

National Chemical Contaminants Programme

Dairy Product Result Summary (July 2018 to June 2019)

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1 Summary

This National Chemical Contaminants Programme (NCCP) report provides a summary of results for dairy products sampled without bias, and tested for a range of residues and contaminants, over the 2018/19 dairy season, 1 July 2018 to 30 June 2019.

The objectives of the NCCP dairy products component are to:

- determine whether dairy products manufactured in New Zealand conform to New Zealand dairy processing requirements;
- verify that dairy processors have effective self-monitoring plans in place under their risk management programmes;
- establish baseline levels for specific constituents naturally present in milk and dairy products;
- confirm the accuracy of attestations provided to other competent authorities; and
- investigate unfavourable findings to ensure that controls remain effective and that emerging hazards are identified and appropriate regulatory measures applied.

More than 200 individual dairy products were tested for more than 33,100 individual test results. There were no non-compliant test results that exceeded regulatory limits for residues and contaminants in dairy products. For compositional and naturally occurring substances, test results were typically within expected ranges.

These dairy product summary results indicate that the controls applied under the current regulatory framework are adequate and continue to ensure that New Zealand dairy products conform to both consumer expectations and international regulatory requirements.

In addition to the NCCP monitoring of dairy products, raw milk and colostrum is also sampled, tested and reported separately for a range of chemical residues and contaminants. These two programmes combine to provide a high level of confidence in the safety and suitability of New Zealand dairy products.

Previous reports covering residues and contaminants in milk and dairy products as well as testing of milk powders for radionuclides, and milk and dairy products for dioxins, dioxin-like PCBs and indicator PCBs, are also issued on the New Zealand Food Safety website.

2 Legal framework

Dairy monitoring and surveillance programmes for substances of interest have been in operation in New Zealand for many years and a national programme for the monitoring of raw milk was introduced in the 1996/97 dairy season. Since that time the programme has become an official programme under the Dairy Industry (National Residue Monitoring Programme) Regulations 2002, where the principal legislation is the Animal Products Act 1999. The NCCP is administered by New Zealand Food Safety.

3 Programme design

At least 200 dairy product samples are obtained under the supervision of a recognised person from a Ministry for Primary Industries (MPI) recognised agency, during a performance-based verification (PBV) audit at the manufacturers' premises. Samples are dairy products deemed eligible for export at the time of sampling. The samples were tested at an MPI recognised laboratory, using ISO/IEC 17025 accredited test methods or validated in-house methods.

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- confirm the accuracy of attestations provided to other competent authorities; and

- investigate unfavourable findings to ensure that controls remain effective and that emerging hazards are identified and appropriate regulatory measures applied.

3.1 ACTION LIMITS

Action limits (ALs) are nominated by New Zealand Food Safety. They are the maximum tolerable level of a particular compound detected in a specified matrix, before action is taken. The action includes confirming whether regulatory limits for New Zealand and intended markets have been met and investigating the reason for a test result.

The nominated ALs are based on those established for raw milk¹ unless:

- a product or food specific tolerance limit applies, or
- the compound is not permitted for use as a veterinary medicine or agricultural compound, and is not permitted for use or addition during the manufacturing process.

In assessing test results against ALs, concentration factors have been taken into consideration, where permitted and where appropriate for the intended market(s) and New Zealand. The general principle applied is that if the raw milk used to manufacture a product conformed to all applicable limits, then the manufactured product is also expected to conform based on concentration factors.

If New Zealand Food Safety becomes concerned that partitioning of a compound within a specific product stream is of concern, then a specific tolerance limit will be established for that compound and product. For example, some lipophilic compounds are expressed on a fat basis in accordance with Codex Alimentarius (Codex) conventions.

For compounds that are not permitted for use in or on milking animals, any confirmed detection is considered unacceptable.

4 Sampling and Testing

4.1 WHAT WE SAMPLED

Routine monitoring samples are independently collected by recognised persons, who are part of an MPI recognised agency. The routine monitoring samples were collected over the period of 1 July 2018 through to 30 June 2019, without bias, from a range of dairy products manufactured in New Zealand, including milk, cream, cheese, butter, anhydrous milk fat (AMF), milk powders, milk protein concentrate, infant formula and other formulated products, whey products and casein.

Dairy products sampled included those:

- intended as ingredients and which are typically in a concentrated form;
- retail ready products intended for sale as foods in a concentrated form that will be reconstituted prior to consumption; and
- that are foods in the form that they will be consumed or used.

The products sampled are set out in Table 1.

Table 1: Summary of dairy products sampled in 2018/2019

Product Type	Proportion of Samples
Powders (Whole milk powder, skim milk powder, butter milk powder and other powders)	42%
Nutritional (Infant formula, follow-on formula, growing up milk powder and their bases, nutritional powders)	32%
Protein (Milk protein concentrate, whey powder, whey protein concentrate, casein and sodium caseinate)	16%
Liquids (Pasteurised and ultra-high temperature (UHT) milk, dairy blend and cream)	4%

¹ <https://www.mpi.govt.nz/dmsdocument/32407-national-programme-for-the-monitoring-and-surveillance-of-chemical-residues-and-contaminants-in-milk-plan-for-1-july-2018-to-30-june-2019>

Product Type	Proportion of Samples
Fat (AMF and butter)	4%
Cheese (Firm cheeses)	2%

4.2 WHAT WE LOOKED FOR

We looked for more than 500 compounds, elements and dairy components covering:

- antibiotics and other veterinary medicines;
- agricultural compounds;
- compounds withdrawn or not permitted for use on or with food producing animals;
- compounds not permitted for use in dairy products or food contact materials;
- compounds with restrictions on their permitted use;
- chemical contaminants;
- chemical elements, including heavy metals and additives or ingredients added to fortified products;
- compositional parameters naturally present in milk and dairy products;
- compounds added as ingredients.

4.3 WHAT WE TESTED

We tested 203 product samples and obtained 31,345 individual test results for routinely monitored residues and contaminants (Table 4).

Some of the dairy product samples were also tested for naturally occurring elements and other compounds, as well as compositional attributes. The results of these tests continue to build a profile by dairy product type which may be used as a point of reference in the future for the assessment of product integrity and determination of adulteration or fraud (Tables 5 and 6).

5 Results

5.1 WHAT WE FOUND – RESIDUES AND CONTAMINANTS

There were no non-compliant results that exceeded regulatory limits for residues and contaminants.

This represents a compliance rate of 100%.

For compositional and naturally occurring substances, results were typically within expected ranges.

