

Summary: *Weight of evidence* – Factors to consider when investigating a food-borne illness outbreak

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Introduction

A guidance document, *Weight of Evidence: Factors to Consider for Appropriate and Timely Action in a Food-borne Illness Outbreak Investigation* (1), was developed to assist federal government decision-makers weigh the scientific evidence collected during a food-borne illness outbreak investigation in order to inform risk mitigation actions.

The objective of the document is to provide guidance on how to weigh evidence collected during epidemiologic, laboratory and food safety investigations in a food-borne illness outbreak investigation, as part of an overall health risk assessment process carried out by Health Canada. This is a short summary of the document.

Approach

This document was collaboratively developed by Health Canada, the Public Health Agency of Canada and the Canadian Food Inspection Agency, in accordance with a recommendation made in the 2009 Weatherill Report (2). Standardized criteria were established to weigh epidemiologic, laboratory and food safety evidence collected during a food-borne illness outbreak investigation. Factors to consider were outlined, and guidance on how much weight to assign the evidence for each criterion was agreed upon.

Highlights

Table 1 outlines the key aspects of each chapter in the weight of evidence guidance document.

Table 1: Highlights of the weight of evidence guidance document

Chapter/section	Highlights
Introduction	Food-borne illness outbreak investigations are complex and multidisciplinary, involving the collection of data from laboratory, food safety and epidemiologic investigations. As data and detailed information are collected, the situation is updated, providing strength to the weight of evidence for risk mitigation action.
Section A: Intact and non-intact sample information	During food-borne illness outbreak investigations, samples of food that may have been eaten by the ill individual(s) are often collected. Samples from opened packages are collected for testing when samples from an intact package are unavailable. In these instances, post-packaging contamination needs to be considered.
Section B: Isolate match	Food samples consumed by the ill people are tested for the presence of food-borne pathogens and are compared with the pathogens that have been isolated from the ill people. Comparisons between isolates are often performed through molecular-typing techniques, such as pulsed-field gel electrophoresis. Four criteria to consider when assessing the strength of microbiological evidence in a food-borne illness outbreak investigation are listed.

Chapter/section	Highlights
Section C: Summary of epidemiologic evidence	Direct and supportive epidemiologic evidence is collected throughout a food-borne illness investigation. While the gold standard epidemiologic evidence would arise from a well-designed analytical study, there are other situations in which the weight of evidence would be considered sufficiently strong to warrant regulatory action based on the epidemiologic evidence alone. Nine criteria to consider when assessing the strength of the epidemiologic evidence in a food-borne illness outbreak investigation are listed.
Section D: Traceback and traceforward	Once a food has been linked to cases of illness, food safety investigators attempt to determine from where the food originated (traceback) and/or other places to which the food was distributed (traceforward) in order to help inform a risk management decision. Five situations are presented to be used as a guide in obtaining the weight of evidence needed to issue a recall and/or other risk management action(s), to ensure that all contaminated product is identified and that the source of contamination is found.
Section E: Health risk assessment	Health risk assessments for microbiological hazards are requested by Canadian Food Inspection Agency technical assessors and/or by provinces and territories, and are performed by Health Canada for food-borne illness outbreak situations. A scientific evaluation team at Health Canada assesses data collected through the laboratory, food safety and epidemiologic investigations and assigns a health risk based on the information that is available at the time of the risk assessment request.
Section F: Health risk definitions	The level of health risk is determined by taking the hazard identification, the exposure assessment and the hazard characterization into account. Definitions for the three health risk categories are provided.
Section G: Potential risk management actions after a health risk assessment	A number of risk management actions can be undertaken following a health risk assessment. The type of action taken will depend on the level of the health risk and other factors.
Section H: Scenario examples	Case studies are provided to demonstrate how the weight of evidence is considered for action in a food-borne illness outbreak investigation. The case studies are provided for guidance only.

Results

The totality of epidemiologic, laboratory and food safety evidence is evaluated through a health risk assessment, and a health risk level is assigned to the food in question. The weight of evidence guidance document has played a central role in the conduct of health risk assessments, thereby facilitating timely and appropriate risk mitigation action. The document is currently undergoing a process of review, led by Health Canada, and this is scheduled for completion in 2014.

Conclusion

The use of a guidance document with standardized criteria to assess the weight of evidence in food-borne illness outbreak investigations facilitates the timely completion of health risk assessments of suspect food vehicles and informs the implementation of public health actions to mitigate food-borne risks to consumers.

Conflict of interest

No conflicts of interests to declare.

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References

- (1) Government of Canada. Weight of evidence: factors to consider for appropriate and timely action in a food-borne illness outbreak investigation. January 2011. <http://www.hc-sc.gc.ca/fn-an/pubs/securit/2011-food-illness-outbreak-eclosion-malad-ailments/index-eng.php>
- (2) Government of Canada. Report of the independent investigator into the 2008 listeriosis outbreak. July 2009. http://www.cpha.ca/uploads/history/achievements/09-lirs-rpt_e.pdf