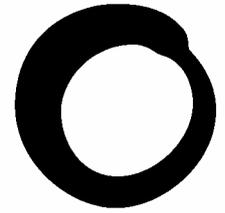


August 2004



**Friends of  
the Earth**

# Briefing

## The pesticides in our food

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## Introduction

**To produce our food most farmers use chemical pesticides to control weeds, pests and diseases, and to help them meet the appearance standards imposed by supermarkets. Residues from these pesticides may still be in the food when we buy it - about half of all fruit and vegetables tested by the Government contain residues.**

Every year the Government's Pesticide Residues Committee (PRC) tests a small proportion of the food sold in our shops for pesticide residues. Since 1998 around 100 different types of pesticide residue have been found in the various fruit and vegetables tested. The Government sets legal limits on the levels of these pesticides that can be present in food - the Maximum Residue Level (MRL) - see box below for more information. In 2001, 1.5 per cent of fruit and vegetables tested had pesticide residues that exceeded the MRLs.

### Safety Levels

The **Maximum Residue Level** (MRL) is the legal level of pesticide residue that can be present in food. Foods containing residues that comply with the MRL are "*toxicologically acceptable*"<sup>i</sup>. Exceeding the MRL can indicate over-use of pesticides but it is **not** regarded as a safety level.

Safety levels are set for short term and long term exposure - the **ARfD** and the **ADI**. The **Acute Reference Dose** (ARfD) is the safety level for a single exposure and the **Acceptable Daily Intake** (ADI) is the safety level for exposure over the lifetime. These are sometimes exceeded. In 2001, samples of nectarines, peaches, lettuces and potatoes had levels of pesticide residues that exceeded ARfDs, while samples of soft citrus fruit, grapefruit and tomatoes had levels of pesticides that exceeded ADIs. In all these cases the PRC concluded that there was no concern for human health, although "safety margins were eroded"<sup>ii</sup>

However, 20 per cent of fruit and vegetables sold in supermarkets contain more than one type of pesticide residue. Very little research has been conducted on the safety of these pesticide mixtures, but some studies have highlighted potential risks to the immune system or behavioural changes<sup>iii</sup>. Recently Dr Ian Brown, the Chair of the PRC admitted that he was "*particularly worried*" about the potential risks where food was contaminated by several similar pesticides, such as different forms of organophosphate pesticides, which could combine to create a "*cocktail effect*" He admitted that there was "*cause for concern*" about the threat to young children being exposed to pesticide residues in food<sup>iv</sup>.

There is also growing concern about the presence in food of endocrine disrupting chemicals, or "gender bender" pesticides which can disrupt hormone levels and are suspected of being linked to declining sperm counts and increased rates of breast and testicular cancers<sup>v</sup>. It is thought that these substances can cause problems at very low doses<sup>vi</sup>. A particular worry here is the potential for interactive effects between these substances, which can come from many other sources as well as pesticide residues. For example, hormone disrupting chemicals are found in household items, including plastics used for children's toys and in toiletries.

## Pesticides in our food

The table below shows the levels of pesticide residues found in supermarket fruit and vegetables in Government tests from 1998 to 2003, and the proportion that contained multiple residues. The levels of pesticide residues vary considerably between different fruit and vegetables. For example, all of the supermarket soft citrus fruits tested contained some form of residue but none of the cauliflower contained any residues at all. In the case of soft citrus fruit, 96 per cent contained more than one pesticide residue. The PRC claims that most residues in citrus fruit are in the peel<sup>vii</sup>, but as it does not actually test the fruit and peel separately this is not proven.

