

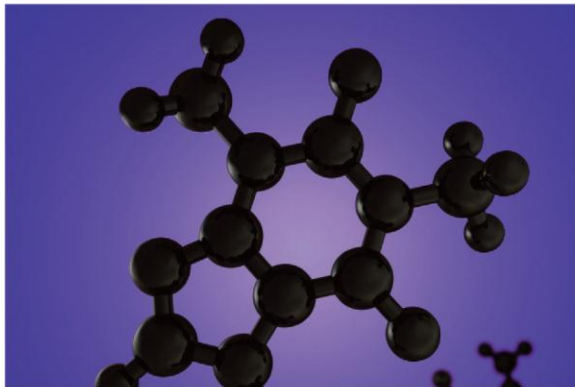


Food Safety Action Plan

REPORT

2010-2011 Targeted Surveys

Allergens



Sulphites in Fresh Grapes

TS-CHEM-10/11

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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.

The main objective of the sulphites in fresh grapes survey was:

- to obtain baseline information regarding the presence and levels of sulphites in fresh grapes.

The presence of sulphites on fresh grapes is permitted according to Section B.11.001.1 of the *Food and Drug Regulations* (FDR), the data from this survey will give an indication as to the level of sulphite residues in/on grapes available at retail. A total of 329 samples of fresh grapes were analyzed for the presence of sulphites. Of those samples analyzed 328 samples levels less than 10 ppm and one sample was positive for sulphites (>10 ppm).

Although sulphites are permitted for use on grapes there is no obligation on the producer's part to inform the Government of Canada whether their grapes have been treated. Therefore, it is not known if the grape samples collected had been previously treated with sulphites. Should grapes be packaged in a manner that requires a label, the presence of sulphites must be declared, however, most grapes do not require labelling. As such, individuals with a sulphite sensitivity should be aware that grapes may have sulphites residues remaining on the fruit.

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 (FSCAP), aims to modernize and strengthen the food safety regulatory system. The FSCAP 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 FSCAP 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 to protect the safety of the Canadian food supply.

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 test various foods for specific hazards and are meant to complement 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). A priority under FSAP includes data collection on fresh produce. There are also no ongoing monitoring activities for sulphites in fresh grapes.

Sulphites are sulphur-based substances used as preservatives to prevent spoilage and discoloration during storage and distribution of foods. In the fresh produce industry, sulphur dioxide (SO₂) gas is commonly used to fumigate grapes against decay during storage, or is used in packaging material for grapes for slow-emission of SO₂ during transportation. This targeted survey focused on the presence of sulphites in fresh grapes.

Currently, grapes are the only fresh non-processed fruit or vegetable where the addition of sulphites is permitted.

The information gathered will provide baseline information regarding the presence and levels of sulphites in fresh grapes. However, it should be noted that no information was obtained as to whether the grape samples had been treated with sulphites prior to analysis.

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 FDA and FDR.

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

Section B.11.001.1 of the FDRs prohibits the sale of "any fruit or vegetable that is intended to be consumed raw, except grapes, if sulphurous acid or any salt thereof has been added thereto." ¹ Grapes are considered to be unstandardized foods according to the FDA and FDRs. The permitted level of sulphites in grapes is 500 ppm.²

Health Canada has recently made amendments to the FDR to enhance the labelling of priority allergens, gluten sources and sulphites in pre-packaged food sold in Canada. On February 16, 2011 Health Canada published these amendments in the *Canada Gazette*, Part II. 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. 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.³

Should grapes be packaged in a manner that requires a label, the presence of sulphites must be declared, however, most grapes do not require labelling. As such, individuals with a sulphite sensitivity should be aware that grapes may have sulphite residues remaining on the fruit.

2. Allergens Survey

2.1. Rationale

The presence of sulphites in a food is not a concern for the majority of Canadians. However, 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.⁴

As the use of sulphites on fresh grapes is permitted, the main objective of this survey is to obtain baseline information regarding the presence and levels of sulphites in/on fresh grapes.

2.2. Hazard: Sulphites

True allergic reactions only occur after exposure to an allergenic protein. Since sulphites are not proteins, a reaction to sulphites is not due to an allergy but to a sensitivity. Regardless, a sulphite-sensitive person may experience the same life-threatening symptoms during a reaction to sulphites as occurs during an allergic reaction.

Sulphite sensitivity affects 3-10% of people with asthma. Individuals with asthma are most at risk to sulphite sensitivity and other sulphite reactions.^{4,5} The severity of the reaction may range from mild to very serious including symptoms such as flushed face, hives, vomiting, rapid heart beat and loss of consciousness.⁵ It has been estimated that in Canada this means sulphite sensitivity affects approximately 200,000 people.⁶ For individuals with a sulphite sensitivity, consumption of a food with a total amount of sulphites lower than 10 ppm is unlikely to lead to possible reactions.^{7,8}

There is no cure for a sulphite sensitivity, and the most important strategy for a person with a sulphite sensitivity, or a person choosing food for an individual with a sulphite sensitivity, is avoidance of sulphites. Pre-packaged foods containing sulphites should be appropriately labelled to ensure consumers have complete, accurate information when choosing food products. However, as the use of sulphites is permitted on grapes and the packaging of grapes may not require labelling, individuals sensitive to sulphites should be aware that there may be residues of sulphites on fresh grapes.

