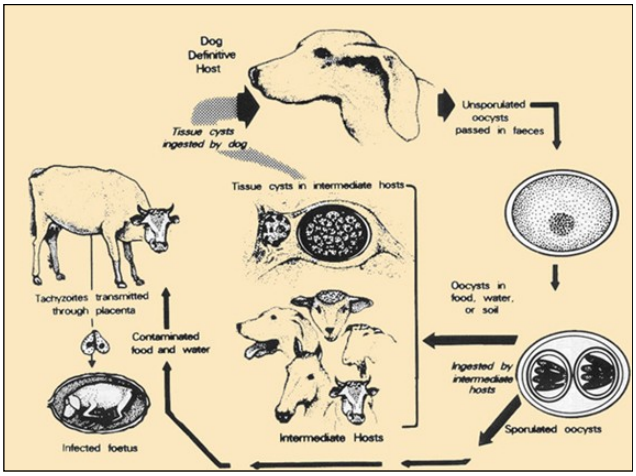
Program Activity Report (PAR)

Serological Surveys on *Neospora caninum*

Neospora caninum is an intracellular, apicomplexan parasite that is similar in many ways to *Toxoplasma gondii*. Both are coccidian parasites, and both produce environmentally resistant, infective oocysts that are passed through the digestive system of definitive hosts as part of a complex reproductive cycle; however, while the definitive hosts for *T. gondii* are felids, the only definitive hosts for *N. caninum* that have been identified to date are canids, including coyotes, domestic dogs, wolves, and dingos. *Neospora caninum* was only first identified in 1988 and the list of canid definitive hosts is likely to increase as additional research is completed.



Serologic surveys and DNA isolation suggest that a large number of domestic and wild mammals are exposed to *N. caninum*, but the parasite has only been successfully isolated from a few species such as cattle, sheep, white-tailed deer, and bison. The primary interest is this organism stems from the isolation of *N. caninum* in cows, where it is the most frequently diagnosed cause of abortion in both dairy and beef cattle. Transmission in cattle is primarily vertical, with positive females passing the infection to calves. Epidemic outbreaks have been documented where > 50% of dairy cows in a herd abort within several weeks of each other, but losses in sporadic or endemically infected herds may be much lower because of an unpredictable recrudescence rate in infected cows. Infected adult cattle generally exhibit no clinical signs. Limited information exists on economic losses associated with *N. caninum*, but one study estimated that the loss in California alone approached $35 million per year and a study in Texas estimated losses to range between $15 and $24 million per year. Economic losses stem from reproductive problems and abortion, loss of milk yield, reduced growth, and impacts on feeding efficiency. In addition to cattle, *N. caninum* can cause clinical disease is dogs, as well as in sheep and goats, although the epidemiologic importance in these species remains unknown.

The NWDP is developing a surveillance project by screening canid samples that have already been collected and are currently held in the Plague and Tularemia Nobuto Archive for *N. caninum* exposure. The large number of samples available will provide a broad-scale analysis of *N. caninum* exposure in canids from across the US and potentially shed light on the links between zoonotic transmission dynamics and cattle. Future surveillance may include paired sera and fecal samples from coyotes, because viable oocysts have not been definitively isolated to date from field coyote samples. Examining exposure in feral swine is also of interest. For more information, please contact Emily Blizzard, Emily.Blizzard@aphis.usda.gov or Sarah Bevins, Sarah.Bevins@aphis.usda.gov

The original artwork on this page was created by the National Wildlife Disease Program's Erika Kampe and Sarah Goff