Of the 31,345 individual test results for the routinely monitored residues and contaminants, there were 178 reported detections (0.57%) above the method reporting limit. One result was just above the AL (based on a product specific concentration factor applied to the AL established for raw milk).

A summary of the detections of residues and contaminants in dairy products are in Table 2 and Table 3. A full set of all the results including compounds and numbers of tests for routinely monitored residues and contaminants in dairy products is in Table 4.

5.1.1 Detection above action limits

Table 2: Compounds detected in dairy products above the method reporting limits and above action limits

Compound	Samples collected ¹	Samples with no detections	Detections at or below the action limit ²	Detections above the action limit	Flag
SEM (semicarbazide)	60	42	17	1	●

Notes

1 Samples are counted as collected if results for the test are reportable. Reportable results are when all the quality control criteria has been met to give results at the method reporting limit.

2 The number of detections reported at or below the action limit.

5.1.1.1 Semicarbazide (SEM)

60 samples were tested for the metabolites of nitrofurans compounds, including semicarbazide, in butter milk powder, follow-on formula, follow-on formula base, growing up milk powder, growing up milk powder base, infant formula, milk protein concentrate, nutritional powder, other powders, skim milk powder, whey protein concentrate and whole milk powder. SEM is a metabolite of the veterinary medicine nitrofurazone which is prohibited in some countries and not registered or available for use in, or on milking animals in New Zealand.

SEM was detected in 18 samples (follow-on formula, follow-on formula base, growing up milk powder, growing up milk powder base, infant formula, milk protein concentrate, nutritional powder, other powders, skim milk powder, whey protein concentrate and whole milk powder).

The AL for SEM is established on a raw milk basis and in this case, is set at the method limit of reporting. In assessing results against ALs, concentration factors for each dairy product type sampled and tested are taken into consideration.

One SEM result in formulated goat powder just exceeded the AL (based on a product specific concentration factor applied to the AL set for raw milk). The result does not represent a food safety risk. A result greater than an AL triggers an investigation. The investigation provided information on the ingredients in the product, in which only one ingredient was from New Zealand. If the concentration factor was applied for this ingredient, then the single ingredient did not exceed the SEM AL. The manufacturer noted the use of sanitisers for soaking various parts of equipment in the plant during a wet wash. The batch of product under investigation was the first run after a wet wash.

17 detections were below the AL and do not represent a food safety concern.

All these detections are consistent with previous studies that have demonstrated that SEM is an inherent component at very low levels of highly concentrated dried dairy products. This has been highlighted in the NCCP sampling plan over the last several years.

Internationally, SEM has been shown to be present from sources other than nitrofurazone. Screening for nitrofurans metabolites is generally considered to be more reliable than analysis for the parent drugs which are less stable in most animal products. However in the case of SEM in dairy products, confirmation of exposure to nitrofurazone requires detections of the parent drug (i.e. nitrofurazone). It is specifically noted that SEM will only be used as a trigger for further investigation and, on its own, is not a conclusive indicator of non-compliance.

5.1.2 Detections below action limits

Table 3: Compounds detected in dairy products above the method reporting limits and below action limits

Compound	Samples collected ¹	Samples with no detections	Detections at or below the action limit ²	Detections above the action limit ³	Flag
2-phenylphenol	60	59	1	0	●
Arsenic	60	59	1	0	●
Benzyltrimethylammonium chloride (BDM-C12)	60	54	6	0	●
Benzyltrimethyltetradecylammonium chloride (BDM-C14)	60	55	5	0	●
Cadmium	60	59	1	0	●
Cyanuric acid	60	59	1	0	●
Di(2-ethylhexyl) adipate (DEHA)	60	53	7	0	●
Di(2-ethylhexyl) phthalate (DEHP)	60	57	3	0	●
Di(2-ethylhexyl) terephthalate (DEHT)	45	43	2	0	●
Didecyltrimethylammonium chloride (DM-DC10)	60	59	1	0	●
Diisononyl phthalate (DINP)	60	54	6	0	●
Hexadecyltrimethylammonium chloride (TM-C16)	60	58	2	0	●
Iprodione	60	59	1	0	●
Lead	60	59	1	0	●
Nitrate	60	3	57	0	●
Nitrite	60	0	60	0	●
p,p'-DDE	60	56	4	0	●
Tin	60	59	1	0	●

Notes

- 1 Samples are counted as collected if results for the test are reportable. Reportable results are when all the quality control criteria has been met to give results at the method reporting limit.
- 2 The number of detections reported at or below the action limit.
- 3 Non-complying results: detection of a compound above the New Zealand or export market maximum limit for the residue or contaminant, or detection at or above the limit of quantitation for a compound not permitted for food producing animals

5.1.2.1 Nitrate and nitrite

Nitrate and nitrite occur naturally in raw milk, however, their presence in dried dairy products above ALs may indicate excessive exposure to heat, fouling or “burn-on” during processing or contamination of liquid milk with cleaning solutions.

60 samples were tested for nitrates and nitrite in butter milk powder, casein, follow-on formula, growing up milk powder, infant formula, milk protein concentrate, skim milk powder, sodium caseinate, whey protein concentrate and whole milk powder.

Detections of nitrite were reported in all of the 60 samples tested. Detections of nitrate were reported in 57 samples. All the detections were below the AL for nitrate and nitrite set for dairy products.

5.1.2.2 Cyanuric acid

60 samples were tested for melamine and cyanuric acid in casein, cheese, follow-on formula, follow-on formula base, growing up milk powder, growing up milk powder base, infant formula, milk protein concentrate, nutritional powder, other powders, skim milk powder, whey protein concentrate and whole milk powder.

Cyanuric acid is a known metabolite of several pesticides and other agricultural compounds. Other sources of cyanuric acid may include feed additives or water treatment disinfectants.

Cyanuric acid was found in a goat formulated powder, below the AL. The sample was also tested for melamine with no detection reportable above the method reporting limit, confirming that the detection is not associated with melamine.

New Zealand Food Safety has previously investigated low level findings and has confirmed that these are not linked to any form of milk or feed adulteration.

5.1.2.3 Metals

60 samples were tested for heavy metals in AMF, butter, casein, follow-on formula, growing up milk powder, infant formula, nutritional powder, skim milk powder, whey protein concentrate and whole milk powder.

