

# Pesticide Monitoring Program

## 2011 Pesticide Report

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U.S. Food and Drug Administration

# Table of Contents

## Foreword

## FDA Monitoring Program

- Regulatory Monitoring
  - Analytical Methods and Pesticide Coverage
  - FDA-State Cooperation
  - Animal Feeds
  - International Activities
  - Focused Sampling
- FDA Total Diet Study
- FDA Pesticide Program Sampling Design
- Identification of Imports (Products or Countries) Requiring Special Attention or Additional Studies
  - Review by Commodity
  - Review by Country of Origin
- Acknowledgments
- References

## Results and Discussion

- Regulatory Monitoring
  - Discussion
  - Geographic Coverage
  - Domestic/Import Violation Rate Comparison
  - Pesticide Coverage
  - Animal Feeds
  - Focused Sampling
- Total Diet Study
- Summary
  - Regulatory Monitoring
  - Total Diet Study

## Appendices

- A. Analysis of Domestic Samples by Commodity Group in 2011
- B. Analysis of Import Samples by Commodity Group in 2011

## Figures

1. Results of Domestic Samples by Commodity Group
2. Results of Import Samples by Commodity Group
3. Summary of Results of Domestic vs. Import Samples

## **Tables**

- A. Import Commodities That May Warrant Special Attention Based on FY 2011 Sampling Results
- B. Countries of Origin That May Warrant Special Attention Based on FY 2011 Sampling Results
  - 1. Domestic Samples Collected and Analyzed per State
  - 2. Import Samples Collected and Analyzed per Country of Origin
  - 2a. Countries From Which Less Than Ten Samples Were Collected and Analyzed
  - 3. Pesticides Detectable, New and Found by Methods Used in FY 2011
  - 4. Summary of the Animal Feed Samples Analyzed for Pesticides
  - 5. Pesticides Most Commonly Reported in Samples of Animal Feed
  - 6. Imported Dietary Supplement and Botanical Products Analyzed for Pesticides
  - 7. Frequency of Occurrence of Pesticide Residues in the Total Diet Study for Foods Other Than Infant and Toddler Foods
  - 8. Frequency of Occurrence of Pesticide Residues in Total Diet Study Infant and Toddler Foods

## Foreword

This report summarizes the results of the U.S. Food and Drug Administration's (FDA or the Agency) pesticide residue monitoring program. Eight of the previous reports were published in the *Journal of the Association of Official Analytical Chemists and the Journal of AOAC International*; these presented results from fiscal years (FY) 1987 through 1994. Results from FY 1995 through FY 2010 were published on FDA's website at <http://www.fda.gov/Food/FoodborneIllnessContaminants/Pesticides/default.htm>. This report includes findings obtained during FY 2011 (October 1, 2010 through September 30, 2011) under regulatory monitoring along with selected Total Diet Study (TDS) findings.

In the early 1990s, FDA conducted comprehensive incidence and level monitoring studies of four major foods and published the results<sup>1,2</sup>. Due to resource constraints, incidence and level monitoring for pesticide residues conducted by FDA's field laboratories, which was typically non-regulatory in nature, has been replaced in recent years by regulatory based "focused sampling." Incidence and level pesticide residue data are, however, provided by FDA's TDS program. The TDS program analyzes market baskets of about 300 foods four times per year.

Results in this and earlier reports continue to demonstrate that levels of pesticide residues in the U.S. food supply are generally in compliance with the U.S. Environmental Protection Agency's (EPA's) permitted pesticide uses and tolerances.

## FDA Monitoring Program

Three federal government agencies share responsibility for the regulation of pesticides. The U. S. Environmental Protection Agency (EPA) registers (*i.e.*, approves) the use of pesticides and establishes tolerances (the maximum amounts of residues that are permitted in or on a food) <sup>3</sup>. Except for meat, poultry, and certain egg products, for which the Food Safety and Inspection Service (FSIS) of the U.S. Department of Agriculture (USDA) is responsible, FDA is charged with enforcing tolerances in both imported foods and in domestic foods shipped into interstate commerce. FDA also acquires data on particular commodity and pesticide combinations by carrying out market basket surveys under the TDS. Since 1991, USDA's Agricultural Marketing Service (AMS) has carried out a pesticide residue testing program, called the Pesticide Data Program (PDP), directed at raw agricultural products and various processed foods through contracts with states to perform the sampling and analyses. FSIS and AMS report their pesticide residue data independently. Information about the PDP is available at <http://www.ams.usda.gov/AMSV1.0/ams.fetchTemplateData.do?template=TemplateC&navID=PesticideDataProgram&rightNav1=PesticideDataProgram&topNav=&leftNav=&page=PesticideDataProgram&resultType=&acct=pestcddatprg>.

## Regulatory Monitoring

FDA samples individual lots of domestically produced and imported foods and analyzes them for pesticide residues to enforce the tolerances established by EPA. Domestic samples are typically collected close to the point of production in the distribution system, *i.e.*, growers, packers, and distributors. Import samples are collected at the point of entry into U.S. commerce. Although processed foods are also included, the emphasis is on the raw agricultural product, which is typically analyzed as the unwashed, whole (unpeeled), raw commodity. If illegal residues are found at a level above EPA tolerances or FDA Action Levels (guideline levels for unavoidable residues of cancelled pesticides that persist in the environment), or residues at a level of regulatory significance for which EPA has established no tolerance for a given food are found in domestic foods, the lot of food, as available, will be removed from commerce. FDA can also issue Warning Letters to the responsible growers and invoke other sanctions such as seizure or injunction to correct the cause of the violation. Imported shipments with illegal residues are refused entry into U.S. commerce. Firms may be placed under an Import Alert (a listing is available at [http://www.accessdata.fda.gov/cms\\_ia/ialist.html](http://www.accessdata.fda.gov/cms_ia/ialist.html)) and "Detention Without Physical Examination," or DWPE may be invoked for future imported lots of the commodity based on the finding of a single violative shipment. Congress has authorized FDA to refuse admission of regulated articles based on information, other than the results of examination of entries *per se*, that causes an article to appear to violate the Federal Food Drug and Cosmetic Act (FFDCA). Entries of imported foods which are suspected of containing illegal pesticide residues because of the results obtained from previous examinations of the same foods may be considered to appear to violate the FFDCA. DWPE can be applied to product from specific growers, manufacturers, or shippers, or to a geographic area or country if the problem is demonstrated to be sufficiently broad-

based. FDA's Import Alerts, describe current DWPEs for pesticide residues and other food issues. There are currently four Import Alerts that address food products that are under DWPE for pesticides:

- Import Alert 99-05, "Detention Without Physical Examination of Raw Agricultural Products for Pesticides"
- Import Alert 99-08, "Detention Without Physical Examination of Processed Foods-for Pesticides"
- Import Alert 99-14, "Countrywide Detention Without Physical Examination of Raw Agricultural Products for Pesticides"
- Import Alert 99-15, "Countrywide Detention Without Physical Examination of Processed Foods for Pesticides"

Growers, manufacturers, and shippers can have their product(s) removed from an FDA Import Alert by providing evidence establishing that the conditions that gave rise to the appearance of a violation have been resolved and that there is sufficient basis for the Agency to have confidence that future entries will be in compliance with the FFDCA . Additionally, a minimum of five consecutive non-violative commercial shipments, as demonstrated by providing FDA with acceptable reports of private laboratory analyses, is required to remove a grower's, manufacturer's, or shipper's product from Import Alert. Removal of a countrywide or geographic area Import Alert would typically require submission to FDA of an effective, detailed approach to correcting the problem, along with acceptable laboratory reports demonstrating compliance of the commodity(ies) in question.

Factors considered by FDA in planning the types and origin of commodities to sample include the following:

- analysis of past problem areas
- commodity/pesticide findings from recently generated state, USDA, and FDA analyses
- available foreign pesticide usage data and regional intelligence on pesticide use;
- dietary significance of the food
- volume of individual commodities of domestic food produced and entered into interstate commerce and of imported food offered for entry into the U.S.
- the origin of imported food
- chemical characteristics and toxicity of the pesticide(s) used.

### **Analytical Methods and Pesticide Coverage**

To analyze the large numbers of samples whose pesticide treatment history is usually unknown, FDA uses analytical methods capable of simultaneously determining multiple pesticide residues. These multi-residue methods (MRMs) can determine the majority of the approximately 400 pesticides with EPA tolerances, and many others that have no

tolerances. The most commonly used MRMs can also detect many metabolites, impurities, and alteration products of pesticides <sup>4</sup>.

Selective or single residue methods (SRMs) are also used to determine targeted pesticide residues in foods; a SRM determines one pesticide or a small number of selected pesticides and/or chemically related residues. SRMs are more resource intensive per residue and therefore employed more judiciously. A suspicion of a violation or a need to acquire residue data in select commodities will usually trigger use of these methods.

The lower limit of residue measurement in FDA's determination of a specific pesticide is usually well below tolerance levels. Tolerance levels generally range from 0.1 to 50 parts per million (ppm). Residues present at 0.01 ppm and above are usually measurable; however, for individual pesticides, this limit may range from 0.005 to 1 ppm. Trace levels of pesticide residues are also reported. The term "trace" is used to indicate residues that are detected and positively identified at levels greater than, or equal to, the limit of detection (LOD) and below the residue's limit of quantitation (LOQ) for the method employed.

FDA conducts ongoing research to update its pesticide monitoring program. This research includes testing the behavior of new or previously untested pesticides through existing analytical methods, as well as developing new methods to improve efficiencies and detection capabilities. In recent years, newer extraction procedures and detection techniques have increasingly replaced older methods, allowing for a greater level of pesticide coverage.

### **FDA-State Cooperation**

FDA field offices interact with their counterparts in many states to enhance the effectiveness of the Agency's pesticide monitoring program. Memoranda of Understanding (MOU) and Partnership Agreements have been established between FDA and many state agencies. These agreements provide for more efficient residue monitoring by both parties by coordinating efforts, broadening coverage, and eliminating duplication of effort. These agreements are specific to each state and take into account available resources. The agreements stipulate how FDA and the state will jointly plan work, for collecting and analyzing samples, sharing data, and enforcing compliance follow-up responsibilities for individual commodities of imported and domestic products.

### **Animal Feeds**

In addition to monitoring foods for human consumption, FDA also samples and analyzes domestic and imported animal feeds for pesticide residues. FDA's Center for Veterinary Medicine (CVM) directs this portion of the Agency's monitoring via its Feed Contaminants Compliance Program. Although animal feeds containing violative pesticide residues may present a potential hazard to a number of different categories of animals (e.g., laboratory animals, pets, wildlife, etc.), CVM's monitoring focuses on feeds

for livestock and poultry animals that ultimately become or produce foods for human consumption.

