



Bio-Security Measures to Prevent Avian Influenza and Other Poultry Diseases

A Guide for Backyard Farmers



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Cover photo: Use of cage in backyard poultry raising.

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I- Introduction

Bio-security is the term that is used collectively to describe the different measures that are taken by farmers, poultry and poultry product traders, and transport workers to prevent and avoid the risks brought about by infectious diseases. These bio-security measures are also implemented to prevent diseases from spreading out from one place to another.

Diseases in poultry have a strong impact on the national socio-economic situation of any country and it is therefore important that a certain level of bio-security is applied in order to safeguard both animal and human health.

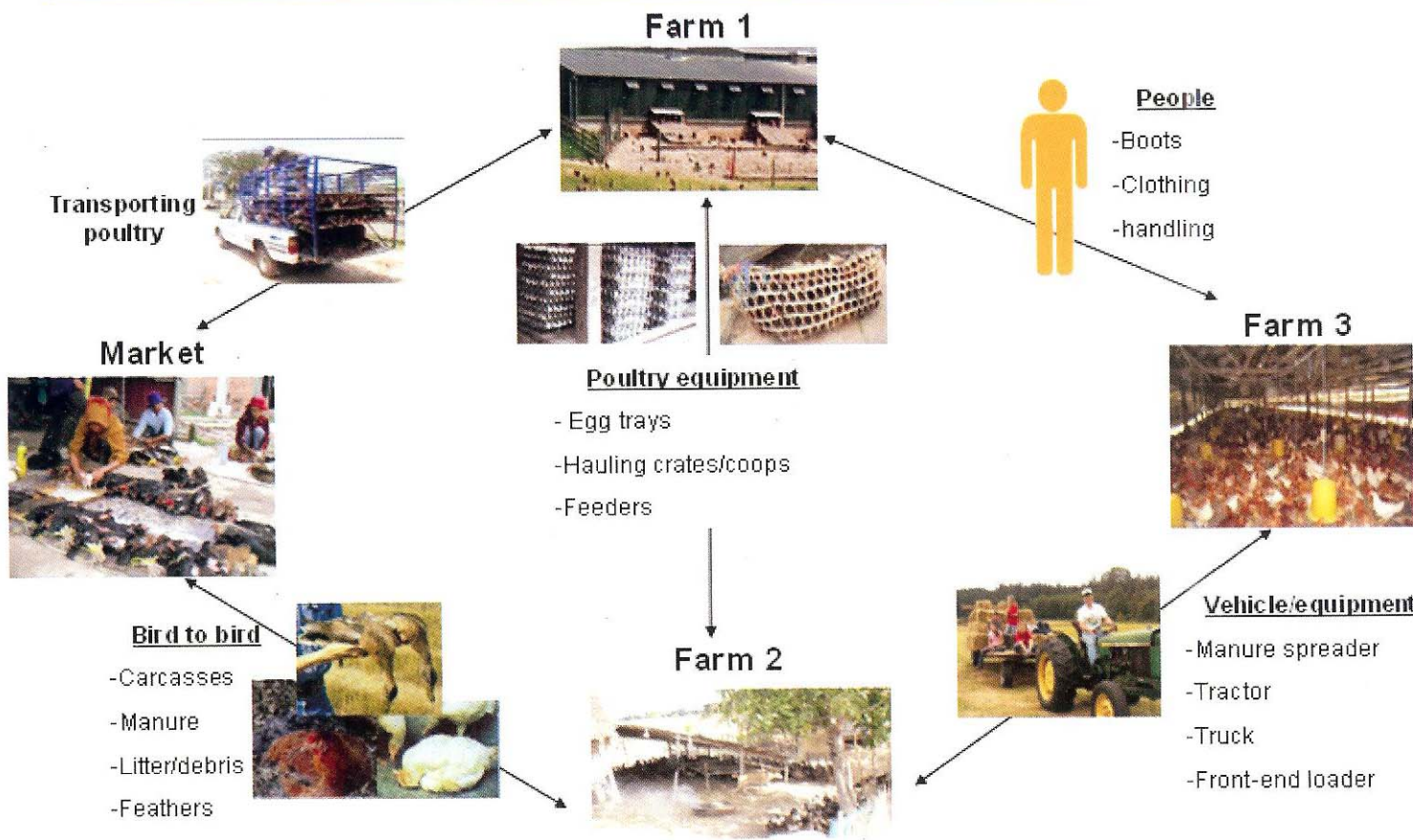
II- Avian Influenza (AI)

AI has also been more commonly referred to as Bird Flu. It is a highly lethal systemic disease that is caused by a virus. The disease can spread rapidly within a flock of birds causing high mortality and risk to human health. Highly Pathogenic Avian Influenza (HPAI) is the type that is spreading in some parts of the world including Cambodia. All avian species (chicken, duck, turkey, quail, peacock and other wild birds especially wild water fowl) are susceptible to infection by the AI virus (AIV). Ducks can carry the AIV without any signs of illness and are considered to be the major reservoir for AIV infections to other domestic poultry.

