



BIOSECURITY

FIELD MANUAL

A Practical Guide to Control Diseases in Village Chickens in Belize



Victor Gongora





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October 2019

Inter-American Institute for Cooperation on Agriculture (IICA), 2019



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Foreword



This Biosecurity Field Manual – *a practical guide to control diseases in village chickens in Belize* – has been written for smallholder farmers but is also for use by agricultural extension officers during training sessions.

It is part of a collaborative poultry project implemented by IICA delegation in Belize, the Belize Poultry Association, the Belize Agricultural Health Authority and the Ministry of Agriculture and is sponsored by the Australian Government's Direct Aid Programme. The manual's author, Dr. Victor Gongora, obtained his veterinary degrees from the University of Guelph and the University of

Edinburgh, has many years' experience working in Belize and internationally and is currently attached to the Belize Poultry Association.

The project's aim is to establish model poultry biosecurity systems to reduce the incidence of diseases that affect, or could affect, poultry in a back-yard setting.

Poultry production is very important for many rural families. It provides high quality protein to feed the family and, in many instances, provides additional income to support the family and help send children to school. Poultry diseases can wipe out this vital food and income supply in a very short time.

The aim of the manual is to encourage farmers, and their extension officers, to adopt simple, but effective, biosecurity measures that will reduce the spread of poultry parasites and diseases, such as coccidiosis, fowl pox and Newcastle disease, around their communities. The last outbreak of Newcastle disease occurred in Belize in 2017; some villages lost most of their flocks within a matter of weeks – contributing to loss of family food source and loss of income.

If extension officers were to use this manual in their training and farmers were to use its advice on their farms, the result will be reduced diseases, healthier chickens and enhanced community livelihoods.

Dr. Gabriel Rodriguez Marques,
IICA Belize Country Representative
October 2019



Acknowledgements

I would like to thank the Belize Poultry Association for the practical experience gained in poultry health over the 9 years conducting consultancy for the commercial poultry farmers. This work opened the doors to work closer with the Belize Agricultural Health Authority (BAHA) and the Ministry of Agriculture (MOA) in matters pertaining to the poultry industry and the smallholder poultry producer. So, thanks BAHA and MOA. Once any work is done with smallholders then one also works with non-government organisations and international organisations. I am quite grateful to these organisations, especially the Inter-American Institute for Cooperation in Agriculture for the honour to prepare this Manual for smallholder poultry producers. Lastly, I would like to thank all the poultry producers – commercial, smallholder, companies – for your willingness to teach me things poultry, and lastly the Australian Government Direct Aid Program for funding this activity.

Many people gladly helped to put this Manual together. I would like to thank the following persons for their review and valuable insights into making this Manual a Belize Manual for smallholder poultry farmers in Belize:

- Dr Stephen Williams: IICA
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- Dr Joe Myers: BAHA
- Mr Barry Palacio: MOA
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Victor Gongora, DVM

Belize Poultry Association, October 2019



Definitions

Backyard poultry: village chickens kept mostly for home use and usually less than 100 poultry.

Biosecurity: the set of practices to avoid contact between animals and germs: to keep animals away from germs and to keep germs away from chickens.

Flock: a group of farm birds kept and managed together.

Germs: disease causing infectious organisms such as bacteria, virus and fungi.

Immunisation: the process by which an animal is made immune or resistant to an infectious disease usually through vaccination.

Incubation period: the time from infection with germs to the manifestation of clinical signs.

Poultry: farm birds kept for meat and eggs and that includes chickens, turkeys, ducks, guinea hens and Bantam chickens.

Quarantine: the keeping new introductions of animals separate from other on-farm animals for a period of time, usually 2 – 4 weeks, to determine their health status.

Vaccine: a medicine used to build an animal's strength and health to fight off specific disease-causing germs.

Zoonosis: an infectious disease naturally transmitted to humans from animals and vice versa.

Introduction 1

Characterisation

Most smallholders in Belize, especially in rural areas, have chickens. They may also have a few turkeys and a few ducks. Sometimes, they also have guinea hens and Bantams. To the North of Belize, there may be a few fighting cocks in the poultry flock as well. These are more kept as ornamentals because there is no cock fighting tradition in Belize. Moreover, cockfighting is illegal. The smallholder would usually have a coop and the poultry are allowed to roam freely during the day. Corn is fed in small amounts along with food scraps such as grated coconut or left-over rice and beans. Concerns for the safety of their poultry may lead the smallholder to limit roaming hours and is the main reason for housing the poultry in coops. Health is not given much

consideration. There are no traveling veterinary drug vendors except in the border villages of the Toledo District. Projects from government and non-government organisations seldom address poultry and when they do it is more on genetics, housing and nutrition.

Disease Outbreaks

Poultry health became an important matter in Belize after the Newcastle disease epidemic in 2009 which started in commercial poultry and then spread in the Belize, Cayo, Stann Creek and Toledo Districts. The Belize Agriculture Health Authority (BAHA) developed laboratory capacity to diagnose Newcastle disease and this led to the confirmation of further sporadic outbreaks of Newcastle disease in the Southern Districts.

Then in late 2014, there was an outbreak of low pathogenic avian influenza (H5N2) in commercial poultry. Fortunately, this outbreak was contained within the outbreak area and the country was declared free of avian influenza in September 2015. These outbreaks of economically important poultry diseases with potential zoonotic impact led to poultry health being considered an important issue to address. In 2014, BAHA did an avian influenza field simulation exercise in the Toledo District. This exercise brought to light the vulnerability of backyard poultry to disease and the high risk of spreading disease to commercial poultry. The Belize Poultry Association (BPA) realized that good poultry health management practices required not only that commercial producers adopt biosecurity measures and implement risk mitigation measures, but also that the smallholder poultry farmer needed to be educated on poultry health. Initially, the BPA implemented a Newcastle disease vaccination programme in the Southern Districts. BAHA has not reported any Newcastle disease since the start of this programme in 2017. This success has led organisations such as the Inter-American Institute for Cooperation in Agriculture (IICA) to further assist the smallholder poultry farmer in poultry management including health.

Purpose of Manual

Poultry health is a broad topic thus it was decided to focus on biosecurity. Since the global scare of an Avian Influenza Pandemic in the mid-2000s countries throughout the world have been focusing on biosecurity. Poultry farmers the world over have found that, when biosecurity is practiced, it works. While some work on biosecurity has been done with commercial poultry farmers in Belize, nothing has been done with backyard poultry farmers. One of the reasons the Newcastle disease epidemic did not occur in the North of Belize is because most backyard poultry farmers keep poultry in a coop which is in a fenced area. This biosecurity manual provides the agricultural extension officers and smallholder poultry farmers with a tool to refresh the knowledge gained in the training sessions and to use it as a reference Manual to establish a poultry biosecurity system that will reduce the incidence of poultry diseases, including those diseases of local village importance. Implementation of the recommendations in the Manual will help the farmer in his day to day activities. Hopefully, he will also transfer his knowledge on biosecurity to other smallholders in his community.

Poultry health 2

Everything that is done in the poultry farm affects the health of the birds. But to know that a chicken is sick you first need to know the healthy chicken and its environment. Hence this section looks at the health of the chicken, the health of the group of birds of which the chicken is a member (flock health) and then the environment. It is important to know the environment around our group of birds, their housing and the space where the birds move about.

