



Title: Swine Husbandry in ACS Facilities

SOP Number: 060

Purpose: To establish proper swine room husbandry and maintenance procedures in order to ensure the highest quality care for the swine housed in ACS managed facilities.

RECEIVING

- A. The large animal receiving record will be completed upon arrival, noting visual health observations and any abnormalities.
- B. Upon arrival, pigs 10 weeks and younger may receive 5g of Probios in their feed daily for 3 days.
- C. Any other health concerns will be treated at the discretion of the veterinarian.
- D. Any swine sourced from non-TTU herd animals will only be allowed to enter ACS facilities after a vet to producer or vet to vet conversation to discuss the source herd's history, vaccination and biosecurity procedures.
 - a. Any swine that are received from out of state sources must be accompanied by a Certificate of Veterinary Inspection (CVI).

HOUSING AND CARE

- A. Swine may be co-housed according to space requirements set forth in the "Guide" or "Ag Guide" or individually housed in approved caging/kennels. Social housing is the standard for swine (Policy 27).
 - a. Swine may be singly housed if:
 - i. There are veterinarian concerns regarding the well-being of the animals, such as incompatibility, for clinical reasons, attrition of cage mates, breeding-age animals.
 - ii. Individual housing based on experimental needs is justified in the animal use protocol and approved by the IACUC.
 - iii. The need for single housing should be reviewed on a regular basis by the IACUC and the veterinarian.
 - iv. Additional steps will be taken to provide extra enrichment and other means of socialization according to the Social Housing Policy 27
- B. All forms located in the room's ACS notebook must be adequately filled out daily.
 - a. Daily Observation Sheet
 - i. Pigs are checked a minimum once daily
 - b. Task sheets
 - c. Temperature/humidity logs
 - d. Temperature range: age dependent
 - e. Humidity range: 30-70%
 - f. Enrichment log
- C. Type of housing is determined after evaluating the age/size/breed of the pig, type of study the pig will be used for (standard Ag or Biomedical), or number of pigs needed in the study.

- D. There are multiple types of housing available for pigs:
 - a. Raised kennels or pens with slatted or woven wire vinyl floors (4' x 6')
 - b. Raised pig pens with either expanded plastic flooring (4' x 8') or rubber coated flooring (5'x5')
 - c. Solid floor pens covered with or without rubber mats and/or wood shavings
- E. Lighting will be on a 12:12 light: dark cycle.
- F. Preferred temperature ranges vary by the age of the pigs:
 - a. Piglets less than one month without the sow: 76-90°F. Temperatures will target 80-85°F and a supplemental heat source will be provided.
 - b. Weaned pigs: 64-90°F. Temperatures at weaning will target 85°F and will gradually be lowered 2-3°F per week after the first week to 70°F
 - c. Grow to Finish: 50 – 77°F.
 - d. Piglet ranges may fall outside of the Guide (61-81°F) parameters but we will target the more species-specific temperature ranges listed in the Ag Guide or in breed specific husbandry guidelines.
- G. Weights may be taken upon arrival and periodically to ensure pigs are housed in appropriately sized pens and for periodic health monitoring.
- H. If pre-weaning age pigs are received then piglet management procedures may or may not be performed at the discretion of the veterinarian and research staff needs. It is recommended these procedures be performed 1-3 days of age but can be done later for pig health and welfare in consultation with the veterinarian.
 - a. Tail docking either 0.5 to 1 inch from the base of the tail or as specific to breed.
 - b. Castration of male pigs. Analgesics/anesthetics may be used.
 - c. Teeth clipping
 - d. Ear notching or ear tagging
 - e. 1 mL iron injections I.M.
 - f. 1 mL penicillin I.M.
 - g. Piglets may also be vaccinated per vendor source protocols.

FEED STORAGE:

- A. Feed storage at Animal Food Sciences Facility-A departure from the Guide for fluctuations in temperature for feed storage has been approved by the IACUC for this location, based on manufacture study which in part states "Periodic loss of temperature or humidity control in feed storage is a realistic scenario and can be driven by ambient changes, movement between food supply rooms to animal rooms, or equipment failure. Feed manufacturers are frequently asked if such changes warrant a reconsideration of feeding the product. A study was performed to evaluate nutrient stability of LabDiet® products under such conditions....Temperature and relative humidity were maintained at 40°C/104°F and 75%, respectively, for the study duration [for 7 days]".
- B. All swine diets will be stored in accordance with the recommendations of the manufacture
 - a. Feed bags will be stored off the floor on pallets, racks or carts, at least 4 inches off the wall, in a manner that facilitate sanitation and pest control.

