

# Not tonight deer: A new birth control vaccine helps reduce urban deer damage

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A new birth control vaccine for white-tailed deer -- a growing nuisance in urban areas for gardens and landscaping -- eliminates the dangerous reproductive behavior behind the annual autumn surge in automobile-deer collisions. The vaccine, just becoming commercially available in some states, was the topic of a report here today at the 242nd National Meeting & Exposition of the American Chemical Society (ACS).

Named GonaCon™, the vaccine also shows promise for reducing or eliminating some of the undesirable behaviors in household pets and farm animals that have not been spayed or neutered. Among them: scent-marking, fighting, caterwauling and wandering in cats, and aggressive behavior in horses. That's because GonaCon blocks the action of the male and female sex hormones, testosterone and estrogen, that spark such behaviors. It also has potential applications in prairie dogs, wild horses and feral dogs.

David A. Goldade, who reported on the vaccine, said that blocking action is one of GonaCon's multiple advantages over other birth control methods developed to cope with the population explosion of white-tailed [deer](#) in many parts of the country. In addition to the damage to gardens and expensive landscaping plants, deer in [urban areas](#) can attract mountain lions and other predators into residential areas. And on both urban and rural roads, 1.5 million deer-auto collisions kill at least 150 people annually and cause more than \$1 billion in property damage.

"Other [birth-control](#) vaccines using porcine zona pellucida (PZP) also

can prevent deer from producing offspring, but PZP-vaccinated animals still exhibit mating behaviors," Goldade explained. He is with the U. S. Department of Agriculture's (USDA's) Animal and Plant Health Inspection Service/Wildlife Services National Wildlife Research Center (NWRC) in Fort Collins, Colo., where GonaCon was developed. "That opens the door to dangerous situations in which males chase females across the highway. With GonaCon, however, vaccinated deer don't even try to mate," Goldade continued.

Goldade explained that GonaCon blocks a biological signal that triggers [reproductive behavior](#) in deer and many other mammals in temperate areas of the world. As day length decreases in autumn, the reproductive systems in these animals "turn on." Testosterone levels rise in males, and females go into estrus, or "heat." Gonadotropin-releasing hormone (GnRH), produced in a gland at the base of the brain, issues the biochemical orders for increased production of the sex hormones estrogen, progesterone and testosterone. Without GnRH, the body makes little or none of those hormones.

The GnRH vaccine induces the body to make antibodies against its own GnRH, thus destroying the signal for sex and inducing infertility in both males and females. USDA studies with white-tailed deer and other animals — free-ranging California ground squirrels, captive Norway rats, domestic and feral swine and wild horses— established the effectiveness of a single injection of GnRH. The effects in penned white-tailed deer lasted up to five years without a booster vaccination.

To use the vaccine on wild deer populations, the researchers first had to register it with the U.S. Environmental Protection Agency (EPA). One requirement for registration is data on the concentration of the active ingredient, in this case, GnRH. Goldade's team developed a test using a standard laboratory technique called mass spectrometry to do just that.

GonaCon is the only EPA-registered multi-year, single-injection wildlife contraceptive for female white-tailed deer population control, but don't expect to see it on store shelves next to the deer and squirrel repellents. It also has to be registered in a state and must be administered by a USDA or state game and fish department staff member, who captures, tranquilizes and injects deer one by one. So far, only Maryland and New Jersey have approved it for use within their borders.

Provided by American Chemical Society

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