### **International Activities**

FDA pesticide residue monitoring activities are a part of the Agency's overall food safety programs. As such, they are subject to the responsibilities FDA has under international trade agreements to which the United States is signatory. The arrangements FDA makes with other countries with respect to food safety programs, and the activities that FDA carries out internationally with respect to food safety, can also affect how some of our monitoring is conducted.

FDA, as a part of the U.S. Government, is subject to the obligations placed on countries by the World Trade Organization (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement). Pesticide residue tolerances and monitoring activities are included as sanitary measures under the SPS Agreement. FDA's obligations under this agreement include the requirement that standards are based on an assessment appropriate to the circumstances of the risk to human and animal health, and on international standards except when a more stringent standard can be scientifically supported. The standards must also be applied equally to domestic and imported products unless there is scientifically based justification for doing otherwise.

Similarly, FDA, as part of the U.S. Government, is subject to obligations arising from several free trade agreements, the most notable of which is the North America Free Trade Agreement (NAFTA). These bilateral or multilateral free trade agreements contain provisions on sanitary measures that are consistent with the provisions of the WTO SPS Agreement. As with the WTO SPS Agreement, the sanitary provisions of these agreements include provisions relating to pesticide residues.

FDA maintains a number of arrangements with counterpart agencies in foreign governments. Such arrangements include MOU, Confidentiality Agreements, and Exchanges of Letters. These arrangements most often contain information-sharing provisions that include the ability to share analytical findings about pesticide residues. Several of the MOUs have specific provisions relating to pesticide residue information sharing or cooperative efforts relating to pesticide residues.

FDA also participates in meetings with counterpart food safety agencies of foreign governments. For example, FDA participates in the work of the quadrilateral discussions on food safety, comprising senior food safety officials from Australia, Canada, New Zealand, and the United States. FDA also carries out bilateral discussions on food safety with several countries, including Canada and Mexico, and meets regularly with the European Commission. Pesticide control programs and pesticide residue issues can be subjects for discussion at these meetings.

FDA participates in the work of international standards-setting organizations, particularly

the work of the Codex Alimentarius Commission (Codex). Within Codex, FDA is an active participant in the work of the Codex Committee on Pesticide Residues.

### **Focused Sampling**

FDA's pesticide monitoring program frequently includes what this report describes as "focused sampling." This approach is primarily regulatory in nature, with the necessary protocols followed to ensure enforcement action can be pursued if a violation is detected. Focused sampling is generally used to follow-up on suspected problem areas or to acquire residue data on select commodities not usually covered during regulatory monitoring. Focused sampling is carried out by short-term field assignments that require collection of specific commodities to be analyzed for pesticide residues using routine MRMs, or targeted residues of interest using SRMs.

Focused sampling differs from what was previously described in FDA's pesticide program as incidence and level monitoring. Incidence and level monitoring to obtain pesticide residue data generally consisted of non-regulatory analyses of selected samples of commodities of interest. Incidence and level monitoring typically required a follow-up collection and analysis of a regulatory sample to confirm a violation before an FDA enforcement action could ensue. However, due to resource constraints, incidence and level monitoring as done in the past by FDA has been replaced by focused sampling, with the exception noted below for samples collected as part of FDA's TDS program.

### **FDA Total Diet Study**

The TDS is distinct from regulatory monitoring in that it determines pesticide residues not in the raw commodity, but in foods that are prepared table-ready for consumption<sup>5</sup>. The sampled foods are washed, peeled, and/or cooked before analysis, simulating typical consumer handling. Residues found in the TDS program are not regulatory in nature but considered incidence and level monitoring.

TDS foods are sampled as "market baskets," with each market basket comprising samples of about 300 different foods that represent the average U.S. consumer's diet. Four regional market baskets are planned for each year and for each market basket, and samples are collected in three different cities within each region. The three samples of each food are combined to form a single composite prior to analysis. In addition to being analyzed for pesticide residues, TDS foods are also selectively analyzed for toxic and nutrient elements, industrial chemicals, and other chemical contaminants. Additional information about the history and design of the TDS as well as analytical results can be found in several FDA publications<sup>5,6,7,8,9,10,11</sup> and on FDA's website (<http://www.fda.gov/Food/FoodScienceResearch/TotalDietStudy/default.htm>).

Another distinction from FDA's pesticide residue regulatory monitoring is that the TDS foods are analyzed using methods that are modified to permit enhanced measurement of residues, generally at levels up to 10–100 times more sensitive than regulatory

monitoring procedures. TDS residue levels as low as 0.1 parts per billion are routinely reported.

## **FDA Pesticide Program Sampling Design**

The goal of FDA's pesticide monitoring program is to carry out selective monitoring to achieve an adequate level of consumer protection. Most of the FDA samples are of the surveillance type; that is, there is no specific prior knowledge or evidence that a particular food shipment contains illegal residues. However, FDA's monitoring is not random because some bias is introduced primarily by emphasizing sampling of commodities and places of origin with a past history of violations, and to a lesser extent emphasizing larger-sized shipments.

For FY 2011, the import violation rate was 7.1 percent and the domestic violation rate was 1.6 percent. The FY 2011 domestic sample violation rate is consistent with those in recent years which have ranged from 0.7 – 2.4 percent; however, the import sample violation rate is up slightly from 2.6–6.2 percent range. The increased violation rate is primarily due to the expanded analytical scope, i.e., detection of additional new pesticide residues, of the pesticide program as a result of implementation of new analytical technologies in 2010 and 2011.

In FY 1991, FDA contracted with the Research Triangle Institute (RTI) to design a statistical approach to conduct a residue study. The resulting report was entitled "Monitoring Pesticide Residues in Fresh Produce: A Probabilistic Approach." The report acknowledged that the program in 1991 (which was similar to FDA's current program except that sample totals were two to three times higher) was not a probability-based approach since it was not free of selection bias. A probabilistic approach described in the report would need to account for, among other elements, a high degree of consumption coverage (coverage of a significant portion of the commodity population), and seasonal and geographical representation. Also, to achieve a meaningful certainty level of confidence of about 95 percent, 800 data points, i.e., samples, of each import or domestic commodity would be necessary.

In FYs 1992 and 1994, FDA conducted "statistically-based" studies of four commodities<sup>1,2</sup>, adhering to as many of the tenets of the RTI report as was practical within available resources. The commodities tested were apples, pears, rice, and tomatoes. Domestically grown and imported products were separately tested. The conclusions of the studies corroborated the premise that when compared to a statistically based study, FDA's monitoring program provides a reasonably reliable estimate of pesticide residues in the U.S. food supply, especially when the data are viewed over many years, and that the levels of residues found are generally well below U.S. tolerances. However, because sampling levels and bias for particular imported or domestic commodities can vary significantly from year to year, FDA does not infer statistical significance to results within a fiscal year.

An important complement to FDA's pesticide program is its TDS Program previously discussed in this report. By its design, the TDS serves as an early warning system, capable of detecting many more pesticide residues and at much greater sensitivity when compared to FDA's regulatory program (FDA's regulatory program is designed to detect residues in violation of EPA tolerances).

Considering the above and coupled with available Agency resources, FDA has not attempted to develop a monitoring program that would be statistically based. However, it is FDA's opinion that the current sampling levels, coupled with broad-based enforcement strategies for imports, are sufficient for FDA to achieve the program's main objective, i.e., adequate consumer protection by selective enforcement. As described previously, import enforcement strategies that are available to the Agency are placement on Import Alert with DWPE for future entries of commodity/grower combinations that are found in violation of U.S pesticide tolerances, (i.e., residue level exceeds the established tolerance level for a specific residue/item combination, or residues were found at a level of regulatory significance in a food for which no tolerance has been established), and country-wide Import Alert and DWPE of particular commodities if the violations are numerous and from multiple growers within any given country. Once a problem is identified, FDA can achieve broad enforcement by employing these strategies and detaining at their entry points the suspect imported foods. This procedure places the burden of demonstrating product compliance with U.S. residue tolerances on the importer before the entry can be released into domestic commerce.

### **Identification of Imports (Products or Countries) Requiring Special Attention or Additional Studies**

Addressing products and countries that warrant special attention is best carried out by providing specific guidance to the Agency field offices and laboratories to conduct increased sampling, both surveillance and focused, by means of field assignments under FDA's "Pesticides and Industrial Chemicals in Domestic and Imported Foods Compliance Program." FDA's sampling strategy of focusing on products that have a history of recurring violations will continue to be applied to future program coverage. Though specifics are provided in this report regarding import commodities and countries of origin that, based on FY 2011 data, may warrant special attention, FDA's sampling guidance provided to its field districts is typically based on multi-year data. FDA also utilizes available foreign pesticide usage data and data from USDA's PDP to develop sampling guidance. However, meaningful violative episodes that do occur are addressed in real-time as much as possible through use of the Import Alert system or enhanced sampling.

When attempting to compare FDA's import pesticide residue data, by product or by country, against its domestic data several factors should be considered:

- The import violation rate has typically been three to four times that of domestic foods. Therefore, it is expected that many imported food products in this report have a violation rate exceeding that of domestic products, and that many foreign countries to have a violation rate exceeding that of the U.S.
- The data analysis by commodity in this report was compiled according to FDA product codes (i.e., distinct commodities). For FY 2011, 761 different import food commodities and 200 different domestic food commodities were tested.
- FDA's pesticide residue monitoring program should not be viewed as random or statistical, rather it is focused towards products and countries of origin that have a history of violations or are suspected of violations based on available intelligence.

### **Review by Commodity**

Considering the above factors, the following criteria were applied to the FY 2011 data to select import commodities that may warrant special attention (this is the same criteria applied since FY 2008):

- Commodities with at least 20 samples analyzed OR with a minimum of 3 violations
- AND a violation rate of 10 percent or higher

Table A lists the import commodities that meet the criteria. The commodities are sorted by violation rate and include the total number of samples analyzed for FY 2011.

Commodities reported under non-specific product codes (e.g., leaf and stem vegetables, not elsewhere classified) were excluded.

**Table A. Import Commodities That May Warrant Special Attention Based on FY 2011 Sampling Results**

<b>Commodity</b>	<b>Samples Analyzed (#)</b>	<b>Violation Rate (%)</b>
Ginseng*	12	75.0
Capsicums ground spice*	27	66.7
Prickle pear	11	45.5
Rice, basmati	13	38.5
Raisins*	9	33.3
Bok choy	9	33.3
Cilantro	9	33.3
Papaya*	69	29.0
Capsicums whole spice*	32	28.1
Pear	18	27.8
Tea	15	26.7
Tea, chamomile	14	21.4
Spinach*	52	17.3
Olives	24	16.7
Serrano pepper*	24	16.7
Sweet potato	26	15.4
Tomatillo*	31	12.9
Jalapeno pepper	120	12.5
String beans	41	12.2
Blackberries	68	11.8
Red beet	48	10.4
Leek	29	10.3
Choyote	20	10.0
Kale	20	10.0

\*Commodity was on the FY 2010 table of import commodities warranting special attention.

