On-farm slaughter operation food safety

Learning module 4:

Safe poultry slaughter



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On-farm slaughter operation food safety learning modules

Learning Module 4: Safe Poultry Slaughter

1.0 Food safety principles of slaughtering poultry animals

This On-Farm Slaughter Operation (OFSO) safe poultry slaughter module provides information on:

- Responsibilities of an OFSO licensee for slaughtering poultry animals
- Typical slaughter controls required for safe poultry slaughter

Slaughter controls can include but are not limited to contamination that comes from the environment (for example, feces and dirt) or from spillage of the intestinal tract of the bird.

OFSO licences, issued by Alberta Agriculture and Irrigation, allow for uninspected outdoor slaughter of birds owned by the customers. The slaughter occurs on land owned, leased, or controlled by the licensee and may be conducted by any experienced individual approved by the licensee. The licence holder must read this module and pass the quiz. It is highly recommended that if the licensees do not conduct the slaughter themselves, they have the person who they trust to perform the slaughter also complete this module.

1.1 Salmonella, Campylobacter, and where it comes from

Salmonella and Campylobacter are the two most common foodborne pathogenic (disease-causing) bacteria associated with poultry production and can be transferred to the meat during slaughter, including on-farm open-air slaughter. According to the World Health Organization, Salmonella and Campylobacter account for 35 and 38 percent of all foodborne illnesses globally, and about 23 percent of these are attributed to poultry consumption. Proper management of the risks associated with contamination during on-farm slaughter helps protect your customers and your business by keeping your meat products safe.

1.2 Controlling the spread of Salmonella and Campylobacter

Salmonella and Campylobacter are shed from the intestines of an infected birds through its feces; therefore, proper handling of feces in crates and barns, and control of the intestinal tract's contents during slaughter, are the keys to preventing contamination with these bacteria.

Birds' feathers and feet can carry feces and be a source of contamination with *Salmonella* and *Campylobacter*. Therefore, shared living quarters, transportation, crates, and slaughter practices can all be involved with the transfer of feces from a bird to the environment, from the environment to a bird, or from one bird to another.

Spillage of intestinal contents during gutting is another main source of bacterial contamination. Punctures occurring during gutting can leak bacteria, contaminating the carcass, workers' hands, knives, equipment, and the slaughter environment.

Workers can also cause bacterial cross-contamination since they can transfer bacteria from their hands or clothing. Good handwashing practices are vital to controlling the spread of pathogens. Dedicated work clothing is another important control measure since workers or visitors can bring contamination from their home barns to the workplace.

Contaminated equipment used during slaughter and carcass processing can transfer bacteria to clean product. Proper cleaning and sanitation procedures before, during and after slaughter and processing helps to control its spread.

Aerosols and spray created during cleaning gives bacteria "wings," which allows it to travel through the air and land on clean surfaces. Minimize the aerosols created when washing dirty areas, particularly drains and floors.

2.0 Prepare your slaughter area

The conditions under which OFSOs operate, e.g., slaughtering outdoors, present distinctive risks that must be recognized and mitigated. Without proper planning and preparation, you could find yourself running around gathering your equipment, as it is needed and risk the spread of contamination as you enter storage areas with dirty boots, clothing, or unwashed hands. Therefore, it is very important to assemble all your tools before you begin handling birds and starting slaughter. To help organize your slaughter and minimize cross-contamination opportunities:

