Infections with the Zoonotic protozoan Toxoplasma gondii during pregnancy can result in severe fetal infections. To investigate the use of pigs as animal models for congenital toxoplasmosis, tachyzoites of 5 T. gondii strains, with low to intermediate virulence in mice, were intravenously inoculated into pregnant minipig gilts. Two strains caused abortions of uninfected fetuses following severe disease of the mothers. One strain caused no disease in the gilts but slightly elevated anti-T. gondii antibodies in 2 of 9 fetuses. One strain produced clinical disease with 4 mummified fetuses and 2 full-term, congenitally infected piglets in 1 gilt and no clinical disease but elevated specific fetal antibodies in both piglets of the other gilt. Infection with the fifth strain (SVS-O14), which was considered apathogenic to both pigs and mice based on the clinical course of this and previous experiments, resulted in significant numbers of congenitally infected piglets, as indicated by production of anti-T. gondii antibodies in all 12 fetuses; the parasite was identified in 3 of these fetuses. This pattern of infection indicates that pigs infected with SVS-O14 (or a similar strain) are relevant animal models for studies of transplacental transmission and pathogenesis of congenital toxoplasmosis.