Canadian Food Inspection Agency
Agence canadienne d'inspection des aliments

Children's food project — Annual report

2022

Canada

Summary

The Canadian Food Inspection Agency (CFIA) uses a number of different monitoring programs for chemical residues and contaminants in food to ensure that the food supply is safe and compliant with Canadian standards. The Children's Food Project (CFP) complements these activities by collecting information specifically on chemical residues and contaminants in manufactured foods frequently consumed by, and targeted to, infants and children. Because of their smaller body weight, their development and growth, and their consumption patterns this group may be at higher risk from exposure to these chemicals.

The main objectives of the 2022 CFP were to:

- collect data and assess the compliance of infant/children's foods to Canadian standards for residues of pesticides and veterinary drugs, and levels of metals/elements;
- collect data on aflatoxin M1 levels in yogurt/yogurt beverages and infant formulas.

Previous years have analyzed selected foods for pesticides, metals/elements, veterinary drug residues, aflatoxin M1, and environmental contaminants.

In the 2022 CFP, a total of 201 samples of children's foods were purchased in Halifax, Nova Scotia between November and December 2022. These samples included infant cereals, cookies/biscuits, crackers, granola/cereal bars, yogurt/yogurt beverages, and dairy-based infant formulas.

A total of 108 samples of infant/children's snacks and cereals were analyzed for metals/elements and pesticides and a total of 93 yogurt/yogurt beverage and dairy-based infant formula samples were tested for aflatoxin M1 and veterinary drug residues. Yogurt/yogurt beverages and infant formulas were not analyzed for metals/elements and pesticides because these commodities were tested in previous years.

Out of 108 samples of infant/children's snacks and cereals, 30% (32) tested positive for pesticides however all were found to be compliant with Canadian regulations.

Out of the 108 samples tested for metals/elements, all samples tested positive for detectable levels of aluminum and 96% (104) contained detectable levels of the other metals/elements of concern (arsenic, cadmium, lead, and mercury). At the time of this survey, there were no maximum levels (MLs) for metals/elements set by Health Canada for the products tested.

Veterinary drug residues were found in 3 (3%) of the 93 yogurt/yogurt beverage and dairy-based infant formula samples, and aflatoxin M1 was found in 1 infant formula sample (1%). All of the residues detected were assessed as non-violative.

The overall compliance rate was 100% for all samples. All data was reviewed by Health Canada and no health risk was identified to Canadian infants and toddlers in any of the foods tested.

What the children's food project is

The CFP began in 2003 to look at levels of pesticide residues and metals/elements in foods for infants and children. Because of their smaller body weight, their development and growth, and their consumption patterns, this group may be at higher risk from exposure to these chemicals.

The CFIA uses a number of different monitoring programs to ensure that the food supply is safe and compliant with Canadian standards. The CFP complements these activities by specifically collecting information on domestically produced and imported manufactured foods frequently consumed by and targeting children (for example, infant formula, cereal-based products, fruit juices, and beverages). Together, the data from these programs help health authorities assess potential exposure to chemical residues and contaminants in a number of foods consumed by Canadian children.

The main objectives of the 2022 CFP were to:

- collect data and assess the compliance of infant foods to Canadian standards for residues of pesticides, veterinary drugs, and metals/elements;
- collect data on aflatoxin M1 levels in yogurt/yogurt beverages and infant formulas.

What was sampled

A total of 201 domestic and imported children's foods were sampled from retail stores located in Halifax, Nova Scotia, between November and December 2022. Out of the 201 samples, 72 were domestically produced, 75 were imported from other countries, and 54 were from unknown countries of origin. Of these samples, 34 were labelled "organic" (note that identification of samples as organic is based solely on the information on the product label).

Table 1: Summary of products sampled in the 2022 CFP

Product type	Number of domestic samples	Number of imported samples	Number of samples of unspecified origin[a]	Total number of samples
Infant food - cereal	8	20	11	39
Infant/children's food - snack	17	22	30	69
Infant formula - dairy	1	33	0	34
Yogurt	39	0	12	51
Beverage - yogurt	7	0	1	8
Total	**72**	**75**	**54**	**201**

Table notes

[a] Unspecified refers to those samples for which a country of origin could not be assigned from the product label or available sample information

Sampling limitations

Due to the limited number of samples and products analyzed, care must be taken when interpreting these results. Regional differences, impact of product shelf-life, storage conditions, or cost of the commodity on the open market were not examined in this survey. Samples were tested as sold, which means the product was tested as is and not prepared according to package instructions.

How samples were analyzed and assessed

Analytical testing for the various types of analytes was performed by ISO/IEC 17025 accredited food testing laboratories under contract with the Government of Canada.

