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A GUIDE TO MEETING THE NOVA SCOTIA FOOD SAFETY GUIDELINES FOR MEAT PROCESSORS

Supporting meat processors in Nova Scotia to meet the requirements of the Nova Scotia Food Safety Guidelines for meat processors by enhancing quality and food safety knowledge and education.


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DOWNLOADABLE FORMS

To download the forms that are highlighted throughout this book please go to https://www.perennia.ca/foodsafetyresources/ or review page 49 in this book for a full list.

INTRODUCTION

Our Quality and Food Safety Team is pleased to present a guide that has been developed to support Meat Processors in Nova Scotia meet the requirements of the Nova Scotia Food Safety Guidelines for Meat Processors.

With this guide, we hope to enhance your knowledge of the requirements and provide resources to assist you in developing and implementing a food safety management program that meets the requirements or to assist you in strengthening your current program.

The resources mentioned throughout this guide can be found on Perennia's website under Quality & Food Safety/Food Safety Resources.

If you have questions, feel free to contact our Quality and Food Safety Specialists. We are here to help.

Perennia's Quality and Food Safety Team

Elaine Grant, Shelly MacDonald, Cheryl Andrews, Amanda Cameron

OVERVIEW

Anyone who prepares and sells food is responsible for providing a safe product. Consumers want to know their food is safe. The Nova Scotia "Food Safety Guidelines for Meat Processors" supports this through the implementation of these requirements.

Through the development and implementation of a food safety management system designed to meet these requirements, food safety hazards can be greatly reduced or even eliminated in some cases. This is the most significant reason to implement a food safety management system. It also comes with additional benefits: it helps meet consumer expectations, reduces consumer complaints, reduces recalls, reduces rework, reduces waste and reduces legal liability – all of which are costly ordeals. The development and implementation of a food safety management system designed to meet provincial requirements equals due diligence, and it protects your brand.

Although consumers are responsible for handling their food with care (i.e., proper storage temperatures, avoiding cross-contamination/cross-contact, etc.), the assurance that a food product will not cause harm to a consumer largely remains the responsibility of those processing, manufacturing, storing and transporting the food. This guide will help Meat Processors interpret the regulations and determine if they are currently meeting the requirements or help identify areas for improvement in their current programs.

TYPES OF FOOD SAFETY HAZARDS

Hazard concerns with meat processing are biological, chemical and physical hazards.

Biological hazards include bacteria, viruses, parasites, or fungi (yeast and molds) that can cause food-borne illness if they or their toxins are ingested. Biological hazards can be found anywhere that conditions favour their growth. Such conditions include ideal: temperature, humidity, pH, water activity (a_w) and oxygen availability. Bacteria can be found in soil, mud, air (i.e., aerosols or dust suspended in air), water, decaying matter, fecal matter, sewage, the gut of warm-blooded animals, and even in our nose, mouth and on our skin. Fungi are typically found in warm and humid environments.

Chemical hazards can fall into four broad categories; naturally occurring toxins and allergens (i.e., shellfish toxins and mycotoxins); chemicals intentionally added to food (i.e., water, preservatives and additives); chemicals unintentionally added to food (i.e., chemicals from packaging material, chemicals used for cleaning or maintenance and chemicals from equipment such as lead residues); and radiological hazards, although they are rarely encountered in food, when they do occur they can present a risk (i.e., from contaminated soil, water or air; packaging materials; ingredients with radionuclides). Chemicals that are intentionally added to food are not intended to be hazardous. However, higher than desired amounts may render them harmful to human health.

A physical hazard is any extraneous or foreign material or object that can cause injury or illness to a consumer, such as (but not limited to) bones, glass, plastic, metal, wood, animal droppings or insects.

HOW DO I USE THIS GUIDE?

This guide is meant to be a tool to assist Nova Scotia Meat Processors in meeting the requirements of the "Food Safety Guidelines for Meat Processors". It can be used to assist you with interpreting the regulations and determining if you are currently meeting them or help identify areas for improvement in your current program. It is designed to include the current regulations (as of August 2021) as they apply to meat processing, packaging, storing and transport within Nova Scotia.

This guide begins with preventing hazards through facility design and flow and continues through detailing the preventive product and process controls that are required to be in place to control potential hazards at your operation through the development and implementation of your Preventive Control Plan (PCP).

Depending on your activities, some aspects of the regulations and components in this guide may not apply to you. Mark these sections as Not Applicable (N/A) and move onto the next component. This guide will complement those resources already posted in the Food Safety Resources section on the Perennia Food and Agriculture website. For those resources not on our website, an appendix section of this guide has been created to capture this information. There are also sample forms/records you can use, or you can create your own and use the samples provided as a guide to help you draft your Preventive Control Plan and supporting documents.

GUIDE LAYOUT

Each section is laid out to match the flow of Nova Scotia's "Food Safety Guidelines for Meat Processors" as they apply to meat processing.

The **TITLE** of each section matches that of the sections in Nova Scotia's "Food Safety Guidelines for Meat Processors".

REQUIREMENTS are the specific guidelines as they are written in Nova Scotia's "Food Safety Guidelines for Meat Processors".

RATIONALE is the reasoning (the why) these requirements must be met.

INTERPRETATION is our interpretation of how you can meet these requirements.

The **CHECKLIST** details what documents you need in your program to meet the requirements of each section as it pertains to you. It can also be used as a "to-do list" while actively using this guide to check off what has been completed.

The **APPENDIX** consists of guidance and resources, which were compiled in response to frequently asked questions we have received from Meat Processors. This information is in-addition to resources available on our website.

The **DOWNLOADABLE FORMS** are editable PDFs that can be used as-is or as a guide when developing your own customized forms and records.

The following is a list of terms with accompanying definitions. This glossary elaborates on specific terms you will see referenced throughout this guide. Terms marked with an asterisk (*) come directly from the Nova Scotia "Food Safety Guidelines for Meat Processors".

ACIDITY*: describes how much acid is in a food product. Higher acid increases the tangy or sour taste of food. Many pathogenic bacteria cannot grow in foods with high level of acid, specifically with a pH of 4.6 or lower.

ACIDULANTS OR ACIDIFIERS*: ingredients added to food products to lower the pH, and therefore limit or control the growth of pathogenic bacteria. Examples of acidifiers are Gluconolactone, or Citric Acid.

ADDITIVES/PRESERVATIVES: a food additive is any substance that, when added to a food, becomes part of that food or affects its characteristics. A preservative is a class of food additives used to protect a food from spoilage and other undesirable quality attributes.

ALLERGEN: a protein that causes physiological reactions due to an immunological response. CFIA priority allergens are peanuts, tree nuts, sesame, soy, fish, crustaceans and molluscs, wheat and triticale, eggs, milk, mustard and sulphites.

a_w, OR WATER ACTIVITY*: the amount of available moisture in a food that microorganisms can use to grow and multiply. If you control the amount of moisture in food, you can limit and control the growth of pathogenic bacteria.

CALIBRATION: measuring the accuracy of a device to a known standard and adjusting, as necessary, so that it conforms to the standard.

CCP – CRITICAL CONTROL POINT: a step at which a control measure is essential to prevent, eliminate or reduce any biological, chemical, or physical hazard that presents a risk of contamination of a food to an acceptable level.

CONSUMER: the final user of the purchased goods.

CONSUMER PREPACKAGED: packaged in a container in the manner in which the food is ordinarily sold to or used or purchased by an individual - or in which the food may reasonably be expected to be obtained by an individual - without being repackaged, to be used for non-commercial purposes.

CORRECTIVE ACTION: any action or step taken to eliminate or resolve the cause of a deviation from the written food safety program.

CROSS CONTAMINATION POINTS: points throughout the process where if control measures are not put in place, a hazard associated with one process, product, or item may contaminate another.

CURING*: describes various meat preservation and flavoring processes that involve adding combinations of salt, nitrates, nitrites, and/or sugar. Curing can reduce the water activity of meat, and adding nitrate/nitrite salts prevents bacterial growth.

DEVIATION: a variation from a written procedure, specification, standard or regulation.

ESTABLISHMENT: any domicile where a food is manufactured, prepared, stored, packaged or labelled.

EXPORTING: sending food to another country.

FERMENTATION*: a process in which lactic acid-producing bacteria increase the acidity of a food by converting sugars, such as dextrose or sucrose in the meat mixture, to lactic acid. By lowering the pH, you can limit or control growth of pathogenic bacteria.

FOOD CONTACT SURFACE: any surface where opened (unpackaged) or packaged product will come into direct contact.

FOOD SAFETY CONSULTANT*: an experienced food safety professional who provides expert knowledge for a fee. They work in an advisory capacity only and usually are not accountable for the outcome of a consulting exercise.

HAZARD: any biological, chemical or physical risk that has the potential to cause illness or injury to a consumer.

HAZARD ANALYSIS: the process of identifying and assessing potential hazards by determining the risk level associated with the likelihood and severity level.

HAZARD ANALYSIS CRITICAL CONTROL POINT (HACCP): a systematic, scientific approach to the identification, evaluation and control of food safety hazards during the production and manufacturing of food.

HEAT TREATMENT*: heat can be used as a kill step (i.e., cooking) to make a ready-to-eat meat product. Heat treatment can also refer to a process that uses heat to change the look and taste of a meat product but does not guarantee the safety of the food product (i.e., cold smoking). The times and temperatures used will vary depending on the purpose of the heat treatment.

HIGH-RISK: foods that are ready-to-eat, do not require further cooking and provide an environment for bacteria to live, grow and thrive.

IMPORTING: bringing food into Canada from a foreign country.

INTERPROVINCIAL: the trade of food from one province or territory to another.

INTRAPROVINCIAL: the trade of food within a home province or territory.

LABELLING: the act of applying information on a product.

LICENSE: a permit allowing an establishment to conduct registered activities.

MODIFIED ATMOSPHERE PACKAGING (MAP) OR CONTROLLED ATMOSPHERE PACKAGING (CAP)*: MAP involves replacing air and oxygen inside a sealed package with an inert gas, such as nitrogen, carbon dioxide, or carbon monoxide. CAP uses a MAP process that includes a packet of oxygen-absorbing material inside the package.

MONITOR: a designated individual who plans to observe or measure control parameters to assess whether a control measure is effective.

NITRATE/NITRITE*: chemical compounds added to meat through the curing process. Nitrite prevents the growth of pathogenic bacteria and spoilage organisms, as well as giving the meat product a desirable pink-red "fresh" color. In meat, nitrate will convert to nitrite as time passes. Adding nitrate to meat is useful where a long release of nitrite is needed.

NON-FOOD AGENT: chemicals that are not considered to be a food or food ingredient. These include cleaning chemicals, detergents, lubricants, agricultural chemicals and pest control products.

PACKING: physically placing product into packaging materials.

PRIMARY PACKAGING: packaging in direct contact with the product.

pH*: a measure of acidity (pH <7) or alkalinity (pH >7) of a food.

PREVENTIVE CONTROLS (PCs): control measures (i.e., sanitation, maintenance, calibration, training, pest control, etc.) used to prevent the risk of contamination of food and achieve compliance with regulatory requirements.

PREVENTIVE CONTROL PLAN (PCP): a written document that demonstrates how risks to food are identified and controlled through preventive controls/prerequisite programs/good manufacturing practices or critical control points (similar to a HACCP plan).

PERSONAL EFFECTS: refers to privately owned items (i.e., jewelry, earbuds, phone, lunches, clothing, medication, etc.).

POTABLE WATER*: water that is safe for human consumption. Potable water must conform to the standards outlined in Health Canada's Guidelines for Canadian Drinking Water Quality.

RECIPE*: the ingredients of the meat product and the components of the ingredients, including food additives, and the proportions of those ingredients and components.

RISK ASSESSMENT: the documented process of identifying, measuring and evaluating the level of risk associated with a product, process, procedure or environmental factor to determine the appropriate control measures.

SAFE FOOD FOR CANADIANS REGULATIONS (SFCR): is a single set of rules for all food commodities to ensure that food prepared domestically, imported, or exported is safe for consumers, complies with grade requirements and is labelled and presented in a way that is not false or misleading. These regulations are enforced by CFIA.

SANITATION STANDARD OPERATING PROCEDURE (SSOP): written procedures that address sanitation conditions and practices before, during and after processing.

SECONDARY PACKAGING: packaging used outside of the primary packaging. This could be the label or an outer packaging securing multiple units contained within primary packaging.

SPECIFICATION: a detailed description of a material, product or service that outlines important characteristics, attributes or requirements.

STANDARD OPERATING PROCEDURE (SOP): written procedures for preventive control measures, production and process control designed to assure the production of safe food.

STARTER CULTURE*: a product made up of microorganisms that perform the fermentation of food products. Starters usually consist of nutrient liquids or powdered cultivation medium that have been colonized by specific bacteria, yeast, and molds.

STORING: keeping product in a pre-determined location (ambient – dry storage, refrigerated storage, frozen storage) for a pre-determined amount of time.

TERTIARY PACKAGING: bulk or transport packaging used to secure groups of products contained within secondary packaging, i.e., shrink wrap.

TRACEABILITY: the ability to track the movement of product one step forward (person to whom you provided the food) and one step back (supplier) in the supply chain.

RECALL: the removal from sale or use, or correction, of a marketed product that poses a health risk or is non-compliant with respect to legislation.

RETAIL: refers to the sale of food to consumers for consumption. Examples: supermarkets, farmers' markets, grocery stores, bakeries and butcheries.

VERIFIER: a designated individual who ensures the monitor is effectively observing or measuring control parameters of a control measure. This individual is referred to as the double checker and should not be the same person as the monitor unless absolutely necessary.

LICENCE

Anyone who plans to operate a meat slaughtering or meat processing business located in Nova Scotia is required to obtain a Meat Slaughtering and Processing Licence under the Meat Inspection Act.

