Biosecurity

Participant's Workbook

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The training material is based on the National Swine Farm-Level Biosecurity Standard and the User Guide of the National Swine Farm-Level Biosecurity Standard.

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Introduction

This visual training material has been developed to help the producer implement best management practices or biosecurity measures to control the major transmission routes of pathogens identified in the National (Canada) Swine Farm-Level Biosecurity Standard.

Biosecurity is a set of measures intended to prevent the introduction of a new pathogen (external biosecurity), to reduce the spread of the farm microbes (internal biosecurity) and to prevent the spread of the farm microbes to other animal populations (biocontainment).

The first step of a farm-level biosecurity program involves defining the areas around and inside the buildings and using adequate signage (Module 1).

Biosecurity measures at a production site vary with the type of production (purebred breeding, multiplication or commercial production), the animal stage (mature sows and boars, nursery pigs or grower-finisher pigs), the production system organization (a single production site vs. multi-site) and the location of the site (low pig density areas compared to high pig density areas).

Transmission Routes of Pathogens

The 20 transmission routes of pathogens identified in the National (Canadian) Biosecurity Standard have been regrouped in ten thematic fact sheets (modules 2 to 11).

National Swine farm-Level Biosecurity Standard		Module
Direct routes of transmission		
1	Domestic live pigs	2
2	Domestic semen and/or embryos	
3	Live pigs and/or semen and/or embryos from foreign countries	
Indirect routes of transmission		
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Biosecurity Zones

1.1 Organize farm routes by defining a controlled access zone (CAZ), which is the external zone, and a restricted access zone (RAZ), which is the building.

1.2 The access routes and boundaries of the CAZ must be properly defined and clearly identifiable (gates, posters, signs, etc.).

1.3 Biosecurity precautions and rules in the RAZ are stricter than in the CAZ.

1.4 Visitor parking should be located outside the CAZ. For personnel vehicles, reserve a parking area for them that will reduce the possibilities of contaminating the access ways to the building as much as possible.

1.5 The building entrance should be locked at all times.

1.6 The access road to the farm should be well drained and maintained to prevent water from pooling and to make clean-up easier.

Module 1

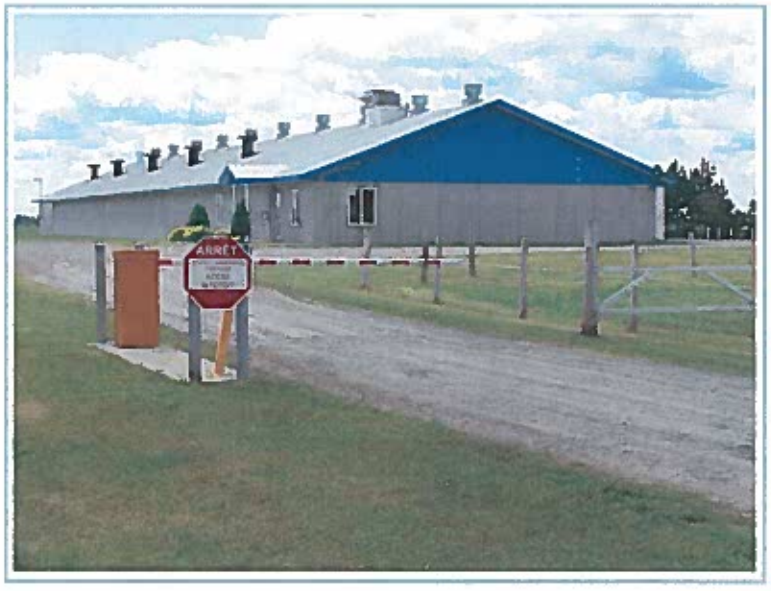
1

Signage

1.7 Clear signage will enable visitors to see where they must park and will include a phone number where contact can be made and permission for entry obtained.

1.8 The signage should properly indicate the building entrance and specify the instructions for entering.

1.9 Access for the delivery of animals and materials, as well as areas for delivering invoices or other documents (mailbox) should be clearly identified.