### Review by Country of Origin

Table B lists countries of origin with a minimum of 50 samples analyzed and a 7 percent or greater violation rate for FY 2011.

**Table B. Countries of Origin That May Warrant Special Attention Based on FY 2011 Sampling Results**

<b>Country</b>	<b>Samples Analyzed (#)</b>	<b>Violation Rate (%)</b>
India	218	22.9
Vietnam	59	11.9
China	598	8.5
Guatemala	126	7.1

Note: Samples from Mexico continue to make up the greatest portion of FDA's import pesticide sampling. In FY 2011, 1964 samples from Mexico were analyzed. The violation rate for Mexican samples was 6.9 percent, just below the 7.1 percent average for all import samples. Continued high coverage of Mexican foods is warranted due to the large volume of foods imported from Mexico. Additionally, 598 samples from China (mainland) were analyzed. The violation rate for samples from China was 8.5 percent. Continued high coverage of foods from China is also warranted based both on import volume and high violation rates.

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*The database containing the FY 2011 data from which this report was derived is also available from FDA web at <http://www.fda.gov/Food/FoodborneIllnessContaminants/Pesticides/default.htm>. The 1996 through 2010 reports and databases are available on the same website. FDA pesticide monitoring data collected under the regulatory monitoring approach in 1992, 1993, 1994, and 1995 are available on personal computer diskettes and may be purchased from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161; (telephone 1-800-553-6847); or at <http://www.ntis.gov>. Order numbers are: 1992, PB94-500899; 1993, PB94-501681; 1994, PB95-503132; and 1995, PB96-503156.*

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<sup>10</sup> Pennington, J.A.T. (1992) The 1990 revision of the FDA Total Diet Study. *J. Nutr. Educ.* **24**, 173–178.

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## Results and Discussion

### Regulatory Monitoring

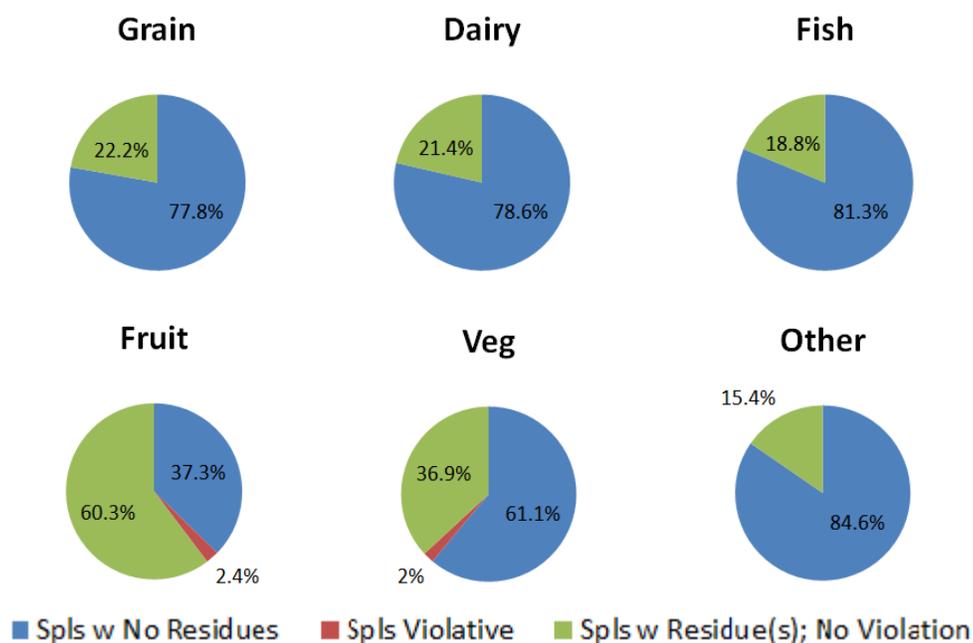
#### Discussion

Under regulatory monitoring, 5,977 samples were analyzed. Of these, 1080 were domestic foods and 4,897 were imported foods.

Figure 1 shows the percentage of the domestic samples by commodity group with “No Residues Found,” “Residues Found; No Violation,” and” ”Violative” (a violative residue is defined in this report as a residue which exceeds an EPA tolerance or FDA Action Level, or a residue at a level of regulatory significance for which no tolerance has been established in the sampled food.)

**Domestic Sample Totals: Grains & Grain Products 153; Milk/Dairy/Eggs 14; Fish/Shellfish 64; Fruit 252; Vegetables 545; Other Foods 52.**

**Figure 1 - Results of Domestic Samples by Commodity Group**



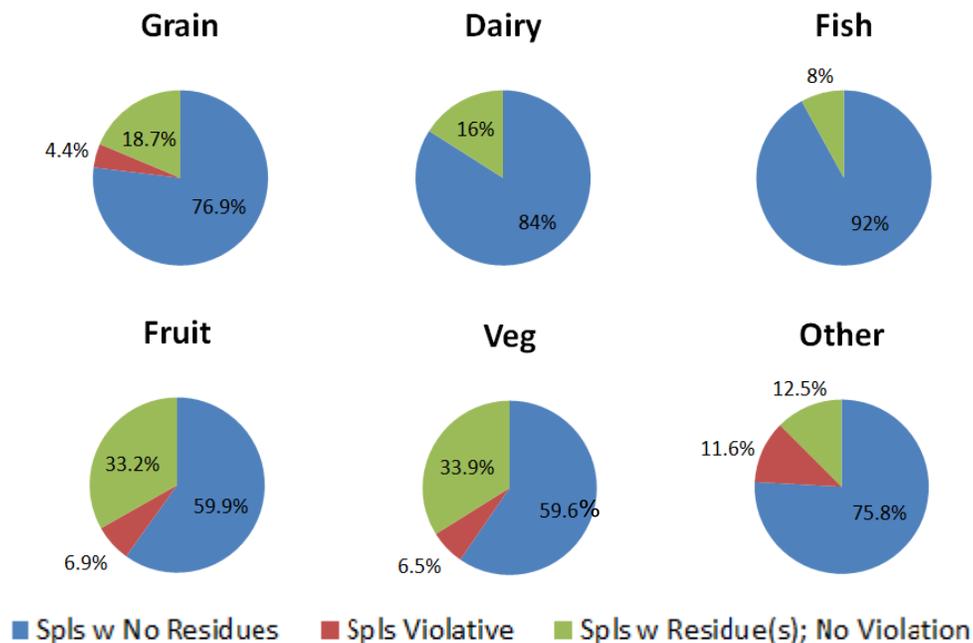
In FY 2011, 98.4 percent of all domestic foods analyzed by FDA were in compliance, i.e., no residues were found or residues found were not at violative levels. The compliance rate for domestic foods for FYs 1996 to 2010 was between 97.6 percent and 99.3 percent. As in earlier years, fruits and vegetables accounted for the largest proportion of the domestic commodities analyzed in FY 2011, comprising 74 percent of the total number of domestic samples.

Appendix A contains more detailed data on domestic monitoring findings by commodity, including the total number of samples analyzed, the percent samples with no residues detected, and the percent of violative samples including the nature of the violation (over-tolerance vs. no-tolerance). Of the 1,080 domestic samples, 60.5 percent had no detectable residues and 1.6 percent had violative residues. In the largest commodity groups, fruits and vegetables, 37.3 percent and 61.1 percent of the samples, respectively, had no residues detected; 2.4 percent of the fruit samples and 2.0 percent of the vegetable samples contained violative residues (Figure 1). In the grains and grain products group, 77.8 percent of the samples had no residues detected, and none had violative residues. In the fish/shellfish/other aquatic products group, 81.3 percent had no detectable residues and there were no samples with violative residues. In the milk/dairy products/eggs group, 78.6 percent of the 14 samples analyzed had no detectable residues and none were violative. In the “Other” foods group that covers nuts, seeds, snack foods, and spices among other foods, 84.6 percent of the 52 samples analyzed had no detectable residues, and none were violative.

Findings by commodity group for the 4,897 import samples are shown in Figure 2. Overall for all imported foods, 92.9 percent of the samples analyzed in FY 2011 were in compliance. This compares with a compliance rate for imported foods for FYs 1996 through 2008 of 94–98 percent. Fruits and vegetables accounted for 75 percent of import samples.

**Import Sample Totals: Grains & Grain Products 203; Milk/Dairy/Eggs 25; Fish/Shellfish 201; Fruit 1,245; Vegetables 2,424; Other Foods 799.**

**Figure 2 - Results of Import Samples by Commodity Group**



Appendix B contains detailed data on import samples. Of the 4,897 import samples analyzed, 64.5 percent had no residues detected, while 7.1 percent had violative residues. No residues were detected in 59.9 percent of imported fruit samples and 6.9 percent samples contained violative residues. Of the vegetable samples 59.6 percent of samples had no residues detected and 6.5 percent samples had violative residues. No residues were found in 84.0 percent of samples of the imported milk/dairy products/eggs group and no violations were detected. No residues were found in 92.0 percent of the imported fish/shellfish group and no violations were found in this food group. In the imported grains and grain products group, 76.9 percent had no detectable residues, and 4.4 percent contained violative residues. In the “Other” foods group consisting largely of nuts, seeds, oils, honey, candy, spices, multiple food products, and dietary supplements, 75.8 percent of the samples analyzed had no residues detected, while 11.6 percent of the samples (mostly dietary supplements and spices) contained violative residues.

Pesticide monitoring data collected under FDA's regulatory monitoring approach in FY 2011 are available to the public as a computer database. This database summarizes FDA 2011 regulatory monitoring coverage and findings by country/commodity/pesticide combination. The database also includes monitoring data by individual sample from which the summary information was compiled. Information on how to obtain this database as well as those for 1992–2010 is provided in the acknowledgements section of this report.

### Geographic Coverage

**Domestic:** A total of 1,080 domestic samples were collected in FY 2011 from 42 states and Guam. Table 1 lists the number of domestic samples from each state and territory, in descending order.

**Table 1. Domestic Samples Collected and Analyzed per State**

California	175	Missouri	26	South Carolina	12	Arkansas	2
Florida	112	Kansas	25	New Mexico	11	West Virginia	2
Minnesota	102	Iowa	22	Massachusetts	11	Utah	2
New York	78	Ohio	21	Indiana	6	South Dakota	2
Virginia	61	Colorado	18	Alaska	6	Kentucky	2
Michigan	49	Wisconsin	18	North Carolina	6	Guam	2
Texas	48	Pennsylvania	17	Maine	5	Georgia	1
Washington	46	Idaho	17	Puerto Rico	4	Mississippi	1
Oregon	41	Wyoming	16	Tennessee	3	Vermont	1
Maryland	38	Montana	15	New Hampshire	3	Rhode Island	1
Illinois	37	North Dakota	12	Delaware	3		

No samples were collected from the District of Columbia or the states of Alabama, Arizona, Connecticut, Hawaii, Louisiana, Nebraska, New Jersey, and Oklahoma

**Imports:** A total of 4,897 samples representing food shipments from 99 countries (excluding U.S. goods sampled in import status) were collected in FY 2011. Table 2 lists the number of samples and country from which 10, or more samples, were collected. Mexico, as in the past, was the source of the largest number (1964) of samples, reflecting the volume and diversity of commodities imported from that country, especially during the winter months. Table 2a lists the countries of origin that had less than ten samples collected in FY 2011.