How does the virus spread?

1. Contact with infected birds and infected poultry products.
2. Transportation of infected poultry and poultry products from place to place.
3. The use of contaminated vehicles and equipment or materials.
4. Gathering birds of unknown source from different places.
5. Using infected tools and other equipment and materials from other pens or places.
6. Visit of strangers into the yard close to the birds.
7. Raising poultry in open fields and without fence which exposes them to contaminated environment.
8. Market and slaughter places that are not cleaned and disinfected properly.
9. The virus can also be transmitted by humans, rodents, insects, flies, free-flying birds like sparrows, and seagulls etc.
10. Unknown source of feed and water.
11. Mixing different types of poultry.

How Poultry Disease Spreads



Transporting poultry and poultry products using contaminated vehicle could carry virus from one place to the next.



Unhygienic practices in the yard will maintain virus population



Gathering birds of unknown source from different places



Mixing different animals.



Mixing different species of birds



Free raising in the lake or field



Free-flying birds can transmit virus



Unhygienic practices in the yard will maintain virus population



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Free raising in the lake or field



Free-flying birds can transmit virus



Raising birds in open field/stream



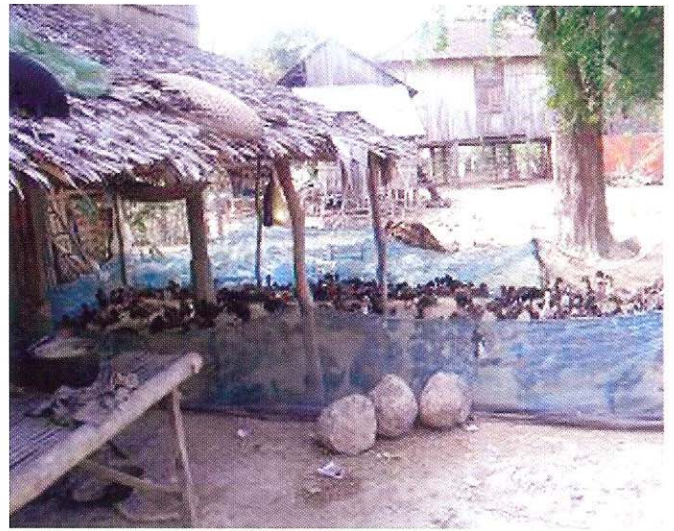
Slaughtering process with unhygienic practices.



Improper disposal of poultry mortality is a good source of infection

Research data also show the possible transmission of AIV from poultry to human which may cause death. This is made possible through:

- Living closely with sick and infected poultry
- Direct contact with infected birds or dead poultry
- Not washing hands thoroughly with soap and water after handling poultry or poultry products
- Eating meat that is not cooked very well and drinking poultry blood.



Do not raise poultry under the house



Unhygienic slaughtering practice can infect humans (2 pictures)

III. So, how much bio-security do I need?

A bio-security program should be designed in such a way that people are able to follow it. A program can not be good only on paper. It has to be practiced by everyone (no exception) everyday. It has to be practical and prepared using common sense. Furthermore, it should be economical so that people can afford to implement it.

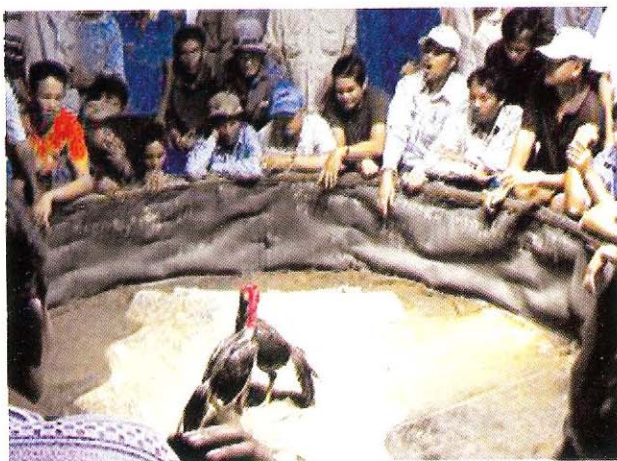
Here are some steps that are easy and practical and can be implemented using common sense by farmers in the village:

A. Isolation – keep your poultry protected

- a. Buy healthy: Keep healthy. Newly purchased birds should be housed in a separate enclosure for at least 14 days before allowing them to mix with birds already in

the yard to make sure that these new arrivals do not harbour any disease. You can use a cage or a separate pen. If they are carrying an infection, they will be symptomatic in two weeks' time. Villagers are advised that it is important to keep species separate and not mix ducks with chickens, chickens with pigs, and ducks with pigs. Some birds do not show certain diseases but act as carriers. Provide your birds with clean feed and water.

