



## **Editorial**

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### **Fruits, vegetables and pesticides - do we know what we are eating?**

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## *Fruits, vegetables and pesticides — do we know what we are eating?*

There is a large body of evidence that relates the consumption of fruit and vegetables with reduced risk of various types of epithelial cancers, such as gastric cancer. The effect has been seen for all types of fruit and vegetables, including raw (salad) vegetables, cooked vegetables, fresh fruit, dried fruit, and citrus fruit. In general, the estimated relative risk for cancer usually decreases with an increasing number of servings per week for both fruits and vegetables.

While there is fairly convincing evidence that higher intakes of fruit and vegetables are associated with lower risk of epithelial cancer, there was a recent report published in the March issue of *Consumer Reports* magazine entitled "How Safe is our Produce?" This report raised some concern that the pesticide residues in certain foods would be hazardous to human health, especially in certain vulnerable subgroups such as children. Consumers Union, the publisher, analyzed the US Department of Agriculture's available pesticide residue data on over 27 000 food samples covering the period 1994 to 1997, and their resulting technical report formed the basis for the article. The Consumer Union's article had computed a "toxicity index" (TI) for each food. The TI is assumed to integrate measures of the frequency of pesticide detection, the levels of residues present and the relative toxicity of the detected residues, yielding an index of the relative toxicity loading of each food. The article emphasizes that the TI does not measure *risk*, per se, the degree of risk associated with pesticide residues in foods also depends on the food intake and on other factors such as dose frequency, other exposures, age, illness, and the like. In any case, the authors of the Consumer Union article use the TI to rank fruits and vegetables and make their recommendations, indicating that produce with scores more than 100 are "of concern".

The foods which had the lowest TI values (10 or less) were frozen/canned corn, milk, US orange juice, US broccoli, bananas, and canned peaches. The foods with highest TI values (100 or more) included fresh peaches, frozen and fresh winter squash grown in the United States (US), apples, grapes, spinach and pears, and US-grown green beans.

Individual food samples often have multiple residues on them. In the US survey, up to 37 different pesticides were detected in apples, and more than 20 in peaches, pears and spinach.

The most important contributors to the TI included relatively few pesticides. Methyl parathion accounted for a large part of the TI values for apples, pears, green beans and peas, as well as peaches. The average methyl parathion residue on peaches tested in 1994—1996 was 0.055 parts per million. The current EPA reference dose for methyl parathion is 0.02 µg/(kg·day). Therefore, a 20-kg child should not consume more than 0.4 µg per day of this insecticide. Eating just 1 medium-sized peach with an average methyl-parathion residue would give that 20-kg child a dose of this neurotoxic insecticide that is almost 14 times higher than the reference dose of the US Environmental Protection Agency.

Methyl parathion on peaches is an extreme example, but it is far from the only case in which a young child can ingest more than a safe dose of a specific pesticide by eating a single serving of a specific food. For instance, the high TI values for winter squash from the United States are almost entirely due to residues of dieldrin, a toxic insecticide that was banned in that country some 25 years ago, but which persists in agricultural soils. Dieldrin was found in 37% of fresh winter squash and 74% of frozen winter squash in samples tested for it in 1997. The majority of the positive samples had residues high enough to give a 20-kg child more than the reference dose of dieldrin in a 100-gram serving of squash. Similarly, if the child were to eat 100 grams of fresh spinach, the odds are about 1 in 12 that he or she would exceed the reference dose for the organophosphate insecticides dimethoate and omethoate or meth-

omyl, a carbamate insecticide. Of course, the reference doses have, in principle, safety factors built into them, and eating a reference dose does not automatically mean that a child will suffer any adverse effects. But a possible weak point in the control of pesticides is pointed out: the confidence of safety may not be guaranteed for children and other vulnerable subgroups.

The fact that a few toxic pesticides account for most of toxicity loading has important policy implications. The hazards to humans associated with residues can be drastically reduced by focusing risk management efforts on a few pesticide uses.

The Consumer Union's report was careful in pointing out that they do not recommend eating fewer fruits and vegetables, since the health benefits of these foods far outweigh the risks from the pesticides they contain. However, the report gives the following recommendations by which any possible hazards could be decreased even further:

- Wash or peel fresh fruits and vegetables before feeding them to children (NOTE: Do not reduce the children's consumption of fruits and vegetables!)
- Buy organically grown apples, peaches, grapes, pears, green beans, winter squash and spinach, if they are available where you live.
- Choose a variety of foods; do not overdo it with any one fresh fruit or vegetable.

The Consumer Union's report is of course based on the situation in North-America. One can argue on the relevance of the toxicity index created. This index may not be really representative of toxicity to humans. But, these criticisms aside, the report carries, in any case, an important message; namely, the unnecessary use of toxic and persistent pesticides should be stopped, and consumers should be made aware of the levels of various pesticides detected in food products. The fact that fruits and vegetables are good for you should not overshadow the fact that even fruits and vegetables should be produced using good agricultural practices which avoid the use of the worst and most problematic pesticides, which leave residues on fresh products. The consumers have to have the right to eat their vegetables and fruits without being exposed to harmful levels of synthetic pesticides.

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