2.1 A healthy chicken

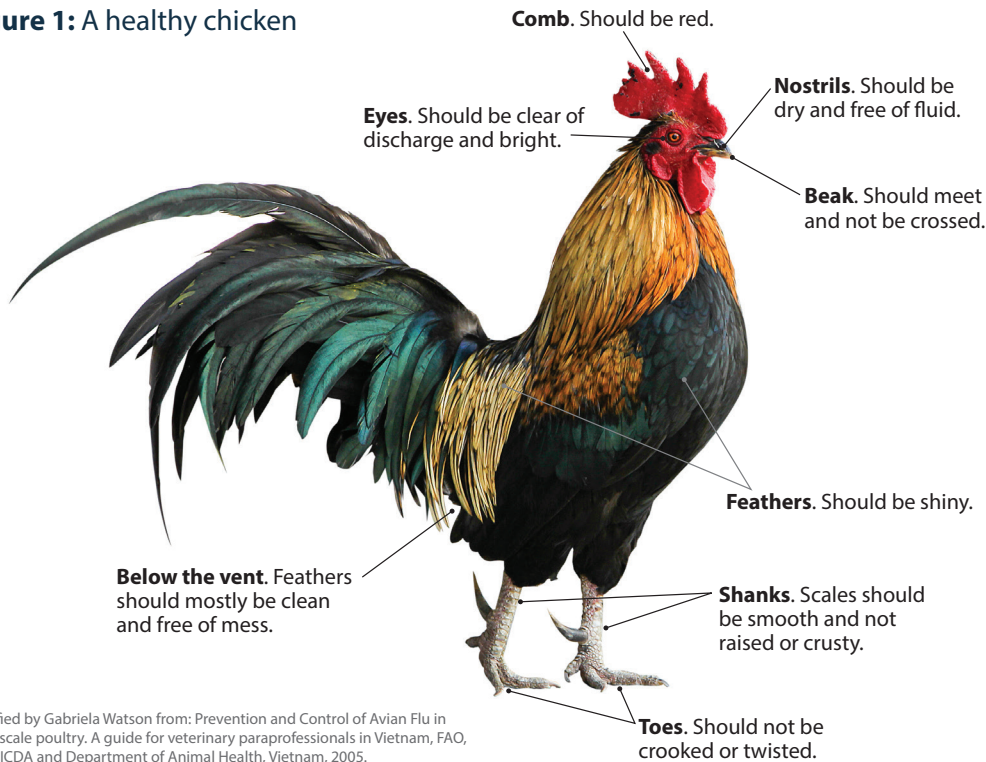
Many people in the village assume that a chicken is not healthy only when it is obviously sick. But chickens will try to hide the evidence that they are sick as long as possible. Thus, it is important to be able to tell a healthy chicken and to recognize

the signs of sickness so that action can be taken as soon as possible.

Chickens try to hide the evidence that they are sick as long as possible

A strong healthy chicken will eat well and move freely around the coop and farm.

Her feathers will be shiny, and her comb will be brightly coloured. And since villagers keep some chickens to lay eggs then we need to know that a strong and healthy chicken will lay consistently, that her eggs have a strong shell and when we crack the egg the yolk has a dark yellow to orange colour.

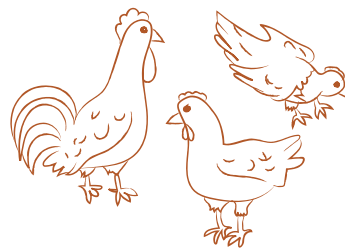
Figure 1: A healthy chicken

Modified by Gabriela Watson from: Prevention and Control of Avian Flu in small scale poultry. A guide for veterinary paraprofessionals in Vietnam, FAO, VSF-CICDA and Department of Animal Health, Vietnam, 2005.

2.2 A healthy flock

Most villagers would keep many chickens along with a few turkeys and sometimes ducks. When we keep chickens along with other birds such as turkeys, ducks, guinea hens and Bantams this group of birds is called poultry. Records of BAHA and BPA show that most people keep about 40 - 50 chickens in one coop (a flock) and may also have other poultry. Hence in talking about health, there is need to consider the entire group of chickens, that is, the flock. It is not easy to tell the health of a flock when the chickens are all over the yard. The best time to look at the health

of the flock is when the chickens are all in the coop and before we let them out for the day.



You need to look quietly inside the coop trying not to disturb the chickens. You need to listen carefully for breathing noises. Are there any dead chickens inside the coop? You also need to look at their behaviour. Are they using the perch? Are

they grooming themselves, that is, preening and dustbathing? If you have chickens laying eggs, then you need to look at the eggs. When and where are the chickens laying? Is the number of eggs laid per week what you expected? You need to look at the eggs for their quality that they are not soft shelled or misshapen.

2.3 A healthy system

Someone once said that no man is an island. Similarly, for your chickens. No chicken is an island. Having understood that chickens are treated as a group (flock) and not really as individuals, you now need to consider the entire system in which the flock lives. Thus, you need to

look at your coop. Where do you put it? You do not want it near pigs or in a noisy area. You do not want the coop near a pond or under a tree where wild birds can be a problem. Once built, you need to maintain the coop structure. You need to examine the coop that it provides good shelter and protection – roof intact, no breaks where wild birds and other animals can enter. You need to look at the fencing, that it is intact with no breaks. Where the chickens are allowed to roam within the fenced area, we need to ensure that there is adequate feed, water and shade and that the chickens are protected from other animals.

The coop and fenced area must always be kept clean and tidy.

Figure 2: A healthy chicken rearing system



Modified by Gabriela Watson from: Prevention and Control of Avian Flu in small scale poultry. A guide for veterinary paraprofessionals in Vietnam, FAO, VSF-CICDA and Department of Animal Health, Vietnam, 2005.

Disease in poultry

3

In this section we will look at poultry diseases in general. It is not necessary for you to be able to identify what sickness your chickens have. There are trained people that can do that. However, you need to know when to call the trained person. You need to understand the causes of sickness and how the sickness can enter your farm, affect your chickens and how it can spread in your coop, to your neighbours and to your village.

3.1 What causes disease

As in people our chickens can get sick from many causes. But if you know what the cause is then you can better treat and

control the sickness. Your chickens can die from heat stress. They can die from poison or be killed by dogs. They can die from lack of water or starvation. They can die from sicknesses caused by bacteria, virus, fungus. We call these infectious causes. They can also die from worms and other parasites.

Thus, we see that understanding what is causing our chickens to be sick helps us a lot in prevention and control. We will concentrate only on the infectious causes – bacteria and viruses which we shall refer to as germs. Table 1 lists the common chicken diseases in Belize. Germs move from one chicken to another in order to survive. They can spread quite quickly and affect the livelihood of the village.

Chickens can die from sicknesses caused by germs

There are many chicken sicknesses. Some of these sicknesses are not in Belize – for

example, avian influenza. Some sicknesses may be carried by wild birds, for example, avian influenza and Newcastle disease. Some sicknesses are in Belize and show up every now and again, for example, fowl pox, fowl cholera and Coryza. Some sicknesses are around all the time – for example, roundworms and lice.

Table 1 The different causes of sickness and the sickness they cause

Disease Agent (Germs)	Disease			
Virus	Newcastle Disease	Fowl Pox	Gumboro	Infectious Bronchitis
Bacteria	Fowl Cholera	Coryza	Salmonellosis	Fowl Typhoid
Fungi	Aspergillosis	Mycotoxins		
Protozoa and parasites	Coccidiosis	Roundworms	Lice	Mites
Biosecurity can help you to reduce the occurrence of these diseases.				

Source: Dr. Victor Gongora

3.2 How disease spreads

A chicken may get sick when it is exposed to a germ that causes illness. To keep your chickens healthy, you need to minimize as much as possible any exposure to germs. A healthy, well fed chicken is more likely to resist germs and so not be a source of germs. So where are the germs? They can be everywhere. When germs enter a chicken, they multiply inside the chicken's body. Once they multiply, they are present in everything that comes out from the bird. So, if the chicken sneezes, they are in the droplets of

