CULLING FOR AVIAN (BIRD) INFLUENZA CONTAINMENT
A Planning and Response Guide For Government Officials

Prepared by the Academy for Educational Development for the USAID Avian Influenza Program
In response to an avian (bird) influenza outbreak, many activities will need to be conducted in affected areas, with the killing of infected and other poultry being only one part of this process. Following are steps to follow if you are planning or participating in the culling of poultry as part of avian (bird) influenza control and eradication. These guidelines are in the following categories:

**PLANNING**

A plan for the culling needs to be developed for each individual farm.¹

The plan should provide answers for the following questions:

- Where should the poultry be culled? To minimize handling and reduce stress on the poultry, they should preferably be culled on the affected farm, as close as possible to where they are housed.
- What are the species, number, age, and size of the poultry to be killed? This is to make sure that all animals intended for culling are culled and disposed of.
- What type of housing do the poultry live in? Different culling approaches may be needed for cage, litter and free range systems.

- What type of equipment is needed for culling? This includes equipment needed for culling such as burdizzo, as well as personal protective equipment for the workers and cleaning / disinfection materials for clean-up operations after the culling is complete.
- Are there any facilities available on the premises that will assist with the culling process?
- What is the health status of personnel who conduct the culling?
- Are there any legal issues that may be involved? For example, legal issues may arise with the use of restricted veterinary drugs or poisons or if the process may affect the environment.
- In what order should the poultry be culled? Usually infected birds should be culled first, followed by birds in contact with infected birds, and finally the remaining birds in the flock.
- Are there other poultry farms in the vicinity of the affected farm?
- What are the costs of the various culling methods?
- What is the number of people/cullers necessary to complete the culling efficiently and effectively?
- Is there necessary training for cullers, particularly with regard to communication to farmers and community leaders?
- Is there necessary training available for workers to learn how to cull the birds properly?
- Will there be government or veterinary officials present to oversee the culling operations?
- What type of compensation might be available for poultry owners?

The method chosen for killing poultry must be safe, humane, and efficient.

- Culling must be done under veterinary supervision and be supported by a sufficient number of trained personnel to ensure all animal welfare aspects are addressed and that workers are safe. If possible, culling should take place at the same location where the birds are.
- Avoid shedding any blood from the poultry since blood is a major source of infection². For example, avoid slicing the neck, beheading, or any other method that involves a significant amount of bloodshed.

¹ http://www.oie.int/eng/AVIAN_INFLUENZA/discussion%20paper%202(Galvin).pdf
² World Animal Health Association, OIE Avian Influenza Disease Card 11. Culling and Disposal Methods,
Backyard Farms
For small numbers of birds that are small-to-medium size, the preferred method of culling is dislocation of the neck by trained individuals using gloved hands. You can also dislocate the neck using burdizzos, bone cutters, or secateurs. Burdizzos are particularly useful when large numbers of poultry with strong necks (such as geese and ducks) are destroyed.

Commercial Poultry Farms
For large numbers of birds (such as in commercial poultry businesses) the preferred method is gassing with carbon dioxide. This method involves lining large garbage waste bins (skips) with plastic sheeting that also forms a canopy over the top of the bin. Carbon dioxide is pumped into the bottom of the gas bins through a 2.5 cm garden hose fitted to the top of the cylinders. The carbon dioxide should be released in 30-45 second bursts. Do not release the gas too quickly, or the bottles will freeze when they become about half empty. The concentration of carbon dioxide must be in the range of 60-70% in the gas bin, with the lid tightly closed for a 1-2 minute period to properly stun and kill the birds.

Usually, half a 45 kg cylinder of carbon dioxide is needed for the three cubic meter gas bins, and three or more cylinders are needed for the 20 cubic meter gas bins. Carbon dioxide should be added so that all birds are dead before others are placed on top of them. The gas bins should be three quarters (75%) filled with birds, sealed, and transported to the disposal site. Make sure that no bird is still alive when dropped into the burial pit. If this happens, birds must be immediately caught and humanely killed.

