Health Benefits of Eating Organic and Biodynamic Food

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Ethical Iceberg 1

- 26 million acute pesticide poisonings per year
- Over 300,000 deaths
- Chronic exposure more insidious
- Children more at risk

Figure 10. Total content of chlorinated hydrocarbons in human milk (mg/kg milk fat) (Aubert, 1987).
I only eat organic milk from my free range mommy.
Things You Don’t Want to Eat: Pesticides

- Chronic Neonicotinoid Exposure:
  - 2017 Systemic review
- Four general population studies reported
  - Tetralogy of Fallot OR 2.4
  - Anencephaly OR 2.9
  - Autism spectrum disorder OR 1.3
  - Symptoms including memory loss and finger tremor OR 14

Things You Don’t Want to Eat: Pesticides

Things You Don’t Want to Eat: Pesticides

Figure 1. Schematic representation of pathways by which direct immunotoxic effects of pesticides may lead to immune alteration-related disorders. (A) Oxidative stress and related mechanisms and (B) inhibition of esterases. ↑, increase; Th2, T helper 2.
Things You Don’t Want to Eat: Pesticides

Pesticide-induced immune alteration

Endocrine disruption

- Blocking/activation of SRs, TRs, and/or XRs
- Activation or suppression of NRs (AhR, PXR, PRAPs, RORs)
- Using the same metabolic pathways with hormones
- Alteration in the level of hormones released from HPA-axis

Alterations in hormone levels and signaling

- Disturbing the survival, activation, proliferation, differentiation and secretion profile of immune cells
- Alteration of well-regulated immune responses to self and microbial antigens or allergens

↑ Risk of cancer
↑ Risk of autoimmunity
Predisposition to certain infections
↑ Risk of Allergy
Things You Don’t Want to Eat: Pesticides

Figure 3. Schematic representation of the pathway by which pesticides may acquire antigenic pattern and cause immune alteration-related diseases.
Pesticides and Cancer

Leukemia
- Chlordane/heptachlor Purdue et al., 2007
- Chlorpyrifos Lee et al., 2004
- Diazinon Beane Freeman et al., 2005
- EPTC van Bemmel et al., 2008
- Fonofos Mahajan et al., 2006

Non-Hodgkin’s lymphoma
- Lindane Purdue et al., 2007
- Oxychlordane/chlordane Spinelli et al., 2007

Multiple myeloma
- Permethrin Rusiecki et al., 2009

Brain cancer
- Chlorpyrifos Lee et al., 2004

Prostate cancer
- Fonofos Mahajan et al., 2006
- Methyl bromide Alavanja et al., 2013
- Butylate Lynch et al., 2009
- Chlordecone Multignier et al., 2010
- DDT, lindane and simazine Band et al., 2011

Colon cancer
- Aldicarb Lee et al., 2007b
-Dicamba Samanic et al., 2006
- Imazethapyr van Bemmel et al., 2008;
- Koutros et al., 2009
- Trifluralin Kang et al., 2008

Rectum cancer
- Chlordane Purdue et al., 2007
- Chlorpyrifos Lee et al., 2007b
- Pendimethalin Hou et al., 2006

Pancreatic cancer
- EPTC and pendimethalin DDT Andreotti et al., 2009;
- Garabrant et al., 1992

Lung cancer
- Chlorpyrifos Lee et al., 2004
- Diazinon Beane Freeman et al., 2005
- Dicamba Alavanja et al., 2004; Purdue et al., 2007
- Dieldrin Alavanja et al., 2004
- Metolachlor Hou et al., 2006
- Pendimethalin

Bladder cancer
- Imazethapyr Koutros et al., 2009

Melanoma
- Carbaryl Mahajan et al., 2007
- Toxaphene Purdue et al., 2007
- Carbaryl, parathion and maneb/mancozeb. Dennis et al., 2010
# Pesticides and Other Diseases

