



## Surgery Not Required: Current and Future Options in Fertility Control of Dogs and Cats

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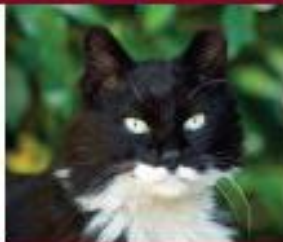




Alliance for Contraception  
in CATS & DOGS

*Mission:* To expedite the successful introduction of methods to non-surgically sterilize dogs and cats and to support the distribution and promotion of these products to humanely control cat and dog populations worldwide.

[acc-d.org](http://acc-d.org)



**imagine...**  
preventing unwanted litters without surgery

# Priorities for Non-Surgical Fertility Control

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- Safe and effective
- Permanent or long-term
- Deliverable in a single injection or treatment
- Approaches for dogs and cats / male and female
- Documented effects on behavior and health
- Affordable

# ACC&D Resources



ESTERILSOL™/  
ZEUTERIN™



February 2013

Product Profile and Position Paper

Esterilsol™/Zeuterin™ is a non-surgical sterilant for male dogs delivered via intratesticular injection. The active ingredient is zinc gluconate neutralized by arginine. The formulation causes permanent infertility in one treatment. It is also known as "zinc neutering".



Why nonsurgical sterilization instead of traditional spay/neuter?









**SURGICAL  
SPAY/NEUTER**

To save more lives.....



...we need more options.

# Let's explore the options.

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- ❑ On the horizon

- ❑ Available now

- ❑ How is ACC&D paving the way for these options?



*Michelson Prize and Grants Program in  
Reproductive Biology*

Founded in 2009



*\$50M available for research grants to develop a non-surgical sterilant for male and female dogs and cats.*

“A nonsurgical sterilant could reduce the global population of homeless dogs and cats, but there hasn’t been money to develop one—until now.”



## A Cure for Euthanasia?

A nonsurgical sterilant could reduce the global population of homeless dogs and cats, but there hasn't been money to develop one—until now

NINETY KILOMETERS SOUTHWEST OF Montgomery and a few decades shy of the modern world, Oak Hill, Alabama, the smallest town in one of the poorest counties in the state. There are 23 houses, one gas station (which doubles as a general store), and a post office staffed by a single employee.

Oak Hill doesn't have much—but it does have cats. Cats that congregate in barns and under sheds. Kitten holes in long-closed restaurants and antique shops. Pregnant queens abandoned in the woods. Towns that fight to remove the felines.

There are no animal control services in Oak Hill, so the cats keep breeding. And dying. Cats roam freely down on the state highway, fending about their own way, and those that do make it to overcrowded, far-away adoption centers are euthanized within days.

A few fortunate felines find their way to the back porch of David Fuller, a retired electronics engineer who, as a contractor for NASA, spent years ensuring that rocket components destined for space survived their environment. These days, Fuller and his wife do the same for Oak Hill's cats. They trap the ones they can and try to find homes for them. They bottle-feed kittens whose

eyes have been glued shut by dust. And they drive an hour each week to the nearest Vet Mart, where they load their pickup truck with 4-bagcat bags of dry cat food.

Thirty-five feral cats and Fuller's property house, and he takes care of another 30 at his neighbor's farm in a rural by town. Despite Fuller's best intentions, however, he can't possibly keep up. He's running out of people to give the cats to, and the overfeeding problem will no longer take them. He's sprayed and neutered a few, but he runs no longer a flood the \$100 expenses. And so the cats keep breeding.

The problem isn't confined to Oak Hill. Homeless organizations throughout the

United States can't surgically sterilize homeless cats and dogs fast enough to keep their numbers, and developing one with dangerous feral dog populations—as China and India—does even worse, millions of dogs and cats are released in U.S. shelters each year, and no more are shot and poisoned, even globally. “There’s almost no hope of us any kind of dent in the problem with surgery,” says Joyce Briggs, the president of Portland, Oregon-based Alliance for Contraception in Cats and Dogs (ACC&D).

For the past decade, ACC&D and homeless organizations have pushed a nonsurgical alternative to traditional spay/neuter surgery, something as simple as a pill as well as a vaccine or a “P-implant,” Briggs says, would let us track far more cats with the same success. Researchers have developed similar products for wild birds; they have turned out, ineffective or impractical for companion animals. It’s a finding and interest has of further progress.

That may be about to change thanks to a \$1.5 billion award. Gary Michelson, has announced \$75 million



Vagrants, about 10 million each year, roam the streets of the United States.

# Goal

- *Reduction or elimination of deaths of healthy shelter cats and dogs in the United States*
- Successful product will likely be made available world wide for feral cat and dog control



