



Food &
Agriculture
Organisation
(FAO)



Agronomes &
Vétérinaires
Sans
Frontières
(VSF-CICDA)



Department of
Animal Health
(Socialist
Republic of
Vietnam)



A guide for veterinary
paraprofessionals
in Vietnam

Prevention and Control of Avian Flu in small scale poultry

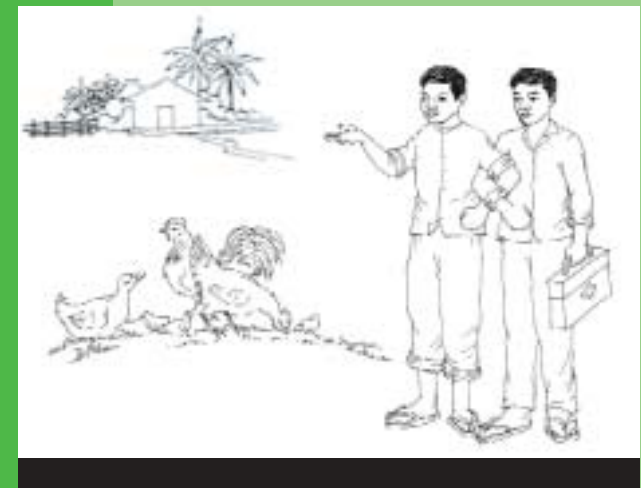


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Acknowledgments

We would like to address our sincere thanks to the people who have prepared this guide with Agronomes & Vétérinaires Sans Frontières (VSF-CICDA), especially: Marie Edan, Stéphanie Desvaux, Mathieu Carles, Ly Proyuth, Bui Xuan Ba, Nguyen Dinh Hoan and Patrice Gautier, as well as the people who have produced the drawings. We would also like to thank the people at Department of Animal Health, FAO Representation in Hanoi, FAO Headquarters, WHO Office in Hanoi as well as other individuals (Universities, Consultants, etc.) who have taken the time to read and review the draft versions. We want finally to thank the veterinary paraprofessionals for their comments during the test of this guide in the field.

Some of the drawings have been copied from: Oosterwijk, G, Van Aken, D. and Vongthilath, S, 2003. A manual on improved Rural Poultry Production (1st Edition, English Language). Department of Livestock and Fisheries, Ministry of Agriculture and Forestry, Lao PDR. VII + 115 PP

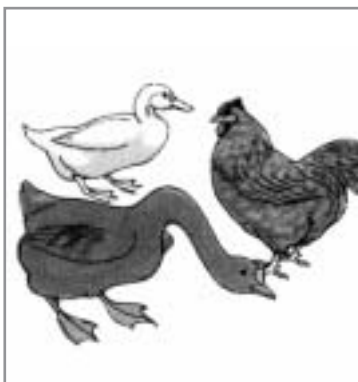
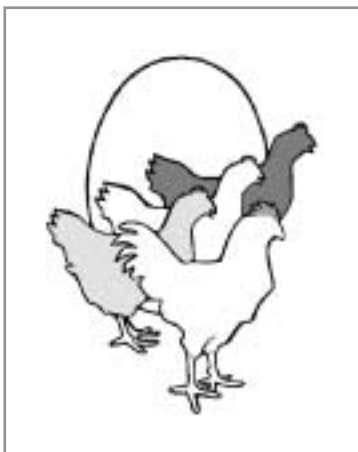
Introduction

This guide has been developed to ensure that adequate information is available for poultry smallholders in South East Asia for them to better prevent and control Avian Flu.

The information is specifically intended to backyard and small-scale poultry production units. The guide therefore emphasizes on simple and inexpensive measures for disease prevention and control.

However, this guide cannot be made available to the millions of poultry smallholders. It has therefore been decided to combine in this guide both information for poultry owners and information for veterinary paraprofessionals (“paravets”), and to distribute this guide to the 50,000 vietnamese paravets, since they represent the major provider of animal health service to livestock smallholders, and therefore can better spread the message to poultry smallholders.

Ideally this guide should be distributed by the staff of the District Veterinary Station (DVS) during a meeting gathering all paravets from the villages / communes of the district. This meeting should be the occasion to discuss the contents of the guide, so that when Avian Flu is suspected in the district or nearby, both paravets and DVS have already discussed the issues.



The Disease

Avian Flu is a dangerous disease since it can kill all poultry on a farm

Avian Flu is a dangerous disease since it can spread rapidly to other farms and to the whole country

Avian Flu is dangerous since some types of Avian Flu can make humans sick and even die.

Cause and virulence:

Avian Flu is a disease caused by a virus. This disease can present different forms:

- ▶ Severe and generalized clinical signs = Highly Pathogenic Avian Influenza (HPAI).
- ▶ Mild and respiratory clinical signs = Low Pathogenic Avian Influenza (LPAI).
- ▶ No clinical signs.

Affected species and natural hosts:

- ▶ Chickens, ducks, geese, turkeys, guinea fowl, quail, pheasants, pigeons and numerous wild birds may all be affected by these viruses. Depending on the virus or on the host, they will show clinical signs or not.

How Avian Flu can affect an animal?

The virus may enter in a poultry farm through various ways:

- ▶ Purchase or gift of one or more domestic birds, even if not sick.
- ▶ Human beings (family members or relatives, staff, “paravets”, middlemen, people who deliver animal feed, etc.) coming to the farm after having been on another farm, in a live bird market, at a slaughterhouse, in a laboratory, etc. that was infected or contaminated. They may carry the virus on their clothes, shoes, boots, vehicules (wheels of the motorbike, for example), on the egg crates, etc.
- ▶ Purchase or gift of other animals (pig, for example) coming from a farm with infected poultry.

- ▶ Dogs bringing dead birds from an infected farm.
- ▶ Wild birds during their migration from one area to another. They may contaminate the farm through close contact with domestic birds or through their infected faeces dropped on the ground or in water ponds.
- ▶ Ducks going and coming back from rice fields.
- ▶ Any domestic poultry that must find its own food outside the farm.
- ▶ Contact with water ponds.
- ▶ Contact with infected manure.

