

STANDARD OPERATING PROCEDURES
DIVISION OF COMPARATIVE MEDICINE
UNIVERSITY OF SOUTH FLORIDA

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TITLE:	Livestock Husbandry
SCOPE:	Animal Care Personnel
RESPONSIBILITY:	Facility Manager, Technical Staff, Veterinary Staff
PURPOSE:	To Outline the Proper Procedures for Receiving, Physical Examination, Evaluating Health Status, Handling, Care and Husbandry Practices Related to Livestock

I. PURPOSE

1. To ensure the highest quality of animal health and preclude the development of spontaneous diseases or disorders, which could compromise the integrity of studies and the interpretation of results.
2. To ensure personnel handling livestock perform their duties in a manner that complies with all current governing laws, regulations, and guidelines.

II. RESPONSIBILITY

1. The Veterinarians oversee all aspects of animal health and are assisted by all program staff.
2. Facility Managers ensure implementation of all procedures.
3. Animal care staff are responsible for the implementation of this procedure.

III. PROCEDURES

1. Upon receipt of newly arrived animals, including those prepared for transfer to other facilities:
 - a. **Shipping crates** (if applicable) **are inspected for signs of damage and shipment accuracy.**
 - b. **Animals are observed for signs of illness, injury, and/or deaths.**
 - c. Animal care staff will **notify the Facility Manager regarding any damage to crate(s) or animal health concerns.**
 - d. The Facility Manager will **notify the Fiscal & Business Specialist of damaged or rejected shipments**, or orders improperly filled (i.e., weight, age, number requested).
 - e. **Clinical Veterinarian will be immediately notified of health concerns or deaths** occurring in transit.
2. Individual **cage cards are prepared** for each animal and include the following information:
 - a. Principal Investigator
 - b. IACUC #
 - c. Species
 - d. Sex
 - e. DOB (or age on arrival if unavailable)
 - f. Body weight
 - g. Arrival date
 - h. Source
 - i. Animal number

3. Individual **Animal Medical Records** are prepared for each animal, to include (see **SOP #012** entitled, **Animal Medical Records**):
 - a. **Arrival Status Sheet** CMDC #008
 - b. **Progress Notes** CMDC #013
 - c. New animals are recorded on the **Monthly Per Diem Sheet** CMDC #175 and on a **Progress Notes** form CMDC #013 located in the **Room Log Book**
4. N95 mask and face shield are recommended when working with/handling livestock.
5. **Physical Examination**
 - a. **A physical examination (PE)/general health evaluation is performed** by the veterinary staff, or animal care staff, within 24 hours of arrival (unless animals appear to be in good health and will be used in terminal procedures within 24 hours).
 - b. Animal is examined, and observations are recorded on the **Arrival Status Sheet**.
The following parameters will be observed and recorded:
 1. ID number (if any) and/or description
 2. Weight
 3. Body temperature
 4. Heart or pulse rate
 5. Respiration rate
 6. Capillary refill time
 7. Hoof (trim if necessary)
 8. Teeth
 9. Ears
 10. Eyes
 11. Skin/coat condition
 12. An impression of general attitude and condition
 13. Any treatments implemented
 - c. A notation of PE having been performed is placed on the **Progress Notes CMDC #013** for each animal.
6. **Handling and Restraint**
 - a. To isolate group-housed animals for examinations/treatments, animals can be herded into a holding pen by opening holding pen first, then animal's pen, and encouraging the animal to move on its own accord.
 - b. Pigs less than 8 kg:
 1. Pick up by grasping around midsection with both hands, then transport/restrain with the hand/forearm supporting the head/neck and the other under the hind quarters, or
 2. Restrain by grasping the pig by the rear feet with one hand and lifting the animal by the hind legs. (This method may facilitate an IM injection by a single person.)
 - c. Pigs greater than 8 kg:
 1. Restrain using two persons, one to hold the animal's head and push the body against the pen/wall, the other to perform injections, blood withdrawal, and/or treatments.
 2. When lifting, use two-three people, depending on the size of the animal. One person should be positioned at each end of the animal and if needed, one to support the mid section.
 - d. Goats/Sheep/Calves:

1. Can be moved using a lead or harness
2. Restrain by gently pressing up against pen or wall to administer injections or treatments
3. Blood withdrawal requires two persons, one to immobilize the head/neck, and the other to hold the vessel and obtain the sample.

