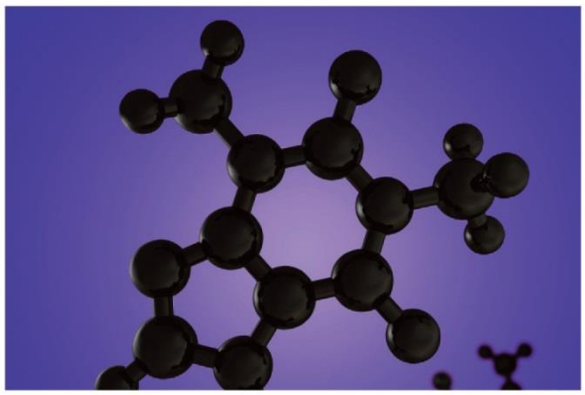
Canadian Food Inspection Agency
Agence canadienne d'inspection des aliments

Targeted Surveys

REPORT

2013-2014

Allergens



Undeclared Allergens and Gluten in Chocolate

RDIMS 6441675

Canada

TABLE OF CONTENTS

Executive Summary

Targeted surveys are used by the Canadian Food Inspection Agency (CFIA) to focus its surveillance activities on areas of highest risk. The information gained from these surveys provides both support for the prioritization of the Agency's activities to areas of greater concern and scientific evidence to address areas of lesser concern. Originally started under the Food Safety Action Plan (FSAP), targeted surveys have been incorporated into the CFIA's regular surveillance activities as a valuable tool for generating essential information on certain hazards in foods, identifying/characterizing new and emerging hazards, informing trend analysis, prompting/refining human health risk assessments, assessing compliance with Canadian regulations, highlighting potential contamination issues, and promoting compliance.

The main objectives of this targeted survey were to obtain baseline information regarding the presence and levels of undeclared allergens and gluten in chocolate, and to identify potential food safety concerns related to undeclared allergens and gluten for the allergic and sensitive population.

A wide variety of prepackaged chocolate products are available on the Canadian market. In some cases, undeclared allergens and/or gluten sources may be present in these products due to incomplete labelling or cross-contamination prior to or during manufacture of the final product, which may indicate a breakdown in good manufacturing practices or allergen controls. The presence of an undeclared allergen in a food may represent a serious or life-threatening health risk for allergic or sensitive individuals. In addition, undeclared gluten may contribute to chronic health issues for those individuals with celiac disease or gluten sensitivity.

For this survey, 583 samples of chocolate were collected and analyzed for one or more undeclared allergens (specifically soy, egg, milk (beta-lactoglobulin and casein), peanut, almond, hazelnut, and sesame) and/or gluten. Samples targeted in this survey were prepackaged chocolate (e.g., bars, chips, baking, chocolate containing additional ingredients, and cocoa powder) or chocolate-based products such as dessert toppings, nut butter blends, granola/cereal bars and crackers. Of the 583 samples tested, 34 (5.8%) were positive for one or more undeclared allergens and/or gluten. Excluding samples that tested positive for both milk proteins, four samples were found to be positive for more than one undeclared allergen.

All positive results were evaluated by the CFIA, taking into account the fact that not all detectable levels of undeclared allergens and gluten pose a risk to consumers. The CFIA initiated appropriate risk management actions based on health risk assessments by Health

Canada. Actions may include notification to the producer or importer, follow-up inspection, additional directed sampling, a food safety investigation, and recall of products.

The CFIA will continue its surveillance activities and inform the Canadian public and other stakeholders of its findings.

1 Introduction

1.1 Targeted Surveys

The Canadian Food Inspection Agency (CFIA) monitors both domestic and imported foods for the presence of allergenic, microbiological, chemical, and physical hazards. One of the tools used to maintain this oversight are targeted surveys, which are a means to establish baseline information on specific hazards and to investigate emerging risks. Targeted surveys are part of the Agency's core activities along with other surveillance strategies, which include the National Chemical Residue Monitoring Program (NCRMP), the National Microbiological Monitoring Program (NMMP), and the Children's Food Project (CFP). The surveys are complementary to other CFIA surveillance activities in that they examine hazards and/or foods that are not routinely included in those monitoring programs.