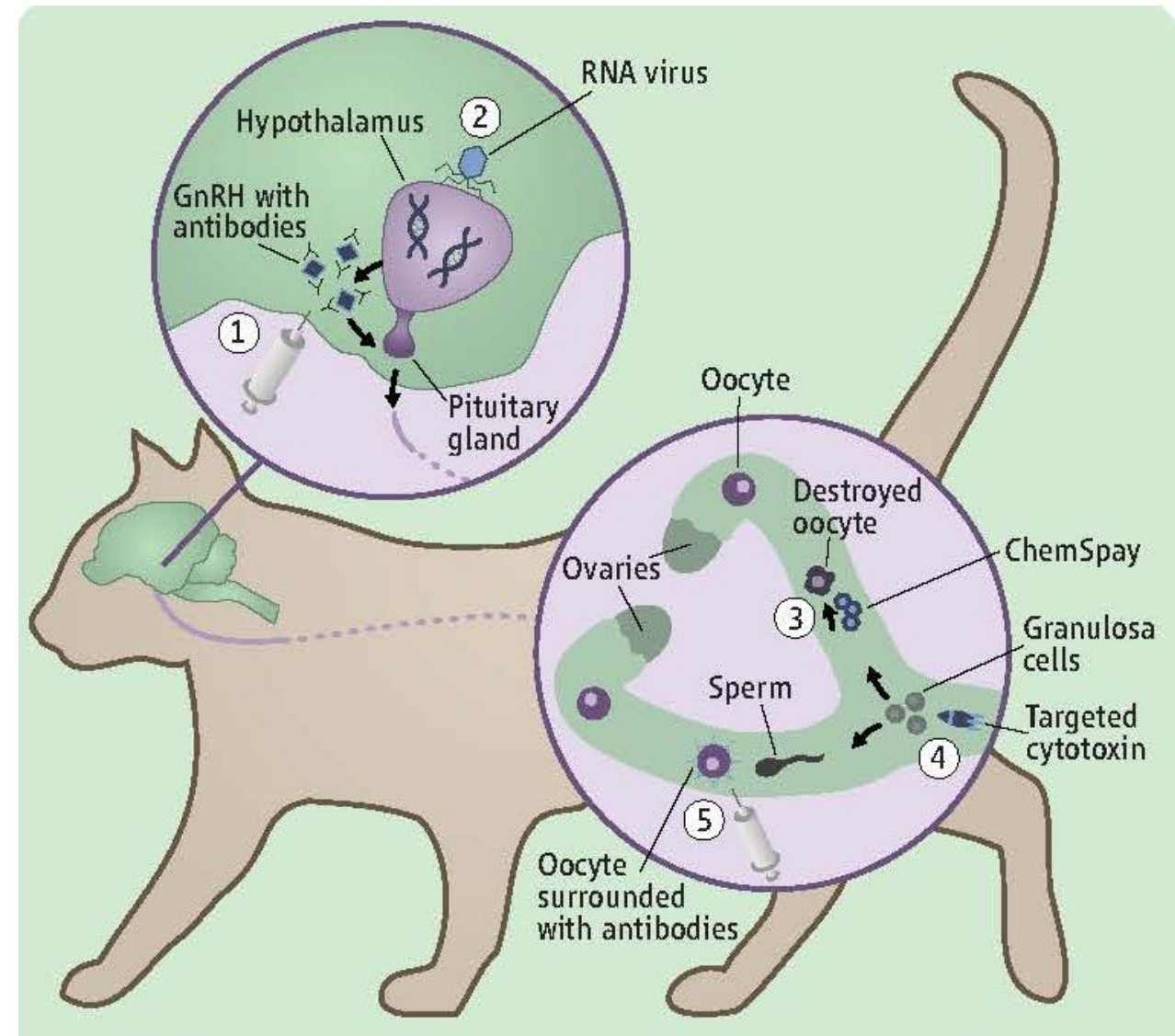
# Research Approaches

Immunocontraception

High dose, long-term GnRH agonists

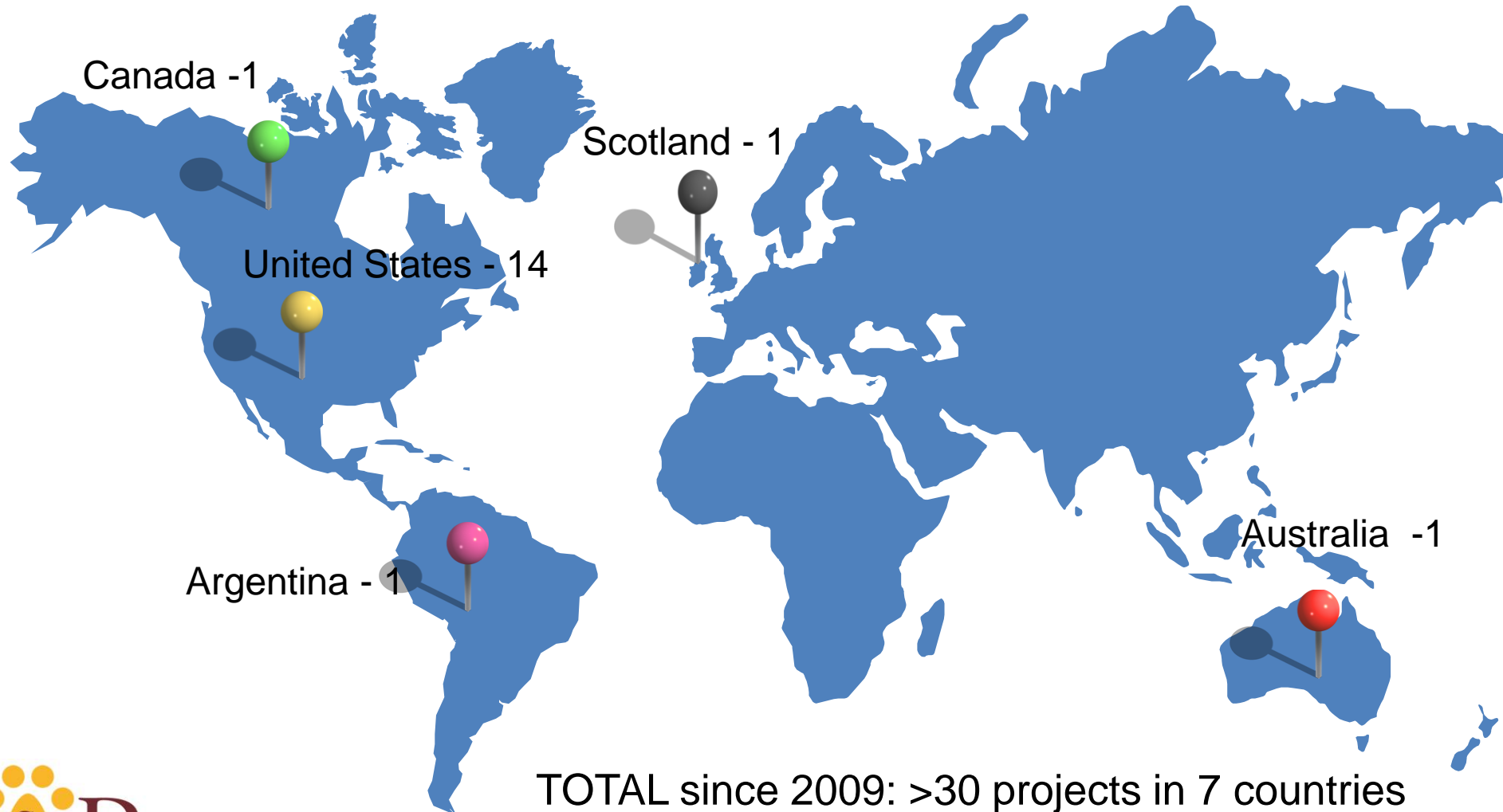
Targeted delivery of cytotoxins

Gene silencing/gene therapy



# Michelson Grant Funding

December 2014

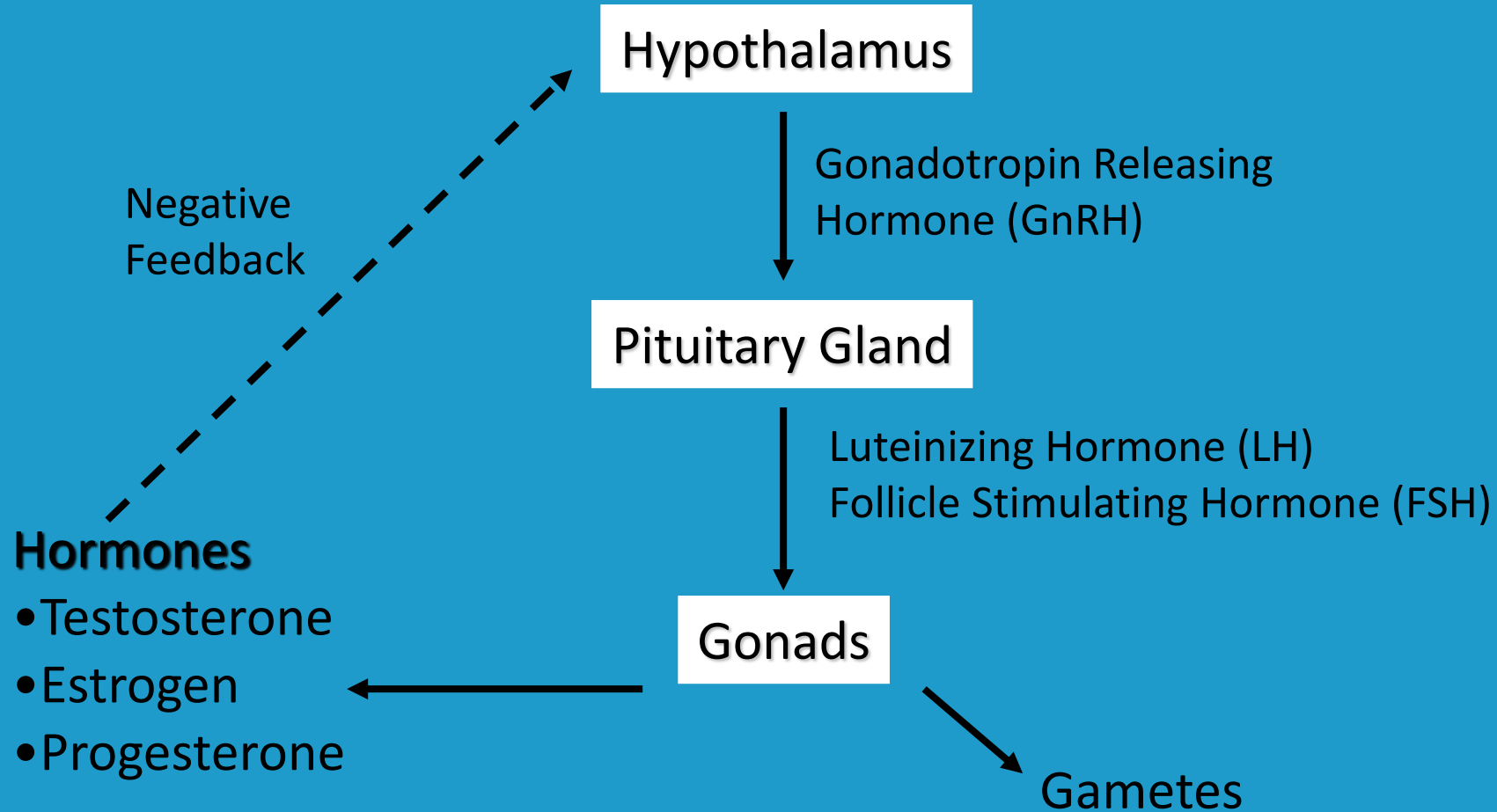


# \$25M Prize

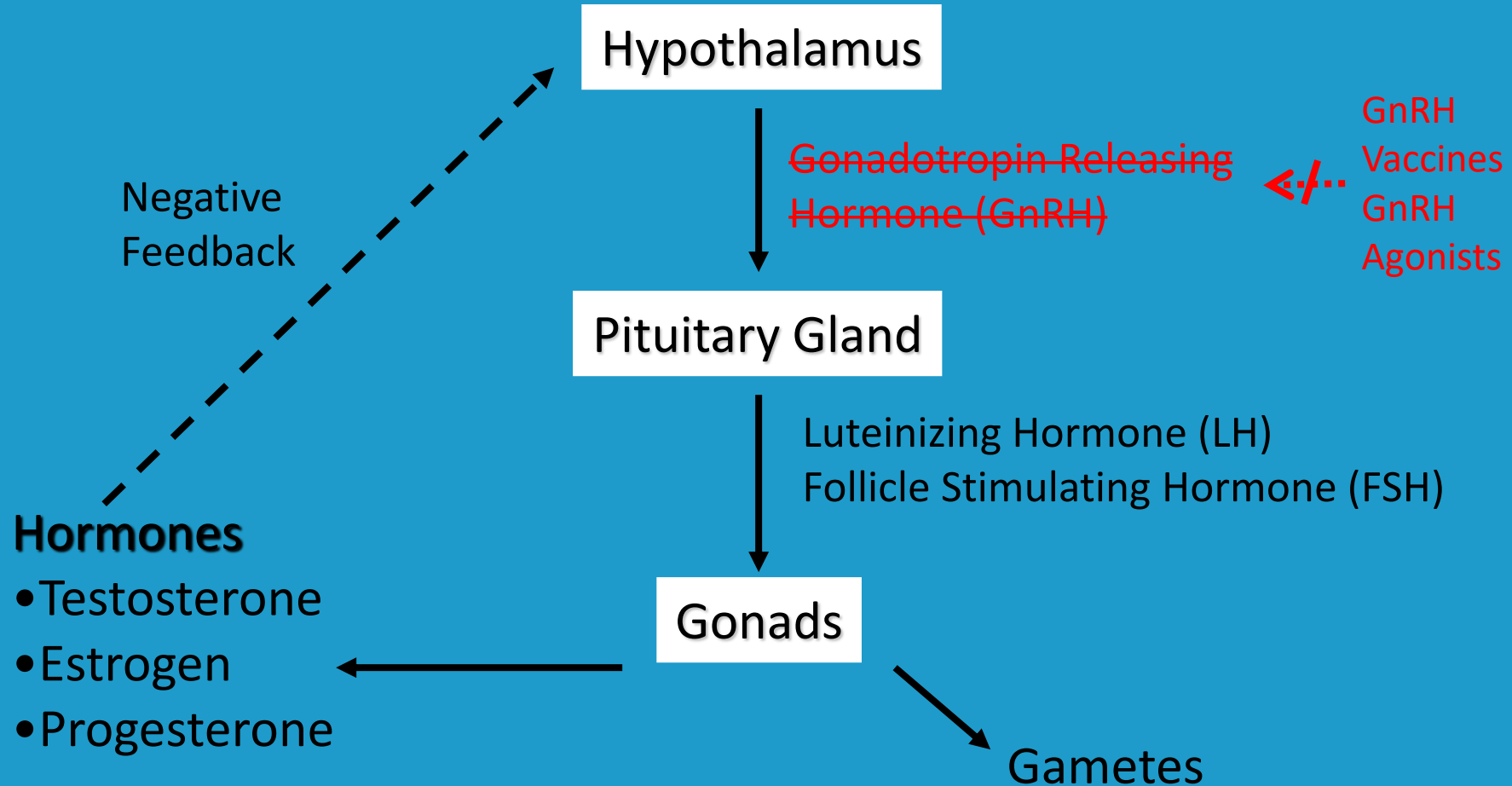