2.3. Sample Distribution

This survey targeted a variety of fresh grapes including organic and non-organic red, green, white and black grapes. Samples were from major retail stores as well as smaller and ethnic retailers. Table grapes and wine grapes available at retail were targeted for this survey. A total of 329 samples were collected. The distribution of samples by product type is listed in Table 1.

Table 1. Sample Distribution of Fresh Grapes Collected including Imported and Domestic Data			
Grape Type	Domestic	Import	Unspecified Origin
Black Grapes	0	44	-
White Grapes	0	4	-
Green Grapes	0	123	2
Wine Grapes	1	0	-
Red Grapes	2	131	-
Black Organic Grapes	0	2	-
Green Organic Grapes	0	7	-
Red Organic Grapes	0	7	-
Unspecified Type	0	4	2
Total	3	322	4

2.4. Limitations

A total of 329 samples of fresh grapes were collected and analysed in 2010 and 2011. Samples were all purchased in various retail locations nationally. The data collected from this survey is meant to provide a snapshot of the targeted commodity and this survey in particular will provide an indication of the levels of sulphites in/on fresh grapes as a result of the permitted use of sulphites on fresh grapes.

2.5. Methodology

Samples were analyzed by an accredited third party laboratory. Third party laboratories are accredited to ISO/IEC 17025, General Requirements for the Competence of Testing and Calibration Laboratories (or its replacement by the Standards Council of Canada (SCC)).

The samples were tested for the presence of added free sulphites plus the reproducible portion of bound sulphites using the optimized Monier Williams method and reported as sulphur dioxide. The reporting level 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. Therefore, only results above 10 ppm are reported as measurable.

3. Results and Discussion

Three hundred and twenty nine samples of fresh grapes were collected and analyzed for the presence of sulphites. Of the 329 samples analyzed, 328 samples had non-detectable levels of sulphites (<10 ppm) and 1 sample of red grapes contained levels (13.5 ppm) of sulphur dioxide above 10 ppm. According to these baseline results it is unlikely that the permitted use of sulphites on fresh grapes would cause adverse health consequences in individual sensitive to sulphites.

4. Conclusion

Three hundred and twenty eight samples of fresh grapes analyzed had non-detectable residues of sulphites (<10 ppm), one red grape sample was found to contain levels of sulphur dioxide above 10 ppm (13.5 ppm).

It should be noted that no information was obtained as to whether the grape samples had been treated with sulphites prior to analysis. However, this survey met the objective of gathering baseline information on the occurrence of sulphites in/on fresh grapes available at retail throughout the year.

Although sulphites are permitted for use on fresh grapes, based on this survey it is unlikely that this use would pose a health risk to an individual sensitive to sulphites.

5. References

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- ¹ Canadian Food Inspection Agency. The Use of Sulphites in Fresh Produce. Notice to: Canadian Importers of Fresh Lychees and Longans. (Online) Access January 20, 2012. <http://www.inspection.gc.ca/english/fssa/frefra/safsal/sulfitee.shtml>
- ² Department of Justice. *Food and Drugs Regulations*. [online]. 2012. Accessed March 12, 2012, http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.%2C_c._870/page-157.html#docCont
- ³ Health Canada. *Health Canada's Modifications to Regulatory Project 1220- Enhanced Labelling for Food Allergens, Gluten Sources and Added Sulphites* [online]. 2010. Accessed October 27, 2010, <http://www.hc-sc.gc.ca/fn-an/label-etiquet/allergen/proj1220-modifications-eng.php>.
- ⁴ Vally, H., Misso, N.L.A. and V. Madan. (2009) Clinical Effects of Sulphite Additives. *Clinical and Experimental Allergy*. 39: 1643-1651
- ⁵ Zarkadas, M., Fraser, S., Salminen, J. and A. ham Pong. (1999) Common Allergenic Foods and their Labelling in Canada- A Review. *Canadian Journal of Allergy and Clinical Immunology*. 4(3):118-141.
- ⁶ Health Canada. *Project 1220 Enhanced Labelling for Food Allergen and Gluten Sources and Added Sulphites*. (Online) Accessed January 4, 2012. http://www.hc-sc.gc.ca/fn-an/label-etiquet/allergen/project_1220_rias_eeir-eng.php
- ⁷ Health Canada. *Project 1220 Enhanced Labelling for Food Allergen and Gluten Sources and Added Sulphites*. (Online) Accessed January 4, 2012. http://www.hc-sc.gc.ca/fn-an/label-etiquet/allergen/project_1220_rias_eeir-eng.php
- ⁸ Zarkadas, M., Fraser, S., Salminen, J. and A. ham Pong. (1999) Common Allergenic Foods and their Labelling in Canada- A Review. *Canadian Journal of Allergy and Clinical Immunology*. 4(3):118-141.