Pesticide analysis

Infant/children's cereals and snacks (cookies/biscuits, crackers, and granola/cereal bars) were analyzed for pesticides. Samples were tested for a range of pesticide residues which are commonly used in farming to control insects, fungi, and weeds. A summary of the pesticide residues analyzed can be found in Appendix A.

Metal/elemental analysis

Infant/children's cereals and snacks (cookies/biscuits, crackers, and granola/cereal bars) were tested for metals/elements. Many metals or elements are present in food due to their natural occurrence in the environment, but they could also be present due to the use of pesticides, agricultural chemicals, environmental contamination, or processing. The focus of this report will be on 5 elements of primary concern to human health, which are: aluminum, arsenic, cadmium, mercury, and lead. A summary of the results of all metals tested in each category in this survey is in Appendix C.

Veterinary drug analysis

Yogurt/yogurt beverages and infant formula samples were tested for residues of a variety of veterinary drugs which can be administered to food-producing animals. Some drugs are administered to individual animals to treat specific diseases, while others are administered to groups of animals, usually through medicated feed or water, to prevent or treat disease or to promote growth. The veterinary drugs analyzed in samples are listed in Appendix B.

Aflatoxin M1 analysis

Aflatoxins are natural compounds released by Aspergillus moulds. These moulds thrive in hot, humid climates and are not typically detected in Canadian crops. Aflatoxin B1 has been classified by the International Agency for Research on Cancer (IARC) as causing cancer in humans[2]. When dairy cows are fed aflatoxin-contaminated feed, aflatoxin B1 is converted to aflatoxin M1, which is transferred to the milk. Animal studies have shown that aflatoxin M1 causes cancer in the same way as aflatoxin B1[2,3,4]. For this reason, dairy-based yogurt/yogurt beverages and infant formula samples were analyzed for aflatoxin M1.

Assessment of results

All results from samples tested in this survey were evaluated against Canadian standards established by Health Canada. Compliance was assessed against the established tolerances available when the survey was carried out. For pesticides, the Maximum Residue Limit (MRL) is the maximum amount of residues that is expected to remain in or on food products when a pesticide is used according to product label directions. For metals/elements, the ML is the maximum level of a contaminant that could safely remain in food products.

Canadian pesticide MRLs are listed in the Maximum Residue Limit database[5] published on the Health Canada website. In the absence of an MRL, pesticide residues must comply with the general MRL (gMRL) of 0.1 parts per million (ppm) as stated in section B.15.002 (1) of the Food and Drug Regulations[6].

MLs for metals/elements in food are found in the Food and Drug Regulations' List of Contaminants and Other Adulterating Substances in Foods[7]. At the time of this survey, Health Canada did not have established MLs for arsenic, cadmium, mercury, or lead for any of the products tested in this survey. Health Canada reviews all metals results from the CFP to determine if there is any health risk to infants and children.

Canadian MRLs for veterinary drug residues in foods of animal origin (meat, milk, eggs, and honey) are published in the List of Maximum Residue Limits (MRLs) for Veterinary Drugs in Food on Health Canada's website[8]. In the absence of an MRL or proposed MRL for a veterinary drug, the CFIA deems any food product containing a veterinary drug residue at or above the Limit of Quantitation (LOQ) to be non-compliant.

There is no established Canadian standard for aflatoxin M1 in milk or dairy products. CFIA assesses these results using the recommended ML of 0.5 parts per billion (ppb) established by the Food and Agriculture Organization (FAO) of the United Nations[15].

Results of the survey

Pesticides

A total of 108 samples of infant/children's cereals and snacks (cookies/biscuits, crackers, and granola/cereal bars) were tested for pesticides. Of these samples, 70% (76) did not contain detectable amounts of pesticides. The 32 samples that were positive for detectable amounts of pesticides were 100% compliant with Canadian regulations.

Metals/elements

A total of 108 samples were tested for metals/elements. All samples had detectable levels of aluminum and most samples (104, or 96%) tested positive for arsenic, cadmium, lead, and/or mercury. All metal/element results were sent to Health Canada's Bureau of Chemical Safety for review and the products tested were determined to not be of concern to the health of children and infants.

Aluminum

Aluminum is one of the most common elements in the Earth's crust and it is commonly found combined with elements such as oxygen[9]. Exposure to aluminum is inevitable — it is in water, air, and soil which is why it is found in most foods. Only exposure to high levels of aluminum is harmful[9]. Those who inhale large amounts of aluminum develop lung problems and children who were given aluminum treatments to aid kidney problems developed bone diseases[9].