<table>
<thead>
<tr>
<th>Condition</th>
<th>Associated Compounds</th>
<th>References</th>
</tr>
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<tbody>
<tr>
<td>Hypersensitivity</td>
<td>Malathion, chlorothalonil, thiabendazole, imazalil and aluminum hydroxide.</td>
<td>Schanker et al., 1992; Luebke, 2002; Vial et al., 1996; Penagos, 2002</td>
</tr>
<tr>
<td></td>
<td>Fipronil and captan</td>
<td>Mark et al., 1999</td>
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<td>Contact dermatitis</td>
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<tr>
<td>Allergic and photo-allergic</td>
<td>Fenthion/dichlorvos, captafol, tributyltin oxide, tetrachloroisophthalonitrile,</td>
<td>Vial et al., 1996; Cushman &amp; Street, 1982; Senthilvelan et al., 1992;</td>
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<tr>
<td>contact dermatitis</td>
<td>parathion, ethylene dibromide, mixture of carbon tetrachloride/carbon disulfide and</td>
<td>Shim &amp; Williams, 1986; Bryant, 1985; Honda et al., 1992; Galloway &amp;</td>
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<td></td>
<td>heptachlor.</td>
<td>Handy, 2003; Garry et al., 1994; Hoppin et al., 2009</td>
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<td>Asthma</td>
<td>Diazinon, chlorpyrifos, dichlorvos, malathion, carbaryl, permethrin, captan, dipropylyl</td>
<td>Hoppin et al., 2009; Slager et al., 2010; Corsini et al., 2013; Chatzi et</td>
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<td></td>
<td>herbicides, parquat, dithiocarbamate and CB.</td>
<td>al., 2007</td>
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<td>Rhinitis</td>
<td>Maternal or early-life exposure to DDE</td>
<td>Corsini et al., 2013; Sunyer et al., 2006; Sunyer et al., 2005; Weselek</td>
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<td></td>
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<td>et al., 2007</td>
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<td>Childhood asthma</td>
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<tr>
<td>Autoimmunity</td>
<td>OCs and herbicides</td>
<td>Cooper et al., 2002; Parks et al., 2011; Gold et al., 2007</td>
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<tr>
<td>SLE</td>
<td>Insecticides</td>
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<tr>
<td>Rheumatoid arthritis</td>
<td></td>
<td>Parks et al., 2011; Lee et al., 2007b; Lee et al., 2007a; Gold et al.,</td>
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<td>Pemphigus vulgaris</td>
<td>Mixture of pesticides</td>
<td>2007</td>
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<tr>
<td>Myastenia gravis</td>
<td>OPs</td>
<td>Valikhani et al., 2007; Fisher et al., 2008</td>
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<tr>
<td>Autoimmune thyroiditis</td>
<td>OCs</td>
<td>He et al., 1998</td>
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<tr>
<td>Multiple sclerosis</td>
<td>Mixture of pesticides</td>
<td>Langer, 2010</td>
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<td>Psychiatric disorder</td>
<td>Pesticide poisoning</td>
<td>Perron et al., 2011</td>
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<td>Depression</td>
<td>Herbicides</td>
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<td>Mixture of pesticides</td>
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<td>Suicide rate</td>
<td>Mixture of pesticides</td>
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<td>Suicide ideation</td>
<td>Mixture of pesticides</td>
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<td>Death caused by mental disorders</td>
<td>Mixture of pesticides</td>
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The Chicken Study

- Best animal study to date on organic vs conventional food consumption
- Two generation study- assumed that nutrition has epigenetic effects.
- Three distinct genetic lines of chickens differing in their immune function- Low, Control, High
- Organic fed chickens had more robust immune response and better rebound weight gain

Immune Response to Trigger

Fig. 7. Control-corrected lipopolysaccharide-stimulated NO production in monococytes. Second generation high, control and low chicken lines. (●), Organic feed; (○), conventional feed. KLH, keyhole limpet haemocyanin. Values are means (n 16 – 26) with standard errors of the mean represented by vertical bars; significant differences are indicated by stars (P<0.05).
Can we go from Chicken to Human?
Asthma and Allergies

- PARSIFAL Study
  - Thousands of school children queried about their incidence of asthma and allergies.
  - Those living on a farm had a significant protective effect.
  - Waldorf students also with similar effect.
    - Intake of Biodynamic and fermented foods
    - Gut flora differences noted in a separate study.
Asthma and Eczema

- ALADDIN Study: Compared a group of “normal” infants to a group of infants raised in Anthroposophic lifestyle
  - home deliveries
  - long period of breastfeeding
  - **diet of organic/biodynamic products**
  - restrictive use of antibiotics and antipyretics
  - postponed vaccination program
  - holistic view of life
- Normals had a 44% incidence of atopy, Anthro kids 26%
Fertilizer

- Nitrates are relatively benign but our intestinal microflora convert these into highly toxic Nitrites
  - These can cause methemoglobinemia
- Nitrites react with amines to form toxic nitrosamines
  - Carcinogen
  - Thyroid disorders
Nutrition

- Little evidence that organic and conventional foods differ in respect to the concentrations of the various micronutrients (vitamins, minerals and trace elements)
- Slight trend towards higher ascorbic acid content in organically grown leafy vegetables and potatoes
- Trend towards lower protein concentration but of higher quality in some organic vegetables and cereal crops
- With respect to the rest of the nutrients and the other food groups, existing evidence is inadequate to allow for valid conclusions
Better Data!

