

Pesticide Residue Issues in California: Is Our Food Safe?

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A NEWSWEEK GUIDE

How Safe Is Your Food?



Food Safety in Perspective

Food safety priorities of FDA and WHO

1. **Microbiological contamination**
2. **Nutritional imbalance**
3. **Environmental contaminants**
4. **Naturally-occurring toxins**
5. **Pesticide residues**
6. **Food additives**



CONSUMER CONCERNS

What type of hazard is posed by pesticide residues in foods?

- 79% Serious health hazard
- 17% Something of a hazard
- 2% Not a hazard at all
- 2% Unsure

- Source: Food Marketing Institute

Regulation – pesticide residues in foods

- US EPA registers pesticides for specific uses
 - “reasonable certainty of no harm”
 - Sets tolerances – allowable levels based on Good Agricultural Practices
- US FDA (primarily) monitors food for residues
 - “traffic cop” – more imports sampled than domestics
- States such as CA may also monitor residues
 - Findings similar to FDA findings

Violative residues

- Level exceeds tolerance (very rare)
- Residue found on commodity for which tolerance not established (more common)

Violative residues

- Level exceeds tolerance (very rare)
- Residue found on commodity for which tolerance not established (more common)
- Important point: **violations very rarely represent “unsafe” residues**
- Could indicate pesticide misuse or incidental contamination

WHAT ARE THE RISKS
FROM PESTICIDE
RESIDUES IN FOODS?