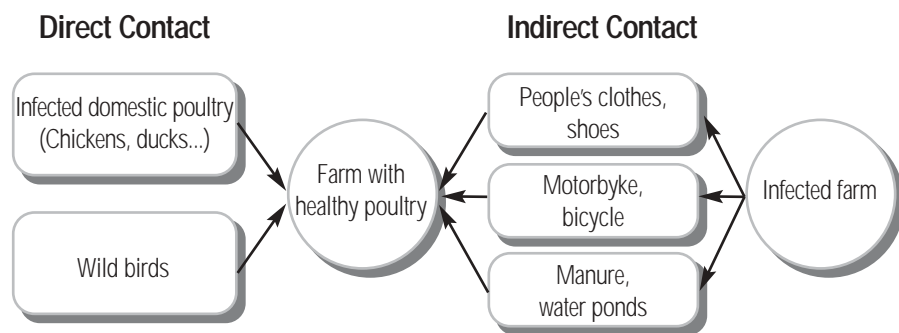


Figure 1: Possible direct and indirect contacts between infected and non-infected poultry that can bring Avian Flu in a farm

Incubation Period:

- ▶ It takes usually few hours to 2 - 5 days between the contamination by the virus and the start of the clinical signs.

Clinical signs:

Avian Flu is very similar to Newcastle disease.

You must suspect Avian Flu when you see important & rapid death in poultry!

- ▶ The clinical signs are very variable and influenced by factors such as the type of the infecting virus, the poultry species affected, their age, the other diseases that may be present and the environment.

- ▶ The disease appears suddenly in a flock, and many birds die:
*Either very quickly without having appeared sick.
Or with minimal signs of depression, little food intake, ruffled feathers and fever.*



- ▶ Other birds show weakness and a staggering gait. Sick birds often sit or stand in a semi-comatose state (“sleepy”) with their heads touching the ground.
- ▶ Some animals, especially younger birds may show neurological signs.
- ▶ Hens may at first lay soft-shelled eggs, but soon stop laying.
- ▶ Combs and wattles are dark red to blue and swollen and may have pin-point haemorrhages at their tips.
- ▶ Profuse watery diarrhea is frequently present, and birds are excessively thirsty.
- ▶ Respiration may be fast and laboured.
- ▶ Heamorrhages may occur on unfeathered areas of skin, especially the shanks of the legs.
- ▶ The mortality rate varies from 50% to 100%: at least half of the poultry die.
- ▶ In turkeys, the disease is similar to that seen in layers, but it lasts 2 or 3 days longer. Occasionally, eyelids and sinuses are swollen.
- ▶ In domestic ducks and geese, signs of depression, little food intake and diarrhea are similar to those in layers, though frequently associated with swollen sinuses.
- ▶ Ducks infected with Avian Flu and excreting the virus may not show any clinical signs or lesions.

Pathology:

- ▶ In birds that die very quickly due to the disease, only minimal gross lesions can be seen:
 - Dehydration, congestion of internal organs and muscles.*
- ▶ In birds that die less quickly:
 - Pinpoint hemorrhages are seen throughout the body, particularly in the larynx, trachea, in and around the heart, etc.*
- ▶ Extensive subcutaneous oedema, particularly around the head and hocks.
- ▶ The carcass may be dehydrated.
- ▶ Yellow or grey necrotic foci may be present in the spleen, liver, kidneys and lungs.
- ▶ The air sac may contain an exsudate.
- ▶ The spleen may be enlarged, dark and hemorrhagic.

Differential Diagnosis:

Highly Pathogenic Avian Influenza may be difficult to distinguish from:

- ▶ Other diseases that cause sudden high mortality:
 - Virulent Newcastle disease;*
 - Duck Plague;*
 - Acute Poisonings;*
- ▶ Other diseases that cause swelling of the combs and wattles: Acute fowl cholera and other septicaemic diseases; Bacterial infection of the comb and wattles.

Avian Flu should be suspected in any disease outbreak in poultry that persists despite the application of preventive and therapeutic measures for other diseases.

Laboratory diagnosis:

Avian Flu is difficult to differentiate from other diseases without the laboratory tests, but the paraveterinarian should not wait for the test results before implementing some control measures (explained further in this manual). The techniques for collecting specimens are not presented in this manual. Veterinarians who received adequate training on these techniques can only do this collection of specimens. They normally take samples from

sick animals but also from healthy animals. They have to sample at least 6 animals per farm.

Treatment

There is no treatment for Avian Flu.

Vaccination

Vaccines against Avian Flu exist and are being further developed. The decision to make these vaccines available in a country can only be taken by the Central Veterinary Services. However, vaccination is only one method for prevention and control, and other methods and principles (for instance, the ones described in this guide) still have to be applied even when vaccines are available and used.

Zoonosis

Avian Flu is a zoonosis: human beings may be affected and die if in contact with certain types of the virus.

What is Biosecurity?

It is a way to avoid contact between animals and microbes

Biosecurity is common sense.

Biosecurity may not cost too much money, it is mainly good practices to use in your farm.

Principles of biosecurity can be applied in both large-scale animal production units and backyard or small-scale animal production units.

For small-scale poultry production, biosecurity consists on various, simple, sometimes zero-cost measures that will:

- ▶ Keep microbes away from poultry.
- ▶ Keep poultry away from microbes.

If biosecurity measures are not followed, we spend more time and more money to try and solve the disease when it does appear.

The principles of biosecurity may however be difficult to follow in cases like ducks scavenging in paddy fields. If you cannot apply biosecurity in these cases, you should make sure that these animals are kept separated from other poultry.

Different measures of biosecurity can be applied in different circumstances. For example, if there are outbreaks of avian flu close to your farm, you must take stronger measures than in normal time. You can look at the following pages for details about the biosecurity measures to be taken according to the disease situation in your area.

Do not forget that biosecurity will help to protect your farm against every disease, not only avian flu.

What to do to protect a farm when there is no outbreak in the province or in the country?

With Avian Flu, there is almost never a time when the risk of getting the disease is zero. Even if you have not heard of outbreaks being reported in the province or in the country, there is still a risk of getting the disease. This is a low to medium risk situation.

When you hear about an Avian Flu outbreak being reported in the neighbouring province, it does not mean that some farms close to yours or even that your farm are not yet infected. Poultry and human beings may have traveled from the infected area to your area before the disease was observed and the outbreak reported.

⇒ **Always consider that Avian Flu may come!**

By following some basic principles, a farm will remain free of disease. These principles are:

Keep the poultry in good condition

Keep the poultry in a protected environment

Control the entries into the farm

⇒ **Rely on yourself to keep your farm free of disease!**

PRINCIPLE No. 1 | Keep the poultry in good condition.

