

# **Health, Hygiene and Sanitation Guidelines for Boar Studs Providing Semen to the Domestic Market**

Current edition: September 2021. Standing Committee: Bob Thompson (Chair), Gary Althouse, Chris Kuster, Darwin Reicks, Laura Dalquist, Joe Fent, Kayla Blake, Cory Faust, Lauren Glowzenski, Perry Harms, Deanne Hemker, Levi Johnson, Brad Chappell, Doug Groth, Darin Madson, Ron Brodersen

Original Organizing Committee: Gary C. Althouse (Chair), Darwin Reicks, Gordon D. Spronk and Timothy P. Trayer. Ex-officio: Thomas J. Burkgren (AASV Executive Director), John T. Waddell (AASV President-Elect)

## Article 1. Domestic (USA & Canadian) Requirements

### Section 1.1 Pre-entry (Herd of Origin) Health Requirements of Semen Donor Boars

1.1.1 All pre-entry qualifying procedures performed on the farm of origin are to be performed by or under the supervision of a United States Department of Agriculture (USDA) accredited veterinarian or, if the farm of origin is located in Canada, by or under the supervision of a Canadian Food Inspection Agency (CFIA) accredited veterinarian.

1.1.2 The herd of origin must be inspected by a USDA accredited veterinarian (or, when appropriate, by a CFIA accredited veterinarian) and found free from clinical evidence of infectious or communicable diseases and insofar as can be determined, from any history of infectious or communicable diseases during the preceding 30 days.

1.1.3 “The herd of origin must be free from clinical evidence of infectious or communicable diseases of swine and be considered a negative herd for PRRSV, Senecavirus A (SVA), brucellosis and pseudorabies (Aujeszky’s) within 30 days prior to animal dispatch from the herd of origin to isolation at the designated AI stud facility.”

1.1.3.1 All boars should be vaccinated at the source farm with a commercially available circovirus vaccine according to label instructions.

1.1.3.2 The herd of origin should not be in a disease quarantined geographical region.

1.1.4 All potential semen donor boars must be examined individually by a USDA accredited veterinarian (or, when appropriate, by a CFIA accredited veterinarian) within 30 days of farm-of-origin dispatch and any evidence of heritable physical defects are to be documented. Boars exhibiting any heritable physical defects should not be used as donor semen boars.

1.1.5 A Certificate of Veterinary Inspection is to be completed by a USDA accredited veterinarian (or, when appropriate, by a CFIA accredited veterinarian) and a copy of this certificate must accompany the animal(s) to the AI stud center isolation facility.

1.1.6 The entry of visitors to the pre-entry site should be controlled. Personnel allowed access to the pre-entry site should be technically competent and observe high standards of personal hygiene to preclude the introduction of pathogenic organisms. Protective clothing and footwear for use only on the pre-entry site should be provided.

1.1.7 Animals shall not have been fed garbage, food byproducts, or meat/bone meal products in diet.

1.1.8 Communication between the source and receiving herd veterinarians shall occur prior to boars leaving the farm of origin, with a transportation plan and relevant biosecurity points approved prior to shipment. Any changes in health status at either location during the duration of isolation should immediately be shared between veterinarians.

### Section 1.2 Disease prevention measures in relation to animal transportation;

1.2.1 1. Transporters shall take the appropriate and necessary preventive measures to ensure that:

- (a) the health status of the animals is not jeopardized during transport;
- (b) transport operations do not cause the potential spread of infectious swine diseases;
- (c) adequate biosecurity measures, including the cleaning and disinfection of, and control of

insects and rodents with respect to transportation equipment, including transport vehicle and trailer, shall be performed as appropriate to minimize the infectious disease risks involved with transportation.

1.2.1.2 Transporters should keep a dated record of vehicle/trailer use and date of cleaning/disinfection.

### 1.3 Isolation Health Requirements of Semen Donor Boars

1.3.1 All procedures associated with the assessment of the isolation health status are to be performed by or under the supervision of a USDA accredited veterinarian.

1.3.2 Only animals which have a completed Certificate of Veterinary Inspection and have followed the pre-entry requirements outlined in Section 1.1 can enter an AI stud center's isolation site.