Please indicate if the measures identified are in place on your farm.		Check one			Estimate the effectiveness of your procedure			Comments
		Yes	No	N/A	Low	Acceptable	High	
1.1	Are the access ways and boundaries (gates, posters, signs, etc.) to the CAZ properly defined?	☐	☐	☐	☐	☐	☐	
1.2	Is the signage at the entry of the buildings (RAZ) adequate for guiding personnel and visitors?	☐	☐	☐	☐	☐	☐	

Comments on the current measures and things to be improved on the farm

2 Live Pigs Semen Embryos Imports from Foreign Countries

Why is it important?

The herd must be protected by limiting the risks of introducing pathogens within the region and from those of other regions and countries:

1. Live pigs are a significant potential source of pathogens.
2. Several pathogens, including PRRS virus, can be transmitted through semen.
3. It is important to know the health status of the herd supplying live pigs, semen and embryos, especially when they come from a foreign country since they represent a risk of introducing new diseases into Canada.

Main control measures

2.1 When buying semen, make sure to comply with minimum biosecurity standards in terms of delivery, packaging, etc., and make sure that the supplier's health status is adequate.

2.2 Purchase from as few suppliers as possible, make sure their health status is adequate and keep on file a current record on the health of animals introduced.

2.3 Make sure that the veterinarian responsible has approved the purchase of animals, semen or embryos from foreign countries.

2.4 Isolate or quarantine new animals and observe them each day for clinical signs. In case of any doubt, have a veterinarian check their health status, especially before allowing the animal to leave the isolation or quarantine area.

2.5 Clean, wash, disinfect and dry the quarantine or isolation section between each batch including the shipping area.

Is there at least one measure taken on your farm to control this factor?		Check one			Estimate the effectiveness of your procedure			Comments
		Yes	No	N/A	Low	Acceptable	High	
2.1	Live pigs from Canadian sources	☐	☐	☐	☐	☐	☐	
2.2	Semen and embryos from Canadian sources	☐	☐	☐	☐	☐	☐	
2.3	Live pigs, semen and embryos from foreign sources	☐	☐	☐	☐	☐	☐	

Indicate if the measure identified is in place on the farm.		Check one			Estimate the effectiveness of your procedure			Comments
		Yes	No	N/A	Low	Acceptable	High	
2.4	Is the health status of all incoming animals verified and recorded?	☐	☐	☐	☐	☐	☐	

Comments on the current measures and things to be improved on the farm

Pig Transport

Why is it important?

Pig transportation comes with risks:

- **Introduction** of pathogens to the site receiving the animals, through vehicles and drivers arriving at the site.
- **Transmission** of pathogens to other sites through vehicles and drivers leaving the site.

Therefore, there must be a protocol for vehicles, drivers as well as producers in order to prevent health risks.

Main Control Measures

3.1 Trucks should be cleaned, washed, disinfected and dried adequately.

3.2 Trucks receiving pigs should be ideally empty upon arrival at the site.

3.3 Make sure that the trucks are clean when receiving and shipping the pigs.

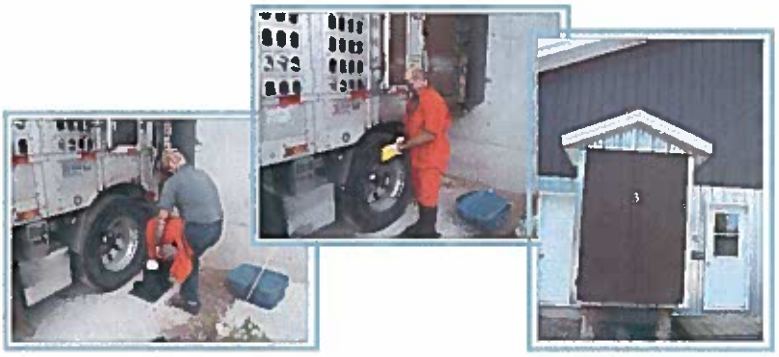
3.4 Choose appropriate routes and an adequate sequence for the truck movement (comings and goings); always take into account the last transportation completed.

