Artificial Insemination Centres' Health Management Program

(Programme de gestion sanitaire
des centres d'insémination artificielle) - PGSCIA

2022-2023

Registration Conditions

CDPQ
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du porc du Québec inc.

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Table of Content

Introduction

The *Programme de gestion sanitaire des centres d'insémination artificielle* (PGSCIA) is a health management program for artificial insemination centres, open to all AI centres wishing to sell boar semen to Quebec farmers and hog producers.

PGSCIA is an adjunct to the program administered by the Canadian Food Inspection Agency (CFIA).

The main objectives are to:

- Attest to the quality of each insemination centre's health management program to monitor the procedures for verifying the safety of boar semen sold to the user farms;
- Check that the AI centres meet minimum standards for facilities and equipment, hygiene, health and safety, record keeping, semen traceability and animal health control;
- Provide AI centre managers with the tools and expertise to improve centre biosecurity regarding PRRS virus, PED, SDCV, TGE, SVA contamination;
- Provide centre managers with tools and procedures to lower the risk of the semen spreading potentially harmful viral pathogens to the user farms;
- Certify the health status of boars purchased by the insemination centres to minimize the risk of animal health accidents; and
- Put forward and improve health status verification procedures for the insemination centres to attest to their health status regarding PRRS virus, PED, DCVP, TGE, SVA.

1 PGSCIA Eligibility Terms and Conditions

1.1 Registration

Fill out the PGSCIA Registration Form for AI Centres (Appendix 1) and send it to the CDPQ (see Appendix 2).

1.2 Preconditions

To qualify for admission to the PGSCIA program an AI centre:

a. Must be a registered farm business with the Bureau de renseignements agricoles (agricultural information office) of MAPAQ, in accordance with provincial regulations;

b. Must be a Canadian Food Inspection Agency approved semen production and distribution centre in accordance with the Health of Animals Act and Regulations (L.C.1990, ch. 21);

c. Must comply with the standards set out in the program regarding facilities and equipment, hygiene and health protection (biosecurity), record keeping and control of animal health;

d. Must use the services of a consultant veterinarian responsible for the development, maintenance and implementation of the health management program; and

e. Must be officially recognized by the Canadian Quality Assurance Program (CQA) and the Animal Care Assessment (ACA) of the Canadian Pork Council (CPC).

1.3 Termination of services and re-registration

Insemination centre members that no longer meet the program requirements in force on April 1, 2022, together with those centres that do not conform, can be suspended or expelled at any time.

Member centres are automatically re-registered on April 1st of each year, unless otherwise specified in writing.

Any centre wishing to abandon the program must provide prior written notice to the CDPQ.

2 Respective responsibilities of the three stakeholders

2.1 Responsibilities of the CDPQ-designated veterinarian

- Develop, enhance, adapt the program to the needs of Quebec's pork industry.
- Inspect the member AI centre's facilities once a year. The purpose of these visits is to verify that the standards for facilities, hygiene, health and safety, record keeping and control of animal health, are applied in accordance with the insemination centre's health management program.
- Authorize animal admission to the isolation (quarantine) unit and, at the client's request, authorize admission of boars to the boar unit/barn.
- Maintain regular contact with the AI centre manager, the centre's consultant veterinarian and the Canadian Food Inspection Agency veterinarian responsible for the program.

2.2 Responsibilities of insemination centre managers

- Comply with the requirements for admission to the program.
- Promptly notify the consultant veterinarian and the veterinarian responsible for PGSCIA (hereafter, the CDPQ-designated veterinarian) in the event of potentially contagious health problems.
- Authorize access to AI centre facilities by the CDPQ-designated veterinarian at all times.
- Provide the CDPQ-designated veterinarian with all health information concerning the AI centre that relates to the program.
- Allow the CDPQ-designated veterinarian to consult AI centre records related to the program.
- Implement health recommendations from the CDPQ-designated veterinarian and the consultant veterinarian without delay.
- Not distribute any semen that, insofar as they know, would present a health risk for the AI centre's clients.

2.3 Responsibilities of the insemination centre's consultant veterinarian

- Inspect centre facilities every four months (minimum three times per year). At least one of these visits will be conducted together with the CDPQ-designated veterinarian.
- During these visits, verify that the standards for facilities, hygiene, biosecurity, record keeping, and animal health control are being applied.
- Following these visits, write recommendations for the AI centre manager and the CDPQ-designated veterinarian concerning facilities, sanitation, biosecurity, record keeping and animal health control.
- In the event of potentially contagious health problems, recommend temporary suspension of the semen distribution and immediately notify the CDPQ-designated veterinarian.
- Write the necessary prescriptions for the purchase of drugs or vaccines and ensure they are used correctly.
- Prescribe the necessary laboratory tests for managing the health of the boar stud.
- Collaborate in maintaining and updating the insemination centre's health management program.

3 Biosecurity of centres

3.1 Basic biosecurity guidelines

- ❖ Identification of critical points/issues
- ❖ Development of an animal health management program for each AI centre
- ❖ Regular verification of compliance with program guidelines

3.1.1 1. Identification des points critiques

- ◦ Location of the premises
- ◦ Management of farm personnel and equipment
- ◦ Selection of livestock suppliers
- ◦ Health status certificate for boars entering the AI centre
- ◦ Bacteriological quality of the semen
- ◦ Transport of animals:
  - ◦ From farm to isolation (quarantine) unit, from isolation (quarantine) unit to boar stud unit, from boar stud unit to slaughterhouse
- ◦ Cleaning and disinfection of the trucks
- ◦ Transportation of the semen
- ◦ Monitoring of vehicle movement around the premises
- ◦ Vermin and pest control (birds, rodents, flies, etc.)

3.1.2 Development of an animal health management program for each AI centre

Each member AI centre of PGSCIA must have a written document outlining in detail its health management program. This document must be updated annually on October 1 each year.

The CDPQ-designated veterinarian may participate in the development of the insemination centre's health management program. However, maintenance of the program and updates to it are the responsibility of AI centre managers and of their consultant veterinarian.

CDPQ can provide an example of a health management program to help orient AI centre managers.

3.1.3 Regular verification of compliance with program guidelines

Centre managers must check the application of the programs (regularly); the consultant veterinarian must do so as well (at least three times a year) and the CDPQ-designated veterinarian also (once a year).