Catching Birds
Birds can be caught using teams of workers. Experienced catching teams may be available.

- Chicks are easily caught under heaters and are transferred to the gassing bins in plastic garbage bins.
- Broiler chickens on the ground are driven, using a movable hessian wall, to the catching area where they are caught and placed directly into skips.
- Caged birds can take more time. Each catcher removes 3 or 4 birds from cages and carries them by the legs to the gas bins.
- Chickens that lay eggs are best caught at night or during low light when they are quiet.

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COMMUNITY AND FARM RELATIONS

Keep in mind that in many communities, poultry is not only the source of income for farmers, but also the main way they provide food to their families. In some areas, poultry are also kept as children’s pets.

Therefore, all avian (bird) influenza control workers should be sensitive to farmers and their families, who may be losing their only valuable possessions (their poultry).

- There should be an official present to ensure that proper and humane methods are taken.
- If possible, allow the government official who is present to address the farmers before culling operations begin. Farmers will likely have questions about why their animals are being chosen for culling, if and how they will be compensated for the loss of their animals.
- If there are no officials present, try to have information on where farmers can obtain information on compensation or answers to any other questions they may have.
- Where possible, culling should not occur in public view, so as not to unduly distress onlookers.

If possible, a public information officer or leader should be assigned to handle media/press questions.

- The public information officer should be regularly briefed on the situation and in touch with all of the relevant government ministries.
- The public information officer ideally should be the only one to communicate with the media to minimize the potential for confusion.
- It is important for journalists to obtain accurate, non-contradictory information, so make sure all individuals involved in the culling operations are briefed by the public information officer about what they can and cannot say.

After culling operations, it will be important to have ways to communicate with the community, workers and individuals on the affected farms, especially if the virus spreads.
CROWD CONTROL AND CREATING A SAFE AREA

Make sure that the area chosen for culling is not in the view of neighbors or other crowds, and that only individuals involved in culling operations are in the area.

- Clearing the culling area of unnecessary bystanders not only makes the process more efficient, but also limits the number of people exposed to blood, feathers, other animal parts, and potentially contaminated equipment and surface areas.
- Children in particular should be removed from the area, not only to minimize upset, but also to keep the area secure.
- Every individual who is in the culling area — even if they are only serving as observers — should wear personal protective equipment (see page 8).
- There should be at least one government official or designated veterinary health official present to supervise culling operations. If an official is not available, make sure that you have consulted with local officials to ensure that culling procedures take place in a correct and humane manner.

HUMAN HEALTH AND SAFETY

All individuals involved in culling operations should be provided with appropriate personal protective equipment and training on how to properly use the PPE.

It is also recommended that, if possible, all people exposed to infected chickens should be monitored by local health authorities for at least 7 days. This includes the workers doing the culling, supervisors of the culling operations, farmers, other property owners (and their families) of the affected farms, and members of the surrounding community.

- If symptoms of avian (bird) influenza are detected, there should be a clear way to report this information to local health officials. These symptoms include:
  - Fever over 38°C
  - Sore throat or cough
  - Respiratory distress or failure
  - Oseltamivir or another suitable antiviral should be available for the treatment of suspected avian (bird) influenza respiratory infections in cullers and farm workers involved in mass culling.
- If possible, workers should be vaccinated with the current World Health Organization-recommended human influenza vaccine to avoid simultaneous infection by human influenza and avian (bird) influenza.
- Additional health monitoring of chicken cullers, others involved in the process, and their family members should be carried out. These individuals should report any relevant health problems (respiratory complaints, flu-like illnesses, or eye infections) to a health care facility.
- Persons at high risk for complications of influenza (such as those with weak immune systems, those over 60 years old, or those with known chronic heart or lung disease) should avoid working with infected poultry.
- Regularly testing the blood of exposed animal workers and veterinarians to ensure they are not infected is encouraged.

