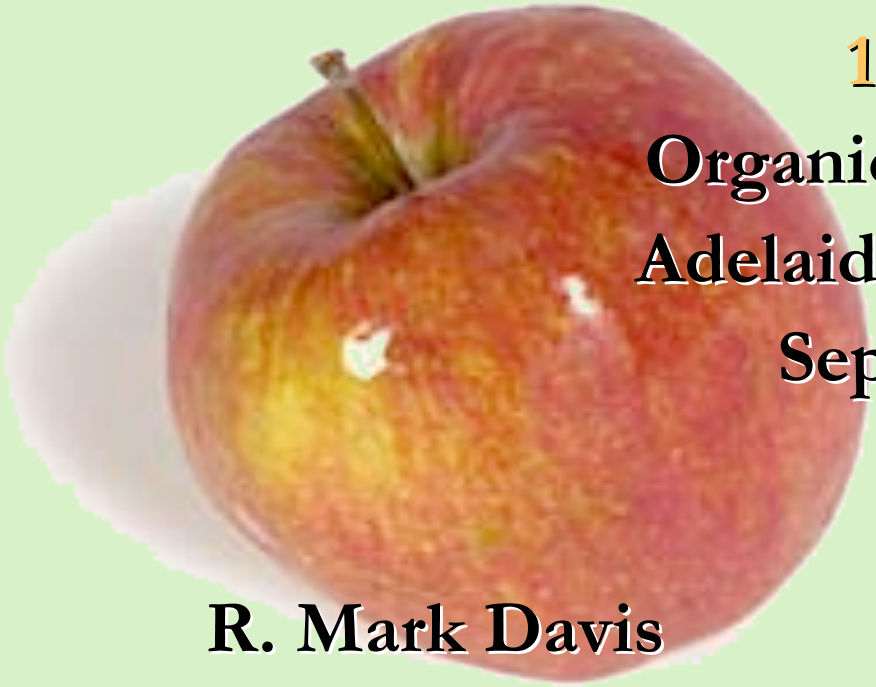
The Organic Center



15th IFOAM

Organic World Congress

Adelaide, South Australia

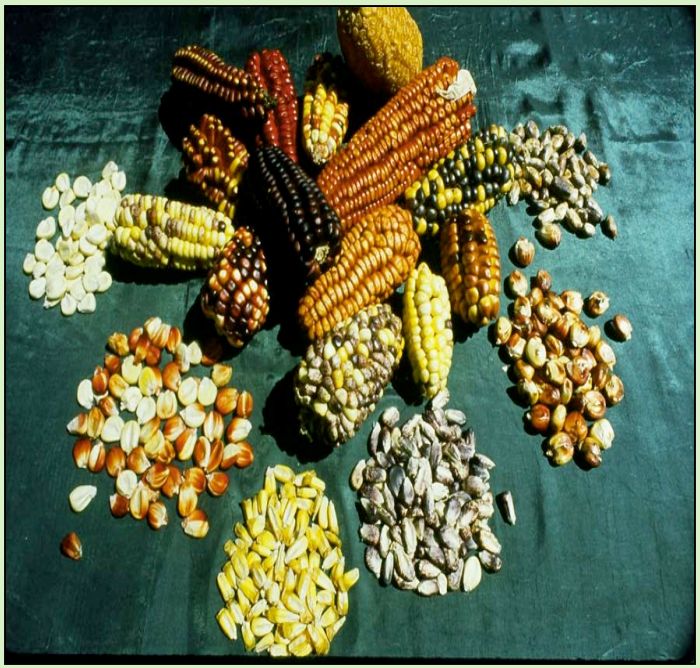
September, 2005

R. Mark Davis

Chief Executive Officer

The Organic Center

Our Vision



Conversion of agriculture to organic methods, improved health for the earth and its inhabitants, and greater awareness of and demand for organic products.

The Organic Center

Our Mission

To generate credible, peer-reviewed scientific information and communicate the verifiable benefits of organic farming and products to society.