- b. Build poultry houses away from the family dwelling. This will ensure that family members are not exposed to the birds' secretions, faeces, and feathers.
- c. Build a fence around the poultry area by choosing materials that are available in the village such as palm stems, small tree branches, bamboo etc. Make sure that dogs, cats, and other birds can not enter. The fence will prevent other animals that maybe carrying disease from contacting your birds.
- d. Clean out vegetation around the yard to remove shelter and food for possible disease carrying animals.
- e. Discard garbage on a regular basis to eliminate harbourage for these pests.
- f. If you find any dead wild birds, treat them as though they are highly infectious. Handle them with gloves and dispose them off by burying or burning.
- g. Avoid sharing with your neighbours equipment and tools to be used for your birds.
- h. Prevent the accumulation of standing water. This is a great attraction for migrating waterfowl and wild birds. At the same time, limit sources of food for these birds.



A cock fighting event



Fencing poultry



Separate the new from the old poultry for at least 14 days

B. Traffic control – traffic in the yard, within the yard and outside the yard. Restricted access means keeping the disease out.

- a. Avoid going to cock fighting events because you may carry a virus with you back to your yard.
- b. Do not bring back any birds left-over from the market as they have been exposed to other birds that maybe ill.
- c. Do not allow middlemen or tradesmen from entering your yard to do business.
- d. Neighbours, friends or any other visitors should be kept off your birds. At the same time, avoid visiting your neighbours' birds.
- e. Do not allow any other type of vehicle to enter your yard where the birds are.
- f. If you suspect AI, be a good neighbour and report to the VAHW or VC, or the hotline.



Traders should do business on the side road.



People should avoid trafficking to other farms

C. Sanitation – cleanliness of materials and people. Clean areas mean healthy poultry.

1. Wash hands with soap and water after handling poultry and poultry products. Good washing with soap and water removes 90-95% of bacteria and viruses.
2. Clean the house and premises on a regular basis by sweeping and shovelling.
3. Disinfect the poultry house and surrounding area. Remember to remove all the debris first, dry clean, and then wash before you disinfect. A disinfectant will not work on any dirty surface. Do not forget to include all the tools (feeding scoops, shovels, brooms) and equipment as well. You can use TH 4 or quicklime to disinfect the ground and poultry house. Always check the label or ask your VAHW for mixing directions.
4. Burn or bury dead poultry and poultry by-products. Bury them about 1 metre deep, cover with soil and a layer of quicklime before the final soil coverage. Make sure that scavenger animals will not be able to dig them back up.
5. Keep the area of the flock clean from garbage (food waste, plastic bottles, glass bottles, tins or drums).
6. Rodents, insects, and other vermin can be kept off the farm by maintaining a rubbish-free farm.

Consult with your veterinarian if you suspect your birds to be sick. Do not wait for them to get worse. Early detection and prompt reporting will probably help stop the spread of disease. Signs to watch include sudden death, depression and decreased appetite, diarrhoea, breathing difficulties such as coughing, sneezing and gasping, nervous twitching or dropped wings or paralysis and swelling of the head with darkened combs, wattles or legs. Do not use medication that is not prescribed by the veterinarian as side effects may occur that can make your birds even sicker.



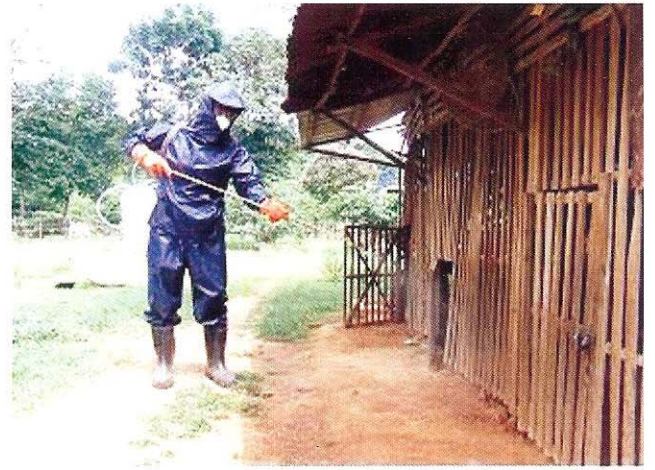
Wash hands with soap and water after handling poultry.



