



Organic Food Quality & Health



***Linking  
Organic Production Methods  
&  
Health Effects  
in the Lab, in Animals and in Humans***

Machteld Huber, MD & Lucy van de Vijver, PhD

Organic Food Quality and Health Workshop –  
“Latest Research Results on Organic Food Quality and Health”

BioFach Congress, Nuremberg, February 19th, 2009



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# *An Overview of Research Results*

Organic Food Quality and Health Workshop –  
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The often posed Question:  
**Is Organic More Healthy?**

*The bad news ....*

**&**

*The good news ....*



# Is Organic More Healthy?

*The bad news ....*

*This question can **not** (yet) be answered  
positively.*



# Is Organic More Healthy?

*The good news ....*

*The 'Body of Evidence' is increasing!*



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# ‘Body of Evidence’ ?

*= The mounting of research results that point  
in the same direction,  
which is necessary in science before you can  
speak of ‘Scientific proof’.*



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*This*

# **‘Body of Evidence’**

*Is increasing internationally....*



# **‘Body of Evidence’ in 2009?**

*Two types of research results:*

- 1. Nutritional value = content of **nutrients***
- 2. Health **effects** in living organisms*

# Nutritional value 1 – Org vs. Conv.




<b>Protein</b>	<b>10-20%</b> ↓	<b>Grain</b>
<b>Healthy fatty acids (CLA, omega 3)</b>	<b>10-60%</b> ↑	<b>Milk, dairy</b>
<b>Vitamin C</b>	<b>5-90%</b> ↑	<b>Leaf vegetables, Fruits</b>
<b>Sec. plantmetabolites (flavonols, polyfenols, glucosinolates, carotenoids)</b>	<b>10-50%</b> ↑	<b>Fruits, Certain vegetables, o.a. tomatoes, maize, wine</b>
<b>Dry matter</b>	<b>Max. 20%</b> ↑	<b>Vegetables</b>

**Source: more than 100 studies. Note: Big variation between studies.**  
 Polyfenols (n=15 studies), 8 org. more, 5 equal, 2 less than conventional.

# Nutritional value 2 – Org vs. Conv.

Residues of pesticides	↓	Vegetables, grains, fruits, wine, etc.
Residues of antibiotics	↓	Milk, meat
Antibiotic resistant bacteria	↓ ↓	Chicken and Pork meat
Mycotoxins	=	Grains
Nitrate	↓	Vegetables

**Reference:** Hoogenboom et al. Contaminants and micro organisms in Dutch organic food products: a comparison with conventional products. Food Additives & Contaminants 2008.



*However: what do these  
research results of nutrient  
contents **Mean**  
in relation to health?*

*Hypotheses exist about that, but these are  
often reconsidered.*

*And contents do not deliver the desired proof,*



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***Because:***

- *Does the body take up the nutrient = **bioavailability**'?*
  - *And once taken up: what is the '**biological effect**'?*
  - *For many nutrients an '**optimum**' amount of intake is known. Too little, as well as too much may be harmful.*
- >That is why other types of studies are necessary: **Effect studies In Vitro (Lab), in Animals and in Humans. Now some results will be presented.***

# Studies In Vitro

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- *Cell proliferation of **cancer cells** decreased on an extract of organic, compared to conventional strawberries (Olsson, 2006)*
- *Better repair of damaged DNA in **bacteria** on juices of organic onions, Chinese cabbage and other vegetables, compared to conventional juices (Ren, 2001)*

# *Animal studies*

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*Indications that organic feed in animals leads to:*

- *↑ Fertility (Staiger 1988)*
- *↑ Immune parameters (Finamore 2004,  
Lauridsen 2007)*
- *↓ Bodyweight and fat tissue (Lauridsen 2007)*

*But... the amount of studies is limited and sources of feed are not always clear.*

# *Animal studies*

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*A recent big study in the Netherlands:*



# *Animal studies*

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## *‘Organic More Healthy?’:*

*A study with 2 generations of 3 **chicken lines**, that received either organic or conventional feed (**intervention study**).*

