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Summary of Comments Received as part of Health Canada's 2013-2014 Call for Data to Assess the Effectiveness of Acrylamide Reduction Strategies in Food

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Bureau of Chemical Safety
Food Directorate
Health Products and Food Branch



Canada

Background

Acrylamide is a chemical that can form in certain foods, particularly plant-based foods that are rich in carbohydrates and low in protein, during processing or cooking at high temperatures. Acrylamide has been demonstrated to cause cancer in experimental animals. In addition, Health Canada's [*Revised Exposure Assessment of Acrylamide in Food*](#) concluded that dietary exposure to acrylamide represents a potential human health concern which aligns with the opinion of other international food safety organizations.

The 2009 assessment of acrylamide conducted under the [*Government of Canada's Chemicals Management Plan \(CMP\) - Batch 5*](#) concluded that acrylamide may be entering the environment under conditions that constitute or may constitute a danger to human health and that steps should be taken to ensure that Canadians' dietary exposure to acrylamide is kept as low as possible. The conclusion of the CMP assessment led to the proposal of several [*risk management strategies*](#) aimed at reducing dietary exposure to acrylamide. These risk management strategies include encouraging the food industry to adopt acrylamide reduction strategies and updating Health Canada's Acrylamide Monitoring Program to evaluate the effectiveness of these reduction strategies.

Since the publication of the acrylamide assessment under the CMP, Health Canada's Food Directorate has met with several industry stakeholders to discuss available and current approaches to reducing acrylamide formation as well as on-going research being undertaken by the food industry to develop new reduction strategies.

In 2012, Health Canada published a [*Revised Exposure Assessment of Acrylamide in Food*](#), which employed the occurrence data collected as part of Health Canada's Acrylamide Monitoring Program in 2009 and 2010. Following the posting of the updated exposure assessment, members of the food industry informed Health Canada of emerging acrylamide occurrence data demonstrating lower levels of acrylamide in foods relative to the results employed in Health Canada's *Revised Exposure Assessment*.

As a result, Health Canada initiated a [*call for data*](#), effective September 20, 2013 (closing date September 20, 2014). Submissions of published and unpublished technical information on the occurrence of acrylamide in foods available for sale in Canada were requested. The main goal of this call for data was to obtain additional information which demonstrated successful acrylamide reduction strategies on the part of food manufacturers. As part of the Call for Data, Health Canada also expressed interest in receiving the following information:

- Current levels of acrylamide in foods, including details of sampling plans and analytical methodologies; and
- Description of process used to achieve any demonstrated reduction.

The information and comments received as part of this call for data are summarized below.

Summary of Comments Received as part of Health Canada's Acrylamide Call for Data

A biotechnology company provided information about the development of a strain of bakers yeast that helps prevent acrylamide formation in a variety of common food items.

The Canadian Food Inspection Agency (CFIA) submitted data collected as part of its targeted surveys conducted between 2010 and 2013. The CFIA's surveys included a wide variety of processed foods, as well as some additional food commodities (e.g. cracker chips, vegetable chips and vegetable crackers) that were not captured in the Health Canada 2009 to 2010 Acrylamide Monitoring Program.

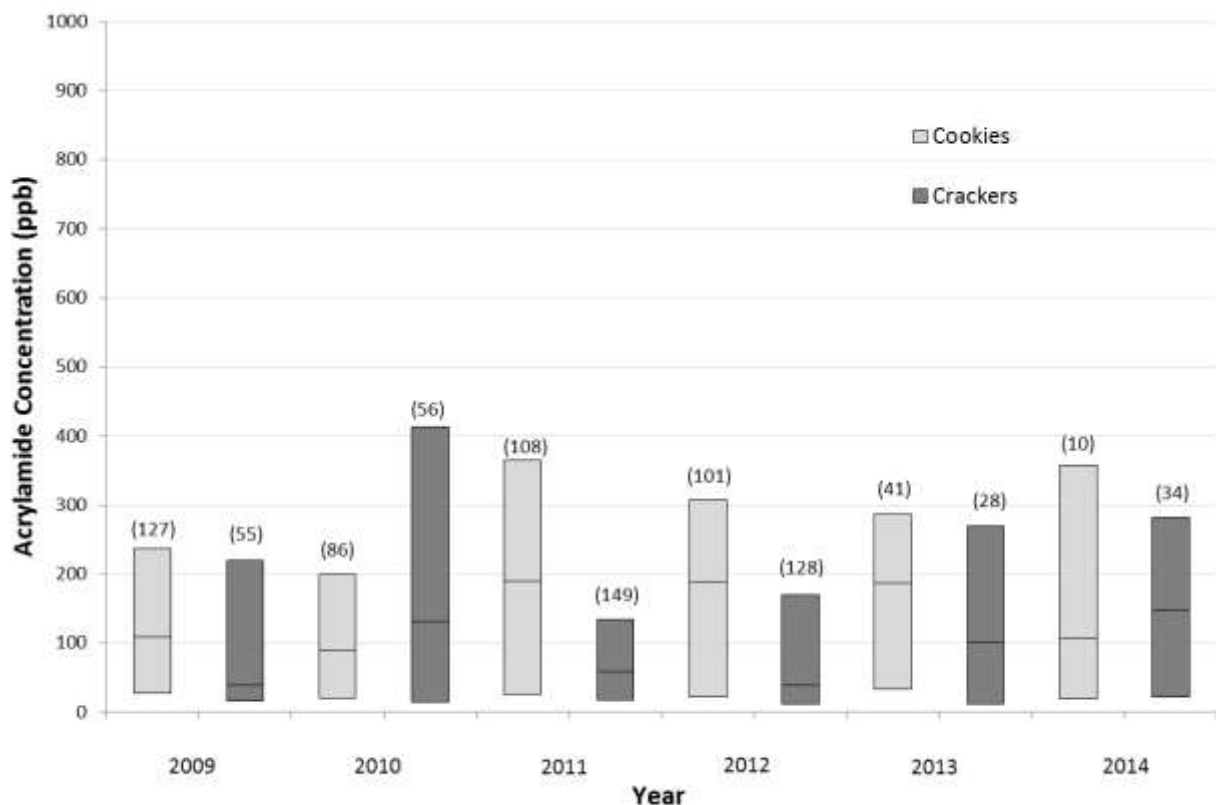
No data on the occurrence of acrylamide in foods sold in Canada were submitted by industry stakeholders.