ISSUING DEPARTMENT

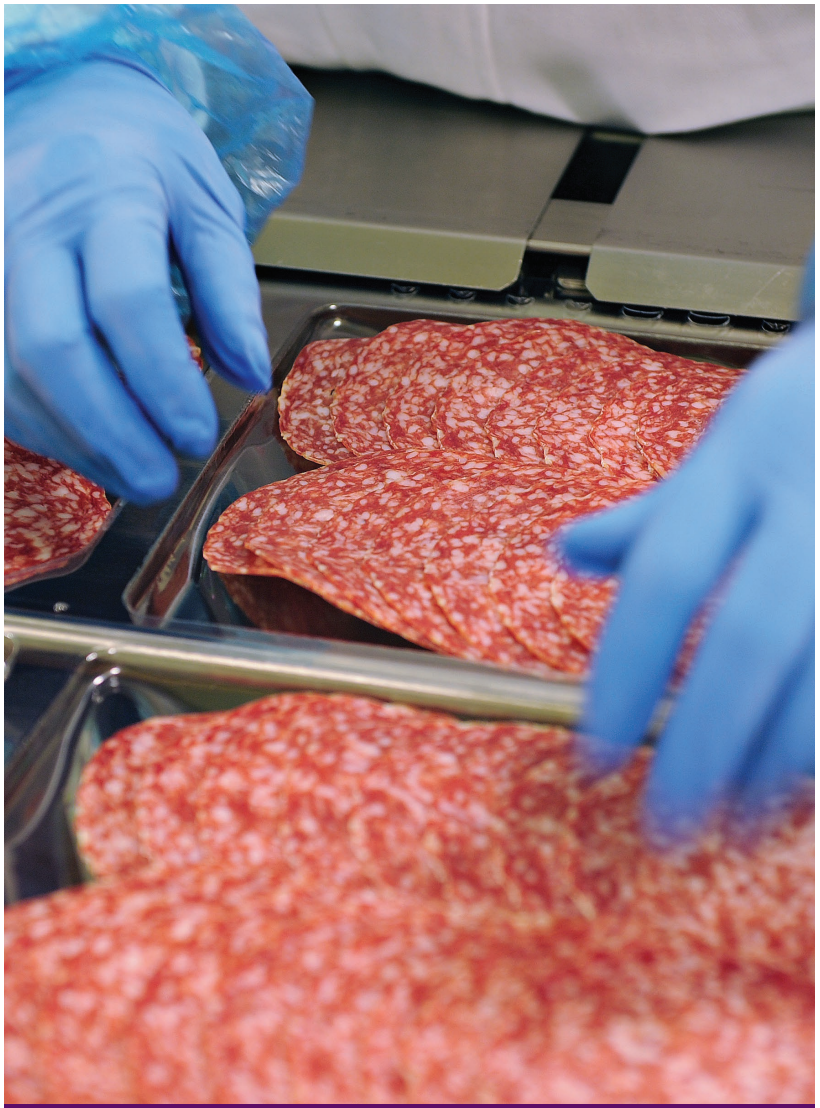
The Nova Scotia Department of Environment is responsible for issuing the Meat Slaughtering and Processing Licence.

INSPECTIONS

Meat inspections within Nova Scotia are a shared responsibility between the provincial and federal governments. The Department of Environment is responsible for inspecting meat slaughtering and processing facilities selling meat within Nova Scotia. The Canadian Food Inspection Agency is responsible for inspecting meat slaughtering and processing facilities selling meat outside of Nova Scotia (crossing provincial borders and internationally).

LICENCE PROCESS

A business must first complete the application form. The Department of Environment will then assess the building plan (facility and premises), process controls and conduct a site visit. Once successful, the licence is issued.



MEETING THE NOVA SCOTIA FOOD SAFETY GUIDELINES FOR MEAT PROCESSORS

1 – GUIDELINE APPLICATION

REQUIREMENTS:

These guidelines apply to any facility that has been issued:

- **a food establishment permit** under the NS Food Safety Regulations (2004), pursuant to the Health Protection Act, and established by the Administrator under Section 4 (1) of these regulations
- **a license for the operation of a meat processing plant** under the NS Meat Inspection Regulations (1990), pursuant to the Meat Inspection Act

In addition, the operator must be aware of and comply with the following, if applicable:

- Nova Scotia Food Safety Regulations
- Nova Scotia Food Retail and Food Services Code
- Nova Scotia Meat Inspection Regulations

Nova Scotia Department of Environment and Climate Change, Inspection, Compliance and Enforcement Division, is responsible for the approval and inspection of meat processors. Public health officers are available for consultation and questions related to your meat processing operation.

RATIONALE:

Processing activities can introduce risks to food safety if adequate controls are not in place. By implementing licences and permits, it allows the government to inspect and enforce regulations to ensure proper control measures are put in place.

INTERPRETATION:

The "Food Safety Guidelines for Meat Processors" apply to any facility that has been issued a food establishment permit and/or a license to operate a meat processing plant. The operator must also be aware of and comply with the Nova Scotia Food Safety Regulations, Nova Scotia Food Retail and Food Services Code, and the Nova Scotia Meat Inspection Regulations as applicable to their operation. Ensure your permit/license is current as applicable.

CHECKLIST

- ☐ You have been issued a food establish permit under the NS Food Safety Regulations (2004), pursuant to the Health Protection Act, and established by the Administrator under Section 4 (1) of these regulations **and/or**
- ☐ You have been issued a license for the operation of a meat processing plant under the NS Meat Inspection Regulations (1990), pursuant to the Meat Inspection Act **and**
- ☐ You are aware of and comply with the following as applicable to your operation:
  - ☐ Nova Scotia Food Safety Regulations
  - ☐ Nova Scotia Food Retail and Food Services Code
  - ☐ Nova Scotia Meat Inspection Regulations
- ☐ Your permit/license is current

2 – PREVENT HAZARDS THROUGH FACILITY DESIGN AND FLOW

REQUIREMENTS:

The **design and construction** of the meat processing facility must prevent hazards that may be present from posing a risk of contamination to the food.

The size and layout of the facility must accommodate the activities conducted. Incompatible operations must be effectively separated. For example,

- cleaning and sanitizing activities occur separately from food preparation activities
- raw food is handled in an area separate from the handling of ready-to-eat (RTE) food
- shipping of finished products is conducted in an area separate from the receiving of incoming ingredients
- waste is stored away from food preparation areas
- food with allergens is handled separately from food without allergens

The **pattern of product flow** should be one-way to ensure that incompatible activities do not occur in the same room or area at the same time:

- Separate raw and unprocessed food from processed foods
- Separate foods containing allergens from allergen-free foods, and check that cleaning is effective
- Use separate equipment and utensils for raw, potentially hazardous foods and RTE food products
- Evaluate areas of shared equipment or physical cross-over to ensure there are not any cross-contamination points. For example, products containing an allergenic ingredient do not travel on a conveyor belt above a product that does not contain allergens
- Use dedicated lines whenever possible: this could prevent cross-contamination of a RTE food product
- Prepare RTE food at the beginning of the operation, before preparing food in which low levels of pathogens can occur without presenting a health risk, or after a full clean-up and sanitization
- When designing the process,
    - consider the proximity of equipment to other machines
    - avoid line cross-over
    - allow sufficient space to perform wash downs
    - reduce the creation and spread of dust
- Identify sanitary and restricted access zones to help control traffic flow patterns and equipment between the incoming ingredients and the finished products
- Establish a flow of operations that prevents employees working in the raw processing area from accessing the RTE area

RATIONALE:

The design and construction of a food manufacturing facility can greatly impact the safety of the product. Building structure, design, condition and equipment layout, can all pose risks to the product if it's not well constructed and maintained.

The pattern of product and employee flows can pose risks to product safety if they're not controlled between incompatible operations, resulting in cross-contamination/contact. By developing and implementing controls to ensure incompatible operations and incompatible product and employee flows do not occur, the introduction of biological, chemical and physical hazards can be prevented.

INTERPRETATION:

The facility shall be constructed and maintained to reduce the risk of contamination, and operational (product and employee) flows must be controlled to prevent risks of contamination. Consider the following traffic flows:

- Employees
- Visitors/Service Providers/Contractors
- Ingredients
- Product (work in process, raw, RTE, finished)
- Packaging
- Allergens
- Chemicals
- Waste/Compost

CHECKLIST

Design and Construction

☐ **Exterior & Interior Inspection Checklist**

- ☐ The building exterior and ground conditions effectively prevent contamination (i.e., adjacent operations do not interfere with safe and hygienic operation, good condition, well maintained and free of pest harbourage areas)
- ☐ The size and layout of the facility accommodates the activities conducted
- ☐ Incompatible operations must be effectively separated (i.e., cleaning and sanitizing activities occur separately from food preparation activities, raw food is handled in an area separate from the handling of RTE food, shipping of finished products is conducted in an area separate from the receiving of incoming ingredients, waste is stored away from food preparation areas, food with allergens is handled separately from food without allergens)
- ☐ Doors are self-closing and close-fitting (i.e., no gaps or visible light when closed)
- ☐ Floors, walls, ceilings, windows and doors are cleanable, constructed of appropriate materials and designed to allow maintenance, cleaning and sanitizing
- ☐ Windows are screened and shatter proofed if located in food handling and storage areas
- ☐ Lighting in storage and production areas is adequate/protected/shatter proof
- ☐ Sound construction and good condition
- ☐ Air intakes and vents are screened, if applicable
- ☐ Ventilation provides sufficient air exchange to prevent the accumulation of steam, condensation and dust, to remove contaminated air
- ☐ Drains are accessible for cleaning and maintenance
- ☐ Floors are in good condition with no pooling water
- ☐ No leaking of overhead pipes or cooling units

☐ **Pest Control Records**

☐ Employee training on design and construction

Pattern of Product and Employee Flows

☐ Operational flow does not pose a risk of cross-contamination/contact. Identify points where they overlap and pose a potential source for cross-contamination/contact (i.e., raw and RTE food products and areas, allergen-containing and non-allergen-containing food products)

- ☐ Raw food is handled in an area separate from the handling of RTE food
- ☐ Use separate equipment (dedicated lines where possible) and utensils for raw and ready-to-eat (RTE) food
- ☐ Prepare RTE food at the beginning of the operation, before preparing food in which low levels of pathogens can occur without presenting a health risk, or after a full clean-up and sanitization
- ☐ Evaluate areas of shared equipment or physical cross-over to ensure no cross-contamination/contact points
- ☐ Take the following into consideration when designing the process:
  - Consider the proximity of equipment to other machines,
  - Avoid line cross-over
  - Allow sufficient space to perform wash downs
  - Cleaning and sanitizing do not pose a risk to food safety
  - Reduce the creation and spread of dust
- ☐ Allergen Management Program is in place:
  - Use separate equipment (dedicated lines where possible) and utensils for allergen-containing and non-allergen-containing products
  - Proper production scheduling (i.e., process non-allergen-containing products first or on separate days, or after a full clean-up and sanitization)
  - Evaluate areas of shared equipment or physical cross-over to ensure no cross-contact points
  - Allergens in employee lunches (handwashing is key, leaving work effects at the worksite to avoid cross-contact)
  - Designate allergen storage areas (where applicable)
  - Allergen-free clean-up and inspections (where applicable)
  - Food-grade lubricants used do not contain allergens
  - Correct labelling and verifications

Pattern of Product and Employee Flows continued

- ☐ Operational flows are identified on the pant schematic and hazard analysis forms with control measures in place to minimize the risk of cross-contamination/contact (refer to component 9 – Create a preventive control plan)
- ☐ Cross-contamination points are identified on the plant schematic
- ☐ Handwashing sinks, employee welfare rooms (lunchroom, washrooms, change rooms), storages, chemical storages and equipment layout should be identified
- ☐ Employee training on the pattern of product and employee flows and the Allergen Management Program
- ☐ Return Products/Non-Conforming Items Policy
- ☐ Held items are identified

Removal and disposal of contaminated materials and waste

- ☐ Waste Management Program
  - ☐ Waste is stored away from food preparation and emptied at appropriate frequencies, not allowing waste to overflow
  - ☐ Waste containers are identifiable
  - ☐ Cleaning and sanitizing of waste containers
- ☐ Employee training on Waste Management Program

3 – PREVENT CROSS-CONTAMINATION BETWEEN RAW AND RTE MEAT PROCESSING OPERATIONS

REQUIREMENTS:

Meat processing facilities that process both raw and ready-to-eat products (RTE) must meet extra requirements to ensure product safety:

- **new facilities** must be laid out to ensure spatial separation at each step of the process, from storage to post-processing
- **existing facilities undergoing renovations** must be laid out to ensure spatial separation at each step of the process, from storage to post-processing
- **existing facilities** that cannot ensure complete spatial separation must use temporal separation to prevent cross-contamination
- Meat processing facilities that produce both raw and RTE products must have employee procedures in place to prevent cross-contamination from the raw production area to the RTE production area:
  - employee handwashing
  - personnel equipment changes — aprons, clothing, footwear
  - established traffic flows between raw product areas and finished product areas
  - entry restriction to these areas, if applicable

RATIONALE:

A well-designed facility paired with well-planned operational flows (product and employee) and good hygiene can ensure the extra requirements for meat processing facilities that process both raw and RTE products are met to ensure product safety by preventing the introduction of biological, chemical and physical hazards.

INTERPRETATION:

By designing your facility and developing and implementing your food safety management program to meet the requirements of components 2 – Prevent hazards through facility design and flow and 6 – Prevent contamination through good employee practices, you will meet the extra requirements for meat processing facilities that process both raw and RTE products to ensure product safety.

CHECKLIST

- ☐ Meets all requirements of component 2 – Prevent hazards through facility design and flow **and**
- ☐ Meets all requirements of component 6 – Prevent contamination through good employee practices

4 – MEET FACILITY EQUIPMENT REQUIREMENTS

REQUIREMENTS:

Equipment must be designed and constructed to be durable and to retain characteristic qualities under normal use and conditions.

Meat processing equipment should comply with international sanitation standards, such as those administered by third parties — NSF International, UL of Canada.

RATIONALE:

Equipment that is well-constructed, maintained and meets sanitation standards (cleanable) minimizes the potential for biological, chemical and physical hazards.

INTERPRETATION:

Conveyances and equipment may present a risk of biological, chemical and/or physical contamination if they are not designed, maintained or able to be cleaned effectively. Well-constructed, maintained and cleanable equipment minimizes risks.

