



# THE WINN FELINE FOUNDATION

For the Health and Well-Being of All Cats

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## *Evaluation of SpayVac™ for Sterilizing Domestic Cats (Felis catus)*

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In recent years, a great deal of research has been focused on new methods for control of stray and feral cat populations. A variety of methods have been used, including inhumane and ineffective options such as poisoning, infection with fatal diseases, and hunting. More humane methods were developed into trap/neuter/return programs. Since domestic cats can have more than one litter each year, their populations have often been quite difficult to control, requiring expensive and labor-intensive efforts.

Recent efforts have been focused on “immunocontraception” as an alternative to lethal methods of control or surgical sterilization. This approach uses various vaccination methods to reduce fertility in male and female cats. Dr. Julie Levy and her colleagues at the University of Florida have evaluated an existing contraceptive vaccine known as SpayVac™. SpayVac™ uses antibodies against porcine (pig) zona pellucida (pZP) to prevent fertilization of the female’s eggs. The zona pellucida is a layer of protein surrounding the egg and it regulates the interaction between sperm and egg. Zona pellucida proteins are not found elsewhere in the body, so that vaccines against these proteins will not have unwanted effects on other body tissues. Vaccination with a ZP vaccine causes antibodies to form and bind to the zona pellucida, thus preventing fertilization of the egg by sperm.

Vaccines containing pZP have already been reported as effective in other species, including hamsters, horses, rabbits, deer, seals, etc. A previous trial evaluated a pZP vaccine in eight cats and found contraceptive potential, although a series of five injections was given.

The goal of this project was to investigate the contraceptive potential of SpayVac™ in cats, including evaluation of antibody levels and a breeding trial. The study used 30 eight to 12-week old cats from a specific pathogen free (SPF) colony. Three intact male cats from the same colony were also used. At the end of the study, all cats were adopted out into private homes.

A single intramuscular dose of SpayVac™ was given to the kittens. Some kittens were given only a dose of an inert vaccine vehicle as a control group. The kittens were then observed for any potential adverse reactions for 48 hours, although none were observed.

At the age of five to six months, the cats were group-housed with males and observed for signs of estrus via videotapes recorded using video monitors. Females were then checked weekly for pregnancy. In addition, antibody titers to the vaccine were measured. Finally, at the time of spay surgery, ovaries were removed and examined.

All the kittens treated with SpayVac™ produced antibodies to the vaccine within four weeks. When the videotapes were examined, all the females showed signs of estrus during the observation period. All cats treated with SpayVac™ and with the inert vaccine vehicle became pregnant within 30 months of treatment. The group of queens treated with SpayVac™ produced a mean of about 4.5 kittens per litter, and the group treated with the inert vaccine vehicle produced a mean of 5.2 kittens per litter. This did not represent a statistical difference.

Although all the treated kittens produced measurable antibody levels after vaccination with SpayVac™, the vaccine was unable to prevent pregnancy or to reduce litter size. Special tests, called immunohistochemical assays, showed that these antibodies did not bind to feline ZP as it was hoped they would. All cats showed signs of estrus, indicating that SpayVac™ did not disrupt normal ovarian function. While a single dose of SpayVac™ has shown efficacy in other species, it was not enough in the cat. For control of feral cat populations, it is not feasible to use an immunocontraceptive vaccine that requires more than one injection.

#### **For Further Reading:**

Gorman SP, Levy JK et al. (2002) Evaluation of a porcine zona pellucida vaccine for the immunocontraception of domestic kittens (*Felis catus*). *Theriogenology* 58(1): 135-149.