



Population Control in Bitches



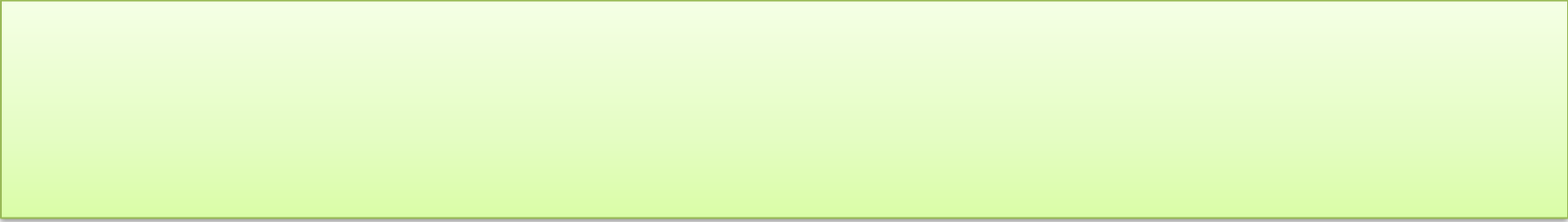
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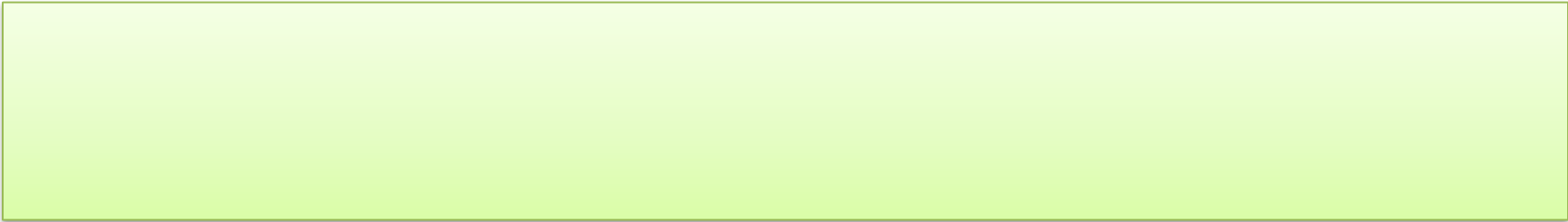
Population control in bitches

- About 75% of the worldwide dogs, often referred to as stray, are free to roam and reproduce.
- Over abundant populations → poor health → low survival rates.
- **Problems caused by free-roaming dogs:**
 - → diseases transmitted to livestock and humans,
 - → predation on livestock,
 - → bites, road traffic accidents,
 - → nuisance behavior such as barking.
- → In Bangalore 64% of dog bites were associated with stray dogs

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- **Zoonoses** → rabies humans and livestock
 - dogs are responsible for human deaths and receive post exposure prophylaxis following a bite
 - The majority of deaths and post bite vaccinations occur in Asian and African countries, which can barely afford this economic burden.
 - Dogs are transmitters of disease, and interbreeding with native species

Population Control

- Public education,
- disease vaccination,
- population management by **fertility control**.
- **Lethal control** → opposed by local communities, nongovernmental agencies, and animal welfare organizations
- Culling has also a social impact, because many free-roaming dogs do have owners that will oppose indiscriminate killing.



→ **Dog population management** → surgical sterilization, often provided as subsidized or free services to dog owners or through catch, neuter, and release of free-roaming dogs.

→ In addition, some dog owners are opposed to surgical sterilization → unnecessary procedure, cost, and behavioral changes as reasons against this method

Contraceptives and sterilants

- → fertility inhibitors or fertility control agents → cost-effective, humane alternative to surgical sterilization.
- → alternatives to surgical sterilization.
- In companion animals, fertility inhibitors are used for preventing reproduction, suppressing nuisance behavior such as spraying, roaming, and aggressiveness.

Contraceptives and sterilants

- **Chemical fertility control** can be achieved through contraception, which prevents the birth of offspring but maintains fertility .
- **By sterilization animals becomes infertile.**
- **GnRH** is one target for fertility inhibitors.
- GnRH controls the release of the pituitary gonadotropins, LH and FSH, which in turn control the production of sex hormones and ultimately ovulation, spermatogenesis, and sexual behavior.
- In males, sterilization can also be achieved by chemicals that cause testicular sclerosis and permanent sterility.

3.1. Hormonal methods

- Several steroid hormones, such as progestins, estrogens, and androgens, have been used as reproductive inhibitors
- block ovulation → achieve contraception
- **Synthetic progestins include megestrol acetate (MA), melengestrol acetate (MGA) and levonorgestrel.**
- MA prevented estrus in 92% of bitches when administered orally for 8 days, starting at estrous cycle (proestrus).
- MA → contraceptive that is very effective for confined companion animals but unsuitable for free-roaming dogs.

3.2. Immunocontraceptives

- Immunocontraceptive vaccines act by inducing antibody production against proteins or hormones essential for reproduction and thus preventing conception.
- The immunocontraceptives most commonly used for wildlife are GnRH-based vaccines and ZP-based vaccines.
- GnRH vaccines target GnRH, thus ultimately preventing ovulation and spermatogenesis;
- ZP-based vaccines inhibit egg– sperm binding and fertilization.

Chemosterilants

- Several drugs have been developed for the sterilization of male dogs.
- Intratesticular sterilants → these are injected in the testes, epididymis, or vas deferens and cause lack of sperm in semen and thus infertility.
- **Zinc gluconate neutralized by arginine** → sterilization of male puppies.
- **Injected into the testicles, this chemical causes sclerosis of the testes and sterility**

- **Neutersol** induced sterilization in 99.6% of the 223 male puppies aged 3 to 10 months.
- **Sedation** is recommended to prevent movements of the dog during injection.
- Unlike surgical castration, **Neutersol** does not involve removal of the testicles so that testosterone is not completely eliminated.

- Zinc gluconate is currently available in Mexico, Colombia, Bolivia, and Panama as Esterilsol and in the United States.
- **zinc gluconate** could be regarded as a permanent sterilant with no observed sign of behavioral alteration or severe discomfort following intratesticular injection.

- **CaCl₂** caused atrophy of the seminiferous tubules and decreased testosterone concentration and sperm count in a dose dependent manner
- Although CaCl₂ did not affect dogs' food intake, chronic stress, or blood parameters, swelling of the testicles persisted for 3 weeks following injection and the behavior of the animals returned to normal (although no definition of normal was provided) a month after treatment .

Novel fertility control inhibitors

- Recombinant vaccines has been used in various animal species to develop novel immunocontraceptive vaccines that could ultimately also be tested on dogs.
- **Recombinant GnRH-based vaccines** → inducing infertility in male and female cats for at least 20 months after administration of two doses (at 0 and 28 days).

Conclusions and recommendations

- The use of fertility inhibitors is gaining acceptance to control populations of companion animals.
- For dog population management, nonsurgical sterilization is increasingly advocated as deserving priority for development because of its potential to be more cost effective than surgical sterilization.
- **The benefits of using sterilization (both surgical and nonsurgical):**
 - Sterilization would decrease diseases transmission.
 - Decrease in dog density is associated with a decrease in bite rates, attacks on livestock, and road traffic accidents



THANK YOU