4 Minimum standards for PGSCIA AI member centres

4.1 Isolation (quarantine) premises

- Must be located more than 1 km from swine operations areas other than artificial insemination centres (AIC);
- Ideally, the isolation (quarantine) units for AICs that are not equipped with an air filtration system at the entrance must be located at a distance of more than one kilometer from the AIC premises;
- Must be accessible to authorized farm personnel only (locked doors);
- Must be equipped with a Danish entry or a shower at the entrance and must follow the principles of unidirectional flow;
- Must be designed so as to prevent the entry of vermin, birds or other animals;
- Must be regularly inspected for flies and vermin by a professional exterminator;
- Must be operated on all-in/all-out (AI/AO) basis per unit;
- Must be sufficiently spacious, airy and comfortable to guarantee the welfare of the animals; and
- Must be cleaned and disinfected and then kept empty for at least five days between each occupation.

4.2 Boar stud premises

- Must be located at a minimum distance of 1 km from other area groups of pigs other than the AIC's isolation (quarantine) unit;
- Must be separated by a physical barrier from other unit areas of the AI centre;
- Must be accessible to authorized farm personnel only (locked doors);
- Must be equipped with a Danish entry or a shower at the entrance and must follow the principles of unidirectional movement;
- Must be designed so as to prevent entry of vermin, birds or other animals;
- Must be regularly inspected for flies and vermin by a professional exterminator; and
- Must be sufficiently spacious, airy and comfortable to guarantee the welfare of the animals.

4.3 Semen packaging laboratory

- Must be separated by a physical barrier from other unit areas of the centre;
- Must be accessible to authorized persons only;
- Must be separated from the collection area by an airlock to prevent airborne contamination; and
- Shall not permit any backward people flow from the other unit areas.

4.4 Local d'entreposage et d'expédition de la semence

- Must be separated by a physical barrier from other unit areas of the AI centre; and
- Must be accessible to authorized persons only.

4.5 Drug cabinet

- Must be designed to allow the storage of drugs and vaccines in accordance with the manufacturer's recommendations and the drug regulation requirements (e.g. CQA).

5 Management of farm personnel and equipment

5.1 Farm personnel management

- Entrance doors to boar and quarantine units must be locked at all times.
- All farm personnel and visitors must change street clothes and shoes before entering the boar stud units.
- Staff and visitors must observe a 48-hour downtime period (two nights) without any direct contact with pigs before entering boar stud premises.
- International visitors who have had no contact with pigs must observe a 48 to 96-hour downtime period depending of the country.
- International visitors who have been in contact with pigs must observe a 48 to 96 hour downtime period depending of the country.
- All visitors must sign the visitor log book upon entering a boar stud premises.
- Visitors and farm personnel must remove all jewelry before entering the boar stud premises.
- Visitors who wear glasses should wash and disinfected them before entering the boar stud premises (example: Virkon 1% solution).

5.2 Managing Equipment and Supplies

- All equipment and supplies that come into the boar stud units and quarantine units must be new and disinfected.
- A workroom where fumigation of equipment and supplies can take place is strongly recommended.

6 Selection of batches of animals for admission to AI centres

6.1 Boars from a PRRS virus-free farm site (PRRS-naïve status)

6.1.1 Characteristics of the Maternity unit

- No clinical signs of PRRS
- Neonatal mortality (birth to weaning) is well controlled with an objective of less than 18%

6.1.2 Characteristics of the Nursery and Grow-to-Finish units

1. Death losses (monthly mortality rate) are:
   - less than 5% in nursery unit.
   - less than 5% in finishing unit.
   - less than 8% between weaning and the end of finishing.
2. Documented seronegative results for PRRS using regular (a) or irregular (b) serological monitoring:
   a. Regular serological monitoring (> 70 kg): minimum of 10 negative subjects per month (ELISA-X3 or other);
   b. Irregular serological monitoring (> 70 kg): minimum of 20 negative subjects for six months (ELISA-X3 or other)
3. Absence of clinical signs consistent with porcine circovirus associated diseases (PCVAD) (see p. 24, **Health certificate – PCVAD**)
4. No clinical signs of other diseases under surveillance (see **List of diseases under surveillance**).
5. Obtaining laboratory results (see pp.18-19) for the selected boars within the 30 days preceding entry into isolation (quarantine) unit.

6.2 Boars from a farm where PRRS virus has been eradicated (PRRS-negative status)

6.2.1 Characteristics of Maternity unit (first year)

- Absence of clinical signs of PRRS; and
- Neonatal mortality (farrow-to-wean) well controlled with an objective of less than 18%.

6.2.2 Caractéristiques de la maternité (années subséquentes)

- Same as for PRRS-free farm (PRRS-naïve status).

6.2.3 Caractéristiques de la pouponnière et de l'engraissement

1. Death losses (monthly mortality rate) are:
   - less than 5% in nursery unit.
   - less than 5% in finishing unit.
   - less than 8% between weaning and the end of finishing.
2. Documented seronegative results for PRRS using regular (A) or irregular (B) serological monitoring:
   a. Regular serological monitoring (> 70 kg): minimum of 10 negative subjects per month (ELISA-X3 or other);
   b. Regular serological monitoring (> 70 kg): minimum of 20 negative subjects for six months (ELISA-X3 or other)
3. Absence of clinical signs consistent with porcine circovirus associated diseases (PCVAD) (see p. 24, **Health certificate – PCVAD**)
4. No clinical signs of other diseases under surveillance (see **List of diseases under surveillance).**
5. Obtaining laboratory results (see pp.18-19) for the selected boars within the 30 days preceding entry into isolation (quarantine) unit.
6. Seronegative (ELISA-X3) and PCR-negative for PRRS, within one full week preceding transport to the isolation (quarantine) unit. Blood sampling procedures on the selected animals must be done in accordance with the procedures of the PGSCIA program (pp.15-16-17).