Procedures shall be in place to:

- Ensure only proper chemicals (lubricants, oil, grease, etc.) are used on equipment
- Equipment is designed and constructed of food-grade materials
- Provide the necessary training of staff on equipment purchasing requirements, maintenance procedures and sanitation procedures

CHECKLIST

Develop and implement a Preventative Maintenance Program (detailing the following):

- ☐ Equipment design and construction is maintained and in good condition, allows for easy cleaning (i.e., no dead zones (hidden/hard to clean areas), open ends, away from walls, easy access)
- ☐ Food contact surfaces that are easy to clean, non-porous, smooth (free from cracks, crevices, pitting or flaking) (i.e., stainless steel, hard plastic, corrosion-free), and gauges on equipment are shatter proof or protected from breakage
- ☐ Storage containers, carts, bins, totes and equipment parts/utensils are food grade, cleanable and in good condition
- ☐ No temporary repairs (i.e., string, cardboard, wire, tape), missing nuts, screws, bolts or cracks in surfaces
- ☐ Preventative Maintenance Program and Equipment List
- ☐ Preventative Maintenance Schedule
- ☐ **Preventative Maintenance Records**
- ☐ Equipment inspections
- ☐ Service reports from outside contractors, if applicable
- ☐ Employee training

5 – ESTABLISH A FACILITY SANITATION PROGRAM

REQUIREMENTS:

Facility operators must establish a **sanitation program**.

The sanitation program must be properly followed, monitored, and verified.

A sanitation program should include but is not limited to:

- areas and items of equipment to be cleaned/sanitized
- designated employee responsible for the cleaning/sanitizing
- chemicals and process to be used:
  - include concentrations and contact time
  - use products with a drug identification number (DIN)
  - check Health Canada's list of approved sanitizers
- procedures used
- frequency of cleaning and sanitizing
- inspection and monitoring records

RATIONALE:

Improper or inadequate sanitation or use of improper chemical concentrations can lead to contamination of food, ingredients, packaging materials and food contact surfaces.

INTERPRETATION:

If surfaces are not cleaned, it will cause:

- bacteria growth causing food spoilage which can affect product quality (i.e., taste, appearance or reduce shelf-life) and potentially cause consumer illnesses
- contamination of the next day's production
- insects and rodents to be attracted to your facility

There are two types of surfaces that need to be kept clean: food-contact and non-food-contact surfaces. Food contact surfaces are surfaces in direct contact with food, food packaging or other food contact items such as knives, utensils, cutting boards, tables, containers, rollers/conveyors, stuffers, grinders, mixers, slicers and other equipment. Surfaces above food contact areas are also considered to be food contact surfaces. Non-food-contact surfaces are surfaces that are not, or should not be, in direct contact with food or food materials, i.e., floors, equipment legs, mop buckets, brooms, walls and pallets.

The sanitation program should include documented procedures on how the cleaning is to be carried out for all areas and equipment; frequencies of cleaning activities; who is responsible for the cleaning activities; housekeeping and sanitation procedures required during operations; a means of conducting a pre-operational inspection prior to the start of production; corrective actions to be taken for non-compliant situations observed; and finally, records that are to be kept.

Chemicals for cleaning and sanitizing food contact surfaces must be suitable for the intended use and not contaminate the food product. Cleaning and sanitizing chemicals for food and non-food-contact surfaces must be differentiated and applied using the manufacturer's instructions (i.e., concentration, contact time, water temperature, etc.). Ensure all food or packaging material is protected before using any cleaning and sanitizing chemicals.

A master **Sanitation Schedule** should be developed and include all items, including walls, ceilings/overheads, drains, exterior premises, and the frequency of cleaning. Cleaning may be daily, weekly, monthly, or less frequent, depending on use and debris accumulation. The master sanitation list helps to schedule and track when cleaning is done and should be in place to ensure areas and equipment do not get missed. Similar to a preventative maintenance schedule, this can be as easy as using an electronic calendar reminder or documenting it on a spreadsheet. Records must be kept of all cleaning activities.

After production is done for the day, cleaning should be done as follows:

1. **Manually** remove large particles/debris
2. **Pre-rinse** with potable water to remove large amounts of food particles/soil
3. **Wash** with detergent and mechanical action
4. **Post-rinse** with potable water to remove detergent and loosened food particles/soil
5. **Inspect**
6. **Sanitize** to kill any remaining microorganisms and prevent the growth of microorganisms
7. **Verify** that cleaning was effective through visual inspection, ATP, protein/allergen swabs, micro swabs, etc. Record results.

For more information, refer to Perennia's Fact Sheet:
Developing a Robust Cleaning & Sanitation Program

CHECKLIST

Sanitation Program:

- ☐ **Sanitation Schedule** for all equipment and facility areas, knives, utensils, cutting boards, tables, containers, rollers/conveyors, stuffers, grinders, mixers, slicers, waste receptacles, personal protective equipment, carts, pans, hoses, etc. (i.e., daily, weekly, monthly)
- ☐ Cleaning and sanitizing procedures (responsibility, methods for cleaning (i.e., pressure washing, cleaning with steam/hot water, manually scrubbing etc.), handling chemicals & chemical concentrations as per the manufacturer's instructions, PPE, etc.)
- ☐ Pre-operational inspection procedures: after cleaning and before product is handled, ensure processing, packing and storage areas and equipment are clean and free from dust, dirt, food product and excessive grease. Include other verifications as necessary: ATP, protein/allergen swabs, micro swabs, etc.
- ☐ **Sanitation Record(s)** and corrective actions are taken when deviations occur
- ☐ Employee training

6 – PREVENT CONTAMINATION THROUGH GOOD EMPLOYEE PRACTICES

REQUIREMENTS:

EVERYONE'S RESPONSIBILITY:

All operators and personnel of food premises are responsible for ensuring that food products are handled in a manner which prevents contamination. This includes storage, preparation and processing, display, service and presentation.

CLEAN CLOTHING:

All personnel in the meat processing area must wear clean outer garments. Clothing that becomes soiled should be changed. Personnel who change workstations from raw food contact activities to ready-to-eat food contact activities must remove any soiled clothing before entering that area.

HAIR AND BEARD RESTRAINTS:

Personnel entering or working in meat processing should wear hair restraints, such as clean hats or hair nets. When required, beards must be completely covered with beard nets.

HAND WASHING:

Personnel involved in meat processing who engage in activities that could result in the transfer of bacteria must wash their hands before resuming activities. Such activities include but are not limited to use of the washroom, eating, drinking, smoking, handling raw food products, touching hair/nose/mouth/eyes.

JEWELRY AND WATCHES:

Personnel who are food handlers must remove jewelry, watches, and rings before working with food.

CUTS AND BANDAGES:

Personnel with cuts and/or bandages must wear vinyl gloves or refrain from handling foods entirely.

ILLNESS:

Personnel suffering from communicable illness with symptoms such as diarrhea, fever, vomiting, jaundice, and/or sore throat with fever must be excluded from work and have the responsibility to advise management of their illness.

FOOD HYGIENE TRAINING:

The operator must:

- have successfully completed a food hygiene training program recognized by the department
- ensure that another staff member who has completed food hygiene training is present when the operator is absent
- ensure that all personnel who handle food are trained in safe food processing techniques appropriate for their level of responsibility and specific to their involvement in meat processing

RATIONALE:

Operators and personnel play a key role in producing safe, quality food; improper hygienic habits can lead to biological, chemical or physical contamination of food, ingredients, packaging materials and food contact surfaces.

INTERPRETATION:

Operator and personnel hygienic standards minimize the risk of product contamination and shall be adopted by all operators and personnel. Good Manufacturing Practices (GMP) that should be in place at your operation for all personnel are:

- Showering/bathing regularly and wearing clean clothes/workwear and footwear
- Clean, short fingernails (i.e., no fingernail polish or artificial nails)
- Jewelry, watches, and rings must be removed before working with food
- No smoking, vaping, chewing gum, eating, drinking, or spitting in the production or storage areas
- Wear hair and beard nets and suitable clothes/gloves/footwear
- Personnel who change workstations from raw food contact activities to RTE food contact activities must remove any soiled clothing before entering that area
- No personal items in production or storage areas
- No loose objects in the production area (i.e., pens, paper clips, pins, buttons, etc.)
- Cover cuts and wounds with a secure, waterproof covering that can be easily detected if it comes off (i.e., bright coloured, metal detectable) and wear vinyl gloves or refrain from handling foods
- Employees of food-contact areas displaying any symptoms of an infectious disease or illness should refrain from coming to work and only return 48 hrs after their last symptom has subsided, as their disease or illness could be transmitted through the product

- Employees should be trained to sneeze or cough into their elbow or turn their head into their shoulder, stepping away from the processing and packing area to avoid contaminating the product and/or equipment
- Employees should be trained on and follow proper traffic flow and product flow throughout the facility to prevent the risk of cross-contamination or cross-contact
- Handwashing sinks should not be used to clean food equipment and vice versa
- Doors must be kept closed at all times, including any applicable refrigerator and freezer doors
- Waste bins must be kept clean, in good condition and emptied whenever full
- Employees should be trained on how to manage blood and bodily fluid spills, glass breakage, spilled product, product that has fallen on the floor or has been exposed to dripping condensation
- Product packaging should only be used for the product, not for things such as equipment parts, temporary stands, tools or garbage
- Handwashing is the most important thing people can do to prevent food contamination. Hands need to be washed at the following times:
  - At the start of a shift
  - After breaks
  - After eating, smoking, or drinking
  - Each time an employee enters the production area
  - After handling anything dirty and returning to handle product, packaging, equipment, etc. (i.e., picking something up off the floor, handling tools, handling garbage, handling pallets, etc.)
  - After using the washroom
  - After coughing or sneezing
  - After touching their face, adjusting hair/beard nets, or using a tissue
- Owners must have successfully completed a food hygiene training program recognized by the Nova Scotia Department of Environment and Climate Change. When the owner is absent, another staff member who has completed the food hygiene training must be present. All employees that handle food must be trained in safe food processing techniques appropriate for their roles and responsibilities

Note: if your handwashing station is not hands-free, please make sure you use paper towel to turn off the taps before you begin.

For more information, refer to Perennia's Video: **How to Properly Wash Your Hands** and Fact Sheet: **Employee Training Tips**

CHECKLIST

- ☐ Personnel Training Program
- ☐ Personnel GMP and Hygiene Policy
  - ☐ Personnel Protective Equipment – clothing and footwear.
  - ☐ Personal Cleanliness – handwashing and sanitizing, where applicable
  - ☐ Personal Conduct – no food, drinks, smoking, vaping or spitting in production or storage areas. If water is allowed or required for health and safety reasons, it must be consumed and stored away from product areas, and proper handwashing following handling
  - ☐ Personal Objects – jewelry and personal effects. Personal effects must be stored away from the production and storage areas
  - ☐ Reporting of health conditions
  - ☐ Communicable disease and lesions
  - ☐ **Daily GMP Checks**
- ☐ Properly operating and adequately stocked handwashing stations
- ☐ **Personnel Training Records**
  - ☐ Proof of training effectiveness checks
- ☐ **Visitor's Record**

7 – SUBMIT RECIPES FOR REVIEW

REQUIREMENTS:

PUBLIC HEALTH OFFICER REQUESTS:

An operator must comply with requests of the public health officer to provide information that may affect the food safety of the product manufactured. This includes, but is not limited to, meat processing recipes and ingredients, and steps in the process of the product formulation.

PROVIDING PRODUCT SAFETY:

A report must be provided indicating that the recipes as submitted are acceptable to produce a safe food product. The report must indicate any parameters that require monitoring to ensure compliance — pH, water activity, additive levels, time/temperature — and must include accredited lab results. This report can be written by a food safety consultant.

TRADE SECRET PROTECTION:

The information collected is protected under the definition of a "trade secret" under the NS FOIPOP Act (1993). The information collected will be used only to determine food safety compliance with this guideline, the regulations, and acts to which the guideline is pursuant.

RATIONALE:

To ensure product safety, meat processors must comply with requests of public health officers to provide information that may affect the food safety of product manufactured, including recipes/product formulations and a report indicating the recipes/product formulations are acceptable to produce a safe food product.

INTERPRETATION:

It is important to ensure all recipes/product formulations are adequate to produce a safe food product, are documented and are available for review by your public health officer. Keep in mind that this information is protected under the definition of a "trade secret" under the NS FOIPOP Act (1993). The information collected will be used only to determine food safety compliance with the Food Safety Guidelines for Meat Processors and the acts and regulations.

Inaccurate recipes/product formulations could lead to ingredients and additives being added in excessive or insufficient amounts, compromising the food safety of your product, adherence to regulatory requirements and even the quality of your product.

To show that your recipes/product formulations are acceptable to produce a safe food product, you will need to have a report documented to show this is the case. The report must also outline any monitoring procedures used for parameters that require monitoring to ensure compliance (i.e., a_w, pH, additive levels, time/temperatures), and it must include laboratory results from an accredited lab to show any parameters required to be monitored meet compliance and to ensure the food safety of your product.

Recipes/product formulations should include which order the ingredients are to be added in, what quantities of each ingredient are required to be added, what temperatures are required for specified time periods, which processing equipment is used and the settings etc., depending on your operation and product being produced. Finished product specifications should also be noted to show which parameters the finished product should meet for things like a_w, pH and additive levels. These can be kept handwritten in a notebook, on recipe cards or may even be digital.

Be sure to document all ingredients/food additives, lot codes and amounts used on **Production/ Packing Records** to maintain product traceability.

It is also important to maintain maintenance and calibration of equipment and devices used for measuring to ensure accurate formulation (i.e., your scales and thermometers are reading correctly).

CHECKLIST

- ☐ Documented recipes/product formulations for each product as prepared
- ☐ Public Health Officer Approvals on file
- ☐ Finished product specifications
- ☐ Food safety report, including laboratory results from an accredited laboratory
- ☐ **Production/Packing Records**
- ☐ Calibration Program and Device List for any equipment and devices to ensure accuracy
- ☐ Calibration Schedule
- ☐ **Calibration Records**

8 – MEET ADDITIVE AND INGREDIENT REQUIREMENTS

REQUIREMENTS:

FEDERALLY REGULATED ADDITIVES

Foods containing additives must meet the requirements of the Food and Drug Regulations (Canada). List of acceptable additives and additive uses in food product: Federal Food and Drug Regulations, Part B, Division 16.