- b. Open bags of feed will be stored in vermin-proof containers to minimize contamination and avoid the potential spread of pathogens.
 - c. All purified and specialized diets will be stored based on the recommendation of the manufacturer- often in a refrigerator (less than 39°F).
- C. All feed expiration dates will be determined based on the recommendations of the manufacturer.
- a. This includes but is not limited to cereal grain diets, purified diets, specialized/custom diets, and food enrichment products.
 - i. Shelf life:
 1. Modified Cereal Diets- 9 months
 2. Purified Diets-6 months
 3. Irradiated Enrichment Products – 24 months
 4. Non-Irradiated Enrichment Products-12 months

FEEDING

- A. Weaned pigs may be fed ad libitum or meal-fed once or twice a day in pans, troughs, or bulk feeders.
 - a. This may be dependent on housing type, husbandry guidelines and research needs.
- B. All pigs will be fed a diet that meets or exceeds daily nutrient requirements set by the NRC regardless of delivery. It is recommended that pigs be fed a restricted diet to control growth.
- C. Pigs normally receive water through an automated drinking system with nipple waterer but can also be offered bowls or portable watering units.
 - a. The waterer is tested daily for water flow.
 - b. If the automatic watering valve is not working a water bowl is provided.
 - c. Replace the nipple to see if it can be easily fixed.
 - d. If replacing the nipple doesn't work, report to the facility manager immediately.

VACCINATION AND DEWORMING

- A. If not vaccinated from the supplier, pigs will receive the following (unless the research dictates otherwise):
 - a. At weaning
 - i. Haemophilus parasuis (like HP-1) with a booster at 3 weeks
 - ii. Mycoplasma and erysipelas (like Respisure one/ER) with a booster at 3 weeks
 - iii. Porcine Circovirus (like Circumvent PCV) with a booster at 3 weeks
 - b. At Grower Stage (approximately 4 months)
 - i. Mycoplasma hyopneumoniae (like M+PAC) with a booster at 22 weeks
- B. Parasite control will be through fecal monitoring and treatment with appropriate dewormers based on fecal float findings
 - a. Fecal float will be performed on pen pooled samples on a quarterly basis starting at 4 months of age

PEN/KENNEL DAILY CLEANING

- A. Rooms are checked daily for any operational deficiencies. Any deficiencies are to be reported immediately to the facility manager.
- B. Feeders are cleared of any clumps and fecal matter daily. Feeders are cleaned at least once a week.
 - a. If feed remains untouched, the veterinarian is to be notified immediately.
- C. As much feces and uneaten food should be removed from the primary enclosure or floor prior to hosing with water.
- D. For raised pens:
 - a. The primary enclosures and floors should be hosed down using care not to get the pigs wet to remove any feces, urine or other debris from the pen. If needed pigs can be removed from the pen.
 - b. The primary enclosures and floors should then be rinsed thoroughly.
 - c. Squeegee or mop the floor dry.
 - d. After the cages have been sprayed, spay all drains to ensure removal of all gross debris.
 - e. Care must be taken to ensure toys, clips, chains, or other solid items do not get into the room drain.
- E. For solid floor pens:
 - a. Remove urine and feces at least once daily or more often as needed.
 - b. Add fresh wood shavings (if used) to the pen as needed.
 - c. Check the walls and other surfaces of the pen for overall cleanliness, and spot clean as necessary.
- F. Check enrichment toys for overall cleanliness. Clean or replace as needed.
- G. Report slow running or clogged drains to the facility manager.
- H. Daily cage/pen cleaning procedures may be conducted more than once daily to reduce odors and maintain appropriate level of cleanliness, should once daily cleaning be insufficient in maintaining a healthy environment for the pigs.

CAGE/KENNEL SANITATION

- A. Total cage sanitation should be done a minimum of every two weeks (Guide).
- B. In some scenarios, cages may only be sanitized at the beginning and end of the study.
 - a. The study falls under the Ag Guide
 - b. Short term studies that removing pigs from pens may be detrimental.
- C. Animals are completely removed from the cage/kennel.
- D. The kennels are scrubbed and rinsed with hot water to remove any gross debris.
- E. The kennels and feed/water bowls are sanitized with a disinfectant (i.e. Peroxigard or 10% bleach solution) and allowed to soak per manufacturer recommendations.
- F. The cages are rinsed thoroughly with hot water and allowed to dry.