- Single-dose, permanent, nonsurgical sterilant
- Safe and effective in male and female cats and dogs
- Ablates sex steroids and/or their effects
- Suitable for administration in a field setting
- Viable pathway to regulatory approval
- Reasonable manufacturing process and cost



# Reproductive Control



# Reproductive Control

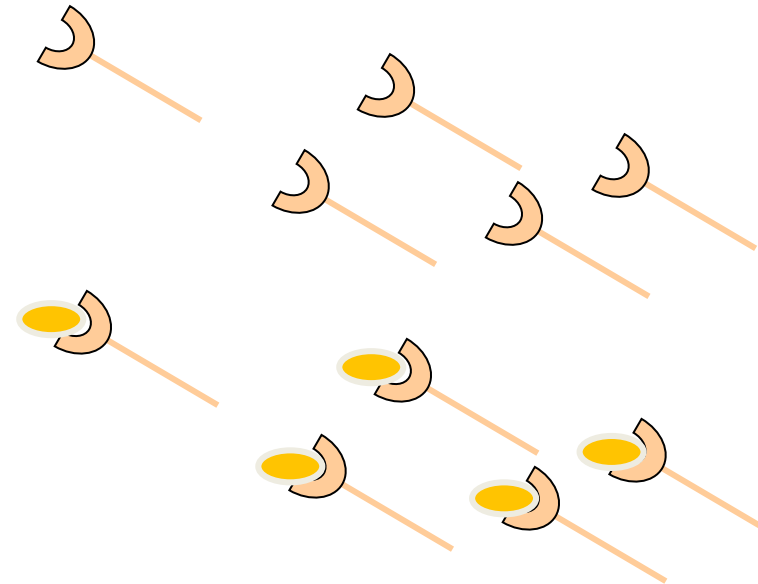


Slimmy receives a rabies vaccine.