***Aim:** To identify **biomarkers** for intervention studies in humans.*

***Special:** The animals were analysed **very extensively**, as well as the feed.*

# *Animal studies*

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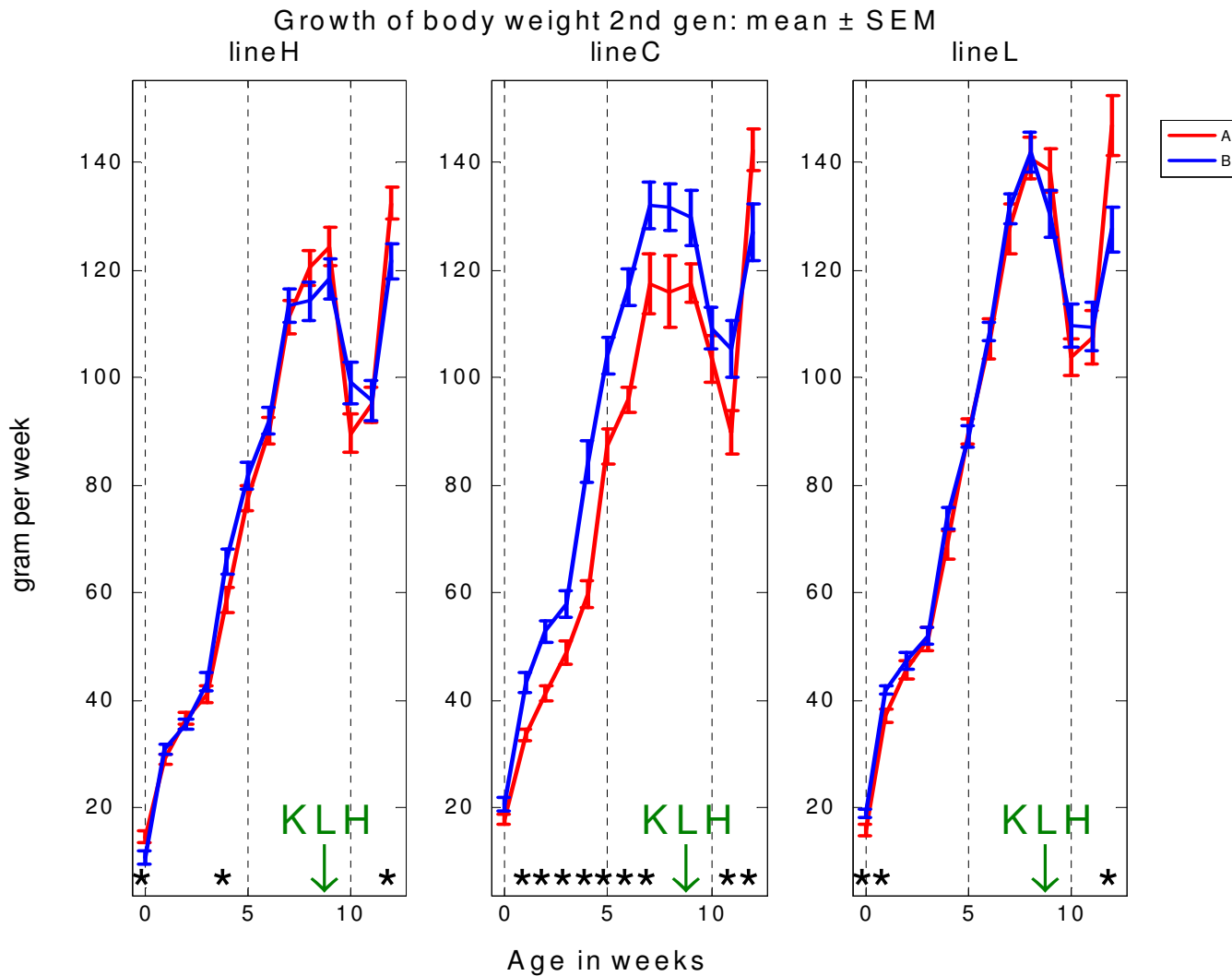
## ***Results of this study:***

*Animals of both groups were healthy! However there were clear differences.*

## ***Organically fed animals had:***

- A lower body weight*
- A higher immune reactivity (more 'alert')*
- After a challenge, a better catch-up growth.*

# Animal studies



# *Animal studies*

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## *Conclusions:*

*Effects were found on **body weight** and on the **immune system**.*

*This seems a similar tendency as in the results of Lauridsen and Finamore.*

*Now a few Human studies.....*

# Human studies

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- Improvement of **physiological** parameters & Improvement of **psychological** parameters in the '**Klosterstudie**' (Karin Huber, 2006), 17 nuns, 1 month on Biodynamic food. Note: Not a 'blinded' study.
- **Less eczema/allergy complaints**  
± 30 % lower in children with an anthroposophic lifestyle, including organic and Biodynamic food (**Parsifal study**, 14.000 children, Alfven et al, 2005)  
> These children had a lower BMI (bodyweight).....

# Human studies



## **Koala study**

Nearly **3000 mothers and children**, of whom 25% with an 'alternative' lifestyle, are being studied e.g. on nutrition, lifestyle factors and allergy complaints. Uni Maastricht, LBI, a.o., start 2000.

