

In many regions of Nova Scotia, smoking meat is a popular activity. There are several provincially and federally approved meat processing facilities and food establishments that smoke products for commercial sale and distribution. Whether these types of foods are prepared for personal or commercial use, significant food safety issues can arise if improper food safety practices occur prior to, during, or after the smoking process.

The specific risk reduction factors covered in this document are based on the science of the survival, growth, and toxin production of disease-causing (pathogenic) microorganisms that can cause foodborne illness.

Smoking Processes

The following will discuss regionally popular methods of food smoking, the risks associated with the methods, and how to reduce these risks through specific food safety controls.

There are many methods of smoking foods, depending on the food product itself, the smoking agent used, and the desired characteristics of the end product. The methods described usually involve introduction of smoke to the food surface via burning untreated sawdust, chips, sticks/ logs, or vapourizing liquid smoke, depending on the style of the smoker unit.

Smoking foods can have adverse effects on the growth of microbes, but the extent is usually minimal or too variable to be considered a primary food safety control factor.



Ready-to-Eat Smoked Meat

This method involves fully cooking the meat while adding smoke.

Examples: Fully cooked hams, jerky, most back bacon, North American style pepperoni and salami, smoked beef

Risks and Risk Controls

Risk # 1 - Incoming raw meat/ poultry typically have moderate to high microbial loads. Some of these microbes can lead to foodborne illness.

- **Control the risk** – avoid cross-contamination when preparing meats prior to smoking; use appropriate cleaning and sanitizing methods for both raw and ready-to-eat (cooked) food contact surfaces; practice frequent and thorough hand washing; use additives known to control certain microbial growth in food (e.g., nitrites).
- **Control the risk** – cook the product to the proper final temperature as found in the **NS Retail and Food Services Code**; verify temperature with a calibrated probe thermometer; ensure the smoking unit has the capability to maintain consistent temperatures throughout the process.

Risk # 2 –Smoking product at very high temperatures in the absence of, or in very low humidity environments can dry the product out before it reaches a high enough temperature to kill some microbes. Therefore, the process intended to destroy the microbes only dries them out. If the food product is exposed to humidity at the processing level after smoking, or at the consumer level, these dried microbes can become viable and grow/ reproduce in the food, causing foodborne illness. This issue is of particular concern with thinly sliced or less moist products like jerky.

- **Control the risk** –Ensure your smoker unit has the ability to control levels of humidity during the hot smoke/ cook; verify the levels of relative humidity present during the cooking/ smoking process using wet and dry bulb temperature measurements; ensure your relative humidity levels are supported by reputable scientific sources and verified as effective in destroying microbes, particularly *E. coli* O157:H7 and *Salmonella spp.* for meat products.

Risk # 3 – Improper handling of smoked product in its ready-to-eat form prior to packaging could contaminate food intended to be eaten without further microbial destruction steps (i.e., cooking).

- **Control the risk** – Practice frequent and thorough hand washing; have a dedicated area (separate from raw meat handling areas) for cooling, handling, and packaging ready-to-eat meats; consider approved post-production interventions to destroy microbes, such as post production pasteurization or additives approved for use to reduce microbial activity in food.

Risk # 4 – Storage of packaged ready-to-eat products at room temperatures, or inconsistent refrigeration.

- **Control of Risk** – Any ready-to-eat meat product without shelf stability testing and verification must be kept at a controlled temperature of 4C (40F) or colder.

Not Ready-to-Eat Smoked Meat (Partially Cooked)

This method involves smoking meat without a full cook. The smoking process is mainly used to flavour the product, and to reduce the risk of a certain parasite. In addition to Risks # 1 and Risk # 4, there are some additional food safety risks for these foods. **Examples:** bacon, most picnic hams

Risks and Risk Controls

Risk # 5 – Inadequate heating of meat to an internal temperature high enough to destroy the parasite *Trichinella spiralis*.

- **Control the risk** – Heat to an internal temperature of at least 63C (145F) for instantaneous destruction, or an alternative time/ temperature combination as approved by NS Agriculture.

Risk # 6 – Consumers can assume the product is fully cooked, and eat it without cooking.

- **Control the risk** – Indicate on the label or verbally let your customers know at the retail level that the product is uncooked, and that they must cook it prior to consuming; for bacon and uncooked hams, the product must reach an internal temperature of 70C (158F).

For more information on food safety, contact your local Food Safety Specialist, or visit the Department of Agriculture's food safety website at <http://www.gov.ns.ca/agri/foodsafety>
