



SWINE HEALTH MANAGEMENT

*Frequently asked questions on pig
biosecurity and disease reporting*

Volume 3



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Frequently asked questions on pig biosecurity and disease reporting

Food and Agriculture Organization of the United Nations
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Foreword

With the increase in worldwide demand for meat, fast-growing species with efficient feed conversion rates – such as pigs – are likely to account for a major share in the growth of the livestock sector. The increase in animal numbers is not spread evenly round the globe: Asia leads the increase, whereas pig numbers in North America and Europe are increasing more slowly or holding steady. In Africa, pig numbers have recently grown more rapidly, reflecting increased adoption of pig husbandry in a continent where “livestock” has traditionally been taken to mean “ruminants”.

Commercial pig production has intensified significantly in recent decades. More pigs of the same few breeds are kept on fewer farms, with increased output of animal products. Large-scale production systems have achieved a high level of uniformity because they are based on the same genetic material and therefore provide similar feed and infrastructure for the animals.

In developing countries, half of the current pig population is still kept in traditional small-scale, subsistence-driven production systems in which pigs provide much more than meat. Pigs in such low-input systems provide value-added for farmers by consuming feed that would otherwise be lost. Hence pork might contribute to food security and provide protein, but the animals might also constitute a financial safety net, fulfill a role in cultural traditions, or provide additional cash for school fees, medical treatment or small investments.

The swine growth trend across Asia is characterized by an increase in production stemming from an increase in herd size. As more and more gilts and young sows populate herds, the risk of disease from these young animals increases. These problems are compounded by the growing movement of animals and the risks of the introduction of new diseases. Hence there are a greater number of reports of swine disease outbreaks such as foot and mouth disease (FMD), porcine reproductive and respiratory syndrome (PRRS) and classical swine fever (CSF). Smallholders and even larger producers face major constraints in actively participating in livestock development opportunities due to the heavy burden imposed by such diseases. The adverse socio-economic impacts of such diseases are significant, particularly in developing countries where the livestock sector shapes prospects for economic growth, poverty alleviation and food security.

This publication is a three-volume set showcasing effective swine disease management in smallholder settings through field surveillance, diagnostic support and the application of good herd health management. The first volume – Volume 1: Handbook on swine health field surveillance – aims to guide national animal health frontline staff in conducting field surveillance in swine herds. The second volume – Volume 2: Guide to prevent and control porcine reproductive and respiratory

syndrome – provides examples on how to prevent, control and respond to outbreaks of PRRS, which have been reported in at least six countries in Southeast Asia. This volume – Volume 3: Frequently asked questions on pig biosecurity and disease reporting – is a compilation of answers to questions raised by pig producers in the course of doing field work on swine health management. These three volumes are an attempt by the Food and Agriculture Organization of the United Nations (FAO), in consultation with other swine health experts, to provide practical information for animal health frontline staff in responding to the needs of smallholder pig producers.

It is hoped that collective action to control and eradicate or manage swine diseases through sharing of information on regional disease control efforts, tools and methods will result in preventing the occurrence and spread of swine diseases in the region.

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Introduction

Animal production is increasing rapidly in Asia. Depending on the country and the scale of production, pigs are important for farmers as a major source of family income and as a “savings bank” (Steinfeld, 1998). Disease outbreaks have caused great economic losses to swine raisers and allied industries. In the Philippines, it is estimated that local hog raisers suffered a loss of PHP 2 billion during the 1995 foot and mouth (FMD) epidemic. In Viet Nam, 833 641 pigs were affected by porcine reproductive and respiratory syndrome (PRRS) in 2010 alone. Of the affected pigs, 457 708 died or were culled to contain the outbreak (Hien, 2011). With huge potential losses related to animal diseases, the importance of strictly implementing good biosecurity measures to prevent the occurrence of economically important diseases cannot be emphasized enough.

Pig biosecurity

What is biosecurity?

Biosecurity is defined as the implementation of measures that reduce the risk of disease agents being introduced and spread (FAO *et al.*, 2010). It is also defined as a set of measures intended to keep a swine herd safe from the introduction of diseases from the environment and from other pigs (PCARRD, 2005). Biosecurity can be implemented at country, regional, provincial and farm level.

Biosecurity measures can be implemented in two ways: (i) bio-containment and (ii) bio-exclusion. Bio-containment (internal biosecurity) includes efforts to prevent the spread of a disease within the herd or to other farms. Bio-exclusion (external biosecurity) includes efforts to prevent introduction of a disease in the farm.

Why do we need to implement biosecurity measures?

Pigs carry a wide range of infectious agents. Some may be unimportant, some harmful and potentially dangerous, and some to be kept out at all costs. It is important to implement biosecurity measures for the following reasons:

Economic impact: Some diseases can cause considerable losses to a pig business.