Targeted surveys are used to gather information regarding the possible occurrence or prevalence of hazards in defined food commodities. These surveys generate essential information on certain hazards in foods, identify or characterize new and emerging hazards, inform trend analysis, prompt or refine human health risk assessments, assess compliance with Canadian regulations, highlight potential contamination issues, and/or influence the development of risk management strategies as appropriate.

Due to the vast number of hazard and food commodity combinations, it is not possible, nor should it be necessary, to use targeted surveys to identify and quantify all hazards in foods. To identify food-hazard combinations of greatest potential health risk, the CFIA uses a combination of scientific literature, the media, and/or a risk-based model developed by the Food Safety Science Committee, a group of federal, provincial and territorial subject matter experts in the area of food safety.

Some hazards are actually a food itself - food ingredients, which are not a hazard to the majority of the population, can be hazardous to allergic individuals. This targeted survey provides baseline information on the presence and levels of undeclared allergens (including milk, egg, peanut, soy, almond, hazelnut, and sesame) and gluten in a range of chocolate products. The sampled foods were not tested for any allergens or gluten present in the list of ingredients or in a precautionary statement.

1.2 Acts, Regulations, and Codes of Practice

The specific acts and regulations applicable to this survey are described below.

The *Food and Drugs Act* (FDA) is the legal authority that governs the sale of food in Canada. The *Canadian Food Inspection Agency Act* stipulates that the CFIA is responsible for enforcing restrictions on the production, sale, composition and content of foods and food products as outlined in the *Food and Drugs Act* and *Food and Drug Regulations* (FDA and FDR).

Health Canada has made amendments to the FDR to enhance the labelling of priority allergens, gluten sources, and sulphites on prepackaged foods sold in Canada. Some of these amendments require that food allergen and gluten sources be declared on the labels of prepackaged foods having a list of ingredients whenever the protein, modified protein, or protein fractions of the food allergen or gluten source are added to the food product. Due to the complexity of the labelling changes required, and given the extended shelf-life of some processed foods, Health Canada provided manufacturers with 18 months from the date of registration of the regulatory amendments to implement any necessary label changes. Thus, manufacturers were required to comply with Canada's amended food allergen labelling regulations when they came into force on August 4, 2012[1]. The food products analyzed in this survey were sampled after these amended labelling regulations came into force and therefore were required to comply with these new regulations.

In addition, failure to declare the possible presence of allergens that are the result of cross contamination may be contrary to subsection 5 (1) of the FDA[2], and such food products may therefore be subject to regulatory measures taken by the CFIA.

Health Canada has stated that foods with a gluten-free claim that are prepared under Good Manufacturing Practices and which contain levels of gluten not exceeding 20 parts per million (ppm) as a result of cross-contamination would not pose a health risk to individuals with celiac disease and would meet the intent of B.24.018 of the FDR[3, 4].

2 Survey Details

2.1 Undeclared Allergens and Gluten in Chocolate

While the presence of undeclared allergens in foods is not a health concern for the majority of Canadians, it may represent a serious or life-threatening health risk for allergic or sensitive individuals. Current estimates indicate that food allergies affect as many as 6% of young

children and 3% to 4% of adults in westernised countries[5]. In Canada, a specific list of food allergens have been identified by Health Canada as being responsible for causing the majority of severe allergic reactions. These are sometimes referred to as the priority allergens: eggs, milk, mustard, peanuts, seafood (fish, crustaceans, shellfish), sesame, soy, sulphites, tree nuts (almonds, Brazil nuts, cashews, hazelnuts, macadamia nuts, pecans, pine nuts, pistachio nuts, and walnuts), and wheat.

Egg allergies are considered one of the most common allergies in children, with an estimated 1.5% of North American infants and children being affected[6]. Allergenic proteins can be found in both the egg yolk and the egg white. The allergenic proteins in chicken eggs are similar to those found in eggs from other fowl (e.g., goose, duck), thus people who are allergic to chicken eggs may also react to other egg types. In Canada, prevalence[a] rates for egg allergy are estimated at 1.2% in children and 0.8% in the general population[7].

