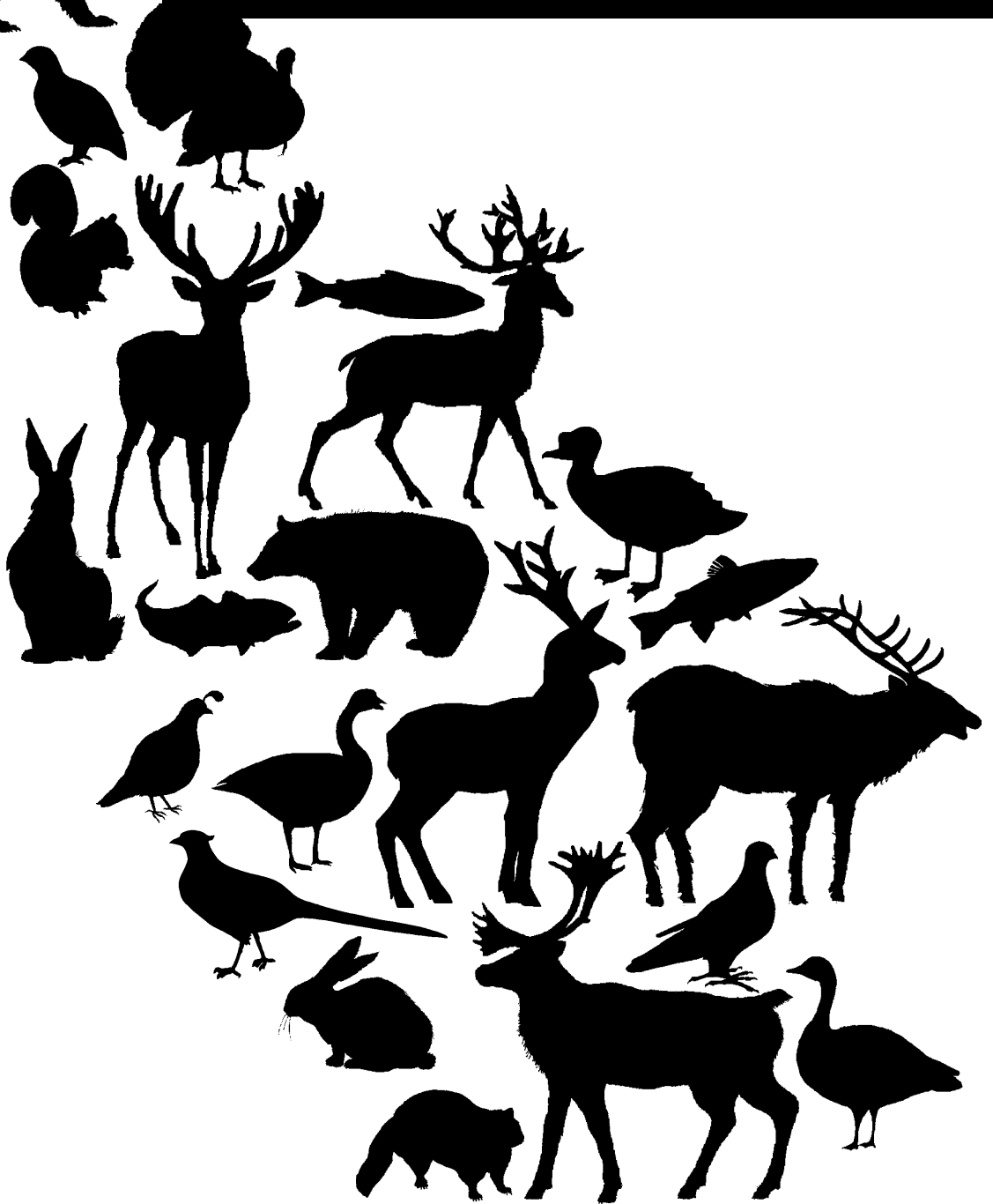
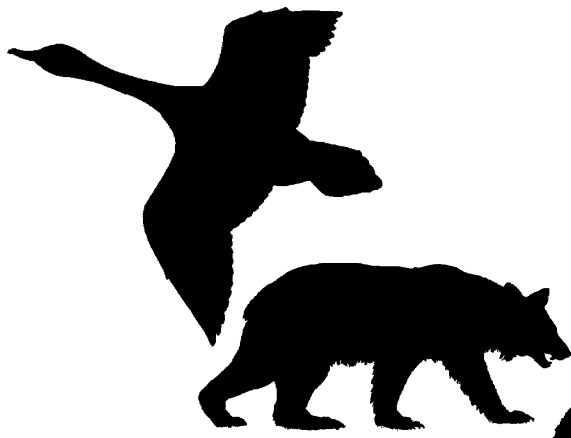