6.3 Boars originating from a PRRS seropositive farm, but raised on another PRRS positive status site

6.3.1 Batch composition guidelines

1. Animals must be weaned early (at <15 days old). In some situations, the veterinarian may require PRRS virus testing using a PCR test, prior to the transfer to the nursery unit.
2. Nursery and Finishing unit premises must be approved by a CDPQ-designated veterinarian.
3. Serological testing for antibodies or PCR testing for PRRS virus during the growth stage must be done in accordance with instructions from the CDPQ-designated veterinarian.
4. Management strategies regarding animals, premises and transport of animals must be approved by the CDPQ-designated veterinarian.
5. Batch death losses: less than 8% mortality between weaning and the end of finishing.
6. Absence of clinical signs consistent with PCVAD (see p. 23, Health certificate–PCVAD).
7. No clinical signs of other diseases under surveillance (see List of diseases under surveillance).
8. Seronegative results (see pp.18-19) for the selected boars within the 30 days preceding transport to the isolation (quarantine) unit.
9. Seronegative (ELISA-X3) and PCR-negative results for PRRS, within one full week preceding transport to the isolation (quarantine) unit. Blood sampling procedures must be done on the selected animals, in accordance with the procedures of the PGSCIA program (pp.15-16-17). It is possible to amalgamate the tests done in section 8 with those of section 9, as long as the boars leave the breeder's site, maximum one week after sampling.

7 List of diseases under surveillance

7.1 Surveillance program

- ❖ Animals in the source herds should display no clinical signs of:
  - Enzootic pneumonia
  - Porcine pleuropneumonia (*Actinobacillus pleuropneumoniae*)
  - *Actinobacillus suis*
  - Glässer's disease (*Glaesserella parasuis*)
  - Porcine reproductive and respiratory syndrome (PRRS)
  - Proliferative enteropathy/ Porcine proliferative enteritis
  - Porcine Circovirus Associated Diseases (PCVAD)
  - Dysentery
  - Atrophic rhinitis
  - Sarcoptic mange
  - Porcine epidemic diarrhea (PEDV)
  - Delta coronavirus (SDCV),
  - Transmissible gastroenteritis (TGE)
  - Senecavirus A
  - Influenza
  - Salmonellosis
  - Leptospirosis

- ❖ Selected boars must be free of:
  - Porcine reproductive and respiratory syndrome (PRRS)
  - Porcine pleuropneumonia *Actinobacillus pleuropneumoniae* (App serotypes 1 and 5)
  - Transmissible gastroenteritis (TGE)
  - Porcine epidemic diarrhea (PEDV), and
  - Delta coronavirus (SDCV)
  - Senecavirus A

7.2 Treatment and vaccination program (quarantine and boar units)

7.2.1 Sarcoptic mange

Treatment and eradication of sarcoptic mange *(Sarcoptes scabiei)* must be carried out in the isolation (quarantine) unit, when the source is considered positive.

7.2.2 Porcine circovirus

It is strongly recommended that boars have been vaccinated on at least two occasions in their lives against porcine circovirus before entering the boar stud unit:

- a single vaccination in the isolation (quarantine) unit is recommended for boars that have already been vaccinated at the farm of origin.
- double vaccination in the isolation (quarantine) unit is recommended for boars who have never been vaccinated against porcine circovirus.

7.2.3 Glässer's disease (*Glaesserella parasuis*) and *Mycoplasma Hyopneumo*niae

Vaccination in the isolation (quarantine) unit is especially recommended for boars from disinfected herds.

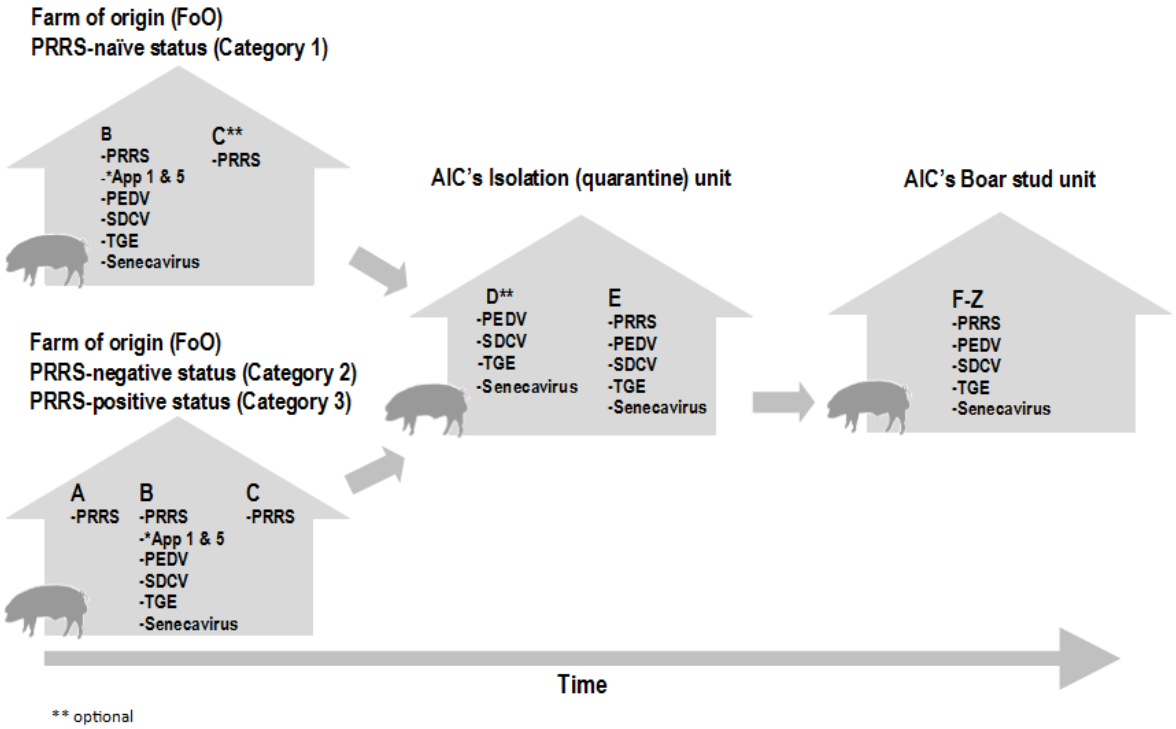
7.2.4 Porcine parvovirus and Swine erysipelas (*Erysipelothrix rhusiopathiae*).

Animals in the boar units must be vaccinated twice a year.