- ▶ An animal in good condition resists better to diseases. Poultry in good conditions:
 - ⇒ **Have a good access to clean water and adequate food.**
 - ⇒ **Have access to an adequate housing.**
 - ⇒ **Receive de-worming products and vaccination.**
- ▶ If your poultry are not in good condition:
 - They are more likely to catch diseases.*
 - They produce fewer eggs, less meat, therefore: less food or less income for your family.*

PRINCIPLE No. 2 | Keep the poultry in a protected environment.

- ▶ Ideally, poultry should be kept in a protected place. But in small-scale production, this is sometimes impractical. In the below figure, some situations are described and ranged according to the level of biosecurity they provide.
- ▶ What is the best system?
 - Situation A is much better for the protection of your birds than Situation E, because the contacts between the poultry and infected animals or contaminated places are less likely if poultry are kept in a closed building than if they are running in paddy fields.*

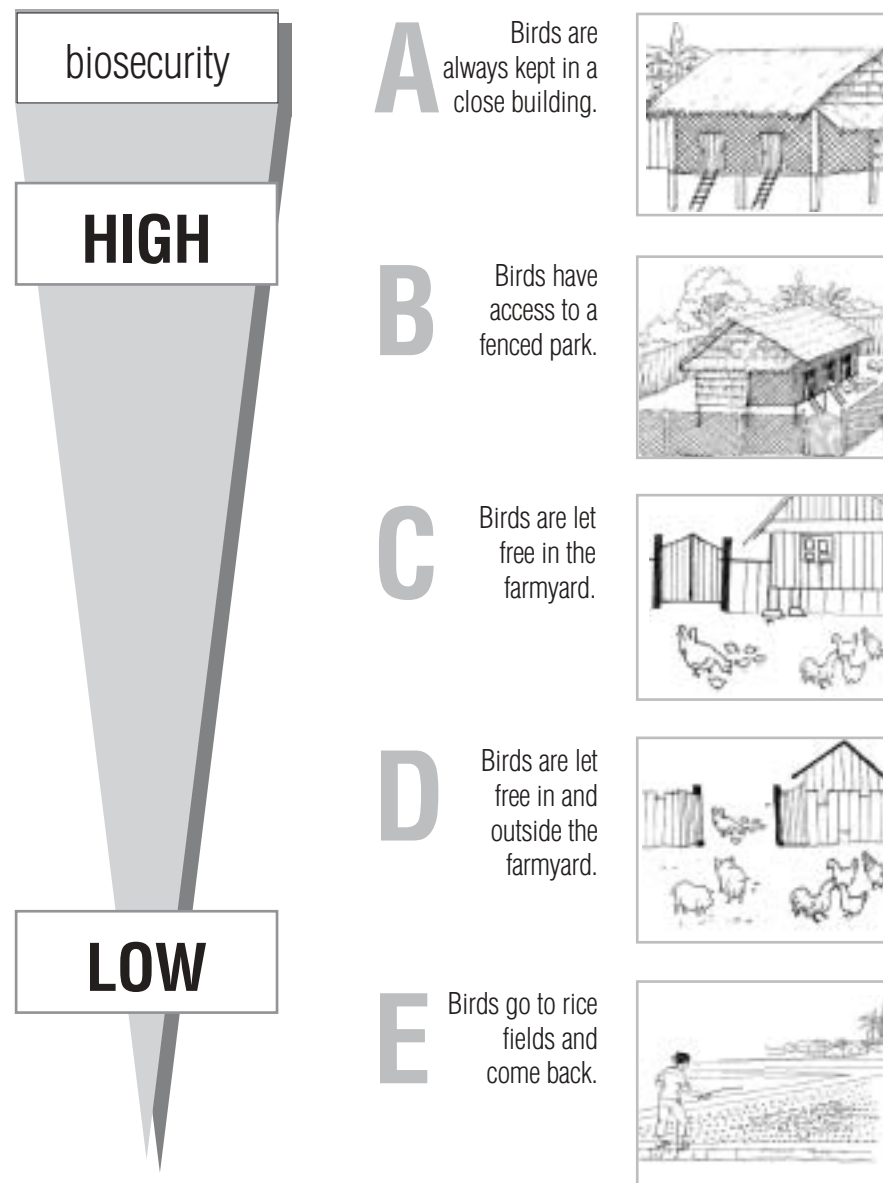


Figure 2: Levels of biosecurity according to some husbandry practices.

- ▶ Letting ducks scavenge in paddy fields is an easy way of getting income without too much inputs BUT it is also a risky behavior. It is better to have a pond, with fences.
- ⇒ A closed building for the night and a fenced park (with a pond if necessary) for the day is a practical solution.

Figure 3: Chickens and Ducks kept within fences.



- ⇒ If your poultry are allowed to go in the farmyard, keep the ground clean.
- ⇒ When you see one or more birds that appear to be sick, take these birds out of the flock and place them in a closed cage. They must not be in contact with other animals.

1
see one or more birds that appear to be sick



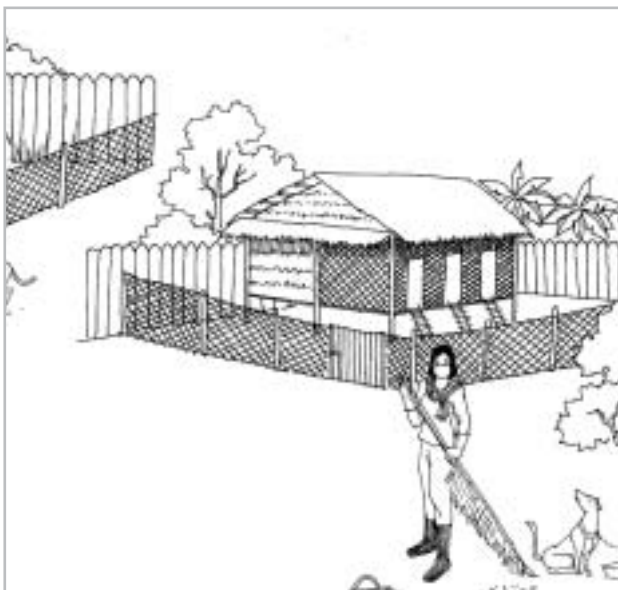
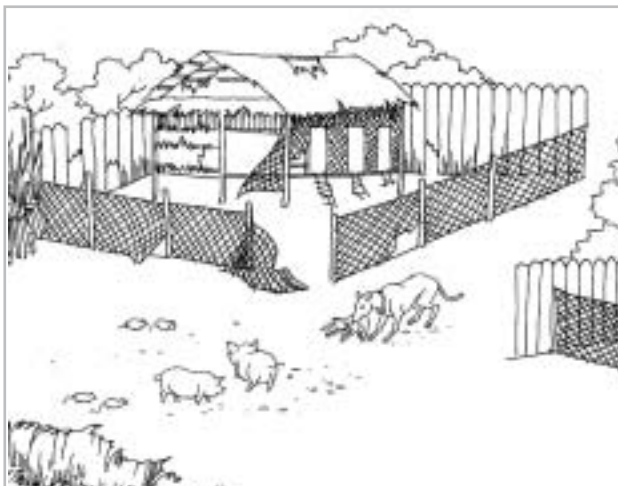
2
place them in a closed cage



Figure 4: Separation of sick poultry away from the rest of the flock.