- **Arsenic** was detected in 1 sample (whey protein concentrate), well below the AL (adjusted on a raw milk basis) of 0.01 mg/kg.
- **Cadmium** was detected in 1 sample (infant formula), well below the AL (adjusted on a raw milk basis) of 0.1 mg/kg.
- **Lead** was detected in 1 sample (casein), below the AL (on an as consumed basis²) of 0.02 mg/kg.
- **Tin** was detected in 1 sample (skim milk powder), significantly below the joint Australia New Zealand Food Standards Code limit.

These detections of metals in processed, concentrated dairy products are well below ALs and are not of concern.

5.1.2.4 Pesticides

60 samples were tested for a wide range of pesticides in AMF, butter, casein, cheese, cream, dairy blend, follow-on formula, follow-on formula base, growing up milk powder, growing up milk powder base, infant formula, milk protein concentrate, nutritional powder, other powders, skim milk powder, whey, whey protein concentrate and whole milk powder:

- **2-phenylphenol** was detected in one sample (whey protein concentrate). This active ingredient is registered for use in dairy cattle as an antiseptic teat spray. It is also used as a general surface disinfectant. The detection was below the AL and is of no food safety concern.
- **DDE (p,p')** was detected in four samples (AMF, cream and whole milk powder). The detections were below the New Zealand Maximum Residue Level (MRL) of 1.25 mg/kg on a fat basis. The detections were also below the AL of 0.50 mg/kg on a fat basis (0.02 mg/kg on a 4% milk fat basis) which is consistent with Codex limits. Periodic findings of DDE at low levels in the fat of dairy products are to be expected due to carryover from historical use. These findings are consistent with the raw milk programme and previous product monitoring results. There is active monitoring in place by dairy processors to ensure only milk that conforms to the DDE/DDT MRL requirements is collected for processing.

Metabolites of DDT are periodically identified very early in lactation from animals grazing land where DDT was historically applied to control grass grub (*Costelytra zealandica*). In 1970, New Zealand became one of the first countries in the world to ban the use of DDT on pastoral land. Most commonly residues of DDE, which can have a half-life in excess of 25 years in some soils under certain conditions, are identified, rather than the parent compound DDT. This confirms historic use rather than recent use of this pesticide in New Zealand.

- **Iprodione** was detected in one sample (nutritional powder). Iprodione is a fungicide used in the control of a range of diseases in a variety of crops. The investigation determined that two plant based ingredients were the most likely source. The detection was below the AL and is of no food safety concern.

² GENERAL STANDARD FOR CONTAMINANTS AND TOXINS IN FOOD AND FEED – CODEX STAN 193-1995s

5.1.2.5 Phthalates

60 samples were tested for a range of phthalates in AMF, butter, butter milk powder, cheese, cream, dairy blend, follow-on formula, growing up milk powder, growing up milk powder base, infant formula, infant formula base, nutritional powder, other powders, skim milk powder, whey, whey protein concentrate and whole milk powder.

There were 18 detections for phthalates in samples (AMF, butter, cream, follow-on formula, growing up milk powder, growing up milk powder base, infant formula and whole milk powder). The detections were all below the AL, and do not represent a food safety concern.

Three results were for **Di(2-ethylhexyl) phthalate (DEHP)**. This compound has been removed from use in the formulation of food contact materials. DEHP was included in the formulation of milk liners to provide the required flexing of the component during milking, and several years ago these milk liners were found to be the primary source of DEHP in milk products. As a consequence DEHP was removed from the formulation for milk liners. The detections of DEHP are likely to reflect legacy use of old formulation milk liners.

Seven results were for **Di(2-ethylhexyl) adipate (DEHA)**. DEHA is not a phthalate but is included within the phthalate group as it shares many similar properties. DEHA has a lesser toxicity than most of the phthalates and its AL has been established based on levels of the compound reasonably expected to be found in milk or dairy products. DEHA has replaced DEHP in some materials (such as milking cup liners) and so detections are not unexpected, but at low levels only.

Two results were for **Di(2-ethylhexyl terephthalate) (DEHT)**. DEHT may be used in replacement of DEHP and DINP. It is a plasticiser and a structural isomer to DEHP.

Six results were for **Diisononyl phthalate (DINP)**. As well as DEHP and DEHA, DINP is reported in other surveys of phthalate results with the pack type of the food. The levels of DINP reported in dairy products were well below the specific migration limits set in the European Union Regulation³

Contaminant migration standards for milk contact materials are applied through the Code of Practice: Design and Operation of Farm Dairies (NZCP14). All findings of phthalates of concern will be acted upon, and investigations will be undertaken where necessary to determine the root source of contamination so that remedial action can be taken.

5.1.2.6 Quaternary Ammonium Compounds (QACs)

60 samples were tested for a range of QACs in AMF, butter, butter milk powder, cheese, cream, follow-on formula, follow-on formula base, growing up milk powder, infant formula, milk protein concentrate, nutritional powder, other powders, skim milk powder, whey, whey protein concentrate and whole milk powder.

QACs were detected in 9 samples (butter, cheese, growing up milk powder, whey protein concentrate and whole milk powder).

Benzyltrimethylammonium chloride (BDM-C12) was detected in six samples and **Benzyltrimethyltetradecylammonium chloride (BDM-C14)** was detected in five of the nine samples and **Didecyltrimethylammonium chloride (DM-DC10)** was detected in one of the nine samples and **Hexadecyltrimethylammonium chloride (TM-C16)** was detected in two of the nine samples. The detections were all well below the AL.

QACs are widely used as surfactants and disinfectants in food processing and several products have been approved for sanitising dairy equipment. More recently QACs have become compounds of interest in some markets, with studies suggesting that residues may carry over in many food products at levels of concern. This presents an added complication for trade, as many dairy products are highly concentrated ingredients and these concentrated forms usually only represent a minor portion of the final food. For a number of years, dairy maintenance compounds containing QACs have been approved in New Zealand with the condition that milk contact surfaces are to be rinsed after use.

³ COMMISSION REGULATION (EU) No 10/2011

⁴ <https://www.mpi.govt.nz/dmsdocument/1367/direct>

5.1.3 Antibiotic screen responses

Two presumptive responses for the tetracycline group of compounds was reported in two samples (growing up milk powder and whole milk powder). This analytical method is a microbial inhibition test. These highly formulated products may have inhibitory components that result in presumptive responses. These samples were tested using a confirmatory quantitative method and with an accreditation body endorsed report. The results confirmed there were no detections for the tetracycline group of compounds for these two samples.

All NCCP raw milk samples are tested for the tetracycline group of compounds along with a wide range of dairy products. The results, from both screening and confirmation testing, verify that milk and dairy products conform to expected requirements.