Milk allergy (which is not the same as lactose intolerance) is also one of the most common food allergies in children[8]. There are two major allergenic proteins in cow's milk: casein and beta-lactoglobulin (BLG; found in whey). These proteins are similar to those found in milk from other animals (e.g., goat, sheep, buffalo), thus people who are allergic to cow's milk may also experience allergic reactions to other types of milk[9]. The prevalence of self-reported milk allergy in the Canadian population is estimated to be approximately 2%[7], and this allergy is often outgrown by children within a few years[8].

Many severe and anaphylactic food-related allergic reactions are due to peanut allergies, and individuals with a peanut allergy do not usually outgrow it[10]. Estimates of the prevalence of self-reported peanut allergies in the Canadian population range between approximately 0.8% (adults) and 1.8% (children), with the prevalence[a] of peanut allergies in the Canadian population being lower in adults than in young children[7].

Tree nuts are also responsible for a significant number of severe food-related allergic reactions. The self-reported prevalence of tree nut allergies in the Canadian population is higher in children than in adults (approximately 1.7% and 1%, respectively)[7].

In comparison to other food allergies, estimates of the prevalence of self-reported sesame allergy are relatively low, at 0.1% in the general population[7].

[a] Based on self-reported allergies

Soy allergy is most common in infants and typically develops around three months of age[11]. There is little information on prevalence rates for soy allergy; a rate[a] of 0.2% in the Canadian population has been reported[7]. Generally, slightly higher rates of soy allergy have been noted in children with eczema[12]. Similar to milk allergy, soy allergy is often outgrown by three years of age[13].

It is important to distinguish between wheat allergy, celiac disease, and gluten sensitivity/intolerance. Wheat allergy is an immune response to specific proteins found in wheat, and the reaction to wheat is similar to other allergic reactions[14, 15]. Celiac disease is an autoimmune disorder that causes inflammation of and damage to the small intestine (in turn resulting in the inability to absorb nutrients from food) when gluten (a protein in wheat, barley, and rye) is consumed[16]. Celiac disease affects approximately 1% of the population and impacts all age groups[17]. Individuals with celiac disease should avoid all foods containing gluten, which includes wheat-, barley-, and rye-containing products. Gluten sensitivity may be an adverse reaction to gluten which is not caused by an allergic response or by celiac disease.

Currently, there is no cure for food allergies or celiac disease. The most important strategy for a person with a food allergy or sensitivity, or a person choosing food for such an individual, is avoidance of the allergen that can trigger an adverse reaction. Allergens and gluten sources must be appropriately labelled on prepackaged food products to ensure consumers have complete, accurate information when choosing food.

2.2 Rationale

A wide variety of prepackaged foods, including chocolate, are available to Canadians. In some cases, an allergen or gluten source may be present in such food products as a result of cross-contamination prior to or during manufacturing, which may indicate a breakdown in good manufacturing practices or allergen controls. Some common foods have allergen-free claims on the labels, implying that measures have been taken by the company to ensure that the claim is accurate and the product is truly allergen-free, which provides a degree of reassurance to an allergic or sensitive individual or their caregiver.