NITRITES/NITRATES

Premixed only:

Provincial meat processing facilities must use premixed nitrites/nitrates only, for safety reasons.

Bulk forms unsafe:

The use of bulk nitrite and nitrate compounds — that is, nitrite/nitrate compounds not mixed with salt to reduce chemical food safety risk — is not permitted in provincial meat processing facilities.

Usage:

Meat products can be cured using a slow curing or a rapid curing method. The nitrate and/or nitrite salts are used in slow curing processes whereas nitrites are used in rapid curing of meat products. Find calculations and prescribed levels on the Canadian Food Inspection Agency website: **https://inspection.canada.ca/preventive-controls/meat/nitrites/eng/1522949763138/1522949763434**

FOOD AND INGREDIENTS

Approved food sources:

All food and food ingredients used in the processing facility must be obtained from a source that is subject to inspection. All food sampling, analysis, detaining action, condemning action, and recall of food product at a meat processing facility are subject to the NS Food Safety Regulations (2004).

Potable water requirement:

When water will come into direct or indirect contact with food, it must be potable water. This includes direct or indirect contact during food handling, processing, and cleaning. This includes water in all its forms — liquid, steam, ice. Potable water must conform to the standards outlined in Health Canada's Guidelines for Canadian Drinking Water Quality. The sampling frequency will be governed by the most frequent sampling regimen required by a regulatory authority.

Starter culture:

Fermented meat products rely on the growth of specific lactic acid–producing bacteria to achieve the pH that ensures their safety. One method of fermenting involves the use of starter cultures. Starter cultures are pure, living cultures of the lactic acid–producing bacteria, available in two forms, freeze-dried and frozen cultures. Various strains can be used separately or in combination for making sausages and other meat products.

Back slopping not recommended:

The practice of back slopping is not recommended. If a facility operator proposes the practice of back slopping in fermented meat production, the facility is required to have in place strict controls including lab sampling of the inoculum batter for pH and for *Staphylococcus aureus* presence. The pH must be less than 5.3 and a confirmed absence of *S. aureus* prior to usage in the new batch.

RATIONALE:

To ensure the use of additives meets the requirements of the Food and Drug Regulations, Part B, Division 16. To ensure control measures are in place to avoid introducing biological, chemical (including radiological) and physical hazards to the finished product from inputs such as additives, ingredients, water and starter cultures.

INTERPRETATION:

The operation shall have methods developed and implemented to ensure that products contain acceptable additives, that additives are used as intended and that input materials such as ingredients, water and starter culture do not introduce hazards

Operations must ensure all inputs, including additives, ingredients and starter cultures, are purchased and received from suppliers that are subject to third-party inspection and have been evaluated and approved by the operation. All additives, ingredients and starter cultures must have current specification sheets on file and certificates of analysis, where appropriate. Specifications must be reviewed on a regular basis, and suppliers must notify the operation when changes are made and provide updated specifications.

For more information on approved suppliers and specifications, refer to Perennia's Fact Sheets: **Approved Supplier Program**, **The Importance of Choosing the Right Supplier** and **Incoming Materials and Finished Product Specifications**

Operations must develop and follow Recipe/Formula Documents and Records that outline the approved usage for additives, ingredients and starter cultures. Recipe/Formula and **Production Records** must include a section for employees to record traceability information pertaining to the inputs used during production, including the lot code of the raw material, ingredients, additives and starter cultures used and the quantities. In the event of a recall, this will allow operations to identify the affected product and recall the product quickly and efficiently. For safety reasons, only premixed nitrates/nitrites are permitted. Find calculations and prescribed levels for nitrates/nitrites on the CFIA website, link: **Preventive control recommendations on the use of nitrites in the curing of meat products - Canadian Food Inspection Agency (canada.ca)**

Scales that are used to weigh the quantity of inputs used during production must be included in the Calibration Program. The program must detail each scale's make, model, serial number and location. It must outline how often the scales are checked for accuracy in-house, as well as the annual third-party calibration completed by an approved, qualified contract service provider. Standard weights that are used to ensure scale accuracy must also be calibrated, at minimum every 5 years or when dropped or damaged, to ensure they remain accurate. It is best practice to calibrate your weights annually when you calibrate your scales. Scale accuracy checks must be recorded, and calibration certificates must be maintained on file.

For more information on scale accuracy checks, refer to Perennia's Video: **How to do a Scale Accuracy Check**.

Water used for direct or indirect contact with food must be potable and tested on a regular basis. This includes water used for handwashing, food handling, processing and cleaning and includes water in all its forms — liquid, steam and ice. A Water Quality SOP must be documented and outline the source of water, treatment methods (if applicable), water testing frequency, the sampling procedure and the standards that must be met. Potable water must meet **Health Canada's Guidelines for Canadian Drinking Water Quality**.

All inputs (ingredients, additives, start cultures, etc.) must be stored in properly labelled and covered containers/bags, off the floor, away from the wall and at the appropriate temperature (if applicable). Allergens must be stored separately or on the bottom rack to prevent cross-contact in the event of a spill. Inputs must be used within their expiration date (if applicable) and follow proper stock rotation such as first in, first out (FIFO). All input materials must be labelled with traceability information, such as the supplier and lot code.

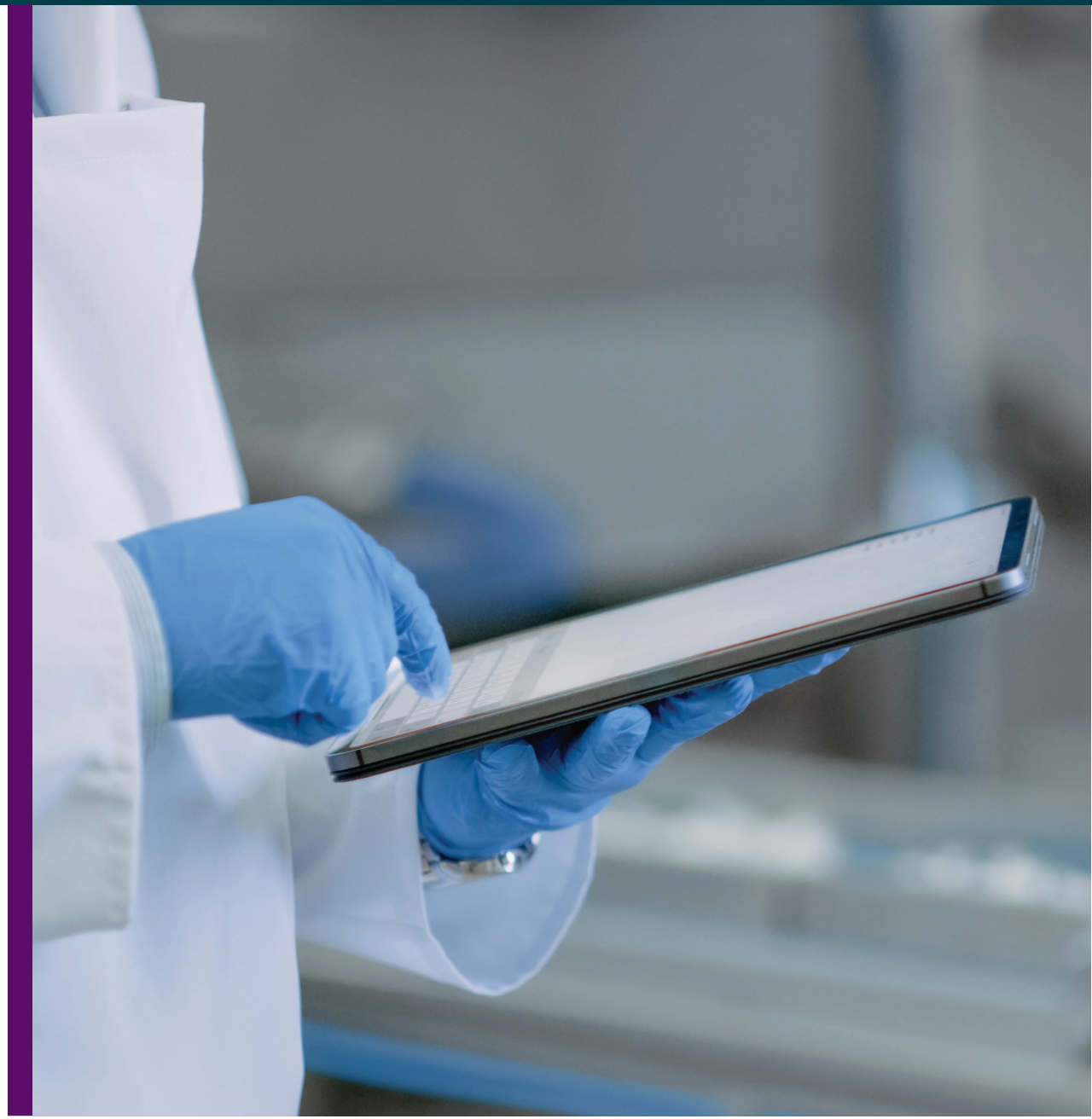
A properly documented and implemented Sanitation Program is essential in preventing the cross-contamination of products that do not contain additives. When there is a product changeover from one that contains additives to one that does not, all equipment and utensils must be cleaned and sanitized. Another option to consider to prevent cross-contamination is production scheduling. For example, an operation can run the product that does not contain additives before the product that does or if possible, they can be run on separate production lines. For more details on what to include in the Sanitation Program, refer to component 5 – Establish a facility sanitation program.

Back slopping is a culture-dependent fermentation method that involves adding a small amount of a previously fermented finished batch to inoculate a new batch of product to initiate fermentation. Back slopping is not recommended because it can affect the fermentation process and result in contamination and inconsistent quality between batches. If operations are to use back slopping, the inoculum from the finished batch must undergo testing to ensure the sample has a pH less than 5.3 and confirmed absence of *S. aureus* before use. Operations should have a documented program outlining how the sample is to be taken, how it is to be tested and how the new batch is to be inoculated in a manner that prevents contamination. All lab testing must be completed by an accredited lab, and lab test results must be maintained on file.

Employees responsible for preparing and using input materials such as additives, ingredients and starter cultures must be trained, and the training must be documented. It is important to follow up on all training with an effectiveness check to ensure the employee can carry out the procedure properly.

CHECKLIST

- ☐ Approved Supplier Program – approved additives and suppliers, spec. sheets, CoAs
- ☐ Product Inspections, Product Temperatures, **Storage Temperature Record**
- ☐ Food Carrier Inspections, temperatures
- ☐ Recipes/Formulation Documents/Records – approved usage for additives, traceability information, i.e., lot codes of ingredients/ raw materials, quantities, description, etc.
- ☐ First In, First Out stock rotation is followed
- ☐ Nitrite/Nitrate Inventory
- ☐ Where and how additives and ingredients are stored
- ☐ **Production/Packing Records** – type and quantity of additives used, traceability information, i.e., lot codes of ingredients/ raw materials, quantities, description, etc.
- ☐ Calibration Program and **Calibration Records** – for scales
- ☐ Water Quality SOP/Program Record
- ☐ Storage – inventory control, traceability, **Storage Temperature Record**
- ☐ **Sanitation Records**
- ☐ Back slopping Procedure
- ☐ Employee Training
- ☐ **Corrective and Preventative Action Report**



9 – CREATE A PREVENTIVE CONTROL PLAN

REQUIREMENTS:

A preventive control plan (PCP) **identifies** food safety risks and **demonstrates** how they will be controlled. Planning and implementing a preventative control system such as HACCP (Hazard Analysis & Critical Control Points) is an important aspect of ensuring food safety in your operation. For all proposed meat processing facilities, preventive control plans must be documented and applied.

For help developing a PCP, refer to the Canadian Food Inspection Agency website: **Fact sheet: Preventive food safety controls - Canadian Food Inspection Agency (canada.ca)**.

Food safety consultants may also be contacted to provide expertise on developing preventive control plans.

CREATE A PREVENTIVE CONTROL PLAN BASED ON HACCP PRINCIPLES

Hazard Analysis Critical Control Points (HACCP) is a system that identifies, evaluates, and controls hazards significant for food safety. Use HACCP principles to prepare your food safety plan.

Your preventive control plan needs to ensure that you control for each food safety hazard in the meat processing industry. For each product your facility produces, this system helps you identify points in the process which microbial, physical, or chemical hazards can be removed, eliminated, or reduced.

Record keeping is also an important aspect to incorporate into a preventive control plan. Keep records such as temperature logs, cooking/cooling times, pest control, sanitation, procedure for recalling products.

SUBMIT YOUR PREVENTIVE CONTROL PLAN

Your PCP plan must be submitted during the permit/license application process.

Existing permitted or licensed meat processing facilities will need to implement a documented PCP based on HACCP principles within a timeline specified by the Public Health Officer.

RATIONALE:

Preventive Control Plans identify potential hazards associated with the process and production of products. By identifying and assessing all potential hazards, control measures can be designed and implemented to reduce, prevent or eliminate hazards.

INTERPRETATION:

The Preventive Control Plan shall be developed and implemented to reduce, prevent, or eliminate hazards associated with inputs, processes and production. A Preventive Control Plan is similar to a HACCP Plan but incorporates preventive controls/prerequisite programs, including traceability and the HACCP plan. The intent of documenting a HACCP plan is to take a proactive approach to identify and control the food safety hazards associated with the production of products that are not already controlled by preventive controls/prerequisite programs.

MANAGEMENT COMMITMENT

For a HACCP-based food safety management system to be effectively implemented, you need support from management/owners. An organization's commitment to food safety will only be as strong as its leaders. Without their support, it is very difficult to implement positive change. Management/owners must demonstrate their commitment to food safety through their actions, not just their words. A template for a **Letter of Management Commitment** is available for download to use as-is or as a reference for creating your own. Refer to the Downloadable Forms (Page 49) section of this guide. This is to be signed by senior management and posted in a prominent place within the facility for all to see.