Proper Field Dressing and Handling of Wild Game and Fish



PENNSYLVANIA STATE UNIVERSITY



Cooperative Extension
College of Agricultural Sciences

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INTRODUCTION

Hunting and fishing are some of Pennsylvania's most popular outdoor activities. According to the Pennsylvania Game Commission, 2.7 million hunting licenses and nearly 1 million fishing licenses were issued in the state in 2009, the most in the United States. While most outdoorsmen hunt or fish for sport, many of them also do it to provide food for themselves and their family. The meat from hunted animals, birds, or fish is processed and either prepared for immediate consumption or preserved for later consumption.

Those who field dress animals, fish, and birds and transport them from the field are often unaware of the potential risks associated with foodborne pathogen contamination. As with any perishable meat, raw or undercooked game meat can contain harmful bacteria such as salmonellae and pathogenic strains of *Escherichia coli*. These bacteria, often associated with the gastrointestinal tracts of animals, can cause illness in humans when ingested. Contamination of meat or fish may occur through the initial wound as well as during field dressing, handling, and transport. Bacterial numbers will increase on the meat, especially if held at improper temperatures. If the meat is not properly cooked or preserved, or if cross-contamination occurs, there is an increased risk that these pathogens will be ingested, often resulting in foodborne illness. Therefore, proper handling of game meat or fish from the field or stream to the table is extremely important. This publication contains guidelines and hints to help you ensure the food you are consuming is handled and prepared safely.

THE IMPORTANCE OF TEMPERATURE CONTROL

Bacteria exist everywhere in nature—in the soil, air, water, and our food—and can grow on food when the temperature is right because it provides the nutrients and other conditions they need to grow. Temperature control plays a critical role in keeping food safe and is essential for the prevention of foodborne illness.

Bacteria grow most rapidly in the range of temperatures between 40°F and 140°F, in some cases doubling in number every 20 minutes. This range of temperatures is often called the “temperature danger zone.”

Temperatures below 40°F will slow the growth of the bacteria but will not kill them. Bacteria capable of causing foodborne illness either do not grow at these refrigerator temperatures or grow very slowly. However, spoilage bacteria, yeasts, and molds will grow and cause the meat or fish to spoil over time. After days of refrigerated storage, meats may develop uncharacteristic odors or colors and/or become sticky or slimy.

Always use a refrigerator/freezer thermometer to verify that the temperature of the refrigeration unit is below 40°F. Properly handled and prepared game meat, birds, or fish stored in a freezer at 0°F will last up to a year or so. Freezing prevents bacterial growth, but it does not kill them. Once thawed, these bacteria can again become active and multiply to levels that may lead to foodborne illness. Therefore, thawed meats should be handled in the same way as fresh meats. Be sure to thaw frozen meats properly, either in the refrigerator, in a microwave, or, if vacuum packaged, under cold running water, but never at room temperature. Cook the meat quickly after thawing is completed.

When storing and handling meats, preventing cross-contamination is important. Prevent meat juice from dripping onto other food items in the

refrigerator and clean all surfaces and utensils that come in contact with the raw meat or its juices with hot, soapy water and rinse well.

Always cook raw game meat, birds, and fish to the proper internal temperature. This internal temperature must be reached or exceeded during baking, roasting, frying, or boiling in order to destroy bacteria that can cause foodborne illness. When roasting meat and poultry, use an oven temperature no lower than 325°F. Cook ground meats to an internal temperature of at least 160°F. Cook game bird breast meat to an internal temperature of at least 165°F. Use an instant-read meat thermometer to ensure that all meats have reached the proper internal temperature.