- · protect your slaughter site and equipment from contaminants that could include mud, dust, and pests
- gather the equipment that you need during slaughter, for example knives and utensils, buckets, soap, disposable wipes/towels, and anything else that you need for slaughter
- · dedicate specific tools for slaughter only; keep them in good repair and stored in clean storage areas
- use stainless steel tables that are easy to clean and do not absorb blood or processing water. Avoid the use of wood
- set up a hand-wash station that is easily accessible during slaughter. A water container with an on/off spigot to hold warm
 water placed on a table and an empty five-gallon pail placed below to collect the grey water is a simple temporary solution to
 hand washing outdoors. Ensure that you have adequate supplies of water, soap, and towels, plus a container to discard
 used towels
- make sure that your water source, including ice, is potable and safe
- provide staff with appropriate clothing, for example, full-length vinyl aprons that can be easily cleaned and removed before using washrooms or entering a clean area
- assemble everything you need to prepare sanitizer solutions throughout the slaughter. A solution of 100-200 ppm food-grade chlorine is a good option, although it is important to check the strength with test-strips regularly as the efficacy reduces when organic matter (dirt) is mixed in. If the solution starts to get cloudy, discard it and use a fresh solution. Make a fresh batch every two hours or fewer

3.0 Cross-contamination points and slaughter best practices

As the OFSO licensee, you are ultimately responsible for the safety of the products produced under your licence. This is true whether you conduct the slaughter yourself or whether you allow someone else to conduct it. As there are many opportunities for cross-contamination to occur during slaughter and processing, many proactive actions can prevent cross-contamination from happening. Sources of contamination include:

- animals being slaughtered ingesta, feces, feathers
- · other farm animals including dogs
- · bodily fluids
- from equipment dirty utensils
- wounds
- bruises
- broken bones
- · necrotic tissue
- · cysts and abscesses

Consider implementing the following best practices into your operation to prevent cross contamination from occurring.

3.1 Animal husbandry

Birds carrying pathogens can pass contamination to healthy birds through their feces; therefore, maintaining clean living conditions is important. Ensure coups are clean and have proper water drainage to minimize pathogen growth. If a bird appears ill, separate it from the other birds.

3.2 Drug residues

It is important to know the drug history of birds presented for slaughter. If you raised the birds on your farm, you would have this information. However, if the birds were bought at an auction market, you must find out if drugs were administered to them and if the appropriate withdrawal time has been met for the drug before the birds are sold and slaughtered.

3.3 Prevent broken needles

If you medicate your birds using needles, follow these guidelines to avoid a broken needle:

- · use sharp needles
- do not re-use a needle more than 10 times
- · do not re-use needles used for sick birds
- · use the appropriate needle size
- inspect the needle after injection to ensure it is intact, make a note if it is broken and watch for it during processing or let the buyer know that it may still be in the meat.
- discard bent needles and do not re-use them or attempt to straighten them

3.4 Animal health

Do not slaughter sick or emaciated birds, sell and slaughter only healthy birds.

Note: Some diseases that can affect human health are reportable. Familiarize yourself with reportable diseases and who to contact if something out of the ordinary is noticed prior to slaughter in this <u>Reportable Animal Diseases</u> factsheet.

3.5 Receiving and animal handling

Treat every incoming bird as though it is contaminated with feces or bacteria, even if you cannot see it. Keep barns, transport vehicles, and crates clear of fecal matter. Brush dirt off birds before slaughter and process dirtier birds at the end of the day.

3.6 Withhold feed

Avoid feeding birds 8-12 hours prior to slaughter. When the intestine is empty, it lies flat and is less likely to be nicked with a knife or torn when the carcass is cut open. It also reduces the chance of defecation during slaughter. Potable water should always be available.

3.7 Stunning

Prior to stunning, restrain the birds in a cone or other manner that limits their contact with the ground following stunning.

3.8 Sticking/bleeding

Sterilize the knife/blade prior to use on every bird. Bleeding the bird completely will prevent blood contamination in the scald or chill tank that could interfere with the action of the sanitizer added to the water. Collect the blood in a bucket and dispose of with other waste.

3.9 Scalding

Scald water can be a source of cross-contamination, passing bacteria from one bird to the next through the water. Maintain a temperature of 65-70°C (150-160°F) and submerge each bird for 90 – 120 seconds. Check the temperature regularly with an accurate thermometer. Situate the plucking area away from the evisceration area to separate the activities and possible contamination. Keep the scald tank as clean as possible and change the water when it is visibly dirty.

