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# Testimony

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**Federal Regulation of Pesticide Residues in Food**

Statement of
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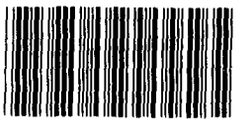
Before the
Subcommittee on Oversight and Investigations
Committee on Energy and Commerce
House of Representatives

Mr. Chairman and Members of the Subcommittee:

We are pleased to be here today to present our views on federal regulation of pesticide residues in food. As you know, during the past year GAO has issued three reports on this subject and these reports are the basis for our testimony today, as is follow-up work done for the Subcommittee. (These reports are listed in att. I.)

Mr. Chairman, as I will discuss in my statement, we believe the Federal Government can do a better job in protecting the public from potentially hazardous pesticides in the food it consumes. Although the FDA is charged with the responsibility of testing domestic and imported foods for such pesticides, its monitoring program is not adequately covering certain pesticides. The problem is particularly serious with imported products, where not only is there inadequate coverage of certain pesticides, but some foods coming from various countries are not being tested for any pesticides at all. When FDA has identified foods containing illegal quantities of pesticide residues, enforcement actions have often been inadequate and therefore do not deter future abuses. Finally, gaps exist in understanding the health risks associated with many of these materials.

I'd like to begin my statement with a brief background on this problem, including how the federal government is supposed to regulate pesticide use for foods. As you know, Mr. Chairman,

pesticides are used extensively in food production worldwide. Many of the pesticides remain as residues on the food and can be ingested along with the food. Most pesticides are toxic and some exhibit evidence of causing chronic health effects, such as cancer or birth defects.

FDA estimates annual food consumption in the United States to be in excess of 290 billion pounds, with imported food accounting for a significant and increasing portion of the total. Census Bureau data indicate that about 43 billion pounds of food was imported into the United States during fiscal year 1985, and included about 25 percent of all fresh fruits and between 5 and 6 percent of all fresh vegetables consumed.

## BACKGROUND ON FEDERAL REGULATORY RESPONSIBILITIES

Responsibility for regulating pesticide residues in food is split between the Environmental Protection Agency (EPA) and FDA. EPA is responsible under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) for regulating which pesticides can be used in food production and how they can be used (i.e., which crops a pesticide can be used on, as well as the number, rate, and timing of pesticide application in relation to harvesting). Every pesticide used in the United States must have an approved EPA registration. The Federal Food, Drug, and Cosmetic (FD&C) Act assigns responsibility to EPA for specifying which individual

pesticides, and in what amounts (referred to as pesticide residue tolerances) will be allowed to be present in specific foods without causing the food to legally be considered adulterated. A pesticide residue tolerance represents an amount of the pesticide that EPA has concluded should not be exceeded on the food for which it is registered to be used, without presenting an unreasonable health risk.

FDA is responsible under the FD&C Act for enforcing the pesticide residue tolerances established by EPA for all food products except meat, poultry, and eggs. (Inspection of these latter foods for illegal pesticide residues is the responsibility of the Department of Agriculture, and was not covered in the three reports that we are discussing today.) The purpose of the FD&C Act is to protect the public from unsafe foods and other products. In this regard, the Act (1) prohibits the importation and/or interstate sale of adulterated food, (2) makes FDA responsible for enforcing these prohibitions, and (3) authorizes FDA to take certain actions against adulterated products and their growers or producers. The Act specifies that food is adulterated if it contains either a residue of a pesticide not registered for use by EPA on the crop in which the residue is found, or a pesticide residue exceeding the amount allowed on the food commodity.

MONITORING FOOD FOR
PESTICIDE RESIDUES

Our review of FDA's monitoring for pesticide residues showed the following:

-- Between fiscal years 1979 and 1985 FDA analyzed 101,191 food samples for pesticide residues and found that 4,028 of the samples--4 percent of the total--were adulterated. For comparative purposes, it should be noted that the violation rate for imported food, 6.1 percent, was twice that of domestically grown food, 2.9 percent. (Details by fiscal year are provided in att. II.)

-- Domestic food constituted 67,504 food samples analyzed--67 percent of the total--and 1,972 (49 percent) of the adulterated samples. The violation rate for domestic food samples averaged 2.9 percent and ranged by fiscal year from a low of 1.8 percent to a high of 4.2 percent.

-- Imported food samples accounted for only 33 percent of the food samples analyzed, but 51 percent of the adulterated samples. The violation rate for imported food samples averaged 6.1 percent and ranged from a low of 4.7 percent to a high of 8.2 percent.