Her body makes antibodies against the virus.

If exposed to the virus, circulating antibodies bind it. The virus does not reach its receptor.

Slimmy is not infected.



Hey, thanks!

Slimmy receives a GnRH vaccine.

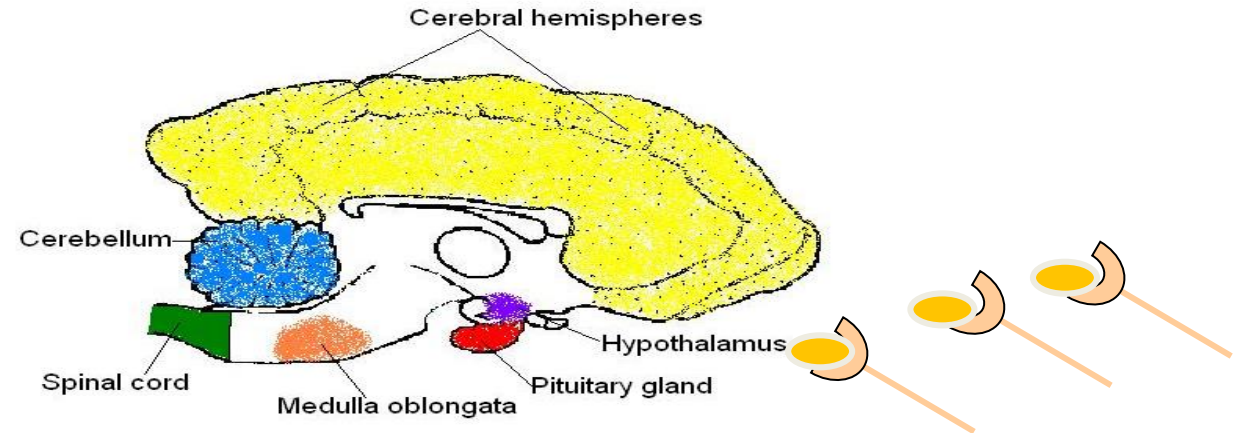
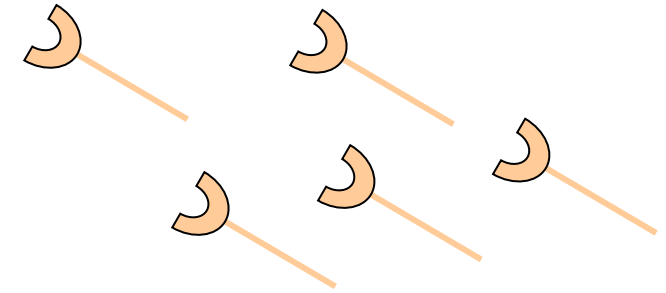
Her body makes antibodies against her own GnRH.

When her hypothalamus releases GnRH, antibodies bind it.

GnRH does not reach its receptors in the pituitary.

FSH and LH are not released.

Slimmy is contracepted.



# GonaCon

- Overview:
  - Developed by USDA-NWRC
  - EPA registered for use in white-tailed deer (2009) and wild horses and burros (2013)
  - Contraceptive effect in several other species



# GonaCon

Dr. Levy's studies demonstrated safety, efficacy & suppression of sexual behaviors in male & female laboratory cats.



Photo: Julie Levy

# Results in Male Cats

- Single dose GonaCon
- 24 adult male cats – 2 studies
  - Antibody titer, testosterone and semen analysis
  - Secondary sex characteristics
- Breeding trial – mean time to successful breeding was 12 mos. for responders
- 3-year follow-up; no injection site issues



# Secondary Male Sex Characteristics



Testicle shrinkage



Loss of penile spines



Slide: Courtesy of Dr. Julie Levy, Maddies' Shelter Medicine Program, University of Florida College of Veterinary Medicine.