**Table 2. Import Samples Collected and Analyzed per Country of Origin**

Mexico	1964	Egypt	46	Guam	19
China	598	Dominican Republic	37	Netherlands	18
Canada	286	United States*	35	United Arab Emirates	17
India	218	France	32	South Africa	17
Chile	166	Lebanon	32	Jamaica	16
Peru	145	Brazil	30	Belgium	16
Guatemala	126	Ecuador	29	Syria	14
Taiwan	117	Colombia	29	Japan	13
Thailand	78	Spain	28	Australia	12
Turkey	71	Philippines	27	Bolivia	11
Vietnam	59	Honduras	24	Israel	11
Argentina	53	Pakistan	24	New Zealand	11
Italy	52	Indonesia	24	Hong Kong	10
South Korea	48	Greece	23	Serbia	10
Poland	47	El Salvador	22	Malaysia	10
Costa Rica	47	Germany	21		

\*Foods reported sampled in import status but of U.S origin, including U.S. goods returned (U.S. products originally exported and subsequently returned).

**Table 2a. Countries From Which Less Than Ten Samples Were Collected and Analyzed**

Russia	Vanuatu	Austria
Ukraine	Bangladesh	Burkina Faso
Morocco	Belize	Montenegro
United Kingdom	Uruguay	Cameroon
Afghanistan	Portugal	Azerbaijan
Fiji	Tunisia	Bulgaria
Hungary	Albania	Kazakhstan
Singapore	Sri Lanka	Venezuela
Ghana	Madagascar	Cambodia
Switzerland	Iran	Uganda
Armenia	Romania	Tanzania
Saudi Arabia	Bosnia-Hercegovina	Turkmenistan
Haiti	Ethiopia	Togo
Norway	Yugoslavia	Iraq
Kenya	Trinidad & Tobago	Ireland
Nicaragua	Jordan	Panama
Nigeria	Macedonia	Ivory Coast
Denmark		

**Domestic/Import Violation Rate Comparison**

In FY 2011, 1,080 domestic and 4,897 import samples were collected and analyzed. Pesticide residues were detected in 39.5 percent of the domestic samples and in 35.5 percent of the import samples. Violative residues were found in 1.6 percent of the domestic samples and 7.1 percent of the import samples. Among grains and grain products, the violation rate was 4.4 percent for imports and none of the domestic samples contained violative residues. No violations were found in the milk/dairy products/eggs group or the fish/shellfish/other aquatic products group for either domestic or import samples. In fruit samples 2.4 percent of the domestic samples contained violative residues while 6.9 percent of imports did. For vegetables, 2.0 percent of domestic samples and 6.5 percent of import samples contained violative residues. In the category "Other" (mostly nuts, seeds, oils, honey, candy, spices, multiple food products, and dietary supplements), no violations were found in domestic samples and 11.6 percent of import samples contained violative residues. Dietary supplements and spices accounted for most of the samples with violative residues for the import "Other" foods group.

Of the 17 domestic violative samples, 16 were found to contain pesticide residues that have no published EPA tolerance, i.e. "no-tolerance" violation; and one was found to contain pesticide residues that exceeded a tolerance, i.e. "over-tolerance" violation. Additionally, two of the 16 that contained no-tolerance, violative residues also had other pesticide residues that exceeded a tolerance.

Of the 346 import violative samples, 331 were found to contain no-tolerance, violative pesticide residues; and 15 were found to contain over-tolerance pesticide residues. Additionally, fifteen of the 331 import violative samples that contained no-tolerance, violative residues also had other pesticide residues that exceeded a tolerance.

### Pesticide Coverage

Table 3 lists the 500 pesticides that can be detected (Detectable) by the methods used in FY 2011; each of the 203 pesticides that were actually detected (Found) is indicated by an asterisk (\*). Residues not previously looked for or detected (New), are noted by a “‡”.

**Table 3. Pesticides Detectable, New and Found by Methods Used in FY 2011**

2,6-DIPN*	3,4-dichloroaniline	4-(dichloroacetyl)-1-oxa-4-azapiro 4.5 decane
Abamectin	Acephate*	Acetamiprid*
Acetochlor	Acibenzolar-S-methyl	Acrinathrin
Alachlor	Alanycarb	Aldicarb*
Aldrin	Allethrin*	Alpha cypermethrin*
Ametryn	Amicarbazone‡	Aminocarb*
Amitraz	Anilazine	Aramite
Aspon‡	Atrazine*	Azinphos ethyl
Azinphos-methyl*	Azoxystrobin*	Benalaxyl*
Bendiocarb*	Benfluralin	Benfuracarb
Benodanil	Benoxacor	Bensulide
Bentazon	Benzoximate	Benzoylprop ethyl
BHC*	Bifenazate*	Bifenox
Bifenthrin*	Biphenyl*	Bitertanol*
Boscalid*	Bromacil	Bromophos
Bromophos-ethyl	Bromopropylate	Bromuconazole*
Bufencarb	Bulan	Bupirimate
Buprofezin*	Butachlor	Butafenacil
Butocarboxim	Butoxycarboxim	Butralin
Butylate	Cadusafos	Captafol
Captan*	Carbaryl*	Carbendazim*
Carbetamide	Carbofuran*	Carbophenothion
Carbosulfan*	Carboxin	Carfentrazone ethyl ester
Chlorantraniliprole*	Chlorbenside	Chlorbromuron
Chlorbufam	Chlordane	Chlordecone
Chlordimeform	Chlorethoxyfos	Chlorfenapyr*
Chlorfenvinphos	Chlorfluazuron*	Chlorflurecol methyl
Chlormephos	Chlornitrofen	Chlorobenzilate*
Chloroneb	Chloropropylate	Chlorothalonil*
Chlorotoluron	Chloroxuron	Chlorpropham*
Chlorpyrifos methyl	Chlorpyrifos*	Chlorthiophos
Clethodim*	Clodinafop-propargyl	Clofentezine*

Clomazone	Cloquintocet-mexyl	Clothianidin*
CMNP (5-chloro-3-methyl-4-nitro-1h-pyrazole)	Coumaphos	Crotoxyphos
Crufomate	Cumyluron‡	Cyanazine
Cyanofenphos	Cyanophos	Cyazofamid*
Cyclanilide	Cycloate*	Cycluron
Cyflufenamid	Cyfluthrin*	Cyhalofop butyl ester
Cymoxanil	Cypermethrin*	Cypermethrin, zeta
Cyprazine	Cyproconazole*	Cyprodinil*
Cyromazine*	Daimuron‡	DCPA*
DDT*	DEF	Deltamethrin*
Demeton*	Desmedipham*	Desmetryn
Diafenthiuron *‡	Dialifor	Diallate
Diazinon*	Dicamba	Dichlobenil
Dichlofenthion	Dichlofluanid	Dichlone
Dichlormid	Dichlorvos*	Diclobutrazol
Diclofop	Dicloran*	Dicofol*
Dicrotophos*	Dieldrin*	Diethyl-ethyl
Diethofencarb*	Difenoconazole*	Diflubenzuron*
Dilan	Dimethachlor	Dimethametryn
Dimethenamid	Dimethipin	Dimethoate*
Dimethomorph*	Dimoxystrobin	Diniconazole*‡
Dinitramine	Dinobuton	Dinotefuran*
Dioxacarb*	Dioxathion	Diphenamid
Diphenylamine*	Disulfoton	Diuron*
DNOC	Doramectin	Edifenphos
Emamectin benzoate*	Endosulfan*	Endrin
EPN*	Epoconazole*	Eprinomectin
EPTC	Esfenvalerate*	Esprocarb‡
Etaconazole	Ethaboxam	Ethalfuralin
Ethephon	Ethidimuron‡	Ethiofencarb
Ethiolate	Ethion*	Ethiprole
Ethirimol*	Ethofumesate	Ethoprop
Ethoxyquin*	Etobenzanid‡	Etofenprox*
Etoxazole*	Etridiazole	Etrimfos
Famoxadone*	Famphur	Fenamidone*
Fenamiphos	Fenarimol*	Fenazaquin*
Fenbuconazole*	Fenfuram	Fenhexamid*
Fenitrothion*	Fenobucarb(BPMC)	Fenoxaprop-ethyl
Fenoxycarb*	Fenpropathrin*	Fenpropimorph
Fenpyroximate, e-*	Fensulfotion	Fenthion
Fenuron	Fenvalerate*	Fipronil*
Flamprop-methyl	Flamprop-m-isopropyl	Flonicamid*
Fluazifop butyl ester	Fluazinam	Flubendiamide*
Fluchloralin	Flucythrinate	Fludioxonil*
Flufenacet	Flufenoxuron*	Fluometuron
Fluopicolide‡	Fluoxastrobin	Fluquinconazole*
Fluridone*	Flusilazole*	Fluthiacet-methyl‡

Flutolanil*	Flutriafol*	Fluvalinate*
Folpet*	Fonofos	Forchlorfenuron
Formetanate	Formothion	Fosthiazate
Fuberidazole*	Furalaxyl‡	Furathiocarb
Furilazole	Gardona	Halofenozide
Heptachlor	Heptenophos	Hexachlorobenzene*
Hexaconazole	Hexaflumuron*	Hexazinone*
Hexythiazox*	Hydramethylnon	IBP
Imazalil*	Imazamethabenz methyl	Imibenconazole‡
Imidacloprid*	Indoxacarb*	Ipconazole
Iprodione*	Iprovalicarb	Isazofos
Isocarbamid	Isocarbophos*	Isofenphos
Isoprocarb*	Isopropalin	Isoprothiolane*
Isoproturon	Isoxaflutole	Ivermectin
Kresoxim-methyl*	Lactofen	Lambda-cyhalothrin*
Lenacil	Leptophos	Lindane
Linuron*	Lufenuron*	Malathion*
Mandipropamid*	Mecarbam	Mefenacet‡
Mepanipyrim	Mephosfolan	Mepronil*‡
Merphos	Mesotrione	Metaflumizone*
Metalaxyl*	Metaldehyde*	Metazachlor
Metconazole	Methabenzthiazuron	Methamidophos*
Methidathion*	Methiocarb	Methomyl*
Methoprene*‡	Methoprotryne	Methoxychlor
Methoxyfenozide*	Metobromuron	Metolachlor
Metolcarb	Metrafenone‡	Metribuzin*
Mevinphos*	Mexacarbate	MGK 264*
Mirex*	Molinate	Monocrotophos*
Moxidectin	Myclobutanil*	Naled
Napropamide	N-desmethyl flucarbazone	Neburon
Nicotine*‡	Nitenpyram	Nitralin
Nitrapyrin	Nitrofen	Nitrofluorfen
Nitrothal-isopropyl	Norea	Norflurazon
Novaluron*	Nuarimol*	Octhilinone
Octyldiphenyl PO4	Ofurace	Omethoate*
Ovex	Oxadiazon*	Oxadixyl*
Oxamyl*	Oxydemeton-methyl	Oxyfluorfen
Oxythioquinox	Paclbutrazol*	Parathion methyl*
Parathion*	PCBs	Pebulate
Penconazole*	Pencycuron	Pendimethalin*
Permethrin*	Perthane	Phenmedipham*
Phenothrin*	Phenthoate	Phenylphenol, o-*
Phorate*	Phosalone*	Phosmet*
Phosphamidon	Phoxim*	Picoxystrobin
Piperonyl butoxide*	Piperophos	Pirimicarb*
Pirimiphos ethyl	Pirimiphos methyl*	Prallethrin‡
Pretilachlor	Prochloraz*	Procyazine
Procymidone*	Profenofos*	Profluralin

