



## Cornell University Program on Breast Cancer and Environmental Risk Factors in New York State (BCERF)

# Consumer Concerns About Pesticides in Food

*This fact sheet covers the following key topics on pesticide residues in food: federal monitoring programs, results of federal monitoring, food safety for children, tips on how to avoid pesticide residues, and where to get further information.*

### What are pesticide residues?

Sometimes foods carry small amounts of pesticides currently used on farms, and even pesticides no longer used, but which are long-lasting in the soil and water. Pesticide residues in this fact sheet refer to the small amounts of pesticides and pesticide breakdown products in or on food.

### Why is it important that pesticide residue amounts in food be tested?

Pesticides need to be toxic to kill pests. However, a pesticide can be useful only if it kills pests at a small enough dose that

causes little or no harm to people, domestic animals and wildlife. It is not easy to establish how much of a pesticide is “safe” for people. Despite many studies done on health effects of each pesticide, there are research gaps. These gaps cause uncertainty in the predictions of long-term health effects of many pesticides. It is thus essential that pesticide exposure be minimized and the presence of pesticide residues in food be regulated and monitored (see BCERF Fact Sheet #25 on *Pesticide Residue Monitoring and Food Safety* for more details on federal regulations and monitoring programs). The consumer can take a few additional steps to reduce the amount of pesticide residues in food as shown below.

### Tips on how to reduce the amount of pesticide residues in food

- Wash your food. To remove pesticides, as well as for general health, it is a good idea to wash food with clean water (but not soap!) before it is cooked or eaten.
- Peel, if possible. Peeling helps reduce the levels of pesticides that may be on the surface. Peeling does not remove all pesticide residues, since some residues are absorbed into the food.
- Trim the fat from meats. Some pesticides collect in animal fat. Trimming excess fat from meats helps to reduce the amount of such pesticides that would be eaten.
- Cooking helps. Cooking helps reduce some of the pesticide residues in food that are not removable by washing or peeling.
- Eat a varied diet rich in fruits and vegetables. Specific pesticides are used for specific food crops. Eating a diet with many different fruits, vegetables and grains is a healthy practice in itself. It also prevents eating an unbalanced amount of a particular food or the pesticide residues that it may carry.
- If still concerned, consider buying food that has been grown using “Integrated Pest Management” or “Certified Organic Methods” (see p. 4 for more information). Buying food grown using less or no synthetic chemicals may help reduce the intake of pesticide residues. Note however, that even organically grown food is not guaranteed to be totally free of pesticide residues.



## **If pesticides are toxic, why are they used in agriculture?**

Pesticides are developed with the aim of helping the farmer protect crops from damage and thus increase the yield, or the storage life of crops. Different pesticides may do so by preventing the growth of weeds or damage to crops by insects, rodents and molds.

## **Is the use of pesticides necessary?**

Supporters argue that pesticide use is necessary to keep the cost of food production low and to maintain an abundant, affordable supply of fruits and vegetables in the market. However, opponents argue that since pesticide-free agriculture has never been tried on a large enough scale, we really do not know if the cost of food production would increase, or by how much. Researchers have studied the profitability of farms that do not use synthetic pesticides and found that results can vary depending on the kind of crop and region of the country.

There are other advantages of using pesticides. For example, pesticides can help prevent some types of food poisonings. Food that is damaged by insects is more easily attacked by mold. Pesticides that prevent insect-damage also help prevent the growth of a mold that produces a natural, but potent cancer-causing poison called aflatoxin in food.

## **How much pesticide residue remains on food?**

The Environmental Protection Agency (EPA) determines the health risk of each pesticide that it approves for use, and sets limits called *tolerances*. A *tolerance* is defined as the maximum amount of a particular pesticide residue that is permitted to be in or on food. A tolerance is **not** an estimate of the pesticide residue that is common or typical for a food (see BCERF Fact Sheet #25 on *Pesticide Residue Monitoring and Food Safety* for more details). Under the Food Quality Protection Act, EPA estimates the exposure to a pesticide from different sources such as food, drinking water and home use. After taking these sources of exposure into consideration it estimates “with reasonable certainty, the level at which a pesticide residue, if it were to remain on food and is eaten, will cause no harm to the consumer.” - EPA (web site: <http://www.epa.gov/opppsp1/fqpa>).

## **What about harmful breakdown products of pesticides?**

In some cases when a pesticide is known to have harmful breakdown products, a tolerance limit may be set for the total amount of “parent” pesticide and breakdown products that may be present in or on food. In such cases, foods may be tested for all these residues. For example, tolerances have been established for the total amount of the pesticide endosulfan and its breakdown product endosulfan sulfate.