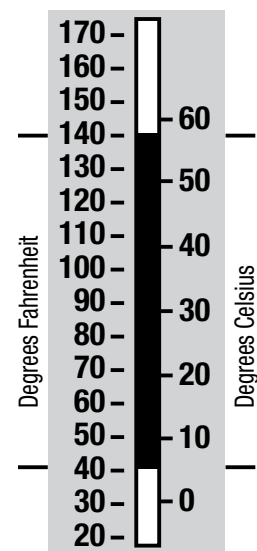
An uncommon but severe parasite that may be associated with bear and wild pigs from North America is *Trichinella spiralis*. The parasite can be inactivated by freezing the raw meat for at least three weeks prior to consumption. Cooking also will destroy the parasite. So, bear or wild pig meat should be cooked using the same temperature guidelines as other meats, such as venison.

Once cooked, it is important to cool the meat down rapidly and then store it at refrigeration temperatures if it will not be consumed immediately. Spore-forming bacteria, such as *Clostridium botulinum* and *Clostridium perfringens* are a risk in cooked meat items that are not properly chilled and stored.

Safe food-handling practices are a good defense against foodborne illness. Because we know how different temperatures affect the growth of bacteria in our food, we can protect ourselves and our families from foodborne illnesses by properly handling, cooking, and storing game meat, birds, or fish at safe temperatures.

The Temperature Danger Zone

41–140°F (5–60°C)



FIELD DRESSING AND HANDLING OF DEER AND OTHER LARGE ANIMALS

Properly field dressing your game animal is an essential first step in preserving the meat and preventing the occurrence of disease-causing bacteria. Techniques for field dressing deer and other large animals depend on the size of the kill. While deer carcasses can be kept intact, elk and moose may require halving or quartering for transport out of the field and to accelerate cooling.

Recommended Equipment

For proper field dressing, bring the following items with you when you hunt:

- Sharp knife
- Small hatchet
- Whetstone or steel for sharpening
- Several feet of rope or nylon cord
- Rubber bands
- Clean cloths or paper towels
- Resealable plastic storage bags
- A large cooler full of ice/snow
- Ground pepper and cheesecloth
- Disposable plastic gloves
- Clean drinking water

Bleeding

It is not really necessary to bleed out an animal. In most cases, a well-placed bullet wound to the neck or torso (lungs, heart, liver) will be all that is needed to bleed the animal out.

Field Dressing

There are several ways to field dress an animal. Most differ in the manner or size of the incision made to remove the intestines. Regardless of the technique used, it is important to eviscerate the animal as soon as possible after shooting. By dressing it quickly, you will ensure rapid loss of body heat, prevent surface bacteria from growing, and improve the overall quality of the meat. To reduce the risk of exposure to disease, wear plastic, disposable gloves while handling animals. If you don't have gloves, wash your hands and arms thoroughly with soap and water before and after dressing.

With 6–8 feet of rope, you can tie one of the animal's legs to a tree to open up the carcass for field dressing. You can also spread the hind legs by propping a branch between them. Position the carcass on its back, using rocks or logs to keep it in place.

If you have shot a male, remove the genitals from the carcass, leaving the scrotum for sex identification. If you have shot a female, remove the udder from the carcass. Be careful not to leave a big hole in the abdominal area. By making a smaller incision, you'll prevent dirt, insects, and other contamination from entering the carcass when dragging or carrying the animal.

Using a clean knife, cut along the midline from the bottom of the breastbone to a point near the scrotum or mammarys; make the cut by lifting the skin and muscle together. The hipbone does not need to be sawed through to field dress an animal. Once you have a big enough incision, you can insert your whole hand in the opening just beneath the breastbone. Grasp the knife with the blade facing upward to avoid puncturing the intestines/entrails; bacteria associated with foodborne illness may be found in these organs. You also can insert two fingers (one on each side of the knife blade) into the slit next to the breastbone, pushing the intestines/entrails down and away from the knife (Figure 2).

Use clean water, pre-moistened wipes, or alcohol swabs to clean your

Figure 1. The internal organs of a deer.