Prolan	Promecarb	Prometon
Prometryn	Pronamide*	Propachlor
Propamocarb*	Propanil	Propargite*
Propazine	Propetamphos	Propham
Propiconazole*	Propoxur*	Prothiofos*
Prothoate	Pymetrozine	Pyracarbolid
Pyraclostrobin*	Pyrazon	Pyrazophos
Pyrethrins	Pyridaben*	Pyridaphenthion
Pyrifenox	Pyrimethanil*	Pyriproxyfen*
Quinalphos*	Quinoxifen*	Quintozene*
Quizalofop ethyl	Resmethrin*	Ronnel
Rotenone*	Salithion	Schradan
Sebuthylazine†	Secbumeton	Sethoxydim
Siduron	Simazine*	Simetryne
Spinetoram*	Spinosad*	Spirodiclofen*
Spiromesifen*	Spirotetramat*	Spiroxamine
Strobane	Sulfallate	Sulfentrazone
Sulfotepp	Sulfur	Sulphenone
Sulprofos	TCNA	Tebuconazole*
Tebufenozide*	Tebufenpyrad	Tebupirimfos
Tebutam (N-benzyl-N-isopropylpivalamide)	Tebuthiuron*	Tecnazene*
Teflubenzuron*	Tefluthrin	Temephos
TEPP	Terbacil	Terbufos
Terbumeton	Terbuthylazine	Terbutryn
Tetraconazole*	Tetradifon*	Tetraiodoethylene
Tetramethrin*	Tetrasul	Thiabendazole*
Thiacloprid*	Thiamethoxam*	Thiazopyr
Thidiazuron	Thiobencarb	Thiofanox†
Thiometon	Thionazin	Thiophanate-methyl*
Tolclofos methyl*	Tolylfluanid*	Toxaphene
Tralkoxydim	Tralomethrin	Tranid
Triadimefon*	Triadimenol*	Tri-allate
Triazophos*	Tributoxy PO4*	Trichlorfon*
Triclosan	Tricyclazole*	Tridiphane
Trietazine	Trifloxystrobin*	Triflumizole*
Triflumuron*	Trifluralin*	Triflusulfuron methyl ester
Trimethacarb	Triphenyl PO4*	Tris(1,3-dichloro-2-propyl)phosphate*
Tris(beta-chloroethyl) PO4	Tris(chloropropyl) phosphate	Triticonazole
Uniconazole†	Vamidothion	Vernolate
Vinclozolin	Zoxamide	

## **Animal Feeds**

In FY 2011 a total of 330 animal feed samples (199 domestic and 131 import) were analyzed for pesticides by the FDA (Table 4). Of the 199 domestic surveillance samples, 134 (67.3 %) contained no detectable residues, 63 (31.7 %) contained one or more detectable, but not violative, residues, and 2 (1.0 %) contained a violative residue (a violative residue is defined in this report as a residue which exceeded an EPA tolerance or FDA action level, or a residue at a level of regulatory significance for which no tolerance has been established in the sampled feed). Of the 131 import samples, 85 (64.9 %) contained no detectable residues, 29 (22.1 %) contained one or more detectable, non violative residues, and 17 (13.0 %) contained one or more violative residues.

During FY 2011, two domestic surveillance samples of whole oats from Missouri were found to contain no-tolerance, violative residue o-phenylphenol at levels of 0.052 ppm and 0.060 ppm, respectively.

Seven samples of alfalfa hay imported from Mexico had no-tolerance, violative pesticide residues. Two of the seven alfalfa hay samples from Mexico contained methamidophos at levels of 0.296 and 0.330 ppm each. Five of the seven alfalfa hay samples had quantifiable amounts of DCPA, ranging from 0.041 to 0.540 ppm.

Six sudan hay samples from Mexico were found to contain no-tolerance, violative residues. Three samples were found to contain DCPA (0.053 to 0.080 ppm) and three samples were found to contain endosulfan sulfate (0.026, 0.055, and 0.076 ppm). Further, the sudan hay sample containing 0.076 ppm endosulfan sulfate also contained no-tolerance, violative residue DCPA at a level of 0.032 ppm DCPA.

Two samples from France were found to contain pirimiphos-methyl, a no-tolerance, violative residue. A shipment of soluble wheat protein for animal feed contained 0.089 ppm, while a sample of hydrolyzed wheat gluten contained 1.65 ppm.

Two shipments of certified organic soybeans from Canada contained no-tolerance, violative residue endosulfan at 0.021 and 0.042 ppm, respectively.

**Table 4. Summary of Animal Feed Analyzed for Pesticides**

Type of Feed	Samples Analyzed #	Samples with No Pesticide Residues #	Samples with No Pesticide Residues %	Violative Samples #	Violative Samples %
Whole/Ground Grains	128	101	78.9	4	3.1
Mixed Feed Rations	72	32	44.4	0	0.0
Plant By-product	53	40	75.5	2	3.8
Supplements/Misc.	19	15	78.9	0	0.0
Hay/Hay Products	45	18	40.0	13	28.9
Animal By-products	13	13	100.0	0	0.0
<b>TOTAL</b>	<b>330</b>	<b>219</b>	<b>66.4</b>	<b>19</b>	<b>5.8</b>

Of the 65 domestic surveillance samples with positive results, a total of 91 residues were detected (82 quantifiable, 9 trace); whereas among the imports, 46 samples contained 74 residues (51 quantifiable, 23 trace). Ethoxyquin and malathion were the most frequently found pesticides and together accounted for 41.2 % of all residues detected (Table 5). DCPA was the third most commonly detected residue, contributing 13.9 % to the total, but was found exclusively in import samples.

**Table 5. Pesticides Most Commonly Reported in Samples of Animal Feeds**

Pesticide	Total # of Samples	Quantifiable Samples	Range* (ppm)	Median* (ppm)
Ethoxyquin	39	38	0.010 – 64.0	0.622
Malathion	29	24	0.010 – 1.92	0.041
DCPA	23	9	0.032 – 0.540	0.058
Chlorpyrifos methyl	11	11	0.011 – 0.080	0.032
Lambda cyhalothrin	8	8	0.015 – 1.90	0.500
Piperonyl butoxide	6	5	0.014 – 0.813	0.021
Endosulfan sulfate	5	5	0.021 – 0.076	0.029
DDE, P,P'-	4	0		
Pirimiphos-methyl	4	4	0.017 – 1.650	0.075
o-Phenylphenol	3	2	0.052 – 0.060	0.056
Boscalid	2	2	0.014 – 0.023	0.019
Carbendazim	2	2	0.006 – 0.014	0.010
Carboxin	2	1	0.013	0.013
Chlorpyrifos	2	2	0.112 – 0.123	0.118
Cyprodinil	2	2	0.107 – 0.890	0.499

Pesticide	Total # of Samples	Quantifiable Samples	Range* (ppm)	Median* (ppm)
Endosulfan I	2	0		
Endosulfan II	2	1	0.013	0.013
Methamidophos	2	2	0.296 – 0.330	0.313
Methoprene	2	2	0.085 – 0.166	0.126
Propargite	2	1	3.07	3.070

*\*For samples containing quantifiable levels of pesticides. An additional 13 contaminants not listed were identified in a single sample.*

### **Focused Sampling**

As previously described, FDA conducts “focused sampling” by means of short-term, regulatory-based field assignments. In FY 2011 FDA issued a pesticide-related field assignment “Sample Collection and Analysis of Imported Dietary Supplement and Botanical Products for Pesticides and Toxic Elements.” In the assignment FDA identified twelve (12) different imported dietary supplement and botanical products widely consumed in the US. Instructions also directed to collect several forms of botanical/supplement products, including liquid, dried, ground, or powdered plant material (root, leaves, whole plant, etc.), and finished dietary supplements labeled or shipped in bulk for re-packing in the U. S. in any form (capsules or tablets) or retail size unit.

Results of the assignment are listed in Table 6. Of the 68 botanical/dietary supplements samples collected and analyzed, only ten were violative. The violations were equally distributed across the different products, i.e. each of the different products had at least one violative sample. The violations were also distributed amongst the import countries; three violative samples were imported from China, two each from Egypt and Korea, and one each from Germany, India, and Spain.

**Table 6. Imported Dietary Supplement and Botanical Products Analyzed for Pesticides**

Botanical	Samples	Samples per Country		
		Country	Total	Violative
Bupleurum chinense DC.	6	China	4	
		Korea	1	1
		Taiwan	1	
Eleutherococcus senticosus	8	China	5	1
		Korea	2	
		Taiwan	1	
Eucommia ulmoides Oliv.	2	China	1	
		Korea	1	
Euterpe oleracea Mart.	2	Brazil	2	
Hibiscus sabdariffa L.	9	Burkina Faso	1	
		China	2	
		Egypt	2	
		Germany	1	
		Morocco	1	
		Taiwan	1	
		Thailand	1	
Matricaria recutita L.	15	Canada	1	
		Egypt	8	2
		El Salvador	1	
		Germany	3	
		India	1	1
		Morocco	1	
Ocimum tenuiflorum L.	5	India	5	
Paullinia cupana Kunth.	3	Brazil	3	
Saposhnikovia divaricata (Turcz.) Schischk.	3	China	1	
		Korea	1	1
		Taiwan	1	
Schisandra chinensis (Turcz.) Baill.	9	China	8	2
		Taiwan	1	
Valeriana officinalis L.	6	Germany	1	1
		Mexico	1	
		Poland	3	
		Spain	1	1

## Total Diet Study

Of the more than 350 chemicals that can be detected by the analytical methods used in FDA's TDS, residues of 173 individual compounds were found in the foods analyzed in the four market baskets reported for FY 2011 (Market Baskets 10-4, 11-1, 11-2, and 11-3). The compounds found consisted of parent pesticides and related compounds (e.g., isomers, metabolites, degradation products) that are included with the results for the parent pesticide for reporting and enforcement purposes.