7. Environmental Enrichment and Social Housing

- a. Appropriate social interactions among members of the same species and enrichment of the animal's environment are essential to normal development and well-being.
- b. **All livestock receive environmental enrichment**, unless an exemption has been approved in writing by the IACUC.
- c. Each animal will have a minimum of one enrichment device, either suspended inside the cage or on the floor inside the cage (e.g., flexi keys, rattle triangles, suspended plastic apples, Kong® toys on chain).
- d. Any environmental changes made must be communicated to and approved by the researcher prior to implementation.
- e. **Single-housing of livestock should be the exception** and should be justified based on experimental requirements or veterinary-related concerns about animal well-being.

8. Feeding and Watering

- a. Refer to **SOP #022** entitled, **Feed and Bedding** for specific diets. **NOTE: procedures below are not for animals on special diets or water.** Special diets must be described in an approved IACUC protocol (e.g., type, amount, and form).
- b. Feeding
 1. Ruminants are fed once a day. Type of feed is determined by species.
 2. Swine are fed twice daily.
 3. The amount fed is based on age, size, and level of activity (e.g., 50-70kg pig @ 3 cups/feeding twice daily).
 4. Animals group-housed are fed in several feed stations to assure less aggressive animals have sufficient access.
 5. Sweet feed can be mixed with pelleted feed to entice finicky eaters.
 6. Hay should be available at all times for ruminants.
 7. Feed troughs and/or bowls are sanitized on an as-needed basis depending on the type of food used, but at least weekly. Receptacles at CAMLS can be returned to COM for cagewash sanitation.
- c. Watering
 1. Water is provided *ad libitum* by way of a water trough or by a drinking valve (lixits).
 2. Lixits are checked daily to ensure water is available.
 3. Water troughs are dumped and refilled each morning and checked for adequate supply each afternoon.
 4. Water troughs are sanitized on an as-needed basis at least weekly. Those at CAMLS can be returned to COM for cagewash sanitation.
 5. Sanitize lixits in occupied rooms weekly, and prior to occupancy, with Oxivir Tb and thoroughly rinse/flush after the appropriate contact time.

9. Health Surveillance:

- a. Each housing room is assigned to an Animal Care Technician. Daily observations of the Animal Care Technician are recorded on the **Room Status Sheet** within the **Room Log Book**.
- b. Surveillance frequency:
 1. On weekdays, health surveillance will occur twice per day, prior to 9:30 AM, and again about mid-afternoon.
 2. On weekends and holidays, the initial health surveillance should take place upon the arrival of the Animal Care Technician, and again just prior to completing their assigned shift.
- c. Observations and communications must be noted on the **Room Status Sheet**, the Facility Manager's **Animal Health and Environmental Concern Form** CMDC #077 and the **Animal Health Concerns Form** CMDC #155.
- d. Performance of daily observations and general health surveillance:
 1. Each animal/cage is observed to evaluate the following
 - a. Food and water intake
 - b. Urine and fecal output
 - c. Assurance of water supply and patency
 - d. General appearance (presence of lesions/injuries, coat condition, disposition)

NOTE: If at any time there is a medical emergency, the Clinical Veterinarian is to be notified immediately.

- e. **Weekly notation is made in the Progress Notes** regarding animals' overall status/condition. (Note: BAR = bright, alert, responsive is an acceptable entry)
- f. **Health evaluations are performed monthly** by either Veterinary or Animal Care Staff and the results recorded on a **Monthly Health Evaluation** label (see 2.a. above for parameters) and placed in the **Progress Notes** form in the animal's medical record.
- g. **Physical examinations are performed** by Veterinary Care Staff as needed, and **at least every six months** and the results are recorded on a **Physical Examination** label and placed in the **Progress Notes** form in the animal's medical record.
- h. Refer to **SOP #006** entitled, **Animal Health and Environmental Surveillance** for specific procedures of reporting and recording health concerns.

10. Pen Cleaning-

- a. **Stationary Pens** -
Center for Advanced Medical Learning & Simulation (CAMLS) rooms 139, 140, 141, & 147.
- b. N95 mask and face shield are recommended when power washing and/or spraying livestock pens.
 1. **Daily-**
 - a. Start at the pen farthest from the floor drain.
 - b. Open sliding door to the adjacent pen and move animal out of the enclosure to be cleaned.
 - c. Turn on floor trough flush by opening gate valve.
 - d. Hose down the empty pen to remove animal waste.

