New Zealand Food Safety
Haumaru Kai Aotearoa

Food Residues Survey Programme Report

2023-2024

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1 Summary

The New Zealand Food Safety (NZFS) Food Residues Survey Programme objective is to monitor agricultural chemical (pesticide) residues in plant-based foods grown and imported for sale in New Zealand. The programme targets those foods not covered by other New Zealand Food Safety monitoring programmes.

This report covers the sampling, testing, results, and actions undertaken in the 2023-2024 programme.

There were 300 samples tested for over 500 compounds and overall, 157,623 test results were reported. There was a total of ten non-compliant test results from eight samples reported above the maximum residue level (MRL). New Zealand Food Safety determined a test result above the MRL to be a non-compliant test result. The ten non-compliant test results are less than 0.01% of total test results reported. New Zealand Food Safety assessed all non-compliant test results and found no food safety risks with the food samples tested.

New Zealand Food Safety traced the non-compliant test results back to the respective growers and reviewed the food production systems and processes. Targeted visits of production sites occurred where previous non-compliant test results for the same grower were found.

New Zealand Food Safety identified consistent findings from the trace backs to growers:

- some non-compliant test results were due to incorrect off-label use by the growers, such as not applying an adequate withholding period; and
- some non-compliant test results were from growers not recognising and managing sources of residues.

New Zealand Food Safety also traced one non-compliant test result to an importer. The food importer was notified in the form of educational letter.

The conformance rate for test results from the 2023-2024 programme is greater than 99.99% and this aligns with previous rates. The 2023-2024 programme supports the conclusion that the plant-based foods for sale in New Zealand are safe to eat. Most of the foods sampled from New Zealand food producers demonstrate conformity with good agricultural practices. Similarly, most of the foods sampled from New Zealand food importers meet the New Zealand food safety requirements.

2 Regulatory framework

New Zealand Food Safety is a business unit of the Ministry for Primary Industries.

New Zealand Food Safety operates the Food Residue Survey Programme under the regulatory framework established by the Food Act 2014[1] and Food Regulations 2015[2]. All domestic foods sold in New Zealand must comply with the Food Notice: Maximum Residue Levels for Agricultural Compounds[3] (New Zealand MRL Notice) or the default MRL of 0.1 mg/kg in the Food Regulations 2015.

Imported plant-based foods sold in New Zealand must comply either with Codex Maximum Residue Limits for Pesticides[4], the New Zealand MRL Notice, or the default MRL of 0.1 mg/kg. Additionally, food imported from Australia that complies with the Australian MRL requirements[5] can be sold in New Zealand. This recognises that MRLs for registered and approved use of the same agricultural compound may vary from country to country due to differences in climate, environment and pest

[1] Food Act 2014
[2] Food Regulations 2015
[3] Food Notice: Maximum Residue Levels for Agricultural Compound
[4] Codex Maximum Residue Limits for Pesticides
[5] Australian-imported food: MRLs

pressure. Also, the range of registered and approved uses vary from country to country meaning an authorised use in one country may not occur in another.

3 Programme design

New Zealand Food Safety uses the Codex Alimentarius classification of commodities[6] as a basis for the types of foods to be sampled in the programme. Each year between five to seven of these commodity classes form the sampling plan.

Each annual sampling plan collects 300 samples and tests for agricultural chemical residues. Samples are collected under the direction of New Zealand Food Safety.

New Zealand Food Safety contracts a laboratory using ISO/IEC 17025 accredited test methods for pesticides. Each sample is tested for more than 500 compounds.

New Zealand Food Safety assess all test results against the relevant MRL. For foods grown in New Zealand, when a test result is above an MRL, it is determined as non-compliant. If no MRL for the food is listed in the NZ MRL Notice, then the New Zealand default MRL of 0.1 mg/kg applies. Imported foods grown in countries other than Australia must comply with either:

- New Zealand MRLs; or
- Codex Alimentarius MRLs.

New Zealand Food Safety performs a dietary exposure assessment on all non-compliant test results in the associated foods.

New Zealand Food Safety begins a trace back when a non-compliant test result is reported, requesting growers identify the cause of the non-compliant test result. This includes a review of spray diaries, application rates and timings, what agricultural chemicals were used and how and when they were used.

New Zealand Food Safety's actions include providing education on the correct use of agricultural chemicals, for example, explaining the requirements for off-label use. This may be escalated to include an on-site visit. when there are repeated non-compliant test results for the same grower from previous programmes.

When non-compliant test results are reported in imported foods, New Zealand Food Safety sends educational letters to food importers about meeting the MRL requirements when selling foods in the New Zealand market.

New Zealand Food Safety uses the information from the programme to review the regulatory controls on agricultural chemicals.

4 2023-2024 programme

The 2023-2024 sampling plan is on the MPI website[7]. The programme sampled foods from sampling points including:

- retail outlets
- farmers markets, and
- distributors such as packhouses, grain silos and wholesalers.