5 World Health Organization (WHO) interim recommendations for the protection of persons involved in the mass slaughter of animals potentially infected with highly pathogenic avian influenza viruses (WHO Regional Office for the Western Pacific, Manila, 26 January 2004).
HOW TO WEAR PERSONAL PROTECTIVE EQUIPMENT
TO PROTECT AGAINST AVIAN (BIRD) INFLUENZA

The following are instructions for properly wearing personal protective equipment (PPE). This section is also available as a separate tool – How to Wear Personal Protective Equipment, How to Remove Personal Protective Equipment – that can be distributed to workers along with the actual equipment.

Because avian (bird) influenza can be transmitted by feathers, feces, saliva, blood, mucus, and other bird fluids that get in the air, it is important for people in contact with potentially infected birds (or in rare cases, humans) to wear the proper personal protective equipment (PPE).

Wearing the proper PPE helps to:
• Protect yourself from disease.
• Prevent the spread of disease to other humans and animals.

BEFORE PUTTING ON YOUR PPE

• Find a clean location to put on your PPE, ideally away from anything that could be contaminated with avian (bird) influenza or other viruses.
• Wash your hands with soap and water if it is available.
• Put on a coverall (or gown) that can be thrown out after each use. If you do not have a disposable coverall/gown, make sure you wear a gown that can be cleaned with disinfectant after EACH use.
• Put on boot covers that can be thrown out after each use. Make sure you tuck your coveralls into the boot covers. If you have shoe covers, put those on over your boot covers. If you do not have disposable boot or shoe covers, put on rubber or polyurethane boots that can be cleaned with disinfectant after EACH use.

• Put on a mask that fits firmly to your face and completely covers your mouth and nose. An N-95 respirator mask is recommended, but a surgical mask is the next best type. See additional instructions for putting on a mask below.
• Put on goggles or other eye protection and head protection. Adjust them so they fit properly. If you are wearing PPE coveralls with a hood, put the hood on.
• Put on an apron that can be thrown out after use. If you do not have a disposable apron, make sure you wear an apron that can be cleaned with disinfectant after EACH use.
• Put on disposable gloves. If you are given two pairs of gloves, put on the inner gloves first. Then put on the outer gloves. Pull the edge of the gloves over the cuff your coveralls or gown, if possible. If you do not have disposable gloves, put on heavy rubber work gloves that can be washed with disinfectant after EACH use.

When using a mask (N-95 recommended), you should take the following steps
1. Put the mask under your chin with the nosepiece up.
2. Pull the top strap over your head, resting it high at the top back of your head.
3. Pull the bottom strap over your head and place it around your neck below the ears. Ensure that the mask fits firmly against your face and completely covers your mouth and nose.
4. If you are using an N-95 respirator mask, place your fingertips from both hands at the top of the metal nosepiece. Using two hands, mold the nose area to the shape of your nose by pushing inward while moving your fingertips down both sides of the nosepiece.

Remember to keep your hands away from your face and change gloves or other PPE if they become torn or heavily contaminated.

Remove your PPE only after cleaning and disinfecting the culling area.
Additional instructions for removing PPE are provided on p. 12
DISINFECTION AND CLEANING

After culling operations, it is of utmost importance to properly clean and disinfect the affected area. Keep in mind that the avian (bird) influenza virus survives best in a moist and soil environment. It also survives well in water, so washing items with only water (and no soap or disinfectant) may spread the virus. Thus, it is important to thoroughly clean and disinfect objects that have been soiled by blood, feathers, or any other poultry fluids, wastes, or other parts following culling.

