

# Bovine Neosporosis

Kurt Rossow, DVM

Department of Veterinary Diagnostic Medicine  
University of Minnesota, St. Paul, MN

*Neospora* is a recently emerging protozoal parasite of cattle. Infection is most often manifested as abortion. This report will review current opinion on the life cycle/transmission, clinical presentation, management and diagnosis of *Neospora sp.* abortion in the bovine.

The life cycle of *Neospora* is unknown but is probably similar to *Toxoplasma gondii*. In toxoplasmosis, a carnivore host passes oocysts in feces. The intermediate host can be infected by consumption of feed or water contaminated with oocysts. Ingestion of tachyzoites or bradyzoites in the tissues of infected animals can also cause infection. The fetus is infected by transplacental migration of the *Toxoplasma* organisms. Experimental and natural transplacental transmission of *Neospora caninum* has been documented in dogs and cats. Transplacental infection has been the only reported route of infection. An oocyst stage for *Neospora* has not been identified. Initial infection with *Neospora* tachyzoites is characterized by invasion of the central nervous system (CNS) and muscle macrophages.

Clinically, infection with *Neospora* is characterized by abortion at 3-8 months of gestation with most abortions occurring at 5-6 months (fetal death and reabsorption has been described in experimentally infected dogs). Abortions can occur sporadically or in storms. Subsequent calves from previously infected cows are usually normal; however, cows with repeated *Neospora* abortions have been described. Gross lesions are nonspecific and the fetus is usually autolyzed. Cows that have aborted appear clinically normal, usually don't have metritis or a retained placenta and continue milk-

ing. Cows that abort have higher antibody titers to *Neospora* when compared to non-aborting herd mates. Occasionally, infected calves are born alive and are recumbent at birth or within a few days. Presenting signs in these calves are hindlimb weakness and paralysis. The prognosis in these calves is poor.

Management to prevent or control *Neospora* abortions should include protection of feed and water from fecal contamination and elimination of domestic and feral animal contact with water and feed. There is no known treatment. Pyrimethamine and trimethoprim are effective in ameliorating *Neospora* infection in puppies, sulfadiazine is effective in ameliorating disease in experimentally infected mice if given early.

Specimens for the diagnosis of *Neospora* abortions should include stomach content and thoracic fluid with fresh and formalin (neutral buffered) fixed brain, heart, skeletal muscle, liver, lung, kidney, thoracic fluid, stomach content, spleen, and placenta. Multifocal, necrotic, non-suppurative encephalitis, mononuclear myocarditis and mononuclear myositis are the characteristic microscopic lesions. An immunohistochemical stain specific for *Neospora* is used to identify the organism in tissue sections. Tissue not fixed in neutral buffered formalin may result in false negative reactions. Serum antibodies to *Neospora* can be detected with an indirect fluorescent antibody test; however, serologic testing is not widely available.

*Neospora sp.* is a major abortifacient of cattle and should be considered as a differential diagnosis for bovine abortion and neonatal calves with rear limb paralysis.