7.2.5 Endoparasites

Treatment against internal parasites (endoparasites) should be carried out every six months in the boar units. When no treatment is done in quarantine for mange, then the boars need to be treated for internal parasites.

8 Macro plan of the testing strategy



The macro plan shows the blood tests performed on boars from the farm of origin to the boar stud unit. PRRS virus, App serotypes 1 and 5, PEDV, TGE, SDCV and SVA status is checked by the CDPQ program.

* Serology for App serotypes 1 and 5 is required for consignments sourced from farms that have a history of infection, or a history of seropositive results, or that are of unknown status).

8.1 Blood draw(s) A

One or more blood draws can be done during the isolation (quarantine) period according to instructions from the CDPQ-designated veterinarian. Blood serums can be tested for PRRS using ELISA-X3, blocking-ELISA or PCR.

8.2 Blood draw B

This blood draw is done by a CFIA-accredited veterinarian on the farm of origin or in the farm of origin isolation (quarantine) unit.

- **SRRP and App:** Serums or oral fluids are sent for PRRS serological testing (Appendix 6) and, if necessary, serums for App serotypes 1 and 5 testing.

- **PED, SDCV, TGE and Senecavirus A:** oral fluid samples taken with the rope technic are done in a minimum of 4 pens; alternatively, manure samples are taken in a minimum of 4 pens with the possibility to sample the boots of the producer or the walkway. The samples can be tested in pools (1 pool of 4) at the laboratory before running the PCR tests.

8.3 Blood draw C

This blood draw is optional for farms with PRRS-naïve status and is mandatory for PRRS-negative and PRRS-positive status farms. The CDPQ-designated veterinarian can insist on a blood draw and further testing within 7 days before the animals are transported to the AIC's isolation (quarantine) unit. Serums can be tested for PRRS using ELISA-X3, blocking-ELISA and PCR.

8.4 Blood draw D

This blood draw is optional and is done 3 to 5 days after the start of quarantine by the quarantine personnel. A pool of 5 fecal samples per building will be taken to perform the PCR tests for PEDV, SDCV, TGE and Senecavirus A.

8.5 Blood draw E

This blood draw is done by staff from the insemination centre three to five days before the transport to the boar stud unit.

- PRRS:
  - The serum are verified by a serological test for all boars;
- PEDV, SDCV, GET and Senecavirus A:
  - A pool of 5 fecal samples per building will be taken to perform the PCR tests for PEDV, SDCV, TGE and Senecavirus A.

8.6 Blood draws F-Z

These blood draws are done at least once a week to verify the status of each population of boars:

- PRRS: a weekly PCR on a pool of ten serums and monthly ELISA-X3 tests on a minimum of five serums;
- PEDV, SDCV, GET and Senecavirus A: weekly PCR testing on a pool of 5 fecal samples.

9 Health status certification for boars destined for AI centres (PRRS)

9.1 Recommended laboratory tests

- IDEXX ELISA-X3 test (to detect antibodies)
- IDEXX ELISA on oral fluids (to detect antibodies)
- IDEXX ELISA-X3 test on oral fluids (to detect antibodies)
- PCR test (to detect virus)
- Biovet blocking ELISA test (to detect antibodies)
- IgG-IFA test, 4 dilutions, (to detect antibodies)

9.2 Evaluation Strategy

- A signed health certificate confirming the absence of clinical signs of disease throughout the growth period received within **two weeks** prior to moving the boars from the farm to the AI centre's quarantine.
- Verification of PRRS status under two options:

- Option A) Serums
  - IDEXX ELISA-X3 test
    - on all serums
  - PCR test
    - On 5 serums with the highest S/P ratios, tested in 1 pool of 5
- Option B) oral Fluids
  - ELISA test on oral fluids from IDEXX or adapted ELISA-X3 test from IDEXX
    - Collect 1 rope from all pens where boars will come from.
    - Test each rope (oral fluids) individually
  - PCR test
    - Test 1 rope (oral fluids) from a pen, when there are more than 12 boars in the pen.
    - When density is low, test a pool of ropes (oral fluids) from different pens, up to a maximum of 12 boars.

9.3 Interpretation of the ELISA-X3 test on serum

Each sample is interpreted individually:

- S:P ratio <0.30 ➡ PRRS-negative animal
- S:P ratio ≥ 0.30 and < 0.40 ➡ PRRS-suspect animal
- S:P ratio ≥ 0.40 ➡ PRRS-positive animal

9.4 Interpretation of the Biovet ELISA oral fluids

❖ ELISA oral fluids from IDEXX

- Rapport S/P < 0,80 ➡ group of animals - negative status;
- Rapport S/P ≥ 0,80 ➡ group of animals - positive status.

❖ ELISA-X3 adapté sur fluides oraux de IDEXX

- Rapport S/P < 0,40 ➡ group of animals - negative status;
- Rapport S/P ≥ 0,40 ➡ group of animals - positive status.

9.5 Interpretation of the PCR test

- CT > 38 ➡ group of animals - negative status;
- CT <= 38 ➡ group of animals - positive status.

9.6 Possible responses

Option A: Serum

❖ All results are negative for ELISA-X3 and PCR tests:

- All boars are accepted.

❖ Certain boars are suspect or positive with the ELISA-X3 test and negative with the PCR test.

- Complementary test with blocking ELISA (Biovet) or a 4-dilution IgG-IFA test on all serum from suspected and positive ELISA-X3 cases (5 serum in total with higher S/Ps)
  - Blocking ELISA test or IgG-IFA are negative:
    - The batch is declared negative; boars with negative status with ELISA-X3 test are accepted; boars with positive or suspect status with ELISA-X3 test are refused.
  - Blocking ELISA test or IgG-IFA positive:

- Several boars have a suspect or positive result relating to the ELISA-X3 test and blocking ELISA/IgG-IFA:
  - If it is only an individual, the boar and nine other boars in contact with it are individually retested 10 days later with an ELSA-X3 test and blocking ELISA/IgG-IFA. A PCR PRRS test in pools of 5 is also required.
    - Only the individual that tested positive has remained positive after the second ELISA-X3 and blocking ELISA / IgG-IFA test, all PCR are negative:
      - ✓ the batch is declared negative: the negative-status boars relating to the ELISA-X3 test are accepted; the boars that are positive or suspect are refused.
    - The individual that previously tested positive and one additional boar is now positive after the second ELISA-X3 test and blocking ELISA / IgG-IFA, and the PCRs are all negative:
      - ✓ the veterinarian designated by the CDPQ demands a new blood testing of the boars and the entire assessment process is restarted.
    - The individual that previously tested positive and one additional boar is now positive after the second ELISA-X3 test and blocking ELISA / IgG-IFA and at least one of the pool PCR is positive:
      - ✓ all the animals are rejected.
  - If two or more individuals test positive, the veterinarian designated by the CDPQ demands a new blood testing of the boars and the evaluation process is restarted.