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Long-Term Goals

1. Expand the scope of research on the benefits of consuming organic food, as well as on organic production and processing methods and systems.

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Long-Term Goals

2. Accelerate the conversion of agriculture to organic methods by building demand for organic products.

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Long-Term Goals

3. Promote research and innovation that will create new and/or expand existing dimensions of the organic benefit, and develop strategic alliances with other research institutions.

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FQH
Organic Food Quality & Health

Long Term Goals

4. Serve as a clearinghouse for organic science information, tracking research, both past and current, analyze the results and make it available to promote environmental, public health and organic causes.

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Our Strengths

- Creation of consumer-friendly summaries of hard-core science and research on the organic benefit.
- Ability to tap expertise and forge teams composed of leading scientists in industry, academia, and private research institutes.

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Our Strengths

- Helping public health and medical professionals understand how organic food can help prevent disease and promote well-being.

The Organic Center

Organizational Structure

- 501(c)(3) Nonprofit - A Virtual Company
- Board of Directors
- Scientific & Technical Advisory Committee
- Cooperating Scientists
- Staff
- Funding

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Demonstrable Outcomes

- State of Science Reviews (SSRs)
- Directly Funded Research Projects
- Product Specific Studies
- Proposal Preparation Grant Program

The Organic Center

Completed Reports

Minimizing Pesticide Dietary Exposure Through the Consumption of Organic Food

October 2004

The Organic Center for Education & Promotion

EXECUTIVE SUMMARY

Number 1

Minimizing Pesticide Dietary Exposure Through Consumption of Organic Foods

Prepared by Charles M. Benbrook, PhD for The Organic Center for Education and Promotion - May 2004

Choosing Organic Fruits and Vegetables Minimizes Risks of Dietary Pesticide Exposure and Maximizes Healthful Benefits

Choosing organically grown fruits and vegetables can significantly decrease the frequency and level of dietary exposure to pesticides, thus reducing the magnitude of one risk factor that can contribute to a variety of health problems.

Public and private sector efforts to increase fresh fruit and vegetable consumption are clearly among the best investments possible to improve public health in America. Yet those who follow United States Department of Agriculture (USDA) guidelines of five servings of fruits and vegetables daily are likely to ingest six or more pesticide residues on most days, if produce is conventionally grown.

Pesticide risk assessment can rarely prove a direct, causal relationship between pesticide exposure and a particular illness or disease that some individual has suffered. But scientists have concluded that, across the population, pesticide exposure is a risk factor that increases the chance that certain health problems will occur with greater frequency or lead to more serious consequences.

Conventionally grown fresh produce is three to four times more likely to contain one or more pesticides than organic produce, and a given sample of conventional food is also far more likely to contain multiple residues than the corresponding organic food. For this reason, choosing organic fruits and vegetables is the most reliable way to reduce overall pesticide dietary exposure.

Dietary Pesticide Residues Are A Public Health Concern

Pesticide residues are a public health concern. Pesticides are intended to kill or control pests, but many are highly toxic to organisms other than those targeted. In the environment, these include beneficial insects like pollinating bees as well as birds, fish and earthworms. In mammals, including humans, some widely used pesticides can alter fetal development, impair immune function, and trigger health problems that can take many years, even decades, to develop.

Though food is not the only source of exposure to the more than one billion

Continued on page 2.

The Organic Center

Pesticide Exposure Findings

Fruits and vegetables grown conventionally are:

- 3 to 4 times more likely to contain residues than organic foods,
- 8 to 10 times more likely to contain multiple residues,
- contain residues that are 3 to 10 times higher, on average, compared to organic food.

