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Short communication

Health effects of organic farming, review of literature since 2005 – Revision

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Abstract

In 2005, a study was carried out with chicks fed either organic feed or conventional feed. The aim of the trial was to see whether there was a difference in health between organic and non-organic fed chickens, as a stepping stone to a study in pigs and ultimately in humans. Thus, the final goal was to see whether organic food has positive health effects on humans. In the study, it appeared that animals fed organic feed showed a stronger immune response after a challenge than animals not fed organic feed. However, the researchers found that no firm conclusions could be drawn about the health status of organically fed animals. Based on these results, it was decided not to commission a follow-up study because the differences would be too small. The current knowledge and insights may give new reasons for follow-up research. For this purpose, a report was published with a summary of the original research and subsequent publications, as well as results from literature since 2005 on the health effects of organic feed for animals and organic products for humans. After the 2005 study, no comparable animal studies were carried out with organic and conventional feed. It is precisely in the case of animals that only the feed can differ, which can provide valuable insight into the effects of using only organic nutrition. Research has been done on the differences in composition between conventional and organic products. Human cohort studies have also been conducted on the effects of organic food on health parameters and the occurrence of various types of cancer. Although most researchers are very cautious about concluding the health effects of organic food, there are several relevant findings on differences in the composition of products, most of which are related to the organic production method. These include no synthetic chemical crop protection agents and fewer biocides as compared to conventional production, more antioxidants, and phenols and fewer antibiotic-resistant germs than conventional food. Moreover, milk has a more beneficial fatty acid pattern. There are some indications that eating organic food lowers the risk of developing certain conditions, such as allergies, metabolic syndrome and obesity, and certain cancers.

The report

Organic food products differ from conventional food products by using organic production methods. In organic livestock production, the use of preventive antibiotics is not allowed and therapeutic use is limited. In addition, there are requirements for housing, pen occupancy, and nutrition, among others. Consumers seem to value organic food because of the way it is produced and processed. It is also assumed that they have less impact on the environment and there are positive effects on animal welfare (more opportunity for natural behavior, walk-outs, fewer animals per area, etc.). Whether there is a difference in 'product quality, i.e. whether there is a difference in food properties between organic food and conventional is a subject of research. Concerning food composition the review, showed

that organic produce was higher only in phosphorus and total phenols there is evidence that exposure to pesticides and antibiotic-resistant germs is lower when consuming organic food [1]. Children who consumed more than 90% organic milk products had a 50% lower risk of developing eczema compared to children who received less than 50% organic milk products [2]. A more recent review [3], described significant and nutritionally relevant compositional differences between organic and conventional foods. These included higher levels of antioxidants and lower levels of cadmium and pesticides in organic crops, and higher levels of omega-3 fatty acids in organic meat and dairy products. The effects of organic food on the incidence of various types of cancer have been described in a prospective cohort study [4]. A cohort study with more than 68,000 adult French showed that a greater frequency of



eating organic foods was negatively associated with cancer risk, compared to a high-quality diet with a low frequency of organic foods. Participants were followed for 4.5 years and 1340 primary cancers were found during this period. A study in the United Kingdom, the Million Women Study (9 years of follow-up), found in 623,080 women that eating organic food did not give a reduced risk of cancer [5]. The more recent Sister study (the USA, 9 years follow-up) did find a reduced risk of breast cancer with a high intake of organic food [6].

Whether these effects are a direct effect of the organic diet, the reduced levels of contaminants or the often different lifestyle of consumers who eat organic are not entirely clear [4,7]. But the indications point to a positive health effect and call for further research.

The aforementioned literature reveals that there is primarily a lack of adequate studies with animal models and a number of specific issues that need more of a meta-analysis approach. Based on this, it is recommended that the original recommendation from the Report “Biologisch Gezonder” (Organically Healthier) study be implemented and a trial be started with pigs fed organic or non-organic. Pigs are considered a good model for humans. This study can cover the whole fattening period to see if the period and age at which animals are fed organic food is influential. In doing so, different (physiological /immunological) parameters will be compared. Secondly, a mild challenge can be carried out halfway to look at the direct effects on the immune system. This study can be combined with a comprehensive residue and microbiology study in animal feed to get a complete picture of the differences between the organic and non-organic animal feed. Also, the composition of the tissues of the organically and non-organically fed animals could be compared. Depending on the results, further conclusions can then be drawn about the health benefits of organic food and, if necessary, a human study can be conducted.

Recommendations for further research

A long list of recommendations emerged from the reviewed literature and its analysis. The main suggestions are:

1. Conduct research with animal models involving both organic and regular feeding to gain insight into research directions that may be relevant to human public health [8]. For example, the pig study as recommended in the original Report “Organic, More Healthy?” [9].
2. Additional well-designed comparison studies on food composition and residues on/in food for specific crops or animal products to provide reliable comparisons of both organic and non-organic food [3]. For this purpose, a follow-up of previous research by WFSR on differences in composition and levels of residues in organic and non-organic foods could be conducted.
3. Investigate the relationship between pesticides in the diet and cancer. And the role of organic food in potentially developing cancer [4]. For this, a literature review of the relationship between pesticides and cancer

could be conducted with an emphasis on available animal models. These could lead to future animal studies where developing cancer and eating/not eating organic food are further studied.

4. Well-conducted human dietary intervention studies on the effects of organic and non-organic food on health and health-related (physiological) parameters [3].

The aforementioned literature reveals that there is primarily a lack of adequate studies with animal models and a number of specific issues that need more of a meta-analysis approach. Based on this, it is recommended that the original recommendation from the Report “Organic, More Healthy?” [9,10], should be implemented and a trial is started with pigs fed organic or non-organic feed. Pigs are considered a good model for humans. This study can cover the whole fattening period to see if the period and age at which animals are fed organic food is influential. In doing so, different (physiological/immunological) parameters can be compared. Secondly, a mild challenge can be carried out halfway to look at the direct effects on the immune system. This study can be combined with a comprehensive residue and microbiology study in animal feed to get a complete picture of the differences between the organic and non-organic animal feed. Also, the composition of the tissues of the organically and non-organically fed animals could be compared. Depending on the results, further conclusions can then be drawn about the health benefits of organic food and, if necessary, a human study can be conducted.

The report is online available at <https://doi.org/10.18174/574260>.

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