



Canadian Food
Inspection Agency

Agence canadienne
d'inspection des aliments

Children's Food Project

2008-2009 Report on sampling



Foods intended for infants and toddlers
0 – 24 months of age

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Executive Summary

The main objectives of the 2008 – 2009 Children's Food Project (CFP) were:

- to assess the compliance status for pesticide residues in foods consumed by infants and toddlers aged 0 – 24 months;
- to provide data to Health Canada that can be used for health risk assessment of foods consumed by children.

In the 2008 – 2009 CFP, a total of 382 processed food samples were purchased in the Ottawa – Gatineau area. The samples included a variety of infant cereals, formulas (soy and dairy-based), fruit and vegetable purees, meat and vegetable purees, cookies, prepared meals and flavoured water. All samples were obtained from national grocery stores and drugstores. The samples were analyzed for pesticide residues and metals. A total of 2449 analytical tests were performed which corresponds to more than 127 000 results.

The scope of pesticide residue analysis was expanded in the 2008 – 2009 CFP, from approximately 300 to over 400 pesticide residues. Approximately 100 new pesticide residues can now be detected in selected infant foods by a new LC/ESI-MS-MS method. The new method is also capable of detecting pesticide residues that were previously detected using single residue methods. All samples were either analyzed for pesticide residues using a multi-residue method that detects 299 individual carbamate, organochlorine or organophosphate compounds in processed fruit, vegetable and meat products or a multi-residue method that detects 32 pesticide residues in dairy products. Single-residue methods were used to detect alar, amitraz, carbamates, carbendazim, ethylene thiourea (ETU), formetanate and thiabendazole in selected samples. All samples were analyzed for metals using an analytical method capable of detecting 15 different metals – aluminum, arsenic, boron, cadmium, chromium, copper, iron, mercury, manganese, nickel, lead, selenium, tin, titanium, and zinc.

Of the 382 samples tested, 294 (77.0%) contained no detected pesticide residues. The remaining 88 samples (23.0%) had detected levels of pesticide residues, with 33 (8.6%) containing more than one chemical residue type. Of the 88 samples with detected pesticide residues, one (0.3% of all samples) contained a pesticide residue level in excess of the 0.1 ppm Maximum Residue Limit (MRL) and was therefore in violation of paragraph 4(d) of the *Food and Drugs Act* (FDA). The violative level of pesticide detected does not, however, pose a human health risk. The majority of the pesticide residue results (99.7%) were in compliance with Canadian MRLs.

Heavy metals that may pose a health risk to human health include arsenic, cadmium, mercury and lead. The levels of most metals detected in this study were below established tolerances. Consistent with the previous year's results, higher arsenic levels were found in several rice products and infant formulas. Health Canada completed an assessment of the total arsenic results from this report.

Introduction to the Children's Food Project Report

The Children's Food Project (CFP) report provides a summary of pesticide residue and metal analysis results conducted in fiscal year 2008 – 2009. The objective of the CFP report is to:

- Summarize the results and assess the compliance of the levels of pesticide residues and metals in foods consumed by children aged 0 – 24 months;
- Provide pesticide residue and metal data to Health Canada from foods consumed by babies and toddlers for risk assessments;
- Gather preliminary information on a new scope of pesticide residues in foods commonly consumed by children aged 0 – 24 months.

The first section of the report is a detailed overview of the CFP. Included is the purpose of the project, a summary of past CFP results and project limitations. Additionally, a brief overview of analytical requirements is described and a short discussion is provided on the regulatory framework that surrounds pesticides and metals in Canada.

The second section of the report describes the design of the CFP for the 2008 – 2009 fiscal year. A description of the CFP's commodity groups and the criteria for sample inclusion are provided. Additionally, the specifics of the analytical methods chosen for the analysis of pesticide residues and metals are also described.

The results of the CFP are reported in section 3. A general discussion is provided on the pesticide residues and metal levels detected in children's foods.

The final section of the CFP report summarizes the results of this year's project. Any conclusions that can be made on the overall safety of these foods are also provided.

1 The Children's Food Project

1.1 Project purpose

As part of the 'Building Public Confidence in Pesticide Regulation and Improving Access to Pest Management Products' initiative, the CFIA receives additional funding to undertake limited monitoring of pesticides in foods consumed by children. In January 2003, the CFIA initiated the "Young Children's Food Chemical Residues Project" to test children's foods for pesticide residues, later renamed the 'Children's Food Project' (CFP).

The general objective of the CFP is to ensure continued compliance of pesticide residues in children's foods, with specific aims to:

- gather data to determine the nature of pesticide residues in children's foods;

- identify food that represent a potential health risk from illegal or inappropriate uses of pesticides;
- determine compliance with pesticide residue and metal tolerances specified under the *Pest Control Products Act* (PCPA) and the *Food and Drug Regulations* which are covered by the *Food and Drugs Act* (FDA).

1.1.1 Summary of past CFP results

Presented in Table 1 is a summary of results for each sampling year since project inception, in 2002 - 2003.

Table 1-1 Summary of results obtained in previous Children's Food Projects

Age Group Targeted	Remarks and pesticide residue results	Sampling Year	Sample Size
0 – 18 months	<ul style="list-style-type: none"> • Overall compliance rate of 99.76% 	<u>2002 - 2003</u>	412
2 – 10 years	<ul style="list-style-type: none"> • Scope expansion to include some veterinary drug residues and metals • Overall compliance rate of 100% 	<u>2003 - 2004</u>	594
0.5 – 15 years	<ul style="list-style-type: none"> • Overall compliance rate of 98.8% 	<u>2004 - 2006</u>	1523
0.5 – 15 years	<ul style="list-style-type: none"> • Overall compliance rate of 100% 	<u>2006 - 2007</u>	350
3 – 15 years	<ul style="list-style-type: none"> • Overall compliance rate of 98.6% 	<u>2007 - 2008</u>	836

1.1.2 Limitations of CFP

The CFP is designed to be a case study. It is not designed to gather statistically valid information on the type and levels of chemical residues and metals in children's foods. This would require more samples, and would substantially increase project costs or reduce the range of foods sampled in a given year.

The sampled foods are chosen based on market availability and do not necessarily correspond to the relative importance of this type of food in typical diets of children. No statistical methods are used to establish sampling plans that take into consideration the prevalence of a food (e.g., cereal grains) to the different samples obtained (e.g., infant cereals, cookies). Products are not targeted (except if marketed to children) and picked at random. No distinctions are made between different brands. Each sample is unique and few duplicate products are ever tested.

The results of the case study should not be directly compared to the results of the Pesticide Data Program (PDP) of the United States Department of Agriculture (USDA) <<http://www.ams.usda.gov/AMSV1.0/PesticideDataProgram>> or Health Canada's Canadian Total Diet Study <<http://www.hc-sc.gc.ca/fn-an/surveill/total-diet/index->

[eng.php](#)>. The aims of these programs differ from the purposes of this project in several ways, including:

- objective (case study versus monitoring of food supply);
- choice of pesticide residues and contaminants investigated;
- choice of analytical methods used (i.e. scope, sensitivity);
- nature of the sampling procedure (i.e. random, targeted);
- degree of preparation of the food samples (i.e. fresh, processed).

1.2 Analytical testing

To analyze samples with unknown pesticide treatments, the CFIA laboratories develop, validate and carry out analytical methods capable of simultaneously determining a large number of pesticide residues. The majority of the analyses in the CFP are analyzed by accredited third party laboratories. The CFIA has established requirements for the acceptance of analytical results from third party laboratories. Such laboratories must have analytical methods that meet or surpass the corresponding CFIA method parameters. The analytical methods used in the CFP may differ year-to-year. The current CFP analytical methods are described in Section 2.2.

1.3 Maximum residue limits (MRLs) and tolerances

1.3.1 Regulatory Guidelines

Two federal organizations share the responsibility for regulating the levels of pesticide residues in food. Health Canada's Pest Management Regulatory Agency (PMRA) is responsible for registering pesticides that can be used domestically and establishing Maximum Residue Limits (MRLs) for pesticide residues in foods. The Canadian Food Inspection Agency (CFIA) enforces MRLs and tolerances in food. Through monitoring programs like the National Chemical Residue Monitoring Program (NCRMP) and special surveys and projects like the CFP, the CFIA acquires incidence information and specific residue data on particular commodity/chemical residue combinations.

1.3.2 Pesticides

An approach to increase the availability of fresh food commodities is through the selective use of pesticides and other agricultural chemicals. These chemicals are applied to food crops for a variety of reasons, including: protection against pest pressures (moulds, insects, etc.), increase yield, expand the geographical location in which crops can be grown, extend shelf-life and improve the appearance of many foods. A consequence of using agricultural chemicals during food production is that some foods may contain chemical residues which may be of concern to Canadian consumers.

Health Canada determines 'whether the consumption of the maximum amount of residues, that are expected to remain on food products when a pesticide is used according to label directions, will not be a concern for human health. The maximum amount of residues expected is then legally established as a maximum residue limit (MRL)'.¹

The pesticide residue results obtained in the CFP are compared to the applicable standards established by Health Canada at the time of sampling. These standards are published in various sources, including:

- MRLs for pesticide residues are specified under the *Pest Control Products Act* (PCPA) and can be found on Health Canada's *Consumer Product Safety* website <<http://www.hc-sc.gc.ca/cps-spc/pest/protect-proteger/food-nourriture/mrl-lmr-eng.php>>, but are legally enforced under the *Food and Drugs Act* (FDA);
- Pesticide residues that lack MRLs must comply with the Canadian general MRL of 0.1 ppm. The 0.1 ppm MRL is enforced under the FDA and specified in Division 15 of the *Food and Drug Regulations* (FDR) <http://laws-lois.justice.gc.ca/eng/C.R.C.-C.870/page-1.html#anchorbo-ga:l_B-gb:l_15>
- The 0.05 ppm MRL for ethylene thiourea (ETU) is enforced under the FDA and established in Division 1 of the (FDR) <http://laws-lois.justice.gc.ca/eng/C.R.C.-C.870/page-1.html#anchorbo-ga:l_B-gb:s_B_01_001>

1.3.3 Metals

Although metals occur naturally in food, they may also result from agricultural chemical use, environmental contamination, fertilizers, canning (i.e., tin, nickel) or from the addition of food additives and nutritional supplements. As a result of these potential metal sources, the presence of metal analytes in food is anticipated.

