Development of Food Safety Fact Sheets on Specialty Foods for Ontario Public Health Inspectors

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Presentation Outline

- Introduction
  - Diversity of Ontario population
  - Definition of specialty foods
  - Public health in Ontario
- Overview of 2008-2009 study of Ontario Public Health Inspectors:
  - Part I: Focus groups
  - Part II: Online survey
- Examples of existing specialty food resources
- Development of specialty food fact sheets
Diversity of Ontario Population

- The population of Ontario is highly diverse and multicultural.
- In the 2006 Census, foreign-born individuals represented 28.3% of the total population.
  - The highest proportion among the provinces.
  - An increase of 12.2% from 2001.
  - With over 200 different ethnic origins represented.

(Source: 2006 Census of Canada)
Specialty Foods

- As the ethnocultural diversity of the population increases, there is a corresponding array of new food products being introduced and tastes being developed.
- Specialty foods, described as foods from different cultures, are becoming increasingly available at retail food outlets and food service establishments across Ontario.
- As a result, local public health inspectors (PHIs) may be required to assess the safety of foods with which they are unfamiliar.
~900 PHIs across 36 health units responsible for protecting and promoting the health and safety of the Ontario population.

Legal mandate from Health Protection and Promotion Act, R.S.O. 1990, c. H.7.

Food safety responsibilities:
- Compliance inspections of ~80,000 food premises
- Provide food handler training
- Investigate food-related complaints from the public
- Investigate cases of suspected foodborne illness

(Source: Association of Local Public Health Agencies, 2004)
2008-2009 Study of Ontario PHIs

- Mixed-method research design to investigate the food safety perceptions and self-identified information needs of PHIs in Ontario:
  - Part I: Focus groups
  - Part II: Online survey
Part I: Focus Groups

Methods:

- June-July 2008: 4 focus group discussions with PHIs from 4 different health units in the Central West region of Ontario.
- 4 to 8 participants per focus group.
- Focus of discussions:
  - perceptions of key food safety issues
  - knowledge confidence
  - resources currently available
  - resource needs

(Source: Association of Local Public Health Agencies, 2004)
Part I: Focus Groups

Results:

- Lack of food safety information on specialty foods was among the 5 key food safety issues identified.
- Participants reported confidence with their knowledge of food pathogens and food safety issues such as cross-contamination and time-temperature abuse, but not with their knowledge of specialty foods.
  - “We’re running into foods where...I mean as a Public Health Inspector, we’re looking at it and going ‘I have no idea what this is and I don’t know what you do with it.’”
  - “If I had a bit more information on that type of cultural food, I would be better able to make a decision other than cut it in pieces and see what it looks like.”
Part I: Focus Groups

Results:
- A need for reliable food safety information on specialty foods.
  - “You’ll find there are a lot of internet resources out there that are garbage and questionable or just don’t have any affiliation with any type of health agency.”
  - “When in doubt, Google search it to see what you can find out about the food.”
April-June 2009: Cross-sectional online survey of Ontario PHIs.

Sampling frame: PHIs with an e-mail listed on the Canadian Institute of Public Health Inspectors (CIPHI) Ontario e-mail listserv.

Response rate: 27.3% (239/875); representing approximately 25% of all PHIs at Ontario health units.

Questionnaire based on focus group data.

- Also included specific questions on specialty foods and food safety resources in languages other than English.
Part II: Online Survey

Demographic characteristics of the survey population:

- **Years employed as a PHI:**
  - 0-1.9 yrs: 10.9%
  - 2-4.9 yrs: 17.9%
  - 5-9.9 yrs: 24.3%
  - 10-19.9 yrs: 18.4%
  - 20+ yrs: 28.5%

- **Region of employment:**
  - North West: 4.7%
  - North East: 6.9%
  - Eastern: 12.1%
  - Central East: 28.0%
  - Central West: 28.5%
  - South West: 19.8%
Results:
- Percentage of respondents “confident”/“very confident” with knowledge of following topics:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-contamination</td>
<td>100.0%</td>
</tr>
<tr>
<td>Proper handwashing</td>
<td>99.6%</td>
</tr>
<tr>
<td>Time-temperature abuse</td>
<td>99.1%</td>
</tr>
<tr>
<td>Proper storage of food</td>
<td>98.3%</td>
</tr>
<tr>
<td>Cleaning and sanitizing of utensils/equipment</td>
<td>97.4%</td>
</tr>
<tr>
<td>Vermin and food pests</td>
<td>91.4%</td>
</tr>
<tr>
<td>Approved sources for food</td>
<td>78.4%</td>
</tr>
<tr>
<td>Specialty foods</td>
<td>35.0%</td>
</tr>
</tbody>
</table>
Part II: Online Survey

