

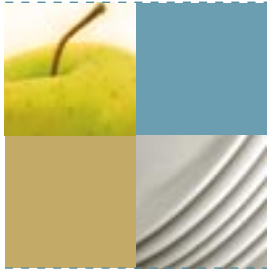


FOOD SURVEILLANCE

AUSTRALIA NEW ZEALAND

Food Standards Australia New Zealand

Autumn/Winter 2003



Chemical Residues and Contaminants Special Edition

Editorial

Monitoring of residues of agricultural and veterinary chemicals and environmental contaminants

Residues of agricultural and veterinary chemicals and environmental contaminants in food are monitored in both Australia and New Zealand. This is done at different levels of government. This edition of Food Surveillance ANZ brings together several articles showing the variety of surveys being undertaken to monitor differing aspects of the food-supply chain.

At a national level in Australia, the Commonwealth of Australia undertakes surveys such as the Australian Total Diet Survey and the Australian National Residues Surveys. Individual industries, such as the Australian Dairy Industry, monitor agricultural and veterinary chemicals in their Australian Milk Residue Analysis Survey.

At the State and Territory level, monitoring of produce for chemical residues tends to focus on local produce and provides state specific data. In some cases State and Territory Governments work closely with industry groups to undertake this work. Articles in this issue on the Victorian Produce Monitoring Program and the Pesticide Residue Survey in NSW are working examples of this type of monitoring work. The Victorian and NSW programs are similar to the Pooraka Food Care Project that appeared in our Spring/Summer edition: *Food Standards Australia New Zealand: Spring Summer 2002*.

In New Zealand a total diet survey is carried out every six years. The New Zealand Food Safety Authority is undertaking the next New Zealand Total Diet Survey in 2003/2004 to assess the health implications of, and estimates the potential dietary exposure to, selected pesticides, contaminants and nutrient elements in the New Zealand food supply. More information can be found at: <http://www.nzfsa.govt.nz/publications/media-releases/2003/2003-03-25-food.htm>. Information about the 1997/98 New Zealand Total Diet Survey can be found at: <http://www.moh.govt.nz/moh.nsf/>.

The Role of Maximum Residue Limits

Chemicals in food

To produce high-quality, low-cost food, farmers may use chemicals to control crop attack by insects, disease and weeds and to maintain healthy farm animals. Residues from these chemicals can find their way into the food supply. In other cases, some chemicals that may have been used in the past, but have now been banned may persist in the environment. These include the environmentally persistent chlorinated organic insecticides such as DDT and dieldrin.

Within Australia, the Australian Pesticides and Veterinary Medicines Authority (APVMA), formerly the National Registration Authority for Agricultural and Veterinary Chemicals (NRA), and Food Standards Australia New Zealand (FSANZ) ensure that the use of chemical products and any subsequent chemical residues in food are safe for human consumption.

New Zealand has its own separate and independent system of regulating the use of chemicals in primary production.

Agricultural and veterinary use of chemicals in Australia

Before an agricultural or veterinary product can be used in Australia, its use and sale must be approved by the APVMA. The APVMA approves the conditions for use of chemicals by primary producers. These conditions are enforced by State and Territory agriculture or environment agencies through relevant state regulations controlling chemical use.

The APVMA also sets levels at which residues of chemicals are allowed to be present in the final food. These levels are expressed as maximum residue limits (MRLs)- the highest residue that could result from using the chemical in the manner approved by the APVMA. The APVMA sets MRLs after a thorough examination of scientific data associated with the chemicals and residue trials, assessment of occupational health and safety aspects of usage, and after considering the results of exposure assessment studies. The concentration is expressed in milligrams per kilogram (mg/kg) of the food.

MRLs are not direct public health limits. This means that MRLs are normally set at levels well below those that would cause an adverse health effect. MRLs act to protect public health and safety by ensuring that residues are no higher than is necessary for effective control of pests and disease. Exceeding the MRL may be an indication that a chemical has been misused. When incorporated into food legislation, the MRL is the highest concentration of a chemical residue that is legally permitted or accepted in a food.

Safety of chemical residues in food

The APVMA notifies FSANZ of new or changed MRLs so that they can be considered for listing in the *Food Standards Code*. This listing is necessary before the treated produce containing residues can be legally sold in Australia.

An MRL does not indicate the amount of a chemical that is always present in a treated food, but it does indicate the highest residue that is legally allowed. Typically residues in food are far lower than the MRL.

Before FSANZ approves an MRL for listing in the Code, it must be satisfied that the residues of the chemicals do not represent an unacceptable risk to public health and safety. FSANZ will not approve a variation of the *Food Standards Code* to include an MRL if the estimated dietary intake of chemical residues (dietary exposure) by consumers shows an unacceptable risk to human health.