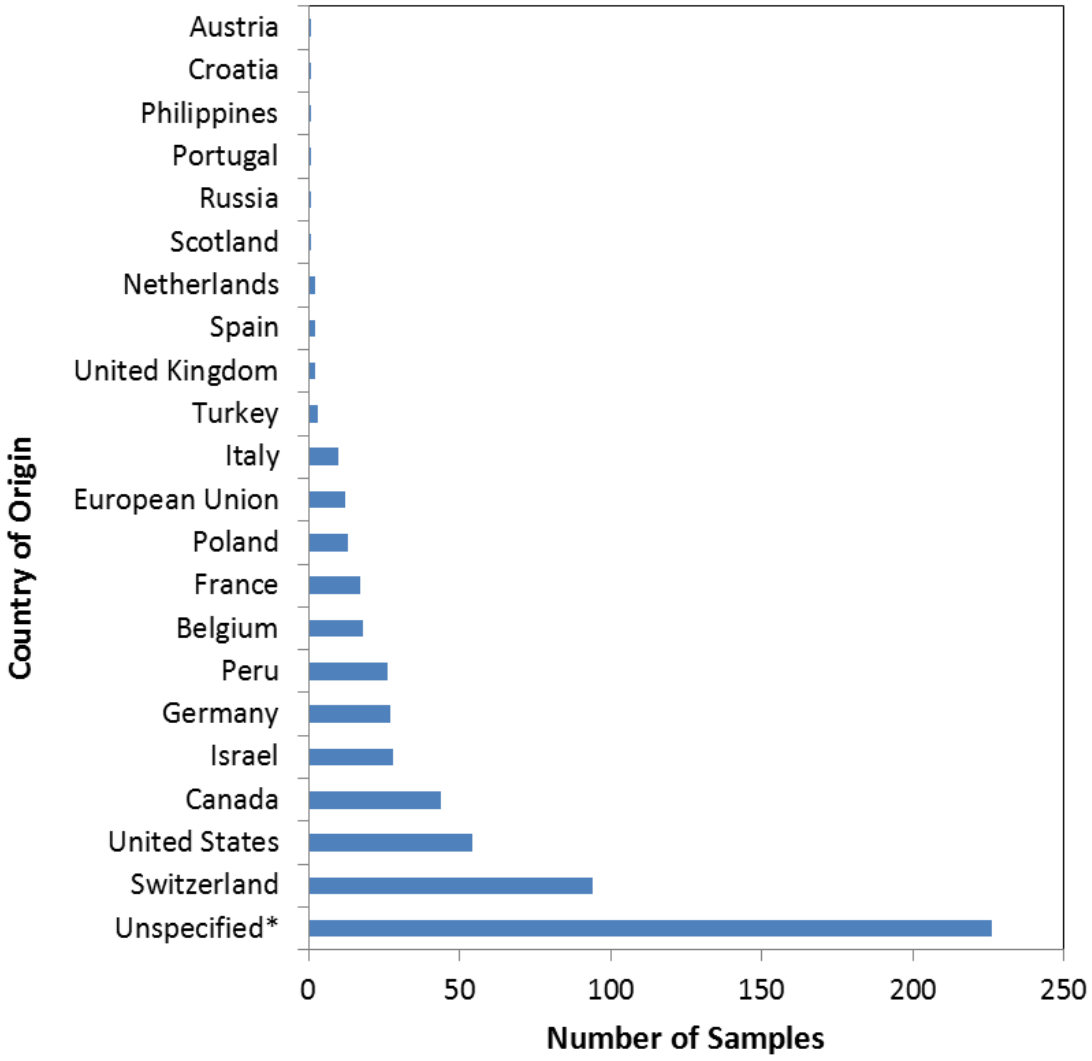
This survey complements previous undeclared allergen targeted surveys and provides baseline information regarding the presence and levels of undeclared priority allergens and gluten sources in prepackaged chocolate (e.g., bars, chips, baking, chocolate containing additional ingredients, and cocoa powder) or chocolate-based products such as dessert toppings, nut butter blends, granola/cereal bars and crackers available in the Canadian marketplace. The

information gathered will provide an indication of potential food safety concerns relating to undeclared allergens and gluten in prepackaged chocolate products.

2.3 Sample Selection

A total of 583 chocolate samples were collected nationally from retail stores in six Canadian cities between June 2013 and March 2014. Specific brands were not targeted.

The 583 survey samples included 44 domestic products, 393 imported products (79 of which were from an unspecified country of origin), and 146 products for which the domestic or imported origin was unspecified. An unspecified country of origin refers to those samples for which the origin is not indicated on the product label. It is important to note that the products sampled often contained the statement “packaged in Country X”, “imported for Company A in Country Y” or “manufactured for Company B in Country Z”, and though the labelling meets the intent of the regulatory standard, it does not specify the true origin of the product ingredients. Only those products labelled with a clear statement of “Product of”, “Prepared in”, “Made in”, “Processed in”, and “Manufactured by” were considered as being from a specific country of origin. The distribution of samples collected in this survey with respect to the country of origin (as indicated on the product label) is depicted in Figure 1.



