



# Fruit, vegetables and agricultural chemicals: 2023 monitoring survey



Eating fruit and vegetables is essential for a healthy diet, but how do we know they are free from harmful chemicals and safe to eat?



## Background

The Australia New Zealand Food Standards Code (FSC) sets legal requirements for the labelling, composition, safety, handling, and primary production and processing of food in Australia. The FSC defines 'maximum residue limits' (MRLs) for agricultural and veterinary (Agvet) chemicals permitted on specific foods. Foods that comply with the MRL indicate they have been grown using good agricultural practice. A food cannot legally be sold if it contains an Agvet chemical residue where there is no defined MRL or where the MRL is exceeded.

The Australian Pesticides and Veterinary Medicines Authority (APVMA) is the statutory authority responsible for the regulation of Agvet chemicals and sets the MRLs at levels that are not likely to be exceeded if the chemicals are used in accordance with approved label instructions. The MRLs are set for a specific Agvet chemical on a specific commodity, at a level to ensure the safety of food. At the time the MRLs are set, the APVMA, Food Standards Australia New Zealand and Australian statutory authorities undertake dietary exposure evaluation to ensure the MRLs do not pose undue risk to human health, including how much of the food is eaten in the average diet, how toxic the Agvet chemical is and how easily the food absorbs the chemical.

In Australia, there are over 10,000 registered Agvet products, and ensuring their safe use and the sale of safe and suitable food is a complex task that involves multiple government agencies and legislation. In WA, the Department of Health, local government and the Department of Primary Industries and Regional Development (DPIRD) work together to monitor residue levels. Since 1988, regular surveys to assess the level of agricultural chemical residues on fresh fruit and vegetables have been conducted under the WA Food Monitoring Program managed by the Department of Health.

## Survey purpose

1. Monitor the level of Agvet chemical residues on fresh fruit and vegetables at retail sale for compliance with Standard 1.4.2 – Maximum Residue Limits under the FSC
2. Work with local government and DPIRD to investigate non-compliance
3. Share monitoring data with regulatory agencies to inform Agvet legislation and policies where appropriate

## Survey scope

Businesses	Samples	Chemical analytes
Large retail stores throughout Perth metropolitan area	Apples Bananas Beans Carrots Garlic Grapes Nectarines Onions Oranges Potatoes Strawberries Tomatoes	2,4-D, Acephate, alpha-Endosulfan, Azinphos methyl, Azoxystrobin, beta-Endosulfan, Bifenthrin, Captan, Carbaryl, Carbendazim, Chinomethionat (oxythioquinox), Chlorpyrifos, Cyhalothrin, Cypermethrin, Cyprodinil, Diazinon, Dichlorvos, Dicofol, Dimethoate, Diphenylamine, Endrin, Ethephon, Fenamiphos, Fenthion, Fipronil, Fluazifop-p-butyl, Flusilazole, Imazalil, Imidacloprid, Indoxacarb, Iprodione, Malathion, Metalaxyl, Methamidophos, Methidathion, Methiocarb, Methomyl, Mevinphos, Myclobutanil, Parathion Methyl, Pendimethalin, Permethrin, Phorate, Piperonyl Butoxide, Pirimicarb, Prochloraz, Propargite, Propiconazole, Prothiofos, Pyrimethanil, Spirotetramat, Fluvalinate, Tebuconazole, Tetradifon, Thiabendazole, Triadimefon, Triadimenol, Triforine

### Sample collection

Each survey focuses on different supply and distribution chains to identify potential food safety risks and ensure compliance. In 2017, samples were collected from major fresh produce distribution centres, while in 2020, samples were collected from farm gates and local markets where growers sell directly to the public. From March to June 2023, *Food Act 2008* authorised officers from the Department of Health purchased samples from large retail stores located throughout the Perth metropolitan area.

### Chemical and commodity selection

The criteria considered for selection include Agvet chemicals in current use, chemical residues commonly found in fruit and vegetables from previous surveys, commonly consumed commodities, seasonal availability, and laboratory analytical capability and costs.

### Laboratory testing

Samples are analysed by the ChemCentre, a NATA accredited facility approved for conducting analyses under the *Food Act 2008*. ChemCentre's Quality Management System and accredited methodology comply with all relevant clauses of ISO/IEC 17025 and meet the principles of ISO 9001.