5.1.4 Dairy components

Samples of follow-on formula, growing up milk powder, growing up milk powder base, infant formula, infant formula base, milk, milk protein concentrate, nutritional powder, skim milk powder and whole milk powder were tested for fat, protein, ash and moisture. The results complied with the Codex Standard for fat, protein and moisture for milk powders and cream powders⁵.

5.1.5 Naturally occurring elements and other compounds

Samples of AMF, butter, casein, cream, follow-on formula, growing up milk powder, growing up milk powder base, infant formula, infant formula base, milk protein concentrate, nutritional powder, skim milk powder, whey, whey protein concentrate and whole milk powder were tested for a range of naturally occurring elements and other compounds.

Copper and iron were reported in casein, follow-on formula, growing up milk powder, infant formula, nutritional powder, skim milk powder, whey protein concentrate and whole milk powder. Copper was also reported in one sheep whole milk powder sample and iron in one cow fortified whole milk powder sample above the expected range for these elements. The type of cow whole milk powder sample tested and the NCCP sheep milk testing showing some higher levels of copper compared to cow's milk mean that the results reported were not unexpected.

The results reported indicate that these naturally occurring elements and other compounds typically present in dairy products within the levels expected. Likewise, where compounds have been added to fortify products, these are present at the levels expected or required.

6 Conclusion

Given the breadth of products sampled and compounds tested for, the number of detections are considered to be very low, which is consistent with monitoring results from previous years. This indicates that dairy processors are operating under risk management programmes that are effective and ensure that the dairy products manufactured are safe, wholesome and free from contamination.

7 Summary of Dairy Product Results for 2018/19

7.1 REPORTING OF RESIDUES AND CONTAMINANTS IN DAIRY PRODUCTS

Table 4: Reported results of residues and contaminants in dairy products

Compound	Samples collected ¹	Samples with no detections	Detections below the action limit ²	Detections above the action limit ³	Flag
(E)-Metaminostrobin	60	60	0	0	

⁵ CODEX STANDARD FOR MILK POWDERS AND CREAM POWDER (CODEX STAN 207-1999) - This Standard replaced the Standard for Whole Milk Powder, Partly Skimmed Milk Powder and Skimmed Milk Powder (A-5-1971) and the Standard for Cream Powder, Half Cream Powder and High Fat Milk Powder (A-10-1971). Adopted in 1999. Amendments 2010, 2013, 2014.

Compound	Samples collected ¹	Samples with no detections	Detections below the action limit ²	Detections above the action limit ³	Flag
(E)-Pyrinobac-methyl	60	60	0	0	
(Z)-Metominostrobin	60	60	0	0	
(Z)-Pyrinobac-methyl	60	60	0	0	
1,2,3,6-Tetrahydrophthalimide	60	60	0	0	
2-Phenylphenol	60	59	1	0	●
5-Hydroxyimidacloprid	4	4	0	0	
Abamectin	57	57	0	0	
Acephate	59	59	0	0	
Acetamiprid	60	60	0	0	
Acetamiprid-N-desmethyl	60	60	0	0	
Acetochlor	60	60	0	0	
Acibenzolar-S-methyl	58	58	0	0	
Acrinathrin	60	60	0	0	
AHD (1-aminohydantoin)	60	60	0	0	
Alachlor	60	60	0	0	
Alanycarb	60	60	0	0	
Aldicarb	60	60	0	0	
Aldicarb sulfoxide	60	60	0	0	
Aldoxycarb	60	60	0	0	
Aldrin	60	60	0	0	
Allidochlor	60	60	0	0	
alpha-Endosulfan	60	60	0	0	
Ametoctradin	60	60	0	0	
Ametryn	60	60	0	0	
Amoxicillin	60	60	0	0	
AMOZ (5-methylmorpholino-3-amino-2-oxazolidinone)	60	60	0	0	
Ampicillin	60	60	0	0	
Anilofos	58	58	0	0	
Anthraquinone	60	60	0	0	
AOZ (3-amino-2-oxazolidinone)	60	60	0	0	
Arsenic	60	59	1	0	●
Atrazine	60	60	0	0	
Azaconazole	60	60	0	0	
Azamethiphos	60	60	0	0	
Azinphos-methyl	58	58	0	0	
Azoxystrobin	60	60	0	0	
Benalaxyl	60	60	0	0	
Bendiocarb	58	58	0	0	
Benfluralin	60	60	0	0	
Benodanil	60	60	0	0	
Benoxacor	60	60	0	0	
Bensulfuron-methyl	59	59	0	0	
Bensulide	60	60	0	0	
Benzyl butyl phthalate (BBP)	60	60	0	0	
Benzyltrimethyldecylammonium chloride (BDM-C10)	60	60	0	0	

Compound	Samples collected ¹	Samples with no detections	Detections below the action limit ²	Detections above the action limit ³	Flag
Benzyltrimethylammonium chloride (BDM-C12)	60	54	6	0	●
Benzyltrimethylhexadecylammonium chloride (BDM-C16)	60	60	0	0	
Benzyltrimethyloctadecylammonium chloride (BDM-C18)	60	60	0	0	
Benzyltrimethyltetradecylammonium chloride (BDM-C14)	60	55	5	0	●
Benzylpenicillin	60	60	0	0	
beta-Endosulfan	60	60	0	0	
BHC (alpha)	60	60	0	0	
BHC (beta)	60	60	0	0	
BHC (delta)	60	60	0	0	
Bifenoxy	60	60	0	0	
Bifenthrin	60	60	0	0	
Bioresmethrin	59	59	0	0	
Bitertanol	60	60	0	0	
Boscalid	60	60	0	0	
Bromacil	60	60	0	0	
Bromobutide	60	60	0	0	
Bromophos	60	60	0	0	
Bromophos-ethyl	60	60	0	0	
Bromopropylate	60	60	0	0	
Bupirimate	60	60	0	0	
Buprofezin	60	60	0	0	
Butachlor	60	60	0	0	
Butafenacil	60	60	0	0	
Butamifos	60	60	0	0	
Cadmium	60	59	1	0	●
Cadusafos	60	60	0	0	
Cafenstrole	60	60	0	0	
Carbaryl	56	56	0	0	
Carbendazim	59	59	0	0	
Carbetamide	60	60	0	0	
Carbofuran	58	58	0	0	
Carboxin	56	56	0	0	
Carfentrazone-ethyl	60	60	0	0	
Carpropamid	60	60	0	0	
Cefalexin	60	60	0	0	
Cefalonium	60	60	0	0	
Ceftiofur	60	60	0	0	
Cefuroxime	60	60	0	0	
Chlorantraniliprole	60	60	0	0	
Chlorfenapyr	60	60	0	0	
Chlorfenvinphos	60	60	0	0	
Chloridazon	60	60	0	0	
Chlorimuron-ethyl	59	59	0	0	
Chlorobenzilate	60	60	0	0	
Chlorotoluron	60	60	0	0	