❖ All results are negative with the ELISA-X3 and positive with PCR testing:

◦ All the boars are refused.

<u>Option B: Oral fluids</u>

❖ All results are negative for ELISA-X3 and PCR tests:

◦ All boars are accepted.

❖ Some oral fluid samples are ELISA-X3 positive and PRC negative:

◦ Proceed with serum testing (Option A)

❖ All results are negative for ELISA-X3 and positive with PCR testing:

◦ All the boars are refused.

10 Health status certification for boars destined for AI centres (APP)

10.1 Recommended laboratory test

- LC-LPS-based ELISA test (to detect antibodies)

10.2 Evaluation Strategy

A signed health certificate confirming the absence of clinical signs of disease throughout the growth period.

In herds considered at risk (check with the CDPQ-designated veterinarian):

- Verification of each boar's serological status for porcine pleuropneumonia due to *Actinobacillus pleuropneumoniae* serotypes 1 and 5 (LC-LPS-based ELISA test).

10.3 Interpretation of the ELISA-LC-LPS test

- Each sample is interpreted individually:
  - OD < 0.30 ➡ negative animal
  - OD ≥ 0.30 and < 0.40 ➡ suspect animal
  - OD ≥ 0.40 ➡ positive animal

10.4 Possible results

- All results in the LC-LPS-based ELISA test are negative:
  - the boars are accepted.
- Some boars are suspect or positive:
  - the positive or suspect boars are refused or re-evaluated.

11 Health status certificate for boars destined for centres (PEDV, TGE and SDCV)

11.1 Recommended laboratory test

- Test PEDV-TGE-SDCV PCR de la compagnie Tetracore (to detect virus);
- Test PEDV PCR, TGE PCR and SDCV PCR of the Faculté de médecine vétérinaire de l'Université de Montréal (to detect virus).

11.2 Evaluation Strategy

- A signed health certificate confirming the absence of clinical signs of disease throughout the growth period received within **two weeks** prior to moving the boars from the farm to AI centres quarantine
- Verify the absence of the virus with the PCR technique using one of two options:
  - **Option A)** Oral fluids with the rope technique in a minimum of four pens;
  - **Option B)** Manure samples are taken in a minimum of 4 pens with the possibility to sample the boots of the producer or the walkway.
    - The samples can be pooled (maximum of 4) at the laboratory before testing for the virus with PCR tests.
- The sampling should be done as close as possible to the shipment of the boars and no more than 30 days prior shipment of the boars in quarantine.

11.3 Interpretation of the PCR test

Each sample is interpreted individually:

- Interpretation of the PEDV-TGE-SDCV PCR test from Tetracore:
  - $C_t \leq 35$ ➡ positive sample;
  - $C_t > 35$ et ≤ 38 ➡ suspect sample;
  - $C_t > 38$ ➡ negative sample.

- Interpretation of the PEDV-TGE-SDCV PCR test from the Faculté de médecine vétérinaire:
  - $C_t \leq 37$ ➡ positive sample;

- C_t > 37 et ≤ 40 ➡ suspect sample;
- C_t > 40 ➡ negative sample.

Note: The interpretation of these tests can change according new scientific knowledge which will emerge

11.4 Possible results

❖ All results in the PEDV-TEG-SDCV PCR test are negative:

- All the boars are accepted.

❖ Some boars are suspect or positive:

- Ask for additional testing on positive samples already in the laboratory:
- Separate (one-pool) and run again the PCR test on each sample.
- Take another set of oral fluids (minimum of 4) or manure samples in 4 pens (the ones that are around the first set of samples):
- Run the PCR test on oral fluids or on manure samples.

If at least one sample turns out positive for one of these tests, no boars will be admitted to the AI centre.

12 Health status certificate for boars destined for AI centres (PCVAD)

12.1 Porcine Circovirus Associated Diseases (PCVAD) – diagnostic criteria for infection among a herd[1]

- ❖ Criterion 1: Clinical signs among the herd:
  - ◦ Wean-to-finish mortality exceeds 8%.
  - ◦ Increase in monthly mortality rate equal to or greater than 1.66 standard deviation (SD), when compared to historical data.

- ❖ Criterion 2: Pathological and histopathological lesions:
  - ◦ Identification of the typical lesions of PCVAD in at least one pig from the herd that is showing clinical signs (Criterion 1);
  - ◦ Testing for typical PCVAD lesions in a minimum of four pigs from the identified population. Two consignments of two piglets less than ten days apart are recommended.

12.2 Evaluation Strategy

A herd becomes suspect when clinical signs meet Criterion 1 (the cause of excess mortality must be explained in a written document from the veterinarian in charge and a laboratory report must confirm the diagnosis).

A herd becomes positive when both Criteria 1 and 2 are met.

[1] The definition is adapted from the definition proposed by the European consortium's research team on PCVAD.

13 Certification of the health status of boars for the centres (Senecavirus A)

13.1 Recommended laboratory technique

- Test PCR pour le Senecavirus A.

13.2 Evaluation strategy

- A signed health certificate confirming the absence of clinical signs of disease throughout the growth period received within **two weeks** prior to moving the boars from the farm to AI centres quarantine
- Verify the absence of the virus with the PCR technique using one of two options:

  Option A) Oral fluids with the rope technique in a minimum of four pens;

  Option B) Manure samples are taken in a minimum of 4 pens with the possibility to sample the boots of the producer or the walkway.
- Verification of the absence of Senecavirus A will be confirmed by the PCR test on four samples (which can be pooled by 4)
- The sampling should be done as close as possible to the shipment of the boars and no more than 30 days prior shipment of the boars in quarantine.