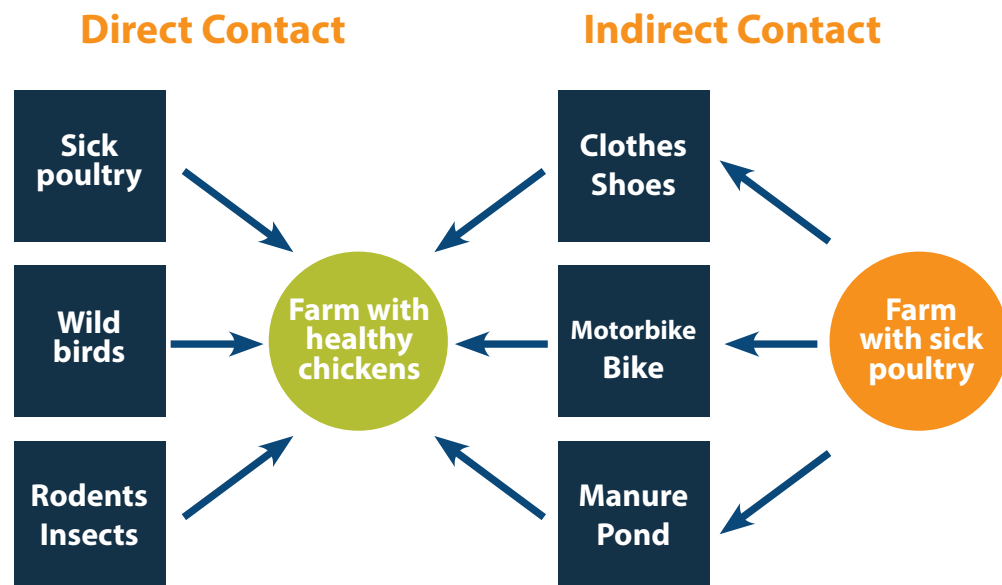
the sneeze. If the chicken coughs, they are in the droplets of the cough. If the chicken stools, they are in the droppings. Very soon the environment around the sick bird is full of germs and as more and more birds get exposed to the germs, there are great quantities of germs from all the sick chickens. Thus, quite soon, the coop becomes a germ factory. Anything that comes in contact with the germs gets the germs on them – they become contaminated. And when the germs get inside a chicken, directly or indirectly, it can cause sickness. If it is an object such as one's shoes, clothes or a farm

equipment, then these may carry the germ wherever they go. So we see that germs can be spread by sick animals, by contaminated animals and by people who can be contaminated themselves (their clothes, their shoes) and carry contaminated things such as tools, feed bags, bicycles.

In a coop one sick bird soon spreads the germs to other birds because of direct contact. Some germs can spread through the flock quickly and others spread through the flock slowly.

Germs multiply in one chicken who spreads the germs to other chickens and soon the coop becomes a germ factory.

Figure 3: How disease spreads by contact



Modified by Gabriela Watson from: Guide for the prevention and control of avian flu in small scale poultry, FAO, Rome, Animal Production and Health, 2006.

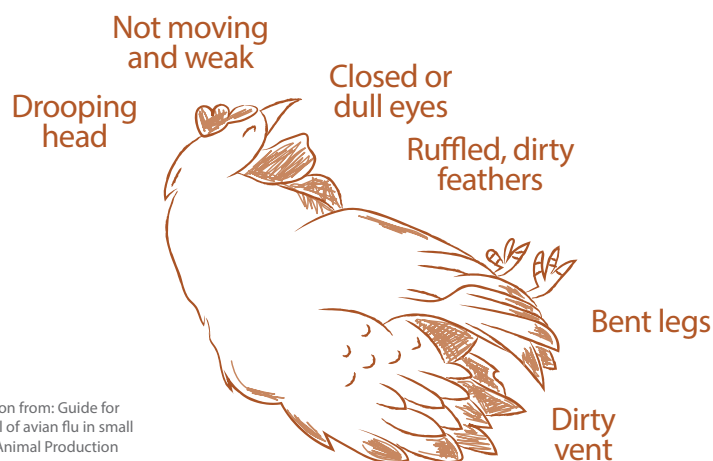
3.3 Recognising that birds are sick

Knowing how a healthy chicken looks and behaves makes it easier to tell when the chicken is ill. Of course, a dead chicken is a dead chicken. Farmers would usually tell something is wrong with their chickens quite early. We need to know how our chickens sound, the noises they make. We need to know their behaviour – how they feed, drink water, perch, groom and walk around the farm. We need to know how the droppings look normally. Sometimes we need to hold a chicken and examine it – for blindness, for change of colour especially around the head and feet, for soiling in the vent area, for pox. Once we tell that something is wrong then we need to follow up and try to understand what may have caused the signs we see. Did we use poison around the chickens? Did we use mouldy stale corn feed? Was it a very hot, hot day? Did a dog come around and chase our

chickens? Do the dead chickens look like an animal got to them – possum, fox, weasel? If we cannot answer these questions, then we have to think that our chickens got exposed to germs. So, we ask a different set of questions: has BAHA announced any outbreak of disease? Have there been reports of sickness in the chickens in the neighbouring village or in the district? At this point, it is best to go to see the Ministry of Agriculture and BAHA especially if we see that the chickens look sad, stay in one place, do not eat, have loose droppings.

A young sick chicken will not eat. It will have puffed up feathers and may have wet and bloody droppings. Old, sick chickens may have dirty feathers around the vent (backside). There may be sores on the comb and wattles. Some birds may not be able to walk well. Weak legs and curled toes may be the problem. If they cannot walk well you should kill them, as they will die anyways.

Figure 4: Signs of sickness in a sick chicken



Modified by Gabriela Watson from: Guide for the prevention and control of avian flu in small scale poultry, FAO, Rome, Animal Production and Health, 2006.

3.4 How to prevent and control sickness

In Belize, we do not have the culture of prevention even though we like to say that an ounce of prevention is worth a pound of cure. We take our chances with life and with our chickens. Then if something does happen, we wait to see if it will get worse. However, by the time it gets worse it is too late to do anything except for our next cycle of chickens.

It is a good practice to clean and disinfect the coop and every tool and equipment used with the chickens before you bring the new batch of chickens. You should leave the coop vacant for at least two weeks after cleaning and disinfecting before bringing in the new batch of chickens. If the same sickness is all over the village then it is best, you wait one month after the last chicken flock in the village got sick and died before you bring in a fresh batch of chickens.

Prevention is doing things right so that the occurrence of sickness is minimised. So, you need to know what sicknesses are around in the village and which ones are a danger to your village and chickens.

Prevention has to do with the healthy system we described above. It means you keep your chickens strong and healthy so that if sickness comes their bodies will be strong to fight it. Prevention means biosecurity, taking action to ensure you keep a clean, healthy system and ensure you do not spread germs from your farm to other farms. It means vaccinating your chickens. In Belize, most vaccines available for chickens are for commercial farmers with 1000 and more chickens. Only for Newcastle disease is there a vaccine available that is good for 150 chickens. It is important to vaccinate chickens before a disease outbreak otherwise the vaccination may not be effective.

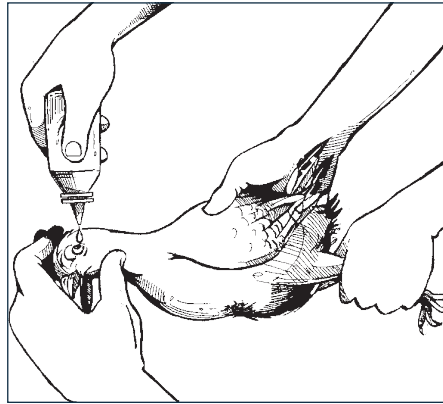
Control usually means the actions you take once you have a sickness problem in your hands. You can use medicines to treat the sick chickens. You can also vaccinate your healthy chickens other than the sick ones. Or you can quickly kill the sick chickens so that the germs of whatever sickness they have does not build up and spread.

Control also means cleaning and disinfecting your coops so whatever germs may have contaminated them are destroyed.

VACCINATION

Vaccination is giving your chickens a medicine which contains dead or living organisms to protect them from getting a particular sickness in the future. Thus, to protect your chickens from Newcastle disease then you need to use a vaccine with Newcastle germs. The vaccine (medicine) needs to be kept cold not frozen - in the fridge until you use it and in an cooler with ice when not in the fridge. Once the vaccine bottle is opened it must be used within two hours. Unused vaccine is to be properly discarded and not used. When you get vaccine for your chickens make sure the vaccine is for the sickness you want to protect from and make sure the vaccine is not expired. Always read the vaccine label and follow the instructions of the trained person.

Some sicknesses are always a threat and they can occur in your village. Newcastle disease can suddenly kill all your chickens. It is very important to vaccinate against this disease before the disease strikes in your village. The Belize Poultry Association has vaccine for Newcastle disease. The vaccine is provided free of cost to villages conducting vaccination campaigns. These village campaigns need to be done every four months. The vaccine can be purchased at cost price at any time and it is available from the Agriculture Department, BAHA and BPA.



