MANAGING Q FEVER RISK IN UNGULATES

PERFORMANCE STANDARD: The care and use of ungulates (general sheep & goats) will be consistent with this policy with the intention that the potential for human exposure to *Coxiella burnetti* is minimized.

BACKGROUND: Ungulates (generally sheep and goats) are a potential source of *Coxiella burnetti* infection in humans leading to a disease known as Q fever. Q fever can be a serious disease in humans leading to both acute and chronic illness as well as death. Although many species can serve as a reservoir, pregnant sheep and goats represent the highest risk to humans. Various measures can be taken to minimize the potential for human exposure to the *Coxiella burnetti* organism.

ROLES:
1. Research and DLAR staff will abide by this policy.
2. The Occupational and Environmental Safety Office (OESO) will provide guidance in assessment of risk and in the appropriateness of personal protective equipment, when necessary.
3. Employee Occupational Health & Wellness will provide health evaluations and risk assessments.

PROTECTIVE POSTURES REQUIRED: Personnel PPE will be worn and employed as described in this policy and as directed by OESO. Other safety measures are also described.

OUTLINE OF POLICY:
1. Principal investigators must designate the use of pregnant sheep or goats as a potential biohazard on their Institutional Animal Care and Use Committee applications.
2. Personnel who work with sheep or goats (pregnant or non-pregnant) will undergo a health and risk assessment to address employee health concerns. High-risk employees may be excluded from working with sheep and goats.
3. Employees who develop a febrile illness while working with ungulates (or their tissues or fluids) will be directed to seek immediate medical attention. Employee Occupational Health & Wellness (EOHW) can be contacted by dialing the Hotline at 919.684.8115 (or 115 from a Duke campus phone)
4. Serological evaluation of employees in regard to *Coxiella burnetti* (Q fever) infection will be performed as deemed necessary by EOHW.
5. Vendors used for animal purchases must be DLAR-approved.
6. Vendor Surveillance measures:
   a. Initial Surveillance:
      i. Sheep: If a one year test result is not available, then obtain a current test result.
   b. Goats: If a one year test result is not available, then obtain current test result.

   On-going Surveillance: A DLAR veterinarian will review the vendor flock/tribe testing results approximately semi-annually. A positive result requires that all sheep and goats on campus be retested and the purchasing relationship with the vendor re-evaluated.

7. Site Procedures:
   a. Animals that arrive at DUMC will have tested negative for Q fever within one month prior to the shipment.
   b. All newly arriving animals are quarantined. Quarantine will consist of separation of newly arrived animals from other animals and placement of the appropriate signage.
   c. Access to these animals will be limited to essential personnel.
   d. The animals are re-tested during the quarantine period. Animals will be immediately re-tested if the results are equivocal. A DLAR veterinarian must confirm two negative tests prior to releasing the animals to the Principal Investigator.
   e. Animals that test negative for Q-fever will continue to be considered a potential source of human infection but are no longer considered under quarantine.

8. Animals that test positive after arrival at Duke will be isolated from any other animals and be re-tested to verify the results. Any confirmed positive animal (defined as two consecutive positives) are reported to the State Veterinarian immediately. After reporting to the State Veterinarian, positive animals will be euthanized and the carcass incinerated (unless otherwise directed by the State Veterinarian). No samples, tissue or otherwise, will be collected from positive animal.

9. Appropriate containment for transport to and within DUMC research facilities is required.

10. Transport of animals outside of the housing area requires HEPA or other suitably filtered transport cages. Animal care personnel will be trained in the use and maintenance of transport equipment.

11. All rooms in the vivarium used to house ungulates shall be under negative pressure in relation to the corridor.

12. Sheep/goats are housed in a location that limits incidental personnel traffic. This can be a dedicated animal room in the vivarium or a stall at the Duke University Research Farm. PPE requirements are posted at the entrance to the animal holding areas.

13. Personnel working with the sheep/goats must wear either a N95 respirator or a powered air purifying respirator (PAPR) when performing procedures that generate aerosols (e.g. high risk surgical procedures, cleaning stalls/ runs and shearing). Medical surveillance and fit testing/training must be conducted before personnel wear N-95 respiratory protection.

14. Operating rooms (O.R.) in which ungulate surgeries are performed shall be set up to provide adequate containment. Several acceptable arrangements may be used:
   a. The O.R. is under negative pressure in relation to the corridor. The exhaust from the room is dedicated out of the building, or HEPA filtered if recirculated inside the building.
b. An anteroom is placed at the entrance of the O.R. and is negative to the corridor and the O.R. In other words, air flows into the anteroom from both directions (O.R. & corridor). This airflow set-up would maintain a traditional surgical environment in regards to infection control. Exhaust from the anteroom would be HEPA-filtered.

c. HEPA filter air units are placed in the O.R. to remove airborne contaminants from the O.R.

d. A ‘bio-bubble’ or other ‘local containment tent’ is constructed around the surgical table. The containment device is maintained under negative pressure, but because the supply air in the OR room is HEPA filtered, there is no increase with infection control risk. Exhaust from the tent would be HEPA-filtered.

15. DLAR, in consultation with OESO and EOHW, will provide training of staff on the potential hazards and proper precautions when working with animals and the signs and symptoms of Q-fever.