



Canadian Food
Inspection Agency

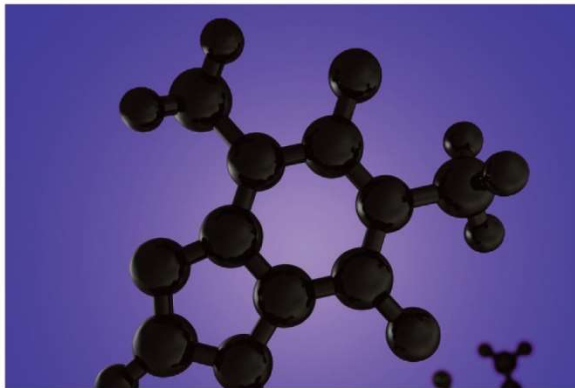
Agence canadienne
d'inspection des aliments

Food Safety Action Plan

REPORT

2012-2013 Targeted Surveys

Allergens



Sulphites in Fruit and Vegetable Based Products

TS-CHEM-12/13
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Executive Summary

The Food Safety Action Plan (FSAP) aims to modernize and enhance Canada's food safety system. As part of the FSAP enhanced surveillance initiative, targeted surveys are used to evaluate various foods for specific hazards.

Sulphites are used in food products as a preservative and to maintain colour. They are frequently added to dried fruit and vegetable products, as well as in juices, jams and fillings. Over the past few years there have been products recalled due to health risk to sensitive individuals from undeclared sulphites. The main objectives of the undeclared sulphites in fruit and vegetable based products survey were:

- to obtain baseline information regarding the presence and levels of undeclared sulphites in fruit and vegetable based products, and;
- to identify potential food safety concerns relating to undeclared sulphites in fruit and vegetable based products.

A total of 478 fruit and vegetable based products, including jams, spreads, juices, and fruit filled snack foods were analyzed for the presence of undeclared sulphites. Of the 9 samples that contained undeclared sulphites (1.9%), 5 were fruit spreads, 1 was a vegetable based product, 2 were separate samples of the same fruit filled cake and one was a fruit juice based salad dressing.

All positive samples were followed up by the CFIA. Follow up actions may involve a food safety investigation, including a health risk assessment conducted by Health Canada and a recall or one of the following: notification to manufacturer/importer and/or additional sampling.

1 Introduction

1.1 The Food Safety Action Plan

In 2007 the Canadian Government launched a five year initiative in response to a growing number of product recalls and concerns about food safety. This initiative, called the Food and Consumer Safety Action Plan (FCSAP), aims to modernize and strengthen Canada's safety system for food, health and consumer products. The FCSAP initiative unites multiple partners in ensuring safe food for Canadians.

The CFIA's Food Safety Action Plan (FSAP) is one element of the Government's broader FCSAP initiative. The goal of FSAP is to identify risks in the food supply, limit the possibility that these risks occur, improve import and domestic food controls and identify food importers and manufacturers. FSAP also looks to verify that the food industry is actively applying preventative measures.

Within FSAP, there are twelve main areas of activity, one of which is risk mapping and baseline surveillance. The main objective of this area is to better identify, assess and prioritize potential food safety hazards through risk mapping, information gathering and testing foods from the Canadian marketplace. Targeted surveys are one tool that is used to test for the presence and level of a particular hazard in specific foods. Targeted surveys are largely directed towards the 70% of domestic and imported foods that are covered exclusively by the *Food and Drugs Act*, and are generally referred to as non-federally registered commodities.

1.2 Targeted Surveys

Targeted surveys are used to analyse various foods for specific hazards and are meant to compliment the CFIA's regular programs and inspection activities. The surveys are designed to answer specific questions about hazards in food. Generally, they test for the occurrence and magnitude of defined hazards in targeted foods, often with the testing focusing on a specific segment of the population (i.e. consumers with an allergy or intolerance).

This targeted survey focused on the presence of undeclared sulphites in fruit and vegetable based products including jams, spreads, juices, and fruit filled snack foods. Several fruit and vegetable based products are recalled each year due to undeclared sulphites, which pose a health risk to sensitive individuals. Sulphites may be intentionally added to these types of products as a preservative to prevent spoilage and/or to maintain colour. Sulphites may also be present due to cross contamination, for example if a product containing sulphites is produced using the same equipment as a product that does not contain sulphites.