1. BEST ESTIMATES OF DAILY HUMAN DIETARY EXPOSURE TO PESTICIDES



= X

2. MULTIPLY HUMAN EXPOSURE LEVELS BY 10,000 TIMES



3. FEED 10,000 X DAILY TO
LABORATORY ANIMALS
THROUGHOUT THEIR LIFETIMES

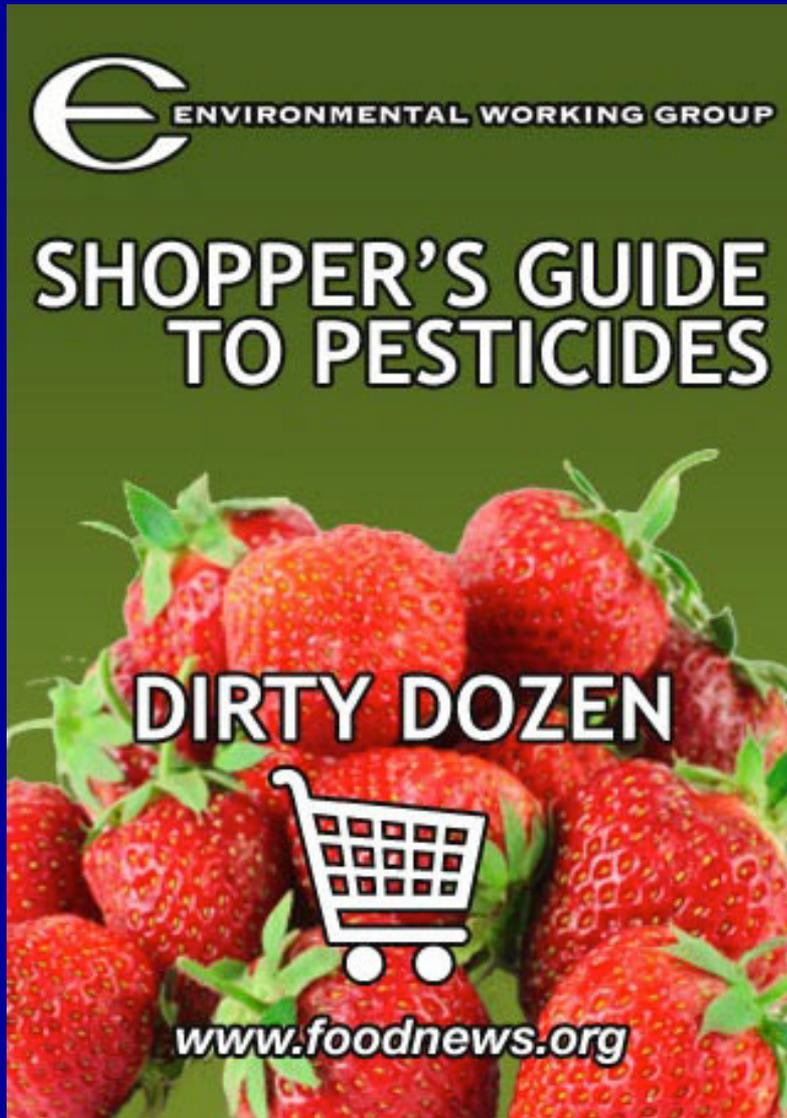


4. WHAT HAPPENS TO THE ANIMALS?



**NO ADVERSE EFFECTS
ARE OBSERVED**

2016: Dirty Dozen List



Strawberries

Apples

Nectarines

Peaches

Celery

Grapes

Cherries

Spinach

Tomatoes

Sweet Bell Peppers

Cherry Tomatoes

Cucumbers

MAJOR RECOMENDATIONS

- Eat lots of fruits and vegetables (conventional and organic)
- Consumers should consider purchasing organic forms of the “Dirty Dozen” commodities
- If not purchasing organic foods, consumers should select conventional forms of the “Clean Fifteen” as replacements for the “Dirty Dozen”

Is EWG Methodology Scientific?

EWG indicators

- Percentage samples with detectable residues
- Percentage samples, 2 or more residues
- Avg. number of pesticides found on single sample
- Average amount of all pesticides found
- Maximum number of pesticides found on commodity
- Total number of pesticides found on commodity

Normal risk assessment parameters

- **Amounts** of pesticide residues found
- **Amounts** of food items consumed
- **Toxicity** of the pesticides

Research Article

Dietary Exposure to Pesticide Residues from Commodities Alleged to Contain the Highest Contamination Levels

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Probabilistic techniques were used to characterize dietary exposure of consumers to pesticides found in twelve commodities implicated as having the greatest potential for pesticide residue contamination by a United States-based environmental advocacy group. Estimates of exposures were derived for the ten most frequently detected pesticide residues on each of the twelve commodities based upon residue findings from the United States Department of Agriculture's Pesticide Data Program. All pesticide exposure estimates were well below established chronic reference doses (RfDs). Only one of the 120 exposure estimates exceeded 1% of the RfD (methamidophos on bell peppers at 2% of the RfD), and only seven exposure estimates (5.8 percent) exceeded 0.1% of the RfD. Three quarters of the pesticide/commodity combinations demonstrated exposure estimates below 0.01% of the RfD (corresponding to exposures one million times below chronic No Observable Adverse Effect Levels from animal toxicology studies), and 40.8% had exposure estimates below 0.001% of the RfD. It is concluded that (1) exposures to the most commonly detected pesticides on the twelve commodities pose negligible risks to consumers, (2) substitution of organic forms of the twelve commodities for conventional forms does not result in any appreciable reduction of consumer risks, and (3) the methodology used by the environmental advocacy group to rank commodities with respect to pesticide risks lacks scientific credibility.