A total of 248 samples were collected from foods produced by New Zealand growers and 52 samples were collected from imported sources. In the Appendix, Tables 1 to 5 set out numbers of the foods sampled, along with the Codex Alimentarius classification category and source (New Zealand or imported).

[6] Portion of commodities to which MRLs apply and which is analysed (CXG 41-1993). Note this document is in the process of being updated.
[7] Food Residues Survey Programme 2023/2024 Sampling Plan

5 Results

A total of 157,623 test results were reported. There were ten non-compliant test results from eight samples. The non-compliant test results reported made up less than 0.01% of the total reported results. Of these, nine non-compliant test results were reported in seven samples of New Zealand grown foods. There was one non-compliant test result reported in one imported food sample.

There were no food safety risks associated with the non-compliant test results.

In the Appendix, Table 6 and Table 7 summarise the non-compliant test results from New Zealand grown foods. Table 8 summarises the non-compliant test result from imported food.

New Zealand Food Safety identified some consistent findings in the trace backs including:

- 40% of the non-compliant test results were due to residue levels that exceeded the MRL when growers applied agricultural chemicals off-label (i.e. applying it differently to the approved label directions). Off-label use is allowed by registration conditions for most agricultural chemicals (refer Table 6). However, it is the responsibility of the user to ensure that any residues resulting from this off-label use do not exceed the MRL; and

- 50% of the non-compliant test results were due to growers not recognising and managing sources of residues (refer Table 7).

5.1 Non-compliant test results in New Zealand grown samples

New Zealand Food Safety's dietary exposure assessments confirmed no food safety risks associated with the non-complaint results from New Zealand grown samples.

In cases where off-label use of agricultural chemicals had occurred, New Zealand Food Safety's actions included providing education on the correct use including the requirements for off-label use.

In some cases, New Zealand Food Safety's actions are based on the outcome of an on-site investigation.

The following non-compliant residues were found and traced back to the respective grower:

Cyprodinil is a fungicide, authorised in New Zealand to control blackspot, powdery mildew and dry eye rot in pome fruits and stone fruits. Cyprodinil (0.011 mg/kg) was reported in one sample of quinces above the New Zealand MRL of 0.01 mg/kg. This sample also had two other non-compliant residues, deltamethrin and pyrimenthanil.

Deltamethrin is a pyrethroid insecticide. It is authorised in New Zealand for the control of pests on agricultural and horticultural crops. Deltamethrin (0.015 mg/kg) was reported in one sample of quinces sample above the New Zealand MRL of 0.01 mg/kg.

Pyrimethanil is a fungicide. It is authorised in New Zealand to control fungal diseases in grapes and onions. Pyrimethanil (0.36 mg/kg) was reported in one sample of quinces above the New Zealand MRL of 0.1 mg/kg.

New Zealand Food Safety undertook an on-site investigation. This included a review of spray diaries, application rates and timings, what agricultural chemicals were used and how and when they were applied.

The grower identified that off-label use had occurred and had not suitably managed residues.

Diazinon is an organophosphate insecticide. It is authorised in New Zealand for restricted use for the control of pests on specified crops including cereal grains. Diazinon was reported in one sample of oats (0.13 mg/kg) above the New Zealand MRL of 0.1 mg/kg.

The trace back to the grower could not conclusively identify the source of the residue.

Fenhexamid is a fungicide. It is authorised in New Zealand for the control of fungal diseases in a specified range of crops. Fenhexamid (0.15 mg/kg) was reported in one sample of blackberries above the New Zealand MRL of 0.1 mg/kg.

The grower identified that off-label use had occurred and had not suitably managed residues.

Methomyl is an insecticide. It is authorised in New Zealand for the control of pests on agricultural and horticultural crops. Methomyl was reported in one sample of strawberries (0.53 mg/kg) above the New Zealand MRL of 0.5 mg/kg.

The grower identified that on-label use had occurred and was not able to identify the reason for the non-compliant result.

Propamocarb is an insecticide. It is authorised in New Zealand for the control of insects in ornamentals. Propamocarb (0.14 mg/kg) was reported in one sample of cucumbers above the New Zealand MRL of 0.1 mg/kg.

The grower identified that off-label use had occurred and had not suitably managed residues.

Propiconazole is a fungicide. It is authorised in New Zealand to control fungal diseases in fruit, vegetables, and wheat. Propiconazole was reported in one sample of raspberries (0.18 mg/kg) above the New Zealand MRL of 0.1 mg/kg.

New Zealand Food Safety undertook an on-site investigation. This included a review of spray diaries, application rates and timings, what agricultural chemicals were used and how and when they were used.

The grower identified that off-label use had occurred and had not suitably managed residues.

Spirotetramat is an insecticide. It is authorised in New Zealand for the control of insects in a range of fruit crops including pears. Spirotetramat (0.034 mg/kg) was reported in one sample of pears above the New Zealand MRL of 0.02 mg/kg.

The grower identified that on-label use had occurred but was not able to identify the reason for the non-compliant result.