The information gathered will provide baseline information regarding the presence and levels of undeclared sulphites in fruit and vegetable based products and identify if follow up with industry is required.

1.3 Acts and Regulations

The *Food and Drug 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 Drugs Regulations* (FDA and FDR).

The use of sulphites in food is regulated under the FDA and FDR. Sulphites are permitted for use in certain foods as preservatives, pH adjusters, starch modifiers, bleaching agents and dough conditioners.

Based on current scientific knowledge, sulphites present in a food product at a level of 10 parts per million (ppm) and below are unlikely to cause an adverse reaction in a sensitive individual.¹ If sulphites are present in a food product above 10 ppm this may pose a hazard for a sensitive individual.

Health Canada has made amendments to the *Food and Drugs Regulations* to enhance the labelling of priority allergens, gluten sources and added sulphites in pre-packaged food sold in Canada.¹ The amendments require that food allergen and gluten sources be declared on the labels of pre-packaged 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 product. The amendments also require the labelling of added sulphites when they are present in the prepackaged product in a total amount of 10 parts per million (ppm) or more. To facilitate label reading, one of the terms "sulphite", "sulfite", "sulphiting agent" or "sulfiting agent" is required to appear on the label of the prepackaged product, either in the list of ingredients or in a "Contains" statement.

Due to the complexity of the labelling changes required, and 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 changes required in their labels. Canada's new food allergen labelling regulations came into force on August 4, 2012. Further information on these regulations can be found on the Health Canada website.¹ The products analyzed in this survey were sampled both prior to and following these amended regulations coming into force.

2 Allergens Survey

2.1 Rationale

The presence of undeclared sulphites in a food is not a health concern for the majority of Canadians. However, undeclared sulphites may represent a serious or life threatening health risk for sensitive individuals. Sulphites are added to some processed foods to maintain colour, prolong shelf life and prevent the growth of microorganisms. Sulphites are also sometimes used as anti-browning agents, to bleach food starches and as processing aids. Fruit and vegetable based products including jams, spreads, juices, and fruit filled snack foods may contain ingredients that contain sulphites, including fruit juice and pectin.²

The main objective of this survey is to obtain baseline information regarding the presence and levels of undeclared sulphites in fruit and vegetable based products. Information gathered will provide an indication of potential food safety concerns relating to undeclared sulphites in fruit and vegetable based products.

2.2 Hazard: Undeclared Sulphites

True allergic reactions to food occur following exposure to allergenic proteins. Sulphites are not proteins; adverse reactions to sulphites in foods are considered a non-allergic food sensitivity. Sulphite sensitivity may lead to the same life-threatening symptoms that occur during an allergic reaction.²

It has been estimated that in Canada sulphite sensitivity affects approximately 200,000 people.¹ Individuals with asthma are most at risk to sulphite sensitivity. The severity of a reaction to sulphites may range from mild to very serious including symptoms such as flushed face, hives, vomiting, rapid heartbeat and loss of consciousness.² For individuals with sulphite sensitivity, consumption of a food with a total amount of sulphites lower than 10 ppm is unlikely to lead to a reaction.¹

There is no cure for sulphite sensitivity, and the most important strategy for a person with sulphite sensitivity, or a person choosing food for an individual with sulphite sensitivity, is avoidance of sulphites.

2.3 Sample Distribution

This survey targeted a variety of fruit and vegetable based products including jams, spreads, juices, and fruit filled snack foods. Samples were collected based on availability in 2012 and 2013 from major retail stores as well as smaller and ethnic retailers. No specific brands were targeted. A total of 478 samples were collected. The distribution of samples by product type is shown in Figure 1 and Table 1. Tomato based products were treated as a vegetable product, for example, tomato juice was counted as a vegetable juice.