-- Sampling of food for pesticides is done judgmentally by FDA. Therefore, it is not possible, with statistical reliability, to project the results of FDA's sampling program to all food being consumed in the United States.

-- The limited capabilities of individual testing methods and the time, resources, and effort involved in analyzing food for pesticide residues severely limits the amount of food and the numbers of pesticides that can be tested. Therefore, testing for pesticide residues is, of necessity, limited to a very small portion of the food being consumed. As best we can determine, FDA is annually testing less than 1 percent of food being consumed in the United States.

Our overall judgment is that because of the limited amount of food that FDA is able to test for pesticide residues, it is important that FDA's monitoring program acts as a strong deterrent against the shipment of food containing pesticide residues that render the food adulterated. Our reviews of FDA's pesticide monitoring program show that this is not the case.

## GAPS IN FDA PESTICIDE COVERAGE

Our two reviews of FDA's pesticide residue monitoring program (GAO/RCED-86-219, September 26, 1986 and GAO/RCED-87-7, October 27, 1986) showed that FDA is overlooking a number of pesticide chemicals with moderate to high health risk potential. This

results from FDA's heavy reliance on selected multiresidue testing methods and the fact that there is a large number of pesticide chemicals that these methods cannot detect, including some that FDA has classified as needing continuous or periodic monitoring. Even when multiresidue tests are used, the one selected is often not capable of detecting many of the pesticides recommended for use in the United States on the crops being sampled.

An additional problem is that FDA lacks adequate information on the pesticides being used on crops grown in foreign countries and imported into this country. Therefore, in many instances FDA does not know with any degree of accuracy what pesticides to test for. Furthermore, we found that many foods being imported into the United States from various countries on a regular basis are not being sampled and tested by FDA for any pesticides.

## Lack of Testing for Pesticides Not Covered by Multiresidue Methods

To illustrate the gaps in FDA's testing, we obtained information on four pesticides that FDA has classified as warranting continuous monitoring, but which are not covered by the multiresidue tests relied on by FDA's laboratories. (A listing of pesticides having a moderate to high health hazard and not covered by these multiresidue tests, is included as att. III.) These pesticides are mancozeb, maneb, metiram, and zineb which are part of a class of chemicals referred to as EBDCs (ethylenebisdithiocarbamates). According to FDA's surveillance

index, EBDCs represent about 22 percent of the total fungicides used in this country and about 57 percent of the total fungicides used worldwide. EBDCs are extensively used in this country on wheat, potatoes, citrus, tomatoes, melons, apples, sweet corn, lettuce, onions, cabbage, celery, beans, cucumbers, carrots, pears, spinach, and peppers, and in foreign countries on grapes, potatoes, tomatoes, fruits, nuts, bananas, and rice.

EBDCs produce a break-down product called ETU (ethylenethiourea) which is classified by EPA as a probable human carcinogen. ETU also has been found to cause birth defects in laboratory animals (rats and hamsters), including a variety of defects in the central nervous system. EBDCs have also been found to convert to ETU in foods such as tomatoes and apples when they are processed.

Our follow-up work found that testing of food for EBDCs is quite limited. We brought this problem of EBDC testing to FDA's attention in our 1975 pesticide report (RED-76-42, December 4, 1975). Between October 1, 1978, and March 9, 1987, FDA's testing of food for EBDCs was limited to 154 domestic food samples of 13 food commodities as shown in att. IV. Foods that are known to have been treated with EBDCs in the United States but which have not been tested include beans, melons, pears, carrots, and peppers. For example, according to California's 1983 pesticide usage data, about 45 different food crops are treated with EBDCs, with about 80

percent of the EBDCs being used on seven crops--lettuce, almonds, onions, potatoes, tomatoes, oranges, and grapefruit. Despite the heavy use of EBDCs on these seven crops, testing for EBDCs by FDA's Los Angeles and San Francisco laboratories on these seven California crops between October 1, 1978, and March 9, 1987, was limited to 12 samples of lettuce, all in 1980. Three other crops were also tested for EBDCs--cabbage (4 samples), celery (1 sample), and spinach (1 sample).

Of even greater concern is that during this 8 1/2 year period, FDA had not tested any imported food for EBDCs. This is in spite of the fact that in two consecutive years in one FDA district alone nearly 600 samples of imported tomatoes were taken. Tomatoes are one of the crops in which EBDCs produce ETU, classified as a probable human carcinogen.

In our report, we concluded that FDA's laboratories should test food samples for pesticides that FDA has classified as requiring continuous or periodic testing when there is a likelihood that they are being used, even if this requires testing apart from the multiresidue testing. FDA is planning on taking action to address this problem.

