

Management of the population of feral cats - castration versus sterilization

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With a worldwide population of 60-100 million, cats who live in the wild [Jessup, 2004] are the most widely spread carnivores [Liberg, 2000 cited by Nutter, 2005]. In the following we refer to these "feral cats" as animals that cannot clearly be allotted to an owner or guardian. Thus they belong to one of 100 listed invasive species [ISSG, 2008], whose existence is a massive potential danger for many ecosystems, habitats and animal species [Feral and unwanted cats, 2006; Loss, Will & Marra, 2013]. The quick growth of social groups of feral cats can lead to a strong reduction of native small mammals and of bird species [Longcore, Rich & Sullivan, 2009; Loss, Will & Marra, 2013]. What at first seems an advantage, because rat and mice populations are strongly decimated, can have serious consequences on islands. The most prominent example is the New Zealand bird Stephan Island wren "xenicus lyalli", who was exterminated by feral domestic cats. [Dickman, 1996]. Also influenced by the high proliferation of feral cats was the population of the Tasmanian long-nosed bandicoot "perameles gunnii" and of the kakapo "strigops habroptilus", a New Zealand parrot species who is unable to fly [Dickman, 1996]. In all the world both animal species are on the "Red List" as "potentially endangered" (Tasmanian bandicoot) and "threatened with extinction" (kakapo) [The IUCN Red List of Threatened Species, 2013].

In urban areas feral cats often live in social groups, what can lead to problems in the cohabitation with humans [Kalz, 2001; Nutter, 2005]. The animals, that otherwise belong to our closest family members, are then regarded as a public nuisance. The reason for that is mainly the strong territorial behaviour of the male cats, who urinate to mark their territory and by that annoy the residents with the repulsive smell. Another nuisance are the cries of the female cats when on heat and the screams of cats fighting for their territory [Nutter, 2005]. Often free roaming domestic cats return home with several wounds, that may cause considerable vet fees for their owners. Due to the fact, that feral cats can transmit numerous fatal diseases to other cats (FIV, FeLV, rabies) and to humans, too (rabies), protective vaccinations of our domestic cats in all the world are required [<https://www.tiermedizinportal.de/therapie/impfungen-bei-derkatze/222222>] (German veterinary portal on therapies and cat vaccines) and cautious interaction between man and animal, especially with rabies in mind, is necessary [<http://www.rki.de/DE/Content/InfAZ/T/Tollwut/Tollwut.html>].

As consequence in many towns two parties form, one consisting of enemies of feral cats and one of lovers of feral cats. Lovers have mercy with the animals and feed them [Nutter, 2005]. Thus, unwillingly, they increase the number of cats in the colony. Enemies on the other hand often try to get rid of the animals, for example by poisoning or by shooting them.

In anticipation of such developments, programs to control the population are carried out, attempting to kill off existing populations or to curtail them. Usually there is a distinction made between lethal and non lethal cat management programs.

Lethal programs include the trapping, shooting, poisoning and hunting with dogs plus the spreading of diseases, that are lethal for cats (feline panleukopenie) [Howell, 1984; van Aarde, 1984; Short et al., 1997]. They aim at the extermination of the entire population [Warburton & Norton, 2009]. On islands, where feral cats can cause great damage, lethal programs are described as the most effective method [Nogales et al., 2003]. In other places such eradication programs are often ineffective, because the human locals bring in new, not neutered domestic cats, who add to the rehabilitation of the feral colonies. [Nutter, 2004]. Lethal programs conflict with the German Animal Welfare Act "Tierschutzgesetz" (tierschg)[<http://www.gesetze-iminternet.de/tierschg/BJNR012770972.html> (website with German law texts and the law for the protection of animals)] and must categorically be rejected. The fact, that lethal programs often kill domestic cats, too, lead to the establishment of non lethal population management programs. They are applied on long terms and are suitable for big populations. Their acceptance by the general public is better.

Non lethal population control programs distinguish between chemical and surgical methods. As the chemical castration in the field still leads to problems and the development of uniform contraceptive vaccines is not mature yet [Levy et al., 2011; Munks, 2012], the castration of both male and female cats still is the method of choice.

In Germany the term "castration" means the surgical removal of the gonads (gonadektomie). Gonads are the male cat's testicles (orchiektomie) and the female cat's ovaries (ovariektomie). According to §6 section 1 of the German Animal Welfare Act of May 18, 2006 [TierSchG, 2006] "the complete or partial removal or the destruction of organs or tissues of vertebrates is prohibited." However the prohibition does not apply, if the surgery is deemed necessary in individual cases due to veterinary indication (§6 sec. 1 no. 1a) or for the prevention of uncontrolled reproduction or ... when castration is effected for the further use or keeping of the animal (§6 sec. 1 no. 5)" [Quotation: Busch, 2011].