OUR METHODOLOGY

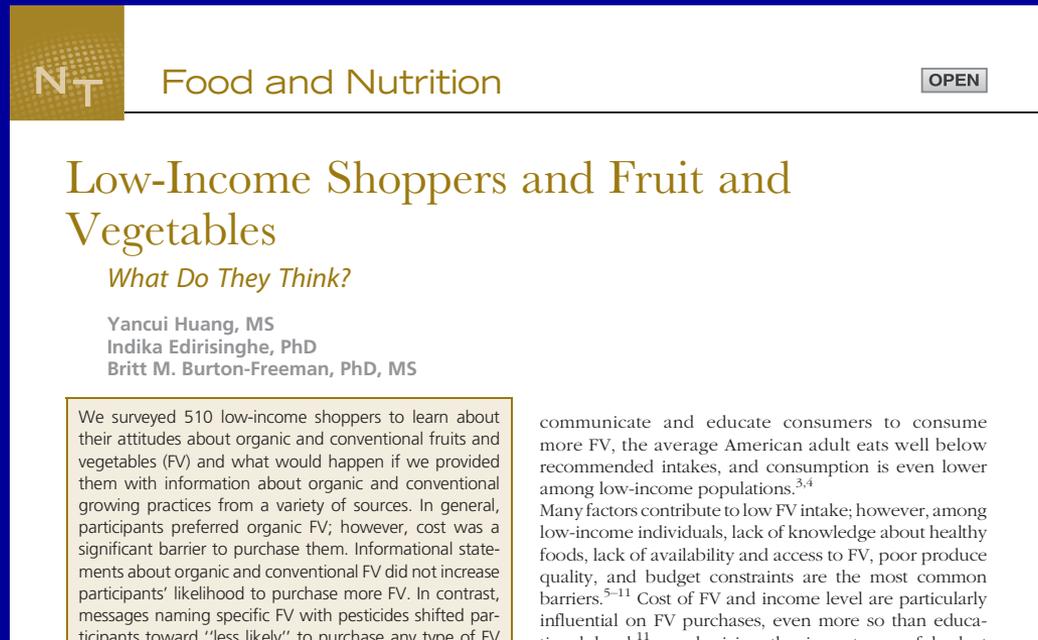
- Looked at 10 most frequently detected pesticides, according to most recent year of PDP data, on each of the 12 “Dirty Dozen” commodities
- Performed exposure assessments
- Compared exposures with EPA reference doses

MAJOR FINDINGS

- No exposures of the ten most frequently detected pesticides on any of the “Dirty Dozen” commodities were anywhere near Reference Doses
- Only 7 of the 120 exposures exceeded 0.1% of the Reference Dose
- 75 percent of exposures less than 0.01% of Reference Dose (one million times lower than doses that cause no effects in laboratory animals)

Unanticipated consequences?

- Recent research – Illinois Institute of Technology
- Low income consumers and their fruit and vegetable purchasing preferences



The screenshot shows a research article page. At the top left is the 'NT' logo. The page title is 'Food and Nutrition' with an 'OPEN' button to its right. The article title is 'Low-Income Shoppers and Fruit and Vegetables' with the subtitle 'What Do They Think?'. The authors listed are Yancui Huang, MS; Indika Edirisinghe, PhD; and Britt M. Burton-Freeman, PhD, MS. The abstract text is partially visible, starting with 'We surveyed 510 low-income shoppers to learn about their attitudes about organic and conventional fruits and vegetables (FV) and what would happen if we provided them with information about organic and conventional growing practices from a variety of sources. In general, participants preferred organic FV; however, cost was a significant barrier to purchase them. Informational statements about organic and conventional FV did not increase participants' likelihood to purchase more FV. In contrast, messages naming specific FV with pesticides shifted participants toward "less likely" to purchase any type of FV'.

NT Food and Nutrition OPEN

Low-Income Shoppers and Fruit and Vegetables

What Do They Think?

Yancui Huang, MS
Indika Edirisinghe, PhD
Britt M. Burton-Freeman, PhD, MS

We surveyed 510 low-income shoppers to learn about their attitudes about organic and conventional fruits and vegetables (FV) and what would happen if we provided them with information about organic and conventional growing practices from a variety of sources. In general, participants preferred organic FV; however, cost was a significant barrier to purchase them. Informational statements about organic and conventional FV did not increase participants' likelihood to purchase more FV. In contrast, messages naming specific FV with pesticides shifted participants toward "less likely" to purchase any type of FV

communicate and educate consumers to consume more FV, the average American adult eats well below recommended intakes, and consumption is even lower among low-income populations.^{3,4} Many factors contribute to low FV intake; however, among low-income individuals, lack of knowledge about healthy foods, lack of availability and access to FV, poor produce quality, and budget constraints are the most common barriers.⁵⁻¹¹ Cost of FV and income level are particularly influential on FV purchases, even more so than education.¹¹ Educational interventions that focus on how to

Unanticipated consequences?

- “An environmentalist group called the Environmental Working Group has developed a list of 12 fresh fruits and vegetables they say have the highest levels of pesticide levels on average: apples, bell peppers, carrots, celery, cherries, grapes, kale, lettuce, nectarines, peaches, pears, and strawberries”
- 15% (n=510) responded that based on this information, they would be **less** likely to purchase fruits and vegetables
- Source: Huang, et al., *Nutrition Today*, 51(5): 242-250, 2016.

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