Controlling Newcastle disease in village chickens, a field manual. Version 14.03.2001. Robyn Alders and Peter Spradbrow, Australian Centre for International Agricultural Research.

3.5 Risk factors for disease

What do we mean by risk factors? By this we mean things that increase the chances of your chickens getting sick and dying. So, if your next-door neighbours have chickens dying from germs – then this is a risk for you. If you keep other birds besides chickens such as turkeys, ducks, guinea hens and Bantams then you have a risk. You may ask why is this a risk? It is a risk because germs may affect one type of poultry but not another type. The unaffected poultry would have the germs but show no sign of sickness. However, in your chickens these same

germs would cause a very bad sickness. So by mixing the poultry types you may expose your chicken to germs in the other types of poultry. If you go to Guatemala or Mexico, neighbouring countries, to buy chickens or eggs to bring to your farm – this is another risk factor. If you buy spent hens from the chicken man and then keep them alive for more eggs or until you are ready to cook them – another risk. Do you go to the bush or lagoon and catch a wild bird to bring to your farm? Can you identify other things as risk factors? For example, if you allow your chickens to go across to the neighbours or roam freely in the village?

Biosecurity 4



Biosecurity is all about common sense. Biosecurity is about practices to avoid contact between chickens and germs: keep chickens away from germs and keep germs away from chickens. There are many good practices that farmers do that we can call biosecurity. But not all good practices are relevant to your situation. For example, in the village you do not need a vehicle dip before you access your chicken coop. Hence, this section will address principles of biosecurity so that you can then use your common sense to come up with your own practices and prepare your own biosecurity system. Biosecurity does not cost a lot of money or time. However, if biosecurity measures are not followed, you will

spend more time and money to try and cure the sickness when it does appear.

Biosecurity is about practices to avoid contact between chickens and germs: Keep chickens away from germs and keep germs away from chickens.

4.1 Definition

So what is biosecurity? The international organization (known as the OIE) that is responsible for setting standards for animal health including chicken health tells us the following: Biosecurity means the things we do and put in place to reduce the risk (danger):

- of bringing in a new sickness to our chickens and village,
- of allowing the sickness to establish itself in our chickens and village and
- of spreading the sickness to other chickens in our village and to other villages.

Biosecurity requires that we adopt a set of attitudes and behaviours to reduce risk in all activities involving poultry production and marketing activities.

peace (no problems) and in times of sickness. For example, if there are outbreaks of Newcastle disease close to your farm, you must take stronger measures than in normal times. The government, that is the Ministry of Agriculture and the Belize Agricultural Health Authority (BAHA), will follow these same principles if there is a problem with an important poultry disease in Belize.

4.2.1 Principle I: Isolation

Isolation is about putting up barriers. These barriers can be physical such as a coop and fence. They can be related to time such as letting out the chickens when animals are not around. They can be procedural such as signs you put up to prevent entry. You do not want your chickens to freely roam all over your farm, go to

Protect your chickens and village from sickness

1. Isolation

2. Traffic control

3. Clean and disinfect

4.2 Principles

The three key principles of biosecurity are: isolation, traffic control and sanitation. Even if you have a few chickens at your farm, you can do several things under each one of these principles. Different measures of biosecurity can be applied in different circumstances in times of

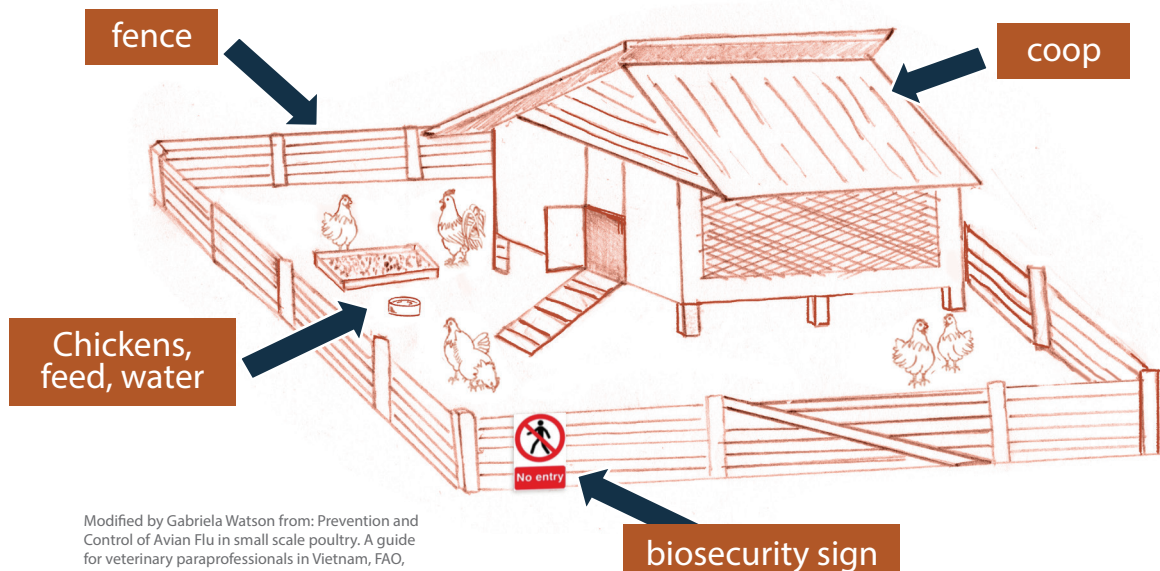
the next-door neighbour or throughout the village.

You also do not want other animals to freely mingle with your chickens. So, to prevent roaming all over the place then you need to put your chickens in a coop. But since you do not want your chickens to be locked in the coop all the time then

you can put a small fence for them to roam in this fenced area. The picture below (Figure 5) shows an example of a coop with a fence around it. In Belize, this is the recommended biosecurity system for village chickens – a coop in a fenced area.

by. A clean and tidy yard will help to keep away rats, possum and snakes. There should not be build-up of trash or overgrown grass. To keep away wild birds then you need to ensure the coop is wild bird proof and there are no feed spills or water

Figure 5: Recommended Biosecurity System



Modified by Gabriela Watson from: Prevention and Control of Avian Flu in small scale poultry. A guide for veterinary paraprofessionals in Vietnam, FAO, VSF-CICDA and Department of Animal Health, Vietnam, 2005.

Under the principle of isolation, you want to consider the location of your coop. It is best you do not have it close to a path in your yard that everyone uses, nor close to the neighbour's yard, especially close to the neighbour's chicken coop. You do not want it close to the road or close to ponds.

To keep other animals away, you need to consider the kind of animals that come

puddles or trees over your fenced chicken area to attract them.

A clean and tidy yard helps to keep away rats, possum and snakes.

It is a good idea to post a biosecurity sign at the entrance to the fenced coop area. This sign can be as simple as “Keep Out”, or “Restricted Entry” or can be as in the sign posted by a commercial poultry farmer in Blue Creek, Orange Walk (picture below):

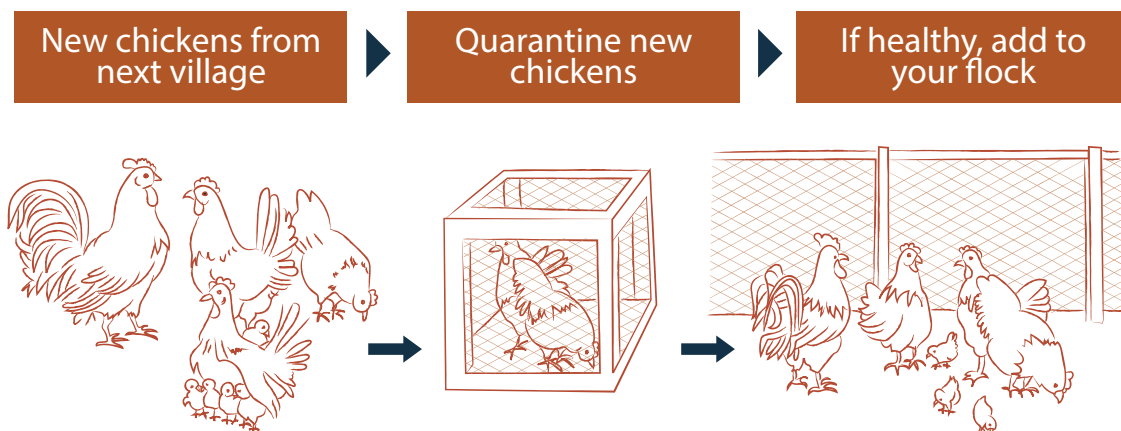


Another good practice under principle number one, isolation, is to use good, clean water preferably from the village supply or well. It is best not to use water from an open body of water such as pond, lagoon and river. The reason for this is that the water may be dirty with germs from wild bird droppings.