- Costs due to loss of production: increased mortality, decreased growth and production, lower feed conversion rates, decreased quality of products, disturbed production planning, and less than optimal use of a production unit.

- Marketing-related costs: poor quality products, risk of contamination, and export restrictions.

There will be a cost to implement preventive and treatment interventions but in the long term these will be less than the cost of a disease outbreak.

Zoonotic diseases: Some diseases are transmissible to humans, therefore good biosecurity reduces risks to human health.

Exotic and endemic diseases: The threat of exotic diseases and the ever-present challenge that endemic pathogens pose to producers emphasizes the need for effective biosecurity practices.

Spread of diseases: The spread of disease through direct and indirect contact can be prevented if sufficient biosecurity measures are in place.

Stress and anxiety: Some diseases are harmful to pig welfare, disrupt farming and rural businesses, and cause considerable stress and anxiety to people living in rural communities.

What biosecurity measures can be implemented in a farm?

Location

- Locate the farm as far as possible from potential sources of infection including other farms, live animal markets, abattoirs and stockyards. A distance of at least one kilometres from any other pig farm is adequate.
- Construct a perimeter fence around the farm to control the movement of people. Make sure that the fence is not broken to prevent access of stray livestock and wild animals.
- Install warning information signs and lock gates and doors to discourage unwanted visitors.
- Provide natural barriers by surrounding pig houses with trees and plants. Avoid planting fruit trees so as not to attract fruit bats into the area.
- Designate the pig area within the farm and fence it securely.
- Locate facilities (changing room, feed delivery and loading areas) that allow external transactions outside the pig area and equip them with appropriate cleaning and disinfection equipment and supplies.

Visitors

- Limit entry of people to the farm, especially those who deal a lot with pigs.
- Do not allow anyone to enter the farm who is not essential to farm operations.
- Use a log book to keep a record of visitors.



Figure 1 Putting up perimeter fences and providing natural tree barriers can help regulate the movement of people in the farm
Photo courtesy of Imelda J. Santos, FAO

- Instruct visitors to wash their hands and change clothing and footwear before entering the farm.
- Minimize movement of visitors inside the farm. Prohibit visitors from entering pens, walk through alleys or touching the pigs unless necessary.
- Advise visitors to use foot baths found at the entrance of each pig house.
- Do not allow visitors to bring food into the farm.
- Post signs asking visitors to comply with the farm's biosecurity measures.
- Strictly implement a downtime of 24 hours.

Farm personnel

- Do not allow farm personnel to raise pigs outside the farm.
- Ensure that farm personnel do not have any contact with pigs, livestock or with persons having contact with pigs or livestock.
- Require all personnel to shampoo shower and completely change into farm clothing and boots before entering the pig area.
- Do not allow farm personnel with symptoms of respiratory illness to have any contact with pigs.
- Drivers of vehicles used to transport hogs or piglets should not enter the pig area.



Figure 2 Advise visitors to use the foot baths and hand wash stands throughout the farm
Photo courtesy of Imelda J. Santos, FAO

Livestock extension personnel

- Visit one pig farm per day. If this is not possible, visit several farms keeping different types of livestock. Alternatively, visit pig farms requiring routine procedures first (e.g. baby piglet processing, castration, iron supplementation), then proceed to those with disease challenges.

Animals

New and replacement stock

- Start a farm with pigs of high-health status.
- Buy pigs from a reliable breeder. Breeder farms should be inspected. The health status of the source herd should be reviewed to minimize the likely extent of imported diseases. Choose healthy pigs.
- Buy breeding stock from as few source herds as possible (one source is best). Pigs bought directly from a farm pose less risk of harboring a disease compared to those purchased from an auction market or other livestock holding areas.
- Transport incoming pigs in appropriate vehicles that have been carefully cleaned and disinfected before the pigs are loaded.
- Quarantine and acclimatize newly bought stock for 15 to 30 days. Quarantine means placing all newly arrived pigs in isolation. Acclimatization is the adjustment of newly arrived pigs to the conditions prevailing in the farm to enable them to perform to optimum standards. In large-scale farms, provide quarantine areas at least 90 meters from other pig houses in a way that drainage will be away from, rather than toward, any other pig buildings. The quarantine area should have its own set of equipment.

Grow-out pigs

- Avoid overcrowding to prevent the multiplication of pathogens in the farm.
- Group pigs according to age and weight. Only pigs with the same age or the same production stage should be housed in the same pen.
- Practice the all-in/all-out system or the batching system. Start with a clean section. Vacate the entire section or dispose of or sell pigs at the same time. Clean again before the entry of a new batch of pigs.
- Vacate rest pens after thorough cleaning and disinfection. This practice is important to break the disease cycle. Most pathogens cannot survive outside a pig's body, especially under dry conditions.
- Locate market pigs/porkers at the outermost part of the farm (loading area) to reduce contact between traders and pigs in the farm.
- Do not return pigs from the outgoing loading area to the pig area.