⇒ When you observe or take care of your poultry, always start by the healthy flock and then go to the sick flock.

Figure 5: Badly (top) and Well (bottom) organised poultry farm.



PRINCIPLE No. 3 | Control the entries on to your farm.

What are the entries to control?

▶ Anyone coming from a place where there are sick poultry, can carry the virus on their clothes, their sandals:



Family members: coming back from neighbours' home, from the local market; from the paddy fields.

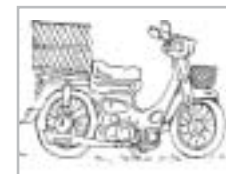
Family relatives: coming for special occasions (wedding, new year)

Neighbours.

Middlemen coming to buy or to sell poultry but also pigs, cattle or other agriculture products.



Paravets coming to treat or vaccinate your animals. They may have just visited an infected farm.



▶ New chicks, ducklings, piglets bought from a middleman, from a neighbour's farm, from the market.

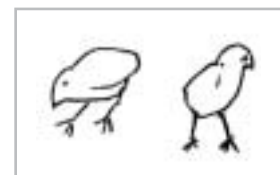
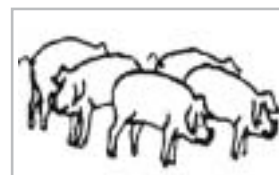
▶ Purchase of animal feed, equipment, etc.

▶ Entry of motorbike, bicycle or other vehicle in the farmyard.



▶ Dogs, cats or fly and mosquito that bring dead animals, garbages and pathogens.

▶ Manure purchased from another farm.



What can you do ?

Those advices may appear difficult to apply but they are the best way to protect the animals and therefore to protect the incomes of the farmer!

This is a lot about changing habits. It may be difficult to change everything at the same time, but the farmer and you must try to adapt yourselves little by little.

- ⇒ Always consider that you or anyone may carry the virus! Even if the person is someone you know very well, be careful!
- ⇒ Keep the visitors away from where the poultry live or eat.
- ⇒ Ask people, especially the middleman carrying live birds, to leave their motorbike or bicycle at the farm gate.
- ⇒ Do not leave the middleman enter your farmyard. Go yourself outside to bring him your animals if he/she wants to buy them.
- ⇒ You and the farmer should wash your hands with soap before and after you take care of the animals.
- ⇒ The farmer should change his/her clothes when he/she comes back from outside, especially from another farm.
- ⇒ If possible:

Farmer should have a bucket of water & soap at the farm gate so he/she and anyone can clean hands, the sandals, shoes, wheels of bicycle / motorbike before entering the farmyard.

Farmer have sandals for visitors so they can leave their sandals at the farmgate and take the farmer's sandals to come in the farmyard. If not, the farmer should ask visitors to wash and brush theirs when they are at the farm gate.

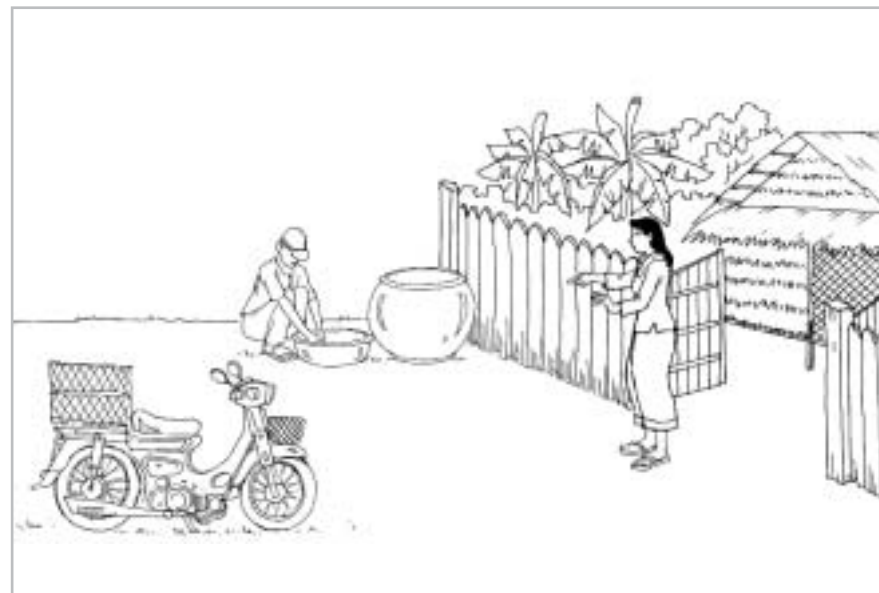
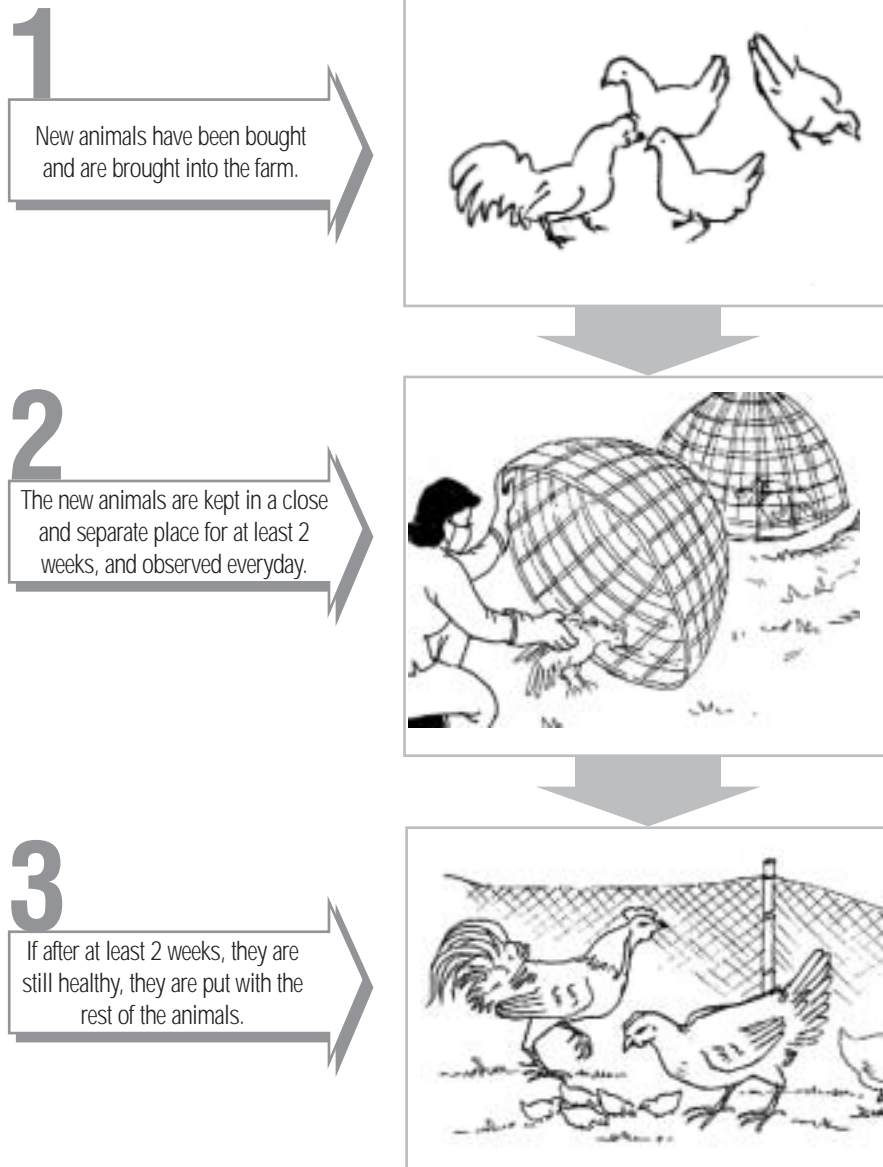


