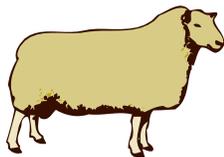


Health and Safety Information for Staff Working with Sheep and Goats, including body fluids or tissues: Q Fever and other Zoonotic Disease Risks



Zoonotic diseases are a potential risk with many farm animals and can be a hazard when working with goats or sheep, including their body fluids or tissues. This information sheet is designed to provide staff working with goats, sheep, or their body fluids/ tissues:

1. Awareness of potential disease risks
2. Exposure preventive measures
3. Symptoms of infection
4. Post-exposure procedures

Q-Fever: Q fever is a zoonotic disease caused by *Coxiella burnetii* (*C. burnetii*). It is most commonly associated with sheep, goats, and cattle. This organism is highly infectious and remarkably resistant to drying, heat and many common disinfectants. A single *C. burnetii* organism may cause disease in a susceptible person. Q fever can cause acute or chronic illness in humans, who usually acquire infection after contact with infected animals or exposure to contaminated environments.

- *Symptoms:* In most cases Q -fever causes flu-like symptoms that usually resolve within 2 weeks and is sometimes misdiagnosed as the flu. The acute symptoms caused by infection with *Coxiella burnetii* usually develop within 2-3 weeks of inhalation exposure, although as many as half of humans infected with *C. burnetii* do not show symptoms. Symptoms can appear in 24-48 hours in people who have accidentally inoculated themselves with the pathogen.

The following is a list of symptoms commonly seen with acute Q fever. However, it is important to note that the combination of symptoms varies greatly from person to person.

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|---------------------------------|------------------------|
| ○ high fevers (up to 104-105°F) | ○ non-productive cough |
| ○ severe headache | ○ nausea, vomiting |
| ○ general malaise | ○ diarrhea |
| ○ myalgia (muscle aches) | ○ abdominal pain |
| ○ chills and/or sweats | ○ chest pain |

Although most healthy persons with acute Q fever infection recover, the elderly or immune compromised individuals may experience serious illness with complications that may include pneumonia, hepatitis (inflammation of the liver), myocarditis (inflammation of the heart tissue) and central nervous system complications. Pregnant women who are infected may be at risk for pre-term delivery or miscarriage. Treatment with the correct antibiotic may shorten the course of illness for acute Q fever. Acute Q fever is rarely fatal.

Q fever can also become chronic and cause significant health problems. Chronic Q fever occurs in <5% of acutely infected patients and is associated with a high mortality rate. It may present soon (within 6 weeks) after an acute infection, or may manifest years later. The individuals at highest risk for chronic Q fever are those with:

- immunosuppressed conditions
- heart valve defects
- vascular grafts
- arterial aneurysms
- pregnancy

Endocarditis is the major form of chronic disease, comprising 60-70% of all reported cases. Patients with endocarditis require early diagnosis and long-term antibiotic treatment (at least 18 months) for a successful outcome. Other forms of chronic Q fever include aortic aneurysms and infections of the bone, liver or reproductive organs, such as the testes in males.

C. burnetii has the ability to persist for long periods of time in the host after infection. Although the majority of people with acute Q fever recover completely, a post-Q fever fatigue syndrome has been reported to occur in 10-25% of some acute patients. This syndrome is characterized by constant or recurring fatigue, night sweats, severe headaches, photophobia (eye sensitivity to light), pain in muscles and joints, mood changes, and difficulty sleeping.

- **Mode of Transmission:** Human are susceptible to the disease and infection may occur by exposure to infectious aerosols, ingestion, or accidental parenteral inoculation (e.g., needle stick). The infectious organisms are shed in the urine, feces, milk and, most importantly, birth products (placenta, amniotic fluid, blood and soiled bedding) of infected animals. Transmission usually occurs by inhalation of these organisms from air that contains airborne dust contaminated by dried placental material, birth fluids, and/or excreta of infected herd animals. Infection may also occur in facilities processing infected animals or their by-products and in necropsy rooms. Direct transmission by blood or bone marrow transfusion has been reported. Person-to-person transmission is rare.
- **Prevention:**
 - ✓ **Engineering controls.** All activities with infectious material should be conducted in a biological safety cabinet (BSC) or other appropriate primary containment device in combination with personal protective equipment.
 - ✓ **Wash your hands.** The single most effective preventive measure is thorough, regular hand washing. Wash hands and arms after handling animals or tissues, and before eating, drinking or smoking. Cover open cuts or scratches with waterproof dressings.