1.3.3 Isolation in this section is defined as a self-contained facility physically separated from swine and other animals (i.e. wildlife). The isolation facility is maintained exclusively for the purpose of isolating incoming boars for observation. Movement out of isolation will be all-out, with the start of isolation commencing after introduction of the last boar into the self-contained facility.

1.3.4 All boars presented for entry as additions to the resident stud of a semen production center must undergo a minimum 15-day isolation to allow completion of the necessary tests as outlined in Section 1.3.6.

1.3.5 All animals in isolation will be observed for clinical signs of disease daily. If clinical signs such as excessive coughing, sneezing, changes in consistency or amount of manure, decreased appetite or water consumption, skin lesions, lameness, or lethargy are observed, the attending veterinarian must be contacted to determine if the animal(s) should be removed from the group for further diagnosis and/or therapeutic management. An examination and necropsy shall be performed by a veterinarian on any animal which succumbs to an unexplained death.

1.3.6 All animals in isolation shall be serologically tested through an accredited diagnostic laboratory with negative results for brucellosis and pseudorabies (Aujeszky's), except when isolation facilities are in such areas that are deemed by state or province to be free of brucellosis or pseudorabies. At the attending veterinarian's discretion, tests for the following pathogens and disease conditions may be performed: *Actinobacillus pleuropneumoniae* influenza, leptospirosis, mycoplasmosis, porcine epidemic diarrhea virus (PEDV), porcine deltacoronavirus (PDCoV), porcine reproductive and respiratory syndrome virus (PRRSV), tuberculosis, and others as deemed necessary.

1.3.7 Removal or release of animals from isolation must be done only with the permission of the attending veterinarian.

1.3.8 The entry of personnel to the center's isolation facility should be controlled. Personnel allowed access to the isolation facility should be technically competent and observe high standards of personal hygiene to preclude the introduction of pathogenic organisms. Protective clothing, footwear, and all husbandry equipment must be provided for use only in the isolation facility.

1.3.9 Animals shall not be fed garbage, food byproducts, or meat/bone meal products in diet.

1.3.10 Pre-entry vaccinations should be administered under the direction of the attending veterinarian with knowledge of the source herd, resident boar stud, area risk and sow farms to be served.

### Section 1.4 Health Requirements for the Resident AI Stud Herd

1.4.1 Resident AI Stud facility requirements include:

1.4.1.0 A clear biosecurity line should separate the boar housing area from the outside, typically a shower

1.4.1.1 Protective clothing and footwear specific for stud

1.4.1.2 Constructed as a bird-proof facility

- 1.4.1.3 Rodent control in place
- 1.4.1.4 Insect control in place
- 1.4.1.5 Physically separated from other swine and preclude direct contact with other livestock (i.e. Wildlife).
- 1.4.1.6 Entry of visitors to the resident AI stud should be controlled. Personnel allowed access to the resident AI stud should be technically competent and observe high standards of personal hygiene to preclude the introduction of pathogenic organisms. Protective clothing, footwear, and all husbandry equipment must be provided for use only on the resident stud site.
- 1.4.1.7 Feed and other supplies must originate from a premise free of livestock and be delivered directly to the stud from the source
- 1.4.1.8 Loading and unloading areas for boars and supplies must be kept clean and free of organic material
- 1.4.1.9 Animals shall not be fed garbage, food byproducts, or meat/bone meal products in diet
- 1.4.1.10 Verified air filtration methods are recommended for boar studs located in areas that are likely to be exposed to PRRSV, IAV-S, or other viral or bacterial pathogens from neighboring farms

1.4.2 Once a boar has completed the pre-entry and isolation requirements, and is officially released by the attending veterinarian as outlined in Section 1.1 and 1.3, he may enter the resident AI stud where he shall continue to be tested in accordance with the testing procedures listed below so long as he remains in the stud.

1.4.3 The resident AI stud should be maintained as a Validated Brucellosis-free and Qualified Pseudorabies (Aujeszky's) Negative Herd by one of two options:

- 1.4.3.1 Stud location in such areas that are deemed by state or province to be free of the above diseases.
- 1.4.3.2 Periodic testing of boars to meet state or provincial requirements for Validated Brucellosis-free or Qualified Pseudorabies (Aujeszky's) Negative herd status.