The chart below lists recommended cleaning methods and disinfectants. If you do not have access to disinfectants or chemical cleaners, you should clean everything with soap and clean water.

| Personal protective equipment – disposable | Burn or bury |
| Personal protective equipment – reusable | Soaps and disinfectants, bleach and other oxidizing agents, alkaline |
| Dead birds/carasses | Burn or bury; some composting methods are acceptable for birds |
| Animal housing/equipment/cages | Soaps and disinfectants, bleach and other oxidizing agents, alkaline |
| Humans | Soaps and disinfectants |
| Water tanks | Disinfect if possible, and drain to meadow/pasture |
| Ponds | Disinfect if possible, and drain to meadow/pasture |
| Feed | Burn or bury |
| Effluent, manure | Burn or bury, acids and/or alkaline, composting |
| Human housing | Soaps and disinfectants, bleach and other oxidizing agents |
| Machinery, vehicles | Soaps and disinfectants, alkaline |
| Clothing | Soaps and disinfectants, bleach and other oxidizing agents, alkaline |
| Poultry paths | Caustic soda, quicklime |

Cleaning Methods – Guidance for Use

Soaps, Detergents
Leave the item being cleaned in contact with the soap or detergent for 10 minutes.

Oxidizing Agents (Bleach)
- Sodium hypochlorite: liquid, dilute to final 2-3% of available chlorine and allow to remain in contact with materials for 10 to 30 minutes. Do not use with living materials.
- Calcium hypochlorite: solid or powder, dilute 2-3% available chlorine (20g/liter powder, 30g/liter solid) and allow to remain in contact for 10 to 30 minutes. Do not use with living materials.
- Scrubbing items with soap and water before using bleach solution (sodium or calcium hypochlorite) removes infectious body fluids and other foreign (organic) matter from contaminated items and makes bleach solutions more effective.
- Virkon®: 2% (20g/liter) and allow to remain in contact for 10 minutes.

Alkalis – Should not be used with aluminum or similar alloys
- Sodium hydroxide (NaOH): 2% (20g/liter) and allow to remain in contact for 10 minutes.
- Sodium carbonate anhydrous (Na₂CO₃·10H₂O): 4% (40g/liter from powder, 100g/liter from crystals) and allow to remain in contact for 10 to 30 minutes. Recommended for use with living materials.

Acids
- Hydrochloric acid (HCL): 2% (20ml/liter). This is corrosive, and should be used only when other chemicals are not available.
- Citric acid: 0.2% (2g/liter) and allow to remain in contact for 30 minutes. It is safe for clothing and body cleaning.

Composting
- Composting is an effective way to dispose of manure and litter waste that reduces the risk of virus being transmitted during transport of the waste.
- Composting should be done in a secure area—such as an enclosed shed—that birds, cats, dogs, pigs, and other animals cannot access. It should be away from where people live, with at least 1 meter of ground between the pile and any water source (any run-off water from the decomposing material should be collected and treated).
- To compost, pile carcasses with other bulky contaminated or non-contaminated material (such as wood chips and straw bedding) to allow air to reach the material and then cover with a natural (biological) filter—not whole plastic. The pile should not be pressed.
- Temperatures should reach 55-60°C within 10 days, and the material should be kept in place for several weeks. At that time, the material should be mixed within the pile. Properly decomposing material at this time should be dark in color with minimal foul odor.


HOW TO REMOVE YOUR PERSONAL PROTECTIVE EQUIPMENT (PPE) TO PROTECT AGAINST AVIAN (BIRD) INFLUENZA

Make sure that all culling, disposal of carcasses (burning or burying), and cleaning/disinfection of the area is completed before removing your PPE. To protect yourself from infection, it is important to remove your PPE in a specific order. Remember that the outside of your mask, gloves, gown, boots, and other equipment are likely to be contaminated.