A food safety management system changes and grows with your company and must be reviewed regularly in order to keep it current and effective. As your facility, procedures, process, employees and products change, so will your program. When a HACCP Coordinator regularly reviews their preventive controls/prerequisite programs and HACCP plan, it is crucial to communicate with employees and management. This provides an opportunity to educate employees and management and learn more about the process to ensure they have things properly documented. By asking questions about the process, getting their

coworker's input, and evaluating the effectiveness of the records and standard operating procedures (SOPs) for those using them, they are positively changing attitudes and behaviours, which over time will help shape the company's culture and create awareness.

PREVENTIVE CONTROL PLAN

The Preventive Control Plan will be documented through a hazard analysis process. For each different product/process type at your facility, there needs to be a Preventive Control Plan. Hazards for incoming materials and ingredients, cross-contamination points and process steps will be identified. Appropriate controls for each will be implemented to reduce the risk or eliminate the hazard. Those control measures must be monitored to ensure they effectively control the hazard. The control measures can include preventive controls or critical control point(s). If one of those control measures fails, then corrective actions need to be taken and a corrective action/deviation report documented. The root cause of the incident needs to be determined and addressed to prevent reoccurrence.

There are 12 steps when implementing a HACCP Plan.

These steps can be divided into the five preliminary steps and the seven basic principles of HACCP.

FIVE PRELIMINARY STEPS

1. Assemble a Preventive Control Plan Team/HACCP Team
2. Describe the product
3. Identify its intended use
4. Construct a process flow diagram and a plant schematic
5. On-site verification of the process flow diagram and plant schematic

SEVEN BASIC PRINCIPLES OF HACCP

6. List all potential hazards associated with each step, conduct a hazard analysis and identify control measures
7. Determine critical control point(s) (CCPs)
8. Establish validated critical limits
9. Establish a system to monitor control of the critical control points
10. Establish corrective actions to be taken when monitoring indicates a deviation of the critical limit at a critical control point
11. Validate the HACCP plan and then establish verification procedures to confirm the HACCP system is working as intended
12. Establish record-keeping

When implementing a Preventive Control Plan/HACCP Plan, the first step is deciding who should be on the Preventive Control Plan/HACCP Team for each HACCP Plan. Secondly, determine how many HACCP Plans are needed. In other words, how many different products/processes are there? For example, a meat processor that produces pork cuts, sausage and smoked ham will have three HACCP Plans.

A Preventive Control Plan/HACCP Team can consist of senior management and production employees from various disciplines, such as:

- CEO, Owner, Operator
- Food Safety, Quality Assurance, HACCP Coordinator
- Shipper/Receiver
- Production Supervisor/Manager
- Sanitation
- Maintenance
- Purchasing and/or Sales
- Product Development

A smaller company may only have two or three people fill these roles. The person who deals with product safety and quality will have the proper food safety training and will be the one that leads the Preventive Control Plan/HACCP Team. A cross-functional team is important because food safety and quality are everyone's responsibility, and one person cannot successfully do it on their own.

The rest of the HACCP steps will correspond with forms and are discussed in further detail in the following section.

THE FORMS

A HACCP Plan generally consists of 11 forms that are best completed in the following order:

- **Form 1**: Product Description
- **Form 2**: List of Product Ingredients and Incoming Materials
- **Form 3**: Process Flow Diagram
- **Form 4**: Facility Schematic
- **Form 5**: Biological Hazard Identification*
- **Form 6**: Chemical Hazard Identification*
- **Form 7**: Physical Hazard Identification*
- **Form 8**: CCP Determination and Other Control Measures (Decision Tree)*
- **Form 9**: Hazards Not Controlled by the Facility
- **Form 10**: Critical Control Point(s) (CCP)
- **Form 11**: Process Controls (PC)

* Forms 5 to 8 can be combined into one 'Hazard Identification and CCP Determination' form.

Each form is in place to help guide the team through the hazard analysis process in order to eliminate or reduce the food safety risk in the products.

Generic Preventive Control Plan templates are available on the CFIA **website**, and examples of HACCP Forms 1-11 are available in the CFIA Archive for "**HACCP Generic Models and Commodity-Specific Food Safety Guidance Documents**" to use as a reference for creating your own.

Form 1's basic purpose is to record the products produced, their specific requirements and special characteristics that need to be considered when completing a HACCP plan. Form 1 should include the product name, important characteristics, how the product will be used (including who the product may be consumed by), packaging used, shelf-life of the product, where it will be sold, important labelling instructions and special distribution controls. With regard to the intended use of the product, be very clear in the documentation and on the labels as to the intended final use of the product; for example, include a 'ready-to-eat' statement.

The purpose of Form 2 is to help identify all ingredients, processing aids, other inputs and packaging materials used to produce the products recorded in Form 1.

Form 3 is documented to show the process steps for the products listed in Form 1. The process flow diagram gives you a snapshot of the process and helps determine what potential hazards could be present at each step in the process. It is important to include everything (inputs and outputs), including rework, store sales, samples and waste where applicable. Each step in the process will be numbered, and a hazard category will be assigned to each (biological, chemical, and/or physical). This information will be used in the hazard analysis in Forms 5-8.

The purpose of Form 4 is to document the facility and how ingredients, product, rework, allergens, chemicals, personnel and waste move through it. This form is for all products that are made in the facility. It is important to include all processes in order to identify any cross-contamination and cross-contact points. Examples of cross-contamination and cross-contact are raw product with ready-to-eat product, waste with finished product or raw ingredients, chemicals with product, people with product and allergens with non-allergens.

Draw a picture of the facility as if you were looking down onto it (bird's-eye view), make sure all equipment and rooms are included and labelled. To show the movement of ingredients, product, rework, allergens, chemicals, personnel and waste, use different colours or different types of lines to identify these. Where the different lines cross are the potential cross-contamination points. The cross-contamination points identified here will be inputted into Forms 5-8. For further explanation on how to input these into Forms 5-8, refer to "How to Include Cross-Contamination Points on the Hazard Analysis and CCP Determination Form" in the Appendix section of this guide. Pest control device numbers (bait stations, tin cats and fly lights) can also be included in this schematic, or you can create a separate map as part of the pest control program.

Combining Forms 5, 6, 7 and 8 can make it easier to complete the hazard analysis. These forms pull the information gathered in Forms 1-4 together and then look at the process, hazards and risks in detail. This form asks five questions to help guide you through the hazard analysis process and determine if the hazards identified are controlled under the documented preventive controls/prerequisite programs or if they will need to be controlled as a process control (PC) or as a critical control point (CCP) and what their risk is. Note that you cannot have a PC without a CCP, but you may have a CCP without a PC.

To assist with hazard analysis, CFIA has an online tool called the **Reference Database for Hazard Identification (RDHI)**. CFIA periodically updates the online tool. However, if you produce an innovative product, it may not be listed in this reference tool.

Sometimes hazards are beyond the control of the facility. In those instances, Form 9 comes into play. On this form, you record the hazard, what part of the process this affects (before or after receipt) and how the outside source will control it. For example, if using a municipal water source as an input, it is the municipality and not the processor responsible for ensuring the biological, chemical and physical hazards associated with the water supply are controlled to ensure the water is potable and safe for use in food manufacturing.

If it is determined that critical control points (CCPs) are required to control a hazard, then Form 10 is used to describe the details of the CCP, who will monitor it, when and how it will be monitored, any critical limits that need to be adhered to and what records and standard operating procedures (SOPs) are used. Other details that need to be considered are how to verify that the hazard is being controlled properly and what happens if the critical limit(s) is(are) not met.

The process controls (PCs) that were determined through the hazard analysis are recorded on Form 11. Much like Form 10, you document the details and refer to the CCP to which the process control is linked. Process controls, as applicable to your operation, required for meat processors in Nova Scotia are outlined in the next section of this guide, section 10 – Process Controls.

Generic Preventive Control Plan templates are available on the CFIA **website**, and examples of HACCP Forms 1-11 are available in the CFIA Archive for "**HACCP Generic Models and Commodity-Specific Food Safety Guidance Documents**" to use as a reference for creating your own.

Once all HACCP Forms have been completed, the next step is to verify that the system is effective. Is the final product completely safe, or was something missed? Records should be simple and nonredundant. Feedback from employees on their usability will be beneficial as employees will be more likely to fill them out if they are easy to use. Records must be legible and filled out in real time when the actual check is performed. They must be signed by the person who monitors the task and by the person who verifies that the record is complete and that the task was performed properly.

Records must be kept for at least two years or the duration of the product's shelf-life plus one year unless otherwise requested.

RECORD KEEPING/DOCUMENT CONTROL

Keeping track of the HACCP records and documentation of your food safety management system is critical. Records will demonstrate the application of the HACCP plan.

Documents are an important tool for training existing and new employees as well as ensuring procedures are followed consistently by all. Documents demonstrate the effective implementation of your food safety management system and allow for continuous improvement. They are most often a condition of registration and/or licensing and are evidence of due diligence on your company's behalf. Creating a basic template for documents such as procedures and work instructions will allow you to keep records organized, up-to-date, legible, accurate and readily accessible. Changes to documents (policies, procedures, records, etc.) must be logged.

Note that it is important to use appropriate languages in your documents.

CHECKLIST

- ☐ **Letter of Management Commitment**
- ☐ Preventive Control Plan Team/HACCP Team
- ☐ Form 1 – Product Description:
  - ☐ Product Name(s)
  - ☐ Source of Raw Material
  - ☐ Important Final Characteristics
  - ☐ Ingredients & Inputs
  - ☐ Product Packaging
  - ☐ How the End Product is to be used (intended use and include who the product may be consumed by)
  - ☐ Shelf-life
  - ☐ Where the Product Will be Sold
  - ☐ Special Labelling Instructions
  - ☐ Special Distribution Controls
- ☐ Form 2 – List of Product Ingredients and Incoming Materials:
  - ☐ Raw Ingredients
  - ☐ Added Ingredients (additives, preservatives, ingredients)
  - ☐ Packaging Materials (Primary Packaging, Secondary Packaging, Tertiary Packaging)
  - ☐ Other Inputs (water, steam, ice)
  - ☐ Allergens
- ☐ Form 3 – Process Flow Diagram:
  - ☐ Inputs, process steps and outputs (i.e., waste, compost, rework, returns, rejects, etc.)
  - ☐ List of biological, chemical and physical hazards
  - ☐ Identification of Critical Control Point(s), if applicable
- ☐ Form 4 – Facility Schematic:
  - ☐ Traffic Flows
  - ☐ Cross-contamination/Cross-contact Points
  - ☐ Water Supply Lines
  - ☐ Sewage and Drain Lines
  - ☐ Raw and Finished Product Flow
  - ☐ Chemical Flow
  - ☐ Waste Flow
  - ☐ Pest Control Devices
  - ☐ Handwash Stations
  - ☐ Chemical Storage Areas
  - ☐ Equipment
- ☐ Forms 5-8 – Hazard Identification and CCP Determination:
  - ☐ Incoming Materials
  - ☐ Cross-contamination/Cross-contact Points
  - ☐ Process Steps
  - ☐ Outputs (i.e., waste, compost, rework, returns, rejects, etc.)
  - ☐ Preventive Controls/Prerequisites Controlling Hazards
  - ☐ Process Controls, if applicable
  - ☐ Critical Control Point(s), if applicable
  - ☐ Risk Assessment of the Hazards
- ☐ Form 9 – Hazards Not Controlled by the Facility
- ☐ Form 10 – Critical Control Point(s) (CCP), if applicable
  - ☐ Process Step
  - ☐ Hazard Description and Control Measure
  - ☐ Critical Limit
  - ☐ Monitoring Procedure
  - ☐ Deviation Procedure
  - ☐ Verification Procedure
  - ☐ Record Keeping
- ☐ Form 11 – Process Controls (PC), if applicable
  - ☐ Process Control Number and Associated Critical Control Point
  - ☐ Hazard Description
  - ☐ Standards
  - ☐ Monitoring Procedure
  - ☐ Deviation Procedure
  - ☐ Verification Procedure
  - ☐ Record Keeping
- ☐ Document Control Procedure:
  - ☐ Retention of Documents
  - ☐ Electronic or Hard Copies of Documents
  - ☐ **Change Log**
- ☐ Maintenance and Reassessment Procedures
- ☐ **Maintenance and Reassessment Record**
- ☐ Corrective and Preventative Action Plan
- ☐ **Corrective and Preventative Action Report**
- ☐ **Personnel Training Records**
- ☐ Submit your PCP plan during the permit/license application process, if applicable

10 – PROCESS CONTROLS

REQUIREMENTS:

GENERAL GUIDELINE FOR PROCESSING POTENTIALLY HAZARDOUS FOODS AND INGREDIENTS

Foods and ingredients that are potentially hazardous should be processed at temperatures less than 10°C (50°F).

The maximum time at which potentially hazardous foods can be kept at temperatures between 4–10°C (40–50°F) must not exceed four hours.

The amount of time processing potentially hazardous foods between 20–60°C (68–140°F) must not exceed two hours.

Exceptions: This guideline does not apply to dry cured or fermented meat production, and other similar processes requiring ripening/aging temperatures within the range of 4–60°C (40–140°F).

SHELF-STABILITY OF FOODS

For a food product to be considered shelf-stable (including fermented and dried meat products) one of the following parameters must be met:

- pH of 4.6 or less regardless of a_w
- a_w of 0.85 or less regardless of pH

A fermented meat product is also considered shelf-stable if it meets three parameters:

- it contains a minimum of 100 ppm nitrite/ nitrate and 2.5% of salt
- the pH is 5.3 or lower at the end of the fermentation period
- the end product has an a_w of 0.90 or lower

Adequate packaging is required so that water activity of product is not altered during storage and display for sale.

Shelf-stability parameters:

- Determining shelf-stability parameters is the responsibility of the meat processing facility operator.
- Samples may need to be submitted to an accredited lab for verification of shelf-stability.
- The operator may need to hire a food safety consultant to determine the requirements for shelf-stability, such as process controls, additives necessary, humidity, and temp controls during processing.
- Results and reports must be made available to the public health officer upon request.

