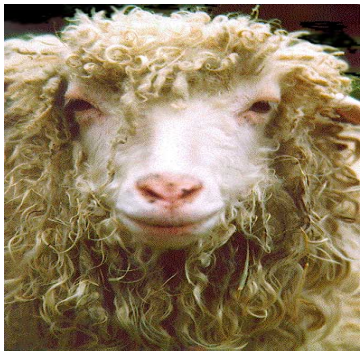

Sheep & Goats

All employees and students working with animals should be aware that laboratory animals might bite, kick or scratch. Animals respond to sounds and smells in the same manner as people, however, they can hear, smell and react to things that people might not detect. Unexpected and sudden movement by and animal can produce injury to an animal handler. Many animals have a "flight zone," in which approaches by another animal or a person cause and attempt to escape. Although the risk of bites, kicks and scratches is species dependent, there are a few simple guidelines, which if followed, will significantly reduce the potential risks of such incidents. These include:

- Always wear appropriate personal protective equipment, especially hand and face/eye protection.
- If moving large contaminated items (e.g. non-human primate cages), wear heavy gloves.
- When available and appropriate, use mechanical restrainers according to IACUC guidelines when performing procedures on unanesthesized animals.
- All bites and scratches that result in bleeding should be immediately and thoroughly scrubbed and cleansed with soap and running water for at least 15 minutes. Notify supervisor and seek medical attention immediately.
- There are some potential hazards inherent in any work environment. These include poor ergonomics, slips and falls, electrical safety hazards, etc. UTSouthwestern Medical Center has developed a wide range of environmental health and safety guidelines to address these potential hazards.

INFECTIOUS DISEASE HAZARDS

- ***Q Fever:*** This zoonotic disease, caused by *Coxielia burnetti*, is most commonly associated with sheep, although goats, cattle and other mammals can be sources of infection. Infected animals are usually asymptomatic. Humans are very susceptible to the virulent organisms, which are excreted in milk, urine, and feces and of infected animals, and disease can occur when even one organism is inhaled.
  - ***Reservoir/source of infection to people***: Most importantly, during birthing the organisms are shed in high numbers within the amniotic fluids and the placenta.
  - ***Transmission***: Q-fever is spread by aerosolization of infected body fluids. Disease transmission can be reduced by careful disposal of birth products and by use of suitable respiratory protection (N95 dust/mist respirator or better). The organisms are resistant to heat, drying, and many common disinfectants. These features enable the bacteria to survive for long periods in the environment.
  - ***Disease in people:*** The disease in humans has a two-week to one-month incubation period. In the acute phase of the disease, symptoms can begin suddenly. In most cases, Q-fever is manifested by flu-like symptoms that usually resolve within 2 weeks. Q-fever is sometimes misdiagnosed as a flu. Q fever can

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be severe, especially in elderly patients where it can cause hepatitis and/or endocarditis, or in immuno-suppressed people. In general, most patients will recover to good health within several months without any treatment. However, 1%-2% of people with acute Q fever die of the disease. The most serious complication of Q fever is endocarditis, which has a very high mortality rate of approximately 65%. Q fever endocarditis generally involves the aortic heart valve, less commonly the mitral valve. Most Patients who develop chronic Q fever have pre-existing valvular heart disease or have a history of a vascular graft. Transplant recipients, patients with cancer, and those with chronic kidney disease are also at risk of developing chronic Q fever

- ***Contagious Echthyma (Orf)****:* This poxviral disease is known as contagious echthyma or soremouth in sheep and goats, and orf in people. In ruminants, it is evidenced by exudative lesions found on the muzzle, eyelids, oral cavity, feet or external genitalia. It is more common in younger animals. The disease in ruminants is highly contagious to humans and other animals. Frequent hand washing is recommended to physically remove bacterial contamination and to prevent ingestion exposure. Of all the Personal Protective Equipment (PPE) recommendations, the most important is wearing gloves during all procedures with sheep. Contaminated gloves must also be disposed of properly following use to prevent exposure.
  - ***Reservoir/source of infection to people****:* Infected sheep or goats are the source of infection to people.
  - ***Transmission***: Transmission can be by direct contact with lesions or indirectly by contaminated fomites (hair, clothing).
  - ***Disease in people***: The self-limiting infection, which is usually found on the hands, consists of painful nodules, cutaneous ulcerative lesions, and usually lasts 1-2 months. No treatment.
- ***Brucellosis****:* A bacterial organism found in sheep/goats
  - ***Reservoir/source of infection to people***: Can infect sheep/goat breeding colonies where it will be manifested by abortions, infertility, testicular abnormalities and poor semen quality.
  - ***Transmission:*** The mode of transmission to people is not clear but is probably oral or transcutaneous contact with organism-infected blood or other tissues.
  - ***Disease in people:*** Flu-like symptoms that may recur are seen in humans.
- ***Leptospirosis****:* *Leptospira* spp. are bacteria found in many animals but are most commonly associated with livestock.
  - ***Reservoir/source of infection to people:*** Rats, mice, voles, hedgehogs, gerbils, squirrels, rabbits, hamsters, reptiles, dogs, sheep, goats, horses, standing water.
  - ***Transmission:*** Leptospires are shed in the urine of infected animals. Direct contact with urine or tissues via skin abrasions or contact with mucous membranes has been reported. Transmission can also occur through inhalation of infectious droplet aerosols and by ingestion;
  - ***Disease in people:*** Flu-like symptoms, mild to severe. Death has been reported.
- ***Other Infections***:
  - There are several other bacterial pathogens that may cause disease in people; Campylobacter, salmonellosis, chlamydiosis.
  - There are several other parasitic infections that sheep and goats may carry and could transmit to humans including:
    - Cryptosporidium
    - Giardia