All 108 samples contained detectable levels of aluminum ranging from 0.36 ppm to 37.1 ppm with highest levels in wheat flour-based snack products.

Arsenic

Arsenic is an element that naturally occurs in the earth's crust and can be found as organic arsenic (compounds containing carbon atoms) and inorganic arsenic (free arsenic ions)[10]. In general, inorganic arsenic is more toxic to humans than organic arsenic. Long-term exposure to high levels of inorganic arsenic is known to contribute to the risk of human cancer and can affect the gastrointestinal tract, kidneys, liver, lungs, and skin[11]. For most Canadians, the primary source of exposure to arsenic is food, followed by drinking water, soil, and air[11].

MLs for inorganic arsenic in polished (white) rice (0.2 ppm) and husked (brown) rice (0.35 ppm) were established in July 2020[7]. As of August 2022, Health Canada established a ML of 0.1 ppm for inorganic arsenic in rice-based foods intended for infants and young children[7]. It should be stated, however, that the samples were only tested for total arsenic, and therefore the MLs mentioned above do not apply to the total arsenic results in this survey.

A total number of 33 samples (31%) did not contain detectable levels of total arsenic. Results from samples positive for arsenic ranged from 0.0050 ppm to 0.413 ppm with highest levels in rice-based cereals.

Cadmium

Cadmium can be present in water and soil through the use of phosphate or sewage sludge fertilizers. Food grown in cadmium containing soils is the primary source of cadmium exposure in the general population[12]. Kidneys and bones are affected by cadmium toxicity[12].

A total of 20% (22) of samples did not contain detectable levels of cadmium. Results in positive samples ranged from 0.0051 ppm to 0.0551 ppm with highest levels in wheat-based crackers.

Lead

Lead exposure may occur from a number of environmental and food sources. Chronic exposure to low levels of lead can be harmful to human health. Lead occurs naturally in the environment and has many industrial uses, such as in mining, smelting and battery manufacturing[13]. The greatest sources of a child's environmental exposure to lead are oral exposure from food and water along with ingestion of house dust and soil contaminated with lead[13].

A total of 44 samples (41%) did not contain detectable levels of lead. Results in positive samples for lead ranged from 0.0050 ppm to 0.196 ppm with highest level in a gluten free cracker product that was made with cassava flour, oat flour, and tapioca starch.

Mercury

Mercury is released naturally from rocks, soils, and volcanoes. Industrial activities have also increased the amount of mercury in the environment[14]. Mercury contamination is a concern because it is toxic, persists in the environment, and can bio-accumulate in the food chain. The health effects of mercury depend on its chemical form (elemental, inorganic, or organic) and the route and level of exposure[14]. Methylmercury is the more toxic organic form because it is easily absorbed and can cross the blood-brain barrier[14]. Children and the developing fetus are particularly susceptible to the harmful effects of methylmercury.

A total number of 106 samples (98%) did not contain detectable levels of mercury. The two remaining samples contained mercury at levels of 0.0052 ppm and 0.0077 ppm, with the highest level in a rice-based cereal.

Veterinary drugs

Yogurt/yogurt beverages and dairy-based infant formula were tested for veterinary drug residues. No residues were detected in 90 of the 93 samples (97%). Meloxicam was found in 2 yogurt samples (0.0001 and 0.0002 ppb) and semicarbazide was detected in one infant formula sample (0.0040 ppb). All 3 of these samples were assessed as non-violative for these compounds in dairy products.

Aflatoxin M1

A total of 93 samples of yogurt/yogurt beverages and dairy based infant formulas were tested for aflatoxin M1. Aflatoxin M1 was detected in 1 sample of infant formula at 0.0566 ppb, which is compliant with the Codex ML of 0.5 ppb[15]. The other 92 samples (99%) did not contain any detectable aflatoxin M1.

The results of the CFP were shared with Health Canada, and they determined that none of the samples tested posed a health risk to Canadian infants or children. Organic sample results were shared with the Canada Organic Regime team. There were no product actions or recalls resulting from this sampling and testing on the basis of health risk. The infant/children's foods tested in this survey, whether domestically produced or imported, are safe for consumption.

CFIA is committed to ensuring a safe food supply for all Canadians, including the vulnerable populations such as infants and young children. In the coming year, pesticide residues and toxic metals/elements will be examined in samples of infant purées and apple sauces.

How to access the survey data

The data associated with this report will be accessible on the Open Government Portal.