The Organic Center

Completed Reports

Elevating Antioxidant Levels in Food Through Organic Farming and Processing

January 2005

STATE OF SCIENCE REVIEW
EXECUTIVE SUMMARY

The Organic Center for Education & Promotion

Number 2

Elevating Antioxidant Levels in Food Through Organic Farming and Food Processing

Prepared by Charles Benbrook, Ph.D. Chief Scientist, The Organic Center for Education and Promotion ~ January 2005

Shift Toward Organic Production and Food Processing Increases Antioxidant Levels in Fresh Produce and Many Other Foods

Antioxidants are chemicals that help prevent or reduce tissue damage in cells caused by free radicals. Free radicals are oxygen and nitrogen-based molecules with unpaired electrons that are generated by a number of metabolic processes within the body. Antioxidants inhibit damaging reactions within human cells by providing the positively charged atoms needed to neutralize free radicals, which are also called "reactive oxygen species" (ROS), or "reactive nitrogen species." (For more on the key terms used in this SSR see the Glossary posted at the end of this summary.)

The total supply of antioxidants circulating in the body is the sum of antioxidant enzymes and acids manufactured by the body, plus antioxidants consumed in foods. The human body manufactures a wide range of antioxidants including enzymes, alpha-lipoic acid, coenzyme Q10, ferritin, uric acid, lactoferrin, and many others.

Plants produce more than 50,000 "secondary plant metabolites" (SPMs) as part of their normal growth processes and in response to stresses in the environment. Stress might arise from insects, plant diseases, chemical imbalances in the soil, or weather extremes. Some 4,000 SPMs are polyphenol flavonoids and many of these are antioxidants. Plants are the source of essentially all antioxidants in the diet, including the carotenoid antioxidants alpha- and beta-carotene, ascorbate, tocopherols, and lycopene. Plant-based animal feed is the source of antioxidants in milk, meat and poultry products.

By lessening free radical damage in human tissues, antioxidants reduce inflammation and can lessen joint and muscle pain. Through this mechanism, antioxidants can play a role in promoting cardiovascular health, lessen the risk and severity of neurodegenerative diseases like Alzheimer's and Parkinson's disease, and in general, help slow the aging process.

A wide range of studies has shown that plant antioxidants are also anti-proliferative (i.e., they slow the proliferation of cells). In this way, antioxidants can prevent or slow the growth of some cancerous tumors. And recent research suggests that some polyphenols in plants can increase the sensitivity of the body to insulin, thereby delaying the onset of Type 2 diabetes or slowing the progression of this increasingly common disease.

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Antioxidant Findings

- Seven studies report careful, side-by-side comparisons of antioxidants in organic and conventionally grown food.
- Antioxidant levels were on average about 1/3 higher in organic food compared to conventional.
- Some organic food processing techniques can help preserve antioxidants in raw commodities, compared to methods used by conventional methods.

The Organic Center

Completed Reports

Breaking the Mold: Impacts of Organic and Conventional Farming Systems on Mycotoxins in Food and Livestock Feed

September 2005

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STATE OF SCIENCE REVIEW
EXECUTIVE SUMMARY

The Organic Center

Number 3

Breaking the Mold
Impacts of Organic and Conventional Farming Systems on Mycotoxins in Food and Livestock Feed

Prepared by Charles Benbrook, Ph.D., Chief Scientist, The Organic Center
September 2005

Organic Farming Can Enhance Food Safety by Lessening Risk of Mycotoxin Contamination

Fungi play vital roles as decomposers, breaking down all kinds of organic matter from roots and leaves to crop residues, wood, and dead animals. The decomposition process releases the nutrients stored within organic matter. In short, fungi help make it possible for one generation of life to sustain the next.

Most fungi pose little or no risk to humans and some are delicacies, including morel and chanterelle mushrooms. Patches of fungal spores create the distinctive flavor and blue splotches in blue cheese, and without fungi, there would be no beer or wine. *Penicillium* and *Streptomyces* fungi produce antibiotics widely used in treating bacterial infections in humans and animals.

However, a few fungi are poisonous, even deadly, to humans. Others produce molds and mold spores that can trigger human allergies and induce asthma. Most fungi thrive by attacking plants, trees, or insects and slowly consuming their tissues. Others break down the integrity of cell walls, causing damage that can prove fatal. This is sometimes a good thing, such as when *Beauveria bassiana* fungi attack Colorado potato beetles in a farmer's field. (see photo on right, page 4)

There are more than 300 species of fungi with the ability to produce mycotoxins. Mycotoxins are secondary metabolites produced by fungi in response to environmental conditions. Fortunately, only about 20 mycotoxins produced by five genera of fungi (*Aspergillus, Penicillium, Fusarium, Alternaria,* and *Claviceps*) are found periodically in food at levels posing threats to people. Still, mycotoxins cost American agriculture between $630 million and $2.5 billion annually, largely because of market rejection of grain that contains mycotoxins at levels above either government or company standards.

