



The Species Specific Educational Resource Team (SSERT)

A Series for Small-Scale Producers and Hobby Owners

Foreign Animal and Zoonotic Disease Information for Small Dairy Goat Enterprises



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Keywords: Dairy Goats, Foreign Animal Diseases of Dairy Goats, Diseases of Dairy Goats

Suspicious Signs of Foreign Animal Disease in Dairy Goats

Zoonotic diseases are diseases that are transmitted from animals to humans. Foreign animal diseases are those that are not currently in the U.S.

Before visiting the section on specific diseases of concern it will be helpful to consider several symptoms of animal disease that may indicate a foreign animal disease. These symptoms occur on several diseases that may appear at the farm level and should be used to create red flags if a reason is not evident. This listing of symptoms is sometimes referred to as the BUDDIES system

- Blisters
- Unusual ticks or maggots
- Death or nonambulatory (downer) animal
- Diarrhea
- Illness
- Eating abnormally
- Staggering

Zoonotic Diseases of Concern

Tuberculosis, TB. The causative agent *Mycobacterium spp.* can be transmitted both ways between humans and goats. Goats

can be tested for TB by a simple skin test performed by an accredited veterinarian. The best prevention for transfer to humans is pasteurization of goat milk. Lesions caused by *M. bovis* in the lungs and lymph nodes of goats are similar to those seen in cattle. The organism may sometimes spread to other organs. Goats are quite resistant to *M. tuberculosis* and *M. avium* infection. TB is a serious debilitating disease of the respiratory system in humans.

Brucellosis. The kind of brucellosis in dairy goats (*Brucella melitensis*) is of a different strain as compared to the brucellosis of cattle. Six species of *Brucella* occur in humans and animals. It is a zoonotic disease that has serious effects on both goats and people. The most frequent exposure to brucellosis comes from unpasteurized milk from infected animals, and also exposure to birth fluids and membranes associated with infected animals. Brucellosis in humans is known as undulant fever because of the recurring fever that comes and goes in humans. It is a serious disease that can be controlled in goats through regular testing and culling of infected animals. The most commonly used protective measure for humans is to pasteurize milk prior to consumption. In many types of cured goat cheese products the brucellosis organism is rendered inactive. *B. melitensis* does not currently exist in U.S. goats, but routine testing and pasteurization of milk is recommended. The bacteria may also be present in the placenta fetal fluids, fetus, vaginal discharges, semen and urine. Wear protective gloves when handling such tissues on the farm. No practical treatment is successful.

Q-fever. This is a zoonotic disease that can be transmitted from dairy goats to humans. It is caused by a bacterium and many times will not cause symptoms in goats themselves, although abortions may occur. In humans, it causes a long-lasting fever and may create conditions for the onset of pneumonia or pregnancy loss in women. Exposure to the animal disease by humans occurs from the inhalation of bacteria from dried remnants of birth tissues, or exposure to birth fluids and tissues through unprotected skin and nasal passages and by consumption of raw milk and milk products from infected goats. People with persistent flu-like symptoms should suggest to their physicians that Q-fever be considered if they work around livestock or consume raw milk. Pregnant women should not have contact with, or should take serious precautions when working around, does at kidding time. Milk should be pasteurized by heating to a minimum temperature of 165° F for 15 seconds.

Anthrax. As a zoonotic disease, anthrax can infect dairy goats and humans. It is caused by a bacteria *Bacillus anthracis*, and although highly communicable it is not highly transmissible among animals. Treatment is possible with antibiotics if started early. Vaccines are available for livestock. Anthrax is usually spread by the animals eating the bacillus spores on plants in grazing areas. The spores remain viable for many years under the right conditions and can multiply rapidly when they enter the body. In dairy goats, sudden death is usually the only sign. Staggering, trembling and difficulty breathing may be seen sometimes. Bloody discharges are sometimes seen. Humans most often become infected by handling infected animals or from contaminated objects. The organism enters via the skin. If one suspects an animal is dying of anthrax, contact your veterinarian immediately. Do not open the carcass of an animal suspected of anthrax.

Rift Valley Fever. Rift Valley Fever is a virus (Bunyaviridae family) that is spread by mosquitoes (and possibly other insects) and by direct contact through coughing and sneezing to ruminants and humans. It is currently not in the U.S. Adult goats have a fever (104 – 106 degrees F), dullness, lack of an appetite for 1 to 3 days, and pregnant does may abort. Kids may have a high fever (108 degrees F), depression, listlessness, lack of an appetite, vomiting, bloody diarrhea, unsteady gait, skin necrosis on the udder or scrotum (also seen in adults), and death within 1 to 4 days. Loss of white blood cells and necrosis of the liver is common. Modified live vaccines are available for non-pregnant animals with immunity lasting up to 2 years in sheep, but use of the vaccine in goats is not reported.

