Food Safety and Traceability for Hazelnuts in Ontario

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Presentation Outline

- Ontario Regulation 119/11
- In-Shell Nut Outbreaks
- Major Hazards
  - Microbial – *Salmonella*, *E. coli*
  - Chemical – Aflatoxins
- Good Agricultural Practices
  - Harvesting practices
  - Washing practices
  - Drying Practices
  - Storage Practices
- Traceability
- Creating a food safety plan

Ontario Regulation 119/11

- Regulates the packaging, labelling, transporting, advertising, and sale of any regulated commodity in Ontario.
- Regulated commodities include:
  - Produce
    - Fruit and vegetables (fresh)
    - Sprouts
    - Culinary herbs (fresh)
    - **Nuts (in-shell)**
    - Edible fungi (mushrooms - wh
  - Honey
  - Maple Products

How are Nut Growers Affected by O. Reg. 119/11?

- In-shell nuts and peanuts are regulated, but shelled nuts are not (still subject to Federal Regulations).
- The regulation contains food safety provisions.
- There are no grade requirements for nuts.
- There is a package suitability requirement but no standardized package size requirements.
- There are requirements for labelling, retail display signs and advertisements for in-shell nuts.
- There are prohibitions against misrepresentation.

What is OMAFRA's Food Safety Monitoring (FSM) Program?

- Samples of Ontario grown nuts are collected from various points of sale across the province.
- As part of this program, inspectors randomly collect samples of Ontario grown in-shell edible tree nuts
- Varieties of nuts collected may include;
  - Hazelnuts
  - Chestnuts
  - Heartnuts
  - Walnuts
  - Pecans

O. Reg. 119/11 - Food Safety

- O. Reg. 119/11 prohibits:
  - Selling, packing or transporting contaminated nuts.

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Salmonella outbreak traced to hazelnuts from Oregon farm

BY CORAL BEACH | JANUARY 9, 2017

Oregon officials are warning consumers to check their homes for hazelnuts from the Schmidt Farm and Nursery farm stand and to immediately discard them because they have been named the cause of a Salmonella outbreak.

The warning Friday from the Oregon Health Authority Public Health Division reported five people have been confirmed in the outbreak of Salmonella Typhimurium. They were all infected with the same strain of the pathogen, which was also found in hazelnuts from the Schmidt Farm and Nursery farm stand on highway southwest of McMinnville, OR.

Although the majority of the Schmidt Farm hazelnut crop goes to wholesalers, a spokesman from the Oregon Department of Agriculture said Friday afternoon that the

Three Major Food Safety Hazards

- Allergens
  - An antigen that produces an abnormal immune response.
- Chemical
  - From crop protection, food allergens and aflatoxin.
- Biological
  - Contamination from bacteria or viruses.

  (e.g., *E. coli*, *Salmonella, Listeria*), Norovirus, yeasts and moulds.
- Physical
  - Foreign materials such as stones, glass and metal.

Aflatoxin

- Toxic compound produced by mould (i.e., mycotoxin).
- Causes acute or chronic effects on humans and animals (carcinogen-cancer causing).
- Usually comes from crop debris and soil, but harvest/post-harvest practices can significantly increase aflatoxin levels (e.g. improper storage).
- Health Canada limit for the edible portion of nuts is 15 parts per billion (ppb).
- Prevention is key:
  - Dry nuts as soon as possible.
  - Keep/store nuts at the right moisture levels.
  - Avoid postharvest rehydration.
  - Follow good agricultural practices (e.g. manure and irrigation practices, harvesting practices).

Microbiological Hazards

- *Salmonella* and *E. coli* have been linked to illness from consumption of tree nuts.
  - Both can cause illness even at very low levels.
- There is evidence that *Salmonella* can live for days to weeks and *E. coli* O157:H7 can live up to 3 months or more on in-shell nuts.
- Potential sources: orchard ground, contaminated irrigation water (or water introduced during further processing), moisture in storage facility.
- Raw nuts do not have a “kill step.”
- Preventing cross-contamination is important, starts with Good Agricultural Practices (GAPs), continues with Good Manufacturing Practices (GMPs).
  –

Good Agricultural Practices (GAPs)