3.5 Implement a sanitary protocol for the driver (boot and outerwear change, washing of hands, etc.). Drivers must be trained on the protocols to be followed when loading or unloading at the farm.

3.6 Have a protocol for the farmer who must avoid all contact with the truck.

3.7 Design loading-unloading docks so that the trucks at risk do not come in direct contact with the building. There are other options such as truck-to-truck transfers.

3.8 Inside a production system or farm, reserve trucks for specific animal movements, i.e. for replacement animals, piglets or slaughter pigs since the strategies and protocols vary according to each group.



Is there at least one measure taken on your farm to control this factor?		Check one			Estimate the effectiveness of your procedure			Comments
		Yes	No	N/A	Low	Acceptable	High	
3.1	Incoming and outgoing animal transportation	☐	☐	☐	☐	☐	☐	

Indicate if the measure identified is in place on the farm.		Check one			Estimate the effectiveness of your procedure			Comments
		Yes	No	N/A	Low	Acceptable	High	
3.2	Is the cleanness of all transport vehicles systematically verified on their arrival at the farm?	☐	☐	☐	☐	☐	☐	

Comments on the current measures and things to be improved on the farm

Personnel and Visitors

Why is it important?

1. Employees and visitors, *essential*[1] or *nonessential*[2], can carry or transmit pathogens when entering or exiting the farm site (through themselves, their boots/clothing and the vehicles they use).

2. Meat products of foreign source are a risk for the introduction of exotic animal diseases into Canada.

[1] ***Essential visitors:*** Employees who contribute to the farming operation providing essential services at the farming site, namely veterinarians, technical advisors, service and delivery personnel, suppliers and employees from regulatory organizations.

[2] ***Nonessential visitors:*** Individuals for which access to the buildings is not necessary or essential. They can be, among others, foreign visitors, guests, friends and members of the family.

Module 4

Main control measures

4.1 Establish a downtime (a minimum required period of time without coming into contact with other pigs) with your veterinarian depending on the health status of your herd.

4.2 Deny access to foreign visitors: certain exceptions may be applicable after approval by your veterinarian.

4.3 Make sure that all persons entering the farm (employees and all visitors) have access at all times to the written protocols about entering the CAZ and RAZ.

4.4 Have clothing and boots reserved for exclusive use in the RAZ i.e. in the building.

4.5 At the boundary between the designated clean and dirty areas, use the Danish entrance method and forward uni-directional flow where personnel entering wash/disinfect hands (and ideally wear gloves), put on boots and outerwear made available in the building.

4.6 Keep a visitors log with the following details: date of visit, name (must be legible), telephone number, reason for visit, date and place of last contact with pigs.

4.7 In the building access protocol, prohibit the introduction of any fresh meat or salted, uncooked meat pro ducts..

Important!
Implement a procedure for checking compliance with farm protocols.

Is there at least one measure taken on your farm to control this factor?		Check one			Estimate the effectiveness of your procedure			Comments
		Yes	No	N/A	Low	Acceptable	High	
4.1	Personnel and visitors	☐	☐	☐	☐	☐	☐	
4.2	Meat products (destined for human consumption)	☐	☐	☐	☐	☐	☐	

Indicate of the measure identified is in place on your farm.		Check one			Estimate the effectiveness of your procedure			Comments
		Yes	No	N/A	Low	Acceptable	High	
4.3	Are all barn doors locked to limit access to unauthorized entry ?	☐	☐	☐	☐	☐	☐	
4.4	Do you have a policy for admitting staff and visitors from Canada ?	☐	☐	☐	☐	☐	☐	
4.5	Do you have a policy for admitting staff and visitors from outside Canada ?	☐	☐	☐	☐	☐	☐	
4.6	Incase no shower at entrance is required, does the the building make it possible to respect a Danish type entrance for personnel and visitors?	☐	☐	☐	☐	☐	☐	

Comments on the current measures and things to be improved on the farm

Pests, Birds and Insects, Domestic and Wild Animals

Why is it important?