- e. Clean pen floor, room floor, and floor trough (e.g., by lifting each individual flooring panel and hosing waste towards trough and trough drain).
 - f. Clean Lixits® with a scrub brush or pad.
 - g. Clean feeders with a scrub brush or pad.
 - h. Return animal to clean pen.
 - i. Only one animal and its cage card will be moved at one time.
 - j. Repeat procedures for each pen to be cleaned.
 - k. After all pens have been cleaned, and floor trough is clean, turn off flush gate valve.
 - l. Squeegee floor dry.
2. **Weekly-**
- a. With each active pen emptied of animals, pen wall panels, floor panels, feeders, and lixits are cleaned and then sanitized in place using a scrub brush or pad, a sponge mop, a degreasing cleansing solution (e.g., KrudKutter, PRL Grease-free), a disinfectant (e.g., Oxivir Tb, Sporicidin, Virkon), and thorough rinsing.
3. **Disinfection-**
- a. Active rooms are disinfected quarterly. The entire room, all pen floors (including underside), walls, doors, Lixits®, room floors, walls, and floor troughs are thoroughly disinfected using pressure, and a degreasing cleansing solution (e.g., KrudKutter, PRL Grease-Free), a disinfectant (e.g., Oxivir Tb, Sporicidin, or Virkon) and thorough rinsing.
 - b. Record "Room Disinfected" for the corresponding date on the **Room Status Sheet** and initial.
- c. **Portable Pens**
1. **Daily**
 - a. Start at the pen farthest from the floor drain.
 - b. Remove all piles of animal waste and hay from the floor.
 - c. Herd animals outside the pen, to another pen, or to one side of the pen, and clean the pen using the hose, and scrub brush if needed, taking care not to wet animals.
 - d. Squeegee floor dry.
 - e. Herd animals back to clean pen and repeat steps.
 - f. Rinse floor drain taking care not to flush hay down the drain.
 - g. Rinse and refill water troughs/bowls.
 - h. Squeegee remainder of floor.
 2. **Disinfection**
 - a. Active rooms are disinfected quarterly. The entire room, all pen floors (including underside), walls, doors, Lixits®, room floors, walls, and floor troughs are thoroughly disinfected (using pressure, and a degreasing cleansing solution [e.g., KrudKutter, PRL Grease-Free] and a disinfectant [e.g., Oxivir Tb, Sporicidin, Virkon]) and thoroughly rinsed.
 - b. Record "Room Disinfected" for the corresponding date on the **Room Status Sheet** and initial.

d. **Room Housing**

1. **Daily**

- a. Start at the side of the room farthest from the floor drain.
- b. Remove all piles of animal waste and hay from floor.
- c. Herd animals to one side of room and clean the other side of the room using the hose, and scrub brush if needed, taking care not to wet the animals.
- d. Herd animals to the clean side of the room and repeat steps.
- e. Rinse floor drain taking care not to flush hay down the drain.
- f. Rinse and refill water bowls/troughs.
- g. Squeegee floor dry.

2. **Disinfection**

- a. Active rooms are disinfected quarterly. The entire room, all pen floors (including underside), walls, doors, Lixits®, room floors, walls, and floor troughs are thoroughly disinfected using pressure, and a degreasing cleansing solution (e.g., KrudKutter, PRL Grease-Free), a disinfectant (e.g., Oxivir Tb, Sporicidin, or Virkon) and thoroughly rinsed.
- b. Record "Room Disinfected" for the corresponding date on the **Room Status Sheet** and initial.

e. **Transport Cages**

1. **After Each Use**

- a. Transport caging used in the relocation of animals or used for the preoperative overnight individual housing of animals (i.e., including water distribution manifolds and lixits) are sanitized in place by pressure/hand washing using degreasing solutions and disinfectants (CAMLS) or sent to cage wash (COM, CAMLS) for sanitization after each use. If the CAMLS garage, room 149, is used for sanitizing cages, it must be empty of all other items and the room sanitized after use.

f. **Recoil Hoses**

1. Recoil hoses in use are sanitized quarterly.
 - a. Disconnect hose from caging.
 - b. Soak in a disinfectant (e.g., Sporicidin, Virkon) for 10 minutes and thoroughly rinse.
 - c. Send through cage wash (CAMLS or COM).
 - d. Reconnect to cages and flush with water for at least 5 minutes.
2. Recoil hoses not in use are stored disconnected from water supply and caging.