## **Can small amounts of different pesticide residues affect my health?**

We do not have a clear understanding of how different residues interact in the body, or how the combined residues affect human health. EPA has taken some steps to prevent situations where a breakdown product common to different pesticides could collect into a larger overall dose in the body. For example, the pesticides triclopyr, chlorpyrifos and chlorpyrifos-methyl all release the breakdown product, 3,5,6-trichloro-2-pyridinol (TCP). A tolerance has been set to limit the total amount of TCP in food.

## **How is our food supply tested for pesticide residues?**

The Food and Drug Administration (FDA) and the Food Safety and Inspection Services (FSIS) of the US Department of Agriculture (USDA) conduct surveys to determine whether pesticide residues in or on foods are below the tolerance limits. Federal and local agencies can remove and destroy any food found to have pesticide residues above these limits. The Agricultural Marketing Services (AMS) of USDA, in cooperation with several states, tests raw agricultural produce for pesticide residues and reports any violations to FDA.

## **What do FDA reports show?**

More than 50% of the food samples collected by FDA for testing are of imported foods, even though imported foods represent about 10% of the US food market. In 1997, FDA analyzed 4,501 domestic food samples and 5,342 imported foods. The imported foods came from 97



different countries. No pesticide residues were found in 66% of the 9,843 domestic and imported foods sampled by FDA. Pesticide residues that did not meet EPA regulations were reported as “violative residues.” Violative residues were reported for 1.2% of the domestic (54 of 4,501) and 1.6% of the imported food samples (85 out of 5,342).

States also monitor food samples for pesticide residues. The state-collected pesticide residue data is compiled under the “Foodcontam” database. Of the 416 food samples collected from New York State (NYS) in 1996, only two samples were found to carry violative residues.

### **What were the kinds of violative residues found?**

Two kinds of violative residues were reported. Presence of a pesticide residue at levels higher than the tolerance limit was one kind. The most common problem, in both

the domestic and imported foods, was the presence of pesticide residues for which there were no tolerances set by EPA. This could happen for one of two reasons: 1) The manufacturer of the pesticide or EPA may have canceled its US registration, or 2) the pesticide was found in a food for which it was not approved.

### **What foods had violations?**

From the survey in 1997, FDA reported violative residues in domestic foods in 16 of 1,171 (1.2%) fruits and 41 of 1,707 (2.4%) vegetables. No violative residues were found in milk, dairy products, eggs, bananas, apple juice, grains and grain products, and seafood. Among the imported food samples, 3 of 322 (0.9%) grain and grain products, 24 of 2,034 (1.2%) fruits, 50 of 2,356 (2.1%) vegetables, and 7 of 268 (2.6%) samples of other products such as nuts and spices had violative residues. No violative residues were found in imported milk, dairy products, eggs, seafood, bananas and apple juice.

### **Do imported bananas have a lot of pesticide residues?**

Imported bananas are often suspected as having a lot of pesticide residues. However, all of the 359 samples of imported bananas analyzed by FDA in 1997, and the 268 samples analyzed in 1996 were free of any violative residues. In 1994, less than 1% of the 280 imported bananas sampled had violative residues.

### **What about imported strawberries?**

Imported strawberries are not tested as much as imported bananas. In 1997, the 38 samples of imported strawberries tested by FDA were all free of any violative residues. However, in 1996, FDA reported that three of the 46 imported strawberry samples tested had residues for which there were no tolerances (6.5%). In 1994, five of the 85 samples of imported strawberries tested (6%) had residues for which there were no tolerances. Surveys conducted by the Agricultural Marketing Services indicate that pesticide treatments of food after it has been harvested is more likely to cause the food to carry residues than treatments of crops during cultivation. Strawberries that need to be shipped over long distances may be treated post-harvest with pesticides to prevent fungi or molds (fungicides). This could be one reason for the higher than average frequency of violative residues on strawberries.



### **What pesticide residues still remain in food after it is prepared?**

Besides monitoring pesticide residues in raw agricultural produce before it reaches the market, FDA also conducts “Total Diet Studies.” The USDA’s Nationwide Food Consumption Surveys provide information on what people eat or what is a “typical meal.” Total Diet Studies are designed to determine pesticide residues in commonly eaten menu items such as macaroni and cheese, chicken nuggets, pop corn and ice cream. The three most common residues found in such studies were the insecticides DDT, malathion and chlorpyrifos-methyl. These residues were not above the acceptable or tolerance limits.

### **Should I stop eating vegetables and fruits to avoid residues?**

No! Studies have found that people who eat a healthy, balanced diet consisting of several helpings a day of fruits and vegetables have a lower risk for developing cancer, including breast cancer (see BCERF Fact Sheet #18 on *Fruits and Vegetables and The Risk of Breast Cancer*). While different interest groups may debate ways to make food safer, avoiding eating fruits and vegetables is not the answer. For reducing cancer risk, and for many other health reasons, the National Cancer Institute and the USDA’s food guide pyramid recommend at least five servings of fruits and vegetables every day.