- Rodents are a major disease transmission vector for pigs.
- Birds and insects, looking for food, can spread disease, whether through their excretions (saliva, excrement, etc.) or by a simple mechanical transfer. A good example of contamination through bird feces is lymphadenitis caused by *Mycobacterium*, which leads to losses at the slaughter facility.
- Domestic animals such as cats and dogs can spread porcine diseases.
- Some wild animals (e.g. wild boars, wapitis) can be a source of introduction for exotic animal diseases.

Main control measures

5.1 Implement a control program for rodents, insects and birds, taking using the recommendations in the Canadian Quality Assurance Program (CQA®).

5.2 Use screens, nets or traps if the insects/birds/rodents are a problem.

5.3 To avoid attracting flies, clean waste and accumulations of food and manure; quickly dispose of carcasses and other organic material (afterbirth, etc.).

5.4 To keep birds and rodents away, avoid any accumulation of feed beneath the feed bins.

5.5 Lay down crushed rock around the building or make sure the grass is kept mowed and weeds controlled to avoid providing a refuge for rodents / insects.

5.6 The buildings must be maintained so that undesirable animals cannot gain access.

5.7 Dogs and cats are prohibited in the RAZ , i.e. in the building.

Is there at least one measure taken on your farm to control this factor?		Check one			Estimate the effectiveness of your procedure			Comments
		Yes	No	N/A	Low	Acceptable	High	
5.1	Rodents, birds and insects	☐	☐	☐	☐	☐	☐	
5.2	Domestic animals other than pigs	☐	☐	☐	☐	☐	☐	
5.3	Wild animals	☐	☐	☐	☐	☐	☐	

Comments on the current measures and things to be improved on the farm

Fomites (Tools, Supplies, Pharmaceutical, and Medical Equipment)

Why is it important?

- Any incoming materials may carry pathogens.
- The entry of materials (equipment, tools, etc.) increases the risk of introducing pathogens.
- Medical supplies are of particular concern, since they are often introduced to the farm on a regular and routine basis, which can reduce vigilance and lead to an oversight of the biosecurity rules.

Main control measures

6.1 Only use the material and equipment dedicated to the site.

6.2 For farms without a fumigation room, implement a sanitation protocol for everything introduced into the building: cleaning / washing, disinfection and drying. If a fumigation room is available, make sure that all the material surfaces are exposed to the disinfectant.

6.3 When transporting objects or equipment from one site to another within the same production system, always establish a specific sequence based on heatlth status.

6.4 Never introduce to a site open bottles of medication from another building or another farm: they may be contaminated. For the same reason never use needles that have been used in another room of the barn or section of the site or another site.

6.5 Follow the requirements of the CQA® program for the use and storage of drugs and vaccines as well as the equipment used to administer them.

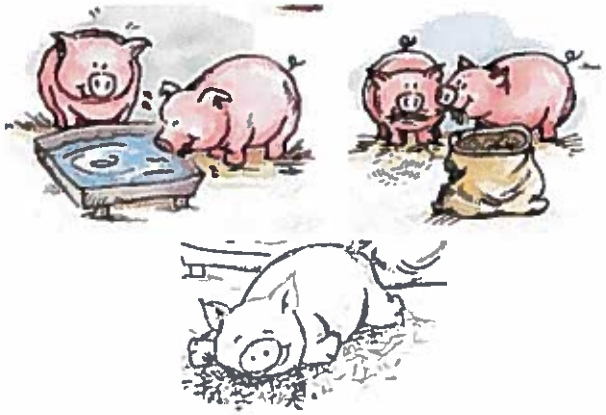
Is there at least one measure taken on your farm to control this factor?		Check one			Estimate the effectiveness of your procedure			Comments
		Yes	No	N/A	Low	Acceptable	High	
6.1	Tools, equipment, materials and supplies	☐	☐	☐	☐	☐	☐	
6.2	Pharmaceutical products and medical equipment	☐	☐	☐	☐	☐	☐	

Comments on the current measures and things to be improved on the farm

Water, Feed and Bedding

Why is it important?