Results:
- Percentage of respondents “concerned”/“very concerned” with the following specialty foods in terms of food safety risk:

<table>
<thead>
<tr>
<th>Specialty Food</th>
<th>Concerned Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donairs, shawarmas, gyros</td>
<td>76.0%</td>
</tr>
<tr>
<td>Exotic cheeses</td>
<td>65.8%</td>
</tr>
<tr>
<td>Game meat</td>
<td>65.5%</td>
</tr>
<tr>
<td>Sushi</td>
<td>64.8%</td>
</tr>
<tr>
<td>Exotic meats</td>
<td>50.4%</td>
</tr>
<tr>
<td>Peking Duck</td>
<td>43.5%</td>
</tr>
<tr>
<td>Filled pastries</td>
<td>41.6%</td>
</tr>
<tr>
<td>Balut eggs</td>
<td>38.8%</td>
</tr>
<tr>
<td>Carpaccio</td>
<td>30.8%</td>
</tr>
<tr>
<td>Century eggs</td>
<td>30.4%</td>
</tr>
<tr>
<td>Ceviche</td>
<td>24.7%</td>
</tr>
</tbody>
</table>
Part II: Online Survey

Results:

- Percentage of respondents who selected “Don’t know/no opinion” when asked about level of concern with the following specialty foods:

  - Donairs, shawarmas, gyros: 2.1%
  - Exotic cheeses: 6.4%
  - Game meat: 0.9%
  - Sushi: 0.0%
  - Exotic meats: 14.2%
  - Peking Duck: 15.8%
  - Filled pastries: 4.7%
  - Balut eggs: 33.8%
  - Carpaccio: 37.7%
  - Century eggs: 38.6%
  - Ceviche: 46.7%
Part II: Online Survey

Results:

- ~60% of respondents reported ≥1 specialty food with which they lacked confidence with their food safety knowledge.
- <10% of respondents were satisfied with availability of information on balut eggs, century eggs, ceviche, exotic meats and carpaccio.
- Information most often reported as “very useful” with regards to unfamiliar specialty foods:
  1. Preparation method
  2. Proper storage method
  3. Factors affecting microbial growth (i.e., pH, Aw)
Development of Fact Sheets

Need for food safety resources on specialty foods that:

- Are reliable and from a reputable source.
- Are usable in the field (i.e., during inspections).
- Can be easily accessed and is accessible to all PHIs in Ontario.
- May also be of use to food premise operators and members of the public.
- Contain information relevant to PHIs (e.g., preparation method, proper storage method, pH, water activity, photos, ingredients, associated outbreaks, etc.).
Development of Fact Sheets

- Develop food safety information fact sheets on 6 specialty foods:
  1. Balut
  2. Century eggs
  3. Ceviche
  4. Donairs
  5. Steak tartare
  6. Beef carpaccio
**Balut**

- Balut is a fertilized duck (or chicken) egg that has been incubated for ~18 days; resulting in a partially developed embryo within the shell. Complete development and hatching of duck eggs typically occurs at 28 days.
- Commonly eaten as a snack in the Philippines, Vietnam and other Southeast Asian countries.
- Eaten directly from the shell after being hard-boiled or steamed.
Century Eggs

- Century eggs are a traditional Chinese food item made from eggs preserved through alkaline fermentation.
- Typically prepared from duck eggs, but can also be made from chicken, quail, turkey or goose eggs.
- Fermentation process causes the albumen to gel and become a translucent brown colour, and the yolk to become dark-green with a creamy texture.
- Typically eaten uncooked as an appetizer or side dish.
Ceviche

- Ceviche is a popular Latin American dish consisting of raw seafood marinated in lime or lemon juice.
- Acid in the citrus juice denatures the protein in the raw seafood, causing the flesh to become firm and opaque.
- While the acidity of the citrus juice can reduce microbial numbers in the raw seafood, it does not destroy all bacteria, viruses, and parasites that might be present on and in the flesh.