- Echinococcus

HOW TO PROTECT YOURSELF

- Always wear appropriate personal protective equipment, especially hand and face/eye protection.
- If moving large contaminated items (e.g. cages), wear heavy gloves.
- All bites and scratches that result in bleeding should be immediately and thoroughly scrubbed and cleansed with soap and running water for at least 15 minutes.
- Avoid using sharps whenever possible; substitute manually operated pipettes for needles and syringes, and cannula for needles.
- Do not eat, drink or store food in research areas.
- Do not handle contact lenses in the laboratory.
- Wearing of gloves, lab coat or scrubs is required.
- Dispose of all waste materials into the appropriate waste stream.
- Appropriately dispose of placenta, birth products, fetal membranes, and aborted fetuses.
- Use appropriate procedures and PPE for bagging, autoclaving, and washing of laboratory clothing.
- Ensure that HVAC measures have been implemented to prevent airflow to other occupied areas.
- **Persons at highest risk for developing chronic Q fever, especially persons with pre-existing cardiac valvular disease or individuals with vascular grafts should not work in areas of potential exposure.**
- Restrict access to laboratories used in housing potentially infected animals.

PHYSICAL HAZARDS

- ***Bruises and cuts:*** Sheep/goats have a tendency to jerk their heads or stamp their feet to push the caretaker away from close contact or to resist. They may also shift their body weight to resist handling and temporary restraint. Sheep/goats are social animals and show visible signs of distress if isolated from others of their kind. In addition, handling of cages, pens and other equipment could cause cuts or scratches. Cuts, bites and scratches could potentially expose the employees to viral, bacterial, parasitic or allergic agents, which are transmissible from animals to humans.
- ***Bites and scratches:*** The potential for receiving a bite or scratch is an ever-present hazard that faces all employees working directly with laboratory animals and related equipment. Employees should be properly trained in handling and general restraint techniques of the species they are assigned to. Additionally, all staff should be familiar with first aid procedures specific to each species
- ***Needlestick / Sharps injury***

HOW TO PROTECT YOURSELF

- Proper training and awareness of animal behavior are vitally important to avoid injuries.
- When available and appropriate, use mechanical restrainers when performing procedures on unanesthesized animals.
- Read and understand the protocol-related procedures before you start the experiment. If necessary, do a dry run.
- Do not recap needles; dispose of them in appropriate sharp containers.

- Use safety needles and sharp devices.
- Until you have washed your hands, keep them away from your mouth, nose and eyes.
- Please read and understand the special safety requirements for each work area or animal species.
- Clean all spills immediately.
- Report all incidents or equipment malfunctions to your supervisor immediate

ALLERGY HAZARDS

Animal related allergies are common. Although there are no known sheep allergens, the sheep containment environment may have allergens present such as hay and dust. Contact dermatitis can occur.

HOW TO PROTECT YOURSELF

- Other personal protective equipment such as dust/mist masks or approved respirator masks (e.g., Type N95) are strongly recommended when working with animals.

PROTOCOL RELATED HAZARDS

Protocol-related hazards are defined as those specifically associated with either routine operational or experiment-specific protocols. Some general hazards also associated with protocols, such as the risk of fire in the use of bunsen burners or torches, or electrical hazards in the use of experiment-specific equipment, are not included in the category of protocol-related hazards. Protocol-related hazards are protocol-specific. For example:

- Hazards associated with the use of a specific viral vector carrying a transgene for toxin production or with a piece of prototype equipment to perform an experimental task.
- Experimental studies can involve any number of hazards such as the use of radioactive materials, infectious agents, toxins or toxic chemicals, flammable substances, etc.

HOW TO PROTECT YOURSELF

- Follow the steps in your approved safety plan.
- Educate yourself on the protocol specific hazards.

Additional information regarding various protocol-related hazards may be obtained from

www.utsouthwestern.edu/workerprotection

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