Common Zoonotic Diseases of the Skin

Ringworm. Ringworm is a zoonotic disease that is contagious for both dairy goats (other livestock), and humans. It is caused by a fungus and can be located anywhere on the body. The name comes from the fact that the infection creates a

ring-like circular lesion absent of hair. Humans need to use gloves and protective clothing when treating ringworm in order to minimize risk. Using an antifungal preparation and daily treatment, it will take 2 to 4 weeks for the infection to disappear. The organism may continue to reside in pens and equipment frequently used with goats and other livestock.

Orf or Contagious Ecthyma. Also known as soremouth, orf/contagious ecthyma is a pox-type viral disease primarily seen in young dairy goats and usually associated with a stressful period of time such as weaning or inclement weather. As a zoonotic disease, this condition occurs in humans as well. Precaution should be taken in handling goats suspected of having orf. Gloves and other protective clothing should be worn. Transfer is via animal to animal and animal to human contact. Older animals that have been exposed to the orf virus will develop an acquired immunity and do not show symptoms, although they can be carriers. A vaccine does exist for orf but should not be used unless the disease has already occurred on the small farm. Vaccination will introduce the disease organism to the farm. Orf is highly contagious and readily transferred among pasture mates or through fence line contact. Symptoms include pustules on the lips, muzzle and sometime the ears of breeds with long ears. Less commonly, lesions are seen in the mouth of young kids and on the eyelids, feet, and teats of does. The lesions progress to thick crusts or scabs which may bleed. Orf in the mouths of kids may prevent suckling and cause weight loss, and can infect the udder of the doe, thus potentially leading to mastitis. There is no highly effective treatment method, although antibiotics are sometimes recommended by veterinarians to prevent secondary infections. Topical treatment is not particularly effective and is risky to the humans involved. Preventing management conditions that lead to an outbreak will help in controlling the disease. People who have acquired orf testify that it is uncomfortable and painful.

These U.S. Chronic Contagious Diseases Cause Lifelong Infections in Goats

Johne's disease. Pronounced "yoo nees", this disease has no direct impact on the health of humans, but results in severe loss of productivity in dairy goats, and eventually the loss of life. The symptoms include a severe and persistent diarrhea (goats do not always have diarrhea) and a wasting of body muscle and fat. Ultimately the animal will die. The incubation period for the disease is relatively long which results in the disease being seen primarily in older and mature animals. Because of its impact on production of milk it must be considered a serious threat to the economic well-being of small dairy farmers. A test is available for the disease and consideration should be given to testing new animals brought into the herd. Ask about the health status of any herd from which new animals might be bought.

Caprine arthritis encephalitis, CAE. This is a difficult disease to manage once it is in the dairy goat herd. In kids and young animals, CAE affects the central nervous system (encephalitis) causing paralysis and ultimately death. In adults the arthritis component of the disease causes swollen and stiff joints. With the joints affected, the animals are reluctant to move about in order to eat for production and well-being. The mammary glands may be affected leading to mastitis, hard bag, and reductions in milk yield. Transmission of the disease from adults to kids is generally associated with the birth membranes and suckling the doe. The CAE virus is contained in the milk and colostrum of infected animals. A test is available to determine the level of infection. It is subject to the effects of heat, so pasteurizing milk will prevent it from being carried in the milk fed to young animals. If CAE is present in the herd, the general practice to prevent the spread of the disease is to remove newly-born kids from the mother immediately at birth and to feed heat-treated colostrum (135° F for 1 hour) and pasteurized milk (165° F for 15 seconds) to the kids by hand. Does that show the signs of CAE need to be culled, and this action may lead to significant economic loss. Because this disease is commonly managed within an infected herd through a pasteurized rearing program and by testing and segregation, a realistic option is to cull on a more graduated schedule in order to save good genetics for milk production. It is important to inquire about CAE when purchasing new breeding stock to determine that the source of the stock is free from the disease. Testing can be done prior to the purchase.

Caprine mycoplasma infection. The signs of mycoplasma infection in milk goats are usually seen as arthritis and mastitis, although other changes may occur. Among adult goats these mycoplasmas are not highly contagious. However, in normal kids readily acquire the infection when housed in close confinement with infected kids. In the U.S., disease outbreaks associated with *Mycoplasma mycoides* (LC) have produced high morbidity and mortality in kids. Often, lactating does become infected in the milking parlor because of unsanitary conditions, which result in the introduction of the mycoplasma into the teat canal by the milking machine. Hand milking also can result in the introduction of the mycoplasma into the teat canal if hands and udder are not properly disinfected before milking. Diagnosis is made by culturing the milk with different media and techniques than used for routine milk cultures, so it must be specifically requested. Sanitation and caution in the purchase of does from outside sources are recommended.

Caseous lymphadenitis. This very important infectious disease affects the lymph nodes and results in abscesses, both external and internal, that ultimately burst and can result in poor health, low viability and ultimately the death of the animal. It is a chronic and recurring disease. Animals with internal abscesses often become thin and “poor doing” animals.

