BDS position statement on fertility control

The British Deer Society believes that currently-available fertility control technologies are not suitable for the widespread control of free-ranging deer populations in Great Britain.

Options to control fertility of wild deer currently pose serious ethical, health and welfare issues, which must be overcome before the benefits of fertility control can be considered optimal. Major problems associated with fertility control technologies include:

- Hormonal contraceptives can result in the development of significant pathologies, particular in females' ovaries.
- Hormonal contraceptives can be excreted in urine and faeces and persist in body tissues, resulting in environmental contamination and potential uptake by other animals, including humans consuming contaminated venison.
- Treatment of male deer with some fertility control vaccines can lead to failure to shed velvet and continuous growth of antler. This precludes their use on males.
- No fertility control agent can currently be delivered remotely and exclusively to a target species or sex.
- Social behaviour can be altered, including prolongation of the rut and increased risk of injuries between males.
- Consequently, natural social organisation may also be disrupted.

The potential advantages often presented by advocates of fertility control are that such methods reduce the need for lethal control. However, to remove diseased, injured or senescent individuals from a treated population, humane, lethal options will still be required. Further, since fertility control improves the survival of treated females, populations cannot be expected to decline rapidly; they may not grow in size (because fewer offspring are produced), but they will age, resulting in static populations comprising a growing proportion of senescent individuals.

While landowners have the right to decide how to manage deer on their land within the limits of the law, no fertility control technology is currently available for wide-spread use in the countryside that can safely and effectively manage wild deer populations.

The British Deer Society welcomes advances in methods for controlling populations of deer and the impacts they have on human interests and the environment, and is particularly keen to see the highest standards of animal welfare applied when deer are actively managed. We believe it is healthy and progressive to debate the relative merits and demerits of novel approaches to deer management, including fertility control. However, we conclude that significant development is required before any fertility control technology is suitable for deployment beyond very localised and specific applications for the control of deer populations. Moreover, research is required to understand the medium to long-term effects of fertility control on population structure and function, and the effects of treatment on the welfare of all animals (both treated and untreated) within a population.

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Background information

There are four general approaches to fertility control: physical sterilisation, chemical control, hormonal control and immunocontraception.

Ruling out barrier methods of physical fertility control for wild animals, surgical sterilization offers the only means of guaranteeing infertility. Male deer cannot be castrated without causing significant disruption of antler growth. They can be vasectomised; however, the procedures are irreversible and the cost per animal is high since the surgery is delicate and must be undertaken by a veterinary surgeon under general anaesthetic. Since one male can mate with and impregnate many females, the overwhelming majority of males need to be vasectomised before there will be any effect upon population growth.

Some anti-cholesterol drugs have been delivered in feed to supress fertility in prairie dogs and birds, but we are unaware of trials involving deer. Chemical control of fertility requires ongoing, repeated dosing to be effective.

Hormonal contraception involves either the daily consumption of drugs based upon ovarian hormones (comparable with oral contraception in humans) or the injection or implantation of a slow-release device. Several hormone preparations have been demonstrated to supress fertility in a range of mammals, from rodents to primates, including humans. Whether injected or taken by mouth, the environmental persistence of these hormones, and their introduction into the human food chain raises serious human health and ethical concerns.

Immunocontraceptives work by giving the animal an antigen vaccine that induces the natural immune system to produce antibodies to one or other of the important proteins involved in the female reproductive process. Targeted compounds include the *zona pellucida* of the egg and GnRH (gonadotrophin releasing hormone) of the pituitary gland. All are reversible, and some work for several years following a single injection. However, all must currently be injected, many by hand, increasing the cost of deployment within populations. In relation to deer, disruption of reproductive hormone pathways by GnRH vaccines can interfere with antler development: antlers remain in velvet and continue to grow for the duration of treatment. Because of this serious impact on welfare, GnRH vaccines cannot be used to control the fertility of male deer. When they are used on female animals, long term field trials suggest that a healthy but aging population of females emerges because of increased life expectancy. In the short and medium term therefore, immunocontraception cannot be expected to reduce populations. This can only result from an elevation of the population's mortality or emigration rates.

The benefits of fertility control over lethal control may include the facts that no animals are killed by humans except to relieve suffering, and treated animals are likely to live longer. With some forms of control, in which ovarian cycling is suppressed, treated animals are released from the stress of competition for mates and reproduction and from behaviours associated with reproduction e.g. aggression and mounting, are reduced. In other forms of chemical control, and some forms of immunocontraception, treated females continue to cycle and may be repeatedly harassed and mounted by males.

Significant challenges to effective immunocontraception of free-living deer include administering an adequate dose exclusively to females of the target species and ensuring that a sufficient proportion of the female population is contracepted to drive recruitment down. Currently, female deer need to be caught to inject them by hand or darted at close range.

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The problems with fertility control relative to lethal control include: individuals may need to be treated multiple times throughout their lives, treated animals live longer, so population-level effects take longer to appear, some hormone and immunocontraceptive treatments have been associated with localised (injection site) or more distant (ovarian) pathology, natural behaviours may be disrupted including those that maintain social hierarchies, development of secondary sexual characteristics (such as antlers) may be unacceptably impacted.

The challenges for further development of fertility control technologies include: developing preparations that do not negatively affect physiology, welfare, behaviour or current pregnancy, ensuring species specificity, improving efficacy (none currently renders all treated individuals infertile), development of novel methods for targeted, remote delivery, development of treatments that work for one sex or the other.

Further reading

Green, P. 2007. Can contraception control deer populations in the UK? The Deer Initiative, Chirk. http://www.thedeerinitiative.co.uk/pdf/contraception-and-wild-deer-control.

Massei, G. and Cowan, D., 2014. Fertility control to mitigate human–wildlife conflicts: a review. Wildlife Research, 41(1), pp.1-21.