Effect of lime juice on raw shrimp:

No lime juice  Elapsed time: 2 min  Elapsed time: 10 min  Elapsed time: 30 min
Donairs

- Donairs are a meat sandwich typically consisting of thin slices of beef, lamb or chicken that has been slowly roasted on a vertical, rotating spit.
- Donairs and similar products are also known as shawarma, shawirma, chawarma, gyro, kebab, dona kebab, döner-kebab, etc.
- Size of donair cones can range from 4.5 to 40kg.
- Potential for foodborne illness is related to the cooking method used; during cooking, temperatures are generally not sufficient to kill pathogenic bacteria in the interior regions of the cone.
Steak Tartare

- Steak tartare is a dish typically made of freshly minced beef mixed with various condiments (such as fresh egg yolks) and served raw.
- Can also be prepared using horse meat.
- Potential for foodborne illness:
  - Raw beef can become contaminated with pathogens such as *Salmonella spp.* and *Escherichia coli O157:H7* during slaughter.
  - Eggs are a major source of *Salmonella* serotype Enteritidis infection in humans.
Beef Carpaccio

- Beef carpaccio is a dish typically consisting of thin slices of raw or partially cooked beef, served with arugula, parmesan cheese and dressing.
- Can also be made with thin slices of raw fish or other meats such as veal, bison and venison.
- Potential for foodborne illness:
  - Raw beef can become contaminated with pathogens such as *Salmonella* spp. and *Escherichia coli* O157:H7 during slaughter.

Beef carpaccio served with mushrooms, arugula and parmesan shavings.
Development of Fact Sheets

- Development of fact sheets based on a review of:
  - Scientific literature
  - Relevant provincial and federal food safety legislation
  - Food safety guidelines and legislation from other jurisdictions
  - Outbreak case reports
  - Reference manuals and non-fiction books
  - Existing specialty food resources
  - And more...
Examples of Existing Specialty Food Resources

Example #1: Fact sheet on balut

- Produced in-house by a local public health unit.
- Useful resource, but not widely accessible to PHIs at other health units.

Information Sheet – Balut Eggs

Eggs containing Embryos or ‘Balut’

‘Balut’ is the Philippine word for fertile chicken or duck eggs that have been incubated and removed from the incubator prior to hatching for consumption. Balut chicken eggs are usually incubated for 11 to 14 days, whereas, ducks are incubated for 16 to 20 days. Under favorable incubation conditions, chicks hatch at approximately 21 days of incubation and ducklings hatch between 26 to 30 days, depending on the breed.

Prior to consumption baluts are usually boiled for 20 to 30 minutes. Edible parts include the embryo, yolk, and amniotic fluid (also referred to as the “soup”).

If an egg is contaminated with bacteria prior to incubation, the heat from the incubation environment and the yolk (an enriched medium) provide ideal conditions for bacterial proliferation for pathogens such as *Salmonella enteritidis*.

In Canada, both shell and processed chicken eggs must meet the requirements set out in the *Egg Regulations* and *Processed Egg Regulations*, respectively, of Canadian Agricultural Products Act. However, eggs from different species of birds, balut and preserved duck eggs are not subject to the egg grading requirement.

Baluts are potentially hazardous food and must be refrigerated upon removal from incubation. Balut eggs should be stored within food premises as specified in Section 33 of the Food Premises Regulation, including shell must be free of contamination and must be kept at an internal temperature of 4 °C or below.

March 01, 2006
Examples of Existing Specialty Food Resources

Example #2: Article on balut
- Published in an online newsletter of a professional organization representing PHIs in one province.
- Easily accessible online, but cites Wikipedia.
Development of Fact Sheets

- Additional information sought from professionals in the field, including a food safety manager with a local health unit and a program specialist from the Canadian Food Inspection Agency.
- Fact sheet drafts reviewed by individuals from local public health, academia and government.
Example: Steak Tartare Fact Sheet

Steak Tartare

Description
Steak tartare, also known as tartare and American-style tartare, is a dish typically made of freshly minced beef, mixed with various seasonings, and served raw. Steak tartare is popular in European countries such as Belgium, the Netherlands, Switzerland, and France. Locally, steak tartare is served as an appetizer or entrée at some restaurants. A small number of food service establishments in Ontario also serve tartare made from horse meat.