Some individuals and organizations critical of organic farming claim that organic food and animal feed are more frequently and heavily contaminated with mycotoxins than conventional food and feed. Those making such arguments typically highlight a few, isolated instances where mycotoxins were detected in organic or "naturally" grown food at levels higher than in other foods. They explain the differences by pointing out that organic farmers are not allowed to apply synthetic fungicides.

Mycotoxins have also become part of the global debate over the benefits of genetically-engineered (GE) crops. Studies showing that GE, insect-protected field

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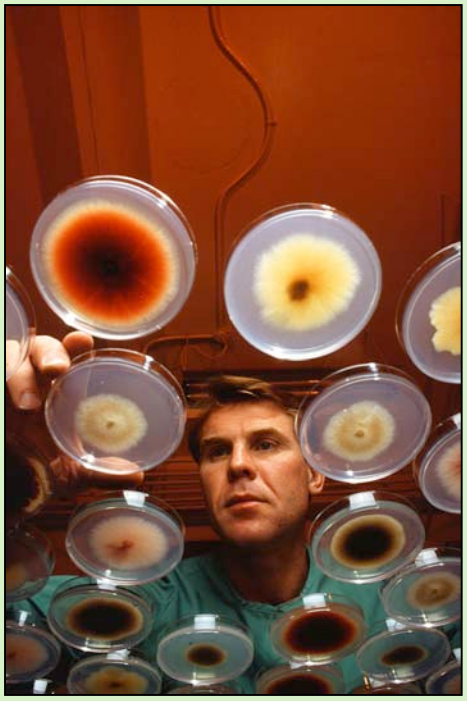
Mycotoxin Findings



- Nine studies allow 24 direct comparisons.
- Mycotoxins were found in conventional samples about 50% more frequently at a little over twice the average level.
- Organic systems help reduce fungal infections and mycotoxin formation, while some conventional practices – especially high N levels and sub-lethal doses of fungicide – can promote mycotoxin production.

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Current Directly Funded Studies

A Comparison of Lycopene and Other Pytochemicals in Tomatoes Grown Under Conventional vs. Organic Management Systems – World Vegetable Center, Taiwan, Republic of China

How can organic farmers increase the concentrations of lycopene in tomatoes?

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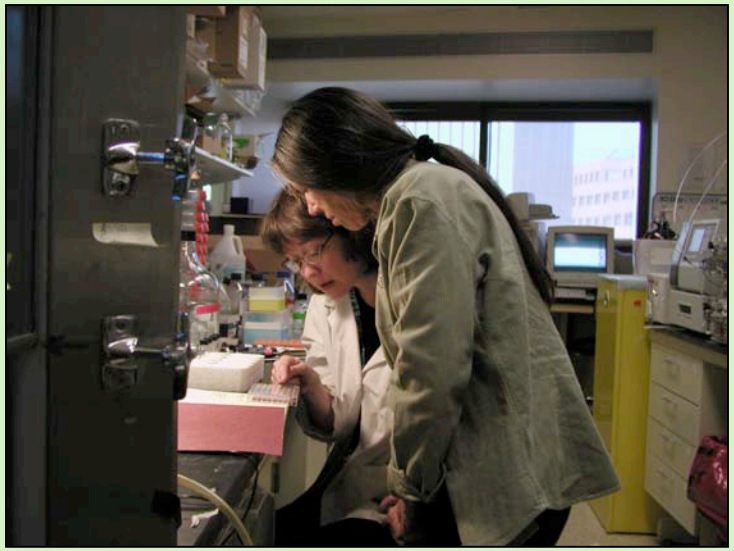
Current Directly Funded Studies

New Approaches to Measure the Impact of Farming Systems and Technology on Food Quality – Friedman School of Nutrition Science and Policy, Tufts University, Boston, MA

Focus on analytical methods to determine how agricultural methods affect antioxidant levels in key fruits and vegetables.