Figure 6: Good control measures for people entering the farmyard (motorbike is left outside, hands are washed, use of the farmer's sandals).

- ⇒ If the farmer takes **manure** from another farm, he must store it in a protected place for at least 3 weeks and spray some disinfectant on the top to kill the virus. Mix this often (every 2 or 3 days, so that any virus can get exposed to the air and die).
- ⇒ **Quarantine:** if the farmer needs to buy some animals, he must put them in a closed and separate place with no contact with your other animals for at least 2 weeks. Because even if the new animals look healthy, no one can know if they carry the virus or not. If they do, not only they will die but all your poultry may also die.
- ⇒ For poultry, you can put these new animals in a large basket, and make sure that your other poultry cannot come near the basket.

Figure 7 : Principles of Quarantine.



What to do to protect a farm when there are outbreaks reported in the country or in the province?

When you hear about an Avian Flu outbreak being reported in the country or in the province, it is possible that the disease is already very close to your farm. Poultry and human beings may have traveled from the infected area to your area before the disease was observed and the outbreak known.

- ⇒ **This is a high risk situation!**
- ⇒ **Consider that Avian Flu may be next door!**

By following some basic principles, your farm will remain free of disease. These principles are:

Keep the poultry in a close environment.	Do not buy nor accept new animals into the farm.	Do not allow people come into the farm.	Clean the farmyard, the animal buildings, the equipment, the motorbike, more regularly.	Store the manure.
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- ⇒ **Rely on yourself to keep your farm free of disease!**

PRINCIPLE No. 1 Keep the poultry in a protected place.

- ▶ As mentioned before, in small-scale poultry production, poultry are more or less let free to walk around to get their feed themselves. When there is an outbreak nearby, allowing your poultry to be completely free, is a very risky practice.
- ▶ A closed building for the night and a fenced park (with a pond if necessary) for the day is a practical solution.
- ▶ Do not walk the ducks in the paddy fields anymore. Do not allow the poultry to walk freely the farmyard. Keep your poultry in a protected place: a fenced park, under the house protected with a fishing net or better, a poultry pen. Be sure that they have access to clean water and feed.
- ▶ Feed the poultry yourself (even if you may need to buy a bit of corn or other feed) rather than letting the poultry scavenge freely.

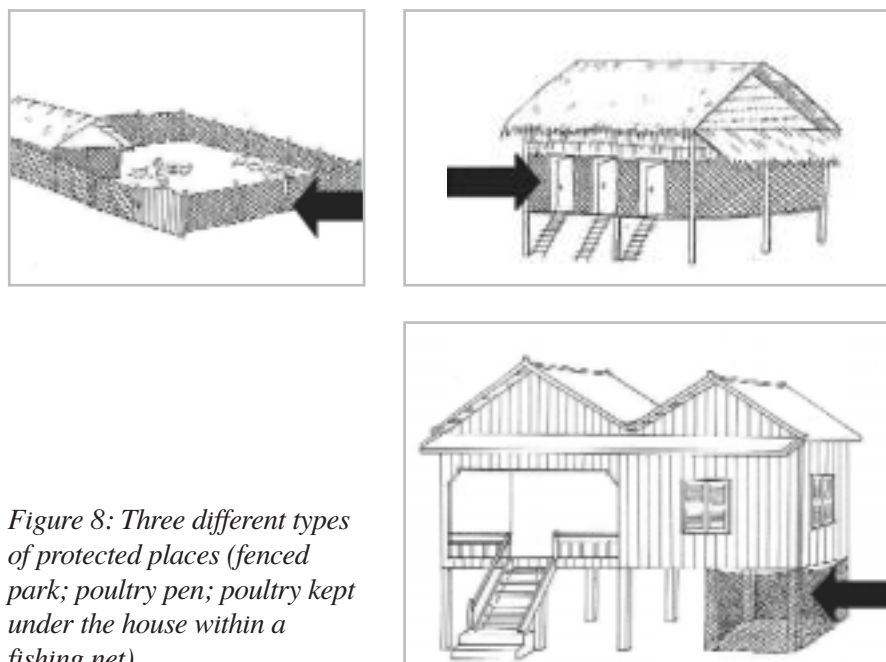


Figure 8: Three different types of protected places (fenced park; poultry pen; poultry kept under the house within a fishing net).