References

1. What is Organic?. (n.d.). Ottawa, Canada. Canada Organic Trade Association.
2. International Agency for Research on Cancer. (2012). A review of human carcinogens: Volume 100F: Chemical Agents and Related Occupations. IARC.
3. Galvano, F., Galofaro, V., Ritieni, A., Bognanno, M., De Angelis, A., Galvano, G. (2001). Survey of the Occurrence of Aflatoxin M1 in Dairy Products Marketed in Italy: Second Year of Observation. Food Additives & Contaminants, 18(7), pp 644-646.
4. Rastogi, S., Dwivedi, P. D., Khanna, S. K., Das, M. (2004). Detection of Aflatoxin M1 Contamination in Milk and Infant Milk Products From Indian Markets by ELISA. Food Control, 15(4), pp 287-290.
5. Maximum Residue Limits for Pesticides. (2012). Canada. Health Canada.
6. Food and Drug Regulations. (2021). Canada. Justice Canada.
7. List of contaminants and other adulterating substances in foods. (2022). Canada. Health Canada.
8. List of Maximum Residue Limits (MRLs) for Veterinary Drugs in Foods. (2021). Canada. Health Canada.
9. ToxFAQs™ for Aluminum. (September 2008). United States of America. Agency for Toxic Substances and Disease Registry.
10. Arsenic in Drinking Water. (2006). Canada. Health Canada.
11. Arsenic. (2022). Canada. Health Canada.
12. Scientific Opinion of the Panel on Contaminants in the Food Chain on a request from the European Commission on cadmium in food. (2009). The EFSA Journal, 980, pp 1-139.
13. Final Human Health State of Science Report on Lead. (2013). Canada. Health Canada.
14. Mercury and Human Health. (2008). Canada. Health Canada.
15. Codex Standard 193-1995: Codex General Standard for Contaminants and Toxins in Food and Feed. (1995). Rome, Italy. Food and Agriculture Organization of the United Nations.

Appendix A: List of pesticides

A	B	C	D	E	F	G	H	I	J	K	L	M
N	O	P	Q	R	S	T	U	V	W	X	Y	Z

1-9

- 2,3,4,5 Tetrachlorophenol
- 2,3,4,6 Tetrachlorophenol
- 2,3,5,6 Tetrachlorophenol
- 2,4,5-T
- 2,4-D
- 2,4-DB
- 3-hydroxycarbofuran

A

- Abamectin
- Acephate
- Acetamiprid
- Acetochlor
- Acibenzolar-s-methyl
- Acifluorfen
- Aclonifen
- Acrinathrin
- Alachlor
- Aldicarb
- Aldicarb sulfone
- Aldicarb sulfoxide
- Aldrin
- Allethrin
- Allidochlor
- Ametryn
- Aminocarb
- Aminocyclopyrachlor
- Aminomethylphosphonic acid
- Amitrole (aminotriazole)
- Anilofos
- Aramite
- Aspon
- Atrazine
- Atrazine-desethyl
- Azaconazole
- Azinphos-ethyl
- Azinphos-methyl
- Azoxystrobin

B

- Benalaxyl
- Bendiocarb
- Benfluralin
- Benodanil
- Benomyl
- Benoxacor
- Bentazon
- Benzoylprop-ethyl
- Bifenazate
- Bifenox
- Bifenthrin
- Biphenyl
- Bitertanol
- Boscalid
- Bromacil
- Bromophos
- Bromophos-ethyl
- Bromopropylate
- Bromoxynil
- Bromuconazole
- Bupirimate
- Buprofezin
- Butachlor
- Butafenacil
- Butocarboxim
- Butocarboxim sulfoxide
- Butralin
- Butylate

C

- Cadusafos
- Captafol
- Captan
- Carbaryl
- Carbendazim
- Carbetamide
- Carbofenthion
- Carbofuran
- Carbosulfan
- Carboxin
- Carfentrazone-ethyl
- Chloramben
- Chlorantraniliprole
- Chlorflurenol-methyl
- Chloridazon
- Chloridazon desphenyl
- Chlorimuron-ethyl
- Chlormephos
- Chlormequat
- Chlorobenzilate
- Chloroneb
- Chloropropylate
- Chlorothalonil
- Chloroxuron
- Chlorpropham
- Chlorpyrifos-ethyl
- Clopyralid
- Cloquintocet-mexyl
- Clothianidin
- Coumaphos
- Crotoxyphos
- Crufomate
- Cyanazine
- Cyanofenphos
- Cyanophos
- Cyanuric Acid
- Cyazofamid
- Cycloate
- Cycloxydim