## Testing With Multiresidue Methods Insufficient in Some Cases

According to FDA laboratory officials, most domestic food samples are generally analyzed using one of five multiresidue

methods. Our review of FDA's testing of seven domestically grown foods indicates that FDA laboratories generally did not test for pesticides that were not detected by the multiresidue method used by the laboratory. Many of these pesticides are identified by FDA as requiring continuous or periodic testing because of their potential health hazards.

The multiresidue method used by FDA's Atlanta laboratory detected those pesticides that were registered for use on oranges and grapefruit in Florida having a moderate to high health hazard potential. On the other hand, the multiresidue methods used by the Seattle, Dallas, Minneapolis, San Francisco, and Los Angeles laboratories could not detect some of the potentially harmful pesticides that are registered or used on apples, lettuce, cabbage, corn, and grapes in various states under their jurisdictions. Despite this, however, these five laboratories did not use other available methods to test these pesticides of concern.

More specifically, the multiresidue methods used by the Minneapolis laboratory could not detect 24 pesticides recommended for use on corn in Illinois. FDA classified 9 of the 24 pesticides as posing a moderate to high health hazard warranting periodic or continuous monitoring. The Minneapolis laboratory did not test for any of these pesticides on corn during fiscal year 1984. We recommended that FDA test pesticides of concern on a continuous and

periodic basis as required by its own policy. The agency agreed to do more in this area.

## Additional Serious Problems in Monitoring Imported Foods

In addition to the gaps in coverage associated with pesticides not detectable by FDA's multiresidue methods, the monitoring of imported foods for illegal pesticide residues is further hampered by inadequate information about what pesticides were being used on individual commodities in the exporting countries. Information of this kind is necessary for FDA to target its testing to cover the pesticides that are most likely used. This is especially true if there is heavy use of pesticides that are not detectable by the multiresidue tests that are normally relied upon by individual FDA laboratories.

We also found that some high volume imports are heavily sampled while others are not. Our analysis showed that many commodities that are imported on a regular basis are not being sampled at all or in some cases--as illustrated by the EBDC example--are not being sampled for pesticides of concern that are known to be used extensively on a worldwide basis.

Our review of statistics for 40 selected food commodities imported into the United States for fiscal years 1983 through 1985 showed that while all of these commodities were sampled at least

once, foods from many of the importing countries were not sampled even though they are imported year after year (see att. V). Some of these foods have not been sampled in at least 6 years. For example, cucumbers and cucumber products were imported into the United States from 50 different countries during this 3-year period and from 27 countries in each of the 3 years. However, FDA sampled shipments of cucumbers from only 9 of the 27 countries. Further analysis showed that cucumbers from 17 of these countries had not been sampled in any of the 6 years for which we had data, including the country from which the United States imported the second largest volume. During these 6 years FDA took 1,561 samples of imported cucumbers and found that about 6.9 percent of them contained illegal pesticide residues.

In another example, pineapples and pineapple products were imported into the United States from 58 different countries during this 3-year period and from 26 countries in each of the 3 years. Yet FDA sampled shipments of pineapples from only nine of the 26 countries. Further analysis showed that pineapples from eight of these countries had not been sampled in any of the 6 years for which we had data, including the country from which the United States imported the largest volume. During these 6 years FDA took 215 samples of imported pineapples and found that about 18.6 percent of them contained illegal residues.

We reported that FDA needs to better target its sampling of imported food and recommended that FDA redirect resources away from highly sampled commodities with low violation rates to provide coverage of a wide range of imported commodities and importing countries, using a comprehensive monitoring summary to assist in the analysis. FDA agreed with this recommendation and has stated it plans to develop the necessary systems to better target its sampling of imported foods.

FDA also needs to obtain information on foreign pesticide use to better determine what pesticides to test for. This information could be obtained from various sources, including pesticide sales to foreign countries, cooperative agreements with foreign countries, certifications by importers on the pesticides used during production and other available means. Our report contained these recommendations. FDA has taken a step in this direction by obtaining a study, called the Battelle World Agrochemical Bank, on pesticide usage in about 30 countries.

## DETERRING ILLEGAL PESTICIDE RESIDUES IN FOOD

Because of the small amount of food that is actually sampled and tested for pesticide residues, FDA needs to take strong actions against the violations it detects in order to maximize the deterrent capabilities of its monitoring program. For a number of reasons, FDA has not been able to prevent a majority of both the domestically grown and imported adulterated food it finds from

being marketed and consumed. Furthermore, in cases where FDA has been unable to stop the marketing of adulterated food, it generally has not taken any enforcement action against the grower or producer.

