

# SULFITE CONCENTRATION IN PURE MAPLE SYRUP

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## INTRODUCTION

Sulfites are regulated food additives used as preservatives to maintain food color and prolong shelf-life, for the prevention of micro-organism growth, and for maintenance of the potency of certain medications (*Sapers, 1993; Taylor et al., 1986*). In many cases, sulfite concentrations are primarily related to food preservative use, however some food products may naturally contain low levels of sulfites (*Grotheer et al., 2008; Taylor et al., 1986*).

Consumption of food containing sulfiting agents may cause moderate to severe allergic-type reactions in some individuals. The overall prevalence of sulfite sensitivity in the general population is unknown and is probably low. Sulfite sensitivity is seen more frequently in asthmatic than in nonasthmatic people (*Knoldel, 1997*). Consequently, several food regulation agencies have adopted rules to control the use and concentration of sulfiting agents. Typically, the presence of sulfites in food at more than 10ppm should be declared on the food labelling (*Lecos, C.W. 1986; Health Canada - Food Labelling, 2010*).

Maple syrup is a natural product free of artificial coloring or other additives. Regardless, some publications mention that maple syrup may contain sulfites. These published data are based on theoretical estimates of similar products (sweeteners) or assumptions about the processing or product. To our knowledge, analytical tests of sulfites in maple syrup have never been conducted. In this study, which is conducted by Center ACER in collaboration with UVM Proctor Maple Research Center, direct measurements of sulfites concentration in maple syrup samples collected during 2011 and 2012 were made.

## MAPLE SYRUP SAMPLING

The chemical composition of maple syrup may be related to several factors such as color or geographic production area. Several studies have clearly established a relationship between chemical composition of maple syrup and its color classes as well as the microbial activities found in sap. Also, in products other than maple, the natural occurrence of sulfites has been related in certain cases to microorganism activities or fermentation. Thus, to assess the natural occurrence of sulfites, the maple syrup color class and provenance were considered in the acquisition of maple syrup for testing.

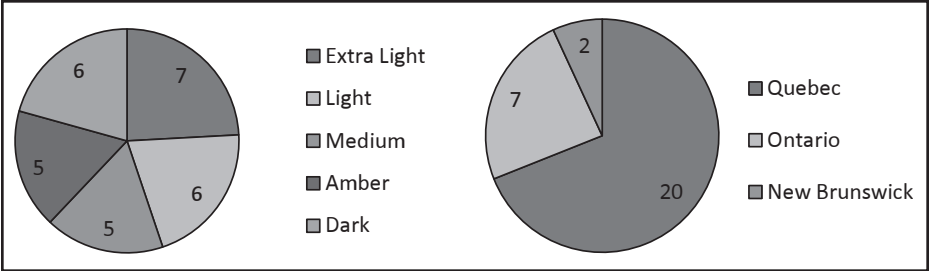
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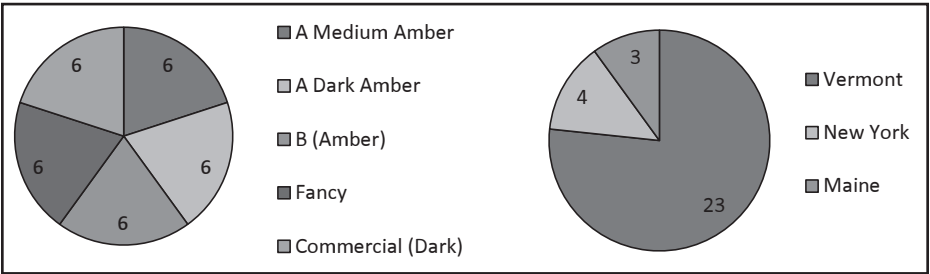
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## SULFITES TESTING

Maple syrup samples of different color classes were collected from different provenances (geographic production areas). A total of 59 maple syrup samples, 29 from Canada (Quebec, 20; Ontario, 7 & New Brunswick, 2) and 30 from USA (Vermont, 23; New York, 4 & Maine, 3) were tested. These samples cover all color classes from Extra-Light (Fancy) to Dark (Commercial). Figures 1 & 2 show the distribution of samples by color classes and provenance.



**Figure 1.** Provenance and Color Classes of Canadian Maple Syrup Samples (2011)



**Figure 2.** Provenance and Color Classes of United States Maple Syrup Samples (2012)

## SULFITES ANALYSIS

Sulfites were tested according to the AOAC Official Method 990.28 (Optimized Monier-Williams Method), and the analyses were conducted by Maxxam Analytics (Mississauga, Ontario), an ISO 17025 accredited laboratory.

## RESULTS

Sulfite concentrations observed in all maple syrup samples were below the detection limit (less than 10ppm). This level corresponds to the limit fixed by different regulation agencies for sulfites to be declared on the food labelling. The result of this investigation, which is observed on a set of 59 samples of different color classes and provenance, clearly shows that sulfites are not commonly found in pure maple syrup at levels of regulatory concern, although it cannot be ruled out that some processing methods may infrequently result in detectable levels.

## ACKNOWLEDGEMENTS

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