3.10 Feather removal

The likelihood of cross contamination at this step is high, therefore attention to this step is important. If removing feathers by hand, wash hands thoroughly between birds. If using a mechanical plucker, thoroughly clean all equipment before use, replace worn rubber fingers, and avoid excessive feather accumulation. Situate the plucking area away from the evisceration area to separate the activities and possible contamination. Clean the scald tank thoroughly at the end of the day.

To reduce the attachment of *Salmonella*, *Campylobacter* and other bacteria to the skin, spray washing of carcasses must occur soon after de-feathering. Feathers and debris must be completely removed from the carcasses, including the hocks and other surfaces. The carcasses also must be washed prior to feet and oil gland removal and evisceration.

3.11 Evisceration

Use clean equipment, knives, and hands/gloves, etc., to prevent contamination between birds. If the intestine is nicked, the gallbladder is punctured, or the crop leaks and its contents spill out, the contamination must be trimmed off (rinsing is not appropriate). Also, clean the work area before the next bird is eviscerated. Keep the intestines and other waste products in a leak-proof container and dispose of appropriately and regularly. Trim visible contamination, instead of washing it, at any stage to reduce contamination.

Key steps to follow for evisceration of birds (chicken, turkey, duck):

- 1. Birds must be rinsed after being removed from the plucker and before being opened for evisceration.
- 2. Pin feathers, feet, oil gland must be removed.
- 3. If the neck is kept, the end exposed during scalding/plucking must be cut back at least 1 cm (0.4 inches).
- 4. Take special care not to rupture the intestines or the gallbladder (bile).
- 5. All viscera from inside the cavity must be removed including the lungs, kidneys, and reproductive organs.
- 6. Identify and trim any pathological conditions, blisters, bruises and contamination.
- 7. Viscera and inedible waste must leave the evisceration area via a dedicated waste collection bin.
- 8. Birds must be rinsed thoroughly inside and out prior to chilling.

3.12 Post-mortem examination

Once the carcass has been opened and the internal organs are visible, an examination of the organs will detect abnormalities or diseases that make the meat unfit for human consumption. Watch for signs such as swelling, discharge, tumors or growths, or anything else that appears out of the ordinary. If any observations are questionable, the carcass should not be allowed for human consumption, or a veterinarian may be consulted for disposition.

3.13 Trimming

The trimming step is the final point for removing all contamination and meat that is not fit for human consumption. Wash and sanitize the knife after removing parts of contamination and then again between each bird.

Note: It is recommended to trim visible contamination instead of rinsing it, at any stage, because rinsing is ineffective in removing bacteria and will spread the contamination throughout the surface of the carcass.

Consider the following when conducting the final trim:

- stick wounds: remove approximately 2.5 cm (1 inch) of tissue around the stick wound to remove contamination that enters the carcass with the knife during sticking
- bruises: trim the visible bruise where blood has collected, as this provides an ideal growth environment for bacteria. heavily bruised animals should not be used for human consumption

broken bones: if the bone protrudes through the skin, infection may have developed, and the fracture site must be removed. Fractured limbs should be removed completely and not consumed

- · necrotic tissue: unhealthy tissue that has died due to infection or trauma must be removed
- cysts and abscesses: must be removed completely in a manner that does not puncture the growth. Remove enough tissue around the cyst or abscess to safely remove it in one piece

3.14 Chill tanks/cooling

Inspect each bird for visible contamination and trim it again before chilling if necessary. If chill tanks are used, birds must be immediately placed in the chill tank with fresh ice water at 1-4°C (33-44°F) or less. The birds must remain in the chill tank until the internal temperature is 4°C or less. Add ice as necessary to keep the temperature of the chill tank at 1-4°C (33-40°F). Monitor the temperature regularly with an accurate thermometer. Take the temperature of the carcass by inserting a thermometer into the thickest part of the meat, usually the breast. Consider treating the chill tank water with an antimicrobial solution such as food-safe chlorine at 50 ppm. Check the label for instructions on how to mix the solution. Remember that the ice and water must come from a potable source.