Compound	Samples collected ¹	Samples with no detections	Detections below the action limit ²	Detections above the action limit ³	Flag
Chloroxuron	60	60	0	0	
Chlorpropham	60	60	0	0	
Chlorpyrifos	60	60	0	0	
Chlorpyrifos-methyl	60	60	0	0	
Chlorsulfuron	59	59	0	0	
Chlortetracycline	60	60	0	0	
Chlorthal-dimethyl	60	60	0	0	
Chlorthiophos	60	60	0	0	
Chlozolate	60	60	0	0	
Chromafenozide	60	60	0	0	
Cinidon-ethyl	60	60	0	0	
cis-Chlordane	60	60	0	0	
Clethodim	2	2	0	0	
Clodinafop-propargyl	60	60	0	0	
Clofentazine	60	60	0	0	
Clomazone	60	60	0	0	
Cloquintocet-mexyl	60	60	0	0	
Clothianidin	60	60	0	0	
Coumaphos	58	58	0	0	
Coumaphos-oxon	55	55	0	0	
Crufomate	60	60	0	0	
Cyanazine	58	58	0	0	
Cyanophos	60	60	0	0	
Cyantraniliprole	60	60	0	0	
Cyanuric acid	60	59	1	0	●
Cyazofamid	60	60	0	0	
Cycloate	6	6	0	0	
Cyclosulfamuron	60	60	0	0	
Cyflufenamid	60	60	0	0	
Cyfluthrin (sum of isomers)	60	60	0	0	
Cyhalofop-butyl	60	60	0	0	
Cyhalothrin (sum of isomers)	60	60	0	0	
Cymoxanil	60	60	0	0	
Cypermethrin (sum of isomers)	60	60	0	0	
Cyproconazole (sum of isomers)	60	60	0	0	
Cyprodinil	60	60	0	0	
Cyromazine	6	6	0	0	
Daimuron	60	60	0	0	
Deltamethrin	60	60	0	0	
Demeton-S-methyl	60	60	0	0	
Demeton-S-methyl-sulfoxide	60	60	0	0	
Desmedipham	59	59	0	0	
Di(2-ethoxyethyl) phthalate (DEEP)	45	45	0	0	
Di(2-ethylhexyl) adipate (DEHA)	60	53	7	0	●
Di(2-ethylhexyl) phthalate (DEHP)	60	57	3	0	●

Compound	Samples collected ¹	Samples with no detections	Detections below the action limit ²	Detections above the action limit ³	Flag
Di(2-ethylhexyl) terephthalate (DEHT)	45	43	2	0	●
Di(2-methoxyethyl) phthalate (DMEP)	45	45	0	0	
Di(2-n-butoxyethyl) phthalate (DBEP)	45	45	0	0	
Di(4-methyl-2-pentyl) phthalate (BMPP)	45	45	0	0	
Diallyl phthalate (DAP)	45	45	0	0	
Diazinon	60	60	0	0	
Dichlobenil	60	60	0	0	
Dichlofenthion	60	60	0	0	
Dichlofluanid	60	60	0	0	
Dichlorvos	60	60	0	0	
Diclobutrazol	60	60	0	0	
Diclocymet	60	60	0	0	
Diclofop-methyl	60	60	0	0	
Dicloran	60	60	0	0	
Diclosulam	59	59	0	0	
Dicofol	60	60	0	0	
Dicrotophos	58	58	0	0	
Dicyandiamide (DCD)	60	60	0	0	
Dicyclanil	60	60	0	0	
Dicyclohexyl phthalate (DCHP)	45	45	0	0	
Didecyl phthalate (DDP)	60	60	0	0	
Didecyltrimethylammonium chloride (DM-DC10)	60	59	1	0	●
Didodecyltrimethylammonium chloride (DM-DC12)	60	60	0	0	
Dieldrin	60	60	0	0	
Diethofencarb	60	60	0	0	
Diethyl phthalate (DEP)	60	60	0	0	
Difenoconazole	60	60	0	0	
Diflubenzuron	60	60	0	0	
Diflufenican	60	60	0	0	
Diheptyl phthalate (DHP)	60	60	0	0	
Dihexyl phthalate (DHXP)	60	60	0	0	
Dihydrostreptomycin	60	60	0	0	
Diisobutyl phthalate (DIBP)	60	60	0	0	
Diisodecyl phthalate (DIDP)	60	60	0	0	
Diisononyl phthalate (DINP)	60	54	6	0	●
Diisooctyl phthalate (DIOP)	45	45	0	0	
Diisopropyl phthalate (DIPP)	60	60	0	0	
Dimepiperate	60	60	0	0	
Dimethenamid	60	60	0	0	
Dimethoate	58	58	0	0	
Dimethomorph	60	60	0	0	
Dimethyl isophthalate (DMIP)	45	45	0	0	
Dimethyl phthalate (DMP)	60	60	0	0	
Dimethylditetradecylammonium chloride (DM-DC14)	60	60	0	0	
Dimethylvinphos	58	58	0	0	

