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Organic Food – Part 2

Last week in Organic Food – Part 1, I addressed the issue of whether organically grown food contains more nutrients than conventionally grown foods. The research proved to be equivocal, but there are more issues in the organic food debate and in this week's message, I'm going to talk about them. Let me be clear: I'm not arguing against eating organically grown vegetables, fruit, or grains, or animal products that are raised more humanely or without growth enhancers. If you can afford to eat organic, do it. I'd like to see all of us be more responsible in how we treat our environment, both internal and external. At the end of the day, my goal is to have you eat healthier foods. Period. But my job is to translate the latest research to everyday language and recommendations. For me, it's all about the science.

The most important issue other than nutrient content is the safety of organic versus conventional crops—if there are no pesticides, fungicides, antibiotics, or other artificial chemicals, that must yield healthier plants and animals, right? Let's get started.

Chemicals

The Environmental Working Group (EWG) ranks produce from worst to best (1) in terms of pesticide residue, and they've created what they call the Dirty Dozen—the 12 types of produce you should never eat because they contain the most chemicals. You can find the list on the website given in the references, but I'll tell you that peaches are Number One on the list with a 100 rating. More on peaches in a moment.

In researching how they do their analyses, I found that they referred to the United States Department of Agriculture Pesticide Data Program Annual Report as the source of their data (2). I found the reports and checked the years from 2005-2008. I'm not going to tell you I read every word—each report is over 150 pages including appendices. The sampling techniques and methodology seemed sound, so I focused on the results. Based on what I found, I couldn't disagree with how EWG ranked the Dirty Dozen. However, what they used as criteria and their lack of interpretation of those criteria was problematic in my opinion. Let me fill in the details, and I'll use peaches as an example since they're at the top of the list.

Peaches
Every sample of peaches examined had some residue of at least one pesticide and some had more than one of the 104 chemicals that were tested—that's how peaches got a 100 rating. That sounds really bad, but here's what they didn't say: 51 of the 104 chemicals were not found on any samples at all, and of the remaining 53 chemicals, 26 tested positive in 2% or less of the batches. The highest percentage of a single chemical was the fungicide Fludioxonil at 44%—that means 44% of the batches tested had at least some Fludioxonil. Looking at each batch of peaches for each chemical, tests were positive an average of only 3.7%. The peaches had been washed and pitted but not peeled, so if you love peaches as much as my wife does, peeling them will reduce your chemical exposure.

More important, none of the samples exceeded the EPA limits set for the chemicals—none. That doesn't mean the chemical is good for you. It just means that based on toxicity tests, the amounts did not exceed the limit set for human consumption. However, EWG's evaluation did just one thing: it looked at the raw numbers.

But that really doesn't really tell you much. For example, getting past the assumption that every chemical is bad for you, how does the human body deal with the pesticide? We haven't started dropping in the streets since pesticides became widely used, have we? There has to be a reason that some people are more sensitive to chemicals than others. Here's a potential reason.

The liver naturally detoxifies the body and that's where the chemicals end up for processing. How does the body eliminate them? There's not a lot of research on this topic, but one of the interesting studies I found examined one of the scarier groups of chemicals, organophosphorothioates, which are very toxic in high amounts (3). In a test-tube study, researchers found that slight differences in some of the detoxification genes found in the liver might be the real culprit, which means that those people with certain genetic polymorphisms might be more susceptible to this classification of chemicals than others. That makes absolute sense—just like the way pollen bothers my wife more than it does her brother or her son, who are genetically similar. Hypersensitivity to chemicals and other substances will always be an issue because we're all genetically different, no matter how similar we seem.

More About Chemicals
What the EWG also don't consider are other factors that can affect the amount of chemicals on crops. Pesticide residues may be broken down naturally by time or by the exposure to phytonutrients in the plants. There's a natural rate of degradation for every chemical—that's why there isn't 100% residue present for every chemical they tested. The chemicals degrade while the produce is in the fields, while it's picked, while it's being transported, while it's stored, while it's cleaned, and finally while it's peeled or cooked. The samples were bought "close to the consumer," but they may have been quicker to get their hands on the product than you are, and the longer time involved would allow further degradation of the chemicals.

There's another factor that occurred to me. The fruits and vegetables contain antioxidants and phytonutrients. If they help our body detoxify itself, wouldn't it be possible for the fruit or vegetable to use its own antioxidants and phytonutrients to degrade the chemical, too? In fact, a study was just published in July that examined that very question (4). Looking at the genotoxic and mutagenic activity of 12 different pesticides typically used on vegetable crops, researches found no activity in any of the vegetable extracts that contained the chemicals. In other words, the phytonutrients and antioxidants neutralized the toxic chemicals. This is only a test-tube study and it's something that needs further research, but as I said earlier, there has to be a reason that we're not dropping in the streets after eating conventionally grown vegetables and fruits, and the natural ability of the foods to neutralize the chemicals may be one factor.

The Bottom Line

In spite of what I'd consider a low level of risk, you may decide it's worth the money to buy organic. If I were feeding a two-year-old whose brain is growing exponentially or if my wife was in the middle of chemotherapy, I would do everything I could to put the odds in our favor and reduce even the smallest risk—including buying organic food as much as possible.

Pesticide use is the biggest issue for most people—it certainly stirs emotions. I'm trying to demonstrate that there's more to the pesticide issue than reaches the press or organic-farming advocacy websites. While I'm certainly not in favor of more chemicals in our bodies or the environment, U.S. farmers have to feed over 307 million people every day as cost effectively as possible. Many people can't afford to buy organic food exclusively, and even if most people switch to organic, the economies of scale will probably never make the price comparable because there's more involved in farming organically. We need conventional farming practices to feed everyone—we just need to get better at it.

We've covered the two most important factors in choosing whether to buy organic produce—nutrient content and chemical exposure—but there are more issues to consider, and we'll get into those next Saturday. In the meantime:

Are you prepared to eat your fruits and vegetables today?

One More Thing

Just a reminder that my NPR radio show, *Straight Talk on Health*, is moving to FM. Catch it at 7 p.m. Sunday in the Eastern Time Zone on WGVU-FM 88.5 or 95.3.

Dr. Chet

References:
1. Shopper's Guide to Pesticides. www.foodnews.org

2. www.ams.usda.gov/pdp
3. Buratti FM, et al. CYP-specific bioactivation of four organophosphorothioate pesticides by human liver microsomes. Toxicol Appl Pharmacol. 2003 Feb 1;186(3):143-54.
4. Isidori M, et al. Antimutagenic and antigenotoxic effects of vegetable matrices on the activity of pesticides. Food Addit Contam Part A Chem Anal Control Expo Risk Assess. 2009 Jul;26(7):1049-62.