1.4.4 At the attending veterinarian's discretion, tests for the following pathogens and disease conditions may be performed: *A. pleuropneumoniae*, influenza, leptospirosis, mycoplasmosis, PEDV, PDCoV, PRRSV, SVA, tuberculosis and others as deemed necessary.

1.4.5 If on any given day greater than four percent (>4%) of the boars standing at the resident AI stud facility exhibit similar clinical signs which could be associated with an infectious disease, a USDA or CFIA accredited veterinarian must immediately assess the resident AI herd, and will be required to determine if sufficient risk warrants closure of the herd to further shipments of donor semen. Closed herds can be released by the USDA or CFIA accredited veterinarian after he/she determines there is minimal risk in the transmission of disease via semen.

1.4.6 An examination and necropsy should be performed by a veterinarian on any animal which succumbs to an unexplained death.

1.4.7 A vaccination program may be employed in the resident barn under the direction of the attending veterinarian to maintain consistent health status.

## Section 1.4 Hygiene and Sanitation Requirements for Semen Collection, Processing and Storage

### 1.5.1 General Requirements

1.5.1.1 Semen may only be collected, processed, and stored from boars that fulfill the requirements set forth in Sections 1.1, 1.2 and 1.3 of this document.

1.5.1.2 Only semen originating from resident boars may be analyzed, processed and stored at the resident stud.

1.5.1.3 Semen collection, processing and storage takes place only on the premises set aside for this purpose and under conditions of the strictest hygiene.

1.5.1.4 All implements which come into contact with the semen or the donor animal during semen

collection and processing are single-use, disposable materials or, if reusable, are properly disinfected or sterilized between use.

### 1.5.2 Semen Collection

1.5.2.1 Semen can only be collected from boars which show no clinical signs of infectious disease on the day the semen is collected.

1.5.2.2 Each collection of semen, whether or not it is separated into individual doses, is clearly marked in such a way that the identification of the donor animal(s) is evident.

1.5.2.3 Each collection of semen is obtained using prudent minimum contamination protocol practices, which include the:

1.5.2.3.1 Use of a collection pen which is cleaned after each daily use following proper sanitary techniques.

1.5.2.3.2 Use of triple gloves of a non-spermicidal nature, with the outer glove discarded after preparation and stimulation of the boar, second glove removed after grasping the penis and wiping it off with a paper towel allowing for the third gloved hand for direct grasping of the penis for free catch collection, or connection to a closed semi-automatic collection system

1.5.2.3.3 Clipping of preputial hair surrounding preputial opening

1.5.2.3.4 Cleaning of the preputial opening and surrounding area (if needed) with a single-use disposable wipe

1.5.2.3.5 Evacuation of preputial fluids prior to grasping of the penis for semen collection

1.5.2.3.6 Holding of the penis perpendicular to the boar to minimize the contamination of the semen with preputial fluids

### 1.5.3 Semen Processing

1.5.3.1 The entry of personnel to the semen processing site should be controlled. Personnel allowed access to the semen processing site should be technically competent and observe high standards of personal hygiene to preclude the introduction of pathogenic organisms. Protective clothing and footwear for use only at the semen processing site should be provided.

1.5.3.2 Only single-use disposable products or sterilized re-useable products should come into contact with semen in order to prevent cross-contamination of ejaculates or pooled semen during processing.

1.5.3.3 Semen extenders or diluents:

1.5.3.3.1 Whenever any animal protein is used as part of a semen diluent, the product must be free of pathogens and sterilized.

1.5.3.3.2 If a preservative antibiotic or antibiotic combination is present in the extender or diluent which is to be used to expand the volume of boar semen, only chemicals of U.S.P. grade may be included, the antibiotic or combination must be effective, with either the antibiotics disclosed or an MSDS sheet available. Preservative antibiotic or antibiotic combination choices with minimal active concentrations at final dilution are as follows:

1.4.3.3.2.1 500 IU penicillin/500 µg streptomycin per mL final dilution.

1.4.3.3.2.2 150 µg lincomycin/300 µg spectinomycin per mL final dilution.

1.4.3.3.2.3 250 µg gentamicin sulfate/250 µg neomycin sulfate per mL final dilution.

1.4.3.3.2.4 200 µg gentamicin sulfate per mL final dilution.