- Find a clean area that is not contaminated with blood, soil, feces, or other waste. If possible, this area should be located close to the incinerator so that disposable PPE items can easily be thrown out after use.
- If you have them, wipe your gloves and foot covers with virucidal wipes, alcohol pads, or another chemical cleaner to disinfect them and reduce the chance that you will be exposed to virus as you are removing your PPE. Place used wipes in an infectious waste bag, if you have one, or other waste container.
- Remove your outer gloves. Do not yet remove your inner gloves. Begin with one hand, rolling down the outer glove (with your other hand) starting at the wrist until the glove is inside-out. Hold the removed glove in your other hand, and then roll down the other glove — starting at the wrist — with your first hand. Place the gloves into an infectious waste bag, if you have one, or other waste container.
  If you are using reusable rubber gloves, make sure to wash them with soapy water or a disinfectant after use.
- Remove your shoe covers and then your boot covers. Place the covers into an infectious waste bag, if you have one, or other waste container.
  If you are using rubber boots, wash them with soapy water or a disinfectant after use.

- Remove your apron and coverall/gown, rolling down the coverall until it is inside out. Then step out of the coverall. Place the used coverall into an infectious waste bag, if you have one, or other waste container.
- Remove your head cap and goggles. Handle goggles by the headband or ear pieces. Place these items into an infectious waste bag, if you have one, or other waste container.
- Remove your mask. Grasp the bottom, then the top ties or elastics, and remove. Place it into an infectious waste bag, if you have one, or other waste container.
- Remove the inner gloves, if you are wearing them, and place them in the infectious waste bag, if you have one, or other waste container.
- Throw all disposable PPE (or the full infectious waste bag) into the incinerator or burial pit (depending on which is used in your location).
- Wash your hands thoroughly with soap and water or a chemical cleaner after you remove your PPE, or after touching anything — such as shoes, pants, shirt, or any equipment — that has possibly come in contact with infected birds or humans.

Throw away disposable PPE by burning or burying them, following the directions in the following section.

For reusable PPE, clean these items with soaps and disinfectants, bleach, or other oxidizing agents, or alkalis, following the directions in the Disinfection and Cleaning section.
BURNING AND BURIAL OF CARCSSES, USED PPE, AND OTHER CONTAMINATED TOOLS

The way to dispose of carcasses, used PPE, and other tools may be different in each situation or location. There are many factors to be taken into account in deciding whether to burn or bury dead poultry, used PPE, and other items that have come in contact with blood or other byproducts of the culling.

Please note: Burning or burying carcasses and other animal parts should be completed before taking off PPE. The used PPE can be discarded (burned or buried) separately from the carcasses.

If you are BURRING carcasses, used PPE, and other contaminated tools, keep the following points in mind:

• Burial should occur as close as possible to the infected area, so that infected materials do not have to be transported a long distance.
• The burial hole should be located away from human and animal living areas and water (wells, lakes, ponds, rivers).
• The burial hole should be large enough to fit all of the dead birds, with at least 0.6 meters (2 feet) of soil on top of the carcasses.
• If you have one, an excavator machine to dig burial pits. This is the best way to dig long, deep, vertically sided pits.
• After adding the carcasses to the burial pit, cover them with 40 cm of soil and then with a solid layer of slaked lime [Ca(OH)₂] before filling the hole. This will help keep animals (such as dogs, cats, and pigs) from digging up the dead chickens and other contaminated animal parts. Quicklime should not be placed directly on carcasses because it slows, and may prevent, decomposition.
• Gasses from the decomposition of unopened carcasses might cause the surface of the closed pit to rise and allow carcasses to escape from the pit. Quicklime may be added to pits to prevent earthworms from bringing contaminated material to the surface after closing the pit.
• Inspection of the burial site after closure is recommended so that appropriate action can be taken if there is seepage or other problems.

DESTOCKING PERIOD

After culling, disposal, and cleaning have been completed, the area should be without poultry for a period of time. This is called “destocking.”

• Replacing birds to the area should not take place until at least 21 days after cleaning and disinfection has been completed and the outbreak has been brought under control in the area.
• A small number of birds should be added first, and checked daily for signs of disease.
• If disease is observed, the authorities should be contacted immediately to determine the cause of the illness.
• If the birds remain healthy, more birds can be added.
• Monitoring of the birds should continue to make sure infection has not returned.

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