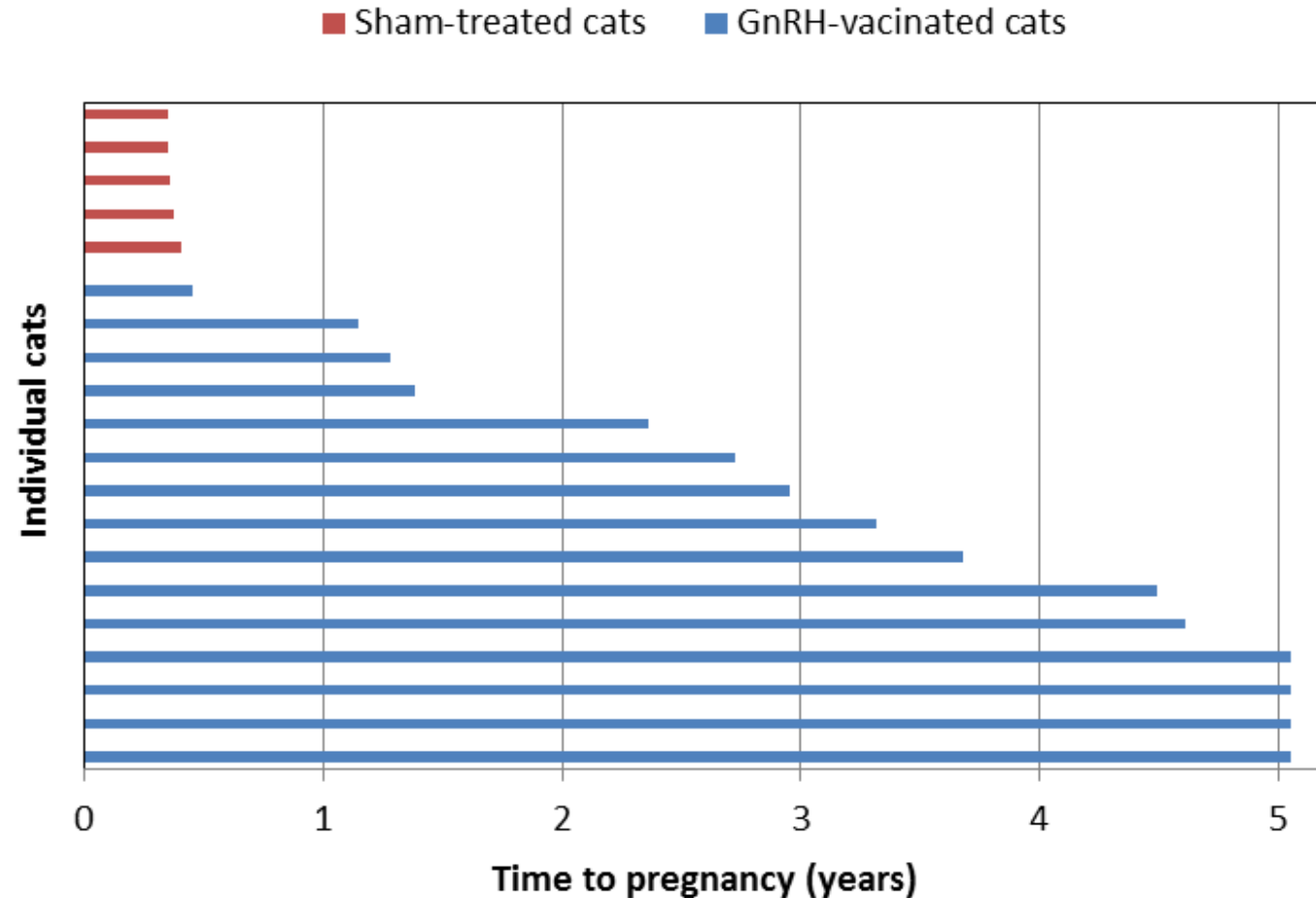
# Results in Female Cats

- 20 adult female cats
- Single dose GonaCon
- Monthly measurements
  - GnRH antibody titers
  - Estrogen, progesterone
- Breeding trial
- 5-year follow-up



Photo: Julie Levy

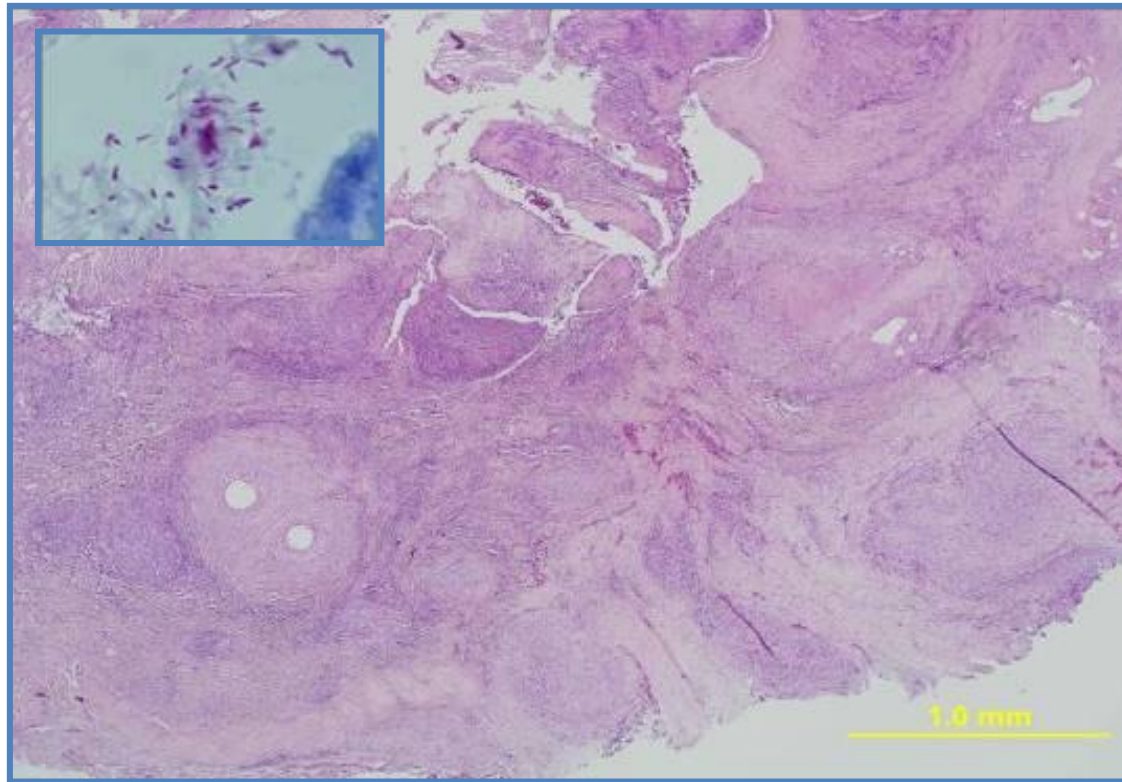
# GonaCon treated female cats: Median time to pregnancy 39.7 mos.



Slide: Courtesy of Dr. Julie Levy, Maddie's Shelter Medicine Program,  
University of Florida College of Veterinary Medicine

# Injection-Site Reactions

- Non-painful granulomatous masses
- Late onset (~24 months) in 6/20 cats



Slide: Courtesy of Dr. Julie Levy, Maddies' Shelter Medicine Program, University of Florida College of Veterinary Medicine.

# Why we are excited about GonaCon

- Contraceptive vaccine safe & effective in female cats
  - 3+ year average duration; suppression of sexual behaviors
- Practical for field administration
- Potentially very affordable





ACC&D is working to realize GonaCon's potential for free-roaming cats.

# Deslorelin / Suprelorin®

VIRBAC, formerly Peptech Animal Health

- GnRH agonist
- Delivered by implant
- Approved in Australia, New Zealand and EU for male dogs
- FDA-indexed product to treat adrenal tumors in ferrets



# Dogs with No Names

Dr. Judith Samson-French  
and her team implant dogs  
on First Nations Reserves  
with Suprelorin.

Give female dogs a  
“pregnant pause”