1.5.3.3.3 If preservative antibiotics are not included in the extender, an alternative form of bacterial control must be utilized, with similar levels of efficacy demonstrated.

1.5.3.4 Each dose of diluted semen must be clearly marked in such a way that, at a minimum, the date of semen collection and appropriate identification of the donor animal(s) is evident. If donor identification is coded, the semen processing center must keep on file for no less than 5 months a record of donor animal(s) which contributed to the coded doses.

1.5.3.5 Each extended/diluted semen dose shall have a unique origin/laboratory identity clearly marked on it. Semen originating from any other laboratory shall not have the same identity.

154.3.6 When bulk bags or containers of extended semen are prepared, the same labelling requirements apply as above.

#### 1.5.4 Extended/Diluted Semen Storage

1.5.4.1 Only extended/diluted semen doses that originate from the resident AI boars which have fulfilled the requirements set forth in Sections 1.1, 1.2 and 1.3, and have been collected and processed as set forth in Section 1.4 may be stored in individual semen containers and storage areas at the stud.

1.5.4.2 Extended/diluted bulk and packaged semen is to be stored only in individual semen containers and storage areas which are capable of being disinfected.

#### 1.5.5 Disease Control of Extended/Diluted Semen

1.5.5.1 Aerobic bacteriological culturing is to be performed on randomly selected individual or pooled semen lots which are at least 48 hours of age post-processing, with the number sampled sufficient to detect if 10% or more have significant bacterial growth with at least 90% confidence based on quarterly production or 200 lots, whichever is greater. The calculated sample size should be divided by the sampling frequency; at a minimum of monthly, with biweekly to weekly recommended. Identification of samples positive for significant bacterial contamination will be followed up with a review of stud hygiene and sanitation by a veterinarian.

1.5.5.2 An established monitoring program which minimizes the risk of PRRSV transmission in the extended semen product is to be in place. PRRSV RT-PCR testing of serum or blood swab taken at the time of semen collection provides for the earliest possible detection of PRRSV infection in boars whose semen is being distributed to downstream sow farms. Blood swabs are an acceptable alternative to serum provided the system is approved by the veterinary diagnostic laboratory. PRRSV surveillance in boar studs can be improved and strengthened by the routine testing of oral fluid specimens randomly collected from the population. Periodic PRRS ELISA testing is recommended due to the potential for false negative PCR from an undetected strain.

1.5.5.3 An established monitoring program which minimizes the risk of PEDv/PDCoV transmission to sow farms is to be in place. A combination of PCR on fluids obtained from routine environmental swabs at congregation points (e.g., collection area or warm-up pens) and targeted fecal samples of potential clinical suspects is recommended in conjunction with intensive individual boar observations twice daily for clinical signs. A veterinarian must be available to interpret diagnostic results and clinical observations to determine if sufficient risk warrants closure of the stud to further shipments of donor semen.

## Links

Web-based interactive calculator for PRRSV monitoring & descriptive PDF:  
<http://www.aasp.org/members/only/committee/BoarStud.php>

PPRSV Task force document: “Monitoring Boar Studs for PRRSV” Rossow et al.  
<https://www.aasv.org/documents/BoarStudPPRS2-24-7.pdf>

Pepin B, Kittawornrat A, Gauger P, Main R, Garton C, Hargrove J, Rademacher C, Zimmerman J. Comparison of specimens for monitoring PRRSV in boar studs: What works best?  
<http://www.aasp.org/library/swineinfo/Content/AASV/2013/099.pdf>

Johnson J, Johnson J, Olsen C, Schwartz K, Zimmerman J, Engle M. Feasibility of oral fluids for detection of antibody response to porcine parvovirus, *Leptospira*, swine influenza, *Lawsonia*, or *Salmonella* in adult swine  
<http://www.aasv.org/library/swineinfo/Content/AASV/2011/127.pdf> Accessed February 26, 2014.

Andrea Pitkin, John Deen, Scott Dee. Use of a production region model to assess the airborne spread of porcine reproductive and respiratory syndrome virus; *Veterinary Microbiology* 136 (2009) 1–7.  
[https://www.aasv.org/documents/Air\\_Filtration\\_PRRS.pdf](https://www.aasv.org/documents/Air_Filtration_PRRS.pdf)