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Survey of Bisphenol A in Canned Food Products from Canadian Markets

Bureau of Chemical Safety
Food Directorate
Health Products and Food Branch

A WHO Collaborating Centre for
Food Contamination Monitoring



June, 2010



Canada

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Health Canada is the federal department responsible for helping the people of Canada maintain and improve their health. We assess the safety of drugs and many consumer products, help improve the safety of food, and provide information to Canadians to help them make healthy decisions. We provide health services to First Nations people and to Inuit communities. We work with the provinces to ensure our health care system serves the needs of Canadians.

Published by Authority of the Minister of Health.

Survey of Bisphenol A in Canned Food Products from Canadian Markets is available on Internet at the following address:
http://www.hc-sc.gc.ca/fn-an/securit/packag-emball/bpa/bpa_survey-summ-enquete-can-con-eng.php

Également disponible en français sous le titre :

Enquête sur la présence de bisphénol A dans les produits alimentaires en conserve provenant des marchés canadiens

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Cat.: H164-79/5-2010E-PDF
ISBN: 978-1-100-16029-0

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Background

Bisphenol A (BPA) is the common name for 2,2-(4,4'-dihydroxydiphenyl)propane, 4,4'-isopropylidenediphenol, or 2,2'-bis(4-hydroxyphenyl)propane. It is used as an intermediate in the production of epoxy resins which are used in the internal coating for food and beverage cans to protect the food from direct contact with metal. BPA can migrate from cans with epoxy coating into foods, especially at elevated temperatures (for example, for hot-fill or heat-processed canned foods). BPA is one of the 23000 chemical substances on the CEPA (Canadian Environmental Protection Act) Domestic Substance List (DSL) identified for further evaluation under government of Canada's Chemical Management Plan (CMP).

BPA was included in [Batch 2 of the Challenge](#) under CMP carried out by Health Canada and Environment Canada. On October 18, 2008, the Government of Canada released its final assessment report, including the Government's proposed risk management approaches to reduce Canadian exposure to BPA. Health Canada has committed to a research and monitoring agenda to further investigate potential human health effects of BPA and improve its understanding of Canadian exposure to this chemical through food sources. The purpose of this survey was to gather occurrence levels of BPA in canned food products available for sale in Canada to contribute in updating the BPA exposure estimate for Canadians.

Sampling Plan and Analytical Methodology

This survey examined samples from 78 canned food products marketed under a variety of brands. The products were purchased in April 2009 from local grocery stores in Ottawa. These products covered a variety of domestic and imported foods, including one canned pasta product, 15 canned vegetable products of seven brands, six canned tomato paste products of four brands, 41 canned soup products of five brands, and 15 canned tuna products of four brands. Among the 41 canned soup products, 29 were concentrated and 12 were ready to serve.

Health Canada continually works to develop more sensitive methods with detection limits as low as possible for the determination of chemicals in foods in order to support more accurate human exposure assessments. For this survey, an analytical method based on gas chromatography/mass spectrometry (GC/MS), developed previously for the [determination of BPA in various food samples](#), was adapted and employed for the analysis of canned food samples for BPA. The average method detection limit (MDL) was 0.60 ng/g*. The results of the analyses for each canned food product collected are shown in [Table 1](#).

* 1 ng/g is equivalent to 1 part per billion (ppb)

** Results are displayed in [Table 1](#) as consumed.

Notes:

- ❑ All canned food samples were tested as purchased. Some [results](#) have been adjusted to account for the product-recommended dilution factor and represent as consumed levels.
- ❑ It should be noted that the absence of any particular brand from this survey means only that the brand was not included in the survey. No particular inference should be drawn from the presence or absence of any brand.
- ❑ Samples represent a “snapshot” of the market at the time of sampling and do not represent market share. Product names and availability correspond to the time of sampling and may not represent current products on the market. Differences between brands do not necessarily reflect differences in consumer exposure to BPA.
- ❑ The results shown in [Table 1](#) are generated for research purposes and should not be considered as representative of the distribution of BPA in canned food products or to assist or guide product choices for consumers.
- ❑ All samples were analysed before their expiry dates.
- ❑ Results from this survey represent single samples analyzed in duplicate. The values in the table are the averages of those duplicates.

BPA Levels in Canned Food Products

[Table 1](#) summarizes the results of the analysis for BPA in samples from canned food products. BPA was detected in almost all 78 canned food products; the BPA level in only one product (tomato paste) was below the method detection limit (MDL) of 0.60 ng/g*.

