



Pet Overpopulation: A Global Crisis

Ironically, the principal problem facing domestic cats and dogs is their ability to reproduce an exponential number of offspring. Having long since been removed from the wild and the pressures of natural selection that once limited their population, more puppies and kittens now survive to become sexually mature and reproduce.

We now bear the responsibility for this state of affairs. For thousands of years we have chosen to breed our companion animals, especially dogs, to serve our human needs. They have essentially ceased to be wild and have become dependent on humans for survival.

In many ways, we are accepting and passionately acting on our responsibilities. The vast majority of people now consider their companion animals as “family members”,¹ with significant attachment to them as domestic pets. In a 2001 study, it was found that many people would not trade their dog even if offered a million dollars or more, and if the care of their animal was guaranteed. This confirms that for many people pets are seen as family members rather than possessions.² If pets are indeed members of our family, what is the scope of our problem and how do we find a solution?

The Size of the Problem

In the US alone, 30 million puppies and kittens are born each year. This is a ratio of seven pets born for every human birth. At this rate, there will simply never be sufficient available homes for all those loving companion animals. Estimates now suggest that only one out every 10 animals born will find a permanent home.³

The current estimate of homeless dogs worldwide is over 500 million,⁴ with the number of homeless cats likely even greater. In the United States, approximately six to eight million dogs and cats enter shelters annually, from which they are either adopted into new homes, re-united with their families or euthanised.⁵ It is estimated that, of these animals, only 24.9% of dogs and 23.4% of cats in shelters are adopted each year.⁶ The remaining animals are either housed in no-kill shelters or euthanised. According to the Humane Society, three to four million animals are euthanised due to the lack of adoptive homes. In light of these figures, overpopulation is the number one killer of companion animals in the United States.

According to a study performed by the University of Appalachia (North Carolina), one unaltered female dog and her offspring can produce 67,000 puppies in a six-year period. Being an induced ovulator, combined with the ability to birth two to three litters per season, the statistics are even more dramatic in cats. In a seven-year period, one female cat and her offspring can produce a staggering 370,000 kittens.⁷ Unaltered males, especially cats, obviously have the capacity to reproduce an immeasurable number of offspring.

A Global Issue

The 2014 Winter Olympics in Sochi brought worldwide attention to the overwhelming pet overpopulation problem that exists in Russia, with many athletes attempting to bring pets home to their own countries. Russia and the US are not alone, however, with pet overpopulation being a global issue.

Euthanasia as a means of animal population control in countries such as the US, the UK and the EU, is performed in a humane fashion by qualified veterinary staff. In many countries, however, stray dogs and cats are seen as vermin and carriers of disease and parasites. As such, companion animals are often not treated with respect and empathy, and euthanasia techniques are often barbaric and inhumane in nature.

Human Health Consequences

Relinquishment of pets to shelters is also a major contributor for the number of animals entering shelters. A common reason cited by owners for surrendering their dogs to a shelter is behavioral issues, such as biting, which accounts for 26.4% of animals surrendered.⁸ In the US, there are 4.7 million dog bites per year.⁹ It is notable that unsterilised dogs are 2.6 times more likely to bite than sterilised dogs.¹⁰ Thus sterilisation is not only of paramount importance in the management of companion animal populations, but is also a public health and safety issue.

Fear of homeless animals, especially dogs, carrying and spreading diseases to humans is also a very real concern. According to the World Health Organisation, canine rabies potentially threatens over 3 billion people in Asia and Africa, with tens of thousands of people dying from the disease every year.¹¹ The greater the number of stray dogs, the greater is the potential risk posed to human health.

One study in Gabon suggests that dogs can become infected with Ebola. In a 2002 outbreak, after witnessing dogs eating infected dead animals, researchers tested dogs for the Ebola virus. Of the 337 dogs tested, 9 to 25 per cent showed antibodies to Ebola, a sign they were infected or exposed to the virus.¹² As recently as October 2014, a Spanish dog, Excalibur, in Madrid was euthanised due to fear of potentially carrying the deadly virus, Ebola. Excalibur’s owner tested positive for carrying the disease and the dog was euthanised as a preventative measure. In this case, it has not been proven whether Excalibur is infected with Ebola or not, but given the deadly nature of the disease, officials are not willing to take the chance.

Disease outbreaks such as these will put increasing pressure on authorities to control stray dog populations through lethal methods.

A Complex Problem

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creation, and one for which we are morally indebted to find a solution. The complexities of the issue abound, from human health and the potential spread of zoonotic disease to the financial burdens placed on nations globally. Companion animal overpopulation is nothing short of a manmade disaster. Most significantly, however, the ultimate price is being paid by the cats and dogs of the world surviving without a loving home. We owe it to our valued companion animals to find a solution to the problem we created.

An Imperfect Solution: Spay and Neutering Programmes

The current shelter systems of most nations are overwhelmed and ineffective in reducing their pet overpopulation problems. With only a small percentage of the animals that enter shelters being found permanent homes, the majority are left to face euthanasia or long-term confinement within no-kill institutions. Alternatively, stray and feral companion animals are left to fend for themselves, often becoming the victims of abuse and starvation, and potentially becoming sources for the spread of disease.

Euthanasia has become a solution in many countries, which comes at a high price. Not only are the financial burdens to local governments onerous; the moral predicament of systematically and routinely euthanising millions of healthy cats and dogs weighs heavily on societies, which value their companion animals deeply. The veterinary staff and shelter workers who are charged with the task of performing the euthanasia procedures are those most affected. Psychological, emotional and physical illness including ulcers, high blood pressure, unresolved grief, depression, and suicide have been reported among those responsible for the regular euthanasia of companion animals.¹³

It is well accepted and supported that the only long-term effective and humane means of pet population control is through targeted, affordable spay and neutering programmes. Veterinarians are well-known for passionately supporting such programmes, often offering discounted procedures as a way to give back to the community and improve animal welfare for the individual. Organisations such as World Vets run programmes for volunteer veterinarians and technicians to travel to countries such as Nicaragua and Paraguay to perform large-scale spay and neuter programmes. These programmes are to be commended and make a real and lasting difference to the local communities. The inherent limitations to such programmes, however, include their high cost, and the need for facilities, supplies and skilled personnel.

