

3.0 Cantaloupe Risk Assessment Introduction and Summary

Cantaloupes are a type of melon and are available to Ontario consumers throughout the year, either imported or domestically produced. Imported cantaloupes are mainly grown in the United States and Mexico. Cantaloupes are popular and demand for both whole product and fresh-cut/semi-processed product is increasing.

In Ontario the majority of the commercial cantaloupe production occurs on the sandy loam soils along the north shore of Lake Erie. There is limited cantaloupe production throughout the remainder of the southern part of the province. Although there are no accurate data of cantaloupe acreage, the estimated production is 600 acres. Ontario grown cantaloupes are available from late July through to September. Growers sell their crop to consumers through farm gate, farm markets and wholesale distributors.

Most of the Ontario cantaloupe crop is grown on plastic mulch. Cantaloupe plants grow through holes cut in the thin plastic mulch at specific intervals. Water is applied using trickle or overhead irrigation systems. Surface water is often used for irrigation, but ground water and other water sources may also be used. Melon growers use chemical fertilizer and may also apply manure as a soil amendment.

Fruit is hand-harvested into plastic tote boxes, wood veneer bushel baskets or is moved by a conveyer into large wood or plastic bins. Growers normally wash the cantaloupe before packing it into boxes or bulk bins. Any storage of cantaloupes at packing and wholesale is short-term, up to two weeks under ideal conditions. Retail displays of cantaloupe are usually not refrigerated.

Food safety concerns have historically been associated with dairy products and meats such as chicken or beef. Due to an increased number of foodborne outbreaks involving fruits and vegetables there is an increased interest in the risks associated with the production and consumption of fruits and vegetables. In the past number of years, cantaloupes imported into the United States and Canada from Mexico have been associated with foodborne outbreaks (66). In the fall of 2002, both the United States Food and Drug Administration (FDA) and Canadian Food Inspection Agency (CFIA) issued import alerts on cantaloupe from Mexico (164 & 165). FDA continues to work with the Mexican government on a food safety program for the production, packing and shipping of fresh cantaloupe (66).

FDA sampled domestic cantaloupe between April 30, 2000 and May 15, 2001 to test for *Salmonella*, *E. coli* 0157:H7, and *Shigella*. Interim results as of July 31, 2001 show four (3.5%) violative samples of 115 cantaloupes tested (146). Ontario grown cantaloupes have not been implicated in any known outbreaks.

Appendix A is a list of outbreaks associated with cantaloupes and other fruits and vegetables.

The purpose of the following risk assessment on Ontario grown cantaloupe is to provide a systematic review of the potential food safety risks from pre-production through to sale at retail. Fresh-cut or semi-processed cantaloupe is not considered in this risk assessment.

Biological hazards present the greatest and most immediate risk to human health. Biological contamination can occur from an original source or through cross-contamination. Cross-contamination of the food product occurs when the contaminant is spread from another source other than the original. Original sources include water, soil, waste and humans.

Being a vine crop, the cantaloupe plant grows across the ground either directly on the soil or on top of thin plastic mulch. The cantaloupe fruit sits in direct contact with the soil or mulch in one particular spot referred to as its "ground spot". In the field, the rind or surface of the cantaloupe and the ground spot may be particularly vulnerable to biological contamination. Although the rind is not eaten, the process of cutting through a contaminated rind or the infiltration of the pathogen into the cantaloupe possibly through the ground spot, which structurally could be weaker, can inoculate the edible portion. Cantaloupe has a pH value of 6.17 – 7.13, which can support the growth of pathogens. If cantaloupes are improperly handled or stored after cutting, pathogens can multiply and increase the risk to human health. An assessment of the risks and past history indicate that there is potential for biological hazards to contaminate cantaloupes which may cause foodborne illness. Biological food safety risks are considered to be mainly low, with risks ranging from negligible to medium.

The risk of chemical hazards contaminating the crop is negligible to high, high being immediately after a crop has been sprayed while growing the crop. There are a number of mechanisms in place to manage the use of chemicals on food. Applied chemicals must be registered for a specific crop and used according to label directions. Residues in foods must not exceed the levels prescribed in the Food and Drug Act. In Ontario, pesticide users must be trained and certified, and sellers are licensed. Ontario has established an annual food safety-monitoring program and there have been no incidences of excessive residues in Ontario grown cantaloupes.

Physical hazards are less of a concern in the production and distribution of cantaloupes. It is unlikely that physical hazards would be incorporated into the flesh during growth. A cantaloupe's shape and protective rind make it unlikely that metal, glass, stones, and other materials would remain on the surface. Since the rind is not eaten, contamination by physical hazards and subsequent human exposure is unlikely.

The risk assessment also considers the uncertainty of data, and a summary of risk and uncertainty at each production step. For an interpretation of the ratings refer to section 2.0 Interpretation of the Commodity Risk Assessment Ratings. Information under the “Recommendations for Action” heading is under development and will be expanded as research results and additional information becomes available.

Ontario’s cantaloupe industry is unregulated and has no established food safety system at this time. Although there are no known outbreaks associated with cantaloupes produced in Ontario, results from the risk assessment and past outbreak information indicate that there is potential for biological hazards to contaminate cantaloupes and cause foodborne illness. There are steps being taken on individual farms to reduce the risk to the crop.