PRINCIPLE No. 2 Do not buy nor accept new animals onto the farm.

- ▶ Even if the new animals are isolated from the rest (“quarantine”), the risk of getting the virus is too high.
 - ⇒ Do not introduce new animals even for a short duration.
 - ⇒ Do not bring live poultry for cooking at home. If it is necessary to do it, prepare the poultry in a separate place that it can be cleaned thoroughly. Burn or bury the feathers and other wastes away from the farmyard.
 - ⇒ Avoid bringing your poultry to the market for selling and bringing it back again to your farm if you do not manage to sell it all. In case you have to bring back poultry keep it separated from the others.
 - ⇒ Do not attend competition of fighting cocks.

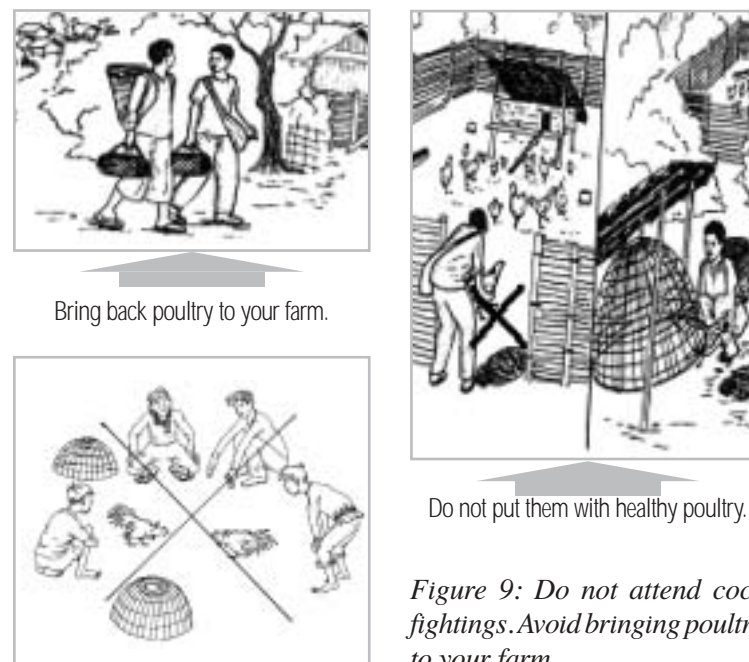
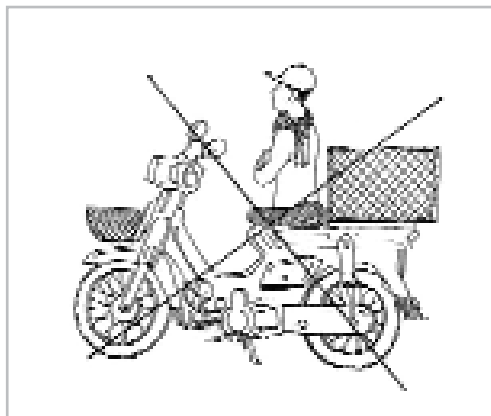


Figure 9: Do not attend cock fightings. Avoid bringing poultry to your farm.

PRINCIPLE No. 3 Decrease and control entries from humans.



- ▶ Only family members should be allowed to come onto the farmyard.
- ▶ Everyone, including family members, should wash with soap, brush and disinfect their hands, shoes, sandals, wheels of motorbike / bicycle, at the farm gate before going onto the farmyard.
- ▶ Only one family member should take care of the poultry.

PRINCIPLE No. 4 Sweep the farmyard, clean the animal buildings, the equipment, the motorbike, more regularly.



- ▶ The farmyard should be swept everyday (wear a mask to do it).
- ▶ The fenced park and poultry housing should be swept and brushed every day if possible.
- ▶ Take away the feces and the unconsumed feed. Destroy or store them in a protected place.
- ▶ Wash, brush and disinfect the small equipment more regularly.

PRINCIPLE No. 5 Store the manure.

- ▶ Viruses can stay alive in the manure for many weeks. If the manure is spread too quickly in the fields, the virus may contaminate poultry.
- ▶ Composting enables:
 - Killing bacteria and viruses.*
 - Increase the quality of the manure for fertilization.*
- ▶ Method:
 - Take the manure away from the poultry everyday.*
 - Store the manure (away from ponds, wells, etc):*
 - ⇒ in a plastic bag,
 - ⇒ on the ground under a plastic,
 - ⇒ in a hole digged in the ground
 - When you have 10 kilo or more, add some water to the manure (2,5 litres for 10 kilo of manure)*
 - Add some quicklime (half of kilo for 10 kilo of manure)*
 - Turn twice a week for the first 2 weeks and then once a week*
- ▶ The length of time required for decomposition is extremely variable from compost to compost (depending on volume, particle size, frequency of turning, moisture content, ambient air temperatures, etc).
- ▶ The compost is ready when the temperature has come down, when the colour is dark brown and when it has a humus smell.

What to do when there is high mortality on the farm?

In poultry production, the death of few birds can be a regular problem. Poultry may die for several reasons, including because of diseases. Some diseases are not so important because they will only affect a small number of animals.

Avian Flu is different: consequences can be much severe. This means that when you observe High Mortality you should think about Avian Flu.



Figure 10 : Sick and dead birds.

For the farmer and the paravet, it is impossible to be certain that the poultry death is due to Avian Flu. But they should act as if it was Avian Flu. This is why, in this chapter, we refer to “Suspect Mortality”.

What is **suspect mortality**?

- ▶ Sudden death on your poultry (this means that your chicken were healthy and they die suddenly in less than 24 hours) and a daily mortality over 5 % of your flock during few days.
- ▶ For instance, if you have 50 chickens, the first day you have 3 chickens dead, without symptoms, and the second day 3 again, and the third day 4...

When you have suspect mortality in a farm:

- ⇒ **Only the laboratory can confirm that it is or that it is not Avian Flu.**
- ⇒ **The farmer and the paravet must act before getting the results from the laboratory. If you wait for the laboratory results, the situation will become impossible to control.**

When you observe suspect mortality on your poultry, the **farmer and the paravet must work together**. Their objectives must be:

- ▶ To eliminate the virus from the infected farm as soon as possible.
- ▶ To avoid contamination of other farms.
- ▶ To avoid infection of human beings.
- ▶ To report immediately to the Village & Commune leaders and to the District Veterinary Station.
- ▶ To write down information about the event.

The farmer must inform immediately the paravet.