TEMPERATURE MONITORING EQUIPMENT REQUIREMENTS

Requirements for temperature monitoring equipment used for determining temperatures of foods before, during, or after processing:

- must have sensors or probes constructed of material that does not significantly increase risk of physical contamination of food — for example, not glass that has a risk of breaking
- must have a temperature measurement range appropriate to the food process
- must have the capacity to withstand temperature extremes if the food production process requires measurement during the cooking and/or cooling
- must be easily cleaned and sanitized after each use
- must have the capability to be calibrated

READY-TO-EAT COOKED PRODUCT – MINIMUM TEMPERATURE REQUIREMENTS

	CELSIUS	FAHRENHEIT
Pork, Veal, Lamb	71°C	160°F
Ground Meat	71°C	160°F
Whole chicken/turkey	82°C	180°F
Chicken/turkey stuffing (inside temp.)	74°C	165°F
Chicken/turkey pieces	74°C	165°F
Ground Poultry	74°C	165°F
Beef steaks/roasts – *medium rare* – *medium* – *well done*	63°C 71°C 77°C	145°F 160°F 170°F
Ground game meat, meat mixtures, ground venison, sausage	74°C	165°F
Deer, elk, moose, rabbit	74°C	165°F

DEVIATIONS FROM THE NS FOOD CODE:

Approval to use a temperature/time combination in a cooking process that may deviate from the NS Food Retail and Food Services Code (NS Food Code) recommended minimum internal cooking temperatures may be granted to a facility operator if it is based on microbiologically validated information — that is, process lethality determination curves and established F-values.

For alternate internal cooking time/temperature options, refer to "Preventive control recommendations for manufacturing cooked ready-to-eat meat products": **Preventive control recommendations for manufacturing cooked ready-to-eat meat products - Canadian Food Inspection Agency (canada.ca).**

WRITTEN PERMISSION NEEDED:

The use of time/temperature cooking processes that deviate from the NS Food Code or other approved regulatory codes cannot occur until the Public Health Officer gives written permission to use such a process.

SMOKING

Smoking occurs when the product is exposed to smoke and can be considered as the cooking step if the temperatures used are cooking temperatures (Refer to page 15). Smoking at cooking temperatures is referred to as hot smoking. Cold smoking occurs when smoke is introduced at lower temperatures and these products are not fully cooked.

MEAT COOLING CURVE

The following procedures are known to control the risk of pathogen growth during the cooling of heat processed meat.

Slow cooling

Slow cooling criteria

A 20-hour continuous cooling method can be used if the product meets at least one of the following prerequisites:

- a water activity above 0.92, no less than 120 ppm nitrite, and a finished product salt concentration of 3.5% or more
- a water activity above 0.92, no less than 40 ppm nitrite, and a finished product salt concentration of 6% or more
- a water activity above 0.92, no less than 180 ppm nitrite, and finished product salt concentration of 2.3% or more
- a water activity that is less than or equal to 0.92 at the beginning of the cooling process, with or without nitrite

SLOW COOLING		
Water activity	**Nitrite levels**	**Finished product salt content**
above 0.92	no less than 120 ppm	3.5% or more
above 0.92	no less than 40 ppm	6.0% or more
above 0.92	no less than 180 ppm	2.3% or more
less than or equal to 0.92 at the beginning of the cooling process	with or without	

Determining eligibility for slow cooling

If a processing plant wishes to use slow cooling for a product, a food safety consultant must be contacted to determine if the parameters above are met.

An accredited lab is recommended for moisture or salt analyses, and any other parameters not measured by the operator, to ensure that the results are accurate. A validated method must be used by the lab for any analysis. Documentation must be provided to the PHO.

If the product **meets** one of the prerequisites for the slow cooling process, the following cooling steps must be met:

- The internal temperature does not remain between 49°C (120°F) and 4°C (40°F) for more than 20 hours, and
- The cooling process causes a continuous drop in the product's temperature OR controls the product's surface temperature so that it does not stay between 49°C (120°F) and 20°C (68°F) for more than 2 hours

SLOW COOLING FOR FOODS THAT MEET ONE PREREQUISITE	
Temperature	**Time limit**
Surface: 49°C–20°C (120°F–68°F)	max 2 hours
Internal: 49°C–4°C (120°F–40°F)	max 20 hours

If the product **does not meet** one of the prerequisites for the continuous slow cooling process, the rapid continuous process must be used.

Rapid Cooling

Rapid cooling criteria

During cooling, product's maximum internal temperature must not remain between 54°C (129° F) and 27°C (81°F) for more than 2.0 hours, nor from 54°C (129°F) to 4°C (40°F) for more than 7 hours.

As an option, products consisting of a piece of intact (excluding tenderized) muscle such as roast beef, moist cooked beef, turkey breast or pork loin, may be cooled to 4°C (40°F) within 7.5 hours from initiation of the cooling process while taking no more than two hours for the 50°C (122°F) to 20°C (68°F) temperature zone.

RAPID COOLING	
Temperature	**Time limit**
Internal: 54°C–27°C (129°F–81°F)	max 2 hours
Internal: 54°C–4°C (129°F–40°F)	max 7 hours
RAPID COOLING FOR INTACT MUSCLE, UNTENDERIZED	
Temperature	**Time limit**
Internal: 50°C–20°C (122°F–68°F)	max 2 hours
Cooled to 4°C (40°F)	max 7.5 hours

Interrupted Cooling Rate

The following applies to heat-treated product kept at intermediate temperatures. Heat-treated products that are cooled from 54°C (129° F) to 18° C (64° F) within 2 hours may be held for up to 4 hours if they are:

- kept below 18° C (64° F) during the 4 hours, and
- protected from post cooking contamination (covered, wrapped, etc.), and
- cooled to 4° C (40° F) within 2 hours immediately at the end of the 4-hour holding period

Alternative cooling process

Any deviation from the approved process must be assessed by a food safety consultant to validate its safety. If there is no objection to the reviewed process, there must be scientific evidence provided by the facility operator to support the decision of using an alternative cooling process.

More information on cooling processes can be found here: **Preventive control recommendations for cooling heat processed meat products - Canadian Food Inspection Agency (canada.ca)**.

DESTROY *TRICHINELLA SPIRALIS* IN PORK

Meat processing operators that process pork must implement control measures for *Trichinella spiralis*. *T. spiralis* larvae may be destroyed by curing, heating, and freezing.

If pork is sourced from a commercial supplier and has already been treated for *Trichinella*, or if the pork is sourced from a *Trichinella*-free herd, then additional *Trichinella* control is not necessary. *Trichinella*-free or *Trichinella*-treated pork will be certified by the CFIA and a label identifying it as such will be on the meat packaging.

For information on methods of destruction of *T. spiralis*, refer to "Control recommendations for the inactivation of *T. spiralis* in pork products": **Control recommendations for the inactivation of Trichinella spiralis in pork products - Canadian Food Inspection Agency (canada.ca)**.

LISTERIA MONOCYTOGENES CONTROLS

Contamination of a food with *L. monocytogenes* is one of many hazards that should be considered when developing a preventive control plan. It is recommended that meat processing operators use validated *L. monocytogenes* controls.

For more information refer to "Control measures for *Listeria monocytogenes* in ready-to-eat Foods": **Control measures for *Listeria monocytogenes* in ready-to-eat foods - Canadian Food Inspection Agency (canada.ca)**.

RATIONALE:

If identified biological, chemical and physical hazards are not fully controlled by preventive controls/prerequisite programs, process controls or critical control points, product safety may be compromised and result in a food-borne outbreak. Evaluating the food safety management system to ensure all preventive controls/prerequisite programs, process control and critical control point measures are adequate and effective guarantees safe quality products.

INTERPRETATION:

Process controls (PC) are specific to the final product and implemented to achieve regulatory compliance. Process controls encompass the entire process, from the incoming inputs (ingredients, raw materials, packaging), product formulation and specifications to specific processing parameters to ensure food safety. Process controls are put in place where preventive controls/prerequisite

programs cannot fully control identified hazards but are not the final step in preventing, eliminating or reducing the likely occurrence of the hazard. Examples of process controls include but are not limited to incoming material specifications, formulations, recipes, use of additives and preservatives and finished product specifications. Another example of a process control is when there is more than one step in the process flow that contributes to the reduction of an identified hazard but does not fully control the hazard, as it is paired with a subsequent step which will reduce, prevent or eliminate the hazard. This subsequent step is referred to as a critical control point (CCP). Process controls are not to be confused with critical control points (CCPs), which are implemented to reduce, prevent or eliminate identified biological, chemical and physical hazards. Critical control points are steps in which parameters and limits are put in place to achieve food safety. Critical control point parameters include time, temperature, pH, a_w, salt %, preservation level, humidity, metal detection limits, etc. If these control measures are not met, product safety may be compromised. Note: if a process control is not followed by a subsequent control measure, it becomes a CCP, the last step to control the hazard. There can be a CCP without a PC, but there cannot be a PC without a CCP. Using the CCP determination tree helps clarify the difference between a PC and CCP.

Depending on your products and operation, refer to the requirements table above for process controls required for meat processors in Nova Scotia.

CHECKLIST:

- ☐ Incoming Input Specifications (raw materials, ingredients, additives, preservatives, packaging)
- ☐ Processing Procedures (Curing, Fermenting, Smoking, etc.)
- ☐ Thawing Procedures, if applicable
- ☐ Cooling Procedures
- ☐ Cooling Records
- ☐ Temperature Monitoring Procedures
- ☐ Temperature Records
- ☐ Weighing/Blending/Mixing/Formulations/ Recipes
  - ☐ Documented procedure for the use of preservatives and additives
- ☐ Finished Product Specifications
- ☐ Shelf-stability Results, Lab Results from an Accredited Laboratory
- ☐ Environmental Monitoring Program
- ☐ Environmental Monitoring Records
- ☐ Forms 5-8 – Hazard Identification and CCP Determination:
  - ☐ Incoming Materials
  - ☐ Cross-contamination/Cross-contact Points
  - ☐ Process Steps
  - ☐ Outputs (i.e., waste, compost, rework, returns, rejects, etc.)
  - ☐ Preventive Controls/Prerequisites Controlling Hazards
  - ☐ Process Controls, if applicable
  - ☐ Critical Control Point(s), if applicable
  - ☐ Risk Assessment of the Hazards
- ☐ Form 10 – Critical Control Point (CCP)
  - ☐ Critical Control Point Number
  - ☐ Hazard Description and Control Measure
  - ☐ Critical Limits
  - ☐ Monitoring Procedure
  - ☐ Deviation Procedure
  - ☐ Verification Procedure
  - ☐ Record Keeping
- ☐ Form 11 – Process Controls (PC)
  - ☐ Process Control Number and Associated Critical Control Point
  - ☐ Hazard Description
  - ☐ Standards
  - ☐ Monitoring Procedure
  - ☐ Deviation Procedure
  - ☐ Verification Procedure
  - ☐ Record Keeping
- ☐ Validation Records, if applicable
- ☐ **Production/Packing Records**
- ☐ Corrective and Preventative Action Plan
- ☐ **Corrective and Preventative Action Report**
- ☐ **Personnel Training Records**

11 – FERMENTED AND DRIED MEAT

REQUIREMENTS:

Fermentation is the process of using lactic acid producing bacteria to lower the pH of meat, by allowing the growth of lactic acid producing bacteria, while preventing the growth of pathogens.

All products that are fermented are also cured. They may subsequently be cooked and may be dried as well.

Starter culture containing lactic acid bacteria and other microorganisms that encourage the fermentation process must be obtained from an approved source.

CONTROL OF *CLOSTRIDIUM BOTULINUM* IN FERMENTED MEAT PRODUCTS

To control the outgrowth of *C. botulinum* spores and the development of the botulinum toxin in fermented meats, a minimum level of 100ppm of nitrite/nitrate are added as well as a minimum of 2.5 % salt.

CONTROL OF *STAPHYLOCOCCUS AUREUS* (*S. AUREUS*) IN FERMENTED MEAT PRODUCTS

Certain strains of the bacteria *S. aureus* are capable of producing a highly heat stable toxin that causes illness in humans. Above a critical temperature of 15.6°C, *S. aureus* multiplication and toxin production can take place. Once a pH of 5.3 is reached, *S. aureus* multiplication and toxin production are stopped.

The safety of fermented products is determined by the production of a minimum level of acid at a sufficient rate. The measurement of the rate of acid production in fermented products is referred to as degree-hours.

Degree-hours are the product of **time** multiplied by **degrees Celsius**:

- time (as measured in hours at a particular temperature) multiplied by
- degrees Celsius (measured in excess of 15.6°C, the critical temperature for growth of *S. aureus*)

Degree-hours are calculated for each temperature used in the process. The limitation of the number of degree-hours depends upon the highest temperature in the fermentation process prior to the time that a pH of 5.3 or less is attained.

A fermentation process must meet *S. aureus* degree-hour limits as outlined in "Preventive control recommendations for manufacturing fermented and dried meat products": **Preventive control recommendations for manufacturing fermented and dried meat products - Canadian Food Inspection Agency (canada.ca)**

Documentation by the facility operator to show compliance with these time/temperature requirements must be available for review during inspection. A food safety consultant can help with this documentation.

E. COLI AND *SALMONELLA* CONTROL OPTIONS IN FERMENTED SAUSAGES

To suitably control these hazards and prevent incidents of food borne disease, facilities that manufacture fermented sausages can use one of the five options as listed in "Preventive control recommendations for manufacturing fermented and dried meat products" for the control of verotoxinogenic *E. coli* including *E. coli* O157:H7 and *Salmonella* when they:

- use beef as an ingredient in a dry or semi-dry fermented meat sausage or
- store or handle uncooked beef on site or
- obtain raw meat from a supplying facility which stores or handles uncooked beef on site

Facilities that do not use beef and do not obtain meat ingredients from facilities that handle beef are not currently required to use one of the five options for the control of *E. coli* O157:H7 in dry/semi-dry fermented sausages. However, they must validate through a microbiological testing program that their process will not result in the presence of *E. coli* O157:H7 or *Salmonella* in the finished product.

