

BACKGROUND

This document provides information about potential zoonotic exposure while working with or exposed to small ruminants or their products (e.g., fecal sample). Small ruminants can be vectors/reservoirs of pathogens that are zoonotic (i.e. can infect humans). The infectious agents listed here are not all inclusive, but provide the most common zoonotic agents seen in small ruminants. The safe work practices are provided as suggestions for staff and researchers who work with animals, in animal facilities, or with animal products.

ZOONOTIC PATHOGENS

There are a number of zoonotic diseases that can be spread from animal to human. In general, the risk of acquiring the diseases listed below is low, and in some cases, you are more likely to acquire an infection from other sources (e.g., contaminated food). However, you should remain vigilant and follow safe work practices and the instruction from your instructor or supervisor. Zoonotic diseases of concern include by are not limited to the following:

1. Rabies
 - a. Organism: Rabies Virus
 - b. Clinical Signs
 - i. Animals - Depression or aggression; generalized neurological signs.
 - ii. Humans - Local pain at site of inoculation; headache, malaise, fever; anxiety, agitation, paralysis, coma.
 - c. Transmission: Saliva (via bites or open wounds), direct contact with central nervous system tissue (e.g., brain, spinal cord).
 - d. Prevention: Wear gloves when in contact with saliva. Do not handle wildlife around the facility. Report any abnormal behavior in wildlife to facility manager immediately. Seek medical evaluation immediately after any possible exposure to common potential carriers of the virus (e.g. bats, raccoons, skunks, foxes, etc.), and report the presence of these animals to the facility manager.
 - e. Animal Management: Animals are vaccinated for rabies prior to entering the herd.
2. Tetanus
 - a. Organism: *Clostridium tetani*
 - b. Clinical Signs
 - i. Animals – Falling to the ground, arched back
 - ii. Humans - Spasms and stiffness in your jaw muscles, stiffness of your neck muscles, difficulty swallowing, stiffness of your abdominal muscles, painful body spasms lasting for several minutes

- c. Transmission: Contamination of wounds with soil or foreign bodies carrying *C. tetani* spores
 - d. Animal Management: Animals are vaccinated for tetanus prior to entering the herd.
- 3. Contagious Ecthyma (Orf)
 - a. Organism: Parapoxvirus
 - b. Clinical Signs:
 - i. Animals – vesicles and scabs around the mouth, and nostrils of lambs, or on the udder and teats of milking females.
 - ii. Humans – Skin blisters, pustules and scabs which usually resolve on their own, but secondary bacterial infection may occur.
 - c. Transmission: Direct contact with skin lesions of infected animals or contaminated environment.
 - d. Prevention: Wear gloves when in contact with infected animals or their environment. Maintain dedicated clothing (e.g. coveralls and boots) and equipment when working with infected animals (Clothing and equipment may act as vector to spread infection to other areas).
 - e. Animal Management: Animals are vaccinated for Orf prior to entering the herd.
- 4. Coxiellosis (Q Fever)
 - a. Organism: *Coxiella burnetii*
 - b. Clinical Signs:
 - i. Animals – Asymptomatic or may cause abortion.
 - ii. Humans – Acute fever, headache, weakness, fatigue, pneumonia, hepatitis, heart valve infection, or may be asymptomatic.
 - c. Transmission: Inhalation or accidental ingestion following exposure to placenta, amniotic fluid, milk or urine.
 - d. Prevention: Wear gloves when in contact with placenta or amniotic fluid, wash hands after handling animals or being in their environment. Do not drink raw, unpasteurized milk. Wear N95 respirator during procedures that could aerosolize organism (e.g. changing bedding).
 - e. Animal Management: Animals are tested semiannually for Q Fever.
- 5. Gastrointestinal Infection
 - a. Organisms: *Salmonella* spp., *Escherichia coli* (e.g., O157:H7), *Campylobacter* spp., *Cryptosporidium parvum*.
 - b. Clinical Signs
 - i. Animals – Diarrhea.
 - ii. Humans – Diarrhea, nausea, vomiting, abdominal pain.
 - c. Transmission: Accidental ingestion of fecal-contaminated materials.
 - d. Prevention: Good personal hygiene, wear gloves when working with animals with diarrhea and wash hands after removing gloves and before leaving the animal facility.

ANIMAL CARE PROGRAM

Healthy animals are less likely to transmit diseases. URI's comprehensive animal care program includes selection of the source of animals, quarantine of newly arrived animals where appropriate, preventative health programs and treatment of sick or injured animals. Where possible, animals are obtained from disease-free colonies or herds.

SAFE WORK PRACTICES

1. Good Personal Hygiene
 - a. Wash hands after working with animals or animal products and when leaving animal facilities.
 - b. Do not eat, drink, or use tobacco products in animal facilities.
 - c. Keep hands away from your mouth, nose, and eyes.
2. Personal Protective Equipment (PPE)
 - a. Use proper PPE for work setting as appropriate (e.g. coverall, facemask, boot covers). Maintain dedicated protective clothing and footwear while working with animals or in animal facilities. Do not wear protective clothing outside of animal facility or to other facilities.
 - b. Wear disposable gloves during procedures that increase the likelihood of exposure to zoonotic agents (e.g. handling animals, fecal material, saliva, bedding). Also wear disposable gloves for handling sick animals, or contaminated surfaces and/or equipment.
 - c. Use disinfecting boot dips as applicable.
3. Animal Care
 - a. Isolate sick or infected animals.
 - b. Handle and care for sick or infected animals last.
4. Cleaning and Disinfection
 - a. Maintain clean, dry, and uncluttered animal areas and workspace.
 - b. Disinfect laboratory work surfaces after each use and after any spills when working with animal products. Use only disinfectants approved by facility managers.
 - c. Dispose of deceased animals, animal products, items contaminated by animal products, contaminated bedding, and laboratory waste in a facility approved manner.
5. Proper Sharps Handling
 - a. Work only with one uncapped needle at a time and immediately dispose after use in sharps receptacle.
 - b. Avoid recapping needles whenever possible.
6. Medical Attention
 - a. Students: Contact URI Health Services (874-4763) for medical evaluation if you suspect any exposure, or if you develop any symptoms associated with infection with zoonotic agents (e.g., fever, malaise, diarrhea, abdominal pain). Alternatively, see your own personal health care provider if any injury or potential exposure to a zoonotic agent occurs.
 - b. Employees: Contact URI Environmental Health and Safety if you suspect any exposure, or if you develop any symptoms associated with infection with zoonotic agents (e.g., fever, malaise, diarrhea, abdominal pain). Alternatively, see your own personal health care provider if any injury or potential exposure to a zoonotic agent occurs.
 - c. Notify the principal investigator or supervisor AND URI Environmental Health and Safety by completing an accident and injury report, http://www.uri.edu/publicsafety/EHS_incident_reporting_form.html

REFERENCES

Cornell Center for Animal Resources and Education.

http://www.research.cornell.edu/care/documents/OHS/zoonosis_information_sheet_small_ruminants.pdf