13.3 Interpretation of the PCR tests

Each result is interpreted individually:

- Interpretation of the test for the Senecavirus A:
  - CT value < 35 ➡ positive sample;
  - CT value >= 35 et ≤ 38 ➡ suspicious sample;
  - CT value > 38 ➡ negative sample.

Note: The interpretation of these tests may change depending on the new scientific knowledge that emerges.

13.4 Possible answers

- ❖ All results are negative compared to the PCR test for Senecavirus A:
  - ◦ Boars are accepted.
- ❖ Some results are suspicious or positive:
  - ◦ Request additional tests on positive samples already in the laboratory:
    - ◦ Separate (depool) and repeat the PCR test.
    - ◦ Take oral fluids (minimum of 4) or manure samples from four parks (those nearby):
    - ◦ Do the PCR test on oral fluids or manure samples.
  - ◦ If only one of the samples is positive in relation to any of the tests, no boar is allowed in the centre.

14 Surveillance procedures for boar stud units (PRRS)

14.1 Recommended laboratory tests

- IDEXX ELISA-X3 test (to detect antibodies)
- Biovet blocking-ELISA test (to detect antibodies)
- PCR test (to detect virus)

14.2 Minimum testing strategy by boar population

- Once a week:
  - PCR on a pool of ten serums.
- Once a month (first week of month):
  - ELISA-X3 on five serums.

Note 1 The selected animals are those with health or productivity problems (anorexia, semen quality, fever).

Note 2 Boar stud units may comprise a single building (one population) or several premises (many populations).

14.3 Possible responses

- All results are negative for both PCR testing and the ELISA-X3 test:
  - continuation of operations.
- One ELISA-X3 result is positive or suspect:
  - re-test using another kit (blocking-ELISA) and do PCR testing if it has not already been done.
- One PCR result is positive:
  - immediate alert and possible suspension of operations at the centre (see Emergency procedure in case of PRRS alert in an AIC).

14.4 Monitoring the incidence of health problems potentially linked to PRRS

- ❖ Incidence (number of new cases) of the following health problems is recorded each day:
  - ◦ number of boars not eating
  - ◦ number of boars producing poor quality semen
  - ◦ number of boars coughing or having trouble breathing.

An abnormal increase in the incidence of these problems (twice as much as usual) over a period of three days is cause for an immediate alert (see Emergency procedures in case of a PRRS alert in an AIC).

15 Emergency procedures in case of a PRRS alert in an AIC

15.1 Positive blood test result

The insemination centre that receives a positive blood test result (PCR testing or a positive ELISA-X3 test) must take these two steps within the following 24 hours:

- ❖ Request additional tests be done on the positive serums already at the laboratory:
  - ◦ redo the PCR testing or the ELISA-X3 test
  - ◦ do the blocking-ELISA test
- ❖ Do new blood draws from the suspect boars and from the neighbouring boars (the two on the right, the two on the left, the two behind and the two in front):
  - ◦ do the ELISA-X3 test on each serum and a PCR on pools of three serums.
- ❖ If the positive result comes from a PCR test, the sale of semen from all boars located in the same building must be suspended until further tests are carried out.

15.2 Increase in health problems

An insemination centre that sees a significant increase in the incidence of health problems potentially related to PRRS must take the following measure within the next 24 hours:

- ❖ Take blood draws from the boars with health problems and from the neighbouring boars (the two on the right, the two on the left, the two behind and the two in front):
  - ◦ do the ELISA-X3 test on each serum and a PCR on pools of three serums.

15.3 Possible responses

- ❖ Results of the further tests are negative:
  - ◦ continuation of operations
  - ◦ a new verification (ELISA-X3 and PCR) of the suspect boars and their neighbours three days after the alert.
- ❖ Results of the further tests are positive:
  - ◦ the centre is declared positive
  - ◦ suspension of all operations

16 Procedures to follow whenever an AIC is infected with PRRS virus

16.1 Insemination centre is positive

- ❖ Harvest serum from each boar (within less than 24 hours of identifying the problem):
  - ◦ do ELISA-X3 test on each serum
  - ◦ do PCR testing on the pools of five serums
  - ◦ do PCR testing on each serum from the positive pools
  - ◦ identify the positive and the suspect boars
  - ◦ identify all the farms that received potentially infected semen and alert them to the situation.

Note **An insemination centre taking part in PGSCIA that finds itself infected with the PRRS virus is not responsible for the actions to be taken at the client's farm. However, the insemination centre manager may make the following suggestions in the letter to farmers:**

- ❖ Advise the farmer/herdsman to inform his consultant veterinarian as soon as possible so measures judged appropriate can be taken.
- ❖ Suggest the recommendation from the CDPQ-designated veterinarians on what to do in case of a PRRS outbreak in an AIC:
  - ◦ put any sows that were inseminated with the suspect semen into an isolation (quarantine) unit and wait one month before verifying their health status
    or
  - ◦ send all sows inseminated with the suspect semen to the slaughterhouse

17 Surveillance procedures for boar stud units (PEDV, TGE and SDCV)

17.1 Recommended laboratory tests

- ❖ PCR test (to detect virus).

17.2 Minimum testing strategy by boar population

- ❖ Once a week:
  - ◦ PCR on a pool of five fecal samples per building;

Note 1 The selected animals are those with health or productivity problems (diarrhea, anorexia, semen quality, fever).

Note 2 Boar stud units may comprise a single building (one population) or several premises (many populations).

17.3 Possible responses

- ❖ All results are negative:
  - ◦ continuation of operations;
- ❖ One result is positive:
  - ◦ immediate alert and possible suspension of operations at the centre (see Emergency procedures in case of a PEDV, TGE or SDCV alert in an AIC).

17.4 Monitoring the incidence of health problems potentially linked to PEDV and SDCV

- ❖ Incidence (number of new cases) of the following health problems is recorded each day:
  - ◦ number of boars not eating;
  - ◦ number of boars vomiting;
  - ◦ number of boars with diarrhea or soft feces.
- ❖ An abnormal increase in the incidence of these problems (twice as much as usual) over a period of two days is cause for an immediate alert (see Emergency procedures in case of a PEDV, TGE or SDCV alert in an AIC).