- ✓ **Wear gloves.** Wear appropriate gloves for the task. Wash hands after removing gloves.
 - ✓ **Wear protective clothing.** Protective clothing may include laboratory coats, smock, aprons, or coveralls, and dedicated work shoes. They should be changed daily and should not be worn outside of the work environment. Eye and face protection should be used during procedures with high risk for droplet contamination or splashing.
 - ✓ **Wear respiratory protection.** Respiratory protection may be required for some activities such as dust or aerosol-generating tasks, assisting births, surgical procedures, cleaning or changing air filters. Respirator use requires clearance through EH&S.
 - ✓ **Safety Sharp Precautions.** The use of needles, syringes, and other sharp objects should be strictly limited; follow safety sharp precautions.
 - ✓ **Waste Disposal.** Careful disposal of infected tissues and waste, especially birth products, will reduce risk for transmission.
 - ✓ **Tell your physician you work with research animals.** Whenever you are ill, even if you do not think the illness is work-related, inform your physician that you work with sheep, goats, or their tissues. Many zoonotic diseases have flu-like symptoms and would not normally be suspected if your physician is unaware of your work. Your physician needs this information to make an accurate diagnosis.
 - ✓ **Additional Controls.** Never eat, drink or smoke in the animal/lab areas.
- **Medical Screening:** Refer to Attachment A for recommended medical screening prior to starting work with sheep, goats, or their tissues. For questions regarding screening, contact the EH&S Occupational Health Nurse at 858-534-8225 or UCSD Center for Occupational and Environmental Medicine (COEM) at 858-657-1600 or 619-471-9210.

A vaccine for Q fever has been developed and has successfully protected humans in occupational settings in Australia. However, this vaccine is not commercially available in the United States.

- **First Aid for Accidental Exposures:**
 - Wash exposed skin areas with soap and water for at least 15 minutes
 - For eye exposures, flush with large amounts of water for at least 15 minutes
- **Reporting Accidental or Suspected Exposures:** Refer to “What to Do if a Work-Related Injury, Illness, or Exposure Occurs”: <http://blink.ucsd.edu/safety/occupational/reporting.html>
 - Promptly notify your supervisor and complete the on-line incident report
 - Seek medical evaluation promptly (instructions on above Blink page)

Contagious Ecthyma: (Orf) This pox viral disease is known as contagious ecthyma or soremouth in sheep and goats, and orf in people. In ruminants, it is evidenced by exudative (oozing) lesions found on the muzzle, eyelids, oral cavity, feet or external genitalia. It is more common in younger animals. The disease in ruminants is contagious to humans and other animals. Infected sheep or goats are the source of infection to people. Transmission can be by direct contact with lesions or indirectly by contaminated fomites (hair, clothing). No person to person contact has been reported. This is a self-limiting infection, which is usually found on the hands and consists of painful nodules (bumps) and cutaneous ulcerative lesions, and usually lasts 1-2 months.

Rabies: Rabies virus (rhabdovirus) can infect almost any mammal. The source of infection to people is an infected animal. The virus is shed in saliva 1-14 days before clinical symptoms develop. Any random-source (animal with an unknown clinical history) or wild animal exhibiting central nervous system signs that are progressive should be considered suspect for rabies. Transmission is through direct contact with saliva, mucus membranes, or blood, e.g. bite, or saliva on an open wound. The incubation period is from 2 to 8 weeks or even longer. Symptoms are pain at the site of the bite followed by numbness. The skin becomes quite sensitive to temperature changes and there are laryngeal spasms. Muscle spasms and extreme excitability are present and convulsions occur. Rabies in unvaccinated people is almost invariably fatal. If you will be working with wild-caught animals or animals suspected of being infected with rabies, contact the EH&S Occupational Health Nurse at 858-534-8225. Rabies vaccine is available through UCSD Center for Occupational and Environmental Medicine.