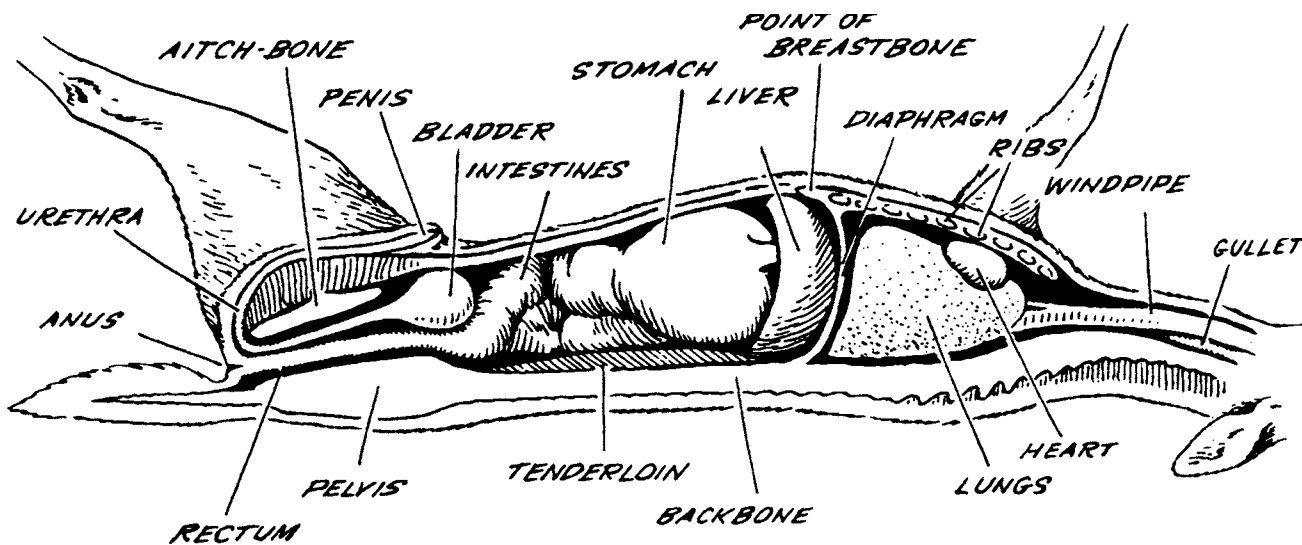
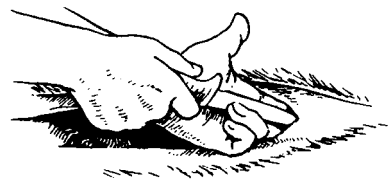


Figure 2. A finger on each side of the blade lifts the abdominal wall away from the entrails.



knife frequently between cuts to avoid dragging bacteria into the meat.

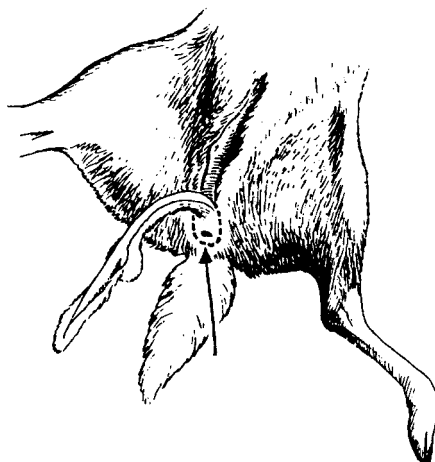
Cut around the anus (and vulva if female), loosening it so it will come out with the rest of the intestines (and reproductive tract if field dressing a female) (Figure 3). You can tie off the anus/vulva with either rubber bands or string after placing a plastic bag over the anus/vulva. Doing so will prevent any feces from the rectum from contacting the carcass. Pull the anus, large intestine (and reproductive tract) into the body cavity. At this point, you can roll the carcass over and remove the entrails. You may need to cut with your knife to loosen them from the inside of the body cavity.

If you want to save the variety meats, you can remove the liver and heart from the rest of the entrails and place them in resealable plastic bags. Place the bags on ice or snow as soon as possible to chill them down.

Reach into the body cavity and cut the diaphragm free from the rib cage. You may have to remove the windpipe and esophagus/gullet by cutting as far forward in the chest cavity as possible. Or, you can reach through the diaphragm up into the neck and, working blindly, cut loose the windpipe and esophagus/gullet ahead of the lungs. Remove the heart, lungs, esophagus/gullet, and windpipe from the chest cavity.