Metals such as chromium, copper, iron, manganese, selenium and zinc are essential minerals required for good health. While inadequate amounts of an essential mineral in the diet can be detrimental to human health, high levels of certain metals may result in toxic effects. Metals of particular concern to human health include arsenic, cadmium, lead and mercury. Ongoing lead exposure can lead to anaemia, kidney toxicity and may result in damage to the central nervous system and brain. Young children and the developing foetus are most susceptible to lead toxicity. Health effects from mercury exposure will vary depending on the chemical form. Inorganic mercury may cause gastrointestinal and kidney damage. Ongoing exposures to organic mercury compounds, such as methyl mercury, can be detrimental to a child's developing brain and sensory changes can be observed in both children and adults. Arsenic (inorganic) is considered a human cancer-causing agent. Ongoing exposure can lead to cardiovascular and circulatory effects.² Cadmium exposure (namely inorganic cadmium) can produce adverse health effects on the kidney, stomach and bones.³

Agricultural chemicals that contain metals are regulated and monitored in the same way as pesticides. Similarly to pesticide MRLs, metal tolerances and standards are regulated by Health Canada and enforced by the CFIA. They include:

- A 50 ppm MRL established under the *Pest Control Products Act* for copper compounds on all fruit and vegetable products;
- Metal tolerances are established under Division 15 of the *Food and Drug Regulations* and can be found on Justice Canada's website

<http://laws.justice.gc.ca/eng/C.R.C.-c.870/page-1.html#anchorbo-ga:l_B-gbl_15>

- Health Canada's website lists Canadian Standards (Maximum Levels) for Various Chemical Contaminants in Foods: <http://www.hc-sc.gc.ca/fn-an/securit/chem-chim/contaminants-guidelines-directives-eng.php>

2 Design of the 2008-2009 Children's Food Project

The design of the 2008 – 2009 CFP is described in sections 2.1 and 2.2. New sampling strategies occur year to year when new information is collected from previous CFP/NCRMP activities and when new analytical capabilities arise from the CFIA laboratories. The 2008 – 2009 CFP differs from previous projects in that a newly validated multi-residue pesticide method now enables a much larger detection scope for pesticide residues in baby food matrices.

2.1 CFP sampling

Food can be broken down into three major categories: 1) fresh fruit and vegetables; 2) foods of animal origin, such as meat, eggs, honey and dairy products, and 3) manufactured foods, such as canned food, cereals, beverages, dried foods, etc. In the NCRMP, emphasis is on foods of animal origin and on raw agricultural products (i.e. “an apple”), analyzed as the unwashed, unpeeled, raw commodity. Alternatively, the Children's Food Project collects information on chemical residue levels in manufactured foods frequently consumed by children (e.g., apple juice and apple snacks).

Manufactured foods are also the focus of targeted surveys under the Food Safety and Consumer Action Plan <http://www.healthycanadians.ca/pr-rp/plan_e.html>. Together, the data from these programs help health authorities assess potential exposure of children to pesticide residues.

2.1.1 Sample selection for 2008-2009

The multitude of foods available and targeted at children, as well as the different consumption patterns of children of different age groups, makes it impossible for the CFIA to test all of the different foods on an annual basis. This project overcomes this challenge by sampling children's food consumed by different age groups in different project years.

As a result of previous Children's Food Projects, the 2008 - 2009 CFP integrated various changes to sampling. Much of the food tested in previous years targeted children between the ages of 0.5 and 15 years. Not since the project began in 2002 - 2003 has baby foods (or food targeted at children aged 0 – 18 months) been the primary focus of the project.

Due to the evolution of baby foods within the past five years (namely products targeted at the diets of children aged 8 months or greater), the emphasis of the 2008 – 2009 CFP was

manufactured food products targeting the diets of children aged 0 – 24 months. Examples of new products on the market include ready-to-serve prepared meals and a variety of cereals and other cereal-based snacks from around the world. The samples in the CFP include both domestic and imported manufactured foods. The samples were packaged in a variety of formats: glass and plastic bottles, cans, boxes, cartons and bags. Samples included products with both short shelf-lives (i.e., perishable, frozen) and longer shelf-lives. Samples were purchased from several national grocery and drugstore chains in the Ottawa-Gatineau area. The number of samples purchased from each grocery store was related to the variety of products and/or brands available and does not reflect the relative demographic composition of or the relative amounts of food consumed by Canadian children.

2.1.2 Sample breakdown for 2008-2009

A total of 382 samples were included in the 2008 – 2009 CFP. Of these, 84 (22%) are cereal-based, 30 (8%) are dairy-based, 184 (48%) are fruit- and vegetable-based, 81 (21%) are meat-based and several (~1%) miscellaneous products. Table 2-1 provides a summary of the different types of children's food samples selected in the 2008-2009 project. More information on the specific samples collected in the project can be found in Appendix A.

Table 2-1 Breakdown of sampled products in the 2008 – 2009 CFP

Commodity Group	Food Category	Sample Description	Number of Samples
<i>Cereal-based</i>	Casserole	Corn casserole, creamed corn	2
	Cereal	Wheat, oat, barley, rice, and oatmeal cereals	28
	Cereal & Fruit	Cereals and oatmeal with fruit	36
	Cereal Crisps	Mixed berry cereal crisps	1
	Cookies	Toddler, arrowroot, biter and banana cookies	4
	Pasta Dinner	Macaroni and cheese, vegetables and pasta, cheese ravioli and vegetables	5
	Rice & Fruit	Rice and banana, rice and yogurt, rice cereal with fruits	6
	Rice & Vegetables	Green peas and beans with brown rice	2
<i>Dairy-based</i>	Custard	Custard and vanilla custard	2
	Formula	Dairy-based formulas, lactose-free formula, supplemented formula	26
	Yogurt	Banana and apple-pear yogurt	2

Commodity	Food Category	Sample Description	Number of Samples
<i>Fruit and vegetable-based</i>	Formula (soy)	Soy-based formulas, hypoallergenic formulas	9
	Juice	Juices, concentrates, blends and medleys	4
	Puree	Fruit and vegetable puree, strained F&V, medleys, fruit salads, applesauce, stews, desserts, creamed corn, coconut cream and blends	170
	Soup	Hearty vegetable soup	1
<i>Meat-based</i>	Pasta	Meat lasagna, spaghetti, stars, noodles, alphabets, macaroni and meat pasta casseroles	21
	Puree	Meat stroganoff, cacciatore, meat-based purees, strained meat, stews, casseroles, rice and meat and dinners	53
	Soup	Meat-based soups and broths	7
<i>Miscellaneous</i>	Water	Bottled water samples that contain real fruit juice	3
<i>Total</i>			382

2.2 Sample testing

The scope of analytical testing in the CFP has been relatively consistent from year to year. Analytical testing is generally performed using multi-residue methods (MRMs) or single-residue methods (SRMs). MRMs are capable of detecting a larger number of pesticide residues and are generally more cost-efficient. SRMs are capable of detecting single residues or residues of a similar chemical family. SRMs are less cost-effective.

2.2.1 New pesticide residue MRM for infant foods

As part of the Building Public Confidence (BPC) initiative, the CFIA received federal funding to purchase new analytical equipment and develop and validate new pesticide detection methods to enhance surveillance of Canada's food supply. The 2008 – 2009 CFP was the first CFIA project/program to include pesticide analyses from a method developed and validated for the BPC initiative. The new method, a pesticide expansion MRM, is applicable for determining 142 pesticide residues in processed infant foods. The method (CFIA method PMR-006-V1.0) is entitled 'Determination of Pesticides in Infant Foods using Liquid Chromatography Electrospray Ionization Mass Spectrometry (LC/ESI-MS/MS)'.

In the recent past, much of the pesticide residue analysis was conducted with an older MRM (Section 2.2.2) and SRMs (Section 2.2.3). The scope of the traditional pesticide residue MRM included pesticide residue analytes that could be volatilized to the gas phase

(or non-polar analytes). The new LC/ESI-MS-MS uses liquid chromatography and Electrospray Ionization which allows for less volatile (or more polar) pesticide residues to be analyzed in food. The new LC/ESI-MS-MS method now enables the screening of approximately 100 additional pesticide residues in multiple food matrices. The scope of the new pesticide MRM is provided in Appendix B.

There were 97 samples out of 382 samples that underwent LC/ESI-MS-MS testing in the 2008-2009 CFP. Only a limited number of samples were chosen because of the limited number of planned in-house analyses. This method is not currently available in contract laboratories. The selected 97 samples included products with validated food matrices. The method is currently applicable for the following food matrices: fruit and vegetable purees, fruit juices and nectars. Further method validation is required by the CFIA laboratories before this method can be used to detect pesticide residues in other food matrices like cereals, meat and dairy products.

2.2.2 Other MRMs

The MRM used by the contract laboratory for pesticide residue analysis in processed products (meat-based, cereal-based and fruit- and vegetable-based) had to meet or exceed the requirements of the CFIA reference method entitled 'Determination of Pesticides in Honey, Fruit Juice and Wine (With Solid Phase Extraction Clean-Up and GC/MSD and HPLC Fluorescence Detection)'. The method (referred to as 'FPH053') scope includes 299 pesticide residues which are listed in Appendix C. The minimum detection limits (MDLs) of the analytes in the third party method range from 0.001 ppm to 0.0162 ppm. The MRM used by the contract laboratory for pesticide residue analysis in dairy-based products had to meet or exceed the requirements of the CFIA reference method entitled 'The Determination of Organochlorine Pesticides and Polychlorinated Biphenyls PCB's in Dairy, Raw Milk, Egg and Egg Products by GC/ECD'. The MDLs range from 0.0001 ppm to 0.00485 ppm. Table C-2 in Appendix C lists all of the pesticide analytes included in the third party laboratory method, entitled 'D-E'.

The CFIA does not provide a reference method for multi-metals analysis. However, third party laboratories must meet the MDLs for metals specified by the CFIA. These can be found in Appendix D. The following metals have MDL requirements: aluminum, arsenic, boron, cadmium, chromium, copper, iron, mercury, manganese, nickel, lead, selenium, tin, titanium and zinc.

2.2.3 SRMs - Pesticides

There were relatively few single residue tests performed in the Children's Food Project. The CFIA-validated SRM MDLs and LOQs for alar, amitraz, benomyl (carbendazim), ethylene thiourea (ETU), formetanate and thiabendazole are outlined in Appendix E. Benomyl, carbendazim, formetanate and thiabendazole are now also detectable in the new LC/ESI-MS-MS.

2.2.4 Analysis Summary

Summarized in Table 2-2 is the distribution of analytical tests and results for the 382 samples in the 2008 – 2009 Children's Food Project.

Table 2-2 Number and type of analytical tests performed in the 2008 – 2009 CFP

PROGRAM	COMMODITY GROUPS						
	CEREAL BASED	DAIRY BASED	FRUIT/ VEGETABLE BASED	MEAT BASED	MISC.	TOTAL TESTS	TOTAL RESULTS
ALAR	81	1	175	0	3	260	260
AMITRAZ	81	1	175	0	3	260	260
BENOMYL	81	1	175	0	3	260	260
CARBAMATES	0	28	0	0	0	28	28
EBDC (ETU)	81	1	175	0	3	260	260
FORMETANATE	81	1	175	0	3	260	260
METALS	84	30	184	81	3	382	5 730
PESTICIDES LC/ESI-MS-MS	0	0	97	0	0	97	13 774
PESTICIDES-D-E	0	26	5	0	0	31	992
PESTICIDES- FPH053	84	4	179	81	3	351	104 949
THIABENDAZOLE	81	1	175	0	3	260	260
TOTAL	654	94	1515	162	24	2449	127 033

3 Results and Discussion

The results obtained in the 2008 – 2009 CFP are presented in Chapter 3. The supporting information is available in tabular form in the accompanying appendices.

When applicable, the results obtained in this study are compared to the results from other CFP years and to those of the NCRMP. It is important to consider the following when discussing the results of this survey:

- 1) pesticides may be added to food for pest-management purposes (including copper-based fungicides), and, when used appropriately and according to product label instructions, may be detected at low, safe levels;
- 2) detected metals may result from multiple processes. No distinction or conclusions can be made on the source(s) of the detected metals;
- 3) processed products may contain ingredients from a variety of countries with no known origin. The results (i.e. compliance rates) should not be interpreted as indicative of the product type or product origin.