- MOBA birth cohort study of 28,000 mothers- 21% reduction in pre-eclampsia if consuming organic vegetables
- 62,000 participants of the NutriNet-Santé study showed lower BMI increase over time, 31% obesity in organic consumers
- Lower incidence of hypertension, DM2, hypercholesterolemia and cardiovascular disease
- Among 600,000 women, 21% reduction in incidence of Hodgkins lymphoma noted who consumed organic

Better Data!

- Organic strawberries and beet roots had stronger in vitro effects against colon and breast cancer cell lines.
- Collectively, in vitro and animal studies organic/biodynamic does impact aspects of cell life, the immune system, and overall growth.
  - Most outcomes observed in animals have not been examined in humans so far.
- Published meta-analyses reveal modestly higher content of phenolic compounds in organic food.
  - Hard to tie causal relationship to health.
- Cadmium
  - Linked to kidney disease.

Large scientific reviews finding higher levels in conventional vs organic food.

recent meta-analysis reports conclusively 50% higher more omega-3 fatty acids (as percent of total fatty acids) in organic compared to conventional milk

Data from 44 studies show the content of total PUFA and omega-3 PUFA was found to be significantly higher (23 and 47%) in organic compared to conventional meats

MRSA is 7 times more common in conventional herds of pigs vs organic

Among 600,000 women, 21% reduction in incidence of Hodgkins lymphoma noted who consumed organic

Quality

13 million IQ points per year lost due to 1 pesticide alone

Figure 11. Pictures made by children from valley (area of pesticide risk) and foothills (contamination-free area) in Sonora, Mexico (Guiette et al., 1998).
How does better soil health translate into better human health?

- darker color
- good organic structure
- good root development
- rich and refined aromatic smell

- lighter color
- cubic structure
- poor root development
- less olfactory aromas
No Lettuce Was Harmed in the Making of this Presentation
Reductionist Science

- Close Observation of Nature
- Inductive Reasoning
- Testing Hypothesis
- Skeptical Approach

- Bacon’s guiding image of nature is that of a female waiting to be dominated and violated, and he vows to his readers that the new philosophy will render nature the very “slave of mankind.”

- “My only earthly wish is to stretch the deplorably narrow limits of man’s dominion over the universe to their promised bounds. Nature will be bound into service, hounded in her wanderings, and put on the rack and tortured for her secrets.”
Rudolf Steiner
The Power of Thinking

- Biodynamic Preparations
- Prediction of Mad Cow Disease
  - “What would happen if the ox were to eat meat directly instead of plants? ..... the oxen would go mad, would turn into terribly wild, furious creatures...”
- Prediction of Colony Collapse Syndrome
  - In 1923 Rudolf Steiner warned beekeepers that to continue down the road of industrialized beekeeping would result in the disappearance of the bees within 80 years. The first report of what is now known as Colony Collapse Disorder (CCD) was in November of 2006
As early as 1917, Rudolf Steiner suggested the injection of mistletoe extracts for the treatment of cancer.

- Over 60-70% of cancer patients in European countries use mistletoe as a complementary therapy today.
- Clinical effectiveness of mistletoe extracts in cancer has been investigated in a great number of studies, among these 43 prospective randomized controlled trials. They report significant clinical benefits.
- Johns Hopkins currently leading a phase 1 clinical trial prompted by Ivelisse Page, a Stage 4 colon cancer survivor who credits her success to mistletoe.
Goethean Science

- Experiment as interactive experience
  - "The human being himself, to the extent that he makes sound use of his senses, is the most exact physical apparatus that can exist."

- Goethe developed two dynamic concepts applicable across all domains
  - Polarity
  - Morphology - logical-linear sequence
Goethean Science

- “exact sensorial imagination”
  - process of conscious picture building
- “If we want a living perception of nature, we must become as mobile and flexible as nature herself”
- Science is a conversation with nature
How do we measure Quality

Copper Chloride alone
Picture Forming Methods

Figure 3. Biocry stallization patterns of pasteurized conventional and organic milk at high concentrations
• Raw Biodynamic Milk
Coffee

Figure 2 Comparison of different CuCl$_2$ crystals obtained by our sensitive crystallization procedure. Crystal of CuCl$_2$ without additive (a); crystals of CuCl$_2$ obtained by using Powder2 (b) and Guatemala (toasted beans) (c) samples as additive. The magnification is 10x. The different color of the background is due to the different polarized light conditions and does not affect the acquired features.
Babies!
Picture Forming Methods

Figure 4. The biocrystrallogram image of organic (on the left) and conventional (on the right) carrot (Meelumsrn, 2006).

Top fermented Belgian craft beer (alcohol content 5% vol.)

Italian craft beer (8% vol.)
Annual emissions must drop to ~41 GtCO2e by 2020 if we are to have a feasible chance of limiting global warming to 1.5°C

Currently at 52 GtCO2e