- ▶ Usually, most of the small-scale poultry producers do not use the services of the paravet to take care of the poultry. One of the reasons is because the economic value of few poultry is not high enough in comparison with the fees of the paravet or the cost of treatment.
- ▶ However, when a suspect mortality occurs, it is crucial to inform the paravet or the district vet. This is the law, but it is also simply in the farmers’ interests. Why?

The paravet will help eliminate the virus from the farm:

It will be safer for the farmer and his family and will reduce the risk of the farmer and his family getting sick.

The farmer will be able to restart poultry raising quicker.

It will help prevent the disease go to the neighbours’ farms. If the neighbours’ poultry are kept free of the disease, it may be possible for you to buy some poultry from them to restart poultry activities.

- ▶ It is possible that the farmer receives money from the State to compensate for the economic losses.

The paravet must:

- ▶ Immediately visit the farm and give the appropriate advise to prevent the disease from spreading.
- ▶ Then inform the District Veterinary Station (DVS) as soon as possible.
- ▶ Do not wait for laboratory results before acting. In such a situation, laboratory results are only here to help the DVS and the paravet take the decision to maintain / extend the control measures (if the specimens are positive for Avian Flu) or to stop them (if specimens are negative). Laboratory results are to help better understand the problem. The control measures should start immediately with the paravet’s visit. If you wait, it would be too late!

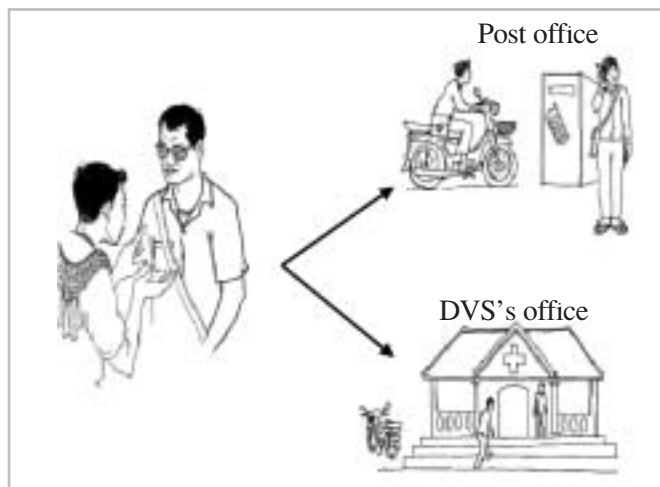


Figure 11: Paravet contacting the District Veterinary Station (telephone or visit).

- ▶ **Do not wait for DVS staff** to come before acting.
- ▶ If the disease is confirmed to be Avian Flu, the district vet and the paravet should ensure that the control measures are maintained or extended, according to what is decided by the DVS (advised by the National & Provincial Veterinary Services).

Below is an example of the steps that should be followed:

On Sunday, at 18.00, Mrs Thuy feeds her 20 chickens. They all look normal.

On Monday:

7.00	5 chickens are dead and the others are weak.
8.00	Mrs Thuy washes her hands and sandals and then goes to the house of the paravet.
9.00	The paravet takes some disinfectant at his home, and he goes to the house of Mrs Thuy.
9.30	The Paravet arrives; leaves his motorbike at the farm gate.
9.35	The Paravet looks at the poultry (alive and dead). Asks some questions to Mrs Thuy. He learns that one week before a lot of chickens died at the next house. He thinks that it may be Avian Flu or Newcastle disease. He explains to Mrs Thuy what must be done.
10.00	Mrs Thuy puts the dead chickens in plastic bags. She closes the plastic bags and places them in a protected area (away from the house, from other animals, from the well). She keeps the live ones in a protected place (poultry pen or fenced park).
11.00	The Paravet prepares a solution of commercial disinfectant in 1 bucket. The Paravet goes to the farm gate, washes and brushes his hands and his sandals in the bucket, as well as the wheels of his motorbike. Mrs Thuy puts small equipments at risk in the bucket. Mrs Thuy agrees to control the entry and exit of people and animals into her farmyard. Mrs Thuy puts some quicklime on the poultry house, and everywhere the poultry may have walked during the last few days. She checks that all animals are kept in their pens or attached.
11.30	The Paravet goes immediately to inform the village chief and goes to phone to the District Veterinary Station to inform them about the disease, gives them detailed information of what he has seen and what he has done. The Distric Vet informs him that someone will go in the afternoon to discuss and take some specimens for laboratory testing.

15.00	One staff from the DVS arrives at Mrs Thuy house with the paravet. DVS and the Paravet follow the same principles before entering the farm. DVS opens the bags, observes the dead birds, opens them (post-mortem). He takes specimens from the dead and alive birds. During these operations, DVS and others wear gloves and face-masks.
16.00	DVS asks Mrs Thuy the following questions: Who has entered her farm during the past 3 weeks and where they have gone? What animals have been purchased during the past 3 weeks and where did they come from? What animals have left (sold or given) her farm during the last 3 weeks and where have they gone?
17.00	The DVS advises Mrs Thuy not to move any animal in or out the farm, to reduce the human movements in and out the farm and he advises her to cull the remaining animals before getting the laboratory results. Mrs Thuy agrees on the measures to take at her farm.
17.30	The DVS goes to the next house to ask the same questions and to see if there are still live animals. If so, he also take samples and advises to keep the animals in a protected place
19.00	Back at the Station, the DVS staff calls the Provincial Sub-Department of Animal Health (SDAH) to inform them. Specimens are stored in the fridge of the DVS. DVS prepares a brief report to fax to SDAH and to attach to the specimens for the laboratory.

On Tuesday

08.00	The DVS send specimens to the laboratory.
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What to do with dead birds and other contaminated objects?

- ▶ Never throw the dead birds in river, bourn, pond...
- ▶ Never eat the birds.
- ▶ Dead birds should be put immediately in a bag.



Figure 12: Placing dead birds in a bag (good practice).

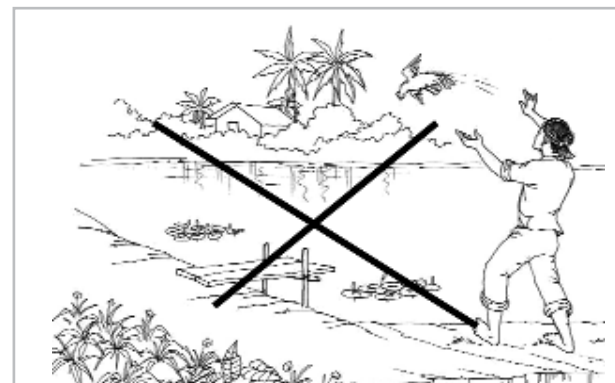


Figure 13: Throwing dead birds in the river (bad practice).