3.1 Results for pesticide residues

3.1.1 Distribution of residues

Figure 3-1 illustrates the distribution of samples found to contain no detected pesticide residues, non-violative residue levels (detected residue levels that are at or below the established MRLs) and violative residue levels (detected residue levels that exceed the MRLs at the time of analysis).

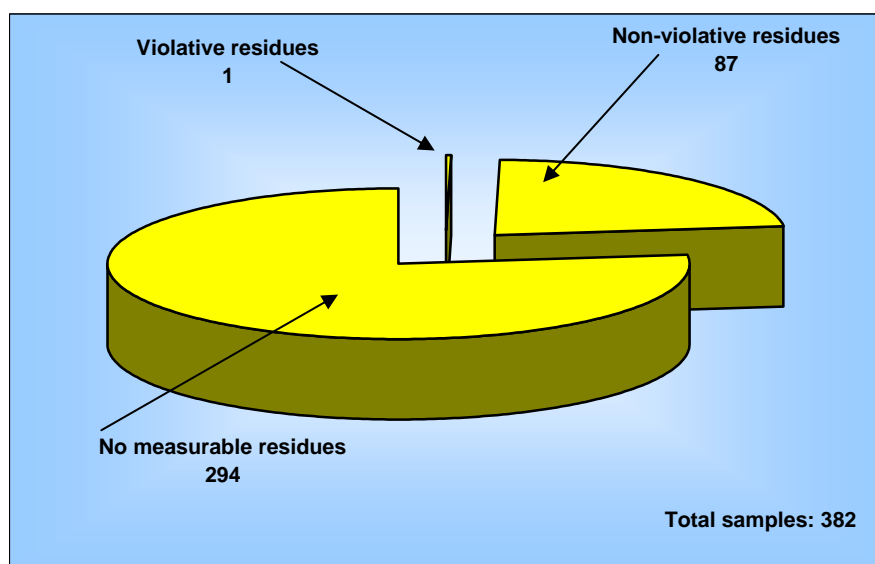


Figure 3-1 **Distribution of sample residue results**

A total of 2 067 analyses for pesticide residues were carried out on 382 samples, corresponding to 121 303 results. A total of 88 samples (23.0%) contained at least one pesticide residue. Of the 88 samples with detected residues, one sample result (0.3% of all samples) was in violation of the 0.1 ppm specified in the FDR. The overall sample compliance rate is therefore 99.7%. This is comparable to the overall sample compliance rates in both the CFP and NCRMP within the last five years.

The 2008-2009 CFP included samples from 10 countries. Table 3-1 is a summary of pesticide tests and compliance results by sample origin. Included in the summary are the total number of samples, the number of 'positive' samples (samples with one or more detected pesticide residue result), the number of sample violations observed and the sample compliance rate. Of the 10 countries whose products were sampled, four had samples with detected pesticide residues. All sample results from Canada and all but one sample result from the United States were compliant with Canadian MRLs.

Table 3-1 Distribution of residue results by sample origin

Sample origin	Number samples	Number positive samples	Positive samples (% total)	Number violations	% Overall compliance
Canada	166	44	26.5	0	100
China	1	0	0.0	0	100
Ireland	3	0	0.0	0	100
Italy	1	0	0.0	0	100
Netherlands	2	0	0.0	0	100
Poland	12	3	25.0	0	100
South Africa	2	0	0.0	0	100
Switzerland	16	0	0.0	0	100
United Kingdom	2	1	50.0	0	100
United States	177	40	22.6	1	99.4
TOTAL	382	88	23.0	1	99.7

The results also indicate that the compliance rates for domestic and imported children's food samples are similar (100% for domestic products, 99.5% for imported products).

Approximately 8.6% of all samples had more than one detected pesticide residue. Of the 88 samples with detected pesticide residues, 22 of the samples had two different residues, eight samples had three different residues, two samples had four different residues and one sample had five detected pesticide residues (see Appendix F). The distribution of detected pesticide residues is illustrated in Figure 3-2.

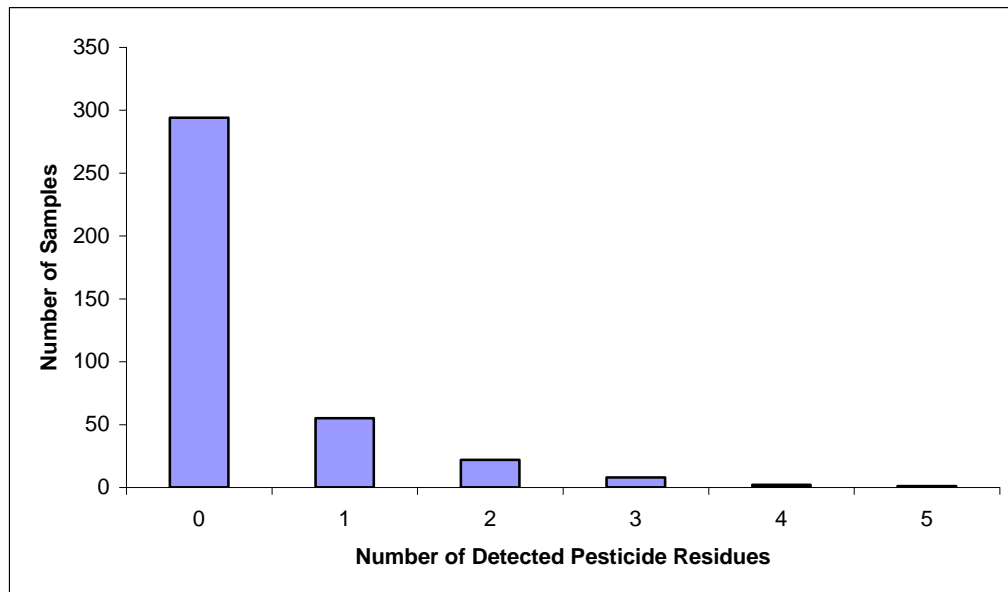


Figure 3-2 Distribution of detected pesticide residues

Table F-1 in Appendix F lists the details of the samples that contain more than one distinct pesticide residue result, including the country of origin. The data in Table 3-2 indicate that the majority of the samples with positive results were fruit- and vegetable-based products.

Table 3-2 Distribution of pesticide residues by commodity group

Commodity Group	Number samples	Number positive samples	% positive samples	Number violations	% compliance
Cereal-Based	84	20	23.8	1	98.8
Dairy-Based	30	1	3.3	0	100
Fruit- and Vegetable-Based	184	50	27.2	0	100
Meat-Based	81	17	21.0	0	100
Miscellaneous	3	0	0.0	0	100

3.1.2 Discussion of pesticide results

The following food categories had no samples with detected pesticide residues:

- Casserole
- Cereal crisps
- Milk-based formula
- Soy-based formula
- Pasta dinner
- Soup
- Fruit-flavoured water
- Yogurt

The nature of pesticide residues observed in the different food categories is presented in Table 3-3. Table 3-3 indicates that the majority of the positive pesticide results were found in fruit/vegetable puree, meat puree and cereal products with fruit. The most commonly detected pesticide residues were the following: captan (32), carbendazim (17), diphenylamine (15), chlorpropham (14), and carbaryl (10).

Table 3-3 Detected pesticide residues by food category

Food Category	Number samples	Number positive samples	*Number residues detected	Detected residues, (# of samples with detected residue)
All samples	382	88	136	2-phenylphenol (3), acibenzolar-S-methyl (2), bifenthrin (4), captan (32), carbaryl (10), carbendazim (17), chlorpropham (14), chlorpyrifos, chlorpyrifos-methyl, cyprodinil (3), dichloran (2), diphenylamine (15), endosulfan total (6), fenpropathrin (2), fludioxonil (2), formetanate (2), iprodione (4), malathion (2), methamidophos, methoxyfenozide, permethrin total, piperonyl butoxide, pirimiphos-methyl, propiconazole, thiabendazole (7), trifloxystrobin
Fruit/ Vegetable Puree	170	49	82	Bifenthrin (4), captan (23), carbaryl (9), carbendazim (13), chlorpropham, chlorpyrifos, cyprodinil (2), dichloran (2), diphenylamine (7), endosulfan total (6), fenpropathrin, fludioxonil (2), formetanate, iprodione (3), methamidophos, methoxyfenozide, permethrin total, propiconazole, thiabendazole (2), trifloxystrobin
Cereal and Fruit	36	13	22	Captan (6), carbaryl, carbendazim (3), cyprodinil, diphenylamine (6), iprodione, thiabendazole (4)
Meat Puree	53	15	18	Acibenzolar-S-methyl (2), captan (2), chlorpropham (12), diphenylamine (2)
Cookies	4	2	3	Chlorpyrifos-methyl, malathion (2)
Rice and Fruit	6	2	3	2-phenylphenol, captan, thiabendazole
Cereal	28	2	2	2-phenylphenol, pirimiphos-methyl
Custard	2	1	2	Carbendazim, fenpropathrin
Juice	4	1	1	2-phenylphenol
Meat Pasta	21	1	1	Piperonyl butoxide
Meat Soup	7	1	1	Chlorpropham
Rice and Vegetables	2	1	1	Formetanate
Casserole	2	0	0	-
Cereal Crisps	1	0	0	-
Formula - Milk	26	0	0	-
Formula - Soy	9	0	0	-
Pasta Dinners	5	0	0	-
Soup	1	0	0	-
Water	3	0	0	-
Yogurt	2	0	0	-

*Note 1: As a food item may contain more than one type of pesticide residue, the number of analytes detected could exceed the number of positive samples.

There was one pesticide residue result violation in 382 samples. The detected pesticide residue, 2-phenylphenol, was detected in a cereal product from the United States. Although this pesticide has multiple MRLs specified under the PCPA for various foods, it does not have a specific MRL in/on cereals in Canada and the product is, therefore, in violation of paragraph 4(d) of the *Food and Drugs Act* (i.e. the product is adulterated). The product does not pose a risk to human health as the detected level is low in comparison to 2-phenylphenol MRLs specified in/on other foods.

3.1.3 Conclusions

The overall sample compliance rate for pesticide residues in domestic and imported children's foods is high (100% for domestic products and 99.5% for imported products). No pesticide residues were detected in casseroles, cereal crisps, formulas (soy and milk-based), pasta dinners, soups, juice-flavoured water and yogurt. Most of the detected but compliant levels of pesticide residues were found in fruit/vegetable purees, meat purees and cereals with fruit. However, collectively, these three food types represent the majority of the CFP samples (67.8%). Of the samples that contained multiple pesticide residues, none had pesticide residues in violation of Canadian regulations. There was one 2-phenylphenol residue result (a widely used fungicide and bactericide) violation in a cereal product from the United States. The cereal product is in violation of paragraph 4(d) of the *Food and Drugs Act* (FDA) as the level detected exceeded the 0.1 ppm MRL specified in Division 15 of the FDR. However, the product does not pose a risk to human health as the level detected is low in comparison to permissible residue levels of 2-phenylphenol established in/on other foods.

A direct comparison between the results of this survey and those obtained in the NCRMP is limited by the nature of the sampling strategy used (i.e. analytical scope, smaller overall sample size, different distributions of domestic and imported products, etc.). However, the following general conclusions can be made:

- the sample compliance rate for pesticide residues observed in this study is similar to the sample compliance rates observed in the NCRMP and CFPs for the past five years;
- the detected residues in both domestic and imported samples are very similar;
- Carbaryl, diphenylamine, carbendazim, captan and chlorpropham were detected at non-violative levels in both the NRCMP and in previous Children's Food Projects.

