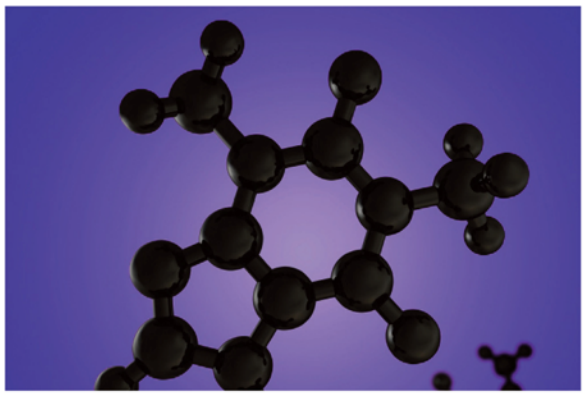
Canadian Food Inspection Agency
Agence canadienne d'inspection des aliments

# Food Safety Action Plan

## REPORT

2009-2010 Targeted Surveys

Allergens



## *Fining Agents in Wine*

TS-ALLERGEN-09/10

Canada

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# 1 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 objectives of this targeted survey were to:

- Provide baseline surveillance data for allergens in the fining agents used in wine production
- Determine if the traces of allergens observed in wines would potentially pose a risk to the allergic population in Canada

Fining agents are used to remove fine particles naturally present in wine. This improves the clarity, as well as, enhances the palatability of unfinished wine prior to filtration and bottling. Commonly used fining agents are milk protein, Isinglass (fish protein), and egg white. As a result of using these products there is the potential for allergenic proteins to be left behind, which could result in a reaction of a sensitive individual.

One hundred samples of wine were collected at retail. The one hundred samples consisted of forty nine red wine samples, one rosé and fifty white wine samples (of which one was a sparkling wine). Samples of the wine were analysed for milk (casein and beta-lactoglobulin) and egg allergens using a proven method validated in multiple matrices. We did not analyze for fish, an allergen found in Isinglass, as there are no commercially available methods for this component. None of the samples analysed had detectable levels of the milk or egg allergens. At the present time, allergens including sulphites are exempted from declaration on wine labels under the *Food and Drugs Act and Regulations (FDA&R)*. No milk or egg allergens were detected in the wine samples collected for this targeted survey. Therefore, the samples are considered to be compliant with current regulations.

# 2 Introduction

## 2.1 The Food Safety Action Plan

The Food Safety Action Plan (FSAP) is a five-year project (2008-2013) led by the Canadian Food Inspection Agency (CFIA) and is a part of the Food and Consumer Safety Action Plan (FCSAP), a joint federal initiative with Health Canada, the Public Health Agency of Canada and the Canadian Institutes of Health Research. The FCSAP encompasses a series of initiatives to modernize and strengthen Canada's safety system for food, health and consumer products and to better support the collective responsibilities that government, industry and consumers have for product safety. The four main priorities identified for the FSAP were imported food ingredients, fresh produce, mycotoxins in cereals and undeclared allergens.

Within FSAP, the CFIA gained increased ability to monitor potential food risks and to prevent unsafe food products from entering the Canadian marketplace. The CFIA fulfils this mandate through an enhanced surveillance initiative which includes targeted surveys. The CFIA works on these targeted surveys with input from other federal partners (e.g., Health Canada) and Provincial and Territorial (P/T) representatives.

## 2.2 Targeted surveys

Targeted surveys are pilot surveys used to test various foods for specific hazards and are a complementary approach to the CFIA's regular programs and inspection activities. The surveys are designed to answer specific questions about specific hazards in a given 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). Surveys may be developed using a number of factors such as policies and/or regulations, existing data from food safety investigations, inspections, and other regular agency activities.

This targeted survey focused on the presence of two undeclared allergens, milk and egg proteins in wines available at retail. The information gathered will identify if these commodities require follow up with industry in order to provide further guidance, education and monitoring for the presence of allergens when they are not expected or declared. This survey will also inform the allergic consumer about the present and potential levels of milk and egg protein in the wine they may be consuming.

## 2.3 Acts and Regulations

The *Food and Drug Act* (F&DA) 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 & Regulations* (FDAR).

If a pre-packaged food product displays a list of ingredients without disclosing potential allergens this may result in an unsafe product for allergic consumers. Failure to declare allergenic components may be contrary to Subsection 5(1) of the F&DA. These products may therefore be subject to regulatory measures taken by the CFIA, which can include a product recall.