In their assessments, the APVMA and FSANZ consider the dietary exposure of consumers to chemical residues from all foods in the diet by comparing the dietary exposure with the relevant health standard. The APVMA and FSANZ conduct these dietary exposure

assessments according to internationally accepted practices and procedures.

Changes to maximum residue limits

Maximum residue limits for chemicals in foods are listed in Standard 1.4.2 of Volume 2 of the *Food Standards Code*. If an MRL for a chemical residue is not listed for a certain food, there must be no detectable residue of that chemical in the food.

MRLs need to be altered from time to time, reflecting the changing patterns of agricultural and veterinary chemicals available to farmers. Such changes arise from the development of new chemical products and crop uses and the withdrawal of older products. FSANZ must be satisfied that any changes to the residues arising from the use on which the MRLs are based, do not represent an unacceptable risk to public health and safety before approving a variation to the MRL in the *Food Standards Code*.

All changes to the *Food Standards Code* require scrutiny through a public consultation process. Proposed changes to MRLs are outlined in reports posted on the FSANZ website and comments invited from interested

individuals and organisations. Only after submissions have been considered, and changes made where appropriate, are the proposed changes approved by FSANZ and referred to the Ministerial Council for review.

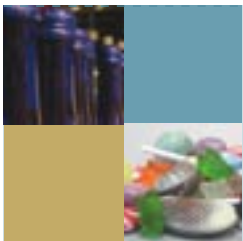
MRLs for New Zealand

Food produced in New Zealand must comply with the New Zealand (Maximum Residue Limits of Agricultural Compounds) Mandatory Food Standard 1999. Under the Trans Tasman Mutual Recognition Arrangement (1998), food produced in New Zealand that complies with the New Zealand MRL regulations can be legally sold in Australia. Similarly, food produced in Australia that complies with MRLs in the *Food Standards Code* can be legally sold in New Zealand.

For more information

Visit the APVMA website: www.apvma.gov.au.

Read about agricultural and veterinary chemical regulation in New Zealand using the following link: <http://www.nzfsa.govt.nz/acvm/index.htm>



Australian Milk Residue Analysis Survey



The Australian Milk Residue Analysis (AMRA) Survey is an independent monitoring program for agricultural and veterinary residues and environmental contaminants in raw cow's milk. Dairy Food Safety Victoria coordinates the AMRA Survey on behalf of the Australian Dairy Authorities Standards Committee (ADASC) and the Australian dairy industry. The AMRA Survey is an integral part of the Australian dairy industry's efforts to secure access to major export markets, including the European Union. The samples taken in the survey are from bulk milk farm pick-up tankers. The relevant state or territory dairy authority investigates all positive samples. Residues detected in

this survey are reported against the Australian Maximum Residue Limits (MRLs). Results are published quarterly in the Animal Health Surveillance Quarterly Report as part of the sectioned titled "Quarterly Disease Statistics-Surveillance Activities":

<http://www.aahc.com.au/status/ahsquarterly/index.htm>

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Release of the 20th Australian Total Diet Survey Report



The 20th Australian Total Diet Survey (ATDS) report was released by the Parliamentary Secretary to the Minister for Health and Ageing, the Hon Trish Worth, at Parliament House in Canberra on 28 February 2003.

The Australian Total Diet Survey, formerly known as the Australian Market Basket Survey, is Australia's most comprehensive assessment of consumers' dietary exposure (intake) to pesticide residues, contaminants and other substances.

Purpose of the Survey

The purpose of the ATDS is to estimate the level of dietary exposure of the Australian population to a range of pesticide residues, contaminants and other substances that can be found in the food supply. In the ATDS, dietary exposure is estimated by determining the level of the substance in foods by direct analysis, and then multiplying this by the amount of food consumed, as derived from the 1995 National Nutrition Survey. The estimated dietary exposure to each chemical from the Australian diet was compared to Australian health standards. In those cases where there were no Australian health standards, international health standards were used.

The survey also provides valuable background data that can be used for the development of food regulatory measures. Data from previous surveys were used by FSANZ during the Review of the *Food Standards Code* and were

integral to the development of standards in Volume 2 of the *Australia New Zealand Food Standards Code*. The APVMA also uses the survey when considering registration of chemical products.

How the survey was conducted

In order to achieve more accurate dietary exposure estimates, the foods examined in the ATDS were prepared to a 'table ready' state before they were analysed. As a consequence, both raw and cooked foods were examined. Sixty-five types of foods representative of the Australian diet were tested for pesticide residues, contaminants and other substances from foods sampled during July and November 2000 and February and April 2001. [To view the ATDS list of foods see table 1: http://www.foodstandards.gov.au/_srcfiles/20thATDS_SUPPL_Part1a.pdf]. These food types incorporate foods central to the Australian diet (core foods), foods that might be expected to show regional variation of residue, contaminant or other substance levels (regional foods), and foods that are available nationwide and are not expected to show regional variation (national foods). These food types were sampled in each of the States and the Northern Territory and some were sampled at four different times throughout the year.