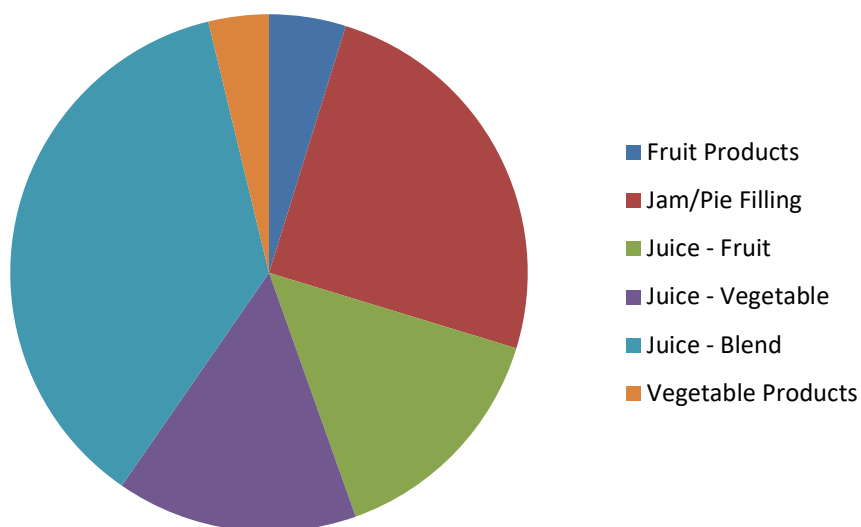


Figure 1: Sample distribution of products by type

Table 1: Distribution of samples by type and domestic/imported

Product type	Domestic	Imported	Unspecified*
Fruit Products	5	14	4
Jam/Pie Filling	42	55	22
Juice - Fruit	29	26	16
Juice - Vegetable	41	23	8
Juice - Blend	34	104	37
Vegetable Products	4	8	6
Total	155	230	93

*Unspecified refers to those samples for which the origin (i.e., imported or domestic) could not be determined from the product label or sample information

2.4 Limitations

A total of 478 samples of fruit and vegetable based products were collected and analysed in 2012 and 2013. Samples were all purchased in various retail locations in Ottawa, ON. This represents a small sample size in comparison to what is available to Canadian consumers throughout the country. The samples collected in this survey do not represent national availability. The data collected from this survey is meant to provide a snapshot of the targeted commodity and has the potential to highlight problem areas that warrant further investigation.

2.5 Methodology

Samples in this targeted survey were analyzed by a laboratory under contract with the Government of Canada. This laboratory is accredited by the Standards Council of Canada (SCC) or by the Canadian Association for Laboratory Accreditation Inc. (CALA). The laboratory was required to use an analytical method that met or exceeded the requirements and limit of detection of the equivalent CFIA method.

The samples were tested for the presence of sulphites using the optimized Monier Williams method, which measures free sulfite plus reproducible portion of bound sulfites, such as carbonyl addition products in foods and reported as sulphur dioxide. The reporting limit for the AOAC optimized Monier William's method is 10 ppm. Results below this level can be natural background levels from other compounds that liberate sulphur dioxide or from reaction or breakdown products in the form of SO₂ when heated under reflux.

3 Results and Discussion

Of the 478 fruit and vegetable based products analyzed, 9 samples contained levels of sulphur dioxide above 10 ppm (Table 2 and Figure 2). The same brand and type of fruit filled cake was unintentionally sampled twice and both samples were shown to contain undeclared sulphites (Table 2).

Fruit products, which included fruit filled snack bars and cakes contained the highest percentage of positive results, 13% (3/23). Both vegetable products 5.6% (1/18) and jams and pie fillings 4.2% (5/119) also had samples which contained undeclared sulphites. None of the juices contained undeclared sulphites. Sulphites were detected in 3 out of 155 domestic (1.9%), 6 out of 230 imported samples (2.6%) and were not detected in products of unspecified origin.