- Harvest, storage and transportation practices
  - Orchard floor management
  - Clean and sanitize harvest equipment and ensure clean dry storage area.
- Cleaning and sanitation program
- Employee training
  - Worker hygiene
  - GAP principles
- Irrigation and wash water
- Documentation
  - Should have traceability program

Harvesting Practices

- Orchard floor management is important as usually there is direct contact of nuts.
  - Keep orchard floor as level, smooth and dry as practical during the season.
  - Wildlife/pest control through minimizing habitat/nesting areas.
  - Develop an action plan
    - During storm-related flooding any up-flow source may carry hazardous pathogens.
- Worker hygiene plays a critical role in minimizing potential contamination.
  - Building awareness and attention to proper in field hygiene.
  - Ensure supplies and facilities are adequate.

Harvesting Practices

- Clear debris and decayed material from under trees.
- Begin harvest as soon as nuts are mature
  - Pick up dry nuts off the ground with as little delay as possible.
- Avoid wet soil surface nut pickup as much as possible.
- Transport nuts in clean, dry, closed containers/bins.
  - Free of mould, insects and contaminated material.
- Containers should be constructed of durable, easily cleanable materials.
- Clean, sanitize and maintain harvesting equipment before use.
  - This includes your pickup machine or nut gatherer.

5 Step Cleaning and Sanitation

1. Prepare the area
    - Remove all food, products, packaging and ingredients.
    - Take apart equipment for cleaning if necessary.
2. Rough Clean and Pre-Rinse
    - Use potable water to remove food residue and dirt.
    - Water under light pressure is preferable.
3. Apply Cleaner
    - Use cleaning solutions approved for food operations.
    - Scrub to help remove organic matter and debris.
4. Post-rinse (with potable water) and inspect
5. Apply sanitizer
    - Use sanitizer approved for use in food operations.

**Complete your cleaning and sanitation record!

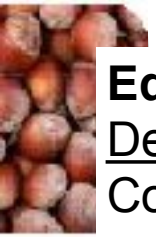
Cleaning Hazelnuts

- After harvesting, hazelnuts can be de-husked, cleaned, washed sanitized and dried.
  - Be sure to prevent cross-contamination at each of these steps.
- Trash and deposits from the field should be removed.
- Nuts should then be inspected which can be done using a filter or by hand.
  - Harvesting bins with grated bottoms will also help remove debris and allow air to circulate between nuts.
- The nuts are then washed and sanitized.
  - Continuous flow
  - Batch system – most common for smaller growers

Wash Water Sanitizing Options

- Water used for wash water should be potable.
  - Level of turbidity
  - Level of organic matter
- Most smaller operations will use bleach to sanitize nuts.
  - In a batch system the nuts will be placed in a in a tank/container with a **200 ppm bleach** and water solution.
  - Nuts should be left to sanitize for 1-2 minutes.
- Several other options are available for wash water including:
  - Peroxyacetic acid (PAA)
  - Hydrogen peroxide (H_2O_2)
- Must monitor and maintain levels of sanitizer
  - Concentration or oxygen reduction potential (ORP), temperature and pH.

Wash Water Sanitizing Options



Equation:

$$\frac{\text{Desired concentration (ppm)} \times \text{litres of water}}{\text{Concentration of Chlorine Product (\%)} \times 10{,}000} = \text{litres of chlorine to add in water}$$

Using 5.25% Household Bleach:

$$\frac{(200 \text{ ppm}) \times (25 \text{ litres water})}{(5.25\%) \times 10{,}000} = \frac{5{,}000}{52{,}500} = 0.095 \text{ litres or } \textbf{95 ml of chlorine}$$

Mix 95 ml of household bleach (5.25%) in 25 litres of water to get a 200 ppm solution.

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Drying Practices

- In-shell nuts should be dried to 5%-8% moisture content to prevent nuts from becoming rancid or mouldy.
  - Should be dried within 24 hours after harvest.
  - Can buy a moisture meter to measure content.
- Optimal drying temperature is between 32.2^{o}C-38^{o}C.
- Can be dried in permanent bulk dryers or portable bin dryers.
- For small operations, homemade box dryers are suitable.
  - Remodelling a modern tobacco kiln or grain dryer.
    - Ensure these are clean, sanitary and pest proof.
- After drying, hazelnuts should be stored in plastic lined air tight containers.