Domestic Food

Our review of 179 domestic food samples that FDA found to contain illegal pesticide residues in nine district offices between October 1, 1983, and June 30, 1985, indicated that FDA was unable to prevent the sale of the adulterated food in 107 of the 179 cases. This means that in 60 percent of the cases, adulterated domestic food identified by FDA was consumed by the American public.

FDA has not been able to prevent most adulterated food from being marketed because the food moves very quickly into the marketplace partially due to its perishablity. In many cases, the food has already been sold before FDA completes the analysis needed to confirm the presence of illegal pesticide residues. Another factor contributing to delay is that FDA lacks the authority to detain domestic food suspected of containing illegal residues while it seeks a court order to remove the food from the marketplace.

The growers and producers of adulterated food not removed from the market are not penalized for marketing adulterated food. This

is because FDA is not authorized to issue civil penalties in such cases. It is authorized to assess criminal penalties, but these are too difficult to substantiate for most pesticide-related adulteration.

In view of the difficulties that FDA faces in preventing the marketing of domestic food with illegal pesticides and the need to provide a strong deterrent to marketing such adulterated food, we urged the Congress to consider giving FDA the authority to assess civil penalties against growers of adulterated food when it is not removed from the marketplace. We also reiterated our continued support for an earlier GAO recommendation that Congress provide FDA with the authority to detain domestic food that it suspects is adulterated.

Imported Food

Our review of 164 imported food samples that FDA found to contain illegal pesticide residues in FDA's Los Angeles, Dallas, and New York districts during fiscal year 1985 indicated that FDA was unable to prevent the sale of the adulterated food in 73 of the 164 cases. (In another 23 cases, agency records did not show the disposition.) This means that in about 45 percent of the cases adulterated imported food identified by FDA was consumed by the American public. In these cases, the importers would have been directed by the U.S. Customs Service, at FDA's request, to

redeliver the adulterated food to Customs for re-export or destruction; the adulterated food was not, however, so redelivered.

Customs requires importers to post bonds when food is released to the importers before FDA has determined that their shipments comply with pesticide-residue requirements. Failure to redeliver adulterated food when directed to do so subjects the importer to forfeiture of bond up to the value of the adulterated food. Our review of FDA and Customs records for the 73 cases where the adulterated food was not recovered indicated that damages were assessed in only eight cases--that's only 10 percent.

We concluded that since only a small portion of imported food shipments are analyzed for pesticide residues, it is essential that FDA recommend the assessment of damages in order to discourage importers from distributing adulterated food. We recommended that (1) FDA request Customs to assess maximum damages against the importer for all adulterated food shipments that are not redelivered to Customs, and that (2) Customs assess and collect damages from importers in all cases where adulterated imported food is not redelivered as directed. FDA is examining its position on assessing damages against importers for all adulterated food shipments not recovered. Customs is following up on those instances where damages were recommended but not assessed.

## HEALTH RISKS RELATED TO PESTICIDE RESIDUES IN FOOD ARE UNCERTAIN

When FDA tests food for pesticide residues, it is doing so to ensure that the residue tolerances established by EPA are being complied with. As a result of EPA's assessment, pesticide residues that comply with established tolerances are presumed to pose no unreasonable risk to health. However, as we noted in our April 1986 report (RCED/GAO-86-125) on EPA's pesticide reregistration and tolerance reassessment effort, health risks related to pesticide residues in food are uncertain because EPA lacks the data with which to determine safe residue limits for many of the pesticides requiring EPA residue tolerances. It will be some time in the next century before all tolerances are reassessed. Adding to this uncertainty is the lack of data on health hazards of inert pesticide ingredients and pesticides in groundwater.

### Tolerance Reassessment

Approximately 400 pesticide chemicals are registered for food uses, with about 6,000 tolerances for residues of these chemicals on numerous crops and processed foods. Existing tolerances for about 390 of these pesticide chemicals were established without all the data EPA now requires to assess health risks of food-use pesticides according to current scientific standards. Some tolerances were set before tests for a pesticide's potential to cause cancer and genetic change were required. For example, it

will be several years before EPA can reassess tolerances for mancozeb and other EBDCs, if the agency follows the normal reregistration process. Tolerances for mancozeb were first set in 1962. Data gaps prevented EPA from fully reassessing mancozeb tolerances in its April, 1987 registration standard. (A registration standard describes what EPA knows about a pesticide, what studies are still needed, and the agency's current regulatory position.) The mancozeb registration standard identified the need for chronic toxicology and residue chemistry studies for mancozeb and its toxic metabolite, ETU. The more time-consuming chronic toxicology studies are due in about 4 years. This is only one of the approximately 390 pesticide chemicals that will undergo tolerance reassessment.