- Chlorbenside
- Chlorbromuron
- Chlorbufam
- Chlordane
- Chlordane-cis
- Chlordane-trans
- Chlordimeform
- Chlorfenson
- Chlorfenvinphos (e+z)
- Chlorpyrifos-methyl
- Chlorthal-dimethyl (Dacthal)
- Chlorthiamid
- Chlorthion
- Chlorthiophos
- Chlortoluron
- Chlozolinate
- Clodinafop-propargyl
- Clomazone
- Cycluron
- Cyfluthrin (I,II,III,IV)
- Cyhalothrin-lambda
- Cypermethrin
- Cyprazine
- Cyproconazole
- Cyprodinil
- Cyromazine

D

- Daminozide
- Deltamethrin
- Demeton-O
- Demeton-S
- Demeton-S-methyl
- Demeton-s-methyl sulfone
- Demeton-s-methyl sulfoxide
- Desmedipham
- Desmetryn
- Diallate
- Dialofos
- Diazinon
- Diazinon-o analogue
- Dicamba
- Dichlobenil
- Dichlofenthion
- Dichlofluanid
- Dichlormid
- Dichlorprop
- Dichlorvos
- Diclobutrazole
- Diclocymet
- Diclofop-methyl
- Dicloran
- Dicofol
- Dicrotophos
- Dieldrin
- Diethatyl-ethyl
- Diethofencarb
- Difenoconazole
- Difenzoquat
- Dimethachlor
- Dimethametryn
- Dimethenamid
- Dimethoate
- Dimethomorph
- Dimetilan
- Dimoxystrobin
- Diniconazole
- Dinitramine
- Dinoseb
- Dinotefuran
- Dioxacarb
- Dioxathion
- Diphenamid
- Diphenylamine
- Dipropetryn
- Diquat
- Disulfoton
- Disulfoton sulfone
- Diuron
- Dodemorph

E

- Edifenphos
- Emamectin
- Endosulfan sulfate
- Endosulfan-alpha
- Endosulfan-beta
- Endrin
- EPN
- Epoxiconazole
- EPTC
- Erbon
- Esfenvalerate
- Etaconazole
- Ethalfluralin
- Ethephon
- Ethiofencarb
- Ethiofencarb sulfone
- Ethiofencarb sulfoxide
- Ethion
- Ethiprole
- Ethirimol
- Ethofumesate
- Ethoprop
- Ethoprophos
- Ethylan
- Ethylene thiourea
- Etofenprox
- Etoxazole
- Etridiazole
- Etrimfos

F

- Famoxadone
- Fenamidone
- Fenamiphos
- Fenamiphos sulfone
- Fenamiphos sulfoxide
- Fenarimol
- Fenpropimorph
- Fenpyroximate
- Fenson
- Fensulfothion
- Fenthion
- Fentrazamide
- Fluorochloridone
- Fluorodifen
- Fluoxastrobin
- Fluridone
- Fluroxypyr
- Flusilazole

- Fenazaquin
- Fenbuconazole
- Fenchlorphos (Ronnel)
- Fenfuram
- Fenhexamid
- Fenitrothion
- Fenoprop
- Fenoxanil
- Fenoxaprop-ethyl
- Fenoxycarb
- Fenpropathrin
- Fenpropidin
- Fenvalerate
- Fipronil
- Flamprop-isopropyl
- Flamprop-methyl
- Fluazifop-butyl
- Flucarbazone-sodium
- Fluchloralin
- Flucythrinate
- Fludioxonil
- Flufenacet
- Flumetralin
- Flutolanil
- Flutriafol
- Fluvalinate
- Folpet
- Fonofos
- Forchlorfenuron
- Formetanate
- Fosetyl-aluminum
- Fosthiazate
- Fuberidazole
- Furathiocarb

G

- Glufosinate
- Glyphosate
- Griseofulvin

H

- Haloxyfop
- HCH-alpha
- HCH-beta
- HCH-delta (delta-lindane)
- HCH-gamma (lindane)
- Heptachlor
- Heptachlor epoxide endo
- Heptenophos
- Hexachlorobenzene
- Hexaconazole
- Hexazinone

I

- Imazalil
- Imazamethabenz-methyl
- Imazethapyr
- Imidacloprid
- Indoxacarb
- Iodofenphos
- Ipconazole
- Iprobenfos
- Iprodione
- Iprovalicarb
- Isazophos
- Isocarbamide
- Isofenphos
- Isoprocarb
- Isopropalin
- Isoprothiolane
- Isoproturon
- Isoxadifen-ethyl
- Isoxathion