Finish cleaning out the cavity by removing any remaining entrails, and drain all excess blood. Remove all visible dirt, feces, hair, and bloodshot areas. Wipe the inside of the body cavity with a dry cloth or paper towels. If you choose to rinse the cavity with water to remove extraneous material, use clean water and dry the inside

Figure 3. Score deeply around the anus and urethra to free them from the pelvis.



thoroughly. Do not rinse the deer in a pond or stream. Excess moisture will encourage bacterial growth that can affect the quality and safety of the meat. Propping the cavity open with sticks or branches will aid in air circulation and drying.

If desired, you can remove the scent glands on the inside of the legs at the hock or leave them intact. Research has indicated that they do not cause any "off" flavors or odors when left on the carcass.

Some hunters prefer to tag their animals as soon as they find them, while others tag them after dressing. Follow your state laws for tagging your animal and notifying authorities at the check station.

It is important to dissipate the heat from the carcass as soon as possible. If the air temperature is above 40°F, you can rapidly chill it by inserting resealable plastic bags of ice or snow into the body cavity and securing them in place by tying the cavity shut with small lengths of string. Tying the cavity shut will also prevent dirt, insects, and other contamination from entering the carcass when you drag or carry the deer. If you do not have snow or ice available, allow for adequate air circulation in the cavity and keep the carcass out of direct sunlight. Upon arrival at your home, camp, or processor, refrigerate the carcass (at lower than 40°F) as soon as possible

to prevent spoilage and to improve the quality of the meat. Carcasses also may be hung and chilled outdoors if the temperature is below 40°F.

Note: If any of the internal organs smell offensive or exhibit greenish discharge, black blood, or blood clots in the muscle, do not consume meat from the carcass. According to the Pennsylvania Game Commission (PGC), a hunter who legally kills a deer and discovers the flesh is unfit for consumption at the time of killing shall, within 12 hours following the discovery, deliver the entire carcass, less entrails but including the head and hide, to any PGC officer. At that time, the PGC officer will make a determination that the deer is unfit for consumption at the time killed and shall issue a written authorization to the person to kill a second deer during the remaining unexpired portion of hunting season.

Skinning

Once you have field dressed your animal, you will need to consider whether or not to remove the hide. There are several reasons for removing the hide immediately. First, you can maintain its integrity for taxidermy purposes, especially if it is removed before transport. Second, you can chill the carcass faster by removing the hide, which may act as an insulator and keep in body heat.

Leaving the hide on the carcass also has its advantages. If the deer is left outside for chilling, it can act as an insulator from the extreme cold; it can prevent contamination from bacteria, dust, leaves, insects, and hair during transport; and it can prevent drying of the meat. Leaving the hide on the carcass during aging (at below 32–38°F for 2–3 days), also will minimize shrinkage, keep the carcass clean, and avoid discoloration of the meat.

The main things to keep in mind when skinning are using the knife as little as possible and pulling and fisting the hide, especially if you want keep the meat surface and hide intact.

Using a clean knife, cut the skin over the rear of the hock and down

the back of the leg toward the rectum. Skin around the hocks and remove the legs at the break joints just below the knees. Make an opening between the tendons and the hocks. Be careful not to cut the tendons, as you can use them later to hang your carcass.

Open the skin around the anus and skin along the midline of the carcass. Once the hide is loosened, you can begin to pull it over the rounds/haunches, over the loin and back, and over the shoulders. Use your fist to remove the hide from the sides, continuing to pull it down the back. If you get some flesh/muscle with the hide, trim it off with your knife or fist it back into the carcass. Pull the hide completely from the carcass.

If you decide to save the hide, liberally rub the inside with fine salt and let it absorb for 24–48 hours. Ship or transport the hide to a taxidermist for tanning and mounting.

To remove the head, split the underside of the neck. Remove the head at the atlas joint (the connection between the head and the first vertebra of the neck and spinal column). Remove the esophagus/gullet and windpipe as well as any other remaining organs.

If desired, clean up the carcass with plenty of clean water and remove any extraneous material. Store the carcass under refrigerated conditions (below 40°F) until it is boned and/or processed.

