Dynamic Chiropractic

NUTRITION / DETOXIFICATION

Organic vs. Conventional Foods: The Stanford Study (Part 2)

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In part 1 of this article [Nov. 4 *DC*], I discussed the conclusions of a literature review comparing the health benefits of organic vs. non-organic food as published in the *Archives of Internal Medicine*,[1] and referred to as the "Stanford Study," since it was done by Stanford Medical School faculty, staff and students. The results / conclusions are summarized as follows (for greater detail, see part 1):

- Pesticide levels of all foods (conventional and organic) generally fell within the allowable limits.
- Consumption of organic foods may reduce – but not eliminate – exposure to pesticide residues and antibiotic-resistant bacteria.
- No significant differences in health benefits between organic and conventional foods were found.

Media from around the world picked up the story and ran headlines proclaiming organic foods aren't healthier than conventional foods. This prompted a tsunami-like backlash with a flood of accusations against the review paper, its authors and their motives. The headlines and responses to them both misinterpreted the actual study. In other words, organic foods *do* have benefits and the authors were not out to get anyone.

The longest studies in this review were only two years in length. "Health benefits" were defined as nutrient levels in the foods analyzed from the 200-plus studies that met the authors' criteria. Health benefits were not defined as long-term pesticide accumulation.

When the researchers examined the pesticide exposure data that compared organic vs. non-organic, the difference was smaller than they expected. When chemicals were detected, most were within the safe range. This causes a knee jerk of negativity in many, but the study did not address, let alone validate, the accuracy of "allowable" amounts of pesticides. That is not the subject of this article, either, but it does pose an interesting question: How many chronic, long-term problems commonly addressed by nutritional intervention are caused by eating too many servings of non-organic produce for too many years?

I wondered which foods were the most affected by pesticides and discovered the answers were in 77 pages of fine print on the massive United States Department of Agriculture Web site.[2] I went through an alphabetical list that added up to 313 different chemicals, which broke down into seven basic categories: acaricides, bacteriacides, fungicides, herbicides, insecticides, plant activators and soil fumigants. Each chemical had a list of the produce that were tested for it, the number of samples studied, the number with detectable residues, the range of the amounts present and the Environmental Protection Agency (EPA) tolerance level.

Table 1:
Produce Highest in Pesticides
- Apples
- Celery
- Bell peppers
- Peaches
- Strawberries
- Nectarines
- Grapes
- Spinach
- Lettuce
- Cucumbers
- Blueberries
- Potatoes
- Green beans
- Kale
- Collard greens

I was dreading how long it would take to answer my question when I discovered the Environmental Working Group (EWG) had already had compiled a highest and lowest list (with trademarked catch phrases I will not use) from the USDA data.[3] They recommend people purchase organic from all foods on the highest list, which is presented in order. (Table 1)

The most contaminated food: apples, with 98 percent of tested samples showing residues from 48 different agrochemicals. Celery, in second place overall, was first in chemical variety with 57. Each food in Table 1 had detectable pesticides present in 90 percent of the samples tested. This does not mean these foods had agrochemical levels above what is considered safe. Of course, opponents will counter with the following question: "Would you rather eat an apple with *safe* levels of agrochemicals or *no* agrochemicals?"

The EWG states that people who cannot afford the higher cost of organic food may buy certain conventional varieties of food. (Table 2) For example, only 1 percent of the onions tested had detectable levels of agrochemicals.

Table 2:
Produce Lowest inPesticides
- Onions
- Corn
- Pineapples
- Avocados
- Cabbage
- Sweet peas
- Asparagus
- Mangoes
- Eggplant
- Kiwi
- Cantaloupes
- Sweet potatoes
- Grapefruits
- Watermelons
- Mushrooms

Regarding nutrient levels in organic vs. conventional, I looked at the data from a table summarizing the number of studies that compared nutrient values between organic and non-organic foods.[1] The nutrients that were compared were beta carotene, vitamin E (alpha tocopherol) and vitamin C (ascorbic acid). The minerals were calcium, magnesium, potassium, phosphorus and

iron.

The phytonutrients tested were quercetin, kaempherol, flavanols and phenols. The macronutrients tested were protein and fiber. Each nutrient was determined from different samples.

A total of 35 types of fruits, vegetables and grains were analyzed, with no more than 18 for any single nutrient. For example, the vitamin E comparisons came from analysis of cabbage, carrots, corn, olives, peaches, pears and plums, while the flavanol comparisons used apples, grape leaves, strawberries, black currants and chicory. Each nutrient comparison also came from a different number of studies, ranging from a high of 41 for vitamin C to a low of five for flavanols.

Based on the studies they analyzed, organic did have a greater chance of having more nutrients than conventional produce, although the margins were not statistically significant. It should also be noted that two macronutrients (protein and fiber) heavily favored conventional based on the study count, but their differences did not reach statistical significance, either. (Table 3)

Table 3: Studies ComparingNutrient Content in Foods

# of Studies	# of Comparisons	Favored Organic	Favored Non-Organic	No Difference
322	879	22.6%	15.1%	62.2%
287*	805	23.6%	11.2%	64.7%
35**	74	12.2%	52.7%	35.1%

** Macronutrient (protein and fiber) studies excluded*
***Macronutrient (protein and fiber) studies only*

In one interview, a principal researcher of the Stanford study explained their meta-analysis was not intended to address many of the other reasons people buy organic, including lower agrochemical exposure to workers, the soil and groundwater, or to reduce the development of antibiotic-resistant bacteria.[4] They also stated that the data was just as unexpected and surprising to them as it was to the public.[5] This shows me they weren't out to get anybody.

Finally, the Stanford study does show that a higher percentage of organic food is chemical free. And the EWG, which recommends purchasing organic from anything in Table 1, also states: "The health benefits of a diet rich in fruits and vegetables outweigh the risks of pesticide exposure."[3]

References

1. Smith-Spangler C, Brandeau ML, Hunter GE, et al. Are organic foods safer or healthier than conventional alternatives? A systematic review. *Annals of Internal Medicine*, Sept. 4, 2012;157(5):348-366.
2. U.S. Department of Agriculture Agricultural Marketing Service. *Pesticide Data Program: Annual Summary, Calendar Year 2010*.
3. EWG's 2012 Shoppers Guide to Pesticides in Produce. Environmental Working Group: www.ewg.org/foodnews/summary/.
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5. Neergaard L. "Study Questions How Much Better Organic Food Is." Associated Press, Sept. 4, 2012.