What was tested

All foods were screened for pesticide residues, including chlorinated organic pesticides, organophosphorus pesticides, synthetic pyrethroids, carbamates and fungicides; as well as antimony, arsenic, cadmium, copper, lead, mercury, selenium, tin and zinc. [To view the ATDS tables of pesticides tested, see table 5: http://foodstandards.gov.au/_srcfiles/20thATDS_SUPPL_Part1a.pdf]. Breads, biscuits, rice, oats, processed wheat bran, breakfast cereals (including infant cereal), instant coffee, peanut butter, almonds and milk chocolate were tested for aflatoxins (B1, B2, G1 and G2) and ochratoxin A. A range of meats, dairy products, eggs, offal and infant formula were tested for inhibitory substances (penicillin G, streptomycin and oxytetracycline).

Summary of results

Key results showed that the estimated dietary intake of pesticide residues and contaminants are well within acceptable health standards.

In addition, there were no detections of either aflatoxins or ochratoxin A in any of the food tested, including nut and cereal products—the foods in which they are most likely to be found. Also there were no antibiotic residues detected in any meat and poultry products, dairy products or eggs tested.

The results of this survey will be provided to the World Health Organization as a contribution to the Global Environmental Monitoring System (GEMS) that collects data on the levels of pesticide residues and contaminants in the food supply worldwide.

Future direction of the ATDS

Future ATDS's will be restructured to incorporate a broader range of compounds and will be conducted on an annual basis. This will more accurately reflect the wide range of substances for which FSANZ has statutory responsibility (e.g. food additives). Pesticide and antibiotic residues and contaminants will remain as a part of the ATDS but surveys on these substances will be less frequent than in the past. The 21st ATDS is focussing on sulphites, sorbates, benzoates and nitrites, with a limited number of samples being examined for nitrates. Sample collection for this survey is almost complete and analysis of samples has started.

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To view the 20th ATDS publication (the main Report) and additional background information (Supplementary Information-FSANZ 2002), link to FSANZ's website: <http://www.foodstandards.gov.au/mediareleasespublications/publications/20thaustraliantotaldietsurveyjanuary2003/index.cfm>



National Residue Survey

The National Residue Survey (NRS) is an operational unit of Agriculture, Fisheries and Forestry – Australia (AFFA). The NRS works in close cooperation with other areas of AFFA, such as the Australian Quarantine and Inspection Service (AQIS), and with the statutory authority, the APVMA.

The NRS started monitoring chemical residues in meat in 1961 and since then the range of commodities tested has expanded. Forty commodities were monitored from 1 July 2001 to 30 June 2002.

This report provides the results of the NRS monitoring surveys, for which 24 100 samples were collected between 1 July 2001 and 30 June 2002. These surveys are designed to obtain a statistically appropriate sample for the occurrence of a residue in a commodity using a randomised sampling process.

Results are compared with the maximum residue limits (MRLs), extraneous residue limits (ERLs) and maximum levels (MLs) applicable to the levels of residues or contaminants that are legally permissible in food. These standards are included in the *Food Standards Code* (the Code).

The NRS results for 2001 – 2002 show that Australian produce is of a high quality with respect to residues and contaminants. The results of 322 274 analyses on the 24 100 samples conducted during the reporting period indicate only 61 analyses detected residues above the limits set in the Code. These consisted of 47 residues of agricultural and veterinary (agvet) chemicals and 14 of metals.

The meat monitoring project covered 14 commodities (largest number of samples being for cattle, sheep and pig) with 16 171 samples collected. These were subjected to 228 913 analyses that found 26 residues above the limits set in the Code; of these, 18 were of agvet chemicals and eight were of metals.

Four and six representative commodities respectively were monitored in the aquaculture and wild caught fish project; 10 704 analyses were conducted on 713 samples. There were six residues of metals above the limits set in the Code, of which five were for mercury levels in shark and one for lead in aquaculture tuna.

The egg project involved the analysis of 92 composite egg samples; 1387 analyses were performed with no residues over the limits set in the Code.

The honey project involved analyses of 515 samples; 11 798 analyses were performed and no samples analysed contained residues above the limits set in the Code.

The grains project covered 10 commodities (wheat contributing the largest number of samples) with 5924 samples collected; 69 460 analyses were conducted with 21 residues above the limits set in the Code. Ten of the contraventions were due to dichlorvos residues in cereal grains.

The horticulture project covered five commodities involving 685 samples and 20 463 analyses. Eight residues were detected over the limits set in the Code, seven of which were of diphenylamine, a scald inhibitor on apples in storage.