*Unspecified refers to those samples for which the country of origin could not be determined from the product label. Of the 225 unspecified samples, 79 were labelled as imported.

Figure 1. Distribution of prepackaged chocolate samples by country of origin

2.4 Limitations

This targeted survey was designed to provide a snapshot of the presence and levels of undeclared allergens and gluten in selected prepackaged chocolate products available to Canadian consumers, and highlight commodities that warrant further investigation. The limited number of samples analyzed represents a small fraction of the products available to consumers. Therefore, care must be taken when interpreting and extrapolating these results. Few

inferences or conclusions were made regarding the data with respect to country of origin (refer to Section 2.3).

Analysis was completed on products as available on the Canadian retail market. Samples were tested as sold, meaning that the product was not prepared as per the package instructions, if applicable.

3 Results and Discussion

3.1 Overview of Survey Results

Samples in the Undeclared Allergens and Gluten in Chocolate Targeted Survey were analyzed by an ISO 17025 accredited food testing laboratory under contract with the Government of Canada. Commercially available ELISA-based allergen testing kits were used for analysis. These kits are manufactured by various companies who may use different materials to calibrate and standardize their tests. Consequently, when data is generated by these different kits, the results cannot necessarily be directly compared to one another. To eliminate this issue, the CFIA usually converts the result found to a common unit of measurement (i.e., concentration of soluble allergen protein in parts per million (ppm)) by applying a conversion factor. Details relevant to interpretation of the results of this survey can be found in sections below.

Samples were tested for one or more of a specified number of allergens and/or gluten that were not declared on the label, either in the list of ingredients or in a precautionary statement. In this targeted survey, samples were analyzed for one or more of the following priority allergens and/or gluten: almond, egg, gluten, hazelnut, milk (beta-lactoglobulin; BLG), milk (casein), peanut, sesame and soy. An overview of the product types analyzed and the results are presented in Table 1.

Table 1. Overview of undeclared allergen and gluten testing results of chocolate samples, by product type

Product Type	Description of Product Type	No. Samples Tested	No. Samples Positive	Percentage of Samples Positive
Chocolate	Chocolate containing additional ingredients	199	17	8.5%
Chocolate - Bar	Chocolate-only chocolate bars or truffles	178	10	5.6%
Chocolate - Chips	Pure chocolate chips, chunks or pieces	77	1	1.3%
Chocolate - Baking	Chocolate disks, squares or blocks for cooking/baking	59	4	6.8%
Topping - Dessert/Fruit	Ice cream/dessert toppings and sauces	40	0	0%
Butter - Blend	Nut/seed butters pre-mixed with chocolate/cocoa	25	2	8.0%
Granola/Cereal Bar	Chocolate-covered granola/cereal bars	3	0	0%
Cocoa Powder	Pure cocoa	1	0	0%
Crackers	Chocolate-covered pretzels	1	0	0%
Total		583	34	5.8%

Of the 583 chocolate samples analyzed, 549 samples (94.2%) were negative for undeclared allergens and/or gluten. Thirty-four samples (5.8%; 27 imported and 7 of unspecified origin) were positive for one or more undeclared allergens and/or gluten. Of the 34 samples found to contain undeclared allergens and/or gluten, 29 samples were positive for milk (24 for both beta-lactoglobulin (BLG) and casein, 4 for BLG only and 1 for casein only), 3 samples were positive for hazelnut, 2 samples were positive for almond, 3 samples were positive for gluten (one of which was below 20 ppm of gluten), 2 samples were positive for peanut and 1 sample was positive for egg. Excluding samples that tested positive for both milk proteins, four samples were found to be positive for more than one undeclared allergen (see Appendix).