Health Canada has enhanced labelling regulatory amendments to the *Food and Drugs Regulations* (FDR) for the nine priority allergens, gluten and sulphites in pre-packaged food sold in Canada. On February 16th, 2011 Health Canada Published Amendments to the Food Allergen Labelling Regulations in *Canada Gazette*, Part II (CGII). 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. In addition to requirements around gluten labelling, mustard seed is proposed for addition to the list of priority.

Due to the complexity of the changes and the shelf-life of foods, Health Canada is allowing manufacturers 18 months to implement the new allergen labelling regulations. Health Canada continues to encourage industry to declare priority allergens, gluten sources and added sulphites on pre-packaged food labels to provide Canadians with the information necessary to make informed food choices. Canada's new food allergen labelling regulations will come into force on August 4, 2012**.** Further information on these proposed regulations can be found on the Health Canada website[1].

# 3 Allergen Survey

## 3.1 Rationale

The presence of an undeclared allergen or gluten in a food for sensitive individuals can be life threatening or contribute to chronic health issues. Current estimates indicate that food allergies affect as many as 6% of young children and 3% to 4% of adults[2]. Celiac

[1] 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.
[2] Health Canada. *Food Allergies and Intolerances* [online]. 2010. Accessed October 27, 2010, http://www.hc-sc.gc.ca/fn-an/securit/allerg/index-eng.php.

disease has been recognized as a common chronic disease affecting 1 in every 100-200 people[3]. In Canada, eight main allergens (known as priority allergens) have been identified by Health Canada as responsible for causing the majority of allergic reactions[4]. These allergens are: milk, eggs, peanut, sesame seeds, tree nuts, soy, wheat and seafood. Sulphites have also been recognized as having the potential to produce serious symptoms similar to an allergen in sensitive individuals. There is no cure for a food allergy, and the most important strategy for a person with a food allergy, or a person choosing food for an individual with a food allergy, is avoidance. Allergens and gluten sources should be appropriately labelled to ensure consumers have complete, accurate information when choosing food products.

This survey was designed to sample wines for milk and egg allergens found in commonly used fining agents which are used to clarify and increase the palatability of the final product. The main objective is to determine if the allergenic proteins from eggs and milk still remain in the finished wine after the fining process is completed. The information gathered will be an indicator of potential food safety concerns relating to undeclared milk and egg allergens in the wines tested.

## 3.2 Hazard Allergic Proteins

Fining agents are introduced prior to filtration and are used to improve clarity, odour, colour, flavour and physical stability of wine. They do so by attracting positively and negatively charged particles in unclear wine. Once completed the fining agents and the captured compounds settle to the bottom and form a precipitate.[5] Commonly used fining agents in wine production are milk protein, Isinglass (fish protein), and egg white. As a result of the precipitate formed by these agents, there is the potential for allergenic proteins to be left behind after filtration. Any of the allergenic proteins remaining in the wine could result in a possible reaction in a sensitive individual.

When a food allergen is consumed it can trigger a reaction of the immune system in sensitive individuals. The immune system in a sensitive individual produces antibodies, called immunoglobulin E (IgE) in response to the presence of allergenic proteins in the body. When the immune system is re-exposed to the allergenic protein the IgE antibodies and other defence chemicals are released causing allergic reactions that can vary by type, severity and rates of development. Symptoms of an allergic reaction can include hives, swelling, trouble breathing, weakness, cramps, vomiting, drop in blood pressure, shock, loss of consciousness and even death[6].

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[3] Health Canada. *Celiac Disease, The Gluten Connection* [online]. 2010. Accessed October 27, 2010, http://www.hc-sc.gc.ca/fn-an/alt_formats/hpfb-dgpsa/pdf/securit/gluten_conn-lien_gluten-eng.pdf.

[4] Health Canada. *Food Allergies and Intolerances* [online]. 2010. Accessed October 27, 2010, http://www.hc-sc.gc.ca/fn-an/securit/allerg/index-eng.php

[5] Bill Collings. *Fining and Fining Agents* [online]. 2002. Accessed October 27, 2010, http://www.bcawa.ca/winemaking/fining.htm

[6] Health Canada. *Food Allergies and Intolerances* [online]. 2010. Accessed October 27, 2010, http://www.hc-sc.gc.ca/fn-an/securit/allerg/index-eng.php

## 3.3 Sample Distribution

The survey targeted a variety of wines, domestic and imported. A total of 100 samples of red wine, white wine, sparkling white wine and rose were collected nationally. The distribution of sample by type and commodity is listed in Table 1. Wines were collected at provincial liquor stores across the country.