5.2 Non-compliant test result in an imported food sample

New Zealand Food Safety's dietary exposure assessments confirmed no food safety risk in the non-complaint result from the imported food sample.

The following non-compliant residue was found in one imported food sample:

Acetamiprid is an insecticide used to control insects on crops. Acetamiprid was reported in one sample of grapes (0.89 mg/kg) above the Codex MRL of 0.5 mg/kg.

6 Conclusion

The overall rate of conformance of greater than 99.99% for the 2023-2024 programme aligns with previous rates (refer Table 9). This confirms that most growers apply good agricultural practices to produce safe and suitable foods for sale. The food importers also showed that they are aware of their legal obligations to meet the relevant MRL or standards to sell safe and suitable food in New Zealand.

7 Appendix

Table 1: Source of 'Berries and other Small Fruits' samples

Berries and other Small Fruits	New Zealand	Imported	Total
Blackberries	4	China (1)	5
Blackcurrants	2	nil	2
Blueberries	13	Ukraine (1)	14
Boysenberries	4	nil	4
Cranberries	nil	Canada (1)	1
Gooseberries	1	nil	1
Grapes	nil	Australia (4), Chile (1), Peru (1), United States (3)	9
Kiwi berries	5	nil	5
Raspberries	6	Poland (1)	7
Strawberries	9	Australia (2), China (1)	12
Total	**44**	**16**	**60**

Table 2: Source of 'Cereal grains' samples

Cereal grains	New Zealand	Imported	Total
Barley	3	Australia (1), China (1)	5
Maize	4	nil	4
Oats	6	Australia (1), Canada (2), India (1)	10
Quinoa	1	Bolivia (1), Peru (2)	4
Rice	nil	Australia (1), China (1), Fiji (1), India (4), Pakistan (2), Spain (1), Taiwan (1), Thailand (2), United States (1), Viet Nam (2)	16
Rye	2	nil	2
Sweetcorn	4	Viet Nam (1)	5
Wheat	14	nil	14
Total	**34**	**26**	**60**

Table 3: Source of 'Fruiting Vegetables, Cucurbits' samples

Fruiting Vegetables, Cucurbits	New Zealand	Imported	Total
Butternut squash	3	nil	3
Cantaloupes	9	Australia (1)	10
Courgettes	5	Australia (2)	7
Cucumbers	16	nil	16
Kamo kamo	3	nil	3
Pumpkins	7	nil	7
Watermelons	9	nil	9
Winter squash	5	nil	5
Total	**57**	**3**	**60**

Table 4: Source of 'Pome Fruits' samples

Pome Fruits	New Zealand	Imported	Total
Apples	28	nil	28
Pears	16	Australia (2), China (2)	20
Persimmons	8	nil	8
Quinces	4	nil	4
Total	**56**	**4**	**60**

Table 5: Source of 'Root and Tuber Vegetables' samples

Root and Tuber Vegetables	New Zealand	Imported	Total
Beetroots	4	nil	4
Carrots	14	nil	14
Celeriac	3	nil	3
Parsnips	3	nil	3
Potatoes	15	nil	15
Radishes	4	nil	4
Swedes	1	nil	1
Sweet potatoes	8	nil	8
Taros	nil	Fiji (1), Samoa (1) Tonga (1)	3
Turnips	1	nil	1
Yams	4	nil	4
Total	**57**	**3**	**60**

Table 6. Summary of non-compliant residue results following off-label agricultural chemical use

Residue detected	Codex classification – sample type tested	Test result (mg/kg)	NZ MRL (mg/kg)
Fenhexamid	Berries and other small fruits – blackberries	0.15	0.1
Propamocarb	Fruiting vegetables, cucurbits – cucumbers	0.14	0.1
Propiconazole	Berries and other small fruits – raspberries	0.18	0.1
Pyrimethanil	Pome fruits – quinces[8]	0.36	0.1

Table 7. Summary of non-compliant residue results following on-label agricultural chemical use

Residue detected	Codex classification – sample type tested	Test result (mg/kg)	NZ MRL (mg/kg)
Cyprodinil	Pome fruits - quinces[8]	0.011	0.01
Deltamethrin	Pome fruits – quinces[8]	0.015	0.01
Diazinon	Cereal grains – oats	0.13	0.1
Methomyl	Berries and other small fruits – strawberries	0.53	0.5
Spirotetramat	Pome fruits – pears	0.034	0.02

Table 8. Summary of non-compliant residue results from imported food samples

Residue detected	Codex classification – sample type tested	Test result (mg/kg)	NZ MRL (mg/kg)	Codex MRL (mg/kg)
Acetamiprid	Berries and other small fruits - grapes	0.89	0.1	0.5

Table 9: Conformance rate

Sampling period	Number of samples	Number of results	Number of non-compliant test results	Conformance rate (%)
2021-2022	300	157,064	12	99.99
2022-2023	300	147,063	33	99.98
2023-2024	300	157,623	10	99.99

[8] One sample with three non-compliant residues