### **How do I find out where the food comes from?**

Under the Federal Food, Drug and Cosmetic Act, labels on processed food must be marked in English with the country of origin. These labels must contain the name and address of either the manufacturer, packer or distributor. If a US firm is responsible for the distribution of an imported food item, the country of origin should also be marked on the label. A label indicating the country of origin is not required for raw fruits and vegetables currently. Some grocers do label produce on a voluntary basis.

### **Is the food supply safe for children to eat?**

In 1993, the National Academy of Sciences (NAS) Research Panel concluded that although food in the US

is safe, certain improvements should be made to better estimate health risks to children. EPA is acting on the recommendations made by the panel to set tolerances that are safer for all people, including children. The 1996 Food Quality Protection Act was passed to coordinate the regulation of pesticides by FDA and EPA and to introduce important new protections for children. An additional safety factor may be used to set lower tolerances for pesticide residues in foods that are commonly eaten by infants and children.

While some pesticide tolerances or limits may be modified in the near future, the American Association for Pediatrics recommends a diet rich in fruits and vegetables for children. FDA gets information about the foods that children in the US typically eat from the Nationwide Food Consumption Surveys conducted by USDA. The year following the NAS report, FDA studied a larger number of foods such as carrots and fruit juices that are eaten in greater amounts by children. Less than one percent of these foods had residues above the tolerance limits. The American Association for Pediatrics does not regard pesticide residues in food sold in the US currently as cause for concern by parents.

### **Some agricultural practices that strive to reduce the amount of pesticide used to grow food**

#### **1. Integrated Pest Management:**

Federal and state agencies are encouraging farmers to move towards Integrated Pest Management (IPM) techniques to reduce pesticide use and reduce costs. IPM recommends using pest-resistant varieties of plants and the natural enemies of pests, rather than chemical pesticides. IPM recommends the least toxic chemical pesticide for specific pest problems. It advises that chemical pesticides be used only when needed and not as a routine. The following mission statement is from the web site of the IPM in NYS at <http://www.nysaes.cornell.edu/ipmnet/ny/>:

“The mission of the NYS IPM Program is to educate and encourage agricultural producers to grow crops and raise animals using pest management methods that:



- reduce or replace the use of synthetic organic pesticides
- are environmentally sound
- pose minimal risk to human health
- enable growers to obtain a reasonable return on investment
- ensure consumers a supply of high-quality, safe, and economical foods and other agriculturally related products.”

## 2. Organic Production Methods:

Organic farming uses less or no synthetic pesticides. Prior to 1990, state or private organizations worked independently to regulate organic food production methods, but the standards were not consistent nationwide. In 1990, a new

Organic Foods Protection Act was established to have a common nationwide set of rules on how organic food should be produced. Under the proposed National Organic Program, USDA will accredit state and private organizations to become “certifying agents.” Certifying agents will inspect farms, and harvesting and handling operations, to make sure that they comply with national standards. It has been proposed that USDA and certifying agents carry out periodic surveys of organic foods for pesticide residues.

According to a press release from USDA on May 8, 1998, many changes are expected in the National Organic Standards and Regulations. One of the issues being debated is whether sewage sludge should be used to fertilize organic farms. Sewage sludge may contain many of the same residues that a consumer of organic food is trying to avoid. For more information on the standards required for certification of organic food, call the National Organic Program Staff at 202-205-7806.

### Where can I find more food safety related information?

- USDA, Food Safety and Inspection Services: 1-800-535-4555
- USEPA, Office of Pesticide Programs: 703 305-5017 or [www.epa.gov/pesticides/food](http://www.epa.gov/pesticides/food)
- National Pesticide Telecommunications Network: 1-800-858-7378 or <http://ace.orst.edu/info/nptn>
- FDA: 202 205-5275
- FDA, Food Information and Seafood hotline: 1-800-332-4010
- FDA’s Residue Monitoring Report: <http://vm.cfsan.fda.gov/~dms/pes97rep.html>, or request a reprint: Bernadette M. McMahon, Food and Drug Administration, Division of Pesticides and Industrial Chemicals, HFS-337, 200 C St., SW, Washington, DC 20204
- The NAS Report “Pesticides in the Diet of Infants and Children”: <http://www.nap.edu/bookstore/isbn/0309048753.html>
- IPM in NYS: <http://www.nysaes.cornell.edu/ipmnet/ny/>, or by mail: IPM Program Office, New York State Agricultural Experimental Station, Cornell University, Geneva, NY 14456
- Cornell Cooperative Extension: <http://www.cce.cornell.edu/food/index.html>, or call your local or county Cooperative Extension office



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**An extensive bibliography on *Consumer Concerns About Pesticides in Food* is available on the BCERF web site: <http://www.cfe.cornell.edu/bcerf/>**

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