3.15 Cooler Storage

If carcasses are stored in a cooler, ensure they are stored in a way that prevents them from touching other carcasses. This permits adequate air circulation between carcasses for efficient cooling. Keep coolers cold and chill carcasses to 4°C (40°F) or less to slow bacterial growth.

3.16 Managing waste

Dispose of waste materials, including wastewater, during slaughter away from the slaughter area so that it cannot be tracked around on people's boots. Solid waste, such as feathers, blood, and viscera, must be collected in leak-proof containers that are moved away from the slaughter processing area regularly to prevent cross-contamination of bacteria and to minimize attracting flies to the slaughter area.

4.0 Sanitary design

Effective cleaning and sanitation prevents pest infestations and sources of bacterial cross-contamination by removing meat and residues that attracts/nourishes pests and bacteria. It also protects the consumer from potential chemical and physical hazards. The chance of the procedures being successful is greatly increased when they are designed specifically for your operation and considers its design, construction, equipment, and maintenance.

4.1 Evaluate the sanitary design of your operation

Under your on-farm slaughter operation licence, all slaughter must occur outdoors, and processing occurs indoors. This is an important point of separation. The slaughter component is considered the "dirty" part and the processing is considered the "clean" part.

A sanitary design is based on both the flow of the product and the movement of people. It considers who has to travel where to do what. Cross-contamination is the unintentional transfer of a hazard from a dirty surface to a clean one. For example, when someone from the slaughter area enters the processing area with dirty boots on the chance that they will spread bacteria is extremely high. This type of risk can be designed out of your operation in many ways:

- a concrete pad is the preferred area to conduct slaughter because it is east to clean and prevent the transfer of ground
 contamination on to the carcasses. If a concrete pad is not available, select a clean, grassy area freed from feces to conduct
 slaughter. The use of tarps or floor mats could work to protect carcasses from ground contamination
- create a distinct area designated as "dirty" for activities such as slaughter, bleed-out, scalding, plucking, and evisceration
- keep the dirty activities separate from the "clean" activities that include chilling tanks and packaging
- product flow (from receiving birds to packaging the carcass) is in a straight line or a loop that never crosses paths with itself
- people (including those performing the slaughter and visitors) are physically limited to certain areas. For example:
 - keep people from dirty areas of the operation separate from the clean areas
 - if people must move from the dirty area to the clean area, enhance separation between the two areas by:
 - washing hands upon entry to the clean area
 - using foots baths to clean boots
 - changing outer layer of clothing like smocks or coats
- sanitizing stations and hand-wash sinks that are conveniently located makes it handy for people to wash their hands and sanitize small utensils frequently. People are more likely to use them if they are convenient.

4.2 Consider the equipment and materials used in your facility

Effective cleaning is improved when equipment is easily accessed, designed to be cleanable, maintained, and dedicated to slaughter activities. For example, paint that breaks down and begins to chip after repeated cleaning and sanitizing can be hazardous to the consumer particularly if the paint is not safe for human consumption. In the construction or renovations of your operation, consider the following:

- Avoid using equipment that is painted and can chip. If this is unavoidable, monitor the equipment regularly for chipped/flaking paint. The monitoring should be done prior to using the equipment.
- Position the equipment so that it can be easily dismantled and thoroughly cleaned.
- Use stainless steel where possible to avoid equipment rusting.
- Ensure that all welds are smooth and continuous to prevent meat residues being caught, which makes it harder to clean.
- · Avoid using wood in the facility because it can splinter or crack, is very difficult to clean, and it can harbor bacteria.

- Ensure all meat contact surfaces are constructed with materials that will not contaminate the meat. Ask your supplier for materials that are approved for food use.
- Surfaces that are not in direct contact with meat, such as floors, walls, tables, racks, etc., must be easy to clean, nonporous, and able to withstand the cleaning and sanitizing process.
- Dedicate saws, knives, and other equipment to the slaughter operation and do not use them for other purposes on the farm.