Compound	Samples collected ¹	Samples with no detections	Detections below the action limit ²	Detections above the action limit ³	Flag
Di-n-butyl phthalate (DBP)	60	60	0	0	
Di-n-nonyl phthalate (DNP)	45	45	0	0	
Di-n-octyl phthalate (DNOP)	60	60	0	0	
Di-n-pentyl phthalate (DNPP)	60	60	0	0	
Di-n-undecyl phthalate (DUP)	45	45	0	0	
Dioxabenzofos	60	60	0	0	
Dioxathion	58	58	0	0	
Diphenamid	60	60	0	0	
Diphenyl phthalate (DPP)	45	45	0	0	
Diphenylamine	60	60	0	0	
Disulfoton	56	56	0	0	
Dithiopyr	60	60	0	0	
Diuron	60	60	0	0	
Edifenphos	58	58	0	0	
Emamectin Benzoate	60	60	0	0	
Endosulfan sulfate	60	60	0	0	
Endrin	60	60	0	0	
Endrin ketone	60	60	0	0	
EPN	60	60	0	0	
Epoxiconazole	60	60	0	0	
EPTC	60	60	0	0	
Erythromycin	60	60	0	0	
Esprocarb	60	60	0	0	
Ethalfuralin	60	60	0	0	
Ethametsulfuron-methyl	60	60	0	0	
Ethiofencarb	53	53	0	0	
Ethion	60	60	0	0	
Ethiprole	60	60	0	0	
Ethofumesate	60	60	0	0	
Ethoprophos	60	60	0	0	
Ethoxyquin	47	47	0	0	
Ethoxysulfuron	60	60	0	0	
Ethychlozate	60	60	0	0	
Etobenzanid	60	60	0	0	
Ettoxazole	60	60	0	0	
Etridiazole	60	60	0	0	
Etrimfos	60	60	0	0	
Famoxadone	60	60	0	0	
Famphur	58	58	0	0	
Fenamidone	60	60	0	0	
Fenamiphos	60	60	0	0	
Fenarimol	60	60	0	0	
Fenbuconazole	60	60	0	0	
Fenchlorphos	60	60	0	0	
Fenhexamid	60	60	0	0	

Compound	Samples collected ¹	Samples with no detections	Detections below the action limit ²	Detections above the action limit ³	Flag
Fenitrothion	60	60	0	0	
Fenobucarb	60	60	0	0	
Fenothiocarb	60	60	0	0	
Fenoxanil	60	60	0	0	
Fenoxaprop	53	53	0	0	
Fenoxaprop-ethyl	60	60	0	0	
Fenoxycarb	60	60	0	0	
Fenpiclonil	60	60	0	0	
Fenpropathrin	60	60	0	0	
Fenpropidin	2	2	0	0	
Fenpropimorph	60	60	0	0	
Fenpyroximate	60	60	0	0	
Fensulfothion	58	58	0	0	
Fenthion	60	60	0	0	
Fenthion oxon	60	60	0	0	
Fenthion oxon sulfone	60	60	0	0	
Fenthion oxon sulfoxide	60	60	0	0	
Fenthion sulfone	58	58	0	0	
Fenthion-ethyl	60	60	0	0	
Fentrazamide	60	60	0	0	
Fenvalerate	59	59	0	0	
Ferimzone	59	59	0	0	
Fipronil	60	60	0	0	
Fipronil sulfide	60	60	0	0	
Fipronil sulfone	60	60	0	0	
Flamprop	2	2	0	0	
Flamprop-methyl	60	60	0	0	
Flazasulfuron	60	60	0	0	
Fluacrypyrim	60	60	0	0	
Fluazifop-P-butyl	60	60	0	0	
Flubendazole	60	60	0	0	
Flubendiamide	60	60	0	0	
Flucythrinate	60	60	0	0	
Fludioxonil	60	60	0	0	
Flufenacet	60	60	0	0	
Flumethrin	60	60	0	0	
Flumiclorac-pentyl	60	60	0	0	
Flumioxazin	60	60	0	0	
Fluometuron	60	60	0	0	
Fluopicolide	60	60	0	0	
Fluopyram	60	60	0	0	
Fluquinconazole	60	60	0	0	
Fluridone	60	60	0	0	
Flusilazole	60	60	0	0	
Fluthiacet-methyl	60	60	0	0	

Compound	Samples collected ¹	Samples with no detections	Detections below the action limit ²	Detections above the action limit ³	Flag
Flutolanil	60	60	0	0	
Flutriafol	60	60	0	0	
Fluvalinate	60	60	0	0	
Fonofos	60	60	0	0	
Forchlorfenuron	59	59	0	0	
Fosthiazate	57	57	0	0	
Fuberidazole	60	60	0	0	
Furalaxyl	60	60	0	0	
Furametpyr	60	60	0	0	
Furathiocarb	60	60	0	0	
Gentamicin	60	60	0	0	
Glyphosate	30	30	0	0	
Halosulfuron-methyl	59	59	0	0	
Haloxyfop-etotyl	60	60	0	0	
Haloxyfop-methyl	60	60	0	0	
Heptachlor	60	60	0	0	
Heptachlor-endo-epoxide	60	60	0	0	
Heptachlor-exo-epoxide	60	60	0	0	
Heptenophos	60	60	0	0	
Hexachlorobenzene	60	60	0	0	
Hexaconazole	60	60	0	0	
Hexadecylpyridiniumammonium chloride (C16-Py)	60	60	0	0	
Hexadecyltrimethylammonium chloride (TM-C16)	60	58	2	0	●
Hexaflumuron	52	52	0	0	
Hexazinone	60	60	0	0	
Hexyl 2-ethylhexyl phthalate (HEHP)	45	45	0	0	
Hexythiazox	6	6	0	0	
Imazalil	60	60	0	0	
Imazamethabenz-methyl	60	60	0	0	
Imazosulfuron	59	59	0	0	
Imidacloprid	60	60	0	0	
Imidacloprid-olefin	59	59	0	0	
Inabenfide	60	60	0	0	
Indanofan	60	60	0	0	
Indoxacarb	60	60	0	0	
Iodosulfuron-methyl	59	59	0	0	
Iprobenfos	60	60	0	0	
Iprodione	60	59	1	0	●
Iprovalicarb	60	60	0	0	
Isazofos	60	60	0	0	
Isofenphos	60	60	0	0	
Isofenphos-methyl	60	60	0	0	
Isoproc carb	60	60	0	0	
Isoprothiolane	60	60	0	0	
Isoproturon	60	60	0	0	