Clean and disinfect the working tools after use



Clean premises regularly



Disinfect poultry house and surrounding area



Burn or bury dead poultry properly

Middle men and live bird market seller

Middlemen act as conduits between the birds in the village and the market. They can be the number one source of contamination because they go from one place to another. If they do not follow bio-security measures, they can transmit micro-organisms that may cause the next serious poultry disease.

1- Middlemen

- a. Do not put too many birds in a coop or cage (300 cm² per kg of bird).
- b. Do not buy sick or dead poultry
- c. Wash hands with soap and water after handling poultry
- d. If possible, have a designated unloading area.
- e. Avoid stacking cages; use waste tray or paper.
- f. Avoid carrying people and poultry together.
- g. Clean cages and vehicles with soap and water after unloading the birds and before using them again
- h. Do not buy or transport poultry from and within outbreak areas
- i. Wash clothes and shoes at least once a day
- j. Wear mask, gloves, and boots when handling poultry



Disinfect transport vehicles after unloading poultry.



Wash motorbike with soap and water

2- Live bird market and live bird market sellers

Live bird markets operate all over Cambodia. Live birds also can be found in small slaughter houses. The live bird market is a busy centre of activity as middlemen, direct sellers, and consumers converge to do business. But it also is the gathering place for bacteria, viruses, and other pathogenic organisms which can spread easily and rapidly by traditional activities in the market such as selling and buying live birds, slaughtering, and mixing many kinds of poultry and other commodities in one place. Avian Influenza viruses can be introduced in these markets if they receive infected birds or have been in contact with contaminated cages and transport vehicles. Once the virus is established in the market, the movement of these contaminated materials from the market can spread the virus to other facilities and markets. The substandard hygiene practices also make the situation worse. In order to prevent the spread of infectious diseases, the traders must exercise good hygienic practices, ensure that meat is processed and handled properly, and consumers are aware as to how the meat should be handled when they get home.

It is recommended that traders and market managers follow these measures:

- ✓ Have easily identified cages so that each vendor knows which ones are theirs.
- ✓ Have a designated cage for sick and/or dead birds and record the occurrence.
- ✓ Clean cages, stalls and other equipment everyday with soap and water at least.
- ✓ Clean and disinfect stalls at least once a week. Market is recommended to shut down once a month for a more thorough cleaning and disinfection.
- ✓ If possible, have a single entry and exit point. This will allow for a smoother human traffic flow.
- ✓ Keep scales and floor clean of manure, feathers and other debris
- ✓ Isolate the live bird market and have appropriate selling stalls. The area should be located away from where food is sold, prepared or cooked.
- ✓ Sell only one type of bird in one place. If this is not possible, at least separate cages should be used.
- ✓ Separate the slaughter area from the live bird area
- ✓ Practice good hygiene before, during, and after slaughter
- ✓ The market should have a program for controlling rodents and other vermin (like flies). Dogs and cats should not be allowed in the market.



Inappropriate selling practice – mixing raw and cooked food



Keep vending area and weighing scale clean

Clean and disinfect the areas at the end of the day. Do not forget the stalls and cages. Remove all the manure and feathers with water and then spray with an appropriate disinfectant (e.g. TH 4, GPC8, First Stop, quicklime).



Slaughtering poultry in market
with substandard hygienic practices



Inappropriate selling places

Take home message-

A bio-security program is essential in raising healthy birds. They will have minimal health problems and will grow bigger and produce more eggs and farmers will earn more money. When farmers, traders, middlemen, and live bird market vendors practice bio-security, the threat of diseases such as HPAI will be lessened. The program should be designed so that everybody can understand and will not have problems following the steps. Tell your friends and neighbours that healthy birds come from farms that practice bio-security.