Quarantine: When you buy or get chickens from another person to add to your coop you need to ensure that the chickens you get are healthy. These new introductions should be kept separate from your chickens and other animals because they may have germs of a sickness which has not yet caused them to be sick. If you get a live turkey or duck to cook keep them separate from your chickens. If the new introductions are to become part of your chicken flock, then keep them separate for at least two weeks. If the new chickens are still healthy after the two weeks, then they are healthy enough to add to your flock. If they show signs of sickness, seek help from the nearest trained person.

Keeping new chickens separate from your flock for two weeks is called quarantine.

Figure 6: Quarantine new chickens



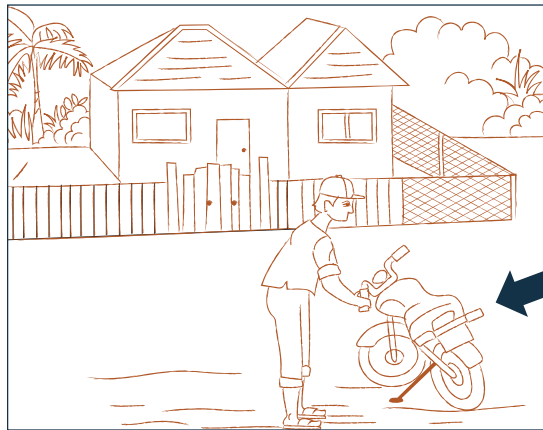
4.2.2 Principle II: Traffic control

This includes both the traffic onto your farm, the traffic patterns within the farm and the traffic leaving your farm. Sickness is spread through the movement (traffic) of animals, people, vehicles and materials because germs, especially from droppings, can stick to these. So, restrict access to your fenced coop area and chickens. Control the traffic into and out of your farm. If visitors must be allowed access to your chickens, then they

take these outside to them. Do not let them enter the fenced coop area.

You also need to control your own traffic in the fenced coop area. If you have other poultry besides chickens, then tend to your chickens first before you tend to the turkeys or ducks. And keep them separate, too. Other animals may have germs that do not get them sick but these same germs in your chickens would make them sick. This is the reason you need to handle each type of poultry separately.

Figure 7: Restrict access of vehicles



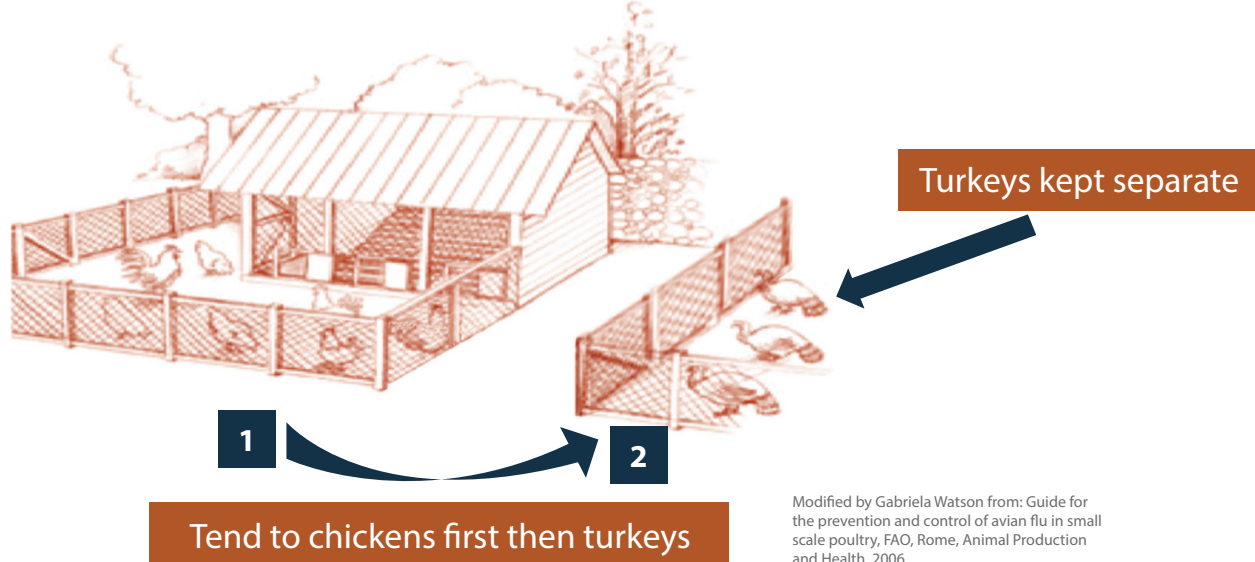
Motorbike parked
outside farm

Modified by Gabriela Watson from: Prevention and Control of Avian Flu in small scale poultry. A guide for veterinary paraprofessionals in Vietnam, FAO, VSF-CICDA and Department of Animal Health, Vietnam, 2005.

need to be clean, that is, not contaminated with germs that cause chicken diseases. Know who they are and where they come from. It is difficult to remember who visited when, so can you think what can be done to remember visitors?

To control traffic, you can ask the visitors to leave their bicycles, motor bikes and vehicles at the farm gate or entrance. When people come to buy your chickens or eggs

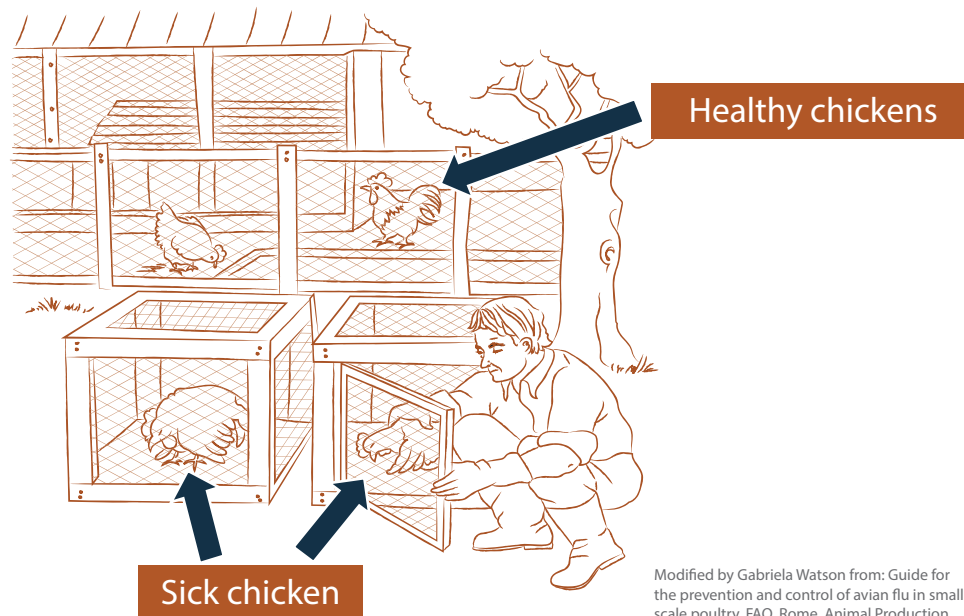
Other animals may have germs that do not get them sick but these same germs in your chickens can get them sick.

Figure 8: Keep different types of poultry separate

Modified by Gabriela Watson from: Guide for the prevention and control of avian flu in small scale poultry, FAO, Rome, Animal Production and Health, 2006.

And within the chicken flock, do clean jobs first before you do the dirty jobs. Feeding the chickens is a clean job. Picking up a dead chicken and burning or burying is a dirty job. Tend to the young chickens first before you tend

the older ones. When you have any sick chicken, it is a good practice to separate the sick ones from the healthy ones in the coop. And do not forget to tend to the healthy chickens first before you tend to the sick ones.