A recent feline trap, neuter, release (TNR) programme, undertaken by the University of Florida, found that a targeted approach helped effectively manage the feral cat population and reduce shelter euthanasia rates in the targeted area. Participants neutered an estimated 54% of the feral cat population in the target area and subsequently reported a 70% decline in animal control cat intake within the study area and a 13% decline in the surrounding areas. Euthanasia rates also declined by 95% in the target area, and by 30% in surrounding areas.¹⁴

In Canada in 2012, a cat overpopulation research initiative was performed by the Canadian Federation of Humane Societies. When asked the question “What would be the best way to deal with the cat overpopulation problem in Canada?” the one overwhelmingly clear recommendation of animal welfare organisations was to ensure that sterilisation (currently spay and neuter surgeries) is affordable and accessible to everyone.¹⁵

The message is unequivocally clear: the most effective solution to companion animal overpopulation is widespread sterilisation. However, the issue with stray and feral companion animals is that execution of widespread surgical spay and neuter programmes are prohibitively costly to local and national governments. The Ontario Veterinary Medical Association of Canada estimates the average cost of a male cat castration to be \$447 and a female cat spay to be \$547. The costs for a male dog castration are estimated at \$571, with a female dog spay estimated to be \$626.¹⁶ Even for pets with homes, the costs associated with spay and neutering procedures can be unaffordable for many owners. Of the animals surrendered to shelters, only 10% are sterilised. This is in contrast with the non-surrendered pet, where over 80% of pets are sterilised.¹⁷

Alternatives to Surgical Spay Procedures

The invention of a non-surgical, affordable means of sterilisation of companion animals would provide a practicable and realistic solution to the global pet population crisis. Such is the need that there is an organisation, Found Animals, which offers a substantial prize for such an invention.

Founded by philanthropist Dr Gary Michelson, Found Animals is a privately funded foundation, which is working to achieve a singular goal - to find a solution to help reduce the number of pets euthanised each year in shelters. Found Animals offers grants to scientists to pursue non-surgical sterilisation technologies for companion animals and will award a \$25M prize to the first entity that agrees to surrender rights to a product that meets its contest criteria.

Not only is there a need for a more cost-effective method of sterilisation, but given the extent of the population problem, a non-surgical method would offer a much more efficient method of sterilisation on a global scale.

Emerging Technologies

With an urgent need for a non-surgical sterilisation procedure, animal health innovators globally continue to search for a solution to the pet overpopulation crisis.

Ark Science recently launched their zinc-based Zueretin™ sterilisation injection for male dogs. The mode of action of Zeuterin™ involves destruction of spermatozoa in all stages of maturation in the seminiferous tubules and in the epididymis. Ark Science have launched the product in the US and are certifying veterinarians in the use of the product through training programmes.¹⁸

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Inc., is currently completing a proof-of-concept study into a novel, drug-based technology for the permanent sterilisation of female mammals. The inventor is Dr Duncan Hockley, Director of the Veterinary Medical Centre of the University of Saskatchewan. The study will measure the effects of multiple potential drug actives at several doses versus a negative control group. The primary endpoint of the study will be a definitive count of all viable follicle types in the ovary, allowing an assessment of immediate fertility as well as reproductive reserves. The aim would be to produce a drug-based means of accomplishing permanent sterilisation in female mammals.

Small Efforts Add Up

As a veterinarian, I am personally aware of the issues facing stray and feral domestic animals. My cat, Oliver, was a tiny four-week-old stray kitten when he was brought into the vet school in Australia where I was a student at the time. He, of course, came home with me and the rest is history. It is a common story, as veterinarians and technicians, that we open our homes to homeless animals in order to avoid the heartbreak of yet another inevitable euthanasia. But the issue of pet overpopulation is far greater than I ever imagined, and it is fair to label it nothing short of a global crisis.

The animal health industry as a whole is a wonderful sector to work in, providing a rewarding and stimulating workplace for thousands of employees worldwide. Whether you are a veterinarian, a sales representative or a shelter worker, our ultimate responsibility is to the animals our industry serves. As a collective group we have the gift to be able to educate the greater public on the issues and responsibilities surrounding pet ownership and the consequences of pet overpopulation. By encouraging people to consider rehoming a pet from an animal shelter, strongly recommending pet sterilisation and supporting new pet owners to avoid relinquishment of pets, we are making a small difference which has the potential to have a major impact on this vast animal welfare issue.

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Tracy Gillett BVSc joined Avivagen Inc, as Marketing and Technical Services Manager in 2011. Since graduating from the University of Queensland, Australia, in 2000 with a Bachelor of Veterinary Science, Tracy spent ten years in small animal practice in Australia and the UK. Following her time in practice she joined Bayer Animal Health as Technical Services Manager in

New Zealand.

A move to Vancouver, Canada in 2011, saw Tracy join the team at Avivagen. Avivagen is a Canadian Animal Health company founded on the discovery of a unique active ingredient, OxC-beta, which supports the healthy functioning of the immune system of both pets and livestock. Avivagen's most recent project involves R&D into a potential non-surgical means of sterilization of female mammals. Tracy enjoys the natural beauty that British Columbia has to offer and lives there with her husband and young son. Email: t.gillett@avivagen.com