

USDA Investigates Feasibility of Combined Rabies-Contraceptive Vaccine

Researchers from the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS), the Navajo Nation and the Centers for Disease Control and Prevention, have shown the simultaneous injection of the GonaCon™ immunocontraceptive vaccine with a canine rabies vaccine in dogs did not affect the development of rabies antibodies. Their research findings were published in an article titled "No adverse effects of simultaneous vaccination with the immunocontraceptive GonaCon™ and a commercial rabies vaccine on rabies virus neutralizing antibody production in dogs," which was published in a recent issue of *Vaccine* (volume 27:7210-7213). These findings could aid in the development of new vaccination programs, as well as a combined rabies-contraceptive vaccine, for use with free-ranging and feral dog populations. USDA hopes to pursue partnerships with industry and others for future development and potential registration.

While canine rabies was eradicated from the United States in 2007, the risk of reintroduction or cross over from wildlife populations is still high in areas with feral and free-roaming dogs. Rabies continues to challenge public health systems in developing countries, especially Africa and Asia, where many of the estimated 55,000 to 65,000 annual human rabies deaths occur. The threat of rabies virus being transmitted to humans from feral and free-ranging dogs increases when the density of dogs exceeds the threshold density of 4.5 dogs/km². Research has shown that this density is the threshold at which canine rabies is maintained in a canine population in a given area.

"The development of an effective and affordable population management tool could go a long way in reducing the potential public health risks due to feral and free-roaming dogs," notes Dr. Scott Bender, veterinarian and researcher for the Navajo Nation veterinary

and livestock program. "The Nation has been working with USDA's wildlife services to evaluate the use of an oral rabies vaccine in feral and free-roaming dogs. The evaluation of GonaCon™ was a natural and logical extension of our mutual research."

USDA researchers at the National Wildlife Research Center (NWRC) collaborated with the Navajo Nation veterinary and livestock program to conduct a controlled study with 18 female dogs. Dogs were divided into three groups of 6 animals each. Group I was vaccinated only with GonaCon™. Group II was vaccinated only with Defensor-3 rabies (Pfizer, Inc., New York, N.Y., USA), a commonly used rabies vaccine. Group III was vaccinated with both GonaCon™ and Defensor-3 rabies. At days 0, 13, 27, 61 and 82, blood was drawn from each animal and rabies antibody titers were compared. Results showed no difference (i.e., no evidence of interference) in mean rabies antibody titers between Group II (rabies only) and Group III (rabies + GonaCon™).

GonaCon™ is a single-shot, multiyear immunocontraceptive vaccine for use in mammals. It is registered by the U.S. Environmental Protection Agency for use in female white-tailed deer. Future NWRC research with GonaCon™ will likely involve studies to support expanded registration to other species, to develop oral delivery systems and to prevent transmission of wildlife diseases.

The NWRC is the research arm of USDA's wildlife services program. It is the federal institution devoted to resolving human-wildlife conflicts. The center applies scientific expertise to the development of practical methods to resolve these conflicts and to maintain the quality of the environments shared with wildlife. To learn more about NWRC, visit its Web site at www.aphis.usda.gov/wildlife_damage/nwrc/.

The Navajo Nation (Tribe) covers more than 28,000 square miles in Arizona, New Mexico and Utah, with a population around 250,000 in 110 communities. Established in 1982, the Navajo Nation veterinary and livestock program provides animal medical services through three agency veterinary clinics. It also provides extension education services; livestock marketing opportunities for livestock producers; veterinary medical, surgical, health, investigation and regulatory services in wildlife medicine; and expertise in the areas of bioterrorism, foreign animal disease and public health.

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