

## Are organic foods safer or healthier than conventional alternatives?

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Researchers at Stanford University, USA conducted a systematic review of published literature to determine if organically produced foods are safer or healthier than conventionally produced foods. Overall, the published literature does not suggest health benefits from consuming organic rather than conventional foods; nevertheless, it found that consumption of organic produce may reduce exposure to pesticides and consumption of organic pork and chicken may reduce exposure to antibiotic resistant bacteria.

Organic refers to the way farmers grow and process agricultural products. Practices vary worldwide; however, organic foods are generally grown without synthetic pesticides, fertilisers or routine use of antibiotics or growth hormones. Irradiation and the use of genetically modified organisms (GMOs) or products produced from or by GMOs are generally prohibited by organic legislation.

The literature review included studies which compared: i) populations consuming diets of organically and conventionally produced foods (17 studies) or ii) the nutrient or contaminant levels of these foods (223 studies). All studies focused on fruit, vegetables, grain, meat, poultry, milk and eggs. Studies on processed foods were excluded. The key findings are outlined below.

No differences were found in the vitamin content of organic and conventional plant or animal products. Of the nutrients evaluated, the phosphorus content of organic produce was found to be higher than conventional produce; however, this is unlikely to be clinically important as phosphorus deficiency is generally not a dietary problem (it is only associated with near-total starvation). Regarding other benefits the authors also found higher levels of: i) total phenols in organic produce, ii) omega-3 fatty acids and omega-7 fatty acid (vaccenic acid) in organic milk (most of these studies were conducted on raw milk) and iii) omega-3 fatty acids in organic chicken. However, these three findings need to be considered with caution as the results from these studies were very variable and only a small number of studies were conducted on fatty acids.

Pesticide residues were less likely to be detected on organic (7%) rather than conventional (38%) produce; however, the limit of detection (i.e. the lowest quantity of pesticide which could be detected by the laboratory method) varied between studies. For both organic and conventional produce, only a small percentage exceeded maximum limits.

Regarding bacteria, there was no difference in the prevalence of bacteria on organic or conventional foods; however, organic pork and chicken were 33% less likely to carry bacteria resistant to three or more antibiotics compared to conventionally produced meat. This may be explained by the routine use of antibiotics during the breeding and rearing of animals by conventional means.

The authors highlighted a number of limitations associated with their findings. These included variability in study design, variability in physical factors between studies (e.g. season, soil type or storage practices) and variability within organic practices. In addition, there are no long term studies on the health outcomes of



populations consuming predominantly organic versus conventionally produced foods.

For further information:

[Smith-Spangler C, Brandeau ML, Hunter GE, Bavinger JC, Pearson M, Eschbach PJ, Sundaram V, Liu H, Schirmer P, Stave C, Olkin I, Bravata DM. Are organic foods safer or healthier than conventional alternatives?: A Systematic Review. Annals of Internal Medicine. 2012;157\(5\):348-66.](#)