4.3 Other things to keep in mind

Slaughter at OFSOs occurs outdoors and this presents distinctive risks that do not occur under other licensed slaughter that takes place inside a clean and well-maintained building where the environment can be controlled. The risks of outdoor slaughter must be recognized and controlled. Consider these opportunities for reducing cross-contamination in your operation:

- Regularly clean trailers and cages used to that haul live birds from the auction market or other locations to reduce the dirt
 and feces transfer between animals and loads.
- Separate birds from other animals if you have a mixed farming operation to reduce the transfer of bacteria.
- Avoid conducting slaughters in areas where there are accumulated feces on the surrounding ground; conduct your slaughter on clean grass or a concrete pad.
- Prevent contact of the carcass with the ground at any point during slaughter.
- Keep live animals out of the processing area. This includes pests, dogs, and other pets as well as animals intended for slaughter.
- Limit the handling of animals by people who visit the farm as they can transfer bacteria from animals they touch to the slaughter and processing equipment, and possibly to their homes.
- Provide hand-washing stations, like those found at petting zoos, if you do permit visitors (especially children) access to live
 animals or areas where animals are held, slaughtered, or processed. Supply hand-wash stations with soap, water, paper
 towels, and a garbage bin.
- Maintain appropriate educational signage throughout the facility to guide your employees and visitors in safe animal and food handling practices.

5.0 Water source

Water can become contaminated with bacteria such as *E. coli* or chemicals like arsenic, uranium, or lead. The Canadian government has set limits of contamination and detail can be found at <u>Canadian Drinking Water Guidelines</u>. Municipal water supplies are routinely tested for contamination by the municipality and alerts are issued when a problem is discovered. Private sources such as wells and dugouts are your responsibility to monitor.

Particular attention must be paid to water sources that are near areas of animal husbandry as fecal matter can seep into the source. It is a good practice to house animals far away from the water source or preventing access to the water source, i.e., fencing. Environmental emergencies like flooding, fires, and drought, can also affect water safety.

The best times to test a water source are:

- · early spring just after the thaw
- · after a rainy season
- · after a long dry spell or drought
- · after heavy rains and floods
- after the well has not been used for a long period of time.

For more information on maintaining safe well water, view the following resources:

- Working Well Resources | Alberta.ca
- Be Well Aware: Information for private well owners | Canada.ca
- Be Well Aware: Ensure your well water is safe during and after emergencies | Canada.ca.

5.1 Water used as an ingredient or processing aid

Water and ice are used as raw materials in many production processes, for example, ice used to cool carcasses in baths, water used to disperse additives, etc. Ice and water used as an ingredient or that comes in direct contact with food must be made from potable water and protected from impurities.

Ice-making machines must be cleaned regularly to avoid contamination of dirt or bacteria.

5.2 Water used for chilling

As the water used in chill tanks or for spraying carcasses comes into direct contact with the meat, it must be safe water and meet the guidelines for safe drinking water (potable).

5.3 Water used for cleaning

Cleaning chemicals are often diluted with water and then rinsed with water, for this reason, all water used in sanitation procedures must be free from contamination and potable.

5.4 Water used for personal hygiene

As hands must be regularly washed to maintain sanitary processing, the water used by staff for personal hygiene must be potable. If not, employees' hands could transfer contamination from the water to the meat.

6.0 Waste disposal

Operators of OFSOs must dispose of their slaughter waste and dead animals that are not processed for consumption according to Disposal of Dead Animals Regulation (DDAR) by on-farm composting, burning, or by burial.