Transporting

Traveling long distances in warm weather with a carcass can be detrimental to meat safety and quality. Transport the carcass to a processing facility with adequate refrigeration as soon as possible. If transporting by pickup truck, make sure the bed is free of debris that may blow onto the carcass. If you dress or skin the animal in warm temperatures or where insects are a problem, you can sprinkle or rub ground black pepper on the inside of the carcass and/or wrap it in cheesecloth. Keeping the hide on the carcass until you have arrived at your destination will prevent further contamination of the meat during transport.

If the weather is cool (below 40°F), allow for adequate air circulation by propping the body cavity open with clean sticks. If the temperature is above 40°F, insert plastic bags of ice or snow into the body cavity and secure them by tying the cavity shut with small lengths of string. Because of the heat associated with the engine or sunlight, do not tie the carcass across the hood or roof of a car or truck. Similarly, do not put the carcass in the trunk while it is still warm. For long trips, it is suggested that carcasses be skinned, quartered, and packed in ice or dry ice. Alternatively, a processor can cut, wrap, freeze, and ship the processed meat to the hunter.

FIELD DRESSING AND HANDLING OF SMALL ANIMALS

It is generally recommended that small animals be handled similarly to large animals. It is also important to dress and cool small game animals as soon as possible. The practice of skinning small game animals in the field, wrapping the carcass, and placing it in a cooler will improve the overall quality and safety of the meat.

Rabbits

Because of the risk of tularemia, an infectious disease acquired from wild rabbits and transmitted to humans via skin cuts and abrasions, you should wear plastic gloves while handling

these animals. Use clean water, pre-moistened wipes, or alcohol swabs to clean the knife frequently between cuts to avoid dragging bacteria into the meat.

Once the animal has expired, make an incision at the rear of the hock, between the bone and the tendon. Suspend the carcass by hanging from one hock. Sever the head at the atlas joint (the connection between the head and the first vertebra of the neck and spinal column).

Remove the other rear leg at the hock joint. Remove the tail and fore-legs (at the knee joints). Cut the skin

from the other rear leg to the base of the tail. Continue to cut the skin up to the rear of the suspended leg. Pull the edges of the hide away from the flesh and down over the carcass. You should need no other cuts to remove the hide.

Cut from the breastbone to the belly and remove the intestines, stomach, and lungs. Remove the suspended rear leg. Rinse the whole carcass in cold water to remove hair and blood. Cut and remove the loin in one piece to keep the muscle intact, and separate the shoulders.

FIELD DRESSING AND HANDLING OF GAME BIRDS

Game birds include grouse, guinea fowl, partridge, squab (young pigeon), quail, pheasant, wild ducks, wild geese, wild turkey, and other species. As with any perishable meat, fish, or poultry, bacteria can be found on raw or undercooked game birds. Bacteria multiply rapidly at temperatures between 40°F and 140°F (out of refrigeration and before thorough cooking occurs).

To reduce the risk of exposure to disease, wear plastic gloves while handling birds. Use clean water, pre-moistened wipes, or alcohol swabs to clean the knife frequently between cuts to avoid dragging bacteria into the meat. It is also important to wash your knife, hands, and cutting boards often with warm soapy water.

Recommended Equipment

For proper field dressing of game birds, bring the following items with you when you hunt:

- Sharp knife
- Resealable plastic storage bags
- Whetstone or steel for sharpening
- Cooler full of ice/snow
- Rope or nylon cord
- Disposable plastic gloves
- Clean cloths or paper towels
- Clean drinking water

Turkey

To field dress a turkey, lay the bird on its back. Follow the breast down to the rear of the bird until it narrows to a point between the legs. Pull up on this tip and cut the bird open by making a shallow horizontal incision (through the skin only) between the tip of the breast and the vent. Make the incision large enough to insert your hand. Be careful not to cut or nick the entrails.

Pull out the entrails, heart, and lungs. Cut around the vent (anus) by carefully following the intestine back and then cutting around its exterior. Remove the crop (organ where food gathers before it goes into a turkey's stomach) by making a cut on the neck of the turkey and reaching down to the top of the breast where the organ is located. Be careful not to cut the crop, stomach, or intestines, as foodborne pathogens may be found in these organs.

After removing the organs, wipe all the blood out of the body cavity with a clean cloth or paper towels. You may also rinse the cavity with clean water, dry it, and ventilate it well. As soon as possible, place a bag of ice inside the body cavity for the trip home. To ensure even cooling, keep birds separate during transport. Once home,

completely wash your turkey inside and out and refrigerate immediately.