If you have poultry mortality and/or you suspect Avian Influenza, please notify your Village Animal Health Worker or Village Chief or District Veterinary Officer or Provincial Veterinary Officer. The Department of Animal Health and Production also has a hotline that you can call and report the problem. The numbers are:

012-833-795

012-214-970

ANNEX:

Protocol for Cleaning and Disinfection

Animals are always exposed to micro-organisms, some of which may cause diseases. These micro-organisms can survive flock after flock because they are protected by dirt (organic materials) or bio-films that are in the environment. In order to prevent diseases, we have to help **BREAK THE CHAIN!**

Cleaning and disinfection (C&D) are two very important parts of a complete bio-security programme and are the best tools used in breaking the chain of infection. A comprehensive and tailor-made sanitation plan must always be included in any health programme for every facility. A good programme can fail if some areas are missed. Isolation and sterilization are the ultimate objectives but are not realistic. Therefore, attainable goals must be established if a constant level of sanitation is to be maintained.

Sanitation Objectives:

1. Clean all animal facilities totally – there should be no exception in the areas that have to be included in the programme.
2. Clean thoroughly – no visible dirt is to be observed.
3. Reduce micro-organisms to the lowest possible level (as close to zero) through proper disinfection.
4. Obtain birds from known sources – ensure that they do not arrive into your facilities harbouring known pathogens like Newcastle virus or Salmonella organisms.

Preparation to cleaning:

1. Institute rodent and pest control.
2. It is best to clean when birds are gone.
3. Cut the grass around the facilities.
4. Remove equipment and other tools that can not be cleaned and disinfected in the barn or loft, i.e. heaters, drinkers, and feeders.
5. Remove left-over feed from feed bins and feeders.
6. Remove litter/bedding from the barn and take it as far away as possible.

Cleaning Procedures:

Dirt can not be disinfected!

The goal of cleaning is to physically remove all visible debris, dirt, soil, faeces, and other organic matter. Clean vigorously with as much force as necessary to remove dirt. Sweep down dust, cobwebs, and feathers from walls, nest, cages, beams, rafters, fans, and other accessible areas inside and outside the barn. Do not forget the service rooms.

Scrub built-up debris and pay attention to hard to reach areas. Wash all surfaces with water and detergent. The detergent or cleaning agent aids in decreasing surface tension (make water “wetter”), splits up dirt particles, emulsifies oils and fats, floats dirt particles, dissolves salts, and carries dirt off the surface. There are two basic types of detergents that can be used: a) Alkaline-based detergents that remove proteins and fats, and b) Acid-based detergents that remove mineral deposits like scales. The thoroughness of cleaning (use of high pressure washer), use of detergent and exposure time (low pressure application/foam/gel), and use of hot or cold water all contribute to the effectiveness of the cleaning job.

A good cleaning job will remove up to 80-90% of the micro-organisms present on the surfaces by using water and detergent. Studies have shown that blowing down dirt will reduce micro-organisms by 3%; airing out- 31%; washing with water – 75%; washing with detergent -80-90%.

Disinfecting Procedures:

A good cleaning job should ensure that the disinfectant will be able to reach all the remaining micro-organism on the surfaces, and reduce them by at least 99%. Choose the disinfectant and the application process based on your facilities and the equipment that you have. Different products and their characteristics will be presented in a separate article. Disinfectants can be applied by low pressure (garden hose), foam using a foam lance, or by thermo-fogging. Some people use formaldehyde fumigation. If doing so, heat up the room to >20 degrees Centigrade. Otherwise, use a disinfectant that works in cold temperatures.

Steps to proper disinfection:

1. It is best to apply the disinfectant on a dry surface. So, air-out the barn after cleaning.
1. Determine the surface area to be disinfected using the following formula:
 - Barn without cages:
 $\text{Length} \times \text{Width} \times 2.6 = \text{sq ft}$
 - Barn with cages:
 $\text{Length} \times \text{Width} \times 3 = \text{sq ft}$
2. Prepare the disinfectant solution based on the total area to be treated and using the dose provided by the manufacturer. For example:

Disinfectant –	TH 4
Dose -	1 litre of TH 4 per 200 litres of water
300 ml of mixed solution will cover 1 sq metre of surface area to be disinfected	
3. Start application from the top of the barn and work your way down to the floor.
4. Return equipment and tools that have already been disinfected in the barn.
5. Close and lock the barn. Ventilate after at least 8 hours.
6. If possible, monitor the C&D by taking environmental samples for bacterial count.

Do not forget:

- Clean and disinfect all equipment and tools (if possible) removed from the barn. This includes drinkers, heaters, feeders, and fans.
- Include trucks and other delivery vehicles in the C&D programme.
- Make needed barn repairs.
- Clean and flush water lines to remove calcium deposits.
- Always wear protective equipment (clothing, mask, eyewear) when handling chemicals.
- Read chemical labels thoroughly and make sure that you have the MSDS (Materials Safety Data Sheet) from the manufacturer.