For more information

Link into the following NRS section within the AFFA website: www.affa.gov.au/nrs <http://www.affa.gov.au/content/output.cfm?ObjectID=D2C48F86-BA1A-11A1-A2200060B0A05746&contType=outputs>



Monitoring pesticide and cadmium residues in fresh fruit and vegetables

NSW Agriculture has compiled a report on the results of the pesticide residue and cadmium-monitoring program in horticultural commodities distributed through the Sydney Markets from November 2000 to June 2001. An interim report for the 2002-03 survey period has also just been completed for samples collected between February 2002 and January 2003. Fruit and vegetable samples from all states are included in these surveys.

NSW Agriculture and Sydney Markets Limited (SML) have funded the Pesticide Residue Survey since its inception in 1989. Between 1989 and 2000, more than 97% of all samples met the MRL standard (98.3% in 1989-92, 98.4% in 1992-95, 98.1% in 1995-96 and 95.3% in 1997-00).

The 2000-01 report discusses the results of the pesticide residue and cadmium-monitoring

programs in horticultural commodities distributed through the Sydney Markets from November 2000 to June 2001. Some 336 samples, comprising 44 different fresh fruit and vegetables, were purchased from Sydney Markets between November 2000 and June 2001. The samples were analysed for residues of 26 pesticides with some samples also tested for the heavy metal, cadmium. Pesticide residues were either absent or complied with the Maximum Residue Limit (MRL) in 97.6% of samples. Only eight samples (2.4%) contained pesticide residues that exceeded the MRL, with another seven samples with residues between 50% and 100% MRL. Of the 37 samples analysed for the heavy metal cadmium, none were above the Maximum Permitted Concentration (MPC) for cadmium. This shows a further decline from the 1997-00 data of 1.1%.

The results for the 2002 survey, which tested 500 samples between February 2002 and January 2003, showed that pesticide residues were either absent or complied with the MRL in 98.6% of samples. Only seven samples (1.4%) contained pesticide residues which exceeded the MRL, with another three samples with residues between 50 and 100% MRL. Of the 72 samples analysed for the heavy metal cadmium, one was above the MPC for cadmium.

For more information

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or view a summary of the report via the following link: <http://www.agric.nsw.gov.au/reader/15234>

Testing Fresh Produce for Chemical Residues in Victoria

New Subscribers

Since 1987 the Victorian government, through the Department of Primary Industries (formally Department of Natural Resources and the Environment) has been running an annual residue testing program for chemicals and other contaminants in Victorian grown produce. The program is called the Victorian Produce Monitoring Program (VPMP), and aims to ensure that the application of agricultural chemicals to agricultural produce is appropriate, and meets national food safety standards. This program is targeted towards areas of perceived higher risk of contamination and is designed to assess produce and chemical combinations that may be of concern.

Survey results consistently find that Victorian produce meets stringent national standards for contaminants (or Maximum Residue Limits) that are set by FSANZ. Victorian results are comparable to those produced by similar national and international residue-testing programs. For example, the results from the 2000/2001 Victorian residue-monitoring programs found that of the 847 samples taken, 99% met the acceptable standards.

In addition to the VPMP, the Department of Primary Industries (DPI) has worked with export orientated horticultural industries to conduct large random testing programs of at least 300 samples. These types of programs take a large number of samples in a random manner to ensure statistical validity and assist



industry and government to ensure that the produce is 'clean'. Produce tested since 2000 includes; asparagus, nectarines, navel

oranges and currently, certified organic and biodynamic produce.

The information generated from both the targeted and random programs helps DPI to manage potential risks of farm chemical use and measure compliance with relevant legislation as well as confirming that fresh produce is generally free from unacceptable residues.

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or link into
www.nre.vic.gov.au following the headings below
Primary Industries
Farming and Agriculture
Chemical Use
Chemical residues

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FSANZ has recently established a facility that will enable new subscribers to register via our website, to receive the Food Surveillance newsletter email. It will also enable existing subscribers to access the records to update the existing information that we hold.

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1. Log on to FSANZ's website www.foodstandards.gov.au or www.foodstandards.govt.nz
2. Click on 'Information Service' under Quick links on the left hand side of the front page.
3. New subscribers can register by following the prompts.
4. Existing subscribers can update their information by entering their personal User ID (email address) to obtain a password and then check and amend any information, such as address, subscription list for other FSANZ publications, areas of interest etc.

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In the pipeline...

Future surveys are planned or underway for a number of food additives, contaminants and hygiene practices including:

Listeria in cooked prawns

Yes it is on the way.... FSANZ has completed a survey of *Listeria monocytogenes* in ready-to-eat cooked prawns. In this survey close to 400 samples of cooked prawns were purchased in four cities – Brisbane, Sydney, Melbourne and Perth, and tested to determine the frequency of occurrence and, for positive samples, the level of *L. monocytogenes*. We plan to report the results of the survey in the winter edition of Food Surveillance ANZ.