*[dogswithnonames.com](http://dogswithnonames.com)*

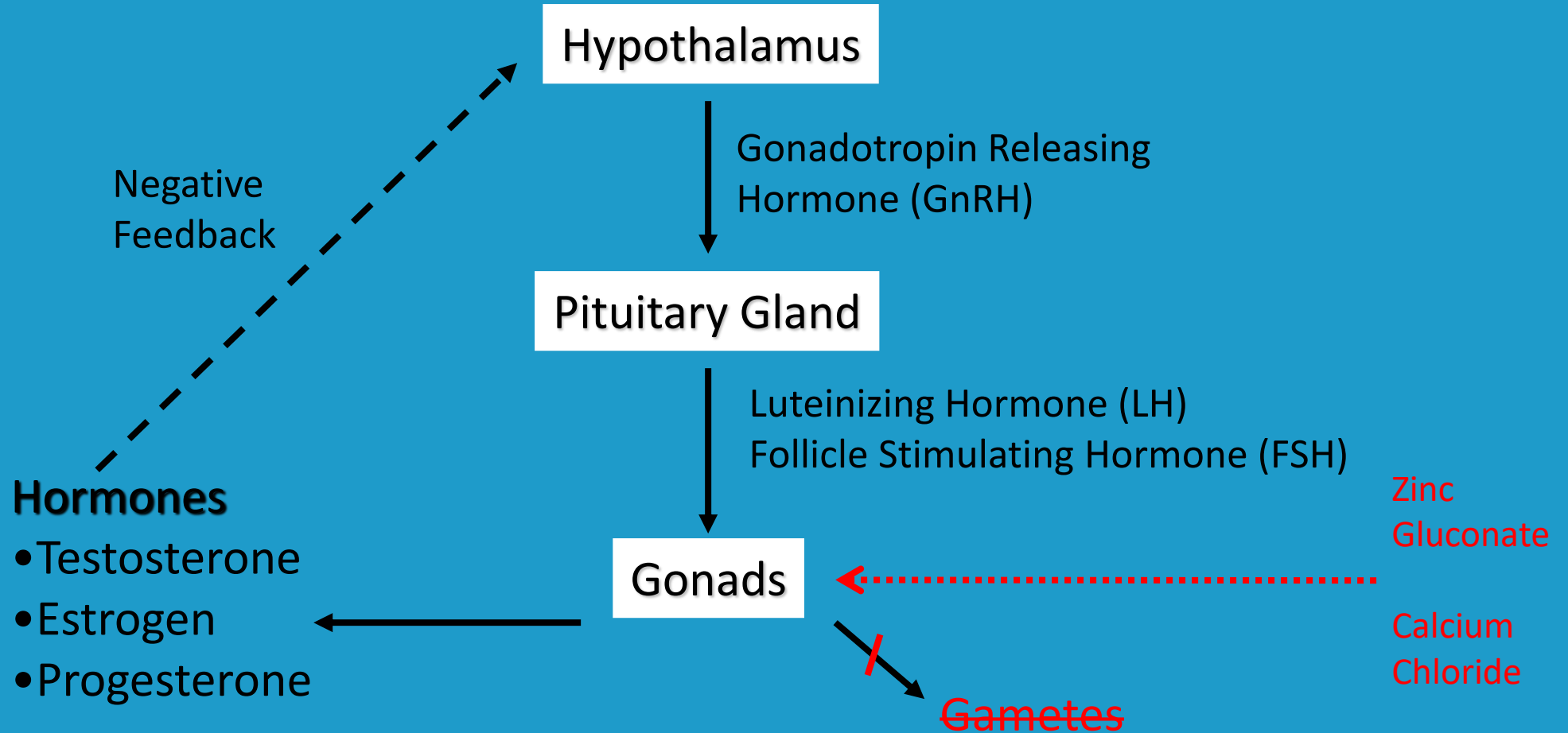


# Chemical sterilization

The use of chemical compounds which destroy and/or render ineffective essential component(s) of the reproductive system

- Current approaches are for males
  - Zinc gluconate neutralized by arginine
    - Zeuterin<sup>®</sup>
  - Calcium chloride

# Reproductive Control



# New York Times

*December 2, 2013*

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“New Strides in  
Spaying and  
Neutering”



# Wall Street Journal

*November 26, 2014*

## “Too Many Dogs: A Simple Solution”

Too Many Dogs: A Simple Solution for Sterilization - WSJ



### Too Many Dogs: A Simple Solution

A cheap, quick, relatively painless procedure could make a big dent in overpopulation. What's stopping it?



A cheap, quick, relatively painless procedure could make a big dent in canine overpopulation. What's stopping it?

**3 MONTHS FOR JUST \$1 ACT NOW**

<http://online.wsj.com/articles/too-many-dogs-a-simple-solution-for-sterilization-1417187544>[11/29/2014 10:08:58]

# Calcium Chloride

Leoci et al. *Acta Veterinaria Scandinavica* 2014, **56**:62  
<http://www.actavetscand.com/content/56/1/62>



## RESEARCH

## Open Access

### Alcohol diluent provides the optimal formulation for calcium chloride non-surgical sterilization in dogs

Raffaella Leoci<sup>1\*</sup>, Giulio Aiudi<sup>1</sup>, Fabio Silvestre<sup>1</sup>, Elaine A Lissner<sup>2</sup> and Giovanni M Lucatandra<sup>3</sup>

#### Abstract

**Background:** Surgical castration is widely used to sterilize male dogs, but has significant impacts on time to perform the operation, recovery of the animals as well as cost, which can limit population control programs. Previous research has shown intratesticular injection of calcium chloride dihydrate (CaCl<sub>2</sub>) in saline to be a promising alternative to surgery. However, long-term azoospermia was not maintained at dosages low enough to avoid side effects. In the search for an optimized formulation, the current investigation is the first study on long-term sterilization effects of intratesticular injection of CaCl<sub>2</sub> in either lidocaine solution or alcohol in dogs. CaCl<sub>2</sub> at 20% concentration in lidocaine solution or alcohol was administered via intratesticular injection to groups of 21 dogs each. The treated animals were examined at 2, 6, and 12 months for sperm production, blood levels of testosterone, and side effects; at time zero and 12 months for testicular size and semen volume. The experimentally treated animals were compared to a control group receiving saline injection only.

**Results:** Testicles of dogs treated with CaCl<sub>2</sub> in either diluent significantly decreased in size. After administration of CaCl<sub>2</sub> in lidocaine solution, sterility was achieved for at least 12 months in 75% of treated dogs. However, optimal long-term contraceptive effectiveness was achieved with CaCl<sub>2</sub> in alcohol, which resulted in azoospermia over the 12-month study period. Testosterone levels significantly decreased following treatment with CaCl<sub>2</sub>, and sexual activity disappeared. Although testosterone returned to baseline levels by 12 months for the group treated with CaCl<sub>2</sub> in lidocaine, dogs injected with CaCl<sub>2</sub> in alcohol had a 63.6% drop in testosterone level, which remained at the low end of physiological range throughout the study. No adverse effects were noted.

**Conclusions:** A single, bilateral intratesticular injection of 20% CaCl<sub>2</sub> in 95% ethanol was a reliable method for induction of sterilization in 18-28 kg male dogs in this study. The approach showed long-term efficacy and reduced sexual behavior. This chemical method of sterilization might provide an effective, efficient, alternative to surgical castration that can have positive impacts on dog welfare.

**Keywords:** Calcium chloride, Canine, Chemical castration, Dog, Nonsurgical sterilization, Population management

#### Background

Canine overpopulation remains a problem facing many countries throughout the world. Alternative methods to surgical sterilization that are effective, easy to administer, safe, and affordable would offer immense benefits, allowing animal welfare organizations, public health programs, and governments to reach further with limited resources [1].