Figure 3 Careful grouping and not overcrowding pigs will reduce the spread of disease
Photo courtesy of Pampanga Veterinary Office, Philippines

Sick pigs

- Do not sell sick pigs.
- Provide isolation pens to separate healthy and sick pigs. In large-scale farms, the isolation facility must be far from the rest of the herd and strategically located to prevent spread of disease through wind and surface drainage systems. The isolation pen must have an all-in/all-out policy.
- Remove dead pigs from the pen and bury them immediately, unless a veterinarian will do a necropsy. Pigs should be buried at a depth of more than 1 meter (depending on the size of the dead pig). Burning is also applicable.

- Ensure different farm personnel are in charge of sick and healthy pigs. If the number of personnel is limited, healthy pigs must be taken care of first before going to the sick area.



Figure 4 Isolation pens for sick pigs and a batching system discourage the spread of disease
Photo courtesy of Pampanga Veterinary Office, Philippines

Pests and pets

- Control rodents and flies. Rodents do not like open areas, so keep grass around the pens trimmed and garbage free.
- Avoid raising pets and other domesticated animals in the farm.
- Make the buildings in the pig area bird, bat and rodent-proof. To make the pig houses bird and bat-proof, install fine mesh netting or insect screen over gaps in the roof monitor and openings in the sidewalls. To make pig houses rodent-proof, (i) cover posts with galvanized iron sheets, (ii) put zinc phosphide around the perimeter of the pig houses, and (iii) hire a professional exterminator who visits the farm on a monthly basis.



Figure 5 Avoid raising pets and other domesticated animals in the farm
Photo courtesy of Pampanga Veterinary Office, Philippines

Vehicles and equipment

- Park vehicles as far as possible from the pig facility.
- Allow only empty, clean and disinfected vehicles to enter the farm. They should be free of visible manure on the tires and wheels. They should be kept away from the pig area and driveways used by the farm's own vehicles.
- Install a wheel bath or sprayer at the entrance to the farm.
- Establish a loading area for selling pigs with holding pens which are away from the pig houses so that no loading vehicle approaches the herd.
- Have one entry point for vehicles so visitors can be easily tracked.
- Clean, disinfect or fumigate all incoming equipment.
- Use farm equipment and supplies in the farm only. Keep them clean and disinfected.
- Do not share farm equipment with neighbors and most importantly other pig farms.
- Sterilize medical instruments after every use. Store in a dry, clean place.
- Unload feeds only at the perimeter of the pig area.

Water and feed

- Test water sources regularly.
- Wash and disinfect open drinkers regularly to prevent bacteria build up.
- Ensure clean and adequate water supply. Water from a creek can easily be contaminated through pig manure from other farms and other animals, waste water from factories and human settlements.
- Buy feeds from a reliable supplier. When commercial feeds are used, buy a fresh supply every two weeks.
- Provide a dry feed storage facility that can be locked and kept free from insects and rodents.
- Ensure that feed and water supplies are free of pathogens.
- Make sure that swill fed to pigs is cooked for 30 minutes at a temperature not less than 100°C.
- Remove feed spills as quickly as possible. Avoid feed leftovers in troughs to avoid attracting birds, rodents and other insects which may carry infectious diseases.
- Dispose of old or contaminated feeds safely, keeping them away from livestock and pests.



Figure 6 Pigs should have an adequate supply of clear water
Photo courtesy of Pampanga Veterinary Office, Philippines



Figure 7 Stored feed should be kept dry and free from insects and rodents
Photo courtesy of Imelda J. Santos, FAO

Are there other ways to prevent animal diseases?

Cleaning

- Remove manure, debris, bedding and other organic materials and clean pens daily. The floor of the pen should be sloping to better manage waste water.
- Maintain good drainage.
- Make sure cleaning detergents are compatible with the disinfectant to be used afterwards.
- Aside from the pens, equipment and vehicles must be regularly cleaned and disinfected.



Figure 8 Clean and disinfect pens regularly
Photo courtesy of Imelda J. Santos, FAO

Disinfection

- Regularly disinfect after thoroughly cleaning empty pens. Selected disinfectants can be used for the food production chain (see Annex 1).
- Implement aerosol disinfection during disease outbreaks.

Record-keeping

- Keep a log book to record any history of disease occurrence in the farm. This will provide baseline data and aid in the immediate detection of unusual disease occurrences and patterns. The data will serve as a basis in determining if there is unusual mortality or illness in the farm.
- Regularly update and provide the farm personnel with a farm guide or manual to ensure that protocols, including disease preventive measures, are strictly followed.