EPA plans to reassess tolerances and exemptions for about 390 older pesticides to determine whether they were set at levels that do not present a health hazard. Until these assessments are completed, EPA cannot assure the public that established residue limits adequately protect health. In our April 1986 report, we concluded that EPA's reregistration efforts would not be completed until after the turn of the century.

## Inert Ingredients Pose Additional Concerns

Another factor contributing to the uncertainty about the health risks of pesticide residues in foods is that tolerances have only been set and enforced on the active pesticide ingredients. In

addition to the active chemicals, pesticide products also contain various inert ingredients, some of which are potentially toxic to humans.

Although not active against targeted pests, inert ingredients may be used as solvents, thickeners, propellants, etc., to make pesticide products more effective or usable. Inerts range from innocuous substances such as water, sugar, and salt to highly toxic substances such as 2-methoxyethanol, a solvent that has been shown to produce adverse reproductive, and developmental toxicity effects in laboratory animals. Approximately 1,200 chemicals are registered as inert ingredients in about 50,000 pesticide formulations. About 500 are registered for use on food and were exempted from the tolerance requirement because EPA concluded that tolerances were not necessary to protect public health at the time the exemptions were approved. However, EPA has little toxicology or residue data on most food-use inerts; thus, both their toxicity and the extent of public exposure to residues in food are unknown. While EPA routinely required registrants to test pesticide formulations, including inerts, for acute toxicity (health effects from short-term exposure), it rarely required them to test inerts for chronic toxicity (effects from long-term exposure, such as cancer and genetic change).

EPA has begun to address the human health and environmental risk uncertainties of inert ingredients. This month EPA issued its

policy statement on inert ingredients in pesticide products, which outlines the agency's strategy for dealing with inerts of toxicological concern. EPA has divided the approximately 1,200 inert ingredients, currently contained in pesticide products into four toxicity categories on the basis of available hazard information: inerts of toxicological concern (57); potentially toxic inerts and inerts with high priority for testing (67); unknown toxicology concern (800); and innocuous substances (300).

EPA is encouraging registrants to use the least toxic inert ingredient available. According to it's policy statement, EPA will: (1) require data and labeling for inert ingredients that have been demonstrated to cause toxic effects, (2) pursue hearings for the 15 inerts of the greatest toxicological concern to determine whether such ingredients should continue to be permitted, (3) require data on inerts of suspected toxicological concern, and (4) subject all new inert ingredients, both for food and non-food uses, to a minimal data set and scientific review. EPA is not taking any particular regulatory actions with respect to inert ingredients of unknown toxicological concern at this time.

## Pesticides in Groundwater Lead to Exposure in Drinking Water

In addition to ingesting pesticide residues in food, many food-use pesticides are beginning to be found in groundwater; this can lead to an increased exposure through drinking water. For

instance, groundwater monitoring has identified the presence of 17 different pesticide chemicals, of which 14 are food-use pesticides. Thirteen of these are included in a group of 70 pesticide chemicals that EPA has identified as having the chemical properties that would allow them to leach into groundwater; 61 of the 70 are food-use pesticides.

EPA is taking several actions to determine the extent of pesticide contamination of groundwater and to decide on appropriate regulatory responses. The agency is developing a strategy for regulating pesticides (and fertilizers) that have the ability to reach groundwater. In addition, EPA will conduct a 50 state survey that will analyze well-water samples for the presence of over 100 pesticides. This critical survey, which will identify pesticides actually leaching into groundwater, is expected to be completed in 1989.

EPA has established environmental fate data requirements that a registrant or applicant must submit to support the registration or reregistration of a pesticide. Among the data required are a variety of studies to evaluate the leaching potential of a pesticide such as data on whether and how the pesticide moves, degrades, dissipates, or accumulates in the air, water, or soil. EPA has taken specific actions to suspend, cancel, or impose restrictions on about ten pesticides because of groundwater concerns.

Currently EPA has five pesticides under special review due, in part, to groundwater concerns. One of these pesticides is aldicarb, which is registered for use on a wide variety of field and vegetable crops, orchard crops, turf, and ornamentals. Aldicarb is an acutely toxic chemical that has been found in the groundwater in at least 15 states. EPA is currently assessing the risks and benefits posed by aldicarb and possible regulatory actions; a decision is expected later this year.

These considerable uncertainties regarding the health risks associated with chemical residues in food underlie the importance of an effective program of monitoring food for pesticide residues.