3.2 Results for metals

3.2.1 Metal result distribution

Table 3-4 summarizes metal results by commodity group and is considered a snapshot of metals detected in children's food.

Table 3-4 Metal results summary by commodity group

Metal Analyte	Total # Samples	Total # Negative	Total # Positive	Min (ppm)	Max (ppm)	*Mean (ppm)
Aluminum (1)	382	31	351	0.067	15.300	1.393
Cereal-based	84	0	84	0.124	15.300	3.304
Dairy-based	30	0	30	0.067	3.686	1.161
Fruit and vegetable-based	184	27	157	0.110	3.548	0.704
Meat-based	81	2	79	0.115	4.292	0.826
Miscellaneous	3	2	1	0.931	0.931	0.931
Arsenic	382	116	266	0.005	0.360	0.038
Cereal-based	84	5	79	0.006	0.360	0.076
Dairy-based	30	0	30	0.008	0.085	0.054
Fruit and vegetable-based	184	96	88	0.005	0.117	0.019
Meat-based	81	15	66	0.005	0.034	0.013
Miscellaneous	3	0	3	0.007	0.008	0.007
Boron	382	29	353	0.120	21.100	2.192
Cereal-based	84	8	76	0.289	21.100	2.454
Dairy-based	30	12	18	0.124	3.341	0.958
Fruit and vegetable-based	184	2	182	0.225	10.350	2.683
Meat-based	81	4	77	0.120	3.418	1.063
Miscellaneous	3	3	0	-	-	-
Cadmium	382	139	243	0.002	0.091	0.012
Cereal-based	84	12	72	0.002	0.091	0.019
Dairy-based	30	9	21	0.003	0.008	0.005
Fruit and vegetable-based	184	106	78	0.002	0.038	0.008
Meat-based	81	10	71	0.002	0.027	0.011
Miscellaneous	3	2	1	0.003	0.003	0.003
Chromium (2)	382	114	268	0.010	0.892	0.053
Cereal-based	84	12	72	0.011	0.892	0.116
Dairy-based	30	4	26	0.014	0.174	0.047
Fruit and vegetable-based	184	65	119	0.010	0.100	0.025
Meat-based	81	30	51	0.010	0.533	0.033
Miscellaneous	3	3	0	-	-	-
Copper (3)	382	4	378	0.031	10.720	1.382
Cereal-based	84	0	84	0.301	6.316	2.122
Dairy-based	30	0	30	0.060	10.720	4.451
Fruit and vegetable-based	184	1	183	0.031	8.583	0.849
Meat-based	81	0	81	0.335	1.524	0.683
Miscellaneous	3	3	0	-	-	-
Iron (4)	382	3	379	0.508	474.800	69.992
Cereal-based	84	0	84	2.201	474.800	249.414
Dairy-based	30	0	30	2.484	159.000	97.394
Fruit and vegetable-based	184	0	184	0.508	246.900	11.503
Meat-based	81	0	81	2.296	22.030	6.640
Miscellaneous	3	3	0	-	-	-
Mercury	382	382	0	-	-	-
Cereal-based	84	84	0	-	-	-
Dairy-based	30	30	0	-	-	-
Fruit and vegetable-based	184	184	0	-	-	-

Metal Analyte	Total # Samples	Total # Negative	Total # Positive	Min (ppm)	Max (ppm)	*Mean (ppm)
Meat-based	81	81	0	-	-	-
Miscellaneous	3	3	0	-	-	-
Manganese	382	3	379	0.045	50.920	5.201
Cereal-based	84	0	84	0.936	50.920	17.426
Dairy-based	30	0	30	0.045	28.390	2.779
Fruit and vegetable-based	184	0	184	0.093	13.290	1.702
Meat-based	81	0	81	0.053	4.307	1.368
Miscellaneous	3	3	0	-	-	-
Nickel	382	18	364	0.010	2.828	0.275
Cereal-based	84	0	84	0.016	2.828	0.637
Dairy-based	30	4	26	0.033	0.104	0.057
Fruit and vegetable-based	184	9	175	0.010	1.991	0.155
Meat-based	81	2	79	0.014	2.399	0.227
Miscellaneous	3	3	0	-	-	-
Lead	382	185	197	0.002	0.087	0.008
Cereal-based	84	45	39	0.002	0.087	0.016
Dairy-based	30	13	17	0.003	0.017	0.007
Fruit and vegetable-based	184	98	86	0.002	0.036	0.007
Meat-based	81	26	55	0.002	0.018	0.005
Miscellaneous	3	3	0	-	-	-
Selenium(5)	382	191	191	0.020	1.503	0.174
Cereal-based	84	11	73	0.021	1.503	0.258
Dairy-based	30	0	30	0.020	0.360	0.226
Fruit and vegetable-based	184	162	22	0.021	0.334	0.132
Meat-based	81	15	66	0.020	0.190	0.071
Miscellaneous	3	3	0	-	-	-
Tin	382	48	334	0.021	0.709	0.123
Cereal-based	84	7	77	0.021	0.198	0.056
Dairy-based	30	0	30	0.022	0.309	0.159
Fruit and vegetable-based	184	30	154	0.022	0.709	0.141
Meat-based	81	8	73	0.021	0.430	0.139
Miscellaneous	3	3	0	-	-	-
Titanium	382	15	367	0.108	25.120	3.099
Cereal-based	84	0	84	0.166	25.120	7.943
Dairy-based	30	0	30	0.425	18.960	8.019
Fruit and vegetable-based	184	15	169	0.108	18.070	1.022
Meat-based	81	0	81	0.268	2.783	0.696
Miscellaneous	3	0	3	0.109	0.115	0.111
Zinc (6)	382	4	378	0.104	104.100	11.719
Cereal-based	84	0	84	1.447	73.570	18.023
Dairy-based	30	0	30	1.893	89.410	51.375
Fruit and vegetable-based	184	1	183	0.104	104.100	4.999
Meat-based	81	0	81	2.153	28.120	5.678
Miscellaneous	3	3	0	-	-	-

* Note that the mean refers to the mean of the positive results.

It is important to note that a number of foods included in this survey may have added amounts of metals and are therefore not comparable to the NCRMP or previous CFP datasets. Several examples of detected metals that can be deliberately added to food include:

- (1) Aluminum – used as a processing aid for baking and is often added to flour and other baking reagents or can also be a component of pesticides;
- (2) Chromium – used to fortify foods (i.e. infant formulas);
- (3) Copper – registered and used as a natural fungicide (including for pest control in organic agriculture) and is used to fortify foods (i.e. infant formulas);
- (4) Iron – used to fortify foods (i.e. fruit-flavoured drinks) or as a component of food additives (i.e. food colours);
- (5) Selenium – used to fortify foods (i.e. infant formulas);
- (6) Zinc – used to fortify foods (i.e. infant formulas).

3.2.2 Discussion of metal results

The results obtained in the CFP provide a snapshot of the metal levels in children's food. All samples had detected levels of metals. As mentioned in section 1.3.3, metals are anticipated in most food products. The results presented in Table 3-4 are a measure of total metal concentration present in food and do not distinguish between organic and inorganic forms, or ionic species. Generally, organic species have a greater potential to bioaccumulate in the human body whereas inorganic species are often soluble in water and are quickly eliminated from the body. The ionic form of a metal is important as some ionic species are required for good health while others can be detrimental to human health. The CFIA continues to develop and validate methods to enable quantitation of metal species to complement the current approach, which measures total metal concentrations.

The following discussion focuses on the four toxic detected metals. These metals are not historically present in food at elevated levels. The presence of these metals in foods may indicate that the food may have come into contact with natural sources such as water, soil or other contaminated environmental sources. Figures 3-3 to 3-6 represent the average amount (of the positive results) of detected metal by commodity group for copper and the toxic metals (arsenic, cadmium, mercury and lead).

Arsenic

Arsenic is a natural element that is incorporated into certain foods such as cereals, apples and pears. It is also a component of arsenic-containing fungicides¹. The levels of arsenic allowed in foods are specified in Table I of Division 15 of the FDR. This includes a 0.1 ppm arsenic tolerance in fruit juice, fruit nectar, beverages when ready-to-serve and water in sealed containers other than spring or mineral water. In addition, a 3 ppm arsenic tolerance exists for food colours (Division 6 of the FDR). For all other foods, there are no Canadian standards or tolerances established. It should be noted that the results

¹ It should be noted however that North America now has restrictions on arsenic-based pesticides. Also, other countries worldwide have also discontinued the use of arsenic containing pesticides.

discussed below are reported as total arsenic only. The arsenic tolerance was not exceeded in any of the four juice samples or the three miscellaneous samples (fruit-flavoured water) tested. Figure 3-3 illustrates the average level of arsenic detected in the five commodity groups of this report. The miscellaneous group had the lowest average amount of arsenic amongst the five groups.

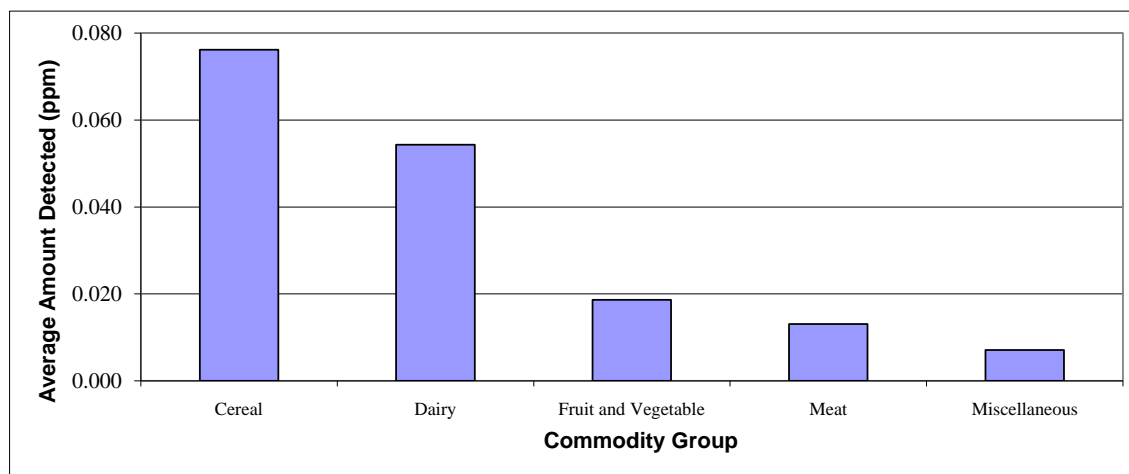


Figure 3-3 Average level of arsenic detected by commodity group

The highest levels of arsenic (> 0.200 ppm) were detected in two infant rice cereal products in 2008-2009. These results are similar to the previous year CFP dataset, where the five samples with the highest arsenic results contained rice. Arsenic occurs naturally in soils and irrigation water. The continual presence of arsenic in soil and water lead to the elevated levels observed. The Food and Agriculture Organization of the United Nations (FAO) is promoting more effective irrigation and agricultural practices to significantly reduce the amount of arsenic in food crops. Ground water is often a sink for arsenic and much of the water supply for growing rice (particularly rice grown in Asia) is supplied from ground water.⁴

The arsenic results from the 2008-2009 CFP were assessed by Health Canada (HC). Although the levels of arsenic observed in rice-based products would not likely result in an unacceptable health risk to the average consumer, high-end consumers of rice-based products may approach or even exceed the safe daily dose of arsenic. This assessment is conservative as it was based on the toxicity of inorganic arsenic. Arsenic speciation data (organic vs inorganic) would allow a more accurate assessment of the potential safety concerns associated with arsenic in certain foods.