Similar dishes
- Kilbäcksås: A Swedish dish consisting of freshly minced lamb or beef, mixed with horseradish, eggs, mustard, and various seasonings.
- Kibbe: An Arabic dish consisting of finely minced beef, mixed with bulgur or rice, and usually seasoned with spices.
- Kibbeh: A Middle Eastern dish made of ground beef, bulgur, and spices, shaped into a patty or stuffed with a filling.

How steak tartare is prepared
Steak tartare is typically made with lean cuts of beef, such as tenderloin or sirloin, which is finely chopped by hand or ground with a meat grinder. The freshly minced meat is mixed with various ingredients such as egg yolks, horseradish, mustard, vinegar, mayonnaise, onions, capers, garlic, and thyme, and then topped with a raw egg yolk.

Potential food safety risks
- Raw beef can become contaminated with pathogens during slaughter. According to the 2004 Food Code published by the United States Food and Drug Administration (FDA), hazards in raw beef products such as steak tartare include Listeria spp. and Escherichia coli 0157:H7.
- Steak tartare is often prepared with raw egg yolks. Eggs can be contaminated with Salmonella enteritidis through transmission, and raw egg is a major source of S. enteritidis infection in humans. According to Health Canada, foods containing raw eggs may be harmful to vulnerable people such as young children, the elderly, pregnant women, and people with weak immune systems.

Associated outbreaks
- Between December 2008 and January 2009, 20 cases of Shiga toxin-producing Escherichia coli (STEC) O157 were associated with the consumption of contaminated steak tartare in the Netherlands (Greenland et al., 2009).
- Between December 22, 1994 and January 4, 1995, 107 confirmed and 51 probable cases of Salmonella Typhimurium gastroenteritis in Wisconsin were associated with the consumption of raw ground beef (FitzGibbons et al., 1995).
- Between August and October 1986, two outbreaks of typhoid in France were associated with the consumption of raw or lightly cooked horse meat (Ascolle et al., 1988).

Food safety legislation
- The Canada Food Inspection Agency (CFIA) requires that all products be prepared, cooked, and served in a manner that ensures the safety of the consumer.
- The CFIA also requires that all food products, including steak tartare, be prepared and served in a manner that ensures the safety of the consumer.

Safe food handling of steak tartare
- Food safety guidelines for raw meat dishes such as steak tartare are contained in the 2009 FDA Food Code: Subparagraph 2-401.11(D)(2) states that undercooked ground meat should not be offered for sale on a food Establishment.
- Subparagraph 5-603.11(A) states that food establishments that sell or serve an animal food such as beef or eggs should be undercooked, or otherwise be processed to eliminate pathogens in a ready-to-eat form as an ingredient in another ready-to-eat food. It should inform consumers of the significant increased risk of consuming such foods by way of a prescribed disclosure and removal.

Healthy Canada recommends that pasteurized eggs or egg products be used in the preparation of foods that call for raw or undercooked eggs in the final product.

Who should avoid eating steak tartare
Health Canada recommends that people with weakened immune systems, older adults, and pregnant women avoid the consumption of raw meat products such as steak tartare.

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Example: Steak Tartare Fact Sheet

Steak Tartare

Description
Steak tartare, also known as filet Américain and Américain préparé, is a dish typically made of freshly minced beef mixed with various condiments, and served raw. Steak tartare is popular in European countries such as Belgium, the Netherlands, Switzerland and France. Locally, steak tartare is served as an appetizer or entree at some restaurants. A small number of food serve establishments in Ontario also serve tartare made from horse meat.

Similar dishes
- Kibbeh nayyeh: A Lebanese dish consisting of freshly minced lamb or beef, mixed with bulgur wheat, spices, olive oil, green onions, and herbs such as mint and basil. It is served raw and typically eaten with pita bread.
- Kifto: An Ethiopian dish consisting of freshly minced lean beef, mixed with mitmita (a blend of red chili powder and spices) and other kibbeh (clarified butter infused with herbs and spices). It is typically served with injera (a traditional type of flatbread) and aybé (Ethiopian cottage cheese).
- Yukhoe (or yuk hwe): A Korean dish consisting of raw beef cut into thin matchsticks or mince, mixed with green onions, Asian pear, soy sauce, sesame oil, garlic, pine nuts, and sesame seeds, and then topped with a raw egg yolk.