18 Emergency procedures in case of a PEDV, TGE or SDCV alert in an AIC

18.1 Positive blood test result

The insemination centre that receives a positive test result (positive PCR testing) must take the following two measures within the next 24 hours:

- ❖ Request that additional tests be done on the positive samples already at the laboratory:
- ◦ redo the PCR testing;
- ❖ Take fecal samples or rectal swabs from the suspect boars and from the neighbouring boars (the two on the right, the two on the left, the two behind and the two in front):
- ◦ do the PCR testing on the fecal samples or rectal swabs.
- ❖ The sale of semen from all boars located in the same building must be suspended until further tests are carried out.

18.2 Increase in health problems

An insemination centre that sees a significant increase in the incidence of health problems potentially related to PEDV, TGE or SDCV must take the following measure within the next 24 hours:

- ❖ Take fecal samples or rectal swabs from the boars with health problems and from the neighbouring boars (the two on the right, the two on the left, the two behind and the two in front):
- ◦ do a PCR test on the fecal samples or rectal swabs.

18.3 Possible responses

- ❖ Results of the further tests are negative:
- ◦ continuation of operations;
- ◦ new verification (PCR) of the suspect boars and their neighbours three days after the alert;
- ❖ Results of the further tests are positive:
- ◦ the centre is declared positive;
- ◦ suspension of all operations.

19 Procedures to follow when an AIC is infected with by PEDV, TGE or SDCV virus

19.1 Positive insemination centre

- ❖ Identify all the farms that have received potentially contaminated semen and alert them to the situation.

Note: An insemination centre taking part in PGSCIA that finds itself infected with the PED, TGE or SDCV virus is not responsible for the actions to be taken at the client's farm. However, the insemination centre manager may make the following suggestions in the letter to farmers:

- ❖ Advise the farmer/herdsman to inform his consultant veterinarian as soon as possible so measures judged appropriate can be taken.

20 Microbiological quality control of the semen

20.1 Objectives

- Sperm survival
- Bacteriological quality of the diluted semen

20.2 Methods

20.2.1 Bacteriological monitoring of the semen sent to farms

Each week, three to five boar semen samples that have been stored for 48 hours, are selected for bacteriological testing.

Two methods are to be used in the AICs:

1. Rapid non-qualitative method:
    a) on-site analysis with 3M's Petrifilm ® technology:
        - One millilitre (1 ml) of semen is inoculated and incubated for 72 hours at 30º C.
        - Bacteria are counted, and the information is recorded in a logbook.
        - A bacterial count of more than 10 colonies per ml in three consecutive samples suggests that there may be a problem. Inform those in charge.
    b) Alternatively, the on-site analysis can be done with the Compact Dry® technology.
2. Precise qualitative method: laboratory analysis by MAPAQ's own laboratory (see Appendix 5) (minimum of five samples per month).

20.2.2 Bacteriological monitoring of the water

The bacteriological quality of the water will be assessed on a regular basis (min. once per month). Water containing more than 10 colonies will be considered inadequate for semen preparation.

Appendix 1 - Registration Form for AI centres

Note: Fill out one form for each boar stud unit

GENERAL INFORMATION	
Company name:	
Boar stud unit name:	
Boar stud unit address:	
Contact name:	
Phone:	
Cell phone:	
Fax:	
E-mail:	
Billing address:	
Number of pig-places:	

Participation fees for the PGSCIA program for 2022-2023 have been set at $420 per boar stud unit.

The fees per batch of animals assessed by the CDPQ-designated veterinarian vary according to the size of the batch:

- $70: 10 boars or less
- $80: 11-20 boars
- $90: 21-40 boars
- $100: more than 40 boars

The member certifies that this information is correct and undertakes to comply with the registration requirements of the PGSCIA for 2022-2023.

Owner or Agent

Date

Appendix 2 - Contact Details for the Resource Persons

20.2.3 Administrative centre

Centre de développement du porc du Québec inc.
Place de la Cité, tour Belle Cour
2590, boulevard Laurier, bureau 450
Québec (Québec) G1V 4M6
Phone : 418 650-2440
Fax : 418 650-1626
E-mail : labo-sante@cdpq.ca

Head office

Centre de développement du porc du Québec inc.
202-2170 route des Rivières
Lévis (Québec) G6K 1A5
Téléphone : 418 650-2440
Télécopieur : 418 650-1626
Courriel : labo-sante@cdpq.ca

20.2.4 Resources

Marie-Claude Poulin, D.V.M., D.A.
Phone : 418 522-6015
E-mail : marie-claude.poulin@hotmail.co.uk

Claudia Coulombe, Animal health technician
Centre de développement du porc du Québec inc.
Phone : 418 650-2440, poste 4316
Fax : 418 650-1626
E-mail : ccoulombe@cdpq.ca

Christian Klopfenstein, Ph. D., D.V.M,
Centre de développement du porc du Québec inc.
Phone : 418 650-2440, poste 4309
Fax : 418 650-1626
E-mail : cklopfenstein@cdpq.ca

Appendix 3 - CDPQ Health Certificate for Boar Entry into the AIC (D03)

Batch from a PRRS negative farm

Farm name _____ **Inventory in finishing unit** _____

% Mortality	Months of the year (the last 6 months)					
Preweaning						
Nursery						
Finishing						

Disease	Clinical signs	Date of last testing	Laboratory			Health Status[1]	
			ELISA	PCR	Others	Positive	Negative
Enzootic pneumonia			☐	☐	☐	☐	☐
Pleuropneumonia (App)			☐	☐	☐	☐	☐
Actinobacillus suis			☐	☐	☐	☐	☐
Glässer's disease			☐	☐	☐	☐	☐
PRRS			☐	☐	☐	☐	☐
Proliferative enteropathy			☐	☐	☐	☐	☐
PCVAD			☐	☐	☐	☐	☐
Dysentery			☐	☐	☐	☐	☐
Atrophic rhinitis			☐	☐	☐	☐	☐
Sarcoptic mange			☐	☐	☐	☐	☐
PED			☐	☐	☐	☐	☐
Delta coronavirus (SDCV)			☐	☐	☐	☐	☐
TGE			☐	☐	☐	☐	☐
Senecavirus A			☐	☐	☐	☐	☐
Influenza			☐	☐	☐	☐	☐
Salmonella			☐	☐	☐	☐	☐
Other significant health problems							
Have your animals been vaccinated? If yes, what vaccines were used?							
Date of the last veterinarian's visit (less than 3 months)							

1- Establish the health status based on laboratory results, veterinary visits, slaughterhouse controls or any other diagnostic means.