All positive results were evaluated by the CFIA, taking into account the fact that not all detectable levels of undeclared allergens and gluten pose a risk to consumers. The CFIA initiated appropriate risk management actions based on health risk assessments by Health Canada. Actions may include notification to the producer or importer, follow-up inspection, additional directed sampling, a food safety investigation, and recall of products.

The following sections present a summary of the analysis results, as well as details on the positive results for undeclared milk, hazelnut, almond, gluten, peanut and egg. Common sources of undeclared allergens and gluten in products are cross-contamination prior to or during manufacturing, adventitious (i.e., inadvertent) presence in the case of grain-containing products, or intentional addition. Refer to the Appendix for a more detailed summary of samples found positive for undeclared allergens and gluten.

3.2 Results by Allergen

The analysis results, by allergen, are summarized in Table 1 and discussed below. None of the samples in this survey were found positive for undeclared sesame or soy.

Table 2. Overview of undeclared allergen and gluten testing of chocolate samples, by allergen

Allergen	No. Samples Tested	No. Samples Positive	Percentage of Samples Positive
Milk (Beta-lactoglobulin)	152	28	18.4%
Milk (Casein)	152	25	16.4%
Hazelnut	210	3	1.4%
Almond	193	2	1.0%
Gluten	426	3	0.7%
Peanut	305	2	0.7%
Egg	528	1	0.2%
Sesame	572	0	0%
Soy	153	0	0%

3.2.1 Milk

In this survey, 152 samples were tested for two undeclared milk proteins, beta-lactoglobulin and casein. The product types and samples positive for undeclared milk and the results associated with those samples are shown in Table 3.

Table 3. Concentration of soluble milk proteins (beta-lactoglobulin and casein) detected in chocolate samples

			Soluble Milk Protein (ppm)	
Product Type	**Sample Description**	**Origin**	**Beta-lactoglobulin**	**Casein**
Chocolate	Chocolate bar with cognac flavour	Unspecified	160	500
	Chocolate-covered almonds	Unspecified	1200	8.2
	Chocolate-covered dried apricot and almond	Imported	0.4	1.3
	Chocolate-covered raisins	Imported	58	93
	Chocolate-covered mint	Imported	0.7	-
	Chocolate chews with peanuts	Unspecified	0.9	1.7
	Dark chocolate-covered golden berries	Imported	0.5	3.6
	Dark chocolate-covered hazelnuts	Imported	1.8	66
	Praline-filled bittersweet chocolate	Imported	0.1	1.7
	Praline-filled bittersweet chocolate	Imported	0.2	1.2
	Praline-filled bittersweet chocolate	Imported	0.1	1.6
	Praline-filled bittersweet chocolate	Imported	0.1	-
	Praline-filled bittersweet chocolate	Imported	0.2	1.9
	Praline-filled bittersweet chocolate	Imported	0.2	-
Chocolate - Baking	Baking chocolate	Imported	1.3	3.7
	Organic 56% cacao semi-sweet baking chocolate	Imported	0.2	1.4
	Bittersweet baking bar	Imported	-	1
	Baking chocolate	Imported	0.7	2.6
Chocolate - Bar	51% Cacao dark chocolate	Imported	3.8	17
	70% Cacao bittersweet chocolate	Imported	0.9	3.6
	53% Cacao chocolate bar	Unspecified	370	1800
	Sugar-free dark chocolate bar	Imported	110	830
	72% Cocoa bittersweet chocolate	Imported	0.1	0.8
	72% Cocoa bittersweet chocolate	Imported	0.2	1.8
	72% Cocoa bittersweet chocolate	Imported	0.2	1.7
	Dark chocolate	Imported	300	1400
	Bittersweet chocolate	Imported	68	67
	52% Cacao dark chocolate	Imported	9	48
Chocolate - Chips	Pure chocolate chips - semi-sweet	Unspecified	0.2	-

Note: An unspecified origin refers to those samples for which the country of origin could not be determined from the product label

3.2.2 Hazelnut

In this survey, 210 samples were tested for undeclared hazelnut, three of which were positive. The product types and samples positive for undeclared hazelnut and the results associated with those samples are shown in Table 4.