Table 2: Product information for positive samples

Product type	Product information	Sulphites (ppm)	Domestic/Imported
Fruit product	Lemon balsamic dressing	84.5	Imported
	Pineapple cake	12.2	Imported
	Pineapple cake	20.1	Imported
Jam/pie filling	Black current pomegranate spread	16	Domestic
	Mixed berry spread	14.1	Imported
	Raspberry jam	13.4	Domestic
	Blackberry spread	12.8	Imported
	Peach spread	11.5	Domestic
Vegetable product	Mixed vegetable pickle	26.9	Imported

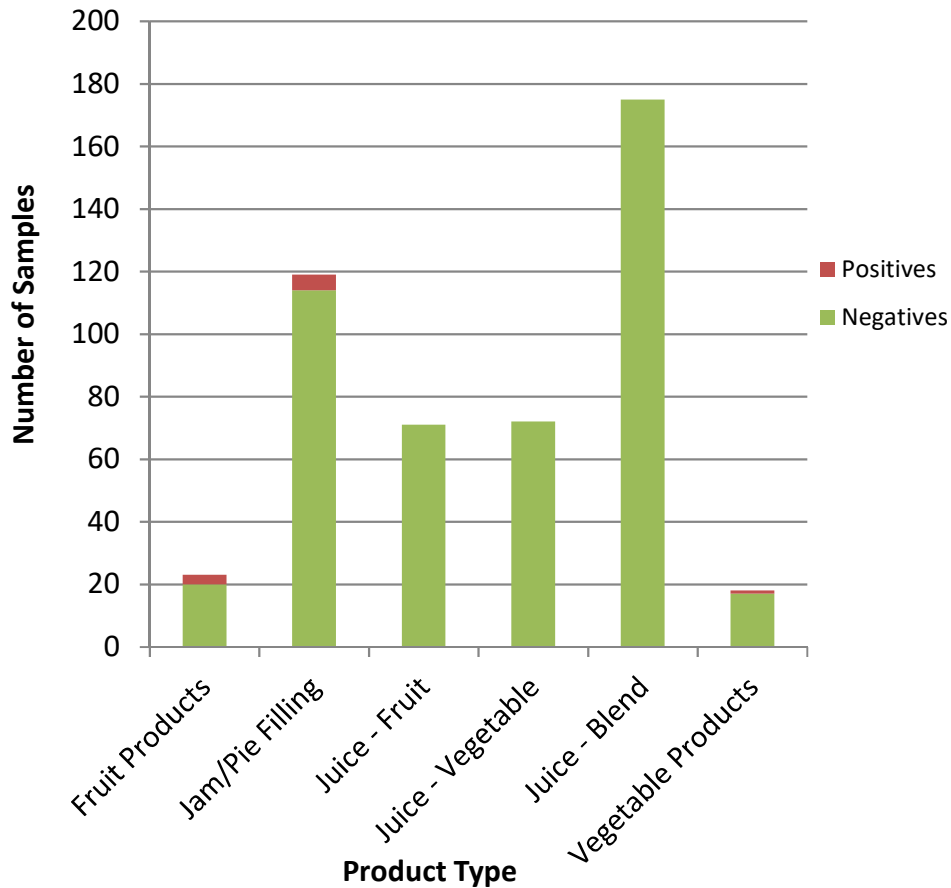


Figure 2: Distribution of results by product type

The samples that had levels of sulphites above 10 ppm were followed up by the CFIA. Follow up actions may involve a food safety investigation, including a health risk assessment conducted by Health Canada and a recall or one of the following: notification to manufacturer/importer and/or additional sampling.

4 Conclusion

Of the 478 fruit and vegetable based products that were analysed for undeclared sulphites there were 9 samples with sulphites above 10 ppm. Excluding juice blends, fruit based products had a higher percentage, 3.8% (8/213) of undeclared sulphites than vegetable based products, 1.1% (1/90).

A pre-packaged food product with a list of ingredients and a level of sulphites above 10 ppm should have sulphites listed in the list of ingredients to inform sensitive individuals of its presence. If sulphites are not an intentionally added ingredient or ingredient component, and their addition cannot be controlled through good manufacturing processes, the use of a precautionary statement should be considered.

5 References

¹ Health Canada. Regulations Amending the Food and Drug Regulations (1220 -Enhanced Labelling for Food Allergen and Gluten Sources and Added Sulphites). (Online) September 24, 2013.
<http://gazette.gc.ca/rp-pr/p2/2011/2011-02-16/html/sor-dors28-eng.html#REF13>

² Health Canada. *Sulphites- One of the ten priority allergens*. (Online) Accessed September 24, 2013.
http://hc-sc.gc.ca/fn-an/pubs/securit/2012-allergen_sulphites-sulfites/index-eng.php