K

- Kresoxim-methyl

L

- Leptophos
- Linuron

M

- Malaoxon
- Malathion
- Maleic hydrazide
- Mandipropamid
- MCPA
- MCPB
- Mecarbam
- Mecoprop
- Melamine
- Mepanipyrim
- Metazachlor
- Metconazole
- Methabenzthiazuron
- Methamidophos
- Methidathion
- Methiocarb
- Methiocarb sulfone
- Methiocarb Sulfoxide
- Methomyl
- Methoprotryne
- Metolachlor
- Metolcarb
- Metosulam
- Metoxuron
- Metribuzin
- Mevinphos
- Mexacarbate
- Mirex
- Molinate
- Monocrotophos

- Mephosfolan
- Mepiquat
- Mepiquat-4-hydroxy
- Malaoxon
- Metalaxyl
- Methoxychlor
- MPPA (3-Methylphosphinicopropionic acid)
- Methoxyfenozide
- Metobromuron
- Metazachlor
- Monolinuron
- Myclobutanil
- Metolachlor

N

- N-Acetylaminomethylphosphonic Acid
- N-Acetylglufosinate
- N-Acetylglyphosate
- Naled
- Napropamide
- Naptalam
- Neburon
- Nereistoxin
- Nicotine
- Nitenpyram
- Nitralin
- Nitrapyrin
- Nitrofen
- Nitrothal-isopropyl
- Nonachlor-trans
- Norflurazon
- Novaluron
- Nuarimol

O

- o,p'-DDD (o,p'-TDE)
- o,p'-DDE
- o,p'-DDT
- Octhilinone
- Ofurace
- Omethoate
- Ortho-phenylphenol
- Oxadiazon
- Oxamyl
- Oxamyl-oxime
- Oxycarboxin
- Oxychlordane
- Oxyfluorfen

P

- p,p'-DDD (p,p'-TDE)
- p,p'-DDE
- p,p'-DDT
- Paclobutrazol
- Paraoxon
- Paraquat
- Parathion-ethyl
- Parathion-methyl
- Pebulate
- Penconazole
- Pencycuron
- Pendimethalin
- Penoxsulam
- Pentachlorophenol
- Pentachlorothioanisole
- Permethrin-cis
- Permethrin-trans
- Phenthoate
- Phorate
- Phorate sulfone
- Phosalone
- Phosmet
- Phosphamidon
- Picloram
- Picolinafen
- Picoxystrobin
- Piperonyl butoxide
- Piperophos
- Pirimicarb
- Pirimiphos-ethyl
- Pirimiphos-methyl
- Pretilachlor
- Primisulfuron-methyl
- Prochloraz
- Procymidone
- Profenofos
- Profluralin
- Promecarb
- Prometon
- Prometryne
- Pronamide
- Propachlor
- Propamocarb
- Propamocarb-N-desmethyl
- Propamocarb-N-oxide
- Propanil
- Propargite
- Propazine
- Propetamphos
- Propham
- Propiconazole
- Propoxur
- Propyzamide
- Prothiophos
- PTU (N,N'-(1,2-Propylene)thiourea)
- Pymetrozine
- Pyracarbolid
- Pyraclostrobin
- Pyraflufen-ethyl
- Pyrazophos
- Pyridaben
- Pyridalyl
- Pyridaphenthion
- Pyridate
- Pyrifenox
- Pyrimethanil
- Pyriproxyfen
- Pyroquilon
- Pyroxsulam

Q

- Quinalphos
- Quinomethionate
- Quinoxyfen
- Quintozene
- Quizalofop
- Quizalofop-ethyl

R

- Resmethrin

S

- Schradan
- Secbumeton
- Simazine
- Simeconazole
- Simetryn
- Spinosyn A
- Spinosyn D
- Spirodiclofen
- Spiromesifen
- Spirotetramat
- Spiroxamine
- Sulfallate
- Sulfentrazone
- Sulfotep
- Sulprophos

T

- TCMTB
- Tebuconazole
- Tebufenozide
- Tebufenpyrad
- Tebupirimfos
- Tecnazene
- Tefluthrin
- Tepraloxydim
- Terbacil
- Terbufos
- Terbumeton
- Terbuthylazine
- Terbutryne
- Tetrachlorvinphos
- Tetraconazole
- Tetradifon
- Tetraiodoethylene
- Tetramethrin
- Tetrasul
- Thiabendazole
- Thiacloprid
- Thiamethoxam
- Thiazopyr
- Thiobencarb
- Thiodicarb
- Thiofanox
- Thiofanox sulfone
- Thiofanox sulfoxide
- Thiophanate-methyl
- Tolclofos-methyl
- Tolfenpyrad
- Tolyfluanid
- Tralkoxydim
- Triadimefon
- Triadimenol
- Triallate
- Triazophos
- Tribufos
- Trichlorfon
- Triclopyr
- Tricyclazole
- Trietazine
- Trifloxystrobin
- Trifloxysulfuron
- Triflumizole
- Trifluralin
- Triforine
- Trimesium (trimethylsulfonium)
- Trimethacarb
- Triphenyl phosphate

