



Canadian Food
Inspection Agency

Agence canadienne
d'inspection des aliments

Bacterial pathogens and indicators in ready-to-eat arctic surf clams - April 1, 2021, to March 31, 2023

Food microbiology - Targeted surveys - Final report



Summary

A 2-year targeted survey¹ analysed 107 samples of ready-to-eat (RTE) arctic surf clams for the presence of the pathogens *Salmonella* species (spp.) and *Listeria monocytogenes* (*L. monocytogenes*). All samples were also tested for generic *Escherichia coli* (*E. coli*) which is an indicator of the overall hygienic and sanitary conditions of the food supply chain from production to the point of sale.

All (100%) of the 107 samples tested were found to be satisfactory. *Salmonella* spp. and *L. monocytogenes* were not found in any of the samples. Generic *E. coli* (>4 most probable number (MPN)/g) were not found in any of the samples.

Overall, our survey results indicate that Canadian harvested and processed arctic surf clams sold in Canada are generally safe for consumption. However, as with all foods, and especially with those that are RTE, good hygienic practices are recommended for producers, retailers, and consumers.

Why the survey was conducted

The survey was conducted to generate information on the quality and safety of prepackaged RTE arctic surf clams sold at retail in Canada.

Arctic surf clams are harvested for their meat, which is considered a delicacy in many countries. Arctic surf clams are typically harvested using specialized fishing vessels equipped with hydraulic dredges which are dragged along the ocean floor to scoop up the clams. The vessels target specific areas where arctic surf clams are known to inhabit, often in deeper waters off the coast of Atlantic Canada². Once harvested, the clams are typically blanched and then frozen on board the vessels to preserve their freshness and extend their shelf life. The clams are then sorted at the processing facility and only those that are deemed to be sushi-grade are packaged for retail sale. Currently, the majority of the arctic surf clam harvested in Canada are exported to Asian countries³ such as Japan, China, and South Korea where they are consumed in sushi and sashimi dishes and known as hokkigai⁴. However, in recent years they have grown in popularity in Canada resulting in increased availability on the Canadian retail marketplace.

Contamination with bacterial pathogens can occur at any step in the food supply chain such as during harvesting, processing, and/or packaging. Consequently, if pathogens are present, there is a potential for foodborne illness as arctic surf clams are RTE.

When the survey was conducted

The survey was conducted over a 2-year period from April 1, 2021, to March 31, 2023.

Where the samples were collected from

Samples were collected from national retail chains and local/regional grocery stores located in the following 5 major cities across Canada:

- Montreal
- Toronto
- Ottawa
- Vancouver
- Calgary

The planned number of samples to be collected from each city was based on the population of the province in which the city was located relative to the total population of Canada.

Total number and description of samples collected

A total of 107 prepackaged RTE frozen arctic surf clam samples were collected, and all were harvested and packaged in Canada. It should be noted however that the scope of sampling was not restricted with respect to sample type (fresh or frozen) or origin (domestic or imported). A sample consisted of a single or multiple consumer sized packages of the same lot weighing at least 250g.

What the samples were tested for

All samples were tested for *Salmonella* spp., *L. monocytogenes*, and generic *E. coli*. *Salmonella* spp. and *L. monocytogenes* are pathogenic bacteria while generic *E. coli* is an indicator of the overall hygienic and sanitary conditions under which the samples have been produced, processed, stored, and transported.

Methods used to test the samples

Samples were analyzed using analytical methods published in Health Canada's *Compendium of Analytical Methods for the Microbiological Analysis of Foods*⁵ that were appropriate for the testing of arctic surf clams.

How the samples were assessed

The samples were assessed using criteria based on the principles of CFIA's *Bacteriological guidelines for fish and fish products (end product)*⁶, and Health Canada's *Policy on Listeria monocytogenes in Ready-to-Eat Foods*⁷.

Table 1 - Assessment criteria

Bacteria	Satisfactory	Investigative	Unsatisfactory
<i>Salmonella</i> spp.	Not detected	Not applicable	Detected
<i>L. monocytogenes</i>	Not detected	Not applicable (category 1 ^a) Detected and ≤ 10 ² CFU/g (category 2 ^a)	Detected (category 1 ^a) > 10 ² CFU/g (category 2 ^a)
Generic <i>E. coli</i>	≤4 MPN/g	>4 and ≤40 MPN/g	>40 MPN/g

Survey results

All (100%) of the 107 samples tested were found to be satisfactory. *Salmonella* spp. and *L. monocytogenes* were not found in any of the samples. Generic *E. coli* at elevated levels (>4 MPN/g) were not found in any of the samples.

Table 2 – Analysis assessment results

Bacterial analysis	Number of samples tested	Satisfactory (%)	Investigative	Unsatisfactory
<i>Salmonella</i> spp.	107	107	Not applicable	0
<i>L. monocytogenes</i>	107	107	Not applicable	0
Generic <i>E. coli</i>	107	107	0	0
Total	107^b	107 (100)	0	0

What the survey results mean

No previously published studies on the microbiological quality or safety of arctic surf clams were found at the time of writing this report.

Overall, our survey results indicate that arctic surf clams sold in Canada are generally safe for consumption. However, as with all foods, and especially with those that are RTE, good hygienic practices are recommended for producers, retailers and consumers.

^a The storage condition (frozen or refrigerated) and if applicable, pH and water activity of the sample are used to determine the product category.

^b All 107 samples were tested for the presence of *Salmonella* spp., *L. monocytogenes*, and generic *E. coli*.

What is done with the survey results

All results are used to:

- inform risk management decisions
- support program design and re-design

Where to access the survey data

The data will be accessible on the [Open Government Portal](#).

References

1. Canadian Food Inspection Agency, [Food chemistry and microbiology](#).
2. Fisheries and Oceans Canada, [Offshore clam - Maritimes and Newfoundland and Labrador regions](#). 2023.
3. CBC Canada, [Why Nova Scotia's Arctic surf clams are such a big hit in Japan](#). 2017.
4. Fisheries and Oceans Canada, [Arctic Surf Clams](#). 2015.
5. Health Canada, [Compendium of Analytical Methods](#). 2011.
6. Canadian Food Inspection Agency, [Bacteriological guidelines for fish and fish products \(end product\)](#). 2019.
7. Health Canada, [Policy on Listeria monocytogenes in Ready-to-Eat Foods](#). 2011.