Cadmium

There are no Canadian tolerances or standards established for cadmium levels in food. Cadmium occurs naturally in water and soils. It can also result in food from contaminated phosphate fertilizers or sewage sludge. Food crops grown in cadmium-contaminated soils are the primary source of cadmium exposure in the general population.⁵ Figure 3-4

illustrates the average level of cadmium detected in the five commodity groups within this report. Miscellaneous and dairy-based products had the lowest average amount of cadmium amongst the five commodity groups.

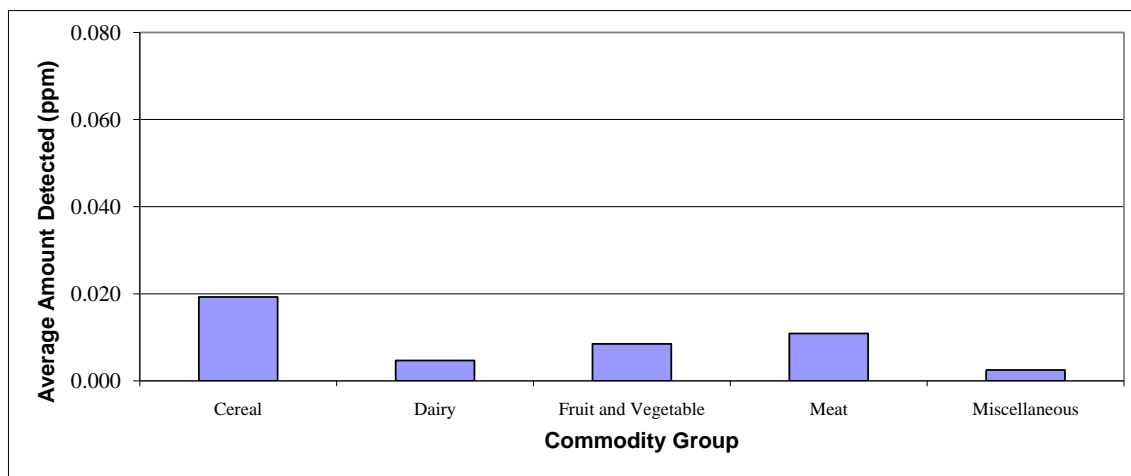


Figure 3-4 Average level of cadmium detected by commodity group

Copper

Although copper is not one of the four toxic metals, it is used as a natural fungicide. An MRL of 50 ppm is specified under the PCPA for fruit and vegetable products. No results of concern were identified in the 2008-2009 study. Figure 3-5 illustrates the average level of copper detected in the five commodity groups. Meat and cereal-based products had the highest average amount of copper amongst the five commodity groups. Foods that are rich in copper include meats, cereals, nuts and legumes.

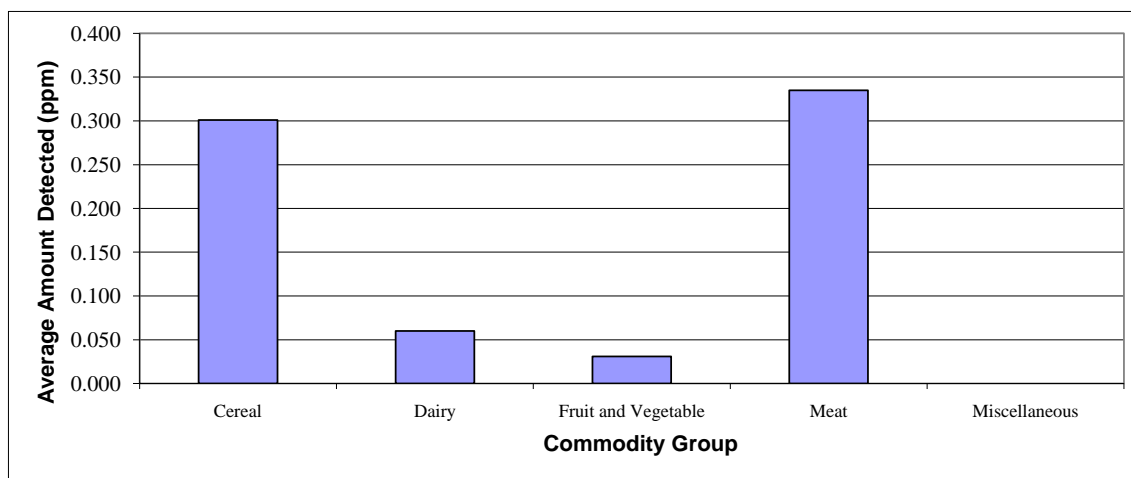


Figure 3-5 Average level of copper detected by commodity group

Lead

Lead exposure may occur from a number of environmental and food sources. There are several tolerances for lead in food that are specified in Division 15 of the FDR. Included are limits of 1.5 ppm lead in tomato paste and tomato sauce, 0.5 ppm in fish protein and whole tomatoes, and 0.2 ppm in fruit juice, fruit nectar, beverages when ready-to-serve and water in sealed containers other than spring or mineral water. Evaporated milk, condensed milk and concentrated infant formula have a lead tolerance of 0.15 ppm and ready-to-serve infant formula has a lead tolerance of 0.08 ppm.

Figure 3-6 illustrates the average level of lead detected in the five commodity groups. There were no violations of the Canadian tolerances. Miscellaneous (water) and meat products were found to contain the least average amount of lead.

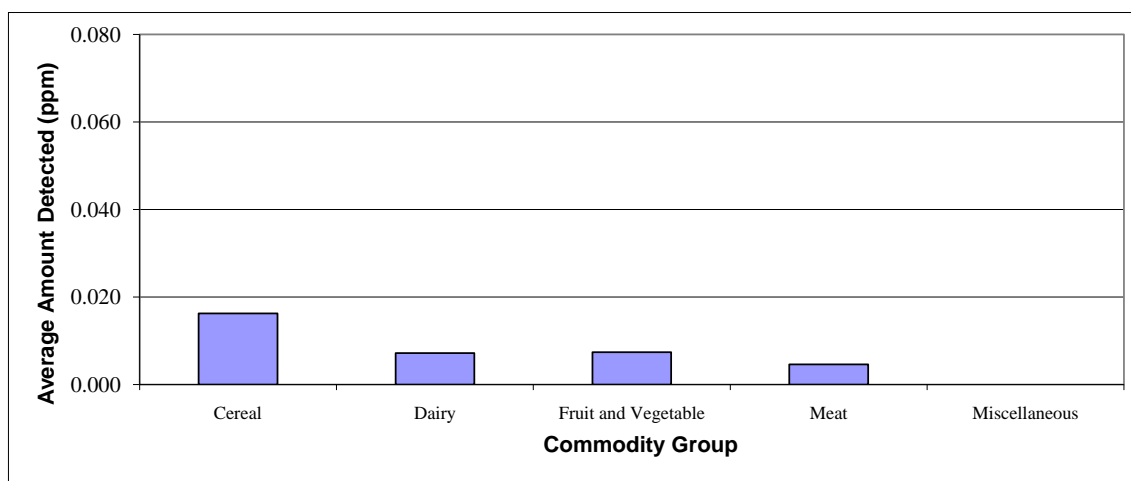


Figure 3-6 Average level of lead detected by commodity group

Mercury

Health Canada has established a maximum level of 1 ppm total mercury in the edible portion of escolar, orange roughy, marlin, fresh and frozen tuna, shark, and swordfish. The maximum level of mercury permitted in other types of retail fish is 0.5 ppm. No detected amounts of mercury were found in any of the CFP samples.

3.2.3 Conclusions

All samples were found to contain metals. The levels of all metals detected were compliant with established Canadian MRLs, tolerances and standards. None of the 184 fruit and vegetable-based food samples was found to have copper in excess of the 50 ppm MRL for copper compounds.

Dairy products had higher levels of zinc than in previous reports. The dairy samples in the 2008 – 2009 CFP consisted mainly of dairy-based infant formulas which are fortified

with zinc, an important trace nutrient required for proper development of the immune system and brain.⁶

The total arsenic results were assessed by Health Canada (HC). Although the levels of arsenic observed in rice-based products would not likely result in an unacceptable health risk to the average consumer, high-end consumers of rice-based products may approach or even exceed the safe daily dose of arsenic. None of the metals detected in the 2008-2009 CFP (including arsenic, lead, mercury and cadmium) exceeded Canadian MRLs, tolerances, or standards.

4 Report conclusions

The results of the 2008-2009 Children's Food Project indicate that the majority of samples analyzed (77.0% of 382 samples) contained no detected pesticide residues. There were 88 (23.0%) samples with detected pesticide residues, of which one (1.1%) with a result found to be in violation of Canadian regulations. The overall sample compliance rate for pesticide residues was 99.7%. This sample compliance rate is similar to the compliance rates of previous CFPs and also to those determined for the much larger number and scope of samples tested under the NCRMP.

There were no violations of the Canadian MRLs, tolerances or standards established for metals. Elevated amounts of arsenic were found in some rice products and infant formulas. The total arsenic results were assessed by Health Canada (HC). Although the levels of arsenic observed in rice-based products would not likely result in an unacceptable health risk to the average consumer, high-end consumers of rice-based products may approach or even exceed the safe daily dose of arsenic. In order to better assist Health Canada to refine their health hazard assessment for arsenic (specifically for the more toxic inorganic species of arsenic), the CFIA has completed the development of an arsenic speciation method which enables the collection of specific data on the different forms of arsenic present in food. At this time, Health Canada is not recommending that any dietary changes be made based on the presence of arsenic in rice-based products but continues to recommend that Canadians consume a variety of foods from each food group outlined in Eating Well with Canada's Food Guide.

Due to the limited scope and number of samples collected in the project, no clear relationships can be made between sample compliance rate and product type or country of origin. The data obtained from studies like the Children's Food Project are, however, instrumental in the assessment of the dietary exposure to pesticide residues and metals in foods consumed by Canadian children. The data obtained from the Children's Food Project represents a typical overview of the nature of pesticide and metal species in the Canadian food supply and allows sound conclusions to be drawn about its safety.