- Water can be a major source of pathogenic agents (*E. coli*, etc.).
- Most susceptible of being contaminated are surface water sources (e.g. puddles, reservoirs, ponds, lakes and rivers) and rainwater collection systems.
- Feed and bedding can be a potential risk for pathogen contamination.
- Animal feed can easily be contaminated directly or indirectly by insects, rodents or wild birds at any stage of distribution and storage.
- Source and storage of the bedding are two important health risk factors for animals.



Main control measures

7.1 Regularly analyze the water contamination risks at each production unit and make sure to resolve problems when they occur.

7.2 Put a fence around surface sources of drinking water in order to block access to wild and domestic animals.

7.3 For any surface water supply, a water treatment system is recommended (chlorination or other).

7.4 Have the water tested at least once a year for bacterial contamination (coliform bacteria, etc.). Keep a record of the water tests: dates, results, etc.

7.5 Make sure the area where the pigs are housed is drained adequately to prevent them from drinking any accumulation of liquids.

7.6 Make sure that feed and bedding suppliers are reliable and that they respect the principles described in the CQA® program.

7.7 The delivery sequence, within a production system, must begin with sites where the health status is the highest. Keep the suppliers well informed of any important health status change of the farm so that they can adjust their delivery sequence as required.

7.8 Store the feed and bedding in an enclosed area (feed bins, closed rooms) to avoid contamination by rodents, birds and insects.

Is there at least one measure taken on your farm to control this factor?		Check one			Estimate the effectiveness of your procedure			Comments
		Yes	No	N/A	Low	Acceptable	High	
7.1.	Feed	☐	☐	☐	☐	☐	☐	
7.2	Bedding	☐	☐	☐	☐	☐	☐	
7.3	Water	☐	☐	☐	☐	☐	☐	

Comments on the current measures and things to be improved on the farm

Solid and Liquid Manure

Why is it important?

- Manure can represent a high risk for the transmission of pathogenic agents.
- Pathogenic agents contained in manure can spread through direct contact in the air.
- Each step in the handling of manure, including collection, storage, transportation and disposal, must be considered to be a risk of spreading pathogenic organisms.
- Municipal and provincial regulations provide a framework for the management of manure and producers must comply with them.

Main control measures

8.1 Where feasible, create a separate entrance on the farm for machinery used to spread manure.

8.2 Never spread manure from another pig site on your own farm or near your barn site.

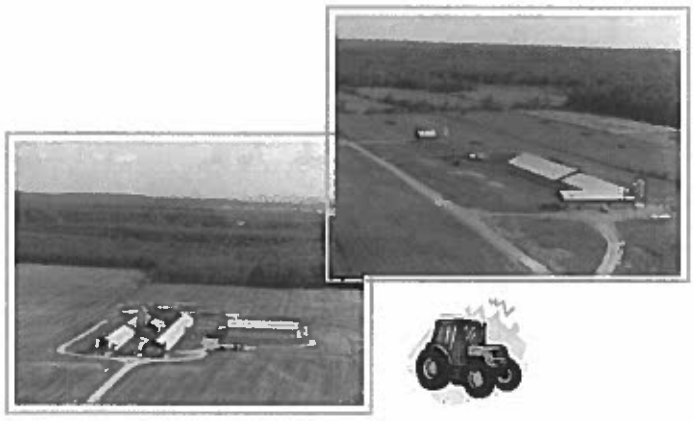
8.3 Where feasible, only use equipment specifically assigned to your farm site.

8.4 When equipment is shared by several sites, move from higher to lower health status. The equipment must be cleaned between each site.