Canned tuna products had the highest BPA levels, in general, with average and maximum BPA levels of 137 and 534 ng/g*, respectively. Canned soup products had the next highest BPA levels. BPA levels in the condensed soup products were considerably higher than those in the ready-to-serve soup products, with average and maximum BPA levels of 52 and 94 ng/g* for the condensed soup compared to 15 and 34 ng/g* for the ready-to-serve soup.

* 1 ng/g is equivalent to 1 part per billion (ppb)

** Results are displayed in [Table 1](#) as consumed.

BPA levels in canned tomato paste products were considerably lower. The average and maximum BPA levels for the tomato paste products were 1.1 and 2.1 ng/g*, while they were 9.3 and 23 ng/g* for the pure tomato products.

On average, the BPA levels observed in the vast majority of samples within this survey are consistent with those of past surveys and are not considered to represent a human health concern. Health Canada continues to work with the food packaging industry to better identify the factors which may influence BPA migration to food, with a goal to limit human exposure to BPA to the greatest extent possible.

Health Significance of the Survey Results

In March, 2008, Health Canada's Food Directorate completed a [Health Risk Assessment of BPA from food packaging applications](#)⁺ to determine exposure estimates to BPA. Health Canada's Food Directorate has concluded that:

- ❑ The current dietary exposure to BPA through food packaging is not expected to pose a health risk to the general population, including newborns and infants.

In view of uncertainties related to possible neurodevelopmental and behavioural effects that BPA may have in experimental animals, Health Canada's Food Directorate has recommended that precaution be exerted on products consumed by the sensitive subset of the population, i.e. infants and newborns, by applying the ALARA (as low as reasonably achievable) principle to reduce their exposure to BPA through food packaging applications.

Other international food regulatory agencies – notably in the United States, Europe, the United Kingdom and Australia-New Zealand – have reviewed the “[Health Risk Assessment of Bisphenol A from Food Packaging Applications](#)⁺”, prepared by Health Canada's Food Directorate, and have confirmed that the conclusions reached are supported by the current scientific evidence as described in the document.

* 1 ng/g is equivalent to 1 part per billion (ppb)

** Results are displayed in [Table 1](#) as consumed.

⁺ Health Risk Assessment of Bisphenol A from Food Packaging Applications. ISBN: 978-0-662-48686-2

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Table 1: Concentrations (ng/g) of BPA in canned food products as consumed

- It should be noted that the absence of any particular brand from this survey means only that the brand was not included in the survey. No particular inference should be drawn from the presence or absence of any brand.
- Samples represent a “snapshot” of the market and do not represent market share. Product names and availability correspond to the time of sampling and may not represent current products on the market. Differences between brands do not necessarily reflect differences in consumer exposure to BPA.
- The results shown in the table are exploratory and should not be used to indicate the distribution of BPA in canned food products or to assist or guide product choices for consumers.

Company / Manufacturer	Brand name	Product Description	Type	BPA Concentration (ng/g) *
Aliments Caneast Foods Ltd.	Riviera	Pieces and Stems Mushrooms	Vegetable	5.2
Aurora Importing & Distributing Ltd.	Aurora	Diced Tomatoes	Vegetable	23
Baxters Canada Inc.	Baxters	Chicken & Vegetable Soup, Low Fat, Ready to Serve	Soup	10
		Vegetable Soup, Low Fat, Ready to Serve	Soup	11
		Lentil & Smokey Bacon Soup, Low Fat, Ready to Serve	Soup	10
	Primo	Roasted Chicken & Noodle, Low Fat, 30% Less Sodium, Ready to Serve	Soup	13
		Beef Barley, Low Fat, 40% Less Sodium, Ready to Serve	Soup	14
		Lentil, Low Fat, 50% Less Sodium Than Our Previous Lentil, Ready to Serve	Soup	14
Campbell Company of Canada	Campbell's	Chicken Broth, Fat Free, 25% Less Salt, Condensed	Soup	60 **
		Chicken Broth, Fat Free, Condensed	Soup	61.5 **
		Consomme Broth, Fat Free, Condensed	Soup	74.5 **
		Beef Broth, Fat Free, Condensed	Soup	46 **
		Chicken Gumbo, Low in Fat, Condensed	Soup	51.5 **
		Chicken with Rice, Low in Fat, Condensed	Soup	65 **
		Chicken Noodle, Condensed	Soup	33 **
		Vegetable Beef, Low in Fat, Condensed	Soup	67 **
		Beef with Vegetables & Barley, Low in Fat, Condensed	Soup	55.5 **
		Bean with Bacon, Low in Fat, Condensed	Soup	71.5 **
		Cream of Broccoli & Cheese, Condensed	Soup	69 **
		Cream of Asparagus, Condensed	Soup	55.5 **
		Cream of Celery, Low Fat, Condensed	Soup	91.5 **
		Cream of Celery, Condensed	Soup	94.5 **
		Cream of Chicken, Condensed	Soup	33.5 **
		Cream of Chicken, Low Fat, Condensed	Soup	52.5 **
		Cream of Wild Mushroom, Condensed	Soup	68 **
		Cream of Mushroom, Condensed	Soup	78 **
Cream of Broccoli, Low Fat, Condensed	Soup	43 **		
Tomato Soup, Condensed	Soup	2.05 **		