V

- Vernolate
- Vinclozolin

Z

- Zinophos
- Zoxamide

Appendix B: List of veterinary drug residues

A	B	C	D	E	F	G	H	I	J	K	L	M
N	O	P	Q	R	S	T	U	V	W	X	Y	Z

1-9

- 19-Nortestosterone
- 1-Aminohydantoin (AHD) (Nitrofurantoin metabolite)
- 20-Dihydroprednisolone
- 20-Dihydroprednisone
- 2-Aminosulfone albendazole
- 3 Amino-2-oxazolidinone (AOZ) (Furazolidone metabolite)
- 3-Amino-5-methylmorpholino-2-oxazolidinone (AMOZ) (Furaltadone metabolite)
- 5-Hydroxythiabendazole

A

- Abamectin
- Acepromazine
- Albendazole
- Albendazole sulfone
- Albendazole sulfoxide
- Amikacin
- Amoxicillin
- Ampicillin
- Amprolium
- Apramycin
- Azaperol
- Azaperone

B

- Beclomethasone
- Betamethasone
- Boldenone
- Brombuterol
- Buquinolate

C

- Cambendazole
- Carazolol
- Carbendazim
- Carprofen
- Ceftiofur
- Chloramphenicol
- Chlorpromazine
- Chlortetracycline
- Chlortetracycline-epi
- Cimaterol
- Ciprofloxacin
- Clenbuterol
- Clenbuterol-methyl-hydroxy
- Clenpenterol
- Clenproperol
- Clindamycin
- Clopidol
- Cloxacillin

D

- Danofloxacin
- Dapsone
- Decoquinate
- Desethylene-ciprofloxacin
- Desmycosin
- Detomidine
- Dexamethasone
- Dianabol
- Diclazuril
- Diclofenac
- Dicloxacillin
- Difloxacin
- Dihydrostreptomycin
- Dimetridazole
- Dimetridazole-hydroxy
- Dinitolmide
- Doramectin
- Doxycycline

E

- Emamectin B1a
- Enoxacin
- Enrofloxacin
- Epi-19-nortestosterone
- Eprinomectin
- Erythromycin
- Etodolac

F

- Fenbendazole
- Fenbendazole sulfone
- Fenoterol
- Firocoxib
- Florfenicol
- Flubendazole
- Flumequine
- Flumethasone
- Flunixin
- Formoterol

G

- Gamithromycin
- Gentamicin

H

- Halofuginone
- Haloperidol
- Hygromycin

I

- Ipronidazole
- Ipronidazole-hydroxy
- Isoxsuprine
- Ivermectin

J

- Josamycin

K

- Kanamycin
- Ketoprofen

L

- Lasalocid
- Levamisole
- Lincomycin

M

- Mabuterol
- Maduramicin
- Mapenterol
- Marbofloxacin
- Mebendazole
- Mefenamic acid
- Meloxicam
- Methylprednisolone
- Metronidazole
- Metronidazole-hydroxy
- Monensin
- Moxidectin

N

- N,N'-bis(4-nitrophenyl)urea (Nicarbazin marker)
- Nafcillin
- Nalidixic Acid
- Naproxen
- Narasin
- Neomycin
- Neospiramycin
- Niflumic acid
- Norfloxacin

O

- Ofloxacin
- Oleandomycin
- Orbifloxacin
- Ormetoprim
- Oxacillin
- Oxfendazole
- Oxibendazole
- Oxolinic acid
- Oxyphenbutazone
- Oxytetracycline
- Oxytetracycline-epi

P

- Penicillin G
- Penicillin V
- Phenylbutazone
- Pipemidic acid
- Pirlimycin
- Prednisolone
- Prednisone
- Propionylpromazine

R

- Ractopamine (free)
- Ritodrine
- Robenidine
- Ronidazole

S

- Salbutamol
- Salinomycin
- Sarafloxacin
- Semicarbazide (Nitrofurazone metabolite)
- Sparfloxacin
- Spectinomycin
- Spiramycin
- Streptomycin
- Sulfabenzamide
- Sulfacetamide
- Sulfachloropyridazine
- Sulfadiazine
- Sulfadimethoxine
- Sulfadoxine
- Sulfaethoxypyridazine
- Sulfaguanidine
- Sulfamerazine
- Sulfameter
- Sulfamethazine
- Sulfamethizole
- Sulfamethoxazole
- Sulfamethoxypyridazine
- Sulfamonomethoxine
- Sulfamoxole
- Sulfanilamide
- Sulfaphenazole
- Sulfapyridine
- Sulfaquinoxaline
- Sulfathiazole
- Sulfisomidine
- Sulfisoxazole