Figure 9: Isolate sick chickens away from healthy ones

Modified by Gabriela Watson from: Guide for the prevention and control of avian flu in small scale poultry, FAO, Rome, Animal Production and Health, 2006.

4.2.3 Sanitation

Here we address cleaning and disinfection of materials and equipment entering the farm and our own cleanliness as well as those of visitors. For disinfectants to be effective dirt and trash must first be removed through cleaning. The water

For disinfectants to be effective, dirt and trash must first be removed through cleaning.

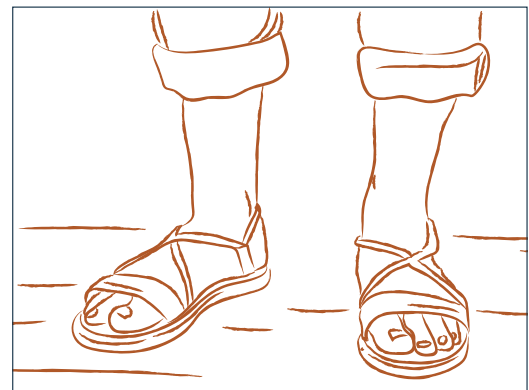
must be clean, and the container must also be clean and not have dirt.

You must check that whatever comes into our coop area is free of manure, feathers and litter from the coop floor. If we cannot properly clean and disinfect then we need to not use the equipment or, if it is a vehicle, then we park the vehicle away from our coop area.

The farmer who takes care of the chickens rather than cleaning and disinfecting boots or shoes every time he goes into the coop area it is best, he has one pair of boots or slippers for use in the coop area. Every time you enter, put the boots or slippers on. Leave them in the barn every time you exit. Clean and disinfect the boots or slippers regularly. Any visitor

to the coop area must clean and disinfect their footwear or put a cover over them.

There is a lady farmer in San Pedro Columbia who has a good biosecurity practice. She has two pair of slippers, a house and walkabout pair and a yard pair. Whenever she goes to the yard to look after her chickens, she puts on the yard pair. The yard pair of slippers is used only in her yard.



It is a good practice to wash your hands before and after tending your chickens. Always use soap or soap powder when you wash your hands as the soap kills germs.

Figure 10: Scrub boots then disinfect them

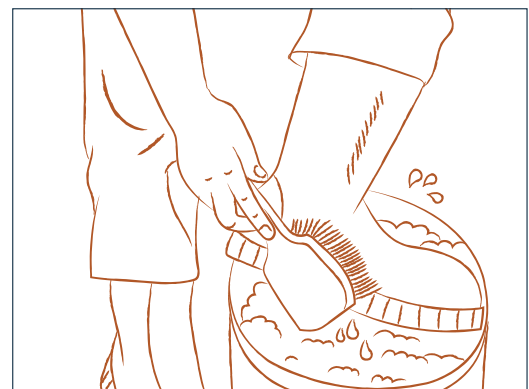
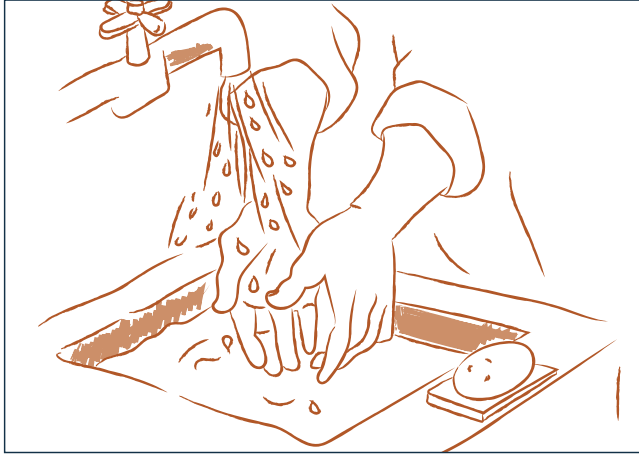


Figure 11: Always wash hands before and after handling chickens



Modified by Gabriela Watson from: Guide for the prevention and control of avian flu in small scale poultry, FAO, Rome, Animal Production and Health, 2006.

Any dead chicken that you find in your coop and farm, you need to get rid of it as soon as possible because it is a source of germs. Do not handle the chicken with your bare hands. It is best to bury them or burn them. Dead wild birds in your yard should be buried or burnt, too. You can burn the dead chickens by putting them in a drum or other container, add

kerosene then light a fire. If you prefer to bury them then dig a hole (pit) in the ground, far from animals, wells and ponds. Put white lime at the bottom and sides of the pit. Put all the dead chickens in the pit, cover with more white lime then cover with earth. And do not forget to wash your hands with soapy water after you have handled any bird.

Figure 12: Cover dead chickens with white lime then cover with earth.



Modified by Gabriela Watson from: Guide for the prevention and control of avian flu in small scale poultry, FAO, Rome, Animal Production and Health, 2006.

A model backyard poultry biosecurity system

5

There are many things you can do in the way you take care of your flocks to protect them from sicknesses. Only healthy chickens will grow well to provide you with meat and many eggs. Cleanliness is the key to healthy chickens. To keep your chickens healthy, you need to provide clean water. Clean the water and feed bins and the coop often.

Keeping your chickens in a coop and the coop in a fenced area is a good example of the first principle of biosecurity - isolation. Many farmers keep chickens, turkeys, ducks and some may even have bantam chickens, geese and guinea hens. It is best if we keep only one type of poultry because germs may be in one type of poultry

and not cause problems but if the same germs get into another type it can cause sickness. **But if we have other poultry then we need to keep them separate and never allow them to mix.**

The second principle of biosecurity – traffic control – in a model biosecurity system can be addressed by having the following:

- Only one person to tend to the chickens
- Only one way in and out (one gate) to the fenced coop area

When you buy any replacement for your chickens – baby chicks, pullets or hatching eggs - you must buy them from

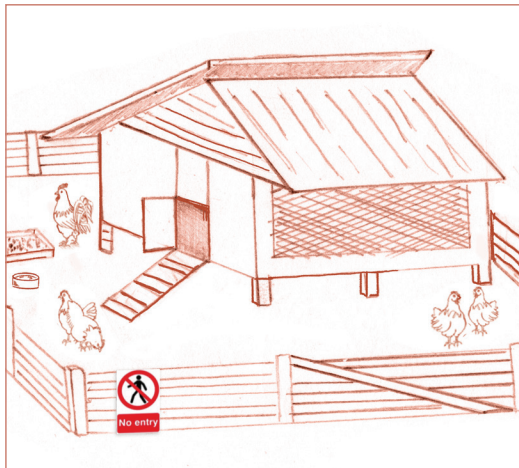
reliable sources. And when you bring them to the farm, you must keep them separate (quarantine) from your other chickens for at least 2 weeks. During this time if they had any sickness it will show. If nothing happens then it is safe to mix them with your other chickens. Sick chickens should be removed from the rest of your chickens and housed separately and given fresh water and extra food. If they are young, they should be kept warm and dry because they are quite sensitive to cold. If the sick ones do not recover in 4 – 5 days, you must kill and bury them far away.

The third principle of biosecurity – that of cleaning and disinfection – can be addressed by regular cleaning and disinfection of the coop including the perches and nest boxes as well as all equipment and tools used in the fenced coop area.

Figure 13 below shows a model biosecurity system. The picture on the left is a well-organized poultry farm while the picture on the right is a poorly organised poultry farm. In a well-organized poultry farm, the farm would be registered with the government and the chickens would be vaccinated for Newcastle disease.

Figure 13: A chicken farm: Well-organized versus poorly organized.

A well-organized chicken farm



A poorly organized chicken farm



Modified by Gabriela Watson from: Guide for the prevention and control of avian flu in small scale poultry, FAO, Rome, Animal Production and Health, 2006.

Keeping records 6



Most farmers think that keeping records is complicated and takes a lot of time. But records are important as you cannot remember everything. Or you may not be home when something happens and information on your chickens is required. When did you deworm the chickens? When did the BAHA vet visit?