Table 4. Concentration of soluble hazelnut protein detected in chocolate samples

Product Type	Sample Description	Origin	Soluble Hazelnut Protein (ppm)
Chocolate	Chocolate bar with cognac flavour	Unspecified	90.9
	Chocolate-covered dried apricot and almond	Imported	1.4
Chocolate - Bar	53% Cacao chocolate bar	Unspecified	0.5

Note: An unspecified origin refers to those samples for which the country of origin could not be determined from the product label

3.2.3 Almond

In this survey, 193 samples were tested for undeclared almond, two of which were positive. Table 5 shows the product type and samples positive for undeclared almond and the results associated with those samples.

Table 5. Concentration of soluble almond protein detected in chocolate samples

Product Type	Sample Description	Origin	Soluble Almond Protein (ppm)
Butter - Blend	Chocolate hazelnut spread	Imported	46.3
	Hazelnut cocoa spread	Imported	68.5

3.2.4 Gluten

In this survey, 426 samples were tested for undeclared gluten, three of which were positive. The product type and samples positive for undeclared gluten and the results associated with those samples are shown in Table 6.

Table 6. Concentration of soluble gluten protein detected in chocolate samples

Product Type	Sample Description	Origin	Soluble Gluten Protein (ppm)
Chocolate	Almond truffle	Unspecified	120
	36% Cacao chocolate bar with crisped rice	Unspecified	10
	Hazelnut-filled chocolates	Imported	68

Note: An unspecified origin refers to those samples for which the country of origin could not be determined from the product label

One of the three samples positive for undeclared gluten had a concentration below the 20 ppm level considered by Health Canada not to pose a risk to individuals with celiac disease. Gluten was detected at a level above 20 ppm in two samples.

3.2.5 Peanut

In total, 305 samples were tested for undeclared peanut, two of which were positive. The product types and samples positive for undeclared peanut and the results associated with those samples are shown in Table 7.

Table 7. Concentration of soluble peanut protein detected in chocolate samples

Product Type	Sample Description	Origin	Soluble Peanut Protein (ppm)
Chocolate	Chocolate bar with cognac flavour	Unspecified	2.6
Chocolate - Bar	53% Cacao chocolate bar	Unspecified	2.4

Note: An unspecified origin refers to those samples for which the country of origin could not be determined from the product label

3.2.6 Egg

In this survey, 528 samples were tested for undeclared egg, one of which was positive. The sample positive for undeclared egg and the result associated with that sample are shown in Table 8.

Table 8. Concentration of soluble egg protein detected in chocolate samples

Product Type	Sample Description	Origin	Soluble Egg Protein (ppm)
Chocolate	Dark chocolate-covered golden berries	Imported	0.9

4 Conclusion

This targeted survey obtained baseline information regarding the presence and levels of undeclared allergens and gluten in chocolate available to consumers on the Canadian market.

In total, 583 samples of chocolate were collected and analyzed for the presence of one or more undeclared allergens (specifically soy, egg, milk (beta-lactoglobulin and casein), peanut, almond, hazelnut, sesame) and/or gluten. Product types included chocolate (i.e., bars, chips,

baking, chocolate containing additional ingredients, and cocoa powder) or chocolate-based products such as dessert toppings, nut butter blends, granola/cereal bars and crackers.

Of the 583 samples tested, 34 (5.8%) were positive for one or more undeclared allergens and/or gluten. Excluding samples that tested positive for both milk proteins, four samples were found to be positive for more than one undeclared allergen.

All positive results were evaluated by the CFIA, taking into account the fact that not all detectable levels of undeclared allergens or gluten pose a risk to consumers. The CFIA initiated appropriate risk management actions based on health risk assessments by Health Canada. Actions may include notification to the producer or importer, follow-up inspection, additional directed sampling, a food safety investigation, and recall of products.