Table 7 lists the most frequently found residues (at least 2 % of the samples) in the TDS foods other than infant and toddler foods, the total number of findings, and the percent occurrence in the four market baskets analyzed in FY 2011 (916 total samples). Historically, the five most frequently observed chemicals were DDT, malathion, chlorpyrifos-methyl, endosulfan, and dieldrin. In FY 2011 these pesticides are still found in comparatively high frequency, but are now joined by new pesticide residues, including piperonyl butoxide, boscalid, pyrimethanil, and methoxyfenoside, that have been added to the analytical scope in 2010 and 2011.

**Table 7. Frequency of Occurrence of Pesticide Residues in the Total Diet Study for Foods Other Than Infant and Toddler Foods<sup>1</sup>**

Pesticide <sup>2</sup>	Findings #	Occurrence %	Range ppm
Piperonyl butoxide	137	15	0.0001-0.020
DDT	136	15	0.0001-0.099
Malathion	126	14	0.0001-0.087
Boscalid	95	10	0.0001-0.212
Pyrimethanil	95	10	0.0001-0.704
Methoxyfenoside	91	10	0.0001-0.090
Chlorpyrifos methyl	78	9	0.0001-0.025
Chlorpropham	77	8	0.0001-2.760
Azoxystrobin	77	8	0.0001-0.109
Pyraclostrobin	72	8	0.0001-0.064
Chlorpyrifos	68	7	0.0001-0.084
Thiabendazole	65	7	0.0001-0.266
Carbendazim	64	7	0.0002-0.046
Carbaryl	62	7	0.0001-0.108
Imidacloprid	61	7	0.0003-0.059
Endosulfan	59	6	0.0001-0.089
Bifenthrin	53	6	0.0001-0.593
Acetamiprid	53	6	0.0002-0.041
Myclobutanil	50	5	0.0001-0.088

<b>Pesticide<sup>2</sup></b>	<b>Findings #</b>	<b>Occurrence %</b>	<b>Range ppm</b>
Metalaxyl	50	5	0.0001-0.026
Imazalil	48	5	0.0001-0.193
Chlorantraniliprole	44	5	0.0002-0.247
Phenylphenol, o-	40	4	0.0005-0.230
Tebuconazole	38	4	0.0001-0.138
Dieldrin	37	4	0.0001-0.025
Thiamethoxam	35	4	0.0001-0.009
Propargite	34	4	0.0001-0.002
Permethrin	29	3	0.0003-1.428
Propamocarb	28	3	0.0001-0.102
Difenoconazole	26	3	0.0001-0.029
Dimethoate	26	3	0.0001-0.023
Cyprodinil	26	3	0.0001-0.047
Propiconazole	25	3	0.0002-0.018
Buprofezin	25	3	0.0001-0.010
Methamidophos	23	3	0.0002-0.020
Fludioxonil	22	2	0.0001-1.500
Quintozene	21	2	0.0001-0.018
Pirimiphos methyl	21	2	0.0001-0.234
Fenhexamid	21	2	0.0005-0.819
Bifenazate	20	2	0.0001-0.030
Clothianidin	20	2	0.0004-0.013
Mandipropamid	20	2	0.0001-0.956
Lambda-cyhalothrin	20	2	0.001-0.043
Cypermethrin	20	2	0.001-0.172
Biphenyl	19	2	0.0005-0.006
Acephate	19	2	0.0005-0.049
Linuron	19	2	0.0003-0.035
Omethoate	18	2	0.0001-0.012
Trifloxystrobin	18	2	0.0001-0.011
Indoxacarb	18	2	0.0002-0.019
Ethion	18	2	0.0001-0.011
Captan	17	2	0.0005-0.636
Iprodione	17	2	0.0004-1.484
Pyriproxyfen	16	2	0.0001-0.012
Thiophanate-methyl	16	2	0.0002-0.040
Fenamidone	15	2	0.0004-0.216
Spinosad	15	2	0.0004-0.166
Hexachlorobenzene	14	2	0.0001-0.001
MGK 264	14	2	0.0004-0.006

<b>Pesticide<sup>2</sup></b>	<b>Findings #</b>	<b>Occurrence %</b>	<b>Range ppm</b>
Spirodiclofen	14	2	0.0004-0.022

<sup>1</sup> Based upon 4 market baskets consisting of 916 total items.

<sup>2</sup> Isomers, metabolites, and related compounds are included with the 'parent' pesticide

The TDS program also collects and analyzes infant and toddler foods. Table 8 provides the frequency of occurrence of the pesticide residues that were found in 2 percent or more of these samples in the four collections of infant and toddler foods (167 samples total) in FY 2011 and the range of levels found. As noted for Table 7, the pesticide residues found most frequently in FY 2011 have changed slightly to reflect the expanded analytical scope of the pesticide program.

**Table 8. Frequency of Occurrence of Pesticide Residues in Total Diet Study Infant and Toddler Foods<sup>1</sup>**

<b>Pesticide<sup>2</sup></b>	<b>Findings #</b>	<b>Occurrence %</b>	<b>Range ppm</b>
Piperonyl butoxide	57	34	0.0001-0.017
Carbendazim	50	30	0.0002-0.057
Acetamiprid	48	29	0.0002-0.017
Methoxyfenozide	47	28	0.0001-0.007
Thiabendazole	45	27	0.0001-0.038
Pyrimethanil	44	26	0.0001-0.117
Boscalid	35	21	0.0001-0.009
Thiacloprid	28	17	0.0002-0.007
Chlorantraniliprole	24	14	0.0003-0.008
Carbaryl	21	13	0.0001-0.008
Azoxystrobin	20	12	0.0001-0.001
Captan	19	11	0.0005-0.211
Diphenylamine	18	11	0.0005-0.053
Chlorpyrifos	17	10	0.0001-0.005
Malathion	16	10	0.0001-0.258
Myclobutanil	15	9	0.0001-0.001
Chlorpropham	14	8	0.0002-0.060
Cyprodinil	12	7	0.0001-0.008
DDT	12	7	0.0001-0.002
Ethylenethiourea <sup>3</sup>	12	7	0.003-0.012
Propiconazole	12	7	0.0003-0.003
Pyridaben	12	7	0.0001-0.001

<b>Pesticide<sup>2</sup></b>	<b>Findings #</b>	<b>Occurrence %</b>	<b>Range ppm</b>
Phenylphenol, o-	11	7	0.0005-0.005
Fludioxonil	10	6	0.0001-0.021
Lambda-cyhalothrin	10	6	0.001-0.016
Trifloxystrobin	10	6	0.0001-0.0005
Spinosad	10	6	0.0002-0.003
Diflubenzuron	10	6	0.0002-0.004
Difenoconazole	10	6	0.0001-0.0005
Bifenazate	9	5	0.0002-0.007
Bifenthrin	9	5	0.0001-0.023
Clothianidin	9	5	0.0003-0.002
Hexythiazox	8	5	0.0002-0.003
Spinetoram	8	5	0.0001-0.002
Tebuconazole	8	5	0.0001-0.002
Indoxacarb	7	4	0.0004-0.001
Dieldrin	6	4	0.0002-0.001
Dioxacarb	6	4	0.0002-0.0006
Fenpyroximate, e-	6	4	0.0002-0.0005
Propargite	6	4	0.0001-0.002
Novaluron	6	4	0.0004-0.003
Pyraclostrobin	6	4	0.0001-0.003
Methamidophos	6	4	0.0008-0.010
Thiamethoxam	6	4	0.0003-0.001
Propamocarb	5	3	0.0002-0.009
Phosmet	5	3	0.0001-0.007
Fenbuconazole	5	3	0.0001-0.009
Fenhexamid	5	3	0.002-0.013
Biphenyl	5	3	0.001-0.006
Imazalil	5	3	0.0001-0.003
Metalaxyl	5	3	0.0002-0.002
Thiophanate-methyl	5	3	0.0002-0.002
Iprodione	5	3	0.0003-0.012
Chlorpyrifos methyl	5	3	0.004-0.022
Dicloran	4	2	0.0003-0.002
Acephate	4	2	0.0006-0.005
Imidacloprid	4	2	0.0005-0.001
Pyriproxyfen	4	2	0.0001-0.0001
Flusilazole	4	2	0.0001-0.0002
Permethrin	3	2	0.003-0.007

Pesticide <sup>2</sup>	Findings #	Occurrence %	Range ppm
Kresoxim-methyl	3	2	0.0001-0.0003

<sup>1</sup> Based upon 4 market baskets consisting of 167 total items.

<sup>2</sup> Isomers, metabolites, and related compounds are included with the 'parent' pesticide.

<sup>3</sup> Reflects overall incidence; however, only 23 selected foods per market basket (i.e. 92 items total) were analyzed for Ethylenethiourea.

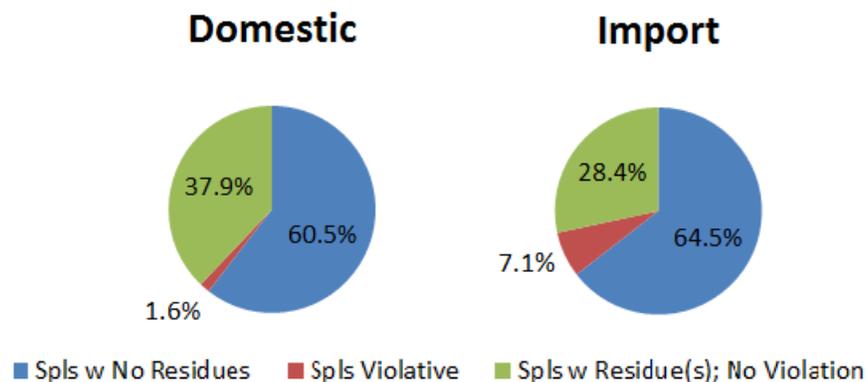
## Summary

### Regulatory Monitoring

A total of 5,977 samples of both domestically produced and imported food from 99 countries were analyzed for pesticide residues in FY 2011. No residues were found in 60.5 percent of domestic and 64.5 percent of import samples (Figure 3) analyzed under FDA's regulatory monitoring approach in FY 2011. Only 1.6 percent of domestic and 7.1 percent of import samples had residue levels that were violative. The findings for FY 2011 demonstrate that pesticide residue levels in foods are generally well below EPA tolerances; the increased import sample violation rate reflects the expansion of the analytical scope of pesticide residues from the implementation of new technologies in 2010 and 2011.

FDA also collected and analyzed 199 domestic and 131 imported animal feed samples for pesticides. No residues were found in 67.3 percent of the domestic feed samples and in 64.9 percent of the import feed samples. Two domestic feed samples and 17 imported feed samples had residue findings for which no EPA or FDA acceptable levels have been established.