When did you get the pullets from your comadre who lives in Toledo? These questions can easily be answered if you keep records. The records provide good information to help you to make wise decisions. Record keeping can be as simple as writing down the information on a calendar as shown below:

July

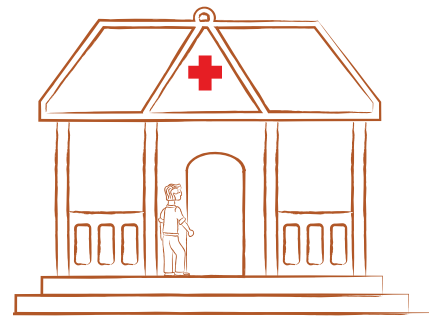
Nº	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
27		1 Deworm	2	3	4	5 Village Newcastle vaccination	6
28	7	8	9	10 BAHA visit	11	12	13
29	14	15	16	17	18	19	20 Sold 3 hens to Chinese
30	21	22	23 Pullets from Dolores	24	25	26	27
31	28	29	30	31			

Your health 7

Sick animals including sick chickens can pass on their sickness to you just as they can pass on the sickness to other animals. Fortunately, not every chicken sickness can be passed on to people. When a sickness is passed on (transmitted) from an animal to people, it is called a zoonosis. When there is an outbreak of a serious poultry disease in Belize, the government authorities will inform you whether it is a zoonosis or not and whether it is a food safety risk. However, there are some common chicken sickness that can affect you such as runnings (diarrhea) in chickens which you can get by handling the sick chicken. So, it is best you always wash your hands with soapy water before and after you tend to your chickens. You should not sell or give away chickens from a sick flock even if the ones you sell or give away look healthy. Of course, you

should not cook them for dinner, either. They should be burnt or buried.

If you or someone in your family gets sick after handling chickens or eating food with chicken in it – fever, runnings, common cold – go as soon as possible to your village health centre or community health worker and do not forget to inform them that you were in contact with chickens or had food with chicken or eggs.



A Poultry Biosecurity System

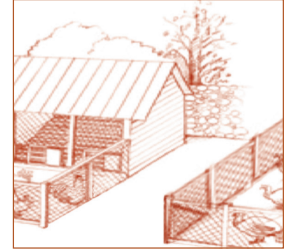


Bury dead chickens with white lime and cover with earth.

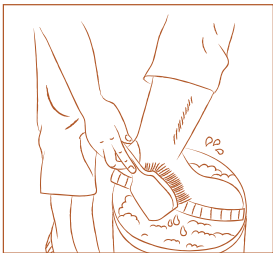
July

Nº	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
27		1 Deworm	2	3	4	5 Village Newcastle vaccination	6
28	7	8	9 BAHA visit	10	11	12	13
29	14	15	16	17	18	19	20 Sold 9 hens to Chinese
30	21	22 Pullets from Dolores	23	24	25	26	27
31	28	29	30	31			

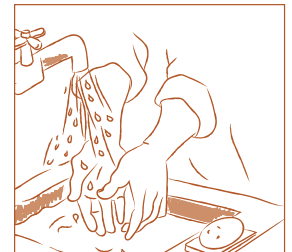
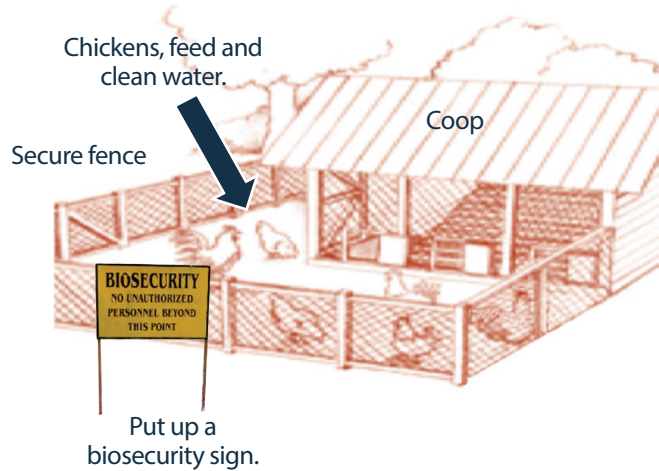
Keep records when something happens.



Keep different types of poultry separate.



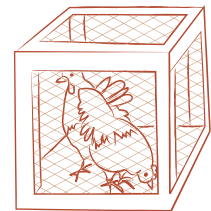
Use clean footwear dedicated to the chicken area.



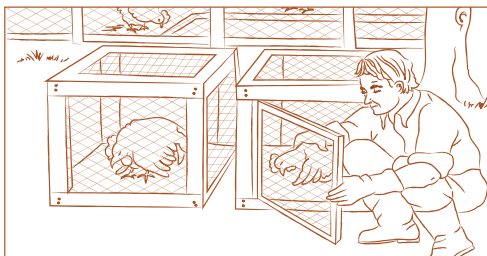
Always wash hands before and after handling chickens.



Restrict access for people and vehicles.



Quarantine new chickens at a separate location.



Remove sick chickens and keep them separate from the main flock.



Vaccinate your flocks against diseases like Newcastle Disease.

When, how and where to get help

8

This section is about being able to tell that you need help to keep your chickens healthy. This may be because you hear rumours about a sickness somewhere in the country or your district, the neighbour told you that her chickens all died suddenly, or you have sick chickens.

8.1 When to get help:

Help is always available. The Ministry of Agriculture and BAHA are always willing and able to help. So do not hesitate to call them if you need information because you hear rumors or sickness killing all the chickens in the neighbouring village, or if your neighbour tells you that she found many of her chickens dead and the day before they were strong and healthy.

Now, if you have sick chickens, then you need to quickly check into it. If many of

the chickens are sick try to describe the sickness:

- What colour is the head and is it swollen?
- Any runnings (loose stools)?
- Are the breathing sounds what you normally hear?
- Can the chickens move easily?
- Are the chickens stiff, on the ground and unable to walk.

If you find a dead chicken in the coop, you can ask yourself these questions: Are the other birds strong and healthy? What killed the chicken – possum, pecking from other birds, or cannot tell? If you cannot tell why the chicken died it is a good idea to step up care for the chickens.

Always go to get help when many of your chickens are sick, or you have chickens dying? If you treat your chickens before you get help keep a

record of the treatment on your calendar and do not throw away the medicine container as the vet will want to look at it. If the vet gives you or recommends antibiotics to treat your chickens, follow his instructions carefully. It is important to use antibiotics as instructed because throughout the world there is concern about germs being resistant to many antibiotics and misuse contributes to resistance.

8.2 How to get help:

Do you know the local person in your village who looks after sick chickens? You can call him to help you find out more

about the sickness? But make sure you maintain your biosecurity. You can also contact your village chairman, the school principal or the community health worker from the Ministry of Health. You can also call or go to the Ministry of Agriculture office or BAHA in your district.

8.3 Where to get help

Help is available. The following are boxes for you to insert contact information of the different places and people you can call or visit. If you are on social media then also include the Messenger or WhatsApp contact number of these contact organisations and people.