Other Diseases: There are other diseases that are associated with contact to sheep or goats, such as *brucellosis*, *salmonellosis*, *campylobacteriosis*, *coccidiomycosis*, *cryptosporidiosis*, *giardiasis* and *anthrax*. In humans, these diseases cause an acute gastrointestinal illness (nausea, vomiting, and diarrhea), respiratory illness, and/or skin rashes. Good personal hygiene and the wearing of the appropriate personal protection are effective measures for preventing illness.

Allergies: Animal related allergies are common. Although there are no known sheep allergens, the sheep containment environment may have allergens present in hay and dust. Contact dermatitis can also occur when handling sheep wool.

Potential Injury:

- **Sheep:** Sheep are large domestic animals that are normally docile. However, they can become dangerous especially when isolated from their flock. Jumping is common in sheep and they can jump with enough force to break a handler's legs. Butting is another defensive activity of sheep, and the rule of handling is to never turn your back on the animal when in their pens.
- **Goats:** Goats are more difficult to handle than cattle or sheep. They do not flow through handling systems with ease. When they are frightened, they may lie down and sulk and pack in a corner, risking injury to other goats. They can also become aggressive towards each other. They move in family groups with the older females moving first. Their defense mechanisms are to ram or bite. They may need higher gates than sheep and will find escape spots in most handling systems if they exist.
- **Ergonomic Injuries:** Strains of the back or extremities can occur from handling and restraining sheep or goats due to their size, strength and/or agility. Individuals with pre-existing back or joint problems may need assistance when working with sheep.

Environment Health and Safety (EH&S) Contacts:

- Biosafety: ehsbio@ucsd.edu
- Occupational Health: EHS_OHN@ucsd.edu

References:

Centers For Disease Control: <http://www.cdc.gov/qfever/>

Diagnosis and Management of Q Fever – United States, 2013: Recommendations from CDC and the Q Fever Working Group; MMWR, March 29, 2013/62(RR03); 1-23:
<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6203a1.htm>

Public Health Agency of Canada, Pathogen Safety Data Sheet:
<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6203a1.htm>

UC Davis, Zoonoses Information By Species:
<http://safetyservices.ucdavis.edu/ps/occh/acuohp/pem/zis/zoonosisInformationSpecies>

UC San Francisco, Working Safely with Animals:
<http://www.iacuc.ucsf.edu/Safe/awOhsSheepGoat.asp>

APPENDIX A

Occupational Health Surveillance for Contact with Goat or Sheep: Animals, Blood, Body Fluids, or Tissues

Type of Contact	Medical Screening/Surveillance*
Animal Husbandry/Veterinary care activities	Baseline & annual exam (ACP exam); baseline & annual Q Fever titers; N95 respirator clearance
Presence in facilities where animal care is conducted (including ancillary personnel such as maintenance or HVAC workers)	Baseline Occupational Health & Safety Enrollment (OHSP); baseline & annual Q Fever titers; N95 respirator clearance
Procedures with pregnant animals or their fluids/tissues, or with female reproductive tissues.	Baseline Occupational Health & Safety Enrollment (OHSP); baseline & annual Q Fever titers; N95 respirator clearance if work is not done in biosafety cabinet
Procedures with non-pregnant animals or their fluids/tissues, excluding reproductive tissues, if <u>not</u> tested negative for Q Fever	Baseline Occupational Health & Safety Enrollment (OHSP); baseline Q Fever titers; post-exposure Q Fever titers; N95 respirator clearance if aerosol-generating procedures are not done in biosafety cabinet.
Procedures with non-pregnant animals or their fluids/tissues, excluding reproductive tissues, if tested negative for Q Fever	Baseline Occupational Health & Safety Enrollment (OHSP); post-exposure Q Fever titers; N95 respirator clearance if aerosol-generating procedures are not done in biosafety cabinet.

*NOTE: All staff will require Q Fever education to include:

1. Explanation of disease and symptoms
2. Modes of transmission
3. High risk conditions (e.g., valvular heart disease or vascular grafts, immunocompromise, pregnancy, arterial aneurysms)
4. Medical screening/surveillance requirements
5. Reporting suspected exposure/symptoms
6. Post-exposure procedures