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Company / Manufacturer	Brand name	Product Description	Type	BPA Concentration (ng/g)*
Campbell Company of Canada	Campbell's	Tomato with Basil & Oregano, Condensed	Soup	18 **
		Onion , Low in Fat, Condensed	Soup	61 **
		Vegetable, Condensed	Soup	84 **
		Vegetable with Pasta, Low in Fat, Condensed	Soup	63.5 **
		French Canadian Style Pea, Low in Fat, Condensed	Soup	33 **
		Chicken Noodle, Low in Fat, Ready to Serve	Soup	10
		Herbed Chicken with Rice, Low in Fat, Ready to Serve	Soup	11
		New England Clam Chowder, 25% Less Sodium, Low Fat, Ready to Serve	Soup	11
		Tomato Garden Vegetable, Whole Grain Pasta, 25% Less Sodium, Fat Free, Ready to Serve	Soup	11
		Chunky Chicken Soup, Ready to Serve, Low in Fat	Soup	30
		Chunky Prime Rib with Vegetables, 25% Less Salt, Ready to Serve	Soup	34
Cangro Foods Inc.	Aylmer	Diced Tomatoes with Italian Spices	Vegetable	8.4
	Del Monte	Cut Green Beans	Vegetable	14
		Cream Style Corn	Vegetable	7.3
		Zucchini	Vegetable	11
Clover Leaf Seafoods	Clover Leaf	Flaked Light Tuna, Sundried Tomato & Basil	Tuna	39
		Flaked Light Tuna, Dill & Lemon	Tuna	56
		Solid Light Tuna in Olive Oil	Tuna	55
		Flaked Light Tuna in Water	Tuna	534
		Flaked White Tuna in Water	Tuna	12
		Solid White Tuna, Low Sodium in Water	Tuna	30
		Flaked White Tuna, Vegetable Broth & Oil	Tuna	22
		Chunk Light Tuna in Water	Tuna	507
ConAgra Foods Canada Inc.	Chef Boyardee	Spaghetti & Meat Balls in Tomato Sauce	Pasta	32
	Hunt's	Tomato Paste, Garlic	Tomato Paste	2.1
		Tomato Paste, No Salt Added	Tomato Paste	1.3
		Tomato Paste, Herbs and Spices	Tomato Paste	1.1
General Mills Canada Corp	Green Giant	Cream Style Corn Made with Niblets	Vegetable	92
		Cut Green Beans, 1/3 Less Salt	Vegetable	38
Loblaws Inc.	Bella Tavola	Tomato Paste	Tomato Paste	<MDL
	No Name	Tomato Paste	Tomato Paste	0.82
		Chunk Light Tuna in Water	Tuna	9
		Flaked Light Tuna, Tomato Basil	Tuna	49
		Flaked Light Tuna, Spicy Thai Chilli	Tuna	237
		Beef Broth, Fat-free, Condensed	Soup	11.5 **

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Company / Manufacturer	Brand name	Product Description	Type	BPA Concentration (ng/g) * _
Loblaws Inc.	No Name	Chicken & Rice, Condensed	Soup	14 **
		Cream of Mushroom, Reduced Fat, Condensed	Soup	44.5 **
		Whole-Style Cut Carrots	Vegetable	9.1
		Assorted Sizes Asparagus Tips	Vegetable	9.1
		Whole Mushrooms	Vegetable	57
	President's Choice	Cream of Tomato with Parmesan & Basil, Condensed	Soup	18 **
		Solid White Tuna in Water	Tuna	216
		Chunk Light Tuna in Water	Tuna	189
		Whole Tomatoes	Vegetable	4.3
		Diced Tomatoes, No Salt Added	Vegetable	5.2
	Cut Green Beans, No Salt Added	Vegetable	8.9	
Unico Inc.	Unico	Tomato Paste	Tomato Paste	0.79
		Solid Light Tuna	Tuna	62
		Tomatoes	Vegetable	5.7

Additional Information

For more information, please contact the [Bureau of Chemical Safety](#)