BOTSTIBER INSTITUTE
FOR WILDLIFE FERTILITY CONTROL

FAQ

Frequently Asked Questions

WHAT ARE THE CURRENT TYPES OF WILDLIFE FERTILITY CONTROL?

Besides surgical sterilization, contraceptives for wildlife include hormonal methods, fertility inhibitors such as immunocontraceptives, nicarbazin, VCD (4-vinylcyclohexene diepoxide), triptolide and nicarbazin. *Hormonal methods*, used in zoo animals and livestock, are based on synthetic hormones which bind to hormone receptors and disrupt reproduction. Those tested as wildlife contraceptives include levonorgestrel and quinestrol. *Levonorgestrel* implants, originally approved for human contraception, inhibit reproduction by preventing ovulation or fertilization in several marsupials. Combined with another hormone, *quinestrol*, levonorgestrel has been used as oral contraceptive in many rodent species. *Gonadotropin releasing hormone (GnRH) agonists*, such as *deslorelin*, are proteins that mimic GnRH. Delivered as implants, GnRH agonists, inhibit reproduction in cattle, marsupials, felids and wild dogs. *Immunocontraceptive vaccines* induce antibodies against proteins or hormones essential for reproduction. *GnRH-based immunocontraceptives*, used by the pig industry to prevent "boar taint," generate antibodies to GnRH, thus disrupting the release of sex hormones in males and females. Injectable GnRH-based vaccines induce infertility in deer, wild boar, cats, horses, bison, feral cattle, ground squirrels, prairie dogs, and marsupials. *Porcine zona pellucida (PZP)-based immunocontraceptives* are used in females to prevent fertilization. Injectable PZP-based vaccines prevented reproduction in several deer species, primates, seals, elephants, bears, and marsupials. *VCD* and *triptolide*, orally delivered, impair ovarian and sperm function in rats. *Nicarbazin*, employed to prevent coccidiosis in chickens, also reduces the number of eggs laid and hatched and it is used as an oral contraceptive for pigeons.

HOW ARE CONTRACEPTIVES ADMINISTERED?

This depends on the contraceptive. Some contraceptives are available as oral formulations delivered in baits while others are delivered as injectable drugs administered subcutaneously or intramuscularly by hand or remotely delivered by syringe-darts via a dart rifle, and as subcutaneous implants.

DO CONTRACEPTIVES WORK ON MALES AND FEMALES?

This depends on the contraceptive. In some species, such as deer, GnRH-based contraceptives interfere with the normal antler cycle and should not be used in males. Orally-delivered contraceptives target both males and females.

WHY ARE FEMALES TYPICALLY TARGETED?

In many species both males and females mate with multiple partners. If only males were targeted, a very high percentage of male infertility would be required to reduce population growth.

CAN IMMUNOCONTRACEPTIVES BE USED ON PREGNANT ANIMALS?

When injectable immunocontraceptives are administered during gestation, pregnancy normally goes to term and is then followed by infertility. GnRH-based vaccines do not affect pregnancy when administered to pregnant deer, horses, bison and wild boar. PZP-based vaccines are safe when administered to a wide variety of hooved species, including wild horses, burros, deer, bison, and African elephants.

HOW MANY CONTRACEPTIVE DOSES ARE REQUIRED?

This depends on the species, on the route of administration and on the contraceptive. Injectable immunocontraceptives which are effective after a single dose, may last a lifetime or require re-administration every 1-3 years to maintain infertility. A single levonorgestrel implant maintains infertility in several marsupial species for several years. VCD-based oral contraceptives for rats require several weeks of continuous administration in bait to have an effect on fertility. Contraceptives based on a combination of levonorgestrel and quinestrol require one week of continuous administration to affect rodents' reproduction. Nicarbazin must be delivered to pigeons continuously throughout the reproductive season to maintain infertility.

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CAN PEOPLE CONSUME ANIMALS TREATED WITH CONTRACEPTIVES?