**Figure 3. Summary of Results of Domestic vs. Import Samples**



### **Total Diet Study**

In FY 2011, the types of pesticide residues found and their frequency of occurrence in TDS increased due the expansion of the analytical scope of pesticide residues from the implementation of new technologies in 2010 and 2011. The pesticide residue levels found were well below regulatory standards. Results of baby foods tested in FY 2011 (and earlier years) also provide evidence of only low levels of pesticide residues in these foods.

## Appendices

### A. Analysis of Domestic Samples by Commodity Group in 2011

Commodity Group	Samples Analyzed (#)	Without Residues (%)	Violative Samples And Types		
			Samples (%)	Over Tolerance (#)	No Tolerance (#)
<b><u>Grains and Grain Products</u></b>					
Barley & barley products	6	66.7	0.0	0	0
Corn & corn products	28	82.1	0.0	0	0
Oats & oat products	4	75.0	0.0	0	0
Rice & rice products	22	81.8	0.0	0	0
Wheat & wheat products	48	58.3	0.0	0	0
Soybeans and soybean grain products	32	93.8	0.0	0	0
Other grains & grain products	4	100.0	0.0	0	0
Macaroni & noodles	2	100.0	0.0	0	0
Breakfast cereals	6	100.0	0.0	0	0
Bakery products, crackers, etc.	1	100.0	0.0	0	0
<b>Subtotal</b>	<b>153</b>	<b>77.8</b>	<b>0.0</b>	<b>0</b>	<b>0</b>
<b><u>Milk/Dairy Products/Eggs</u></b>					
Cheese & cheese products	1	100.0	0.0	0	0
Eggs	2	100.0	0.0	0	0
Milk/cream & milk products	11	72.7	0.0	0	0
<b>Subtotal</b>	<b>14</b>	<b>78.6</b>	<b>0.0</b>	<b>0</b>	<b>0</b>
<b><u>Fish/Shellfish/Other Aquatic Products</u></b>					
Fish and Fish Products	51	80.4	0.0	0	0
Shellfish & Crustaceans	6	83.3	0.0	0	0
Aquaculture seafood	7	85.7	0.0	0	0
Other Aquatic Animals & Products	0	0.0	0.0	0	0
<b>Subtotal</b>	<b>64</b>	<b>81.3</b>	<b>0.0</b>	<b>0</b>	<b>0</b>
<b><u>Fruits</u></b>					
Blackberries	0	0	0	0	0
Blueberries	9	55.6	0.0	0	0
Cranberries	16	43.8	0.0	0	0
Grapes, raisins	3	66.7	0.0	0	0
Raspberries	3	33.3	0.0	0	0
Strawberries	6	16.7	0.0	0	0

Commodity Group	Samples Analyzed (#)	Without Residues (%)	Violative Samples And Types		
			Samples (%)	Over Tolerance (#)	No Tolerance (#)
Grapefruit	5	40.0	0.0	0	0
Lemons	4	25.0	0.0	0	0
Oranges	24	12.5	0.0	0	0
Other citrus fruit	7	28.6	0.0	0	0
Apples	86	39.5	0.0	0	0
Pears	17	47.1	0.0	0	0
Other pome fruit	0	0.0	0.0	0	0
Apricots	1	0.0	0.0	0	0
Avocados	3	100.0	0.0	0	0
Cherries	4	50.0	0.0	0	0
Nectarines	6	0.0	33.3	1	2
Peaches	19	0.0	10.5	0	2
Plums/prunes	12	33.3	16.7	0	2
Papaya	0	0.0	0.0	0	0
Pineapple	0	0.0	0.0	0	0
Other sub-tropical fruit	0	0.0	0.0	0	0
Cantaloupe	4	100.0	0.0	0	0
Watermelon	1	100.0	0.0	0	0
Other melons	0	0.0	0.0	0	0
Other fruits/fruit products	7	71.4	0.0	0	0
Apple juice	5	80.0	0.0	0	0
Citrus juice	1	100.0	0.0	0	0
Other fruit juices	2	100.0	0.0	0	0
Processed fruit (jellies, toppings, fillings)	7	28.6	0.0	0	0
<b>Subtotal</b>	<b>252</b>	<b>37.3</b>	<b>2.4</b>	<b>1</b>	<b>6</b>
<b><u>Vegetables</u></b>					
Corn	34	88.2	0.0	0	0
Bean sprouts	0	0.0	0.0	0	0
Peas (green/snow/sugar/sweet)	9	88.9	0.0	0	0
String beans (green/snap/pole/long)	37	48.6	2.7	0	1
Other beans & peas & products	33	87.9	0.0	0	0
Cucumbers	24	50.0	0.0	0	0
Eggplant	6	83.3	0.0	0	0
Okra	2	100.0	0.0	0	0
Peppers, hot	19	26.3	0.0	0	0
Peppers, sweet	21	52.4	0.0	0	0
Pumpkins	0	0.0	0.0	0	0
Squash	48	54.2	4.2	1	1

Commodity Group	Samples Analyzed (#)	Without Residues (%)	Violative Samples And Types		
			Samples (%)	Over Tolerance (#)	No Tolerance (#)
Tomatoes	41	61.0	0.0	0	0
Asparagus	3	66.7	0.0	0	0
Bok choy	1	0.0	0.0	0	0
Broccoli	4	75.0	0.0	0	0
Cabbage	16	56.3	0.0	0	0
Cauliflower	2	100.0	0.0	0	0
Celery	5	40.0	0.0	0	0
Collards	2	100.0	0.0	0	0
Endive	0	0.0	0.0	0	0
Kale	11	36.4	0.0	0	0
Lettuce, head	12	66.7	0.0	0	0
Lettuce, leaf	7	14.3	0.0	0	0
Mustard greens	1	100.0	0.0	0	0
Spinach	13	23.1	23.1	1	3
Swiss chard	1	100.0	0.0	0	0
Watercress	0	0.0	0.0	0	0
Other leaf & stem vegetables	25	56.0	12.0	0	3
Mushrooms and Truffles	5	40.0	0.0	0	0
Carrots	20	45.0	0.0	0	0
Onions/leeks/scallions/shallots	17	88.2	5.9	0	1
Parsnips	2	0.0	0.0	0	0
Potatoes	46	54.3	0.0	0	0
Radishes	2	100.0	0.0	0	0
Red beets	2	100.0	0.0	0	0
Sweet potatoes	14	57.1	0.0	0	0
Turnips	1	100.0	0.0	0	0
Other root & tuber vegetables	4	75.0	0.0	0	0
Other vegetables/vegetable products	55	78.2	1.8	0	1
<b>Subtotal</b>	<b>545</b>	<b>61.1</b>	<b>2.0</b>	<b>2</b>	<b>10</b>
<b>Other</b>					
Peanuts & peanut products	3	66.7	0.0	0	0
Almonds	9	88.9	0.0	0	0
Coconut	0	0.0	0.0	0	0
Other nuts	18	100.0	0.0	0	0
Refined oil	0	0.0	0.0	0	0
Edible seeds & seed products	2	100.0	0.0	0	0
Basil	0	0.0	0.0	0	0

Commodity Group	Samples Analyzed (#)	Without Residues (%)	Violative Samples And Types		
			Samples (%)	Over Tolerance (#)	No Tolerance (#)
Other spices	5	100.0	0.0	0	0
Water & ice	0	0.0	0.0	0	0
Beverages & beverage base	0	0.0	0.0	0	0
Honey	0	0.0	0.0	0	0
Confections	0	0.0	0.0	0	0
Miscellaneous foods	14	57.1	0.0	0	0
Animal Byproducts	0	0.0	0.0	0	0
Other products	1	100.0	0.0	0	0
<b>Subtotal</b>	<b>52</b>	<b>84.6</b>	<b>0.0</b>	<b>0</b>	<b>0</b>
<b>Totals - All Domestic Samples</b>	<b>1080</b>	<b>60.5</b>	<b>1.6</b>	<b>3</b>	<b>16</b>

## B. Analysis of Import Samples by Commodity Group in 2011

Commodity Group	Samples Analyzed (#)	Without Residues (%)	Violative Samples And Types		
			Samples (%)	Over Tolerance (#)	No Tolerance (#)
<b><u>Grains and Grain Products</u></b>					
Barley & barley products	6	83.3	0.0	0	0
Corn & corn products	24	75.0	0.0	0	0
Oats & oat products	5	100.0	0.0	0	0
Rice & rice products	45	82.2	15.6	0	7
Wheat & wheat products	21	81.0	0.0	0	0
Soybeans & soybean products	7	85.7	14.3	0	1
Other grains & grain products	38	86.8	0.0	0	0
Macaroni & noodles	28	67.9	0.0	0	0
Bakery products, doughs, crackers	20	50.0	5.0	0	1
Breakfast cereals	4	50.0	0.0	0	0
Snack foods	5	80.0	0.0	0	0
<b>Subtotal</b>	<b>203</b>	<b>76.9</b>	<b>4.4</b>	<b>0</b>	<b>9</b>
<b><u>Milk/Dairy Products/Eggs</u></b>					
Cheese & cheese products	7	85.7	0.0	0	0
Eggs (includes duck & quail)	3	100.0	0.0	0	0
Milk/cream & milk products	15	80.0	0.0	0	0
<b>Subtotal</b>	<b>25</b>	<b>84.0</b>	<b>0.0</b>	<b>0</b>	<b>0</b>
<b><u>Fish/Shellfish/Other Aquatic Products</u></b>					
Fish and fish products	86	90.7	0.0	0	0
Shellfish & crustaceans	36	94.4	0.0	0	0
Aquaculture seafood	71	91.5	0.0	0	0
Other aquatic animals & products	8	100.0	0.0	0	0
<b>Subtotal</b>	<b>201</b>	<b>92.0</b>	<b>0.0</b>	<b>0</b>	<b>0</b>
<b><u>Fruits</u></b>					
Blackberries	70	35.7	11.4	0	8
Blueberries	87	51.7	2.3	0	2
Cranberries	9	88.9	0.0	0	0
Currants	7	71.4	0.0	0	0
Grapes, raisins	46	34.8	8.7	0	4
Raspberries	38	39.5	2.6	0	1
Strawberries	90	33.3	4.4	1	3
Other berries	25	56.0	8.0	1	1
Clementines	5	20.0	0.0	0	0