6.1 On-farm composting

Where one or more dead animals are composted in an open outdoor or indoor compost pile:

- the volume of dead animals must not exceed 25% of the total volume of the compost pile
- materials may not be removed from the compost pile until the dead animal(s) are composted to the extent that:
 - the generation of odours by the compost are minimized
 - the compost will not contaminated surface water or groundwater
 - the compost will not attract vectors of disease, and
 - the use of compost will not cause or contribute to the spread of disease, cause scavenging or create a nuisance

An outdoor farm open compost pile must be:

- at least 100 m from any well or other domestic water intake, stream, creek, pond, spring, river, irrigation canal, dugout or other water source and the high-water mark of any lake
- at least 25 m from the edge of any coulee or embankment
- at least 100 m from any residence
- designed in a manner that will exclude scavengers
- at least 100 m from the boundary of any land owned or leased by a person other than the owner of the dead animal, unless
 the owner or leaseholder of the land has consented in writing to the outdoor farm open compost pile being located closer to
 the boundary,
- at least 300 m from any provincial highway, and
- designed such that the dead animal or animals are covered with at least 60 cm of composting material.

An indoor farm open compost pile must be in a building that has:

- an impervious floor, and
- · adequate drainage control to prevent the contamination of surface water or groundwater from the compost effluent.

For additional information on the composting process, see Poultry mortality composting and On-farm composting

6.2 On-farm burning

Burning on-farm can be done as an open fire or in an incinerator, and there must be no remains left after burning.

Burning of a dead animal and parts may only occur if done in accordance with the Substance Release Regulation (AR124/93) or the Code of Practice for Small Incinerators. Contact Alberta Environment and Protected Areas for additional information about requirements associated with burning. Contact your municipal district regarding burning permit requirements.

6.3 On-farm burial

Burial requires great care in site selection because as carcasses decompose they release materials that potentially enter groundwater. Burial sites should be located in low permeable soils. Areas with a high groundwater level or shallow aquifer must be avoided.

An OFSO may dispose of dead animals by burial in a farm burial pit if the total weight of all animals in the pit are between 100 kg and 2500 kg. (**Note**: the total weight of dead animals is determined by adding the weight at the time of burial of each dead animal buried in the pit to the weight at the time of burial of each dead animal previously buried in the pit).

The requirements for the farm burial pit include:

- at least 1 m above the seasonal high-water table
- at least 100 m from any well or other domestic water intake stream, creek, pond, spring, river, irrigation canal, dugout or other water source and the high-water mark of any lake
- at least 25 m from the edge of any coulee or embankment
- · at least 10 m from any other farm burial pit
- at least 100 m from any residence
- at least 100 m from the boundary of any land owned or leased by a person other than the owner of the dead animal, unless
 the owner or leaseholder of the land has consented in writing to the pit being located closer to the boundary
- · at least 300 m from any provincial highway, and
- · covered with:
 - a minimum of one metre of compacted soil, if no additional dead animals are to be buried in the pit, or
 - a wooden or metal lid that is designed to exclude scavengers and quicklime is applied to the dead animal or animals in sufficient quantities to control flies and odour, if the weight limit established by clause (a) has not been reached and the owner intends to bury additional dead animals in the farm burial pit.

An OFSO must obtain authorization from the Chief Provincial Vet (OCPV) to bury more than 2500 kg in a farm burial pit.

An OFSO may dispose of dead animals by burial in a farm burial pit, if the total weight of all animals in the pit is less than 100 kg, and the pit is:

- is at least 50 m from any well or other domestic water intake, stream, creek, pond, spring, river, irrigation canal or other water source and the high-water mark of any lake
- is at least 25 m from the edge of any coulee or embankment
- is at least 100 m from any residence situated on land owned or leased by a person other than the owner of the dead animal
- is at least 3 m from any other farm burial pit
- · is covered with a minimum of one metre of compacted soil, and
- has not been used for the burial of a dead animal during the previous 5-year period

For more information, see Livestock Mortality Management

7.0 Quiz

After completing learning module 4: safe poultry slaughter, please complete module 5 before completing the quiz for modules 4 and 5.

For more information on safe poultry slaughter, please contact agi.foodsafety@gov.ab.ca.