- ▶ The DVS staff may come and take some specimens from these birds. After the DVS has come or after one day, these birds must be destroyed as described below.

- ▶ All dead birds and other contaminated objects (for instance: manure, eggs, blood, feathers, egg crates) must be destroyed properly as soon as possible during the day through:

Burning

Place all the birds and objects in a recipient, add some petrol, and light a fire.



Burying

Dig a hole (far from a well, pond, animals) in the ground, put some quicklime at the bottom and on the borders of the hole; put all the birds and objects in the hole; cover with quicklime; cover with earth.



What to do with sick birds?

- ▶ **Never eat sick birds.**
- ▶ Sick birds should be **put in a fully closed building** with no contact with any other animal. The DVS staff may come and take some specimens from these birds. After the DVS has come or after one day, these birds should be immediately culled (because when they are alive, they continue to produce some virus and anyway they will probably die).
- ▶ **Culling:** in small-scale poultry production, there may be no other method available for culling than to do it with your hands and a knife (decapitation). It is important that people who do the culling are in good health and protect themselves (with mask, glasses, gloves, boots, etc.) from the start of the culling until they finish cleaning the area and equipment used. Blood, as well as any other waste, must be collected and destroyed (see above). The culling must be done away from natural sources of water (pond, well). The culling must induce death of the bird as quickly as possible both to avoid spreading of contaminated feathers in the environment and to limit the pain induced to the bird before death.
- ▶ **Destruction:** see above (burning or burying).

What to do with healthy birds?

- ▶ Birds that are apparently healthy can be kept alive as long as they are **kept in a fully closed building, with no contact with any other animal.**
- ▶ The paravet and the DVS may suggest culling these birds immediately if the risk is too high, without waiting for the lab results.
- ▶ If the lab test is positive with Avian Flu, these birds should be culled immediately (if they are still alive), as explained above.
- ▶ The farmer should never sell nor give these birds or the eggs even though they may look healthy!! He puts himself and other people in danger of catching the disease. He puts people's poultry in danger of catching the disease.

Cleaning and disinfection of premises and equipment

- ▶ The virus may be present on many objects, materials and areas that have been in contact with the infected poultry or that have been used during the observation, the culling and the destruction of the animals.
- ▶ Plastic bags, animal feed, wooden baskets / walls, etc. can be easily burnt. Manure can be composted or buried.
- ▶ Poultry building whether made with bricks or wooden must be:

WASHED => BRUSHED => SPRAYED with disinfectant.

- ▶ The ground where poultry walked should be cleaned (with a broom) then sprayed with disinfectants.
- ▶ Quicklime is the cheapest disinfectant and should be used for ground and poultry housing.



sandals and the wheels of the bicycle / motorbike, and sprayed them with some disinfectants.

Other things

- ▶ Do not visit other poultry farms: you could bring the virus to them.
- ▶ Do not lend your equipment (for instance: bicycle, egg crates) to someone else.
- ▶ Do not sell, nor give away any animals, eggs, manure.
- ▶ When the farmer and family members leave the farm, they must wash and brush their shoes /

Time before restocking with birds

- ▶ After all poultry have been destroyed and after all materials, surfaces have been washed, brushed and sprayed with disinfectants, you should not bring in new animals.

- ▶ Another cleaning + disinfection operation should be done 1 or 2 weeks later.
- ▶ If the cleaning has been done properly, at least 21 days should be spent before bringing new poultry. Most of viruses cannot survive after these 21 days in the environment if they cannot come into contact with animals.

< 3 weeks >				
1 st September	< 1 week >	8 th September	< 2 weeks >	22 nd September
Cleaning, burning, disinfection.	➔	2 nd cleaning and disinfection	➔	Bring in new animals

Figure 14: Steps and duration before restocking with bird.

Protection of human beings

When there are outbreaks reported in the province or in the country, everyone should be aware that they may get the virus. The avian influenza can be transmitted to human beings mainly through the faeces or by inhaling the virus that are spread by the infected birds when breathing.



In non-infected poultry farms, only one person should take care of the poultry. This person should be an adult in good health. The **pregnant women** and the **young children** should avoid the contact with the animals.



Don't eat animals dead of disease, because you take a risk of getting infected by the avian flu when preparing the poultry.

Each time you have to touch your animals or their products (meat, eggs), you should wash your hands with soap afterwards.

People should not eat raw blood.

Paravets, middlemen, market sellers, people buying live birds at the market, people preparing birds for home consumption or for restaurants, etc. should protect themselves when in contact with poultry. They should at least wear masks and if possible gloves, glasses, etc. They should wash their hands with soap frequently. They should wash their clothes, shoes, and sandals at least once a day.

In infected areas, any contact with poultry or poultry products must be avoided. The only people who have to be in contact with poultry should be: farmers, paravets and vets, and they should wear protection.

Advice should be sought from the local nurses or doctors.

When you or a member of your family, who was in contact with animals, especially sick birds, has fever or respiratory problems, go as soon as possible to a health center and inform the doctor that you were working with poultry.

Paravets and District Veterinary Station: a key partnership to fight Avian Flu

Avian Flu can be best fought if (1) outbreaks are reported early, (2) control measures are implemented early. The fight against avian influenza requires different people to work together: farmers / paravets / district vets / provincial vets / central department of animal health / laboratory and also doctors. The paravet is a key person in this network so he/she must have good relationships with the farmers, must react quickly and must inform the district vet or provincial vets and the village or commune leaders.

Good relationships between poultry farmers and the paravets are key since paravets are the only “animal health” local experts in close contact with the community. This will facilitate reporting of important diseases from farmers to paravets and implementation of measures advised by the paravet.

The paravet and the district vets can help the farmer by giving good advice and by implementing control measures to protect the family and the community.

The paravet and the district vet must have good relationships to ensure early reporting and early action.

- ▶ The paravets have an interest in collaborating with the district vet because they may get technical support from the District Veterinary Station.
- ▶ The District Veterinary Station staffs have an interest in collaborating with the paravets because this is the only way for them to know what happens at the village / commune level. They can also use the services of the paravets to implement control or prevention measures in the villages.

In order to facilitate the coordination at the district level, regular meetings between the paravets (and private veterinarians) and the District Veterinary Station are very useful.



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