Single-Dose, Multi-Year Immunocontraception using SpayVac®

Mark Fraker, SpayVac-for-Wildlife, Sidney, BC, Canada

Ursula Bechert, School of Arts and Sciences, University of Pennsylvania, Philadelphia PA

ABSTRACT: Managing populations of certain species such as free-ranging horses (*Equus caballus*) is a significant challenge, with animal-welfare, environmental, sociological, public policy, and economic dimensions. Immunocontraception is a useful tool, but vaccines must have multi-year efficacy to be technically feasible and cost-effective. SpayVac® has demonstrated single-dose, long-term contraceptive efficacy in several species. Grey seals (*Halichoerus grypus*) experienced an 80-85% decrease in fertility for at least 10 years post-treatment. No fallow deer (*Dama dama*) treated with SpayVac became pregnant for 3 years following vaccination. In a field trial with white-tailed deer (*Odocoileus virginianus*), no treated does became pregnant during the first 2 years post-inoculation, and 13% became pregnant during the year 3 compared to 78-100% of control does. A captive trial with white-tailed deer demonstrated contraceptive efficacy of 80–100% for 5 years with a single injection of SpayVac. Mares exhibited pregnancy rates of 0, 17, 17, and 17%, respectively, 1–4 years after treatment with SpayVac, compared to 75-100% for controls. In another study, the fertility rate for treated mares was 13, 47, 43, and 43% compared to 100, 98, 100, and 83% in controls for 1–4 years post-vaccination, respectively. Horses have seven different IgG isotypes, and we recently demonstrated that SpayVac preferentially stimulates production of IgG4/7 antibodies, which may contribute to its long-term immunocontraceptive efficacy. Vaccination methods, long-term population effects of immunocontraception, herd health and nutritional status, and population modeling scenarios should all be considered, when developing vaccination strategies for different species.

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