

Zoonoses Associated with Small Ruminants and Camelids

This document provides information on various diseases that can be passed from sheep, goats, llamas, alpacas and camels to humans. Often these diseases do not make the animal appear sick but can cause serious illness in humans. Persons with specific medical conditions such as a chronic illness, immunodeficiency and pregnancy may be at higher risk of developing disease or complications from a zoonotic disease and should consult with their physician before working with animals. The diseases associated with small ruminant animals include rabies, orf, ringworm, Q fever, chlamydiosis, leptospirosis, campylobacteriosis, salmonellosis, yersiniosis, listeriosis, pathogenic *E. coli* infections, cryptosporidiosis and giardiasis.

Tuberculosis and brucellosis are potential zoonoses in ruminant animals but due to a federal eradication program for *Mycobacterium bovis*, *Brucella abortus* and *Brucella melitensis*, these diseases are rare in the United States except in a few areas where they persist in a wildlife reservoir. *Brucella ovis*, the primary cause of brucellosis in sheep, does not cause disease in people. Rabies is a fatal viral infection that can be transmitted by bites and mucus membrane exposure from an infected animal. Domestic animals can be infected from contact with wildlife such as bats, skunks, and raccoons. Infected animals often exhibit neurological symptoms and unusual behavior. Rabies is rare in the Pacific Northwest but if a person is bitten or has salivary mucus membrane contact from a suspect animal, the animal should be tested for the rabies virus. If exposed, persons should seek post-exposure rabies prophylaxis from a medical professional. Orf or contagious ecthyma is a viral infection that causes red raised skin lesions around the face and mouth of young animals and the udder on nursing females. Humans can be infected and develop similar pox-like lesions if they come into direct contact with an animal's lesions. Dermatophytosis is a fungal skin infection commonly known as "ringworm" seen in both animals and people as scaly round areas of hair loss. Transmission of both ringworm and orf are by direct contact with an infected animal.

Q fever, *Chlamydophila psittaci* and *Chlamydophila abortus* are agents associated with abortion in pregnant sheep, goats and camelids but may be also carried by normal animals. There is an especially high concentration of these agents at the time that the animals give birth, so particular care needs to be used in handling new born animals, placental tissues and birth fluids. These agents can be acquired by exposure to placental membranes and fetuses from infected animals and by aerosol. *Chlamydophila* infections in pregnant women are associated with infectious abortion or miscarriage. Persons who are pregnant, have valvular heart disease or other chronic disease conditions should consult their physician before working with pregnant or birthing sheep, goats or camelids.

Leptospirosis causes reproductive failure, liver and kidney disease in small ruminants and is typically shed in the urine of infected animals. People acquire the infection by oral ingestion and contact with contaminated urine, placenta, and fetal tissues. The organism can infect through abraded skin. Salmonellosis, campylobacteriosis, listeriosis, pathogenic *E. coli* infections, yersiniosis, cryptosporidiosis and giardiasis are acquired by contact and oral ingestion of fecal material from infected animals. Animals infected with these diseases typically have diarrhea but some animals may show no symptoms of disease. Any animal with diarrhea should be suspect of having a zoonotic disease.

Individuals with exposure to animals and animal environments may develop allergic reactions to animal proteins (allergens). Approximately 20-30 percent of individuals working with laboratory animals will develop an allergic reaction to animal proteins and 5-10 percent of individuals will develop asthma. Personnel may be exposed to allergens through inhalation and contact with skin, eyes and mucous membranes. Animal allergens may be present in animal dander, hair, wool, skin, urine, saliva, serum and any contaminated feed or bedding materials. Risk factors for developing an allergic reaction include history of previous allergies to animals. The signs and symptoms of an allergic reaction are nasal discharge and congestion, conjunctivitis, tearing and eye itching, skin redness, rash or hives and lower airway symptoms (coughing, wheezing and shortness of breath). Individuals with symptoms suggestive of an allergic reaction related to a workplace allergen should report their concerns to their supervisor and consult a physician.

Transmission of zoonotic diseases from animals is primarily by direct contact, contact with contaminated bedding or materials, oral ingestion or inhalation of aerosolized fluids. We can protect ourselves from most injuries and diseases by using the following procedures:

- Handle animals safely to avoid injury.
- Do not eat, drink, apply makeup or use tobacco products while handling animals or in animal housing areas.
- Wear gloves when handling ill animals, animal tissues, body fluids and waste and wash hands after contact.
- Wear dedicated protective clothing such as a lab coat or coveralls and shoe-covers or boots when handling animals. Launder the soiled clothing separate from your personal clothes and preferably at the animal facility.
- Wear respiratory protection when appropriate.
- Keep animal areas clean and disinfect equipment after using it on animals or in animal areas.

Most importantly, familiarize yourself about the animals that you will be working with and the potential zoonotic diseases associated with each species. If at any time, you suspect that you have acquired a zoonotic disease, inform your supervisor and seek medical care.

If you have further questions call University of Idaho Contacts:

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