Filleting a Turkey

If you are not saving the bird's cape for taxidermy purposes, start by laying the turkey on its back. To remove the breast fillets, pull or cut the skin back from the breast. Find the breast bone and make an incision on each side of it to loosen the breast fillet from the bone. Working from the rear of the breast forward, pull off the fillet, using the knife where needed. Repeat this process for the other side of the breast.

Remove the thigh/leg by flipping the turkey over and cutting through the thigh muscle where it attaches to the back. Grab the leg/thigh and pull it up until the joint pops loose. Cut through the thigh until the thigh/leg is freed from the turkey's body.

If you plan on roasting, smoking, or deep-frying your whole turkey, leave the skin on and do not fillet it. Instead, gut the bird as described above and pluck it. A paraffin treatment (see "Waterfowl," p. 8) may help remove the pinfeathers.

Pheasants

To dress a pheasant, make a small lateral incision on the underside of the breast with a clean knife. Pull the skin and feathers off the carcass. From the topside, cut down both sides of the back, starting near the head and cutting through to the last rib.

Separate the carcass by pulling the breast apart from the neck, back, and legs. The intestinal tract, heart, lungs, and liver will remain attached to the back portion. Avoid cutting the crop, gizzard, or intestines since bacteria associated with foodborne illness may be found in these organs. Place the heart and liver in a plastic storage bag and store on ice. If the organs smell offensive or exhibit greenish discharge, black blood, or blood clots in the muscle, do not consume meat from these carcasses; properly discard them.

Remove the feet and lower legs at the joint below the drumsticks. For purposes of identification, leave the head or a fully feathered wing (required by the Pennsylvania Game Commission). Remove all visible dirt, feces, feathers, and bloodshot areas. Wipe out the cavity with individual paper towels, then prop it open with a clean stick or hang the carcass to aid in air circulation. If you wash the cavity with water, dry it quickly to prevent spoilage.

After cleaning the cavity and in preparation for transport, place carcasses in plastic storage bags and pack on ice or snow. Do not pile warm birds together, as this will hamper cooling. Separate and cool the carcasses quickly (to 35–40°F) to prevent bacterial growth. During transport, keep the carcasses out of sunlight.

To remove excess blood, soak grouse, pheasant, quail, and partridge in cold water for 1–2 hours. It is advisable to hold carcasses at 40°F or less since freezing before processing may toughen the meat. If you will be aging the carcass, do so at 40°F or less and for 2–3 days.

Waterfowl

It is important to dress the carcass as soon as possible and to remove all visible dirt, feces, feathers, and bloodshot areas.

Remove entrails, taking care not to break the gall bladder sac on the liver since bile destroys meat flavor. If the organs smell offensive or exhibit greenish discharge, black blood, or blood clots in the muscle, do not consume meat from these carcasses; properly discard them. Place variety meats such as the heart and liver in a plastic storage bag and store on ice. For purposes of identification, leave the head or a fully feathered wing intact (required by the Pennsylvania Game Commission).

Many experts recommend that ducks and geese be plucked rather than skinned because the skin helps retain flavor and moisture during cooking. Dry pluck as many feathers as possible. To remove pinfeathers and down, use a paraffin treatment. For four ducks, place two cakes of paraffin in 4 quarts of water, bring to a boil, and dip the birds one at a time. Cool to harden the paraffin, and then scrape off the wax, down, and pinfeathers with a small, dull knife.

Wipe out the cavity with individual paper towels, then prop it open with a clean stick or hang the carcass to aid in air circulation. If washing the cavity with water, dry the area quickly to prevent meat spoilage.

After cleaning the cavity and in preparation for transport, place the carcasses in plastic storage bags and pack on ice or snow. Do not pile warm birds together, as this will hamper cooling. Separate and cool the carcasses quickly (to 35–40°F) to prevent bacterial growth.

HANDLING OF FISH

With more than 20,000 different species, fish constitute the largest and most diverse class of vertebrates. Pennsylvania's numerous waterways and lakes provide ample opportunity for catching one of the many that are native to this state. Wherever you decide to fish, properly handling and processing your catch will ensure a safe product for consumption.