I, the undersigned, declare that I have forwarded to the veterinarian all the information necessary to assess the health of my herd. Furthermore, in the event of significant changes in the months following the delivery of my animals (boars), I undertake to promptly inform the CDPQ-designated veterinarian.

_____ _____

Owner or Agent Date

I, the undersigned, certify that the above information is, to the best of my knowledge, complete and accurate.

_____ _____

Veterinarian Date

Appendix 4 - CDPQ Health Certificate for Boar Entry into AI Centres (D04)

CDPQ Health Certificate for Boar Entry into AI Centres

Batch from a PRRS positive status farm

Farm name:

Nursery batch size: **Finishing batch size :**

Mortality (%)	Months of the year (the last 6 months)					
Nursery						
Finishing						

	Number of animals tested			Comments on the results obtained
	PRRS PCR	ELISA-X3 PRRS	PEDV/TGE/SCVP	
At nursery entry				
Nursery out/Finishing in				
Finishing out				

Disease	Clinical signs	Date of last testing	Laboratory			Health Status	
			ELISA	PCR	Others	Positive	Negative
Enzootic pneumonia			☐	☐	☐	☐	☐
Pleuropneumonia (App)			☐	☐	☐	☐	☐
Actinobacillus suis			☐	☐	☐	☐	☐
Glässer's disease			☐	☐	☐	☐	☐
PRRS			☐	☐	☐	☐	☐
Proliferative enteropathy			☐	☐	☐	☐	☐
PCVAD			☐	☐	☐	☐	☐
Dysentery			☐	☐	☐	☐	☐
Atrophic rhinitis			☐	☐	☐	☐	☐
Sarcoptic mange			☐	☐	☐	☐	☐
PED			☐	☐	☐	☐	☐
Delta coronavirus (SDCV)			☐	☐	☐	☐	☐
TGE			☐	☐	☐	☐	☐
Senecavirus A			☐	☐	☐	☐	☐
Influenza			☐	☐	☐	☐	☐
Salmonella			☐	☐	☐	☐	☐
Other significant health problems							
Have your animals been vaccinated? If yes, what vaccines were used?							
Date of the last veterinarian's visit (less than 3 months)							

I, the undersigned, declare that I have forwarded to the veterinarian all the information necessary to assess the health of my herd. Furthermore, in the event of any significant changes in the months following the delivery of my animals, I undertake to promptly inform the CDPQ-designated veterinarian.

Owner or Agent — Date

I, the undersigned, certify that the information given above is, to my knowledge, complete and accurate.

Veterinarian — Date

Appendix 5 - Laboratories

20.2.5 Serological tests for *Actinobacillus pleuropneumoniae*

- The animal health services laboratories of the Service de diagnostic de la Faculté de médecine vétérinaire (FMV) of the Université de Montréal

20.2.6 Serological tests for porcine reproductive and respiratory syndrome (PRRS)

- Biovet laboratory in Saint-Hyacinthe
- The animal health services laboratories of the Service de diagnostic de la Faculté de médecine vétérinaire (FMV) of the Université de Montréal

20.2.7 Tests for porcine epidemic diarrhea (PEDV), transmissible gastroenteritis (TGE) and diarrhea caused by porcine delta coronavirus (SDCV)

- Biovet laboratory in Saint-Hyacinthe
- The animal health services laboratories of the Service de diagnostic de la Faculté de médecine vétérinaire (FMV) of the Université de Montréal

20.2.8 Tests for Senecavirus A

- Biovet laboratory in Saint-Hyacinthe
- The animal health services laboratories of the Service de diagnostic de la Faculté de médecine vétérinaire (FMV) of the Université de Montréal

20.2.9 Microbiological analysis (semen) and autopsies

- The animal pathology laboratory of the ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ)
- The animal health services laboratories of the Service de diagnostic de la Faculté de médecine vétérinaire (FMV) of the Université de Montréal

Appendix 6 – Sampling guide for boar purchases (D02)

Sampling guide for boar purchases

Client :	**CDPQ-PGSCIA**	
Adress :	Place de la Cité, tour Belle Cour 2590, boulevard Laurier, bureau 450, Québec (Québec) G1V 4M6	**Phone** : 418-650-2440 **E-mail** : labo-sante@cdpq.ca

Instructions to the CFIA veterinarian

- Please send a portion of the sample (serum, feces or oral fluid) from each boar or each pen to the laboratory of your choice for further analysis.
- Complete the official laboratory form and send a copy of the results to the to the CDPQ by email at **labo-sante@cdpq.ca**
- The letters[1] identifying the company, the tattoo number of each boar or the number of the pen must be written on the containers.
- The samples must be always kept cool (4°C).
- We also require you to check off the tests App serotypes 1 and 5 if they were asked for. The breeder must be informed when CDPQ asks for these tests. When in doubt, contact the CDPQ.

Mandatory tests

Option A)

- PRRS IDEXX ELISA-X3 on all serums.
- PRRS PCR on 5 serums (select the samples with the highest S/P ratios (IDEXX ELISA-X3), including positive or suspect serums), request to be tested in 1 pool of 5.
- PED, TGE and SDCV on **1 pool of 4 pens;**
- Senecavirus A PCR on **1 pool of 4 pens.**

Option B)

- SRRP ELISA on oral fluids (**1 rope by pen**) – no pooling
- SRRP PCR on **1 pool of pen(s)** (up to 12 boars).
- PED, TGE **and** SDCV PCR on **1 pool of 4 pens;**
- Senecavirus A PCR on **1 pool of 4 pens.**

Test optionnel

- App 1 ELISA et App 5 ELISA

[1] The site code matches the pure breed letters.

Centre de développement du porc du Québec inc.
Place de la Cité, tour Belle Cour
2590, boulevard Laurier, bureau 450
Québec (Québec) G1V 4M6
☎ 418 650-2440 ■ 🖷 418 650-1626
cdpq@cdpq.ca ■ www.cdpq.ca
@cdpqinc