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In summary, Mr. Chairman, GAO believes that a number of changes are needed in the Federal Government's regulation of pesticide residues in food. These include expanded testing of moderate to high risk pesticides that are not covered by FDA's multiresidue tests, improved targeting of food to be sampled, and getting the adulterated food off the market or penalizing the grower when it is not removed. This concludes my prepared statement and we would be glad to respond to your questions.

ATTACHMENT I

## GAO REPORTS UPON WHICH THIS TESTIMONY IS BASED

| REPORT NUMBER | ISSUANCE DATE | TITLE |
|---|---|---|
| GAO/RCED-87-7 | October 27, 1986 | Pesticides: Need to Enhance FDA's Ability to Protect the Public From Illegal Residues |
| GAO/RCED-86-219 | September 26, 1986 | Pesticides: Better Sampling and Enforcement Needed on Imported Food |
| GAO/RCED-86-125 | April 18, 1986 | Pesticides: EPA's Formidable Task to Assess and Regulate Their Risks |

Note: A complete list of GAO reports pertaining to federal regulation of pesticide residues in food is contained in attachment VI.

## RESULTS OF FDA PESTICIDE MONITORING
## FISCAL YEARS 1979 THROUGH 1985

| | Domestic | | | Imports | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| Fiscal Year | Samples Analyzed | Samples with Illegal Residues | Violations Rate (percent) | Samples Analyzed | Samples with Illegal Residues | Violation Rates (percent) | Samples Analyzed | Samples with Illegal Residues | Violation Rates (percent) |
| 1979 | 6,758 | 265 | 3.9 | 3,635 | 225 | 6.2 | 10,393 | 490 | 4.7 |
| 1980 | 7,850 | 333 | 4.2 | 4,515 | 305 | 6.8 | 12,365 | 638 | 5.2 |
| 1981 | 7,095 | 202 | 2.8 | 4,401 | 362 | 8.2 | 11,496 | 564 | 4.9 |
| 1982 | 7,013 | 234 | 3.3 | 4,050 | 299 | 7.4 | 11,063 | 533 | 4.8 |
| 1983 | 8,513 | 310 | 3.6 | 5,190 | 245 | 4.7 | 13,703 | 555 | 4.1 |
| 1984 | 18,425 | 328 | 1.8 | 5,948 | 290 | 4.9 | 24,373 | 618 | 2.5 |
| 1985 | 11,850 | 300 | 2.5 | 5,948 | 330 | 5.5 | 17,798 | 630 | 3.5 |
| Total | 67,504 | 1,972 | 2.9 | 33,687 | 2,056 | 6.1 | 101,191 | 4,028 | 4.0 |



ATTACHMENT II

ATTACHMENT III

## CLASS I PESTICIDES

Pesticides that represent a high health hazard on a toxicological basis. Based on both demonstrated adverse effects in animals and/or humans and anticipated dietary exposure, the pesticide warrants immediate inclusion in the monitoring program on a continuing basis.

Number of pesticides in Class I 9

Number of pesticides detected by at least one multiresidue method 1

Pesticides not detected by any of the five multiresidue methods 8

- o Calcium arsenate
- o Copper arsenate
- o Lead arsenate
- o Magnesium arsenate
- o Othoarsenic acid
- o Potassium arsenite
- o Sodium arsenate
- o Sodium arsenite

ATTACHMENT III

## CLASS II PESTICIDES

Pesticides for which a high health hazard has not been demonstrated, but there is evidence of possible high risk toxicity effects combined with the potential for significant dietary exposure. The potential hazard is sufficient to warrant a temporary inclusion of the pesticide in the monitoring program as soon as possible, and to continue until exposure to the pesticide is more clearly defined or until additional toxicity data, exposure data, or EPA actions indicate assignment to a different class.

Number of pesticides in Class II 34

Number of pesticides detected by at least one multiresidue method 20

Pesticides not detected by any of the five multiresidue methods 14

- Benomyl
- Carbon tetrachloride
- Daminozide
- Mancozeb, Maneb, Metiram, and Zineb (EBDCs)
- Ethylene dibromide
- Maleic hydrazide
- Paraquat
- Pentachlorophenol
- 2,4,5-T
- Silvex
- Thiophanate-methyl

ATTACHMENT III

## CLASS III PESTICIDES

Pesticides having a moderate hazard profile, based on weighing both toxicity and dietary exposure factors. Warrants the pesticides periodic inclusion in the monitoring program over the long term due to the chance of exceeding tolerances or the acceptable daily intake.