T

- Terbutaline
- Testosterone
- Testosterone-epi
- Tetracycline
- Tetracycline-epi
- Thiabendazole
- Thiamphenicol
- Tildipirosin
- Tilmicosin
- Tinidazole
- Tobramycin
- Tolfenamic acid
- Toltrazuril sulfone
- Trenbolone-alpha
- Trenbolone-beta
- Triamcinolone acetonide
- Trimethoprim
- Tulathromycin
- Tulobuterol
- Tylosin
- Tylvalosin

V

- Vedaprofen

X

- Xylazine

Z

- Zilpaterol (free)

Appendix C: Metals found in infant/children's foods

Metal analyte	Product type	Total number of samples	Total number of negative samples	Total number of positive samples	Minimum[b] amount (ppm)	Maximum amount (ppm)	Mean[c] amount (ppm)
Aluminum	Infant food - cereals	39	0	39	0.381	12.3	3.57
Aluminum	Infant/children's snacks	69	0	69	0.360	37.1	3.89
Antimony	Infant food - cereals	39	39	0	n/a[d]	n/a[d]	n/a[d]
Antimony	Infant/children's snacks	69	69	0	n/a[d]	n/a[d]	n/a[d]
Arsenic	Infant food - cereals	39	10	29	0.0058	0.413	0.0515
Arsenic	Infant/children's snacks	69	23	46	0.0050	0.0895	0.0205
Beryllium	Infant food - cereals	39	39	0	n/a[d]	n/a[d]	n/a[d]
Beryllium	Infant/children's snacks	69	69	0	n/a[d]	n/a[d]	n/a[d]
Boron	Infant food - cereals	39	0	39	0.736	7.49	2.05
Boron	Infant/children's snacks	69	3	66	0.253	17.1	2.14
Cadmium	Infant food - cereals	39	17	22	0.0051	0.0485	0.0217
Cadmium	Infant/children's snacks	69	5	64	0.0055	0.0551	0.0260
Chromium	Infant food - cereals	39	22	17	0.103	0.297	0.160
Chromium	Infant/children's snacks	69	51	18	0.0250	0.368	0.168
Copper	Infant food - cereals	39	0	39	1.24	5.74	3.18
Copper	Infant/children's snacks	69	1	68	0.740	14.8	2.56
Iodine	Infant food - cereals	39	21	18	0.270	0.930	0.514
Iodine	Infant/children's snacks	69	63	6	0.120	6.97	1.48
Iron	Infant food - cereals	39	0	39	47.2	433	272
Iron	Infant/children's snacks	69	1	68	3.59	296	41.4
Lead	Infant food - cereals	39	16	23	0.0050	0.0211	0.0089
Lead	Infant/children's snacks	69	28	41	00050	0.196	0.0152
Magnesium	Infant food - cereals	39	0	39	205	1920	958
Magnesium	Infant/children's snacks	69	0	69	43	1170	430
Manganese	Infant food - cereals	39	0	39	5.01	41.9	20.4
Manganese	Infant/children's snacks	69	2	67	3.02	25.7	9.46
Mercury	Infant food - cereals	39	37	2	0.0052	0.0077	0.0065
Mercury	Infant/children's snacks	69	69	0	n/a[d]	n/a[d]	n/a[d]
Molybdenum	Infant food - cereals	39	11	28	0.252	1.65	0.914
Molybdenum	Infant/children's snacks	69	26	43	0.252	1.66	0.442
Nickel	Infant food - cereals	39	5	34	0.100	3.83	1.27
Nickel	Infant/children's snacks	69	36	33	0.107	1.61	0.562
Selenium	Infant food - cereals	39	0	39	0.0250	0.722	0.196
Selenium	Infant/children's snacks	69	4	65	0.0230	0.433	0.112
Tin	Infant food - cereals	39	39	0	n/a[d]	n/a[d]	n/a[d]
Tin	Infant/children's snacks	69	69	0	n/a[d]	n/a[d]	n/a[d]
Titanium	Infant food - cereals	39	12	27	0.253	2.10	0.614
Titanium	Infant/children's snacks	69	53	16	0.149	17.6	1.49
Zinc	Infant food - cereals	39	0	39	8.78	36.3	21.4
Zinc	Infant/children's snacks	69	1	68	1.23	26.3	10.1

Table notes

[b] Minimum detected amount

[c] Average of detected amounts

[d] n/a = not applicable; no positive results