Compound	Samples collected ¹	Samples with no detections	Detections below the action limit ²	Detections above the action limit ³	Flag
Isoprazam	60	60	0	0	
Isoxathion	60	60	0	0	
Jodfenphos	60	60	0	0	
Kanamycin	60	60	0	0	
Karbutilate	60	60	0	0	
Kresoxim-methyl	60	60	0	0	
Lactofen	60	60	0	0	
Lasalocid	60	60	0	0	
Lead	60	59	1	0	●
Lenacil	60	60	0	0	
Leptophos	58	58	0	0	
Lindane	60	60	0	0	
Linuron	60	60	0	0	
Maduramicin	60	60	0	0	
Malathion	60	60	0	0	
Mandipropamid	60	60	0	0	
Mefenacet	60	60	0	0	
Mefenpyr-diethyl	60	60	0	0	
Melamine	60	60	0	0	
Mepaniprim	60	60	0	0	
Mepronil	60	60	0	0	
Mercury	60	60	0	0	
Mesotrione	6	6	0	0	
Mesulfenfos	58	58	0	0	
Metalaxyl	60	60	0	0	
Metamitron	60	60	0	0	
Metconazole	60	60	0	0	
Methabenzthiazuron	60	60	0	0	
Methacrifos	60	60	0	0	
Methamidophos	60	60	0	0	
Methidathion	58	58	0	0	
Methiocarb	58	58	0	0	
Methiocarb sulfone	59	59	0	0	
Methiocarb sulfoxide	59	59	0	0	
Methomyl	60	60	0	0	
Methoxychlor	60	60	0	0	
Methoxyfenozide	60	60	0	0	
Metobromuron	60	60	0	0	
Metolachlor	60	60	0	0	
Metosulam	59	59	0	0	
Metrafenone	60	60	0	0	
Metribuzin	60	60	0	0	
Metsulfuron-methyl	59	59	0	0	
Mevinphos	60	60	0	0	
Mirex	60	60	0	0	

Compound	Samples collected ¹	Samples with no detections	Detections below the action limit ²	Detections above the action limit ³	Flag
Molinate	59	59	0	0	
Monensin	60	60	0	0	
Monocrotophos	60	60	0	0	
Monofluoroacetic acid	60	60	0	0	
Monolinuron	60	60	0	0	
Myclobutanil	60	60	0	0	
Napropamide	60	60	0	0	
Narasin	60	60	0	0	
Nicotine	58	58	0	0	
Nitrate	60	3	57	0	●
Nitrite	60	0	60	0	●
Nitrofen	60	60	0	0	
Nitrothal-isopropyl	60	60	0	0	
Norflurazon	60	60	0	0	
Novaluron	53	53	0	0	
o,p'-DDE	60	60	0	0	
o,p'-DDT	60	60	0	0	
o,p'-TDE	60	60	0	0	
Ocithilnone	60	60	0	0	
Oleandomycin	60	60	0	0	
Omethoate	60	60	0	0	
Oryzalin	60	60	0	0	
Oxabetrinil	32	32	0	0	
Oxadiazon	60	60	0	0	
Oxadixyl	60	60	0	0	
Oxamyl	60	60	0	0	
Oxycarboxin	60	60	0	0	
Oxychlorane	60	60	0	0	
Oxyfluorfen	60	60	0	0	
Oxytetracycline	60	60	0	0	
p,p'-DDE	60	56	4	0	●
p,p'-DDT	60	60	0	0	
p,p'-TDE	60	60	0	0	
Paclobutrazol	60	60	0	0	
Parathion	60	60	0	0	
Parathion-methyl	60	60	0	0	
Penconazole	60	60	0	0	
Pencycuron	60	60	0	0	
Pendimethalin	60	60	0	0	
Pentachlorobenzene	60	60	0	0	
Penthiopyrad	60	60	0	0	
Permethrin	60	60	0	0	
Perthane	60	60	0	0	
Phenmedipham	59	59	0	0	
Phenthoate	60	60	0	0	

Compound	Samples collected ¹	Samples with no detections	Detections below the action limit ²	Detections above the action limit ³	Flag
Phorate	60	60	0	0	
Phorate sulfone	60	60	0	0	
Phorate sulfoxide	58	58	0	0	
Phosalone	58	58	0	0	
Phosmet	58	58	0	0	
Phosphamidon	60	60	0	0	
Phoxim	60	60	0	0	
Picolinafen	60	60	0	0	
Piperonyl butoxide	60	60	0	0	
Piperophos	60	60	0	0	
Pirimicarb	60	60	0	0	
Pirimiphos-methyl	60	60	0	0	
Pretilachlor	60	60	0	0	
Prochloraz	60	60	0	0	
Procymidone	60	60	0	0	
Profenofos	60	60	0	0	
Promecarb	60	60	0	0	
Prometryn	60	60	0	0	
Propachlor	60	60	0	0	
Propamocarb	60	60	0	0	
Propanil	60	60	0	0	
Propaphos	60	60	0	0	
Propaquizafop	60	60	0	0	
Propargite	60	60	0	0	
Propazine	60	60	0	0	
Propetamphos	60	60	0	0	
Propham	58	58	0	0	
Propiconazole	60	60	0	0	
Propoxur	60	60	0	0	
Propyzamide	60	60	0	0	
Proquinazid	60	60	0	0	
Prosulfocarb	60	60	0	0	
Prothiofos	60	60	0	0	
Pymetrozine	60	60	0	0	
Pyraclofos	58	58	0	0	
Pyraclostrobin	60	60	0	0	
Pyraflufen-ethyl	60	60	0	0	
Pyrasulfotole	6	6	0	0	
Pyrazophos	58	58	0	0	
Pyrethrins	56	56	0	0	
Pyributicarb	60	60	0	0	
Pyridaben	59	59	0	0	
Pyridaphenthion	58	58	0	0	
Pyrifenox	6	6	0	0	
Pyrifitalid	60	60	0	0	

Compound	Samples collected ¹	Samples with no detections	Detections below the action limit ²	Detections above the action limit ³	Flag
Pyrimethanil	60	60	0	0	
Pyrimidifen	60	60	0	0	
Pyriproxyfen	60	60	0	0	
Pyroquilon	60	60	0	0	
Pyroxsulam	59	59	0	0	
Quinalphos	60	60	0	0	
Quinoclamine	60	60	0	0	
Quinoxifen	60	60	0	0	
Quintozene	60	60	0	0	
Quizalofop-ethyl	60	60	0	0	
Rimsulfuron	59	59	0	0	
Saflufenacil	59	59	0	0	
Salinomycin	60	60	0	0	
Sebuthylazine	60	60	0	0	
SEM (semicarbazide)	60	42	18	0	●
Semduramicin	60	60	0	0	
Sethoxydim	56	56	0	0	
Simazine	60	60	0	0	
Simeconazole	60	60	0	0	
Simetryn	60	60	0	0	
Spinetoram (sum of major and minor components as spinetoram)	60	60	0	0	
Spinosad (sum of spinosyn A and spinosyn D as spinosad)	60	60	0	0	
Spiramycin	60	60	0	0	
Spiromesifen	60	60	0	0	
Spiromesifen-enol	59	59	0	0	
Spirotetramat	60	60	0	0	
Spirotetramat-enol	60	60	0	0	
Spirotetramat-enol-glucoside	6	6	0	0	
Spirotetramat-keto-hydroxy	60	60	0	0	
Spirotetramat-mono-hydroxy	60	60	0	0	
Spiroxamine	56	56	0	0	
Streptomycin	60	60	0	0	
Sulfentrazone	59	59	0	0	
Sulprofos	60	60	0	0	
Tebuconazole	60	60	0	0	
Tebufenozide	60	60	0	0	
Tebufenpyrad	60	60	0	0	
Tebuthiuron	60	60	0	0	
Tecnazene	60	60	0	0	
Tefluthrin	60	60	0	0	
Temephos	60	60	0	0	
Tepraloxymid	60	60	0	0	
Terbacil	60	60	0	0	
Terbufos	60	60	0	0	
Terbumeton	60	60	0	0	