**Violative Samples And Types**

<b>Commodity Group</b>	<b>Samples Analyzed (#)</b>	<b>Without Residues (%)</b>	<b>Samples (%)</b>	<b>Over Tolerance (#)</b>	<b>No Tolerance (#)</b>
Grapefruit	1	100.0	0.0	0	0
Lemons	4	50.0	25.0	0	1
Limes	3	33.3	0.0	0	0
Oranges	10	50.0	10.0	0	1
Other citrus fruit	7	100.0	0.0	0	0
Apples	31	45.2	6.5	0	2
Pears	22	40.9	22.7	0	5
Prickle pear	13	53.8	38.5	0	5
Other pome/core fruit	1	100.0	0.0	0	0
Apricots	12	83.3	0.0	0	0
Avocados	30	80.0	3.3	0	1
Cherries	21	33.3	0.0	0	0
Dates	24	100.0	0.0	0	0
Nectarines	1	0.0	0.0	0	0
Olives	41	85.4	9.8	1	2
Peaches	17	41.2	0.0	0	0
Plums/Prunes	16	81.3	0.0	0	0
Other pit fruit	3	100.0	0.0	0	0
Ackees, lychees, longans	8	62.5	25.0	0	2
Bananas, plantains	23	78.3	0.0	0	0
Breadfruit, jackfruit	2	100.0	0.0	0	0
Figs	12	83.3	0.0	0	0
Guavas	21	52.4	4.8	0	1
Kiwi fruit	8	87.5	0.0	0	0
Mangoes	66	89.4	3.0	0	2
Papaya	74	28.4	27.0	0	19
Pineapple	30	63.3	0.0	0	0
Pepinos	1	0.0	0.0	0	0
Other sub-tropical fruit	38	81.6	7.9	0	3
Bitter melon	3	33.3	0.0	0	0
Cantaloupe	22	31.8	9.1	1	1
Honeydew	8	37.5	0.0	0	0
Watermelon	4	50.0	0.0	0	0
Other melons/vine fruit	2	100.0	0.0	0	0
Pomegranate	4	100.0	0.0	0	0
Mixed fruits	7	71.4	0.0	0	0
Berry juice	32	53.1	6.3	0	2
Citrus juice	13	61.5	0.0	0	0

**Violative Samples And Types**

<b>Commodity Group</b>	<b>Samples Analyzed (#)</b>	<b>Without Residues (%)</b>	<b>Samples (%)</b>	<b>Over Tolerance (#)</b>	<b>No Tolerance (#)</b>
Apple juice	18	88.9	0.0	0	0
Pear juice	10	80.0	0.0	0	0
Stone fruit juice	15	80.0	0.0	0	0
Subtropical juice/milk/nectar	29	86.2	6.9	0	2
Mixed fruit juice	7	85.7	14.3	0	1
Pomegranate juice	10	90.0	0.0	0	0
Other fruit juices	5	80.0	0.0	0	0
Berry fruit jams, jellies, preserves, syrups, toppings	33	78.8	6.1	0	2
Citrus fruit jams, jellies, preserves, syrups, toppings	3	66.7	0.0	0	0
Core fruit jams, jellies, preserves, syrups, toppings	3	100.0	0.0	0	0
Pit fruit jams, jellies, preserves, syrups, toppings	20	70.0	0.0	0	0
Subtropical/tropical fruit jams, jellies, preserves, syrups, toppings	11	90.9	9.1	0	1
Other fruit jams, jellies, preserves, syrups, toppings	19	100.0	0.0	0	0
Other fruits and fruit products	50	62.0	18.0	0	9
<b>Subtotal</b>	<b>1245</b>	<b>59.9</b>	<b>6.9</b>	<b>4</b>	<b>81</b>
<b><u>Vegetables</u></b>					
Corn	20	95.0	0.0	0	0
Peas (green/snow/sweet)	60	61.7	6.7	1	4
Sugar snap peas	12	41.7	8.3	0	1
String beans (green/snap/pole)	58	48.3	12.1	0	7
Garbanzo beans	20	85.0	0.0	0	0
Kidney beans	14	92.9	0.0	0	0
Mung beans	23	73.9	4.3	1	0
Soybeans	24	70.8	8.3	0	2
Bean sprouts and seeds	8	75.0	12.5	0	1
Other beans & pea products	88	81.8	1.1	0	1
Peppers, hot	404	44.3	12.6	3	50
Peppers, pimiento	8	50.0	12.5	0	1
Peppers, sweet	114	52.6	3.5	1	4
Tomatoes/tomatillos	129	50.4	4.7	0	6
Eggplant	32	56.3	9.4	0	3
Okra	27	70.4	3.7	0	1

**Violative Samples And Types**

<b>Commodity Group</b>	<b>Samples Analyzed (#)</b>	<b>Without Residues (%)</b>	<b>Samples (%)</b>	<b>Over Tolerance (#)</b>	<b>No Tolerance (#)</b>
Other fruiting vegetables	0	0.0	0.0	0	0
Cucumbers	100	40.0	0.0	0	0
Pumpkins	5	80.0	0.0	0	0
Squash	81	58.0	0.0	0	0
Choyote	20	75.0	10.0	0	2
Other cucurbit vegetables	3	66.7	0.0	0	0
Artichokes	13	100.0	0.0	0	0
Asparagus	91	93.4	3.3	0	3
Bamboo shoots	8	100.0	0.0	0	0
Bok choy & Chinese cabbage	10	30.0	40.0	0	4
Broccoli	65	72.3	1.5	1	0
Brussels sprouts	14	42.9	0.0	0	0
Cabbage	10	50.0	10.0	1	0
Cauliflower	19	89.5	5.3	0	1
Celery	13	69.2	7.7	1	0
Cilantro	9	22.2	33.3	0	3
Collards	6	66.7	16.7	0	1
Kale	20	5.0	10.0	0	2
Lettuce, head	6	83.3	0.0	0	0
Lettuce, leaf	34	64.7	0.0	0	0
Mustard greens	11	63.6	18.2	0	2
Spinach	53	47.2	17.0	1	8
Endive	1	0.0	0.0	0	0
Swiss Chard	7	71.4	0.0	0	0
Watercress	0	0.0	0.0	0	0
Other leaf & stem vegetables	98	70.4	10.2	2	10
Carrots	37	67.6	0.0	0	0
Cassava	11	100.0	0.0	0	0
Garlic	9	88.9	0.0	0	0
Ginger	65	81.5	6.2	0	4
Leeks	29	44.8	10.3	0	3
Onions	14	85.7	7.1	0	1
Potatoes	47	29.8	0.0	0	0
Radishes	71	29.6	2.8	0	2
Red beets	48	45.8	10.4	0	5
Scallions & shallots	133	56.4	2.3	1	2
Sweet potatoes	27	66.7	14.8	0	3
Taro/dasheen	16	100.0	0.0	0	0

**Violative Samples And Types**

<b>Commodity Group</b>	<b>Samples Analyzed (#)</b>	<b>Without Residues (%)</b>	<b>Samples (%)</b>	<b>Over Tolerance (#)</b>	<b>No Tolerance (#)</b>
Turnips	2	100.0	0.0	0	0
Water chestnuts	5	80.0	0.0	0	0
Parsnips	1	100.0	0.0	0	0
Other root & tuber vegetables	25	68.0	20.0	1	4
Mushrooms/truffles/fungi	40	77.5	10.0	0	4
Vegetables, other, mixed	82	81.7	4.9	2	3
Vegetable juice/drinks	10	80.0	0.0	0	0
Vegetables with sauce	12	58.3	8.3	0	1
Vegetables, breaded	2	100.0	0.0	0	0
<b>Subtotal</b>	<b>2424</b>	<b>59.6</b>	<b>6.5</b>	<b>16</b>	<b>149</b>
<b>Other</b>					
Cashews	27	96.3	0.0	0	0
Coconut & coconut products	9	100.0	0.0	0	0
Peanuts & peanut product	14	85.7	0.0	0	0
Pecans	19	94.7	0.0	0	0
Pistachios	2	100.0	0.0	0	0
Almonds	5	80.0	0.0	0	0
Other nuts & nut products	8	100.0	0.0	0	0
Pumpkin seeds	5	80.0	0.0	0	0
Sesame seeds	16	100.0	0.0	0	0
Sesame paste (tahina)	5	100.0	0.0	0	0
Soybeans, edible	13	84.6	0.0	0	0
Sunflower seeds	5	100.0	0.0	0	0
Other edible seeds & seed products	20	75.0	0.0	0	0
Vegetable oil, crude	8	100.0	0.0	0	0
Vegetable oil, refined	21	81.0	4.8	0	1
Oil seed stock	2	100.0	0.0	0	0
Other vegetable oil products	3	100.0	0.0	0	0
Basil	8	87.5	0.0	0	0
Capsicums	59	32.2	45.8	2	27
Paprika	2	0.0	0.0	0	0
Spices, other	77	74.0	11.7	0	9
Pepper sauce	28	60.7	10.7	1	3
Water & ice	0	0.0	0.0	0	0
Beverage and beverage bases	32	84.4	3.1	0	1
Beer	0	0.0	0.0	0	0
Coffee	6	100.0	0.0	0	0

**Violative Samples And Types**

<b>Commodity Group</b>	<b>Samples Analyzed (#)</b>	<b>Without Residues (%)</b>	<b>Samples (%)</b>	<b>Over Tolerance (#)</b>	<b>No Tolerance (#)</b>
Tea	22	68.2	27.3	3	6
Coffee/tea substitutes	17	76.5	17.6	0	3
Astragalus, dietary supplement	0	0.0	0.0	0	0
Enchinacea, dietary supplement	3	66.7	0.0	0	0
Ginseng, dietary supplement/tea	1	100.0	0.0	0	0
Kava, dietary supplement/tea	0	0.0	0.0	0	0
Senna, dietary supplement/tea	1	100.0	0.0	0	0
Other botanical/herbal teas	35	85.7	14.3	0	5
Other botanical/herbal dietary supplements, not teas	123	70.7	23.6	1	29
Other dietary supplements, not botanicals/herbals or teas	41	75.6	7.3	0	3
Honey & honey products	47	85.1	6.4	1	2
Food sweeteners, not honey	29	79.3	0.0	0	0
Candy, confections, chocolate, cocoa products	38	92.1	0.0	0	0
Condiments & dressings	4	75.0	25.0	0	1
Flavorings and extracts	6	83.3	16.7	0	1
Multi-ingredient foods (dinners, sauces, specialties)	18	66.7	0.0	0	0
Baby foods/formula	3	33.3	0.0	0	0
Food additives/colors	0	0.0	0.0	0	0
Other food products	11	36.4	9.1	0	1
Animal byproducts	0	0.0	0.0	0	0
Other nonfood items	6	83.3	0.0	0	0
<b>Subtotal</b>	<b>799</b>	<b>75.8</b>	<b>11.6</b>	<b>8</b>	<b>92</b>
<hr/>					
<b>Totals - All Import Samples</b>	<b>4897</b>	<b>64.5</b>	<b>7.1</b>	<b>28</b>	<b>331</b>

<sup>a</sup> Whole food commodities include dried, paste, pulp, and puree forms, as well as foods similarly classified by EPA for residue tolerance enforcement, e.g., eggplant includes Chinese/Thai eggplant; radishes include daikon or Chinese/Oriental radishes.

Note: "Over-tolerance" violations include residue findings that exceeded tolerances for pesticides approved for use in establishments where food products are held, processed, or prepared.