Storage

- Stored hazelnuts should be kept in a clean, cool, dry place.
  - Ideally below 8^{o}C with 60-65% relative humidity.
- Storage life can largely depend on temperature.
  - Can go rancid within a few weeks if left at room temperature.
- Protect nuts from rain, insects and other pests (e.g. rodents, birds).
- Nuts should be kept away from wall and off the floor.
  - If possible, they should be covered as well.
- Hazelnuts in-shell or as kernels can be kept for longer period of time at cold (just above 0^{o}C) or freezing temperatures.

Traceability System

- A **traceability system** is the method, format and procedures used by your operation to:
  - Collect, keep, and share information about products and processes.
  - Track raw materials, ingredients and finished product through receiving, processing and distribution.
- Essentially it is your record-keeping system.
  - To track products effectively backwards and forwards through production.
- Traceability systems can be paper-based forms or electronic.
- Most businesses use a combination of both to suit their unique business needs.


Effective and Complete
Traceability System
Premises Identification
Product Identification
Movement Recording

Three Pillars of Traceability

There are “Three Pillars of Traceability”:

1. Premises Identification
    - A unique identifier for the location or facility where product movement/production occurs.
        - At a minimum you need a physical address, and/or a Premises Identification Number which can be obtained from Ontario Provincial Premises Registry (PPR).

2. Product Identification
    - A lot code or lot/batch number that uniquely identifies a product or item.

3. Movement Recording
    - Recording the movement of a product from one location to another (e.g. from supplier location to production location).

Processing Nuts

- Once you process nuts (e.g. roasting, nut butters) this falls under Ontario Regulation 493/17: Food Premises.
  - This Regulation replaced Ontario Regulation 562 on July 1, 2018.
- The overall goal of O. Reg. 493/17 is to make sure food is kept safe to prevent foodborne illness.
- The regulation sets out the requirements that food premise owners and operators must follow.
- It covers safe food handling, cleaning and sanitizing, operations, and maintenance.
- If you are doing any processing activities be sure to contact your local Public Health Unit.

Creating a Food Safety Plan

- Get thinking about your farm and practices.
- Make a plan to follow and ensure everyone who works on your farm is directly involved.
- Document your progress.
- Is not required by regulation, but is a good idea!
  - A written food safety plan may be required by third party audits and some buyers.
- Commitment to food safety is critical to success.

Creating a Food Safety Plan

1. Assess Risks
2. Implement Practices
3. Monitor Practices
4. Outline Corrective Actions
5. Keep Records

Resources

- OMAFRA Infosheets
  - Hazelnuts in Ontario - Growing, Harvesting and Food Safety
  - Food Safety Monitoring Program for Foods of Plant Origin
- Food and Agricultural Organization of the UN and the World Health Organization Publication:
  - Preventing *Salmonella* and *E. coli* in tree nuts
- Grocery Manufacturers Association (GMA)
  - Industry Handbook for Safe Processing of Nuts

Questions

For further information, please contact:

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ADDITIONAL SLIDES FOR QUESTIONS

Labelling

- O. Reg. 119/11 requires in-shell nuts to be identified with specific information for labelling, signage and advertising.
- Labels on packages must include:
  - Name and full address of producer or packer
  - Country or province of origin
    - You must use one of the following phrases:
      - "Product of"
      - "Produce of"
      - "Grown in"
      - "Country of Origin"
  - The common name of the product if it cannot be easily identified through the packaging.
  - Net weight (*Consumer Packaging and Labelling Act*)
    - Metric (imperial can be in addition)

Labelling for Bulk Containers

- Bulk containers should have the same information as consumer ready packages
  - The common name of the product
  - Name and full address of producer or packer
  - Country or province of origin (i.e., Product of Ontario)
- Packages that are filled from labelled bulk containers do not need to be labelled

Advertising and Retail Display Sign Requirements

- Must be on or immediately over the display
- Country or province of origin
- Price per unit of weight in metric, if sold by weight (imperial can be used in addition)
- Print size – readily discernable and in reasonable proportions to the size of the sign