Q-Fever
Precautions and Risks
Q-fever is a disease caused by a microorganism called Coxiella burnetii. It can be acquired by exposure to placental membranes and fetuses from infected sheep, goats and cattle. There may be high levels of pathogenic organisms in these animal tissues when they give birth, so particular care needs to be used in handling pregnant and newborn animals. It should be noted that the bacteria can become airborne, particularly during births and cleaning of birthing areas. This would include the placenta, amniotic fluid and blood or soiled bedding. Special precautions and PPE (personal protective equipment), including respiratory protection, are warranted in these high risk situations. The microorganism is also shed in the milk, feces and urine. In addition, individuals who handle young sheep, goats or calves up to 48 hours old are at higher risk for exposure, as are individuals who participate in the routine care of the animals. Standard PPE practices, listed in the Animal Handler PPE Chart have been deemed sufficient for protection in these situations.

Signs of Infection with Q-Fever Organisms
In most individuals, the disease manifests itself as an acute illness which could be mistaken for influenza, including a high fever up to 104-105° F. The fever is accompanied by fatigue, significant muscle aches and pains, and very frequently by a cough. Up to half of the individuals who develop this acute disease will have pneumonia which can be seen on chest x-rays. A large number of people will also develop hepatitis. In most patients the disease is self-limiting and will resolve on its own after 10-14 days.

It is extremely important that, should an employee who works with these animals develop an influenza-like infection, that they inform their physician of their work with animals. Q-fever is something that is not routinely expected and often goes undiagnosed. Rarely, would a person develop a chronic infection with the Q-fever organism. This will happen in less the 1% of infected individuals and manifest itself as endocarditis, which is an infection on the valves of the heart. This is virtually always fatal when it does occur. Over 90% of the people who develop this have some previous problem with their heart valves. Because of this, people who have congenital heart disease, prior valvular heart disease, or who are immunocompromised should not work with infected animals. It is best that these individuals not work with any sheep, goats or cattle.

Women of child-bearing age or who are already pregnant should be aware that there is a risk of this microorganism causing miscarriage or other problems with the human fetus. It is advisable that pregnant women or those planning to become pregnant consult with their physician, and utilize the highest level of PPE when working around sheep even when there are no pregnant, birthing or lactating ewes due to the small risk of exposure to C. burnetii.

ORF
Orf is a contagious ecthyma and is a highly contagious, zoonotic, viral skin disease that affects sheep, goats and some other domesticated and wild ruminants. Contagious ecthyma results from infection by a member of the genus Parapoxvirus, in the family Poxviridae. It is very resistant to disinfectants and
drying, and may persist in the environment for years. Pox-like skin lesions in sheep and goats often occur on the mouth and muzzle, where they can cause anorexia or starvation. Lesions on the udder may result in the abandonment of offspring, and foot lesions can cause transient lameness. The Orf virus, which is found in skin lesion sand scabs, is thought to enter the skin through cuts and abrasions. This virus can be carried by clinically normal sheep as well as sick animals. It can be transmitted by direct contact or on fomites (bedding, equipment, manure, or feed). The Orf virus remains viable on the wool and may be contagious for up to one month after the lesions have healed. Most infections in humans are localized and heal quickly; however, large, poorly healing lesions can occur in people who are immunocompromised.

**Signs of Orf Infection**

Infection with Orf virus is usually confined to the epidermis (top layer) of the skin. Lesions (one to a few) or nodules will often occur on the fingers, hands, or the forearms. Lesions begin as small papules that will become ulcerative in nature. Orf virus lesions typically progress through six stages, each lasting approximately one week. Other symptoms may include a mild fever, fatigue, or local swelling of lymph nodes. Lesions generally range in size from 2-3 centimeters, but can be as large as 5 centimeters. They can be painful but usually resolve on their own without scarring.

It is important to know and understand the risks of exposure to Q-fever and Orf organisms and to follow appropriate procedures to prevent exposure. Review the [Animal Handler PPE Chart](#) for the required PPE that must be used when working with sheep at the University of Michigan. Levels of PPE differ based on relative risk of exposure in certain groups of animals.

Personnel with concerns or questions about risks of working with sheep should contact UM OSEH for more information (647-1143). Please report any health concerns to your supervisor, complete an [Injury & Illness form](#), and report to the UM [Occupational Health Services](#) clinic.