Compound	Samples collected ¹	Samples with no detections	Detections below the action limit ²	Detections above the action limit ³	Flag
Terbutylazine	60	60	0	0	
Terbutryn	60	60	0	0	
Tetrachlorvinphos	54	54	0	0	
Tetraconazole	60	60	0	0	
Tetracycline	60	60	0	0	
Tetradifon	60	60	0	0	
Thenylchlor	60	60	0	0	
Thiabendazole	60	60	0	0	
Thiacloprid	60	60	0	0	
Thiamethoxam	60	60	0	0	
Thiazopyr	60	60	0	0	
Thidiazuron	59	59	0	0	
Thiobencarb	58	58	0	0	
Thiometon	56	56	0	0	
Tiadinil	56	56	0	0	
Tin	60	59	1	0	●
Tolclofos-methyl	60	60	0	0	
Tolyfluanid	60	60	0	0	
Tralkoxydim	60	60	0	0	
trans-Chlordane	60	60	0	0	
Transfluthrin	60	60	0	0	
Triadimefon	60	60	0	0	
Triadimenol	60	60	0	0	
Tri-allate	60	60	0	0	
Triasulfuron	59	59	0	0	
Triazophos	58	58	0	0	
Tribenuron-methyl	60	60	0	0	
Tribufos	60	60	0	0	
Trichlorfon	59	59	0	0	
Tricyclazole	60	60	0	0	
Trifloxystrobin	60	60	0	0	
Trifloxysulfuron-sodium	60	60	0	0	
Triflumizole	60	60	0	0	
Triflumuron	60	60	0	0	
Trifluralin	60	60	0	0	
Triflusulfuron-methyl	59	59	0	0	
Triforine	51	51	0	0	
Triticonazole	60	60	0	0	
Tylosin	60	60	0	0	
Uniconazole-P	60	60	0	0	
Vamidothion	60	60	0	0	
Vinclozolin	60	60	0	0	
XMC	55	55	0	0	
Zoxamide	60	60	0	0	

Notes

- 1 Samples are counted as collected if results for the test are reportable. Reportable results are when all the quality control criteria has been met to give results at the method reporting limit.
 - 2 The number of detections reported at or below the maximum allowable level. In some cases no limit applies
 - 3 Non-complying results: detection of a compound above the New Zealand or export market maximum limit for the residue or contaminant, or detection at or above the limit of quantitation for a compound not permitted for food producing animals
- The amount reported did not exceed the action limit as set out in section 3.1

7.2 REPORTING OF COMPOSITIONAL TESTING AND NATURALLY OCCURRING COMPOUNDS

Table 5: Dairy components

Product type	Samples collected			
	Ash	Fat	Moisture	Protein
Follow on formula	15	15	6	6
Growing up milk powder	21	21	9	9
Growing up milk powder base	2	2	0	0
Infant formula	12	12	5	5
Infant formula base	1	1	0	0
Milk	0	0	0	5
Milk protein concentrate	0	0	2	2
Nutritional powder	9	9	4	4
Skim milk powder	0	0	10	8
Whole milk powder	0	0	24	21

Table 6: Naturally occurring chemical elements and added compounds

Naturally occurring chemical elements and added compounds	Samples Collected	Product type collected													
		AMF	Butter	Casein	Follow-on formula	Growing up milk powder	Growing up milk powder base	Infant formula	Infant formula base	Milk protein concentrate	Nutritional powder	Skim milk powder	Whey	Whey protein concentrate	Whole milk powder
Aluminium	60	2	3	3	5	8	0	4	0	0	3	7	0	6	19
Antimony	60	2	3	3	5	8	0	4	0	0	3	7	0	6	19
Barium	60	2	3	3	5	8	0	4	0	0	3	7	0	6	19
Bismuth	60	2	3	3	5	8	0	4	0	0	3	7	0	6	19
Chromium	60	2	3	3	5	8	0	4	0	0	3	7	0	6	19
Cobalt	60	2	3	3	5	8	0	4	0	0	3	7	0	6	19
Copper	60	2	3	3	5	8	0	4	0	0	3	7	0	6	19
Iodine	60	2	3	3	5	8	0	4	0	0	3	7	0	6	19
Iron	60	2	3	3	5	8	0	4	0	0	3	7	0	6	19
Magnesium	60	2	3	3	5	8	0	4	0	0	3	7	0	6	19
Manganese	60	2	3	3	5	8	0	4	0	0	3	7	0	6	19
Nickel	60	2	3	3	5	8	0	4	0	0	3	7	0	6	19
Potassium	60	2	3	3	5	8	0	4	0	0	3	7	0	6	19
Selenium	60	2	3	3	5	8	0	4	0	0	3	7	0	6	19
Sodium	60	2	3	3	5	8	0	4	0	0	3	7	0	6	19
Sodium thiocyanate	54	0	0	0	7	9	0	5	0	2	0	8	0	1	22
Zinc	60	2	3	3	5	8	0	4	0	0	3	7	0	6	19
Butanal	26	0	0	0	0	0	0	0	0	0	0	6	1	2	17
Formaldehyde	30	0	0	0	0	0	0	0	0	2	0	6	1	4	17
Heptanal	26	0	0	0	0	0	0	0	0	0	0	6	1	2	17
Hexanal	26	0	0	0	0	0	0	0	0	0	0	6	1	2	17
Nonanal	26	0	0	0	0	0	0	0	0	0	0	6	1	2	17
Pentanal	26	0	0	0	0	0	0	0	0	0	0	6	1	2	17
Arachidonic C20:4n-6	60	0	0	0	15	21	2	12	1	0	9	0	0	0	0
Docosahexaenoic C22:6n-3 (DHA)	60	0	0	0	15	21	2	12	1	0	9	0	0	0	0