Number of pesticides in Class III 48

Number of pesticides detected by at least one multiresidue method 37

Pesticides not detected by any of the five multireside methods 11

- o Chloroxuron
- o Cyhexatin
- o Dibromochloropropane
- o Dinoseb
- o Diuron
- o Formetanate hydrochloride
- o Picloram
- o MCPA
- o Methyl bromide
- o Oxfluorfen
- o 2,4-D

## FDA TESTING FOR EBDCS IN DOMESTIC FOOD BETWEEN FISCAL YEAR 1979 AND THE FIRST SIX MONTHS OF FISCAL YEAR 1987

| Commodity Sampled | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | Total Domestic Samples Tested For EBDCs |
|---|---|---|---|---|---|---|---|---|---|---|
| Apples | - | - | - | - | - | - | - | 8 | 23 | 31 |
| Spinach | - | 2 | - | - | 2 | - | - | 11 | 13 | 28 |
| Cabbage | - | 15 | - | 5 | - | - | 1 | - | - | 21 |
| Mushrooms | - | 7 | 4 | 3 | - | - | 7 | - | - | 21 |
| Lettuce | - | 15 | - | 3 | - | - | - | - | - | 18 |
| Tomatoes | - | 3 | - | - | - | - | - | 10 | - | 13 |
| Potatoes | - | - | - | 3 | - | - | - | 3 | 3 | 9 |
| Celery | - | 4 | - | - | - | - | - | - | - | 4 |
| Cucumbers | - | 3 | - | - | - | - | - | 1 | - | 4 |
| Collard Greens | - | 2 | - | - | - | - | - | - | - | 2 |
| Soybeans | - | 1 | - | - | - | - | - | - | - | 1 |
| Artichokes | - | - | - | 1 | - | - | - | - | - | 1 |
| Mustard Greens | - | - | - | - | - | - | - | - | 1 | 1 |
| Total | 0 | 52 | 4 | 15 | 2 | 0 | 8 | 33 | 40 | 154 |



ATTACHMENT IV

## AMPLING AND VIOLATION RATES FOR SELECTED OOD COMMODITIES EXPORTED TO THE UNITED STATES IN FISCAL YEARS 1983 THROUGH 1985

| Commodity | Total Volume (Pounds) | Total Samples | Total Violations | Violation Rate | Exporting Countries | Exporting Countries in all 3 years | Countries Not Sampled in any of the 3 years |
|---|---|---|---|---|---|---|---|
| Bananas | 17,620,058,245 | 160 | 0 | .0000 | 50 | 19 | 10 |
| Tomatoes | 3,544,578,848 | 2,210 | 10 | .0045 | 52 | 30 | 17 |
| Pineapples | 1,457,155,650 | 137 | 39 | .2847 | 58 | 26 | 17 |
| Cucumbers | 1,178,566,781 | 1,019 | 78 | .0765 | 50 | 27 | 18 |
| Onions | 749,617,017 | 147 | 0 | .0000 | 46 | 18 | 5 |
| Apples | 726,561,174 | 414 | 3 | .0072 | 40 | 18 | 4 |
| Watermelons | 684,297,859 | 178 | 4 | .0225 | 21 | 6 | 5 |
| Peppers | 602,639,198 | 1,964 | 153 | .0779 | 53 | 21 | 11 |
| Plantains | 601,223,466 | 10 | 0 | .0000 | 29 | 14 | 10 |
| Carrots | 448,696,746 | 73 | 1 | .0137 | 31 | 11 | 5 |
| Squash | 362,174,442 | 1,016 | 25 | .0246 | 14 | 5 | 0 |
| Peas | 325,518,161 | 622 | 50 | .0804 | 69 | 34 | 11 |
| Mangoes | 263,533,830 | 381 | 86 | .2257 | 44 | 18 | 8 |
| Peaches | 259,038,703 | 126 | 2 | .0159 | 42 | 16 | 9 |
| Yams/Dasheen | 251,892,819 | 24 | 0 | .0000 | 34 | 16 | 11 |
| Melons (Other) | 245,515,583 | 86 | 8 | .0930 | 39 | 21 | 9 |
| Cabbages | 211,946,334 | 291 | 42 | .1443 | 37 | 15 | 11 |
| Strawberries | 189,333,733 | 206 | 11 | .0534 | 48 | 25 | 11 |
| Beans | 186,160,891 | 806 | 51 | .0633 | 64 | 36 | 6 |
| Broccoli | 177,261,820 | 95 | 1 | .0105 | 12 | 4 | 2 |
| Waterchestnuts | 148,094,982 | 9 | 0 | .0000 | 15 | 6 | 3 |
| Pears | 129,145,747 | 104 | 6 | .0577 | 35 | 11 | 1 |
| Okra | 118,657,748 | 236 | 31 | .1314 | 16 | 5 | 1 |
| Eggplants | 109,633,888 | 314 | 16 | .0510 | 18 | 4 | 2 |
| Artichokes | 104,475,991 | 9 | 0 | .0000 | 19 | 6 | 4 |
| Garlic | 100,079,593 | 15 | 0 | .0000 | 30 | 15 | 11 |
| Tangerines | 77,579,583 | 179 | 23 | .1285 | 9 | 3 | 2 |
| Blueberries | 64,893,338 | 60 | 3 | .0500 | 18 | 11 | 8 |
| Plums | 62,646,973 | 53 | 0 | .0000 | 38 | 19 | 16 |
| Grapes | 50,682,399 | 660 | 9 | .0136 | 25 | 10 | 3 |
| Blackberries | 47,407,986 | 61 | 23 | .3770 | 23 | 3 | 1 |
| Raspberries | 46,699,672 | 2 | 0 | .0000 | 29 | 10 | 8 |
| Chinese Gooseberries | 40,897,679 | 0 | 0 | .0000 | 12 | 2 | 2 |
| Cassaba/Yuccas | 39,130,208 | 4 | 0 | .0000 | 11 | 4 | 2 |
| Chestnuts | 32,091,494 | 14 | 0 | .0000 | 21 | 9 | 6 |
| Papayas | 24,341,700 | 28 | 0 | .0000 | 37 | 13 | 7 |
| Pumpkins | 19,907,604 | 18 | 0 | .0000 | 15 | 4 | 2 |
| Cherries | 16,780,917 | 26 | 0 | .0000 | 32 | 15 | 10 |
| Endives | 15,048,922 | 42 | 0 | .0000 | 28 | 9 | 4 |
| Ginger roots | 3,689,891 | 8 | 0 | .0000 | 19 | 6 | 6 |