Preventive control recommendations for manufacturing fermented and dried meat products - Canadian Food Inspection Agency (canada.ca)

CONTROL OF *E. COLI* O157 IN DRIED BEEF PRODUCTS

Jerky and similar dried meat products are generally considered ready-to-eat and processed to be shelf-stable. If these meat products are sold as shelf-stable (i.e., not labelled as "keep refrigerated"), they must meet one of the following requirements:

- the pH of a finished product must be 4.6 or less, regardless of its final water activity (a_w)
- the a_w of the finished product is 0.85 or less, regardless of its final pH

As dried beef products may pose a hazard associated with *E. coli* O157:H7, these products must be submitted to a heat treatment before the drying process.

The following methods have been found acceptable for this purpose:

- cooking the product so it reaches an internal temperature of 71°C (160°C) for 15 seconds before starting the drying process
- using one of the heat processes that are recognized as controlling *E. coli* O157:H7 and *Salmonella* — Refer to "Preventive control recommendations for manufacturing fermented and dried meat products" for recognized processing parameters (Option 1 table): **Preventive control recommendations for manufacturing fermented and dried meat products - Canadian Food Inspection Agency (canada.ca)**

Use of a commercial dehydrator is required.

RATIONALE:

Controlling biological hazards (i.e., *Clostridium botulinum, Staphylococcus aureus, E. coli and Salmonella*) prevents food-borne illnesses. Fermented and dried meat products must meet the requirements of pH, water activity (a_w), time/temperature controls, minimum salt percentage and the addition of food additives to control the risk of pathogens. Controls must be developed and implemented to ensure the addition of additives (nitrites/nitrates) do not pose a chemical hazard.

INTERPRETATION:

Control measures shall be developed and implemented to manage the risk of pathogens in fermented and dried meat products to produce a safe food product.

When using fermentation, a detailed procedure is required that outlines the process and monitoring parameters to prevent the growth of pathogens. Subsequent control measures must be outlined as well.

Inaccurate measuring of ingredients could lead to additives (nitrates/nitrates) being added in excessive or insufficient amounts, compromising the food safety of your product and posing a risk of biological and chemical hazards. Following product formulation assures the safety and quality of the product.

Heat-stable toxins can cause food-borne illnesses. Adjusting the pH of the product can prevent toxin production. Understanding the product's intrinsic characteristics is important for producing safe products.

Time and temperature are also parameters used to control the risk of pathogens. The food safety management system must clearly outline the minimum time and temperature to be reached during the process to achieve a safe product.

Dehydration is a form of preservation. When drying meat, a heat treatment is required before the drying process to prevent the growth of pathogenic bacteria (*E. coli* O157:H7). It is important to understand the time and temperature of the heating process. The drying process is used to lower the water activity (a_w) to hinder the growth of microorganisms.

Purchasing raw materials and ingredients/additives from approved suppliers is a control measure that can ensure that incoming materials are safe and suitable for use.

Documentation for all control measures used by the facility must be available for review during inspection to demonstrate compliance.

As stated in component 7 – Submit recipes for review, and be sure to document all food additives, lot codes and amounts used on **Production/Packing Records** to maintain product traceability.

Devices used for measuring control parameters (i.e., scales, thermometers, timers, pH meter, a_w meter and salinometer) must be included in the maintenance and calibration program to ensure they are functioning effectively each and every time.

CHECKLIST:

- ☐ Also meet requirements of component 7 – Submit recipes for review, for formulation
- ☐ HACCP Forms 1-11 – CCPs and control parameters are outlined
- ☐ Fermentation Procedure
  - ☐ Detailed instructions
  - ☐ Starter culture from an approved source
  - ☐ Subsequent control measures defined
  - ☐ Monitoring and verification procedures
- ☐ Drying/Dehydration Procedure
  - ☐ Detailed instructions
  - ☐ Subsequent control measures defined
  - ☐ Monitoring and verification procedures
- ☐ Ingredients/Additives
  - ☐ List of approved ingredients/additives
  - ☐ Maximum/minimum amounts, percentages
- ☐ **Production/Packing Records**
- ☐ Approved Supplier/**Receiving Records**/Ingredient Spec. Sheets (Water/Ice/CO_2)
- ☐ Equipment – commercial dehydrator, pH meter, a_w meter, thermometers, timers, cookers, etc.
- ☐ Product Testing Lab Results (micro, chemical, physical) from an Accredited Laboratory / In-house Analysis Results
- ☐ **Corrective and Preventative Action Report**
- ☐ Employee Training

12 – COMMODITY-SPECIFIC REQUIREMENTS: DONAIR AND SHAWARMA

REQUIREMENTS:

DONAIR:

Made with ground meat that is formed into a cone shape and frozen.

SHAWARMA:

Made with thin, whole cuts of meat that are marinated before being stacked on a vertical skewer.

Microbial hazards associated with both products are similar:

- thin layers of sliced meats stacked on top of one another have increased surface areas resembling that of ground product
- pathogens may be introduced throughout all areas of the meat
- the slow, extended cooking process on a vertical broiler may further contribute to potential microbial hazards

These risks can be minimized through controls implemented during

- donair cone production, cooking, and serving
- cooling and storage procedures followed at the end of the day

MOLDS RECOMMENDED:

Molds should be used to ensure size consistency of product and hygienic storage during the freezing stage.

MOLD REQUIREMENTS:

Molds for donair meat must be made of food grade material

- cleaned and sanitized between each use

COOKING TEMPERATURE:

Ready-to-eat donair/shawarma meat must be cooked to a temperature outlined for ground meat in the NS Food Code, or other temperatures as directed by Health Canada.

COOLING PROCESS:

Donair/shawarma meat must be cooled continuously

- from 60°C (140°F) to 20°C (68°F) within 2 hours
- and from 20°C (68°F) to 4°C (40°F) within 4 hours

RATIONALE:

An effective commodity-specific program (donair and shawarma) which identifies biological, chemical and physical hazards and implements control measures throughout the process will ensure compliance, quality and food safety.

INTERPRETATION:

Due to the thin nature of the meat slices, pathogens have the potential to be introduced throughout the entire product. Therefore control measures must be implemented to control risks.

The following control measures reduce the risk of pathogenic microorganisms:

- Clean, sanitized molds that are consistent in size, food grade and used to ensure hygienic storage during freezing
- The temperature for RTE donair/shawarma must be cooked to heat all parts of the product to an internal temperature of 70°C (158°F) as outlined for ground meat in the NS Food Code or other temperatures as directed by Health Canada. Ensure cooking equipment is adequate to properly cook the size of the cone as recommended by the manufacturer
- Donair and shawarma must be continuously cooled after cooking from 60°C (140°F) to 20°C (68°F) within 2 hours and from 20°C (68°F) to 4°C (40°F) within 4 hours. The product must be stored at refrigerated temperatures ≤4°C (40°F) or frozen ≤ -18°C (0°F)

CHECKLIST:

- ☐ Also meet requirements of component 7 – Submit recipes for review, for formulation
- ☐ Also meet requirements of component 10 – Process Controls, for temperature monitoring
- ☐ Donair/Shawarma Recipes/Formulation/Blending/Mixing
- ☐ Cooking Procedures
- ☐ Cooling Procedures
- ☐ Documents/Records – traceability information, i.e., lot codes of ingredients/raw materials, quantities, description etc.
- ☐ **Production/Packing Records** – internal temperature verification (cooking, cooling, storage temperatures and in-process temperatures)
- ☐ Storage – inventory control, traceability, temperatures
- ☐ Calibration Program and **Calibration Records**, scales and thermometers, pH meters, water activity equipment
- ☐ **Sanitation Records**
- ☐ Form 10 – Critical Control Point (CCP)
  - ☐ Critical Control Point Number
  - ☐ Hazard Description and Control Measure
  - ☐ Critical Limits
  - ☐ Monitoring Procedure
  - ☐ Deviation Procedure
  - ☐ Verification Procedure
  - ☐ Record Keeping
- ☐ Form 11 – Process Controls (PC)
  - ☐ Process Control Number and Associated Critical Control Point
  - ☐ Hazard Description
  - ☐ Standards
  - ☐ Monitoring Procedure
  - ☐ Deviation Procedure
  - ☐ Verification Procedure
  - ☐ Record Keeping
- ☐ Validation Records, if applicable
- ☐ Corrective and Preventative Action Plan
- ☐ **Corrective and Preventative Action Report**
- ☐ **Personnel Training Records**

13 – PACKAGING

REQUIREMENTS:

Packaging that reduces or eliminates oxygen content must not create an environment favourable for pathogenic anaerobic bacterial growth and toxin production:

- modified atmosphere packaging
- vacuum packaging
- selectively permeable wrapping

A number of factors affect the likelihood of pathogenic microbial growth and toxin in an anaerobic environment. The combination of factors that must be considered in assessing the safety of using oxygen-reduced environments for food packaging include

- type of food product
- processing treatments, including salt content and nitrite presence
- temperature control, such as refrigeration and freezing

For vacuum-packaged food product in which the only control for *C. botulinum* is refrigeration, employ a shelf-life reduction to a **maximum of 10 days**.

Labelling of product must be in accordance with the Safe Food for Canadians Regulations, Food labelling for industry - Canadian Food Inspection Agency: **Food labelling for industry - Canadian Food Inspection Agency (canada.ca)**.

RATIONALE:

Packaging must be appropriate, not contaminate or permit product contamination, and must not create an environment favourable for pathogenic anaerobic bacterial growth and toxin production when packaging eliminates or reduces oxygen content.

Labelling/coding of the product must be in accordance with the Safe Food for Canadians Regulations. Proper labelling/coding can make product recall situations less difficult when implemented correctly. Correct labelling and coding enable the next person to handle, display, store and use the product safely.

Labels provide buyers and consumers with basic product information as well as health, safety and nutritional information. All information included on labels must be accurate.

INTERPRETATION:

Ensure food packaging is suitable for its intended use, does not pose a risk of contamination to the product, and that your product is packaged correctly. The checklist below will help you confirm these requirements are met.

Lot codes for food-contact packaging should also be recorded on your **Receiving Record** and **Production/Packing Record** for traceability.

The operation shall develop and implement methods to ensure that products will be correctly labelled and coded. Packaged products must be labelled in accordance with the Safe Food for Canadians Regulations. This includes meeting the **core labelling requirements**: the common name, name and principal place of business, net quantity/weight and a lot code or unique identifier etc., along with any other **food-specific labelling requirements** (i.e., **Meat & Poultry**), for traceability purposes. Lot codes should be recorded on your **Production Records** as well as any **Shipping Records/ Farm Gate Sales Records/**Invoices.

Lot codes may be alphabetic, numeric or alphanumeric. Examples of allowable lot coding options for meat products are as follows:

- Production/pack date
- Best before date (if applicable – **note this must be a maximum of 10 days for vacuum-packaged food product in which the only control for *C. botulinum* is refrigeration**)
- Or any other unique code that can be used for traceability reasons

It is recommended to have an expert review your label to ensure compliance.

Keep in mind that retailers may require something specific regarding labelling to supply their stores (UPC codes, specific labelling format, etc.). Please check with those retailers prior to producing a product and creating labels for them.

CHECKLIST: the following may be combined into one Quality SOP

- ☐ Packaging
  - ☐ Written specifications are on file for food-contact packaging
  - ☐ Packaging material meets regulatory requirements
  - ☐ Packing Procedure should detail the following:
    - ☐ Damaged or defective packaging material is not used during the packing process
    - ☐ Packaging material is protected from risks of contamination during receiving, storage and packing
    - ☐ Employee Training
    - ☐ **Production/Packing Records**
- ☐ Labelling
  - ☐ Traceability Program, detailing the following:
    - ☐ Product Coding
    - ☐ Product Labelling
    - ☐ Employee Training
- ☐ Labelling Procedure should detail the following:
  - ☐ Product coding
  - ☐ Product labelling
- ☐ Weights Procedures should detail the following and how they are met:
  - ☐ Weight requirements
- ☐ Employee training
- ☐ **Labelling Checklist**
- ☐ **Production/Packing Records**

APPENDIX

HOW TO DRAFT AN SOP/POLICY/PROCEDURE

The purpose of documenting a standard operating procedure (SOP) or policy, regardless of the size of the operation, is for consistency, transparency and to ensure everyone is clear on what is expected to occur in the run of a day.

Every document must have the company's name, the document title, the issue/revision date, the date of the previous version, who approved or documented the policy, and page numbers. The best practice for page number formatting is page 1 of X, so everyone knows how many pages are included.

The key is to include important information while keeping it short and simple to follow. It should be written so that a new employee can understand it. It's important to include the reason why the procedure is in place (purpose), who is responsible, if there is a backup person (trained designate) and how often the task is to be completed. A simple step-by-step instruction is best to describe the procedure. You will need to include a procedure for when things do not go as planned (deviation), as well as who is going to check to make sure the task is done correctly (verification) and any corresponding paperwork to be filled out.

Company's Name or Logo	**Title of SOP/Procedure**	**Issue/Revision Date:**
		Supersedes Date:
		Approved By:
Purpose:	What is to be accomplished?	
Responsibility:	Who is responsible – designated staff? Who is the alternate?	
Frequency:	How often is it to be done?	
Procedure:	What is to be done? How is it to be done? Detailed instruction.	
Deviation/Corrective Action:	Action(s) to be taken if out of specification.	
Verification:	Who is responsible for the double-check? How is it to be done?	
Records:	List associated records	
Page 1 of X		

HOW TO RESPOND TO A NON-COMPLIANCE

For each non-compliance, you will need to draft a **Corrective and Preventative Action Report** or Deviation Report. You will need to detail the area of non-compliance, any immediate corrective actions taken, document the root cause analysis, permanent (preventive) corrective action taken, and then follow up with an effectiveness check to ensure that the issue has been fully addressed and corrected. For tips on how to do a root cause analysis, please see the Perennia Quality & Food Safety Resource section of our website.