11. **Room Duties**

- a. Upon completion of pen cleaning, feed and watering, and daily health surveillance, the following tasks are to be performed: (Room duties described below are minimal requirements; additional duties and frequencies are at the Facility Manager's discretion)
 1. **Daily** - complete **Room Status Sheet** by recording:
 - a. Minimum and maximum **room temperature** and **humidity** (measurements out of the acceptable range are described under

the **Health and Environmental Concern** column of the **Room Status sheet** and reported to the Facility Manager via the **Health and Environmental Concern Form**).

- b. **Feed** and **water** are available.
 - c. **Husbandry duties** (e.g., pen cleaning/equipment changes/procedures performed).
 - d. **Housekeeping duties** (e.g., room duties/procedures performed).
 - e. Significant **health or environmental concerns**.
 - f. **Time** of observation and the **initials** of technician.
 - g. If no animals are present on this day, record "No Animals Present" and initial.
2. Assure no investigator's supplies or trash is left in the room.
 3. **Check and replenish supplies** (e.g., soap, paper towels) as needed.
 4. Wipe down counter/sink areas with Sporicidin.
 5. **Assure any new arrivals are recorded on the Per Diem Sheet** CMDC #175 and on a **Progress Notes** form CMDC #013 located in the **Room Log Book**.
- b. **Weekly** complete **Room Status Sheet** by recording:
1. Flush automatic watering zones, by opening the flush valve outlet below each drinking valve (e.g., lixit) and at the end of a zone (if applicable) and allow the waterline to flush at maximum flow for approximately 5 minutes
 2. Lixits are sanitized weekly in occupied rooms with Oxivir Tb and thoroughly rinse/flush after the appropriate contact time.
 3. **Environmental enrichment devices and all room cleaning equipment (e.g., mop, broom) are cleaned and** sanitized in place by pressure/hand washing using degreasing solutions and disinfectants (CAMLS) or can be sent to cage wash (CAMLS or COM)
 4. Wipe down door and doorframe with Sporicidin
 5. Physically count animals within the room
- c. **Monthly** complete **Room Status Sheet** by recording:
1. Clean HVAC vents and replace air filters when present
 2. Confirm diurnal light timers are accurately controlling animal room lights (HOB0) and record
 3. Wash walls with Sporicidin
- d. **Quarterly**
1. Disinfect all rooms that have been active during the past quarter.
 2. Sanitize water recoil hoses.

12. Housing density

- a. Animals should be housed at or below the density indicated in the attached table.
- b. Runs and transport cages provide 15 sq. ft. of floor space. Large runs (select runs at CAMLS) provide 20 sq. feet of floor space.
- c. Sufficient space should be maintained to separate swine, should social groups be deemed incompatible.

	Square feet	Swine			Small Ruminant		Large Ruminant		
		Body Weight in KG							
		≤ 25	≤ 50	≤ 100	< 25	≤ 50	< 75	≤ 200	
1 pen/transport cage	15	1	1	n/a	1	1	n/a	n/a	
2 small pens	30	5	2	1	3	2	1	n/a	
1 small + 1 large	35	5	2	1	4	2	1	n/a	
3 small pens	45	7	4	2	5	3	2	n/a	
2 small + 1 large	50	8	5	2	5	4	2	1	
4 small pens	60	10	6	3	7	4	3	1	
3 small + 1 large	65	10	6	3	7	5	3	1	
5 pens	75	12	8	3	8	6	3	n/a	
6 pens	90	15	10	4	10	7	4	2	
Open room footage required for each animal									
2-5 animals					8.5 ft ²	12.5 ft ²			
> 5 animals					7.5 ft ²	11.3 ft ²			
Capacity if singly housed									
CAMLS 139		8	8	4	8	8	4	2	
CAMLS 140		8	8	4	8	8	4	2	
CAMLS 141		8	8	4	8	8	4	2	
CAMLS 147		3	3	1	3	3	1	n/a	

Approved:

Date: