Cat Population Control: 
Vasectomize Dominant Males

The Problem
Mature, intact female cats (Queens) are either in heat or pregnant from January to September. Humane shelters and Public Animal Control facilities are besieged with unwanted kittens, of which the majority are destroyed. In 1978 in Sacramento County approximately 15,000 cats were euthanized. The majority was younger than six months. In 1973, 18 million animals were impounded in the United States at a cost of $125,000,000. Of these, 80-90% were euthanized.

Cats pose a unique reproduction problem. Being polyestrous, mature Queens are difficult to keep from sexual activity. Schneider and Vaida (1975) give some interesting statistical data on controlling feline reproduction. They made a 5% random sample survey of households in Alameda and Contra Costa counties in 1970 and found that between 1960-1970, the feline population increased by 66%. Of the total estimated feline population of about 151,000, 64.6% of all Queens were neutered. The age of highest reproductive capacity in Queens is between 1 and 3 years. 74.4% of all feline litters are born during this period.

Although spaying Queens has been advocated by many as a means of controlling excess feline populations, Schneider (1975) concludes that excess kittens could be expected unless 75-80% of all Queens are neutered. So, unless we have 75% spayed Queens, we aren't making any progress in population control. He found that even if 66% of Queens and 52% of the males were neutered, the production of kittens was still almost twice the number that could be placed in homes. For example, by 1975, 75% of the Queens in Alameda and Contra Costa Counties had been spayed, yet in 1975 there were still more than 12,000 cats being overproduced and subsequently euthanized. Spaying and neutering alone, under present conditions, does not totally solve the problem.

Schneider also found that 66% of Queens entering a household as a pet are no longer in that household after 3 years. Only 30% are given away by the owner. What happens to these cats that nobody owns?

Observations of the Reproductive Cycle in Cats
A Queen is seasonally polyestrous and is a spontaneous ovulator, in that she does not shed her eggs from the ovary unless her reproductive tract is properly stimulated by the Tom during mating or a similar mechanical stimulus. (Tom refers to an intact, sexually mature male cat.) Following this reflex-neuronal stimulation, the eggs are shed from the ovary within 25-27 hours. Paape, et al (1975) found that, in the absence of mating, the Queen does not ovulate and experiences a series of heats at approximately 18-day intervals during
the breeding season. They found the heat lasts an average of 7 days, with a range of 4 to 13 days and mating can occur on any day of heat, but matings are more likely to occur on or about the third day. Hart and Voith (1977) came to similar conclusions.

The anestrus female will not tolerate the mating attempts of a Tom more than momentarily and invariably will free herself from the attempted mounting by a male with considerable vigor, spitting, scratching, and biting. Rape by the male does not occur in cats. The experienced Tom awaits the development of full sexual receptivity (estrous) while younger males make several premature mounting attempts and sometimes are bitten and scratched severely. Michael (1961) found that the estrus female is completely receptive to the Tom's coital efforts and doesn't exhibit aggressive refusal. The time between mounting and intromission rarely exceeds four minutes. When intromission occurs, the female emits a loud, piercing cry and within 5-15 seconds frees herself, spitting and scratching. Preliminary experiments now in progress indicate that some male cats distinguish females in heat without attempting to mount, but it is not known yet whether olfaction is needed for discrimination, if mating is fertile, the ensuing pregnancy lasts about 64 days, with a range of 58-69. Jemmett and Evans (1977) found that the sexual activity of the Queen reaches sexual maturity from 9-10 months. They also found that Queens had an infertile estrus within 7-10 days of Queening (birth of kittens), but may have a fertile estrus before weaning her kittens, thus making it possible to have 3 litters per breeding season. This shows there is no validity in the old wives tale that "as long as she's nursing, she can't get pregnant again." Michael (1961) states, as did Bard (1936), no vestige of estrus response in a series of 400 mating tests conducted with 30 spayed females, and mating with intromission never occurred.

Paape et al (1975), and Foster and Hisan (1935), found mating with a sterile (vasectomized) Tom or manual stimulation with a sterile glass rod, will induce false pregnancy in the Queen which lasts about 41 days. The maximum number of pseudopregnancies a Queen can undergo in one breeding season (January to September) was not fully tested, but it appears that 4-5 may be possible. Based on this data, it would seem possible to keep an intact, potentially fertile Queen "out of the kitten business" for the entire breeding season by being bred by a vasectomized Tom every time she came into heat.

Dr. Benjamin Hart at the University of California, School of Veterinary Medicine Cat Colony, observed that one Tom can breed up to five females coming into heat over a two-day period. Hart and Voith's (1977) present work indicates that a sexually mature Tom can maintain normal copulatory activity with less than half of the normal circulating level of testosterone. With castration, testosterone levels drop to almost undetectable levels within 6 hours of the surgery. Hart and Barrett (1973) found that the sexual aggression occurring between male cats is androgen dependent, in that 88% of the fighting declined following castration. Since Toms form a sexual dominance hierarchy based on their aggressive performance, one would need to castrate an extremely high percentage of the male population to make a dent in the excess kitten population. Each time a dominant Tom in a neighborhood is castrated, the next-in-line Tom moves in to take over. However, by vasectomizing the dominant Toms, these Toms will prevent further elaboration on what he calls a "Tom Brotherhood" that exists in neighborhoods. Leyhausen (1973), who has studied free-roaming cats extensively, says a locality, priority dependent hierarchy exists for food gathering and socialization, but an absolute hierarchy exists in relation to sexual prowess such as exists in herding animals. He further elaborates on what he calls a "Tom Brotherhood" that exists as semi-cooperation between dominant Toms that roam in small packs of 2-3 during the mating season. This would correlate with the findings of Cole and Shafer (1966) in a laboratory environment that the dominant cat of any given group was able to successfully dominate the subordinate members of any other group. It is these "top cats" that, according to Leyhausen, are probably responsible for breeding nearly all Queens in a several block geographical area. Carol Haspel, in unpublished data on free-roaming
cats in New York estimates the territory of a feral Tom as one city block.\textsuperscript{27} Using random surveys of cat population densities and geographical data about human occupancy, the number of dominant cats that need to be vasectomized in a given area could be determined. The results within 6 months to a year if less kittens were euthanized and a subsequent increase in the mean age of cats in the area could be compared.

Most wild felids lead solitary lives,\textsuperscript{3} \textsuperscript{24} \textsuperscript{26} \textsuperscript{30} \textsuperscript{44} \textsuperscript{54} with the exception of the lion. The domestic cat seems to favor a solitary existence in the feral state, but will live on a communal basis to utilize a common food source.\textsuperscript{32} \textsuperscript{33} \textsuperscript{34} Domestic and wild felines have developed territorial behavior to reduce intraspecies communications.\textsuperscript{3} \textsuperscript{15} \textsuperscript{35} \textsuperscript{54} This "territory" is actually the paths between points of food gathering, sleeping, mating, and fighting.\textsuperscript{33} \textsuperscript{34} \textsuperscript{35} These paths are marked with urine, feces, and scratching.\textsuperscript{3} \textsuperscript{30} \textsuperscript{54} Because of urban crowding, domestic cats and free-roaming feral cats rely on visual avoidance and threat behavior.\textsuperscript{23} \textsuperscript{25}

Michael (1961), Hart (1977), and Hediger (1950) found the male cat will normally not mate in strange surroundings, but once settled and established in its territory, will show mounting activity towards every estrus Queen presented. This fact is significant if dominant males are to be trapped, vasectomized and released. They should be released in the same spot they are trapped.

Vasectomy—The Procedure

Robinson, et al (1975) suggested using vasectomies in adult male lions as a method of birth control because of the over-population problem in captive lions. Ree and Tennant (1975) described a surgical procedure for African lions. Burke (1977) suggests using vasectomies for fertility control in the cat. Pineda (1976) and Clinton (1972) suggested its use in dogs. Pineda (1978), Pineda (1977), and Freeman and Coffey (1973) suggest a chemical vasectomy in dogs by injecting sclerosing agents into the lumen of the Vas Deferens. This procedure, if possible in cats, would only apply to adult Toms. A simple surgical vasectomy for Toms has been described by Norsworth (1975) and Herron and Herron (1972) to cause minimal surgical trauma. Although they described the surgery for the adult Tom, Dr. Gourly at the University of California School of Veterinary Medicine, says such a procedure could be developed for 8-12-week-old kittens.\textsuperscript{29} Seager and Wildt (1977) describe a five-minute abdominal vasectomy via an operating laparoscope. Dr. Wildt, of Purina Research, said several young kittens were vasectomized in June, 1978, at the Purina Research Center and he will follow up the results in June, 1979.\textsuperscript{37} Dr. Wildt says he has not observed any reduction in sexual aggressiveness in Toms he has vasectomized or 8-12-week-old kittens who reached sexual maturity later.\textsuperscript{37} The laparoscope would provide the easiest procedure in young kittens. The spermatic artery could be entirely avoided by using this abdominal approach. Destruction of the deferential artery, which lies along the vas deferens, does not seem to pose a problem, according to Dr. Wildt. Since there is anastomosis with the spermatic artery, the major blood supply to the testicles, and collateral circulation develops.\textsuperscript{37} Herron and Herron (1972) pointed out in their procedure on adult Toms that the integrity of the deferential artery should be maintained.\textsuperscript{39}

Outline of a Vasectomy Program

A vasectomy program for dominant Toms should be twofold. 1. All male kittens publicly adopted from humane societies and shelters, and municipal animal control facilities should be vasectomized prior to adoption. In California, we need to change the California Food and Agricultural Code #31255, Division 14.5 on regulation of new cats to cover vasectomies rather than neutering males. Funds would be collected in advance of adoption. 2. Free-roaming feral Toms could be trapped and excess monies collected under Code #31255 from deposits not redeemed (presently running over 50% in Sacramento County.\textsuperscript{17} the city of Palo Alto,\textsuperscript{11} and most other cities in California) could cover the cost to vasectomize these cats. All vasectomized cats, both young and old, should be identified by a tattoo number. These numbers would be coded with a computer card giving location, age, date of vasectomy, veterinarian performing the surgery, and sponsor of the released Tom. Population statistics could then be used to verify the effectiveness of the program.

Summary

Schneider's (1975) studies indicate 75-80% of the feline population must be spayed or neutered to bring the supply of kittens in balance with demand by the human population. Mass spaying and neutering of cats has so far proven ineffective in causing this balance to occur because of the tremendous turnover and productivity of feline populations.

Vasectomizing dominant male cats as a means of animal population control provides a fresh solution to an unsolved problem. With cooperation of humane groups, veterinarians, government agencies, and municipal animal control agencies, we can reach a balanced population in cats.

References and Bibliography


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