Because the lymph nodes are involved, the external abscesses are seen primarily in those areas of the body where the nodes are located. A CL abscess will become relatively large at time of rupture and the resulting pus contains the highly infectious bacteria *Corynebacterium pseudotuberculosis*. Animals with abscesses should be removed from the herd, or at least isolated from other animals. Current recommended treatment is to lance the abscess when “ripe”, catching and disposing of all the abscess contents by burning, treating the wound with an iodine solution, and culling the animal after the wound is healed. The abscess is considered ready for lancing when the top of the abscess becomes devoid of hair and has a soft spot to the touch. Because the abscess is localized, there is no risk to human health by eating the cooked meat. Avoid bringing this disease into the herd by close examination of new animals prior to purchase. Decrease frequency of the disease within the herd by isolating infected animals, hygiene, vaccination and/or culling.

Mastitis. Mastitis may be caused by many classes of bacteria, but two of these, *Staphylococcus aureus* and *Mycoplasma spp.* are considered contagious and usually lifelong infections. In general, mastitis in dairy goats represents a host of contagious and environmental infection sources, but basically bacteria enter the mammary gland through the teat opening and cause an infection which interferes with milk secretion and the production of healthy milk. Environmental mastitis is best controlled through means that protect the teat opening, especially during the time following milking before the natural closure is complete. Keeping the udder and teat ends away from sources of these bacteria will go a long way toward prevention of mastitis. Contagious mastitis would be detected by milk culture. It is important to identify animals that do have evidence of mastitis or where mastitis shows up on tests such as the California Mastitis Test, in order to minimize the transfer of infection to other animals. Does with mastitis should be milked and treated last. It is important to thoroughly clean and sanitize milking equipment, and to dispose of milk from sick does separately. There is evidence that some degree of dry-period treatment of does having had mastitis can be effective in reducing reoccurrence depending on the cause of mastitis. Serious cases of mastitis will destroy the ability of mammary glands to function and therefore produce milk. The loss of an otherwise healthy doe in a small herd results in hardship to the owner. Mastitis is prevented by good milking hygiene and proper milking techniques, teat dipping, proper sanitation of equipment, and early detection and treatment or culling of affected goats.

Scrapie. Mention is made here of scrapie in dairy goats because of the National Scrapie Eradication Program. Scrapie is a fatal, degenerative disease affecting the central nervous system of sheep and goats. It is one of several in the transmissible spongiform encephalopathies grouping which include BSE in cattle, CWD in deer, and Creutzfeldt-Jakob disease in humans.

Although much more prevalent in sheep, a few cases of scrapie have been diagnosed in goats, and much more is currently being learned about the disease in goats through new research. Under the program, both goats and sheep are required to follow a tiered protocol of animal identification and animal movement. Slaughter house monitoring of brain tissue among the more susceptible types of sheep and goats occurs. Suspicious animals on farms are examined by veterinary staff. The disease has a long incubation period and therefore an infected animal will show signs only at an older age.

Some of the symptoms include:

- Intense frequent rubbing against fixed object to relieve itching, hence “scrapie”.
- Subtle changes in behavior or temperament.
- Gait abnormalities such as in-coordination, stumbling, high stepping, swaying.
- Weight loss despite displaying a normal appetite.
- Biting at feet and legs.

Precautions against acquiring breeding animals who are carriers of this disease include:

- Maintain a closed herd to female replacements.
- Through kidding management. Remove placentas and bedding soiled by birth fluids from the kidding areas right away.
- Purchase animals that are from a certified scrapie-free herd.

Additional Foreign Animal Diseases of Concern

Foot and mouth disease (FMD). FMD is not currently present in North America. However, it has the potential to be introduced because of the large numbers of rural people who travel world-wide for business or pleasure. Procedures are in place to prevent the introduction of FMD to the U.S. Many of the signs and symptoms of foot and mouth disease (blisters or open sores around the mouth and lips, and between the toes or on the coronary band of the hoof) are similar to other diseases which are present in the U. S. For this reason, if blisters

or sores are seen, a veterinarian should be consulted. FMD can and will occur in goats of all ages and is of special concern in the U.S. While FMD does not kill most animals outright, its effects on animals never exposed to the virus are severe and animal death can occur because of starvation and secondary exposure to other diseases. In all cases, milk production and growth will be drastically reduced. Foot and mouth disease is a disease of cloven-footed animals and not a disease of humans.

PPR (Peste des Petits Ruminants). PPR is a virus of sheep and goats that is caused by the stomatitis pneumoenteritis complex and Kata. It is closely related to the Rinderpest virus of cattle. It is not currently in the U.S. It is spread through direct contact with secretions by animals or handlers and may live in holding pens for as long as 36 hours. The animals will have a fever for 5 to 7 days, and may have a profuse, often bloody diarrhea, foaming of the mouth, a discharge from the eye, nasal discharge, sneezing, increased respiration rate, and an extended head and mouth when breathing. Pregnant animals may abort. Animals that recover have a severe loss of white blood cells for 10 days. Kids are commonly affected at 6 to 12 months old. It is a sound economic decision to vaccinate in regions where this disease exists.

All states require certain classes of dairy goats to be officially identified on the change of ownership. Be in contact with your state USDA/AHPIS office to learn the rules in your state.

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