**Example 2: Epidemiological Assessment Template**

**Lead public health authority:** *OMD-PHAC*

**Version Date:** *2010-09-22*

**Version Time:** *19:30 EST*

**Outbreak number and title:***2010-22 Multi-provincial E. coli O157:H7 outbreak*

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| **Brief Epidemiological Summary** (Refer to section of guide noted in the column at left)**:** |
| A.1 | Has a line list been provided to investigative team members including Health Canada (e.g., case ID, case confirmation status, age, sex, onset, food exposure and purchase details)? | [x]  Yes [ ]  No |
| A.2 | Has an epidemiological summary been provided to investigative team members including Health Canada ? | [x]  Yes [ ]  No |
| A.3 | How strong is the evidence indicating that cases represent a common source outbreak?*Provide supporting evidence:**Clinical isolates for cases included in this outbreak have indistinguishable genetic fingerprints as defined by pulsed-field gel electrophoresis (PFGE). The PFGE pattern combination has not been seen in Canada prior to this outbreak. Cases have been reported over a three-month period. Given the rarity of the PFGE pattern, the distribution of the majority of cases in Western Canada over a three month period, this is likely a common source outbreak.* | [x]  Strong[ ]  Moderate[ ]  Weak |
| **Food Under Assessment:** |  |
| B.1 | Suspect food: *Brand A raw whole walnuts and walnut pieces* |
| B.2 | Other levels of specificity if applicable/information available (e.g., common product details, purchase location, purchase dates, package type, brand, packager/distributor/manufacturer, lot code/best before date, etc.): * *Raw whole walnuts and walnut pieces supplied to Company A and possibly others*
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| **Epidemiological Assessment Criteria and Considerations**  |
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| C.1 | **Plausibility: The food is a plausible vehicle of infection.** *Provide supporting evidence:* | **[x]  Strong** **[ ]  Moderate** **[ ]  Weak** |
| * Is the food a known vehicle of infection for the outbreak pathogen?
 | [ ]  Yes [x]  No  |
| * Is there literature to indicate that the pathogen been previously identified in the food type?
 | [ ]  Yes [x]  No |
| *There are no published reports of previous E. coli outbreaks associated with walnuts nor are there reports of the detection of E. coli in walnuts. However, walnuts are farmed, harvested and processed in a similar geographic area and manner as almonds. There have been multiple Salmonella outbreaks associated with almonds in the past. In addition, there has also been a recent E. coli outbreak associated with hazelnuts.* |
| C.2 | **Temporality: Cases report eating the food within their period of exposure.** *Provide supporting evidence:* | **[x]  Strong** **[ ]  Moderate** **[ ]  Weak** |
| * What was the time period used to assess case exposures during interviews?
 | \_\_\_*10 days*\_\_\_\_ |
| * Do any cases only report eating the suspect food outside of this time period?
 | [ ]  Yes [x]  No  |
| *If Yes, please explain.* |
| C.3 | **Consistency: The distribution of cases in time and place is consistent with the shelf life and distribution of the food.** | **[ ]  Strong** **[x]  Moderate** **[ ]  Weak** |
| *Provide supporting evidence:**The distribution of the majority of cases (BC=7, AB=2, SK=4) correlates with the distribution of Brand A walnuts (BC, AB and SK). There is one case in QC who reports eating a different brand of Walnuts and it is not yet known whether these walnuts originate from the same place as Brand A walnuts.* *Walnuts packaged by Brand A have a best before date that is 6 months after the date of packaging. The distribution of cases over a three month period is consistent with this type of shelf stable product.* |