References

1. Health Canada. *Maximum Residue Limits for Pesticides*. 2009. Web. 1 October 2009. <http://www.hc-sc.gc.ca/cps-spc/pest/protect-proteger/food-nourriture/mrl-lmr-eng.php>
2. Health Canada. Healthy Living. *It's Your Health – Articles on Environmental Health. (Lead and Human Health; Mercury and Human Health; Arsenic in Drinking Water)*. 2009. Web. 9 October 2009. <http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/alpha-eng.php>
3. Health Canada. Healthy Environments and Consumer Safety. *Cadmium*. 1986. Web. 28 August 2009. http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/water-eau/cadmium/cadmium-eng.pdf
4. Food and Agriculture Organization of the United Nations. FAO Newsroom. *Arsenic threat in rice*. 19 December 2007. Web. 1 September 2009. <http://www.fao.org/newsroom/en/news/2007/1000734/index.html>
5. Damodaran, Srinivasan, Kirk L. Parkin, and Owen R. Fennema. eds. *Fennema's Food Chemistry Fourth Edition*. Boca Raton FL.: CRC Press, 2008. Print.
6. Baylor College of Medicine. *Zinc Absorption from Plant-based Diets Improves with Dairy*. 14 August 2007. Web. 30 November 2009. <http://www.bcm.edu/cnrc/consumer/archives/zinc-dairy.htm>

Appendix A

Table A-1 Description of samples collected in 2008 – 2009 CFP

Food Category	Sample Number	Sample Description
<i>CEREALS</i>	BF-08-100362A	Wheat Biscuit Cereal
	BF-08-100364A	Oat Cereal
	BF-08-100366A	Wheat, Honey & Flakes
	BF-08-100368A	Wheat Cereal
	BF-08-100370A	Rice Cereal
	BF-08-100373A	Mixed Cereals
	BF-08-100374A	Barley
	BF-08-100375A	Oatmeal
	BF-08-100376A	Rice
	BF-08-100377A	Mixed Cereals
	BF-08-100386A	Rice Cereal
	BF-08-100388A	Mixed Cereal
	BF-08-100389A	Oatmeal Cereal
	BF-08-100390A	Toddler Biscuits
	BF-08-100395A	Cereal
	BF-08-100396A	Mixed Cereal LOT 2
	BF-08-100397A	Mixed Cereal LOT 1
	BF-08-100404A	Oatmeal
	BF-08-100405A	Rice
	BF-08-100406A	Barley Cereal
	BF-08-100407A	Oatmeal Cereal
	BF-08-100408A	Rice Cereal
	BF-08-100411A	Mixed Cereal
	BF-08-100413A	Arrowroot Cookies
	BF-08-100425A	Original (Plain)
	BF-08-100427A	Biscuits
	BF-08-100430A	Barley Cereal
	BF-08-100431A	Oatmeal Cereal
	BF-08-100432A	Mixed Cereal
	BF-08-100434A	Rice Cereal
	BF-08-100435A	Whole Grain Brown Rice
<i>CEREALS WITH FRUIT AND/OR VEGETABLES</i>	BF-08-100207A	Pears & Oatmeal
	BF-08-100220A	Apple with Cereal and Egg
	BF-08-100236A	Apple Raisin Granola
	BF-08-100247A	Strained Sweet Corn Casserole
	BF-08-100252A	Peach & Apple Oatmeal
	BF-08-100253A	Green Peas & Brown Rice
	BF-08-100255A	Green Beans & Brown Rice
	BF-08-100264A	Mixed Fruit with Oatmeal Cereal
	BF-08-100270A	Creamed Corn
	BF-08-100318A	Applesauce and Bananas with Rice Cereal
	BF-08-100351A	Apple Date with Oatmeal

Food Category	Sample Number	Sample Description
	BF-08-100354A	Applesauce & Bananas with Oatmeal Cereal
	BF-08-100363A	Wheat & Fruit
	BF-08-100365A	Wheat, Yogurt, & Raspberry
	BF-08-100367A	Mixed Cereals with Fruit
	BF-08-100369A	Muesli with Pear
	BF-08-100371A	Muesli with Apple
	BF-08-100372A	Rice & Banana
	BF-08-100379A	Oatmeal Apple
	BF-08-100380A	Rice Banana
	BF-08-100381A	Mixed Cereals - Fruits
	BF-08-100382A	Wheat & Rice Cereals Biscuit - Fruits
	BF-08-100383A	Rice Cereal Yogurt-Fruits
	BF-08-100384A	Wheat - Rice - Fruits
	BF-08-100385A	Rice - Yogurt - Apples - Bananas
	BF-08-100387A	Mixed Cereal with Fruit
	BF-08-100391A	Apple Cinnamon Cereal Crisps
	BF-08-100392A	Mixed Berry Cereal Crisps
	BF-08-100393A	Apple Cinnamon
	BF-08-100394A	Strawberry Banana Yogurt
	BF-08-100398A	Mixed Cereal with Fruit (Peach, Pineapple and Orange)
	BF-08-100399A	Mixed Cereal with Banana
	BF-08-100400A	Soya Cereal with Pear
	BF-08-100401A	Rice Cereal with Pear & Orange
	BF-08-100402A	Wheat Cereal with Banana
	BF-08-100403A	Wheat & Oat Cereal with Banana & Raspberry
	BF-08-100409A	Oatmeal Cereal with Cinnamon and Apples
	BF-08-100410A	Multigrain Cereal with Mango, Pineapple & Pear
	BF-08-100412A	Mixed Cereal with Fruit (Peach, Pineapple and Orange)
	BF-08-100414A	Mixed Berry
	BF-08-100415A	Strawberry Banana
	BF-08-100423A	Whole Wheat Cereal with Strawberry
	BF-08-100424A	Whole Wheat Cereal with Banana
	BF-08-100426A	Banana
	BF-08-100428A	Banana Cookies
	BF-08-100429A	Rice & Apples
	BF-08-100433A	Whole Grain Oatmeal & Bananas
	BF-08-100439A	Millet & Banana
DAIRY	BF-08-100231A	Custard Pudding with Apples
	BF-08-100272A	Custard
	BF-08-100453A	Banana
	BF-08-100454A	Apple-Pear
FORMULA - MILK	BF-08-100279A	Transition Formula
	BF-08-100281A	Infant Formula - Step 1
	BF-08-100455A	Infant Formula - Step 1
	BF-08-100457A	Dairy Based Infant Formula with Iron
	BF-08-100458A	Infant Formula Plus Omega-3 & Omega-6
	BF-08-100459A	Infant Formula with Iron - Step 1

Food Category	Sample Number	Sample Description
	BF-08-100460A	Regular Infant Formula
	BF-08-100461A	Toddler Nutritional Supplement
	BF-08-100463A	Milk-Based Infant Formula
	BF-08-100464A	Infant Formula
	BF-08-100465A	Lactose-Free Infant Formula
	BF-08-100466A	Infant Formula
	BF-08-100467A	Lower Iron Infant Formula
	BF-08-100468A	Lactose Free Infant Formula
	BF-08-100470A	Toddler Formula
	BF-08-100471A	Regular Milk Based - Infant Formula
	BF-08-100472A	Infant Formula with Iron Plus Omega-3 and Omega-6
	BF-08-100473A	Infant Formula for Older Infants
	BF-08-100474A	Milk Based Infant Formula with Iron
	BF-08-100475A	Infant Formula Stage 1
	BF-08-100477A	Infant Formula Stage 2
	BF-08-100478A	Infant Formula
	BF-08-100479A	Infant Formula
	BF-08-100480A	Toddler Nutritional Supplement
	BF-08-100481A	Advanced Formula with Iron
	BF-08-100482A	Calcium Enriched Infant Formula
<i>FORMULA - SOY</i>	BF-08-100280A	Soy Infant Formula
	BF-08-100282A	Soy Infant Formula
	BF-08-100283A	Soy Infant Formula
	BF-08-100284A	Soy Infant Formula
	BF-08-100456A	Soy Infant Formula - Step 1
	BF-08-100462A	Soy-Based Infant Formula
	BF-08-100469A	Hypoallergenic Formula
	BF-08-100476A	Hypoallergenic Formula
	BF-08-100483A	Soy Infant Formula - Step 2
<i>MEAT</i>	BF-08-100200A	Chicken Soup with Pasta
	BF-08-100201A	Spaghetti Rings with Meat Sauce
	BF-08-100202A	Vegetable Soup with Beef
	BF-08-100203A	Chicken & Potatoes in Cheese Sauce
	BF-08-100204A	Lasagne with Meat Sauce
	BF-08-100206A	Vegetables with Chicken & Pasta
	BF-08-100208A	Vegetables with Beef & Spaghetti
	BF-08-100209A	Beef & Pasta
	BF-08-100210A	Chicken Lasagna
	BF-08-100211A	Sweet Potatoes with Chicken & Rice
	BF-08-100212A	Macaroni & Beef
	BF-08-100213A	Beef Stroganoff
	BF-08-100214A	Carrots, Chicken & Beans
	BF-08-100216A	Vegetables & Chicken
	BF-08-100217A	Vegetables & Chicken
	BF-08-100219A	Ham Dinner
	BF-08-100221A	Chicken and Vegetables
	BF-08-100222A	Vegetables & Beef

Food Category	Sample Number	Sample Description
	BF-08-100223A	Casserole with Chicken
	BF-08-100224A	Chicken Noodle Dinner
	BF-08-100226A	Strained Vegetables & Beef
	BF-08-100227A	Beef & Pasta
	BF-08-100229A	Strained Sweet Potato & Chicken
	BF-08-100230A	Beef Stroganoff
	BF-08-100232A	Beef & Beef Broth
	BF-08-100233A	Beef & Macaroni with Vegetables
	BF-08-100234A	Turkey & Turkey Broth
	BF-08-100237A	Chicken & Chicken Broth
	BF-08-100238A	Country Puree
	BF-08-100242A	Strained Vegetables & Beef
	BF-08-100243A	Strained Vegetables & Turkey
	BF-08-100256A	Vegetable Turkey Casserole
	BF-08-100258A	Strained Sweet Potato & Chicken
	BF-08-100259A	Turkey Rice with Vegetables
	BF-08-100260A	Sweet Potato & Beef
	BF-08-100261A	Vegetables, Beef & Spaghetti
	BF-08-100263A	Turkey Stew
	BF-08-100265A	Beef Stroganoff
	BF-08-100266A	Vegetables, Beef & Spaghetti
	BF-08-100267A	Veal with Broth
	BF-08-100268A	Chicken with Broth
	BF-08-100269A	Pasta with Meat Sauce
	BF-08-100271A	Lamb with Broth
	BF-08-100273A	Lemon Chicken & Vegetable
	BF-08-100275A	Vegetables and Chicken
	BF-08-100276A	Vegetables Beef & Pasta Casserole
	BF-08-100277A	Vegetables, Rice & Chicken
	BF-08-100278A	Strained Sweet Potato & Turkey
	BF-08-100285A	Chicken Cacciatore
	BF-08-100286A	Spanish Chicken with Rice
	BF-08-100287A	Vegetables Chicken & Fruit
	BF-08-100288A	Vegetable Pork & Apple Blend
	BF-08-100290A	Chicken & Vegetable
	BF-08-100291A	Pasta & Beef
	BF-08-100294A	Vegetables and Chicken
	BF-08-100295A	Vegetables, Rice & Chicken
	BF-08-100296A	Vegetables & Chicken
	BF-08-100297A	Vegetables & Turkey
	BF-08-100298A	Vegetables and Beef
	BF-08-100310A	Vegetable Beef
	BF-08-100311A	Vegetable and Turkey
	BF-08-100313A	Vegetables and Chicken
	BF-08-100333A	Vegetables and Turkey
	BF-08-100334A	Vegetables, pork and Apple Blend
	BF-08-100335A	Vegetables, beef & Spaghetti Casserole