### **Pesticide residue results from 1998-2003 based on supermarket produce**

<b>Fruit/Vegetable</b>	<b>Percentage containing pesticide residue</b>	<b>Percentage containing more than one pesticide</b>	<b>Number of samples tested</b>
Soft citrus	100	96	57
Oranges	98	82	123
Strawberries	70	42	175
Celery	70	22	158
Pear	66	31	469
Melon	54	17	107
Apple	49	22	795
Grapes	47	17	266
Potato (main crop)	47	15	354
Lettuce	44	24	352
Peach	43	24	86
Cucumber	30	10	172
Spinach	30	5	198
Carrot	29	6	309
Tomato	21	6	135
Mushroom	16	1	96
Sweet peppers	11	5	190
Cabbage	11	4	53
Peas	10	0	61
Courgette	5	4	57
Cauliflower	0	0	107

## Types of pesticides present

Some of the pesticides we find on our fruit and vegetables are of more concern than others and some are potentially harmful to our health. Aldicarb, carbendazim and vinclozolin are three pesticides that have appeared in the testing results in recent years and for which Friends of the Earth has been calling for a ban. And there are many other substances which are a growing cause of concern.

### **Aldicarb**

Aldicarb is a carbamate pesticide which acts as a nerve poison by disrupting nerve impulses. It is classified by the World Health Organisation (WHO) as “*extremely hazardous*”. It has been banned in Sweden, and the Netherlands has banned it from use in all catchment areas for drinking water supply<sup>viii</sup>. At least 30 people were poisoned in Ireland in 1992 after eating cucumbers contaminated with aldicarb<sup>ix</sup>.

Aldicarb is used to kill insects and nematodes on crops. It is applied to the soil, but is taken up by the plant roots and circulated around the whole plant, so peeling does not make much difference to residue levels. Although usage of aldicarb in the UK has declined since the early 1980s, it is still widely used on potatoes, and is also used on carrots and parsnips.

Since 1998 residues of aldicarb have been found in both new and main crop potatoes and carrots from the UK and overseas. Three per cent of potatoes sampled from 1998 to 2001 contained residues of aldicarb<sup>x</sup>. In a special survey in 1999<sup>xi</sup>, sampling 1000 individual potatoes, the level of residues varied between potatoes by up to twelve times. The levels in some samples exceeded the MRL, with a sample of microwaved potatoes containing such a high level that they exceeded the safety standard for toddlers and infants (the Acute Reference Dose). They had a high enough level to cause immediate health effects in young children eating them.

Aldicarb is a broad spectrum insecticide, so it kills beneficial insects as well as pests. It is dangerous to game, wild birds and animals, fish and other aquatic life<sup>xii</sup>. It has been estimated that one granule of aldicarb product may be enough to kill a small bird<sup>xiii</sup>.

### **Vinclozolin**

Vinclozolin is a proven hormone disrupter, often referred to as ‘gender benders’ because of the effects they can have. Vinclozolin causes anti-androgenic (‘anti-maleness’) effects, by binding to the natural male hormone receptors in the body. While there is currently no direct evidence that exposure to hormone disrupters causes reproductive effects in humans, very few studies have attempted to look for this evidence. However, there is strong evidence to link exposure to effects on wildlife<sup>xiv</sup>. The US Environmental Protection Agency (EPA) is committed to phasing out most uses of vinclozolin because of concern with additive impacts, as vinclozolin may share a common mechanism of toxicity with other fungicides such as procymidone and iprodione<sup>xv</sup>.

Vinclozolin is registered in the UK as a fungicide for use on oilseed rape, apples, peas and beans. It is used worldwide on vines, fruit and vegetables.

Since 1998 vinclozolin has been detected on imported celery, strawberries, kiwi fruits, grapes, carrots, green beans, raspberries and lettuce. It has also been found on UK

tomatoes, strawberries, peas and lettuce<sup>xvi</sup>.

Vinclozolin is harmful to fish and aquatic life<sup>xvii</sup>, and there is a potential risk to breeding birds from the use of this pesticide<sup>xviii</sup>. More research is needed into the wider impact of all endocrine disrupting chemicals on the environment.