Herd Health Program

- Observe pigs through daily farm walk-throughs and do clinical scoring if necessary.
- Routinely test (once or twice a year) for economically important diseases such as classical swine fever, leptospirosis, parvovirus infection, porcine circovirus-associated diseases, porcine reproductive and respiratory syndrome and pseudorabies.
- Establish a herd health program including vaccination, deworming and medication, as prescribed by a veterinarian. Regularly revise the program to suit the current health constraints of the farm in consultation with and on the recommendation of a veterinarian.

HERD HEALTH Prog.

LAREY FARMS (Lubao & Marilao)
Herd Health Program

Breeders (sows & boars)

Stage	Day	activity	brand name	quantity/pig	route of admin	remarks
Gestation	100	E coli vaco	Neocolipor	2 mL	IM	
	103	deworming	Virbamec LA	1 mL/33 kg BW	IM	
	112	farrowing induction	Suproest	2 mL	IM	
Lactation	1	MMA prevention	Shotapen LA	1 mL/10 kg BW	IM	

Mass Medications

month	week	activity	brandname	quantity/pig	route of admin	remarks
Jan	1	SVV vaco	Mesivac Excel 3	2 mL	IM	
Feb	1	App vaco	Neumosin	2 mL	IM	
	3	App vaco	Neumosin	2 mL	IM	
Mar	1	HCV vaco	Coglapest	2 mL	IM	
	3	PRRS vaco	Geskyppur	2 mL	IM	
Apr	1	PRRS vaco	Ingolvac PRRS	2 mL	IM	

Figure 9 An example of a farm herd health program sheet including vaccination and medication
 Photo courtesy of Imelda J. Santos, FAO

Verification

- Regularly verify how well farm personnel understand and implement biosecurity protocols and re-train as necessary.
- Solicit feedback from farm personnel regarding the effectiveness of biosecurity protocols.

Disease reporting

Why do we need to report animal diseases?

Animal diseases are highly infectious in nature and must be reported immediately to prevent spread and minimize economic impact.

Timely disease reporting will improve the health of the national herd, ensure the long-term viability of pig farms, and allow the pork industry to remain competitive locally and internationally.

Information on animal diseases will help government authorities understand where the diseases are in pig populations and whether they are spreading. This information can be used to warn other farmers about the presence of disease so they can take measures to protect their own herds. These reports can also be used to plan and carry out control strategies against diseases to protect animal and human populations.

Disease reports also inform the international community of the disease status of animals in a given country. This information is used as part of the certification process required for international trade of animals and animal products. It also enables a country to control the import of animals from countries with exotic diseases.



Figure 10 Timely reporting of herd disease prevents further spread and minimizes economic impact in the country

Photo courtesy of Pampanga Veterinary Office, Philippines

When do we need to report animal diseases?

Animal diseases must be reported immediately under the following circumstances: (i) unusual increase in the number of sick and dead pigs; (ii) sick pigs showing unusual clinical signs; and (iii) pigs still showing clinical signs of a disease even when they are vaccinated.

Possible signs that an outbreak is occurring in an area include the presence of illegally slaughtered meat and meat without appropriate veterinary inspection markings and certificates in the market, and marketing pigs less than the acceptable market age and weight.

Where do we report animal diseases?

Details of a suspected outbreak or disease incidence (i.e. date when clinical signs and deaths were observed, exact location of affected farms, affected species, clinical signs) should be reported immediately to the city, district, provincial agriculture or veterinary office, or to the national animal health offices.

ANNEX

Annex List of common disinfectants

Disinfectant	Virus	Bacteria	Fungi	Spores	Mycobacterium	Human Health Risk
Alcohol	Cidal	Cidal	Cidal	Inhibitory	Inhibitory	<ul style="list-style-type: none"> • Flammable • Strong odor
Formaldehyde	Cidal	Cidal	Cidal	Cidal	Cidal	<ul style="list-style-type: none"> • Irritating • Explosive • Carcinogen • Allergen
Glutaraldehyde	Cidal	Cidal	Cidal	Cidal	Cidal	<ul style="list-style-type: none"> • Allergen
Halogens: Chlorine Bromine Iodine	Cidal	Cidal	Cidal	Cidal	Cidal in Alcohol	<ul style="list-style-type: none"> • Irritating • Reactive with other chemicals
Phenols	Cidal	Cidal	Cidal	Inhibitory	Cidal	<ul style="list-style-type: none"> • Toxic • Absorbed through the skin • Bio-accumulative
Quaternary Ammoniums	Cidal	Cidal/ Lipophy- lic		Inhibitory	Inhibitory	
Peroxides	Cidal	Cidal	Cidal	Cidal	Cidal	<ul style="list-style-type: none"> • Explosive • Irritating
Acids	Cidal	Cidal	Cidal			<ul style="list-style-type: none"> • Corrosive

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