| C.4 | **Consistency: The food exposure is consistently reported among cases.** | **[ ]  Strong** **[x]  Moderate** **[ ]  Weak** |
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| *Provide supporting evidence:**A majority (10/13 (77%)) of otherwise unrelated cases in four provinces have reported consuming walnuts. Of the ten cases with walnut consumption eight reported eating Brand A raw whole walnuts and/or walnut pieces. Brand information was verified through shopper/loyalty card information for five cases.**Of the three cases that did not report eating walnuts, one did report consuming a trail mix but the case was uncertain if it contained walnuts. There is no explanation for the other two cases, although it should be noted that nuts can sometimes be a “stealth ingrediant” in salads, trail mixes or other food products.**Two young (25 & 32 years) otherwise healthly individuals with no immune compromising conditions developed severe illness requiring hospitalization. Both cases reported consuming Brand A raw whole walnuts daily during their exposure period.* *All cases, except one 6 year-old individual, are over the age of 18 years. This 6 year-old does not like eating meat or beans so the parent reports sprinkling raw whole walnuts that she has crushed into dust on the child’s cereal each morning to provide extra protein.* |
| C.5 | **Strength of association: A higher than expected proportion of cases report the food exposure.***Provide supporting evidence:** Has an analytical study been conducted?
* Do data exist that estimate the proportion of the general population who eat the food or similar foods (e.g., Foodbook, FoodNet Canada, FoodNet USA, other)?
 | **[ ]  Strong** **[x]  Moderate** **[ ]  Weak**  |
| [ ]  Yes [x]  No[x]  Yes [ ]  No |
| *Based on the US Food Atlas 2006-2007, 23% (95% confidence interval) of the population are estimated to have consumed walnuts in the previous 7 day period. FoodNet Canada’s food consumption survey conducted in Waterloo, ON, 2006 found walnuts were consumed by 15% (95% confidence interval) of the general population in the previous 7 day period. Among outbreak cases, 77% of cases reported eating walnuts in the 10 days before symptom onset. When the proportion of cases reporting walnut consumption in this investigation is compared to the US Food Atlas results for walnut consumption, the difference in proportions is significant (p<0.05). The population data may not accurately represent food consumption patterns among the outbreak population (7 day vs 10 day exposure period, historical data, different geographic area) but are the best available data.* |

| C.6 | **Consideration of alternate explanations: Have other plausible hypotheses been adequately ruled out?** | **[x]  Strong** **[ ]  Moderate** **[ ]  Weak** |
| --- | --- | --- |
| *Provide supporting evidence:**All cases completed an outbreak questionnaire which addressed common risk factors for E. coli O157:H7 (beef, leafy greens, sprouts, unpastuerized dairy products, etc.) as well as 8 different varieties of nuts and seeds, and 10 different nut-containing foods including granola bars and dry cereals. Exposure frequencies for these other food items were <60% (see attached epi summary), except for beef which was reported by 72% of cases. However, multiple different forms and brands of beef were reported. The first nine cases also completed the reporting jurisdiction’s routine enteric case interview forms which included open-ended food histories and questions addressing consumption of >15 additional food items. In addition, extensive food histories were obtained for the three most recently reported cases. A review of the three extensive hypothesis-generating questionnaires in combination with a review of all other case interview forms did not reveal other common exposures. The granola and cereal consumed by cases included a variety of different brands containing a variety of different ingredients.*  |
| **Conclusion** |
| D | **Is there strong epidemiological evidence that the [suspect food] is the vehicle of infection for this outbreak?**  | **[x]  Yes** **[ ]  Additional evidence needed** |
| **State any additional conclusions that can be made regarding specific details of the suspect food (e.g., product, purchase locations, purchase time periods, origin of the food):***Including a case reported in the United States, cases reported eating three different brands of walnuts and a common link between all three brands has not yet been identified. It is possible that the point of contamination is further upstream of the Canadian company that imports walnuts and packages them as Brand A.* *Purchase dates and locations of Brand A walnuts have been provided in the line list.* |
| **Briefly highlight any important gaps in the evidence:** *Additional shopper/loyalty card information to confirm brand names is being sought for three cases.* |
| E | **Additional considerations:** *There has been national media attention regarding the possible association of brand A walnuts and human illness. It is possible that public communications about brand A walnuts may be biasing individuals’ memory regarding their food exposures (i.e, more likely to recall walnuts and brand A information).**Samples of leftover walnuts in open, labelled packages have been collected from the home of two cases. Laboratory results are pending on these samples.* |