8.5 During the spreading period, limit the contact between the employee assigned to this task and other farm personnel.

8.6 Insofar as it is possible, immediately clean any manure spill on the access road to the farm and make sure that the trap door on the tank is properly closed during transport.

8.7 Promote spreading methods that limit the aerial dispersion of droplets.



Is there at least one measure taken on your farm to control this factor?		Check one			Estimate the effectiveness of your procedure			Comments
		Yes	No	N/A	Low	Acceptable	High	
8.1	Solid and liquid manure	☐	☐	☐	☐	☐	☐	

Comments on the current measures and things to be improved on the farm

Dead Stock and Waste

Why is it important?

- Dead animals can contribute to pathogen contamination and spread during handling, storage and disposal .
- They are a potential source of infection for live animals on your farm and to other farm operations.
- Improper storage and disposal of household and farm waste can attract rodents and scavengers which can move the waste around and thereby spread pathogens.
- Sharp and pointed objects (needles and scalpels) are risks factors for infections and injuries.

Main control measures

9.1 Consider the various methods for eliminating and managing carcasses at the farm (burying, composting, incineration, rendering, etc), respecting the environmental laws in effect in your area.

9.2 Make sure that the trucks transporting the dead animals never enter the (CAZ). These vehicles must have their own access roadway to the storage area that is different from the one used for regular access to the farm.

9.3 When designing new facilities, include a door exclusively for the removal of dead animals.

9.4 Establish a protocol for the removal of dead animals and their transportation to the temporary storage area. This protocol must take into account, among other things, the use of boots and outerwear used solely for this task.

9.5 Remove dead animals from the building as soon as possible, ideally at the end of the day.

9.6 For sow units, it is recommended that you have a freezer to store the dead piglets and afterbirths. Dedicate specific containers for inside and outside the building (choose separate colours and/or identify the containers).

9.7 The containers (bins, garbage, etc.) should be watertight so that the surrounding land and nearby sources of water cannot be contaminated by the fluids that might come out of them and also provide secure protection from rodents and scavengers. Clean the containers regularly.

9.8 Have a protocol for the daily removal of waste to be transported to the waste storage area. No waste should return to the farm.

9.9 Adopt a system for disposing of sharp and pointed objects (needles and scalpels), that is appropriate, according to the principles of the CQA® program.

Is there at least one measure taken on your farm to control this factor?		Check one			Estimate the effectiveness of your procedure			Comments
		Yes	No	N/A	Low	Acceptable	High	
9.1	Waste other than manure	☐	☐	☐	☐	☐	☐	
9.2	Dead stock	☐	☐	☐	☐	☐	☐	

Please indicate if the measure identified is in place on your farm.		Check one			Estimate the effectiveness of your procedure			Comments
		Yes	No	N/A	Low	Acceptable	High	
9.3	Is the removal of dead animals done through a different access way and outside the CAZ?	☐	☐	☐	☐	☐	☐	

Comments on the current measures and things to be improved on the farm

Aerosols

Why is it important?

- Some pathogens can be transported through the air (aerosols) and can contaminate animals inside the buildings.
- In regions with high pig density, aerosol transmission is a significant risk factor, especially for major pathogens such as PRRS virus, influenza and Mycoplasma hyopneumoniae.
- The acceptable distance between farms varies according to the size of the operations in question, the microbial load, the types of pathogens of concern (resistance of the pathogenic agent to desiccation in the air), weather conditions and local topography.