**Table 1 Sample Distribution**

| Country | Number of Samples | | | |
|---|---|---|---|---|
| | Red Wine | White Wine | Sparkling White Wine | Rosé |
| Argentina | 4 | 4 | - | - |
| Australia | 4 | 4 | - | - |
| Canada | 24 | 24 | 1 | 1 |
| Chile | 4 | 4 | - | - |
| France | 5 | 5 | - | - |
| Italy | 4 | 4 | - | - |
| United States | 4 | 4 | - | - |
| **Total** | **49** | **49** | **1** | **1** |

# 4 Methodology

The samples were tested for beta-lactoglobulin (milk protein), casein (milk protein) and egg. There was no knowledge of the type of fining agents used during the production of the wines tested. Food allergen proteins were detected and measured by CFIA laboratories using ELISA-based accredited methodology. Fish was not included in this targeted survey due to the fact there are no commercially available kits to analyze for fish protein.

The methods and limits of detection were as follows:

- Beta-Lactoglobulin, ELISA Systems, Beta-Lactoglobulin Residue, ESMRDBLG-48, limit of detection 0.10 ppm beta-lactoglobulin
- Casein, ELISA Systems, Casein Residue, ESCASPRD-48, limit of detection 0.52 ppm casein
- Egg, Neogen Veratox Quantitative Egg Assay, 8450, limit of detection 2.5 ppm egg

## 4.1 Limitations

A total of 100 samples were collected and analysed in the 2009-2010 fining agents in wine targeted survey. In comparison to the total number of products available, 100 samples represents a small fraction of wine types available to consumers. This data is

meant to provide a snapshot of the targeted commodities and has the potential to highlight commodities that warrant further investigation. Also, this survey does not examine year-to-year trends, impact of product shelf-life or cost of the commodity on the open market.

# 5 Results and Discussion

## 5.1 Allergen Analysis

Although other fining agents may contain allergens, such as Isinglass (fish protein), this survey focuses on the potential traces of milk and egg protein. Fish was not included in this survey as Health Canada and CFIA have not completed an evaluation of available methods of analysis for the detection of fish protein. Health Canada and CFIA are in the process of evaluating additional methods of analysis which may include an analysis kit for the detection of fish protein. Other fining agents used, such as betonite clay, silicon dioxide and carbon, do not contain allergenic proteins that would be considered a potential hazard to the allergic population.

The 100 samples underwent all three analysis types in order to determine if there were any residual milk and/or egg proteins as a result of using fining agents. All analysis results were below the limit of detection.

There have been very few studies on the level of possible allergenicity of alcoholic beverages as a result of using fining agents containing allergenic proteins. It is widely assumed that the majority of the allergenic proteins, from fining agents, likely to illicit an allergic reaction in sensitive individuals would be removed from the finished wines prior to bottling.[7] One study conducted showed that measurable levels of allergenic protein were as a result of spiking with five times the normal dose used and that residual allergenic proteins from using commercial levels of fining agents were not likely.[8] The results of this survey support these observations.

# 6 Conclusion

A total of 100 wine samples available at retail were collected. Red, rosé and white wines from eight countries, a total of 49 red, 49 white, 1 rosé and 1 white sparkling wine were collected and analysed for the presence of casein, beta-lactoglobulin and egg protein. The results of the analysis showed that within the 100 samples tested no residual allergenic proteins remained as a result of the fining process.

[7] Monaci L, Losito I, Palmisano F, Visconti A. Identification of allergenic milk proteins markers in fined white wines by capillary liquid chromatography-electrospray ionization-tandem mass spectrometry. *J. Chrom. A* 2010; 1217:4300-4305.

[8] Weber P, Steinhart H, Paschke A. Investigation of the Allergenic Potential of Wines Fined with Various Proteinogenic Fining Agents by ELISA. *J. Agric. Food Chem.* 2007; 55:3127-3133.

One hundred samples collected were compliant with labelling requirements according to the F&DA with respect to labelling allergens. This survey was limited in the number of samples collected, however, it met the objective of gathering baseline information on the occurrence of undeclared priority allergens in wine as a result of the fining process. Based on the results, no gaps in food safety for allergens in wines were identified.