### **Results organic nutrition of mothers:**

More CLA's in mothersmilk of mothers who used organic dairy.  
More organic **dairy** consumption gave more CLA's: 0>50%>90%.  
Biodynamic dairy gave the highest level.

### **Results organic nutrition of children at age 2 years:**

30 % less eczema complaints among children that use >90% organic **dairy**.

**References:** Rist *et al.*, **Br J Nutr 2007**; Kummeling *et al.*, **Br J Nutr 2007**.

> *The study is being continued.*

Daily Mail 10/11/07

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## Organic milk 'fights allergies'

ORGANIC milk, cheese and yoghurt could help protect young children against eczema and asthma, researchers say.

They found that infants raised on organic dairy products are a third less likely to suffer from allergies in their first two years than those fed conventional food.

The researchers are unsure why organic food prevents allergic reactions — but believe its higher concentrations of fatty acids could play a role.

A Dutch study followed 2,500 pregnant women and their children for two years after birth.

Some 234 of the children were on strict diets where more than 90 per cent of their dairy intake was organic. Their mothers also ate organic food while pregnant and breastfeeding.

These youngsters were 'significantly less likely' to suffer from allergies, the study found.

Researchers took into account that these children were more likely to come from rich families.

Study author Dr Machteld Huber, of the Louis Bolk Institute, wrote in the *British Journal of Nutrition*: 'There was a clear relationship between organic dairy use and less eczema.'

'The difference was significant, but only for children exclusively eating organic dairy products.'

'We didn't find a relationship if they had organic and conventional dairy products.'

Organic milk may help babies

beat allergies

Rebecca Smithers

Consumer affairs correspondent

[Society Guanlian.co.uk/health](http://Society.Guanlian.co.uk/health) »

Denne melken beskytter fosteret

Vil du beskytte barna dine mot allergi? Da bør mor drikke økologisk melk i svangerskapet og under ammeperioden, ifølge ny forskning.

Av [Karoline Steenbuch](#)

21.11.2007 14:20

*Dette er interessante resultater, men vi trenger flere studier*

*som kan understøtte dette før vi anbefaler økologisk melk*

*for allergiforebygging.*

Den nye hollandske undersøkelsen, fra Louis Bolk Institute ved Maastricht University, viser også at kvinner kan beskytte barna sine mot barneeksem og andre allergiske sykdommer, hvis de drikker økologisk melk.

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ICROFS

# *In Vitro-, Animal and Human studies*

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## **Conclusions:**

- *The number of studies comparing **nutrient contents** is still increasing. Often differences between organic and conventional are found, but also differences within the (organic or conventional) group. A point of attention! A large variation exist!*
- *The number of studies on health effects increases and **a tendency** seems to become visible.*
- *In animals and humans effects are being found on the **immune system** and on **weight development**.*
- *In the laboratory effects on **cellproliferation** and on **DNA-repair** are found*

***Overall the Body of Evidence is growing!!***

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***Body of Evidence: How to continue?***  
**Weighing of scientific proof:**

***Intervention studies***

*Controlled studies in humans*

***Observational studies***

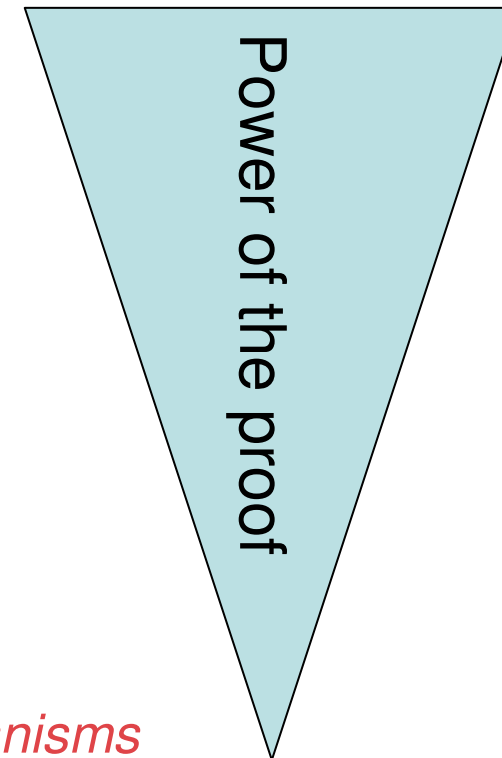
*Prospective cohort studies*

***Intervention studies***

*Controlled studies in animals*

***Supportive studies***

*e.g. in vitro studies > working mechanisms*





*So, about the often posed Question .....  
Is Organic More Healthy?*

*“The proof is increasing fruitfully!”*

~

**Thank you for your attention!**