An intratesticular injection of calcium chloride dihydrate (CaCl<sub>2</sub>) in solution represents a promising method for non-surgical sterilization [2-7]. A previous dose-determination study reported that a 20% solution of CaCl<sub>2</sub> in saline demonstrated good long-term efficacy without the undesirable side effects that occurred with higher dosages [2]. These findings partially confirmed the results of short-term, histology-based studies on CaCl<sub>2</sub> by other investigators who used a 20% concentration [3,5-7]. However, when 20% CaCl<sub>2</sub> in saline solution, as typically used for sterilization, was evaluated for efficacy over a longer period, the effect was not permanent: sperm production

\* Correspondence: [leoci@vet.unipi.it](mailto:leoci@vet.unipi.it)  
<sup>1</sup>Department of Emergency and Organ Transplantation (DOET), Section of Veterinary Clinic and Animal Production, University of Bari Aldo Moro, SP per Grottole (km 3), 70126 Bari, Italy  
Full list of author information is available at the end of the article

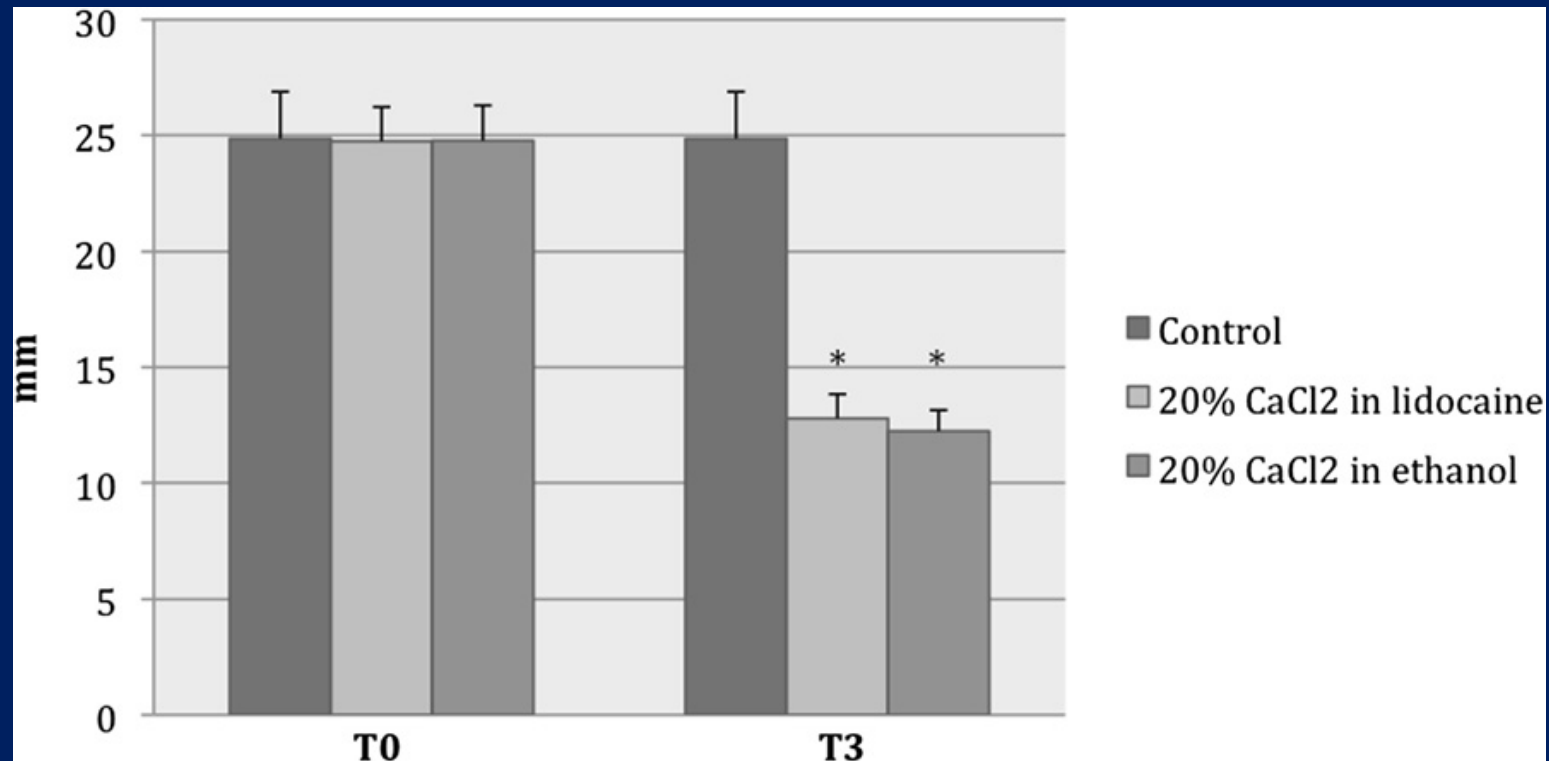


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Results: Testicles of dogs treated with CaCl<sub>2</sub> in either diluent significantly decreased in size. After administration of CaCl<sub>2</sub> in lidocaine solution, sterility was achieved for at least 12 months in 75% of treated dogs. However, optimal long-term contraceptive effectiveness was achieved with CaCl<sub>2</sub> in alcohol, which resulted in azoospermia over the 12-month study period.

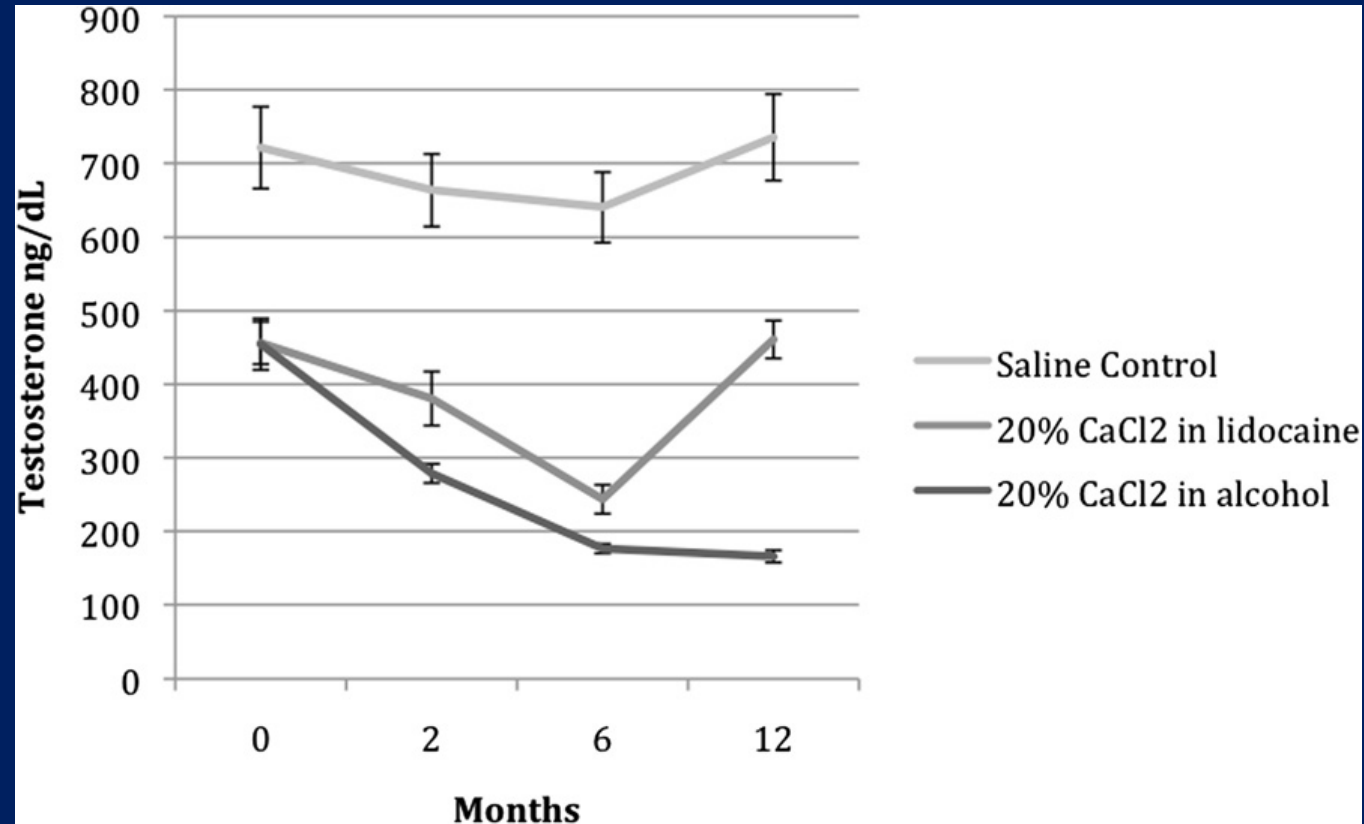
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# Calcium Chloride