ANIMAL ROOM SANITATION

- A. Animals are completely removed from the room if feasible.
- B. Weekly- All surfaces (including door frames, lights, sinks and vents) are wiped down with disinfectant mixed according to manufacturer's recommendations.
- C. Weekly- Flush the floor drains with a 10% bleach solution to help minimize odor.

- I. Every two weeks (Guide) or as needed- Floors, walls, and ceiling should be sanitized with a disinfectant (i.e. Peroxigard or 10% bleach solution) and allowed to soak per manufacturer recommendations. The room is then thoroughly rinsed with hot water and allowed to dry.
- J. All rooms, kennels, feed bowls/feeders, and water nozzles are sanitized every two weeks.
- D. Check feed expiration date and clean feed barrel monthly. Discard any expired feed and replace with fresh feed.

PPE

- A. Personnel should wear a lab coat, scrubs, or coveralls when working with pigs or cleaning the rooms.
- B. Gloves should be worn when handling pigs.
- C. When pigs are from a non-TTU Swine Center source, then the bottoms of shoes must be sprayed with a disinfectant (i.e. Peroxigard) before entering the pig room. Any debris should be removed from the shoes prior to disinfecting. If any fecal matter or debris is collected on the shoes while in the room, be sure to remove the debris before exiting.
- D. A 48 hour waiting/washout period should be observed when contact with pigs in different facilities is required (AFS facilities, New Deal Farm, or Commercial Farms). IACUC Policy 01: Biosecurity at the New Deal Swine Unit and SOP029 Swine Unit should be strictly followed.

ENRICHMENT

- A. Social enrichment:
 - a. Human interaction occurs during daily husbandry.
 - b. Co-housing animals provides socialization between cage mates.
- B. Physical enrichment:
 - a. Balls, hanging chains or water hoses, or various toys are provided to the pigs to help satisfy their need to root and chew and reduce boredom.
 - b. Destructible items (i.e. feed bag) and other rooting materials (i.e. shredded paper, peat moss, soil) may be provided.
- C. Sensory enrichment:
 - a. Auditory enrichment may be provided throughout the day. Music may be instrumental or vocal as voices do help acclimate pigs to humans.
- D. Food enrichment:
 - a. Food treats can be offered as part of human socialization, or to encourage rooting and foraging behaviors.
 - b. Food treats may also be used (with or without clicker training) for training to handling or research techniques.

ENRICHMENT IMPLEMENTATION

- A. An enrichment schedule will be implemented (Policy 29) based on the study and the enrichment devices available. Depending on the type of enrichment, it may be provided constantly, given daily or a few times a week, or rotated at weekly to keep objects novel.

- B. Enrichment will be provided to the swine by the technicians during cleaning and checks and by approved personnel working on the project.
- C. The enrichment will be cleaned during daily husbandry and replaced as needed.
- D. Exceptions to the enrichment portion of this SOP require adequate justification in the protocol as to why environmental enrichment would interfere with the study and then must be approved by the IACUC.

ANIMAL HEALTH MONITORING

- A. Animals are observed once daily by animal care staff for any evidence of illness or change in behavior.
 - a. Everyone with access to the animal facility is responsible for immediately informing the facility manager or university veterinarian when an animal becomes ill or a change in behavior is observed.
- B. In the event of suspected illness:
 - a. Record your observations in the clinical treatment record- include the date, the problem observed, and your initials.
 - b. Immediately contact the Attending or Clinical Veterinarian or the ACS facility manager:

ACS Attending Veterinarian
806-834-8588 Office

ACS Clinical Veterinarian
806-834-7373 Office

ACS Facilities Manager
806-834-2872Office

- c. Record any treatment regimens along with the outcome of the treatment in the appropriate health records.

REFERENCES

Nugent, G., & Schultz, C. (2016, June 28). How Storage Conditions, Product Stability, and the Manufacturer's Warranty Work to Determine your LabDiet® Shelf Life.

Products, L. D. (2015). Effect of short-term condition changes on nutrient stability in LabDiet® PicoLab® Rodent Diet 20, 5053, PicoLab® Mouse Diet 20, 5058, PicoLab® Select Rodent 50IF/6F, 5V5R, and PicoLab® Select Mouse 50IF/9F, 5V5M.