Temporal Trends in Acrylamide Concentrations in Certain Foods

Approximately five years of data collected as part of Health Canada's Acrylamide Monitoring Program (2009 to 2010) as well as the CFIA's targeted surveys (2010 to 2013 data provided as part of the Call for Data; 2014 data shared at a later date) on the concentrations of acrylamide in cookies, crackers, breakfast cereals, potato chips and corn chips were reviewed in order to determine whether there is evidence of any temporal decline in acrylamide concentrations due to possible implementation of acrylamide reduction strategies by food manufacturers. These foods were identified for comparison as they can contain potentially high concentrations of acrylamide, significantly contribute to dietary acrylamide exposure and acrylamide reduction strategies are available for these foods.

A summary of the acrylamide concentrations in a wide variety of brands and types of cookies and crackers, excluding vegetable crackers, sold in Canada are depicted in Figure 1. These data demonstrate that, while some exceptions were noted for specific brands of certain products, in general there is no apparent increasing or decreasing temporal trend in acrylamide concentrations in these food categories over the five years of data presented. Available data on acrylamide concentrations in breakfast cereals, potato chips and corn chips also do not demonstrate any consistent reductions in acrylamide concentrations in these overall product groups between 2009 and 2014. However, some exceptions were noted for specific brands of certain products where acrylamide levels were reduced over the period in question (data not shown).

Figure 1. Distribution of acrylamide concentrations in cookies and crackers sold in Canada between 2009 and 2014



Box plot: box at 25th and 75th percentiles with horizontal bar at 50th percentile. Sample sizes denoted in brackets above boxes

Next Steps

As available Canadian survey data collected by Health Canada and the Canadian Food Inspection Agency between 2009 and 2014 do not demonstrate a decreasing trend in acrylamide concentrations in the types of foods that can significantly contribute to dietary acrylamide exposure, continued mitigation efforts are required. Since the initial [Health Canada Acrylamide Monitoring Program](#) commitments were implemented in 2009 and 2010, acrylamide reduction strategies have been developed, updated and made publically available by various international food safety organisations including the [United States Food and Drug Administration Final Guidance for Industry: Acrylamide in Foods \(2016\)](#), [FoodDrinkEurope Acrylamide Toolbox 2013](#) and the [Codex Alimentarius Code of Practice for the Reduction of Acrylamide in Foods \(CAC/RCP 67-2009\)](#). As outlined in the [risk management objectives for acrylamide under the CMP](#), Health Canada's Food Directorate will continue to encourage the food industry to implement acrylamide reduction strategies.

In addition, the Food Directorate intends to monitor the following types of foods that are known to contain relatively high concentrations of acrylamide, that have the potential to contribute significantly to dietary acrylamide exposure and for which acrylamide reduction strategies are available: breakfast cereals, potato chips, cookies, including cookies targeted to infants, and crackers. Cracker chips, vegetable chips and vegetable crackers will also be monitored, as some data are available to suggest that they may consistently have higher acrylamide concentrations than other types of crackers and chips. The Food Directorate's monitoring results will be made available on Health Canada's website. Monitoring will enable the Food Directorate to continue evaluating any temporal changes in acrylamide concentrations in foods sold in Canada as a result of industry's acrylamide mitigation efforts and explore options for further mitigation measures. These activities will also fulfill additional [risk management commitments of the Food Directorate for 2-propenamide \(acrylamide\) under the CMP](#).

Health Canada's on-going risk management efforts relating to acrylamide in foods will continue to involve follow-up with food manufacturers when products are found to consistently contain significantly elevated concentrations of acrylamide relative to similar foods that are available on the Canadian market.