HOW TO INCLUDE CROSS-CONTAMINATION/CONTACT POINTS ON THE HAZARD ANALYSIS AND CCP DETERMINATION FORM

The purpose of documenting cross-contamination points on Forms 5-8: The Hazard Analysis and CCP Determination Form is to identify and assess all potential cross-contamination/contact points. Start by listing all potential cross-contamination/contact points, the type of hazard and how it will be controlled. Once these have been identified and assessed, you must determine how each one will be controlled to mitigate the risk of contamination. If the cross-contamination/contact point can be fully controlled, the title of the preventive control(s) or standard operating procedure(s) should be listed.

Cross Contamination Point(s)	Hazard	B	C	P	Determine if fully controlled by Preventive Controls/ Prerequisite Program(s)	Q1	Q2	Q3	Q4	Q5	CCP or PC
EMPLOYEE FLOW	**1B** – Risk of cross-contamination from employees not washing their hands when leaving the washroom	X			Yes – Employee Training Program and Good Manufacturing Practices						
EMPLOYEE FLOW	**2BC** – Risk of cross-contamination/contact from employees not washing upon entering production/packing areas	X	X		Yes – Employee Training Program, Good Manufacturing Practices and Allergen Control Program						
EMPLOYEE FLOW	**3B** – Risk of cross-contamination of product and/or employees due to improper movement of waste & compost during processing/packing	X			Yes - Employee Training Program and Waste Management & Disposal SOP						
CHEMICAL FLOW	**1C** – Risk of cross-contamination of packaging and people with cleaning chemicals		X		Yes - Employee Training Program and Chemical Control Policy						

Q1. Could the establishment use a control measure(s) at any process step? If no, indicate how the hazard will be controlled before and after the process on Form 9: Hazards Not Controlled by the Facility. Then proceed to the next identified hazard. If yes, describe the control measure and proceed to Q2.

Q2. Is it likely that contamination with the identified hazard could occur in excess of the acceptable level or could increase to an unacceptable level? If no (not a CCP), identify the reason(s) why it is not likely to occur and proceed to the next identified hazard. If yes, identify the acceptable level of the hazard in the finished product, wherever possible, then proceed to Q3.

Q3. Is this process step specifically designed to prevent, eliminate or reduce the likely occurrence of the identified hazard to an acceptable level? If yes, (CCP) enter the CCP number in the last column. If no, proceed to Q4.

Q4. Will a subsequent step eliminate the identified hazard or reduce its likely occurrence to an acceptable level? If no, (CCP) enter the CCP number in the last column, then proceed to the next identified hazard. If yes, (not a CCP), identify the subsequent controlling step and proceed to Q5.

Q5. Does this step provide partial control of the identified hazard? If yes, (PC) enter the PC number in the last column and proceed to the next identified hazard. If no, proceed to the next identified hazard.

TRACEABILITY

Effective traceability programs allow companies to limit the scope of a recall and quickly and accurately remove affected products from the marketplace to protect consumers. Traceability is defined as the ability to trace a product or components of a product, such as raw materials, ingredients, additives, starter cultures and food-contact packaging, through all steps in the process, from receiving to shipping and sale. It is the ability to trace the finished product one step forward to the customer and all incoming materials one step back to the supplier. The best practice is to link all raw materials and inputs to the supplier and all raw material and input lot codes to the finished product lot codes. Do not forget to trace reworked products or product samples that were sent for sales, testing or taken for staff or personal use.

TRACEABILITY RECORD KEEPING

Traceability documents and labelling/coding can make product recall situations less difficult when implemented correctly. When tracking finished product and incoming materials and inputs, remember to keep the documentation simple where possible. Invoices, bills of lading (BOL) and **Production Record**/books already in use and working well for the facility may be able to be adapted. Companies must maintain records of incoming materials received, including the date, supplier, item, lot code and quantity received (i.e., **Receiving Record**). They must maintain **Production Records** that outline when, where and how much of a specific lot code of an item was used (i.e., **Production/Packing Records**). Finally, companies must maintain distribution records that include the date, customer, finished product description, lot code and the quantity sold (i.e., **Shipping Record**, **Farm Gate Sales Record**, Invoice, etc.). Consider adding rework, waste and samples to existing documents.

Be sure to keep files organized and retain them for at least the length of the shelf-life of the product plus one year or under the Safe Food for Canadians Regulations, for two years after that lot was provided to the company or the company provided the food to a customer. Computerized record keeping can also be an advantage, making it quick and easy to retrieve the information needed. There are many options out there; choose the one that works well for your company and its products.

LOT CODING AND LABELLING

Under the Safe Food for Canadians Regulations, most businesses are required to label their products with the following information for traceability purposes:

- Common name
- Lot code or another unique identifier
- Name and principal place of business of the person by or for whom the food was manufactured

Labelling and lot coding can make product recall situations less difficult when implemented correctly. Lot codes may be alphabetic, numeric or alphanumeric. Examples of allowable lot coding options are as follows:

- Production/pack date
- Best before date (if applicable)
- Establishment number
- SFC license number
- Or any other unique code that can be used for traceability reasons

TESTING THE TRACEABILITY PROGRAM

Testing the traceability program is just as important as having one. Since recalls can happen to anyone at any time in any industry, companies must always be prepared. A practice or mock recall is a means to test the recall plan to ensure it continues to be effective in tracing all materials coming in and all products going out within a reasonable amount of time. It is also a good time to test the communication plan to see if all the contact lists are up to date.

Mock recalls must be completed at least once per year; customers may require them to be done twice per year. Finished product must be traceable to the customer (one step forward) and must also show traceability through to the raw material and input suppliers (one step back).

During the mock recall, use the **Mock Recall Record** to complete and document the following:

- Determine a realistic scenario that would trigger a recall, keeping in mind that incoming materials from suppliers may be the reason to initiate a recall
- Select a finished product that has been sent to a customer or an input such as a raw material, an additive, ingredient, starter culture or food-contact packaging material that has been used in finished product that has been sent to a customer
- If a finished product is selected, determine the total amount of the affected lot(s) produced, the amount in inventory and which customers were sent affected lot(s) and the amount
- If an input is selected, determine the amount of that lot of input that was received, the amount used and in what lot(s) of finished products and the amount remaining in inventory
- Do not forget to include reworked products, product samples that were sent out, product samples sent for testing or product taken for staff or personal use
- Keep copies of all documentation used for the exercise
- Do not let customers know you are performing a mock recall; this may unintentionally trigger an unwanted/unnecessary recall with that customer
- Determine if your recall plan is clear, if your customer/supplier contact lists are up to date, if you were able to account for 100% of the product you produced and packaged or the input used

Once the mock recall is completed and recorded, take the time to determine if your recall plan was effective. Is there room for improvement? The gaps identified are critical in strengthening the traceability program and recall plan. Make corrections as soon as possible and re-test the process to be ready for a potential recall. These documents must be kept for two years.

A **Recall Management Record** template is also available for download to use as-is or as a reference for creating your own. In the event of a recall, this form would be used instead of the **Mock Recall Record**. Refer to the Downloadable Forms section of this guide.

COMPLAINTS

Complaints can vary from quality issues to food safety concerns or even legality issues (misrepresentation). A documented customer/consumer complaint plan enables a food business to quickly access and investigate the complaint to determine its severity. Complaints related to food safety, pests and product misrepresentation must be investigated to determine the root cause and corrective and preventative actions. Complaint files allow a business to track the number and type of complaints and, therefore, can be used as a form of continuous improvement. Complaints must be assessed, investigated, and resolved in a timely manner. Should processes or procedures require changes based on the results of the assessment and investigation, ensure that changes are made and appropriate personnel are notified.

A **Complaint Record** template is available for download to use as-is or as a reference for creating your own. Refer to the Downloadable Forms section of this guide.

ENVIRONMENTAL SWABBING PLAN

An Environmental Monitoring Program (EMP) is a program that uses different indicator tests to monitor the presence or absence of pathogens, food spoilage organisms or allergens in the plant environment. Different indicator tests include ATP swabbing, total plate count (swabbing, settle plates), pathogen testing (swabbing, rapid testing), allergen testing, air sampling (food spoilage organisms) and rinse water testing (indicator organisms). The EMP is used to verify the effectiveness of pathogen control measures in the facility, such as the cleaning and sanitation program, allergen control program or pest control program. The EMP considers all areas of the production area and facility. These areas are classified into zones:

Zone	Definition
Zone 1	Direct food contact surfaces post-lethal processing, i.e., mixers, grinders, needlers, knives, cutting boards, food contact conveyors, hoppers, food contact utensils, aprons, etc.
Zone 2	Non-food contact surfaces adjacent to food and food contact surfaces, i.e., production equipment, non-food contact conveyors, utility tables, control panels, etc.
Zone 3	Non-food contact surfaces located in or near the production area, i.e., floors, walls, drains, doors, hoses, carts, etc.
Zone 4	Non-food contact surfaces located remotely outside of the production areas, i.e., cafeteria, warehouse areas, maintenance areas, locker room, office areas, etc.

By considering all areas, all daily activities that have the potential to introduce environmental contaminants into the production area and finished product are considered, which enables the identification and resolution of any issues.

IMPLEMENTING AN ENVIRONMENTAL MONITORING PROGRAM

1. Hazard Identification – complete an onsite review of the facility, creating a list of sample sites for each area and the Zone the site would be included in. If there is uncertainty on which Zone a site falls under, complete a risk analysis taking into account the risk level of the Zone (Zone 1 – High, Zone 2 and 3 – Medium, Zone 4 – Low) and the cleanability of the site/area (Easy to clean – Low, Harder to clean – Medium, Difficult to clean – High) to help determine which Zone the site falls under. A visual risk matrix can be developed to assist with this.

2. Determine the type of sampling and testing to be completed – take into consideration the target organisms or allergens for the site/area to be sampled. Determine which type of sampling will indicate whether or not the site/area is satisfactory or a risk.
3. Set a frequency for sampling and testing – adequate sampling frequency is essential to manage risk to the consumer/customer. This may or may not be set by regulatory or third parties. Include reasons and supporting documentation for frequencies set.
4. Record keeping – keep a record of all environmental monitoring results, actions taken, etc. Ensure results are communicated as appropriate, evaluated as satisfactory or unsatisfactory and monitored.
5. Perform a trend analysis for results on a regular basis – this will assist in visually identifying increases in indicators that an issue is arising, trends for certain areas/fillers/zones, seasonal trends, etc.
6. Corrective Actions – implement a corrective action plan for non-conforming test results (i.e., complete root cause analysis, including immediate and preventative measures).

THINGS TO CONSIDER

Complete a baseline assessment to learn the current environmental status of the facility. This will also assist with setting limits for pass/fail sampling completed during routine production and assist in determining the frequency in which sampling should take place (i.e., if the baseline assessment indicates control or satisfactory results, sampling could take place on a monthly frequency, if the baseline assessment indicates unsatisfactory results the sampling should be completed on a more frequent basis along with a corrective action plan).

It is essential to re-evaluate the Environmental Monitoring Program annually or when there are:

- Product failures (i.e., product with positive results)
- Failures to identify and address significant issues (i.e., results identifying positive results which the site program did not, re-occurring and unresolved positive results)
- Changes in production and sanitation conditions, process flow, new equipment
- Changes in regulatory or third-party requirements
- New developments in scientific information
- Consistently negative results (consider whether the correct parts of the facility are being tested, is the testing being completed correctly and is the appropriate test being performed?)

Rotate sample site schedules at a minimum annually to ensure the environmental conditions are captured throughout different seasons (i.e., summer, winter, high and low production volumes, etc.) to help identify and manage any risks that may go unidentified.

It is important to implement an effective Environmental Monitoring Program to be proactive and to monitor and control pathogens, food spoilage organisms, allergens and sanitation deficiencies. What is unknown could have a negative impact on the food safety of the finished product and the health of consumers.

For more information, refer to Perennia's Fact Sheet: **Environmental Monitoring Program**

Throughout this guide we have highlighted the names of each record.

To download the records that are referred to in this guide please go to:

www.perennia.ca/foodsafetyresources

PLEASE NOTE: Links will not download if using Internet Explorer. Please ensure your browser is up to date if you encounter issues downloading the files.

DOWNLOADABLE FORMS

The following sample records can be used as is or as a reference in creating your own documents. You may need to modify these records to fit your operation, and some records may not apply. For example, the **Shipping Record** may not need to be used if you have an invoicing system that you can modify to include aspects to meet the requirements, such as truck/trailer inspection and/or lot codes shipped.

- Change Log
- Complaint Record
- Corrective and Preventative Action Report
- Daily GMP Checks
- Exterior and Interior Inspection Checklist
- Farm Gate Sales Record
- Labelling Checklist
- Letter of Management Commitment
- Maintenance and Reassessment Record
- Mock Recall Record
- Packing Record
- Personnel Training Records
- Pest Control Record
- Preventative Maintenance and Calibration Record
- Production Record
- Recall Management Record
- Receiving Record
- Sanitation Record
- Sanitation Schedule
- Shipping Record
- Storage Temperature Record
- Visitor's Record

Resources

Our Quality and Food Safety Team has created a variety of resources which can be found on our website at **www.perennia.ca**. We offer coaching, assessments and online or public training courses covering a variety of topics. We also have a monthly newsletter which you can sign up for at **Perennia Food and Agriculture Inc. (list-manage.com)**. Most recently, we have added a resources page, which includes Perennia's publications and fact sheets, recommended resources, and videos. If you have any questions, please do not hesitate to contact one of our Quality and Food Safety Team members. We are here to help.

Perennia's Quality and Food Safety Team

Elaine Grant, Shelly MacDonald, Cheryl Andrews, Amanda Cameron

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CANADIAN AGRICULTURAL PARTNERSHIP
Innovate. Grow. Prosper.

OFFICE LOCATIONS

28 Aberdeen Street, Unit 6
Kentville, Nova Scotia
B4N 2N1

Phone: 902-678-7722
Fax: 902-678-7266
Email: info@perennia.ca

PERENNIA FOOD AND BEVERAGE INNOVATION CENTRE

173 Dr. Bernie MacDonald Drive,
Bible Hill, Nova Scotia
B6L 2H5

Phone: 902-896-8782
Fax: 902-896-8781
Email: innovation@perennia.ca

WWW.PERENNIA.CA

@nsperennia

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