Food Category	Sample Number	Sample Description
	BF-08-100336A	Vegetable and Turkey Risotto
	BF-08-100338A	Sweet Potato and Chicken
	BF-08-100343A	Vegetables and Turkey
	BF-08-100348A	Veggie Stew with Beef
	BF-08-100349A	Turkey Stew
	BF-08-100357A	Vegetable Beef Dinner
	BF-08-100358A	Chicken Noodle Dinner
	BF-08-100360A	Chicken & Vegetable Risotto
	BF-08-100417A	Pasta Dinner
	BF-08-100418A	Mashed Potatoes, Chicken and Carrots
	BF-08-100420A	Chicken & Pasta in Sauce with Peas
	BF-08-100422A	Vegetables Chicken and Noodles with Green Beans
	BF-08-100441A	Strained Lamb
	BF-08-100446A	Veal and Barley
	BF-08-100447A	Lamb with fruit
	BF-08-100448A	Pork and Leeks
<i>PASTA</i>	BF-08-100215A	Macaroni & Cheese
	BF-08-100300A	Vegetables and Pasta
	BF-08-100316A	Vegetable and Pasta
	BF-08-100419A	Vegetable and Pasta
	BF-08-100421A	Vegetable and Pasta
<i>PROCESSED FRUIT AND/OR VEGETABLES</i>	BF-08-100101A/B	Apricots with Mixed Fruit
	BF-08-100102A/B	Bananas
	BF-08-100103A/B	Pear Pineapple
	BF-08-100104A/B	Carrots
	BF-08-100105A/B	Apples
	BF-08-100106A/B	Bananas with Apples and Pears
	BF-08-100107A/B	Peas
	BF-08-100108A/B	Prunes
	BF-08-100109A/B	Peaches
	BF-08-100110A/B	Sweet Potatoes
	BF-08-100111A/B	Plums with Apple
	BF-08-100112A/B	Bananas
	BF-08-100113A/B	Apple Strawberry Banana
	BF-08-100114A/B	Sweet Corn Casserole
	BF-08-100115A/B	Bananas & Strawberries
	BF-08-100116A/B	Fruit Salad
	BF-08-100117A/B	Apples & Mangos
	BF-08-100118A/B	Bananas
	BF-08-100119A/B	Carrots & Peas
	BF-08-100120A/B	Apples & Blueberries
	BF-08-100121A/B	Prunes
	BF-08-100122A/B	Pears
	BF-08-100123A/B	Sweet Potatoes
	BF-08-100124A/B	Peaches
	BF-08-100125A/B	Carrots
	BF-08-100126A/B	Pears & Raspberries

Food Category	Sample Number	Sample Description
	BF-08-100127A/B	Applesauce
	BF-08-100128A/B	Fruit Medley
	BF-08-100129A/B	Banana Mixed Berries
	BF-08-100130A/B	Mixed Vegetables
	BF-08-100131A/B	Apples & Strawberries
	BF-08-100132A/B	Apricot Dessert
	BF-08-100133A/B	Bananas & Apple Sauce
	BF-08-100134A/B	Peaches
	BF-08-100135A/B	Pears
	BF-08-100136A/B	Applesauce
	BF-08-100137A/B	Banana Orange
	BF-08-100138A/B	Apples & Blueberries
	BF-08-100139A/B	Mixed Fruit
	BF-08-100140A/B	Strained Bananas & Prunes
	BF-08-100141A/B	Strained Apple Plum with Raisin
	BF-08-100142A/B	Banana Grape Plum
	BF-08-100143A/B	Pears
	BF-08-100144A/B	Apples & Blueberries
	BF-08-100145A/B	Apricot Dessert
	BF-08-100146A/B	Apple Raspberry
	BF-08-100147A/B	Wax Beans
	BF-08-100148A/B	Peas & Carrots
	BF-08-100149A/B	Green Beans
	BF-08-100150A/B	Green Beans
	BF-08-100151A/B	Strawberry Dessert
	BF-08-100152A/B	Carrots
	BF-08-100153A/B	Peas
	BF-08-100154A/B	Sweet Potatoes
	BF-08-100155A/B	Carrots
	BF-08-100156A/B	Bananas
	BF-08-100157A/B	Apples and Raspberries
	BF-08-100158A/B	Mixed Vegetables
	BF-08-100159A/B	Squash
	BF-08-100160A/B	Pears
	BF-08-100161A/B	Peas and Carrots
	BF-08-100162A/B	Apples
	BF-08-100163A/B	Mixed Fruits
	BF-08-100164A/B	Peas
	BF-08-100165A/B	Apples & Strawberries
	BF-08-100166A/B	Apples & Strawberries
	BF-08-100167A/B	Strawberry Dessert
	BF-08-100168A/B	Applesauce
	BF-08-100169A/B	Prunes
	BF-08-100170A/B	Green Beans
	BF-08-100171A/B	Mixed Vegetables
	BF-08-100172A/B	Carrots & Peas
	BF-08-100173A/B	Bananas

Food Category	Sample Number	Sample Description
	BF-08-100174A/B	Applesauce
	BF-08-100175A/B	Strawberries
	BF-08-100176A/B	Apples & Cherries
	BF-08-100177A/B	Sweet Potatoes
	BF-08-100178A/B	Sweet Potatoes
	BF-08-100179A/B	Peas
	BF-08-100180A/B	Squash
	BF-08-100181A/B	Carrots
	BF-08-100182A/B	Fruit Salad
	BF-08-100183A/B	Sweet Potatoes
	BF-08-100184A/B	Peas
	BF-08-100185A/B	Blueberry
	BF-08-100186A/B	Butternut Squash
	BF-08-100187A/B	Peaches
	BF-08-100188A/B	Sweet Peas
	BF-08-100189A/B	Apples & Bananas
	BF-08-100190A/B	Prunes & Pears
	BF-08-100191A/B	Apple Mango Kiwi
	BF-08-100192A/B	Strained Green Beans
	BF-08-100193A/B	Carrots Dices
	BF-08-100194A/B	Butternut Squash
	BF-08-100195A/B	Blueberry
	BF-08-100196A/B	Bananas
	BF-08-100197A/B	Fruit Salad
	BF-08-100205A	Hearty Vegetable Soup
	BF-08-100218A	Apple Juice
	BF-08-100225A	Pears
	BF-08-100228A	Strained Plums, Apples, and Pears
	BF-08-100235A	Hearty Vegetable Stew
	BF-08-100239A	Apple Prune Juice Blend
	BF-08-100240A	Strained Mixed Vegetables
	BF-08-100241A	Strained Pears
	BF-08-100244A	Strained Peaches
	BF-08-100245A	Strained Prunes
	BF-08-100246A	Strained Apples & Mangoes
	BF-08-100248A	Strained Pears & Blueberries
	BF-08-100249A	Strained Blueberry Dessert
	BF-08-100250A	Carrots
	BF-08-100251A	Apples & Bananas
	BF-08-100254A	Apples & Apricots
	BF-08-100257A	Apples & Blueberries
	BF-08-100262A	Apple Cherry
	BF-08-100274A	Broccoli, Potato & Cheese Casserole
	BF-08-100289A	Pear
	BF-08-100292A	Apple
	BF-08-100293A	Apple-Prune
	BF-08-100299A	Strawberry Dessert

Food Category	Sample Number	Sample Description
	BF-08-100301A	Creamed Corn
	BF-08-100302A	Sweet Potatoes
	BF-08-100303A	Prunes
	BF-08-100304A	Applesauce
	BF-08-100305A	Pears
	BF-08-100306A	Mixed Fruit
	BF-08-100307A	Apples and Blueberries
	BF-08-100308A	Peaches
	BF-08-100309A	Mixed Vegetables
	BF-08-100312A	Butternut Squash
	BF-08-100314A	Carrots
	BF-08-100315A	Peas
	BF-08-100317A	Apples and Strawberries
	BF-08-100319A	Mixed Fruit
	BF-08-100320A	Strawberry Dessert
	BF-08-100321A	Squash
	BF-08-100322A	Sweet Potatoes
	BF-08-100323A	Strained Apples & Apricots
	BF-08-100324A	Strained Apples & Bananas
	BF-08-100325A	Bananas
	BF-08-100326A	Strawberry Dessert
	BF-08-100327A	Strained Green Beans
	BF-08-100328A	Mixed Fruit
	BF-08-100329A	Strained Peas
	BF-08-100330A	Strained Sweet Potatoes
	BF-08-100331A	Strained Carrots
	BF-08-100332A	Strained Carrots & Peas
	BF-08-100337A	Carrots
	BF-08-100339A	Sweet Potatoes
	BF-08-100340A	Vegetables and Lentils
	BF-08-100341A	Apples and Blueberries
	BF-08-100342A	Apples and Apricots
	BF-08-100344A	Butternut Squash
	BF-08-100345A	Summer Vegetables
	BF-08-100346A	Apples and Bananas
	BF-08-100347A	Apples
	BF-08-100350A	Banana with Coconut
	BF-08-100352A	Apple Pear Blend - Unsweetened
	BF-08-100353A	Apple Apricot Blend - Unsweetened
	BF-08-100355A	Apple Blend - Unsweetened
	BF-08-100356A	Apple Blueberry Blend - Unsweetened
	BF-08-100359A	Banana Dessert
	BF-08-100361A	Apple Juice from Concentrate - Unsweetened
	BF-08-100378A	Corn - Vegetables
	BF-08-100416A	Juice
	BF-08-100440A	Broccoli Puree
	BF-08-100442A	Fruit Compote

Food Category	Sample Number	Sample Description
	BF-08-100443A	Strained Mangoes Puree
	BF-08-100444A	Strained Pears Puree
	BF-08-100445A	Strained Mixed Vegetables
	BF-08-100449A	Sweet Potato
	BF-08-100450A	Banana Blueberry
	BF-08-100451A	Butternut Squash
	BF-08-100452A	Broccoli
	BF-08-100484A	Vegetable
<i>MISCELLANEOUS</i>	BF-08-100436A	Cherry Water
	BF-08-100437A	Watermelon Water
	BF-08-100438A	Grape Water

Appendix B

Table B-2 List of pesticides (142) included in CFIA pesticide MRM method PMR-006-V1.0

3-Hydroxycarbofuran	Diniconazole	Isocarbamide	Pyrifenox
Acetochlor	Dioxacarb	Isoprocab	Pyrimethanil
Aclonifen	Dipropetryn	Isoxathion	Pyriproxyfen
Aldicarb	Diuron	Mepanipirim	Quinoxifen
Aldicarb sulfone	Dodemorph	Mephosfolan	Quizalofop
Aldicarb sulfoxide	Emamectin	Methabenzthiazuron	Quizalofop-ethyl
Azaconazole	Epoxiconazole	Methiocarb	Schradan
Benomyl	Ethiofencarb	Methiocarb sulfone	Spinosad
Benoxacor	Ethiofencarb sulfone	Methiocarb sulfoxyde	Spirodiclofen
Bitertanol	Ethiofencarb sulfoxyde	Methomyl	Spiromesifen
Bromuconazole	Ethirimol	Methoxyfenozide	Spiroxamine
Butafenacil	Ethoprop	Metolcarb	Sulfentrazone
Butocarboxim sulfoxide	Etofenprox	Metoxuron	Tebufenozide
Cadusafos	Etoxazole	Molinate	Tebufenpyrad
Carbaryl	Fenamidone	Napropamide	Tebupirimfos
Carbendazim	Fenazaquin	Naptalam	Tepraloxym
Carbofuran	Fenhexamid	Neburon	Tetraconazole
Carbosulfan	Fenoxanil	Ofurace	Thiabendazole
Carfentrazone-ethyl	Fenpropidine	Oxamyl	Thiacloprid
Chlorimuron-ethyl	Fenpropimorph	Oxamyl oxime	Thiamethoxam
Chloroxuron	Fenpyroximate	Paclobutrazol	Thiazopyr
Chlortoluron	Fentrazamide	Pencycuron	Thiodicarb
Clodinafop-propargyl	Fluazifop-butyl	Penoxsulam	Thiofanox
Cloquintocet-mexyl	Flucarbazone-sodium	Picolinafen	Thiofanox sulfone
Clothianidin	Flutolanil	Picoxystrobin	Thiofanox sulfoxyde
Cyanofenphos	Flutriafol	Piperophos	Thiophanate methyl
Cycloxydim	Forchlorfenuron	Pretilachlor	Tralkoxydim
Cycluron	Formetanate	Primisulfuron-methyl	Trichlorfon
Demeton-s-methyl sulfone	Fosthiazate	Prodiamine	Trietazine
Demeton-s-methyl sulfoxyde	Fuberidazole	Propoxur	Trifloxysulfuron
Desmedipham	Furathiocarb	Pymetrozine	Triforine
Diclocymet	Haloxifop	Pyraclostrobin	Trimethacarb
Diethofencarb	Imazamethabenz-methyl	Pyraflufen-ethyl	Zinophos
Difenoconazole	Imidacloprid	Pyridalyl	Zoxamide
Dimethametryn	Indoxacarb	Pyridaphenthion	
Dimethomorph	Iprovalicarb	Pyridate	