### Assessing test results

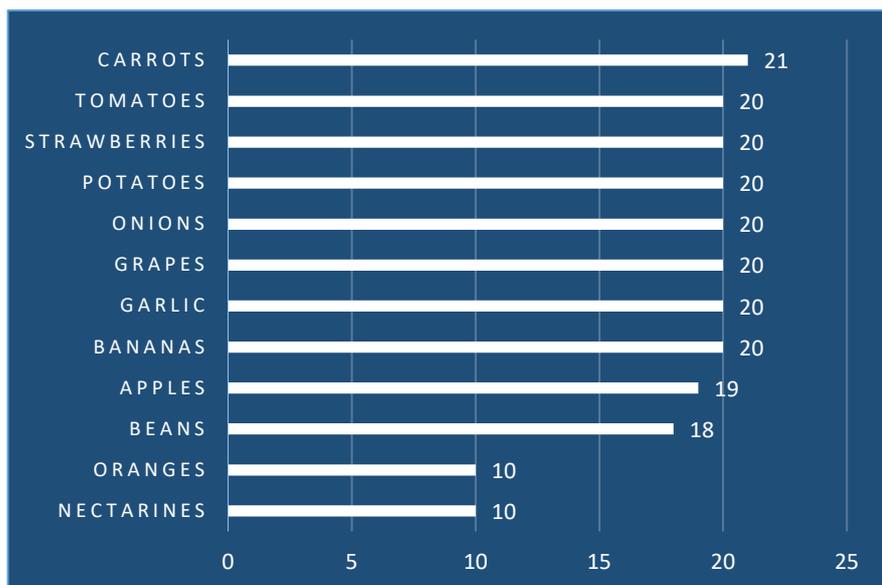
Non-compliance is determined when a chemical residue is detected where there is no set MRL for the commodity analysed, or when the chemical residue is permitted but exceeds the MRL. However, since MRLs are set well below the level that would be harmful, low-level exceedance of an MRL or low-level detection of registered Agvet chemical products that do not have an MRL for the food analysed, does not necessarily mean the food is unsafe.

### Investigation of non-compliance

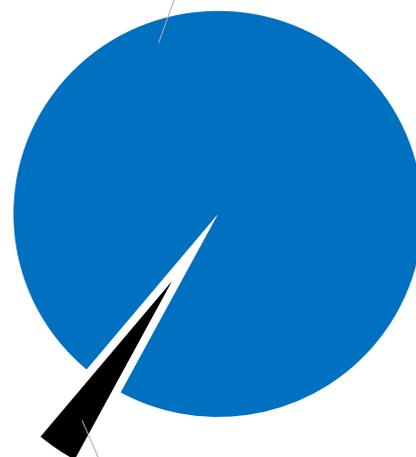
Investigation to determine the cause of contamination and corrective actions required, are carried out by relevant local government *Food Act 2008* authorised officers. Investigation can occur from the retail store, distribution centre or on-farm where required.

## Summary of results

### Samples analysed (n = 218)



97% Compliant (n = 211)



3% Non-compliant (n = 7)

Commodity	Chemical analyte	Maximum residue limit (MRL)	Concentrations detected in samples	Number of samples exceeding MRL
	Fipronil	0.01mg/kg	0.05 mg/kg	1
	Chlorpyrifos	0.01mg/kg*	0.02 mg/kg	3
	Dichlorvos	0.01 mg/kg	0.02 - 0.03 mg/kg	3

\* Temporary maximum residue limit set at the limit of determination

## Key findings

### 1. Food safety risks are low

Food safety risks associated with Agvet chemical residues on fresh fruit and vegetables are low:

- A total of 218 samples of fruit and vegetables purchased from large retail stores was analysed for residue levels of 58 chemical analytes
- Compliance was high at 97% for 211 samples which is consistent with previous surveys. While non-compliance was identified at 3%, all seven samples were only marginally above the MRLs. Food standards provide a large margin of safety, so these exceedances are not likely to represent an increased risk to public health and safety.

### 2. Industry food safety programs are effective

Industry compliance with MRLs permitted on fresh fruit and vegetables are managed appropriately:

- Major fruit and vegetable suppliers are operating under industry-based food safety schemes with quality assurance or food safety programs
- All non-compliant results were investigated by the relevant local government and corrective actions taken in accordance with procedures under the food safety program