BAHA
Address:
Telephone:

AGRICULTURE
Address:
Telephone:

BPA
Address:
Telephone:

Chicken contact person:
Village:
Telephone:

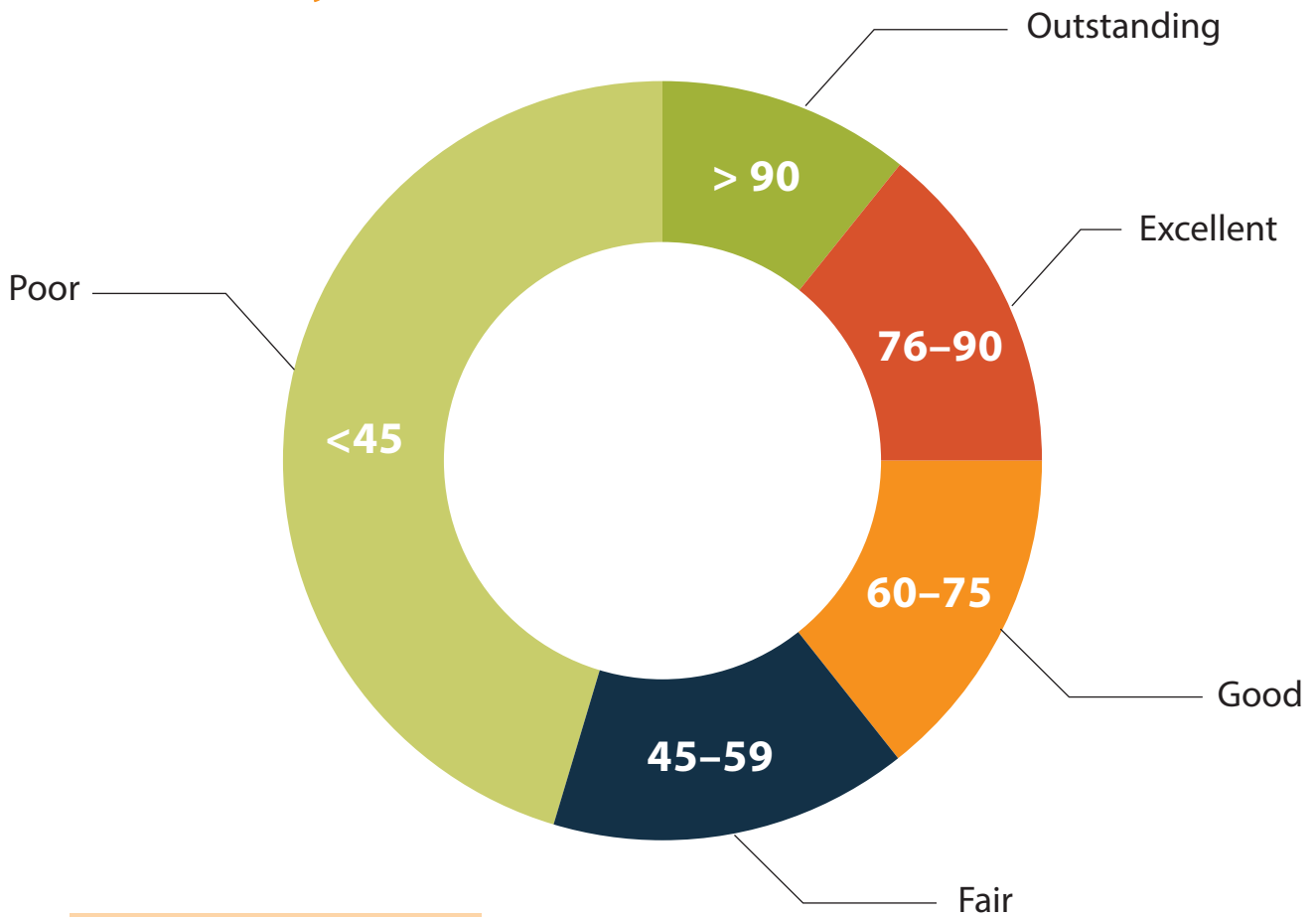
Biosecurity Checklist

9

It is a good practice to check on how you are doing with biosecurity. This section has a biosecurity checklist that you can use to test yourself to see how you are performing. Do it at least once a year. You take one row at a time going from top to bottom. In the YES/NO column, if you answer YES/NO then put a check mark, accordingly. The Points column has the points gained if the answer is YES. if

you answer YES and the points for that row is 5 then your total is 5; if the points were a different value then you put that value. Makes sense? Of course, if you answer is NO then your total for that row is 0. At the end you total all the points on the total column to get your final score. Once you get your final score you can see how your farm scores in the graph below using the following guide:

Biosecurity Score

**SCORE:**

Outstanding: > 90

Excellent: 76 – 90

Good: 60 - 75

Fair: 45 - 59

Poor (need to improve): <45

My Biosecurity Checklist

	BIOSECURITY MEASURE	YES	NO	POINTS	TOTAL
1	My farm is fenced.			5	
2	I have a biosecurity sign at entrance or perimeter fencing.			5	
3	My coop is fenced and has gates.			5	
4	No other birds are kept on my property.			5	
5	I have a programme to control mice, rats and other pests.			5	
6	I quarantine all new chickens before adding them to my flock.			5	
7	I have a foot dip at the entrance of my fenced coop area.			5	
8	I check my chickens every day for sickness and overall flock health.			4	
9	I contact the animal health person if I have many deaths in my chickens.			4	
10	I check feed consumption and deaths for signs of problems.			4	
11	Dead birds are picked up from the coop for appropriate disposal.			4	
12	Birds and other animals cannot access my dead bird disposal site.			4	
13	Visitors that enter fenced coop area are recorded.			4	
14	For necessary visitors their vehicles are parked outside.			4	
15	For necessary visitors, I ensure they clean and disinfect boots.			4	
16	My coop is at least 50 feet from public roads.			3	
17	My coop is animal- and wild bird-proof.			3	
18	All equipment is cleaned & disinfected before coming on my farm.			3	
19	My Coop is regularly cleaned and disinfected.			3	
20	The Coop entrance is kept clean.			3	
21	Boots are cleaned & disinfected at entrance of fenced coop area.			3	
22	Debris and vegetation are cleaned up and kept clear of the coop.			3	
23	Feed spills are cleaned up quickly when they occur.			3	
24	I do not visit other farms with chickens.			2	
25	Vehicles entering my yard do not enter the fenced chicken coop area.			2	
26	I have instructed my family about poultry disease and biosecurity.			2	
27	Household pets are kept away from the chicken coop.			1	
28	I have implemented a fly control programme for my farm.			1	
29	My chickens do not come in contact with pigs.			1	

Appendix 1

Self evaluation

Test your poultry biosecurity knowledge

1. Poultry means:

- A:** A group of chickens
- B:** A group of wild birds
- C:** A group of chickens and wild birds
- D:** A group of birds such as chickens, ducks and turkeys.

2. A flock is:

- A:** A group of chickens kept and reared together.
- B:** A group of birds, sheep and pigs.
- C:** All the chickens in a village.
- D:** A type of sickness that chickens get.

3. True or false: The best time to observe the health of your chickens is early in the morning before you let them out of the coop?

4. When we talk about germs, we mean:

- A:** Anything that can get your chickens sick.
- B:** Bacteria, viruses and worms.
- C:** Bacteria, viruses, and protozoa.
- D:** Bad spirits in the coop.

5. True or false: A “germ factory” is a heavily contaminated coop where germs have been allowed to grow, spread and flourish.

6. When should you call the animal health person about the health of your chickens?

- A:** Anytime and all the time.
- B:** When dogs kill your chickens.
- C:** When you want to sell chickens or eggs?
- D:** When you have many chickens dying every day.

7. True or false: Prevention is the set of practices to protect your chickens from harm and sickness.

8. True or false: Control is the set of practices such as vaccination and use of medicines to manage a sickness.

9. What is a vaccine?

- A:** A medicine that contains dead or living germs.
- B:** A medicine that protects my chickens from getting a sickness.
- C:** A medicine that must be kept cold at all times.
- D:** A medicine that once I open the bottle I must use it within two hours and cannot store for the following day.
- E:** All the above

10. Circle the ones that are “risk factors” for disease to enter your farm?

- A:** Adding new chickens to my flock.
- B:** A coop that allows wild birds to fly in.
- C:** Visitors entering the coop.
- D:** Lending my compadre the shovel and not cleaning it when he returns it.
- E:** Not washing my hands before and after handling my chickens.

11. True or false: Biosecurity means the measures I put in place to prevent sickness entering, spreading and leaving my farm.

12. List the three principles of biosecurity:

13. True or false: Zoonosis means a sickness that animals including chickens have which they can give to a person.

14. True or false: A calendar on your wall is a simple way to keep records.

15. Match the statement on the left with the appropriate box on the right.

Keeping your chickens in a coop.

Keeping your coop in a fenced area.

Having a dedicated pair of slippers for your coop.

Bicycles must park outside the fenced coop area.

Putting up a biosecurity sign in your fenced coop area.

Washing your hands with soap and water.

Cleaning and disinfecting tools that you bring into your farm.

ISOLATION

TRAFFIC CONTROL

CLEANING &
DISINFECTION



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