Appendix C

Table C-1 List of pesticides (299) included in third party method for pesticide analysis in processed products

2-phenylphenol	Cyfluthrin	Flucythrinate	Parathion-methyl
3-hydroxyCarbofuran	Lambda-cyfluthrin	Fludioxinil	Pebulate
Acephate	Cypermethrin	Flumetralin	Penconazole
Acibenzolar-s-methyl	Cyprazine	Fluorochloridone	Pendimethalin
Alachlor	Cyproconazole	Fluorodifen	Pentachloroaniline
Aldicarb	Cyprodinil	Flusilazole	Cis-Permethrin 1
Aldicarb Sulfone	Cyromazine	Fluvalinate	Trans-Permethrin 2
Aldicarb Sulfoxyde	Dacthal (chlorthal-dimethyl)	Folpet	Phenthoate
Aldrin	Delta HCH	Fonofos	Phorate
Allidochlor	Deltamethrin	Heptachlor	Phorate sulfone
Ametryn	delta-trans-allethrin	Heptachlor epoxide endo	Phosalone
Aminocarb	Demeton-O	Heptanophos	Phosmet
Aramite	Demeton-S	Hexachlorobenzene	Phosphamidon
Aspon	Demeton-S-methyl	Hexaconazole	Piperonyl butoxide
Atrazine	Des-ethyl Atrazine	Hexazinone	Pirimicarb
Azinphos-ethyl	Desmetryn	Imazalil	Pirimiphos-ethyl
Azinphos-methyl	Di-allate	Iodofenphos	Pirimiphos-methyl
Azoxystrobin	Dialofos	Iprobenfos	Prochloraz
Benalaxyl	Diazinon	Iprodione	Procymidone
Bendiocarb	Diazinon o analogue	Iprodione metabolite	Prodiamine
Benfluralin	Dichlobenil	Isazophos	Profenophos
Benodanil	Dichlofluanid	Isofenphos	Profluralin
Benzoylprop-ethyl	Dichloran	Isopropalin	Prometon
ALPHA-BHC	Dichlormid	Isoprothiolane	Prometryne
BETA-BHC	Dichlorovos	Kresoxim-methyl	Pronamide
Bifenox	Diclobutrazole	Leptophos	Propachlor
Bifenthrin	Diclofenthion	Lindane	Propanil
Biphenyl	Diclofop-methyl	Linuron	Propargite
Bromacil	Dicofol	Malaoxon	Propazine
Bromophos	Dicrotophos	Malathion	Propetamphos
Bromophos-ethyl	Dieldrin	Mecarbam	Propham
Bromopropylate	Diethyl-ethyl	Metalaxyl	Propiconazole
Bufencarb	Dimethachlor	Metazachlor	Propoxur
Bupirimate	Dimethoate	Methamidophos	Prothiophos
Buprofezin	Dinitramine	Methidathion	Pyracarbolid
Butachlor	Dioxacarb	Methiocarb	Pyrazophos
Butralin	Dioxathion	Methiocarb Sulfoxyde	Pyridaben
Butylate	Diphenamid	Methomyl	Quinalphos
Captafol	Diphenylamine	Methoprotryne	Quinomethionate
Captan	Disulfoton	Methoxychlor	Quintozone
CAPmet	Disulfoton sulfone	Methyl-trithion	Schradan

Carbaryl	Edifenphos	Methyl Pentachlorophenyl sulphide	Secbumeton
Carbetamide	Alpha-Endosulfan	Metobromuron	Simazine
Carbofenthion	Beta-Endosulfan	Metolachlor	Simetryn
Carbofuran	Endosulfan sulphate	Metribuzin	Sulfallate
Carboxin	Endrin	c-Mevinophos	Sulfotep
Chlorbenside	EPN	t-Mevinophos	Sulprophos
Chlorbenzilate	EPTC	Mexacarbate	TCMTB
Chlorbromuron	Erbon	Mirex	Tebuconazole
Chlorbufam	Esfenvalerate	Monocrotophos	Tecnazene
Cis Chlordane	Etaconazole	Monolinuron	Terbacil
Trans Chlordane	Ethalfuralin	Myclobutanil	Terbufos
Chlordimeform	Ethion	Naled	Terbumeton
Chlorfenson	Ethofumesate	Nitralin	Terbutryne
Chlorfenvinphos	Ethoprophos	Nitrapyrin	Terbutylazine
Chlorflurenol-methyl	Ethylan	Nitrofen	Tetrachlorvinphos
Chloridazon	Etridiazole	Nitrothal-isopropyl	Tetradifon
Chlormephos	Etrimfos	Norflurazon	Tetraiodoethylene
Chloroneb	Fenamiphos	Nuarimol	Tetramethrin
Chloropropylate	Fenamiphos sulfone	o,p-DDD	Tetrasul
Chlorothalonil	Fenamiphos Sulfoxyde	o,p-DDE	Thiobencarb
Chlorpropham	Fenarimol	o,p-DDT	Tolclofos-methyl
Chlorpyrifos	Fenbuconazole	Octhilinone	Tolyfluanid
Chlorpyrifos-methyl	Fenchlorophos	Omethoate	Triadimefon
Chlorthiamid	Fenfuram	Oxadiazon	Triadimenol
Chlorthion	Fenitrothion	Oxadixyl	Tri-allate
Chlorthiophos	Fenpropathrin	Oxamyl	Triazophos
Chlozolate	Fenpropimorph	Oxycarboxin	Tribufos
Clomazone	Fenson	Oxychlordane	Tricyclazole
Coumaphos	Fensulfothion	Oxyfluorfen	Trifloxystrobin
Crotoxyphos	Fenthion	p,p-DDD	Triflumizole
Crufomate	Fenvalerate	p,p-DDE	Trifluralin
Cyanazine	Flamprop-isopropyl	p,p-DDT	Vernolate
Cyanophos	Flamprop-methyl	Paraoxon	Vinclozolin
Cycloate	Fluchloralin	Parathion	

Table C-2: List of pesticides (32) included in third party method for pesticide analysis in dairy products

Alachlor	Beta-Endosulfan	o,p-DDE
Aldrin	Endosulfan sulphate	o,p-DDT
Alpha-BHC	Endrin	Oxychlordane
Beta-BHC	Fenchlorophos	p,p-DDD
Cis Chlordane	Heptachlor	p,p-DDE
Trans Chlordane	Heptachlor epoxide endo	p,p-DDT
Chlorpyrifos	Hexachlorobenzene	Cis-Permethrin 1
Cyfluthrin	Lindane	Trans-Permethrin 2
Dicofol	Methoxychlor	Quizalofop-ethyl
Dieldrin	Mirex	Tefluthrin
Alpha-Endosulfan	o,p-DDD	

Appendix D

Table D-1 Detection limits required for metals in fresh fruits and vegetables and processed products

Residue	Detection Limit (ppm)
Al	0.1
As	0.004
B	0.005
Cd	0.0009
Cr	0.002
Cu	0.002
Fe	0.2
Hg	0.002
Mn	0.0008
Ni	0.0002
Pb	0.0004
Se	0.02
Sn	0.02
Ti	0.003
Zn	0.1

Appendix E

**Table E-1 Minimum Detection Limit (MDL) and Limit of Quantitation (LOQ)
for single residue methods validated by third party laboratory**

Program	Analyte	MDL (ppm)	LOQ (ppm)
Alar	Daminozide	0.01	0.02
Amitraz	Amitraz	0.005	0.01
Benomyl	Carbendazim	0.005	0.01
EBDC (ETU)	ETU	0.01	0.02
Formetanate	Formetanate	0.005	0.01
Thiabendazole	Thiabendazole	0.005	0.01

Appendix F

Table F-1 Samples containing more than one pesticide residue

Sample Id	Commodity Type	Origin	# Residues
BF-08-100111A/B	FRUIT AND VEGETABLE BASED	United States	2
BF-08-100120 A/B	FRUIT AND VEGETABLE BASED	United States	3
BF-08-100127 A/B	FRUIT AND VEGETABLE BASED	United States	3
BF-08-100131 A/B	FRUIT AND VEGETABLE BASED	Canada	2
BF-08-100133 A/B	FRUIT AND VEGETABLE BASED	Canada	2
BF-08-100134 A/B	FRUIT AND VEGETABLE BASED	Canada	3
BF-08-100136 A/B	FRUIT AND VEGETABLE BASED	Canada	4
BF-08-100138 A/B	FRUIT AND VEGETABLE BASED	Canada	2
BF-08-100139 A/B	FRUIT AND VEGETABLE BASED	Canada	2
BF-08-100141 A/B	FRUIT AND VEGETABLE BASED	Canada	2
BF-08-100147 A/B	FRUIT AND VEGETABLE BASED	Canada	2
BF-08-100150 A/B	FRUIT AND VEGETABLE BASED	Canada	2
BF-08-100163 A/B	FRUIT AND VEGETABLE BASED	Canada	2
BF-08-100165 A/B	FRUIT AND VEGETABLE BASED	Canada	2
BF-08-100166 A/B	FRUIT AND VEGETABLE BASED	United States	4
BF-08-100167 A/B	FRUIT AND VEGETABLE BASED	Canada	3
BF-08-100168 A/B	FRUIT AND VEGETABLE BASED	Canada	3
BF-08-100174 A/B	FRUIT AND VEGETABLE BASED	United States	2
BF-08-100176 A/B	FRUIT AND VEGETABLE BASED	United States	2
BF-08-100189 A/B	FRUIT AND VEGETABLE BASED	United States	3
BF-08-100190 A/B	FRUIT AND VEGETABLE BASED	United States	2
BF-08-100191 A/B	FRUIT AND VEGETABLE BASED	Canada	2
BF-08-100207A	CEREAL-BASED	United States	5
BF-08-100220A	CEREAL-BASED	United States	3
BF-08-100231A	DAIRY-BASED	United States	2
BF-08-100236A	CEREAL-BASED	United States	2
BF-08-100287A	MEAT-BASED	Canada	2
BF-08-100289A	FRUIT AND VEGETABLE BASED	Canada	2
BF-08-100393A	CEREAL-BASED	Canada	2
BF-08-100394A	CEREAL-BASED	Canada	2
BF-08-100428A	CEREAL-BASED	United States	2
BF-08-100429A	CEREAL-BASED	United States	2
BF-08-100447A	MEAT-BASED	Canada	3