How it is prepared
Steak tartare is typically made with lean cuts of beef, such as tenderloin or sirloin, which is finely chopped by hand or ground with a meat grinder. The freshly minced steak is mixed with various ingredients such as egg yolks, mayonnaise, onions, capers, cornichons, parsley, kelp, Worcestershire sauce, hot paprika sauce, and/or Dijon mustard. After mixing, the steak tartare is served with thin slices of toasted bread or fries.

Potential food safety risks
- Raw beef can become contaminated with pathogens during slaughter. According to the 2006 Food Code published by the United States Food and Drug Administration (FDA), hazards in raw beef products such as steak tartare include Salmonella spp., and Escherichia coli O157:H7.
- Steak tartare is often prepared with raw egg yolk. Eggs can be contaminated with Salmonella enteritidis through transovarian transmission, and are a major source of 
  enteric infection in humans. According to Health Canada, foods containing raw eggs may be harmful to vulnerable people such as young children, the elderly, pregnant women and people with weak immune systems.
- Listeria monocytogenes may also be present in raw beef. In a study examining the occurrence of pathogens in raw and ready-to-eat meat products offered for sale in supermarkets in Edmonton, Alberta, L. monocytogenes was found in 52% of 100 raw ground beef samples collected (Bokhourd et al., 2006).

Front
Example: Steak Tartare Fact Sheet

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- Between December 22, 1964 and January 4, 1995, 107 confirmed and 51 probable cases of *Salmonella Typhimurium* gastrointestinal illness in Wisconsin were associated with the consumption of raw ground beef (Frazzak et al., 1995).
- Between August and October 1985, two outbreaks of hecmosis in France were associated with the consumption of raw or lightly cooked horsemeat (Anoodle et al., 1985).

Food safety legislation

Subsection 33(7), paragraph 3 of Regulation 562 (Food Premises) made under the Health Protection and Promotion Act states that all parts of ground meat (other than ground meat that contains poultry) must be cooked to reach an internal temperature of at least 71°C for at least 15 seconds.

Safe food handling of steak tartare
- Food safety guidelines for raw meat dishes such as steak tartare are contained in the 2009 FDA Food Code:
  - Subparagraph 3-401.11(D)(2) states that undercooked ground meat should not be offered for sale on a child’s menu.
  - Subparagraph 3-403.1(A) states that food establishments that sell or serve an animal food such as beef or eggs “raw, undercooked, or otherwise being processed to eliminate pathogens” in a ready-to-eat form or as an ingredient in another ready-to-eat food, should inform consumers of the significantly increased risk of consuming such foods by way of a prescribed disclosure and reminder.
  - Subparagraph 3-801.11(C)(2) states that partially cooked animal food such as raw meat should not be offered for sale or service in food establishments that serve a highly susceptible population.
- Richard Varga, senior sanitation instructor at the Culinary Institute of America, advises against the use of pre-ground meat for steak tartare, and recommends that the meat should be ground or chopped as close to service as possible (Parsenoglou, 1993).
- Applying a brief surface heat treatment to the meat before mincing or chopping may reduce the risk of microbial infection without ruining the dish (Ehleberg et al., 2007).
- Health Canada recommends that pasteurized eggs or egg products be used in the preparation of foods that call for raw or undercooked eggs in the final product.

Who should avoid eating steak tartare
Health Canada recommends that people with weakened immune systems, older adults, and pregnant women avoid the consumption of raw meat products such as steak tartare.

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Where to Find the Fact Sheets

Fact sheets available for viewing and downloading in PDF format from:

1. The Centre for Public Health and Zoonoses (CPHAZ) website, under “CPHAZ Resources & Links”: http://www.ovc.uoguelph.ca/cphaz/resources/.

2. The Canadian Institute of Public Health Inspectors (CIPHI) Ontario website, under “Resources”: http://www.ciphi.on.ca/resources.
For additional information about the focus groups and online survey:


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“And just because it’s a little different than what we’re used to doesn’t necessarily mean it’s not safe.”

-Focus group participant, 2008