When ingested, PZP and GnRH-based vaccines are digested like any other protein, so they are safe for human consumption. Pigeons treated with nicarbazin are also safe to eat, as this drug is quickly excreted.

DO CONTRACEPTIVES HAVE SIDE EFFECTS ON TARGET SPECIES?

Immunocontraceptive vaccines may cause injection site reaction in some species, similar to that produced by other injectable vaccines. In other species no side effects have been observed. Research on the potential welfare impact of hormonal methods on wildlife is ongoing. No welfare effects have been reported for nicarbazin.

CAN CONTRACEPTIVES AFFECT NON-TARGET SPECIES, SCAVENGERS AND PREDATORS?

PZP and GnRH-based vaccines are digested like other proteins, so they do not pose risks to predators or scavengers. As oral contraceptives delivered in baits may affect non-target species, bait dispensers have been developed for target species. These include rodent-specific boxes and squirrel-specific dispensers, and wild pig-specific and feral pigeon-specific devices.

ARE THERE ANY CONTRACEPTIVES REGISTERED FOR USE IN THE U.S.?

Ovocontrol®, based on nicarbazin, is registered for pigeons. The GnRH-based immunocontraceptive vaccine GonaCon™ is registered for white-tailed deer**,** feral horses, feral donkeys and prairie dogs. The PZP-based immunocontraceptives ZonaStat-H and ZonaStat-D are registered for horses and wild burros (H) and for white-tailed deer (D). ContraPest, based on VDC and triptolide, is registered as an oral contraceptive for Norway rats and roof rats.

ARE OTHER CONTRACEPTIVES REGISTERED INTERNATIONALLY?

Ovocontrol®, based on nicarbazin, is registered for pigeons and other bird species in the US and in Canada. SpayVac® is registered in Canada as a vaccine for animal contraception. EP-1, based on quinestrol and levonorgestrel, is registered in Tanzania for rodents.

HAS FERTILITY CONTROL BEEN USED TO MANAGE WILDLIFE POPULATIONS?

Several elephant populations in South Africa are being managed with PZP-based immuno-contraceptives. PZP- based and GnRH-based immunocontraceptives are also used to manage wild horse, deer and feral livestock populations on public and private lands, military bases, national parks, and islands worldwide. Pigeons are managed with nicarbazin-based contraceptives in many European cities, in Ecuador, Canada, Mexico and Cost Rica, and on chemical plants, power stations, university campuses, hotels, shopping centers and health care facilities. ContraPest, based on VDC and triptolide, has been tested in New York City's subway stations, on US farms, and on Indonesian rice farms. EP-1 has been proven to reduce population size of several rodent species in China and in Tanzania. A single implant of levonorgestrel used in koala and in Eastern Grey Kangaroo populations drastically reduced breeding rates for several years after treatment.

CAN FERTILITY CONTROL TARGET ENOUGH ANIMALS TO REDUCE A POPULATION?

This depends on many factors such as population size, density and reproductive biology of the target species, type of contraceptive and method to deliver contraceptives. The effect of contraception on population size also depends on whether a population is isolated or open to immigration and emigration. Feedback processes, such as increased recruitment, survival rates, and immigration, may compensate for reductions in reproductive output caused by fertility control. Recent mathematical models, developed to compare contraception and lethal control to manage wildlife, suggest that in some contexts, integrating fertility control with culling could be more efficient then culling alone.

IS WILDLIFE FERTILITY CONTROL PUBLICLY SUPPORTED?

Global shifts in public values and attitudes about wildlife in the 21st century are driving innovations towards non-lethal methods, such as fertility control, as an alternative to culling. Opinions vary in relation to wildlife species, local densities and economic or environmental impacts of different wildlife species, and stakeholder groups' attitudes to animal welfare and wildlife control. For iconic species such as elephants, primates, and feral horses, fertility control appears by far the most publicly acceptable method of population control.

For more FAQs and reference information go to **www.wildlifefertilitycontrol.org/faq/**

(10/2022)