Recommended Equipment

For proper fish handling, bring the following items with you when you fish:

- Sharp fillet knife
- Disposable plastic gloves
- Whetstone or steel for sharpening
- Cooler full of ice/snow
- Clean cloths or paper towels
- Clean drinking water
- Sealable storage bags
- Bucket, basket, stringer, or live box to keep fish alive
- Pliers for skinning

Before the Catch

Fish in safe waters. Because of the possibility of heavy metal or pesticide contamination, you should contact your local office of the Pennsylvania Department of Health or the Fish and Boat Commission to determine the safety of fishing waters. The Pennsylvania Fish and Boat Commission maintains a website (www.fish.state.pa.us) that includes news releases and field reports from lakes and rivers throughout the state.

Plan ahead and decide what you will do with the fish immediately after you catch them since the quality of the meat declines soon after they are caught. If you plan to release the fish, do so immediately; waiting until the end of the day to decide diminishes their chances of survival.

After the Catch

Live fish can be kept on stringers or in live wells, as long as they have enough water and mobility to enable them to breathe. Check fish for signs of disease or parasites. Healthy fish have bright, clear eyes and red gills; diseased fish may have sunken eyes, discolored skin, loose scales, and white, bloody, or slimy gills.

To reduce the risk of exposure to disease, wear disposable plastic gloves while handling fish. During processing, use clean water, pre-moistened wipes, or alcohol swabs to clean the knife frequently between cuts to keep from dragging bacteria into the flesh. Wash your knife, hands, and cutting boards often with warm soapy water.

Once fish have been killed, they should be cleaned promptly since enzymes, bacteria, and oxygen all begin working to diminish the quality of the meat. Enzymes will spoil the meat rapidly and cause "off" flavors. Enzymes in living seafood help build tissue, contract and relax muscles, and digest food. After harvest, they continue to work, digesting or breaking down the flesh, softening it, and lowering its quality. Enzymes also produce more food for bacteria, which increases the rate of spoilage.

Bacteria are the major cause of seafood spoilage. Millions of bacteria live on the surface, on the gills, and in the gut of living fish and shellfish. After harvest, they invade the flesh through the gills, along blood vessels, and directly through the skin and belly cavity lining. These bacteria grow and multiply, producing the "fishy" smelling and tasting compounds associated with old seafood. If food-poisoning bacteria are present, they can multiply and cause illness.

Finally, oxygen in the air attacks the oils in seafood and causes rancidity, "off" odors, and "off" flavors. This commonly occurs in fatty fish such as salmon and mackerel.

To clean a fish, first wash it in clean water. Decide whether you will skin or scale it. If you scale the fish, remove

scales by scraping the fish gently from tail to head with the dull edge of a knife or spoon. If you skin the fish, scaling is not necessary. Instead, cut down the middle of the back of the fish and loosen the skin around the fins. Remove the skin with a pair of pliers, pulling the skin from the head to the tail.

Remove the head by cutting through to the backbone above the collarbone. Break the backbone over the edge of the boat, a cutting board, or a table, and then cut any remaining tissue holding the head to the body. Remove the dorsal or large back fin by cutting the flesh along each side and pulling the fin out. Do not trim the fins with shears or a knife since bones will be left at the base of the fin.

To fillet a large fish, lay it on its side and cut down one side of the backbone from the tail to the head with a sharp, clean knife. Angle the knife to separate the filleted flesh from the bone. Run the knife over the rib bones to loosen the rest of the fillet. Flip the fish over and use the same procedure to cut the fillet from the other side.

For a smaller fish, gut it and remove the skin, leaving the fillet on the bones. To skin it, lay the whole fish on a cutting board. Hold the tail with your fingers and cut through the skin to the flesh. Flatten the knife against the skin, and run the knife forward to separate the skin from the flesh.

Rinse the filleted flesh in cold, clean water to remove blood, bacteria, and digestive enzymes. Wipe the fish surface clean with cloth or paper towels, put it in resealable storage bags or wrap it in clear plastic wrap, and place it on ice for transport. It is important to cool fish quickly (to 35–40°F) to prevent bacterial growth. Keep fish flesh out of direct sunlight by covering the cooler with a blanket.

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For more information about food safety, contact Penn State's Department of Food Science at 814-865-5444 or visit Penn State's food safety website at extension.psu.edu/food-safety.

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