## Carbendazim

Carbendazim is a suspected hormone disrupting chemical, as well as a possible human carcinogen. It is registered in the UK for use on beans, apples, mushrooms, oilseed rape, barley, winter wheat and winter rye, and for off-label use (approved but not endorsed by the manufacturer) on celery, lettuce, blackberries, loganberries, raspberries, tomatoes, pears and cucumbers.

Since 1998 carbendazim has been detected on UK apples, blackberries, cabbages, cucumbers, lettuce, mushrooms, pears, plums and tomatoes, and on imported apples, celery, cherries, currants, raisins, sultanas, grapes, lemons, mangetout, mango, melon, mushrooms, nectarines, peaches, passion fruit, oranges, pears, strawberries, sweet potatoes, yams and soft citrus fruit (e.g. satsumas). From 1998 to 2003 it has been found on 8 per cent of supermarket apples, 6 per cent of supermarket celery and 17 per cent of supermarket pears tested. MRLs have been exceeded in yams, celery, blackberries, passion fruit and mangos. Carbendazim has also been detected in processed products such as canned fruit, fruit squash and fruit juice.

Carbendazim is harmful to fish and other aquatic life<sup>xix</sup>. As a hormone disrupter, carbendazim may cause harm to wildlife populations. More research is needed into its effects.

## Chlorpyrifos

Chlorpyrifos is one of the world's most used insecticides in terms of volume. It is an organophosphate insecticide that kills insects by disrupting their nervous systems and is effective against a wide range of plant-eating insects. Suspected effects of chlorpyrifos exposure include birth defects, nervous system disorders, and increased rates of leukemia and immune system abnormalities<sup>xx</sup>.

### "Anticholinesterase review programme"

All organophosphate and carbamate pesticides (anticholinesterase compounds) approved under the Control of Pesticides Regulations have been under review in the UK since 1998. They were chosen for review because of concern about both short and long term exposure. The review is re-assessing the risks they pose to consumers, workers and the environment. Of the UK approved organophosphate and carbamate pesticides found in recent food surveys, nine are being supported for review, while ten are being withdrawn<sup>xxi</sup>.

In 2000 the US Government announced restrictions on the use of chlorpyrifos after conducting "*the most extensive scientific evaluation ever conducted on the potential health hazards from a pesticide*". The pesticide is now banned in home and garden products and severely restricted in farming in the USA. EPA Administrator Carol Browner said "*It is clear*

*the time has come to take action to protect our children from exposure to this chemical*<sup>xxii</sup>. However, the UK Government has yet to follow suit.

Chlorpyrifos is approved for use in the UK for apples, gooseberries, pears, plums, raspberries, strawberries, broccoli, cabbages, cauliflower, Brussels sprouts, chinese cabbage, currants, barley, oats, wheat, carrots, potatoes, onions, maize and sugar beet, with off label approval for kohlrabi, mooli, radishes, collards, kale and green beans.

From 1998 to 2003, chlorpyrifos residues have been found on UK apples, redcurrants, and plums, and on imported apples, oranges, spinach, grapes, broccoli, pears, kiwi fruit, grapefruit, lemons, raspberries and soft citrus. It was found on 16 per cent of supermarket apples and 33 per cent of supermarket soft citrus fruit tested.

Chlorpyrifos is relatively non-persistent in the environment. However, aquatic invertebrates, particularly crustaceans and insect larvae are sensitive to exposure<sup>xxiii</sup>.

## Other pesticides of concern

There is a growing list of pesticides that are suspected of being endocrine disrupters, many of which can be found on our food. Pesticides that have been found in recent surveys that are suspected of having hormone disrupting properties include 2,4-D, dicofol, endosulfan, iprodione, malathion and parathion, as well as dithiocarbamates, a class of chemicals that contains suspected endocrine disrupters<sup>xxiv</sup>. These pesticides have been found on oranges, grapefruit, soft citrus fruit, lemons, apples, tomatoes, strawberries, mangetout, grapes, melons, sweet peppers, aubergine, lettuce, pears, carrots, peaches, nectarines, spinach, spring onions, redcurrants, broccoli, kiwi fruit, courgettes, blackberries, blackcurrants, celery, passion fruit, cucumber and mango.