Source: This data was compiled by GAO staff from U.S. Bureau of Census data on import volume and FDA's Laboratory Management Data System information on commodities sampled.

ATTACHMENT VI

## LISTING OF PREVIOUS GAO REPORTS DEALING WITH PESTICIDE RESIDUES IN FOOD

| | | |
|---|---|---|
| GAO/RCED-87-7 | October 27, 1986 | Pesticides: Need to Enhance Ability to Protect the Public From Illegal Pesticides |
| GAO/RCED-86-219 | September 26, 1986 | Pesticides: Better Sampling and Enforcement Needed on Imported Food |
| GAO/HRD-86-102 | September 30, 1986 | Food and Drug Administration Laboratory Analysis of Produce Samples Needs to be More Timely |
| GAO/RCED-86 -214FS | August 29, 1986 | Pesticides: FDA's Investigation of Imported Apple Juice Concentrate |
| GAO/RCED-86-125 | April 18, 1986 | Pesticides: EPA's Formidable Task to Assess and Regulate their Risk |
| GAO/HRD-86-2 | February 18, 1986 | Food Inspections: FDA Should Rely More on State Agencies |
| GAO/HRD-84-61 | September 26, 1984 | Legislative Changes and Administrative Improvements Should Be Considered for FDA to Better Protect the Public From Adulterated Food Products |
| GAO/RCED-83-153 | September 9, 1983 | Monitoring and Enforcing Food Safety--An Overview of Past Studies |
| GAO/HRD-82-3 | December 11, 1981 | Regulation of Cancer-Causing Food Additives--Time for a Change |
| CED-82-5 | October 15, 1981 | Stronger Enforcement Needed Against Misuse of Pesticides |

ATTACHMENT VI

## LISTING OF PREVIOUS GAO REPORTS DEALING WITH PESTICIDES IN FOOD

| | | |
|---|---|---|
| CED-81-152 | September 10, 1981 | Grain Fumigation: A Multifaceted Issue Needing Coordinated Attention |
| CED-80-32 | February 15, 1980 | Delays and Unresolved Issues Plague New Pesticide Protection Programs |
| CED-79-43 | June 22, 1979 | Better Regulation of Pesticide Exports and Pesticide Residues in Imported Foods Is Essential |
| GAO/HRD-79-10 | April 17, 1979 | Problems in Preventing the Marketing of Raw Meat and Poultry Containing Potentially Harmful Residues |
| HRD-77-72 | July 5, 1977 | Food and Drug Administration's Program for Regulating Imported Products Needs Improving |
| RED-76-42 | December 4, 1975 | Federal Pesticide Registration Program: Is it Protecting the Public and the Environment Adequately from Pesticide Hazards |