5 Appendix

Table A1. Summary of chocolate samples found positive for undeclared allergens and/or gluten, by product type

Product Type	Sample Description	Country of Origin	Allergen	Soluble protein (ppm)
Butter - Blend	Hazelnut cocoa spread	Turkey	Almond	68.5
	Chocolate hazelnut spread	Unspecified	Almond	46.3
Chocolate	Almond truffle	Unspecified	Gluten	120
	36% Cacao chocolate bar with crisped rice	Unspecified	Gluten	10
	Chocolate bar with cognac flavour	Unspecified	Milk (BLG)	160
			Milk (Casein)	500
			Hazelnut	90.9
			Peanut	2.6
	Chocolate-covered almonds	Unspecified	Milk (BLG)	1200
			Milk (Casein)	8.2
	Chocolate-covered dried apricot and almond	Russia	Milk (BLG)	0.4
			Milk (Casein)	1.3
			Hazelnut	1.4
	Chocolate-covered mint	United States	Milk (BLG)	0.7
	Chocolate-covered raisins	Poland	Milk (BLG)	58
			Milk (Casein)	93
	Chocolate chews with peanuts	Unspecified	Milk (BLG)	0.9
			Milk (Casein)	1.7
	Dark chocolate-covered golden berries	Peru	Milk (BLG)	0.5
			Milk (Casein)	3.6
			Egg	0.9
	Dark chocolate-covered hazelnuts	Italy	Milk (BLG)	1.8
			Milk (Casein)	66

	Hazelnut-filled chocolates	Turkey	Gluten	68
	Praline-filled bittersweet chocolate	Switzerland	Milk (BLG)	0.2
			Milk (Casein)	1.2
	Praline-filled bittersweet chocolate	Switzerland	Milk (BLG)	0.1
			Milk (Casein)	1.7
	Praline-filled bittersweet chocolate	Switzerland	Milk (BLG)	0.1
			Milk (Casein)	1.6
	Praline-filled bittersweet chocolate	Switzerland	Milk (BLG)	0.1
	Praline-filled bittersweet chocolate	Switzerland	Milk (BLG)	0.2
			Milk (Casein)	1.9
	Praline-filled bittersweet chocolate	Switzerland	Milk (BLG)	0.2
Chocolate - Baking	Baking chocolate	Switzerland	Milk (BLG)	1.3
			Milk (Casein)	3.7
	Baking chocolate	Switzerland	Milk (BLG)	0.7
			Milk (Casein)	2.6
	Bittersweet baking bar	Israel	Milk (Casein)	1
	Organic 56% cacao semisweet baking chocolate	Peru	Milk (BLG)	0.2
			Milk (Casein)	1.4
Chocolate - Bar	Bittersweet chocolate	Israel	Milk (BLG)	68
			Milk (Casein)	67
	51% Cacao dark chocolate	Italy	Milk (BLG)	3.8
			Milk (Casein)	17
	52% Cacao dark chocolate	Switzerland	Milk (BLG)	9
			Milk (Casein)	48

	53% Cacao chocolate bar	Unspecified	Milk (BLG)	370
			Milk (Casein)	1800
			Hazelnut	0.5
			Peanut	2.4
	70% Cacao bittersweet chocolate	Italy	Milk (BLG)	0.9
			Milk (Casein)	3.6
	72% Cocoa bittersweet chocolate	Switzerland	Milk (BLG)	0.1
			Milk (Casein)	0.8
	72% Cocoa bittersweet chocolate	Switzerland	Milk (BLG)	0.2
			Milk (Casein)	1.8
	72% Cocoa bittersweet chocolate	Switzerland	Milk (BLG)	0.2
			Milk (Casein)	1.7
	Dark chocolate	Unspecified	Milk (BLG)	300
			Milk (Casein)	1400
	Sugar-free dark chocolate bar	United States	Milk (BLG)	110
			Milk (Casein)	830
Chocolate - Chips	Pure chocolate chips - semi-sweet	Unspecified	Milk (BLG)	0.2

Notes: BLG refers to beta-lactoglobulin.
An unspecified origin refers to those samples for which the country of origin could not be determined from the product label

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