## Children's food

It is recommended that adults and children eat five portions of fruit and vegetables per day. Friends of the Earth agrees that eating plenty of fruit and vegetables is essential for good health, but we also believe that we should not have to eat pesticides with them.

It is now normal for children to be exposed to pesticides from the moment they are conceived, and yet very little is known about the possible long term impacts this could have on their health and development. Under UK law, the maximum limit for pesticides in milk formula and baby food is set at the extremely low level of one part in 100 million. This level is so low that it effectively means that there must not be any residues present. However, this only applies to processed baby foods. The first solid food for one in five babies is puréed fruit or vegetables<sup>xxv</sup>, and by 18 months only four per cent of children are still eating processed baby foods<sup>xxvi</sup>. We should ensure that all children are protected.

Popular children's fruit and vegetables such as apples, pears, oranges and carrots are regularly found to contain a cocktail of pesticide residues. 16 per cent of apples contain chlorpyrifos, and 22 per cent contained more than one type of pesticide. 17 per cent of pears contain carbendazim, 17 per cent contain dithiocarbamates, and 31 per cent contained multiple residues. 54 per cent of oranges contained 2,4-D, 10 per cent chlorpyrifos, and 82 per cent contained multiple residues. 21 per cent of carrots contained iprodione.

It is not just fruit and vegetables that contain pesticide residues. Lindane, a hormone disrupting pesticide that is now banned throughout Europe, is still found in chocolate due to use on imported cocoa beans. Lindane residues have also shown up in milk, beef, cheese and mushrooms in recent years due to the persistence of this pesticide.

Surveys of processed foods popular with children have also been carried out in recent years. In 2001 71 per cent of cereal bars were found to contain residues including iprodione, a suspected hormone disrupter, while 28 per cent of breakfast cereals and 45 per cent of crisps contained residues.

## Take Action

### Friends of the Earth is calling for:

1. The law restricting pesticides in baby food to be extended to all food.
2. Because this will take time to implement, as a first step legislation should be extended to those foods, such as apples, pears and bananas, that infants eat most.
3. A ban on those pesticides with most evidence of harm, such as endocrine disrupting pesticides.
4. Retailers to take steps, ahead of legislation, to prohibit the use of the most risky pesticides and ensure that the food they sell is free from pesticide residues. Friends of the Earth has already worked with Marks and Spencer, the Co-op and Waitrose to develop their pesticide policies.
5. Effective monitoring to ensure that food is not being sold that contains pesticides.
6. The government to provide funding for research into alternatives to chemical pesticides, as well as free advice to farmers on the alternatives to using pesticides.

## Other Friends of the Earth briefings on pesticides

Into the Mouths of Babes - Pesticides in the diet and our children's health - Mar 2002

[http://www.foe.co.uk/resource/briefings/mouths\\_babes.pdf](http://www.foe.co.uk/resource/briefings/mouths_babes.pdf)

Endocrine Disrupting Pesticides - European Priority List - Feb 2000

[http://www.foe.co.uk/resource/briefings/endocrine\\_european\\_list.pdf](http://www.foe.co.uk/resource/briefings/endocrine_european_list.pdf)

Pesticides in Supermarket Foods - Feb 2002

[http://www.foe.co.uk/resource/briefings/pesticides\\_supermkt\\_food.pdf](http://www.foe.co.uk/resource/briefings/pesticides_supermkt_food.pdf)

Endocrine Disrupting Pesticides - Oct 1999

[http://www.foe.co.uk/resource/briefings/endocrine\\_disrupting.html](http://www.foe.co.uk/resource/briefings/endocrine_disrupting.html)

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