Castration in male cats as well as in female cats leads to a decline in the production of hormones, which can be positive for the behaviour of the animal. Animals who have been castrated become calmer and show less or no typical reproductive behaviours any more. Female cats will not be in the heat any more, and the frequent cries connected with that will be prevented. Further advantages of the castration of female cats are the prevention of permanent heat and pseudo-pregnancy, and diseases that are induced by hormones are omitted (like breast tumours, ovarian cysts of the cystic hyperplasia of the endometrium respectively pyometra) [Kalz, 2001]. With un-castrated male cats fighting for female cats in heat, there is the risk that the male, by applying the customary bite into the female's neck during intercourse, transmits classical cat epidemics like FIV (feline immune deficiency virus) and FeLV (feline leukaemia virus). Male cats whose sexual drive has declined thanks to castration only seldom mount cats in heat, which significantly reduces the risk of transmitting diseases [Hamilton, 1969; Tabor, 1983; Kraft & Danckert, 1997 cited by Kalz, 2001]. Sometimes male cats are castrated as a precautionary measure to avoid certain diseases like prostate enlargement and prostate tumours. However these diseases play a minor role [Kalz, 2001]. But castration stops the nuisance of the male cats' spraying of urine in order to mark their territory. This makes the keeping of the animals easier, especially if the cats live in the house as well. But there are also disadvantages of castration. In some cats castration causes a gain of body weight. This is caused by the lower demand of energy the cats have after castration. At the same time the cats who have been castrated roam less, so they need less energy. [Kalz, 2001; Nutter, 2005].

More and more as an alternative method to castration another form of surgical contraception, sterilization is being discussed. Sterilization means the ligation or ectomy of the spermatic duct (of the male cat) or of the fallopian tube (of the female cat). With the gonads remaining in the body, the hormone status of the animal changes only marginally, and behavioural changes are minimized. Consequently female cats will continue to become on heat, and male cats will continue to mark their territory. And with male cats continuing to go searching for female cats in season, their behaviour remains the same of un-neutered cats, and the mating act will be completed [Nutter, 2005; McCarthy, Levine & Reed, 2013]. Sterilization does not prevent diseases. However it prevents the birth of further kittens.

As veterinary surgeons do not offer sterilizations as routine operations, projects have been developed that use computer based models to check the success of sterilizations with regard to a reduction of cat colonies living in the wild [McCarthy, Levine & Reed, 2013]. Density related factors were taken into account: changes of the litter size and frequency, increased immigration, lower age at the first litter and an increasing rate of survival. In comparison with castration sterilization proved significantly more successful. This was confirmed by a field study by Nutter [2005]. With a trapping rate of 75-80% sterilization within two years led to a faster reduction of the colony size of feral cats (53% of the initial population) than castration (73% of the initial population). A control group of intact (not treated = fertile) animals grew to 124%.

The obviously reduced life expectancy of sterilized cats is regarded as the reason for the faster decimation of colonies of sterilized cats. Due to the unchanged hormone status, the male cats have a bigger roaming

radius. In conjunction to that the main cause of death is trauma caused by accidents, which happens far less to animals who have been castrated because of their loyalty to location. [Kalz, 2001; Nutter, 2005; McCarthy, Levine & Reed, 2013]. The continuing territorial behaviour of sterilized male cats is regarded as another reason. Effectively it prevents the immigration of un-neutered cats, so these cannot participate in the re-population of the colony and cannot be detected statistically. However such fertile cats, together with emigrating animals, form new colonies somewhere else [Nutter, 2005]. In addition to that, some vets think, that the continuing heat without any prospect of success can be a burden for the female cat. Ovulation in cats is induced, and female cats can suffer of pseudo pregnancies after mating. However it is still unclear, too, whether that condition has negative effects on the cat's health on the long term. Furthermore diseases like tumours of the mammary glands, pyometrea and the transmission of cat epidemics are not prevented.

Considering the well-being of the animals it must be stated as a conclusion, that the advantages of castration are much bigger than those of sterilization. Cats who have been castrated due to their loyalty to the place where they live have a significantly higher life expectancy and tend to have fewer diseases and to transmit fewer diseases thanks to their sexual behaviour. The reduced metabolic performance because of the missing hormone production and the smaller roaming radius result in a gain of weight of about 40%. In the cat colonies within one year the underweight could be lowered from 54% to 14% [McCarthy, Levine & Reed, 2013].

Unfortunately to this day many people have their domestic cats not castrated or too late. This has fatal consequences especially for the male cats. Without territorial behaviour and without any sexual activities of their castrated con-specifics the un-neutered domestic cats quickly cause the re-population of the colony, because animals who have not been neutered easily find each other. In order to promote animal welfare it is of utmost importance to consequently castrate the animals, in order to prevent reproduction successfully and to avoid the spreading of diseases. Kittens born to female cats who live in the wild have an inexplicable high mortality rate. Up to 75% of them do not reach the age of six months, and 48% of them die before they are 100 days old. As main reasons traumata and respiratory and intestinal diseases are mentioned [Kalz, 2001; Nutter, 2005; McCarthy, Levine & Reed, 2013].

Thus castration is not only an efficient means to reduce huge colonies of feral cats but also the most effective method to prevent the suffering of cats on the long term.

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