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Current Directly Funded Studies

A Comparison of Strawberry Fruit Quality from Organic and Conventional Farms – Washington State University, Pullman, WA

An in-depth field study focusing on the impacts of organic farming systems on antioxidant levels, nutritional quality and sensory parameters.

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Consumer Education

Key Messages –

- Organic food delivers more nutrition per calorie consumed.
- Organic food can increase fruit and vegetable consumption, especially among children.
- Organic food can reduce pesticide exposure in fetal development.

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Consumer Education

Key Messages –

- Organic production methods often expand margins of food safety.
- Organic farming is good for the environment, farmers and farm workers.

The Organic Center

Consumer Ads

Alternative Medicine Special Edition "Food As Medicine" Sept. 2005

The Organic Center

Consumer Outreach

- Working with consumer packaged goods companies we license our logo and an educational message for placement on product packaging. To date, we have 1 million impressions in the marketplace and have a goal of 50 million impressions by the end of 2006.

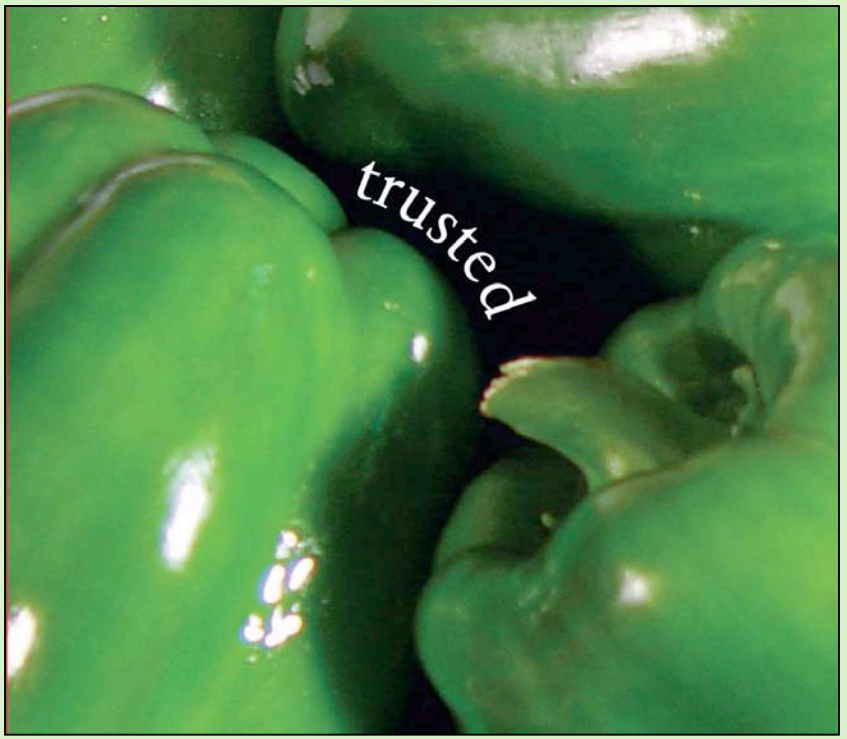
The Organic Center

Traditional Medicinals

The Organic Center

Media Results

Since our inception in 2002 we have garnered print, broadcast, and online media coverage in 50 publications, reaching over 12 million people.



The Organic Center

Summary

- Just as we help consumers see what's inside their products, a look inside the Organic Center reveals an organization that delivers distinctive research, unique products, sustainable benefits, and demonstrable social outcomes.
- Through hard-core science & strategic collaborations we are tilling new fields in organic research - closing the gap between what the industry has long known and what science has yet to prove.

The Organic Center

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www.organic-center.org

All reports are down loadable from

the website in PDF format

Creating Healthy Demand for a Healthy Planet™

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