Main control measures

10.1 Locate new facilities, particularly boar studs, nucleus and multiplier farms, in low pig density areas.

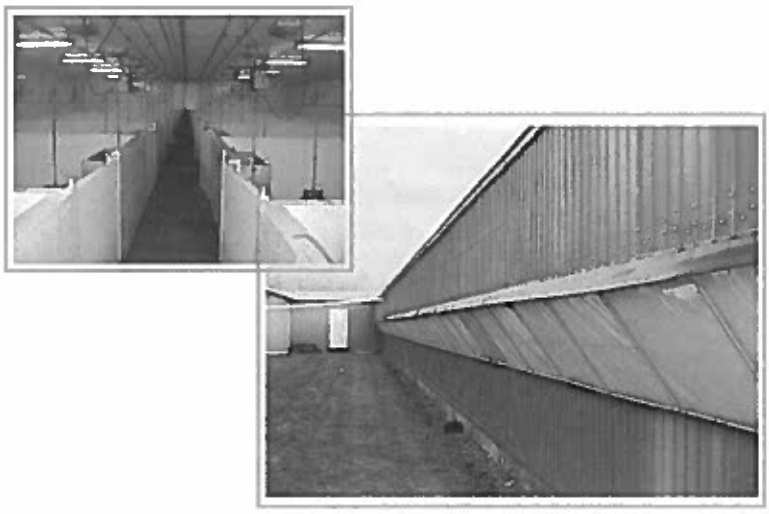
10.2 Develop a source of information such as a social network that allows you to stay informed of new pig health problems.

10.3 Design transportation routes to avoid regions with high pig densities.

10.4 Establish programs to administer vaccines against diseases that are spread through aerosols when these vaccines are available and recognized as being effective.

10.5 When possible, implement all in / all out housing in the nurseries and the finishing units in order to limit the impact of aerosol disease contamination within farms.

10.6 In regions with high pig densities, properly installed air filtration systems have been proven effective in preventing aerosol contamination. However, they must be used in conjunction with conventional biosecurity protocols.



Is there at least one measure taken on your farm to control this factor?		Check one			Estimate the effectiveness of your procedure			Comments
		Yes	No	N/A	Low	Acceptable	High	
10.1	Aerosol contamination	☐	☐	☐	☐	☐	☐	

Comments on the current measures and things to be improved on the farm

Diseased Stock Management and Vaccination

Why is it important?

- Farm health management includes stopping or minimizing disease transmission to healthy animals, as well as the development of immunization programs aimed at making pigs more resistant to infections.
- Sick animals are the main source of pathogenic agents .
- The sick animals' pathogens can also spread from one site to another and from one region to another.

11

Main control measures

11.1 Protocols for the prevention and treatment of diseases must be adapted to the specific health status of each herd.

11.2 Write a plan, with the help of a veterinarian, for reacting quickly in the event of a disease. This plan should also include controlled exposure in acclimatization after the quarantine period.

11.3 Clean, wash, disinfect and dry the pens and facilities before the arrival of replacement animals .

11.4 An animal's health status may require a transfer to a hospital pen. This pen must be laid out and equipped so as to improve the comfort and condition of the pigs.

11.5 The hospital pens must be located in an area that enables the proper supervision of the sick animals. They must be cleaned frequently and the equipment used must be exclusive to this area.

11.6 Sick pigs must always be handled after working with the other animals in the barn. When a pig is taken to a hospital pen outside of its original room, do not bring it back to that room.

11.7 All the treatments given to the animals must be recorded according to the CQA program recommendations.

11.8 Follow the vaccination program established with your veterinarian and follow the recommendations on the use and handling of vaccines.

11.9 Never reuse needles that have been used in another room or with another batch of pigs. For the maximum number of pigs to be injected per needle, follow the recommendations of the CQA ® program. Consider using needleless injector.

Is there at least one measure taken on your farm to control this factor?		Check one			Estimate the effectiveness of your procedure			Comments
		Yes	No	N/A	Low	Acceptable	High	
11.1	Diseased stock management	☐	☐	☐	☐	☐	☐	
11.2	Vaccination of pigs	☐	☐	☐	☐	☐	☐	

Indicate if the measure are in place on the farm.		Check one			Estimate the effectiveness of your procedure			Comments
		Yes	No	N/A	Low	Acceptable	High	
11.3	Is the CWDD's protocol for the facilities (clean, wash, disinfect, dry) written and applied?	☐	☐	☐	☐	☐	☐	

Comments on the current measures and things to be improved on the farm