This may be based on studies into nutritional therapies employing animal models susceptible to specific ailments, for example..

Relevant Research Findings

Does Consumption of Organic vs. Conventional Foods Have a Measurable Positive Impact on Public Health?

Organic food's impact on human health

Generally speaking, people who eat more organic food tend to have healthier diets overall, including a greater intake of fruits, vegetables, and whole grains while consuming less meat. A reduced carbon footprint and a lower risk of chronic diseases like type 2 diabetes and cardiovascular disease are also associated with this eating style.

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