Changes in testicular width after intratesticular injection of CaCl<sub>2</sub>. At 12 months (T3) after treatment with CaCl<sub>2</sub> (group A and group B), significant reductions in testicular width were observed (\*P < 0.001), as compared with no or minimal changes seen in the control (C) group.

# Calcium Chloride



Effects of intratesticular injection of CaCl<sub>2</sub> on serum testosterone levels over time. Following the injection of CaCl<sub>2</sub> in lidocaine solution (group A), testosterone decreased significantly ( $F = 0.47$ ;  $P < 0.003$ ) for up to 6 months, although testosterone levels at 12 months returned to baseline. After injection of calcium chloride in alcohol (group B), testosterone levels decreased significantly ( $F = 65.1$ ,  $P < 0.001$ ) throughout the 12-month follow-up period.

# Calcium Chloride

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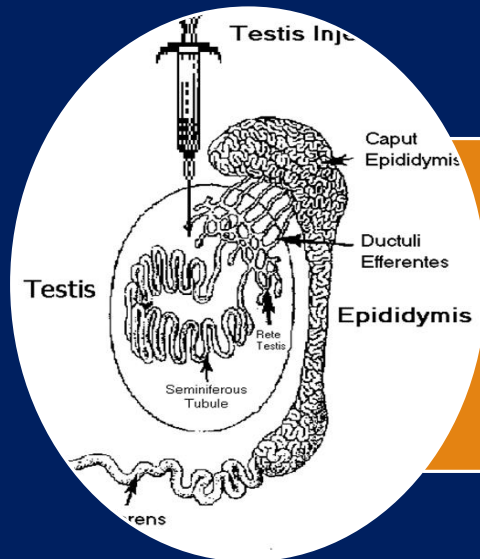
## ACC&D Position Statement on Calcium Chloride:

- To our knowledge,  $\text{CaCl}_2$  has not been reviewed or approved by any regulatory agency for use as an animal sterilant.
- ACC&D believes that the current use of intratesticular  $\text{CaCl}_2$  as a sterilant should be considered experimental.

# Zeuterin™



Zinc Gluconate Neutralized by Arginine is the only FDA approved non-surgical sterilant for male dogs



A single, virtually painless injection to neuter a male dog, permanently

# Zeuterin™ Highlights

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Male dogs 3-10 months of age (older pending)

One-time injection into each testicle

Safe & Effective

Permanent and Irreversible

Reduces Testosterone

# Efficacy

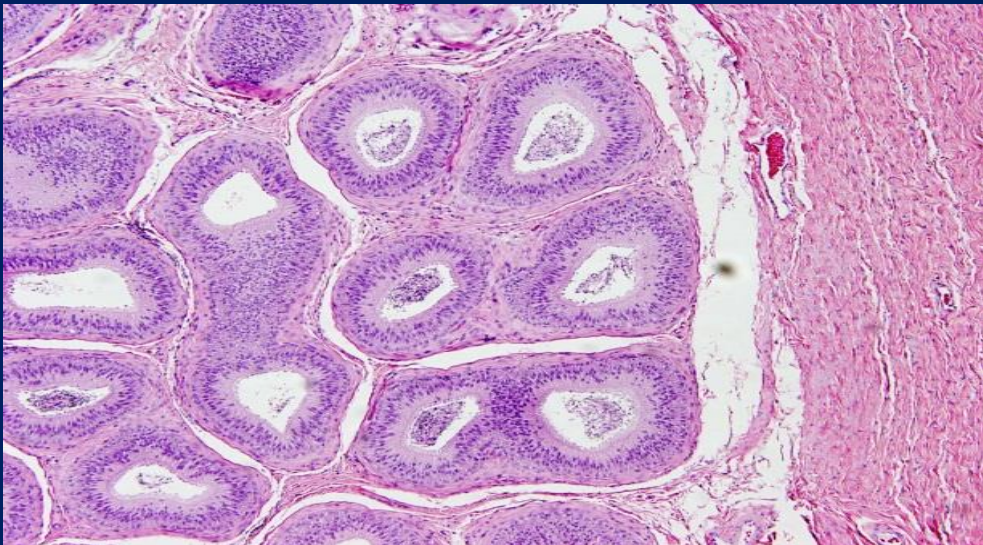
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- ❑ Proven safe and effective
- ❑ 99.6% Efficacy
- ❑ FDA clinical trial: 223/224 dogs  
age 3 to 10 months

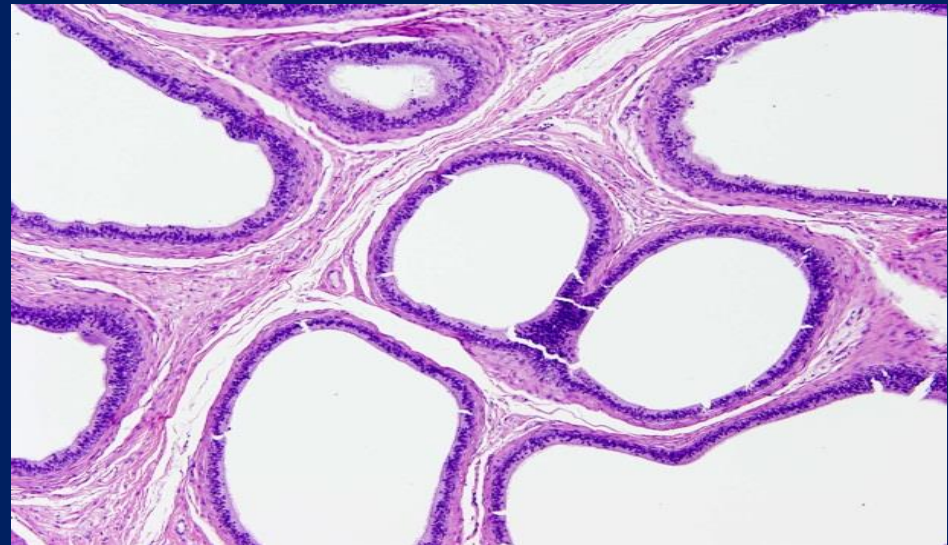
# How do we know Zeuterin is permanent?

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Epididymis from untreated  
dog (100x)



Epididymis from Zeuterin  
treated dog (100x)

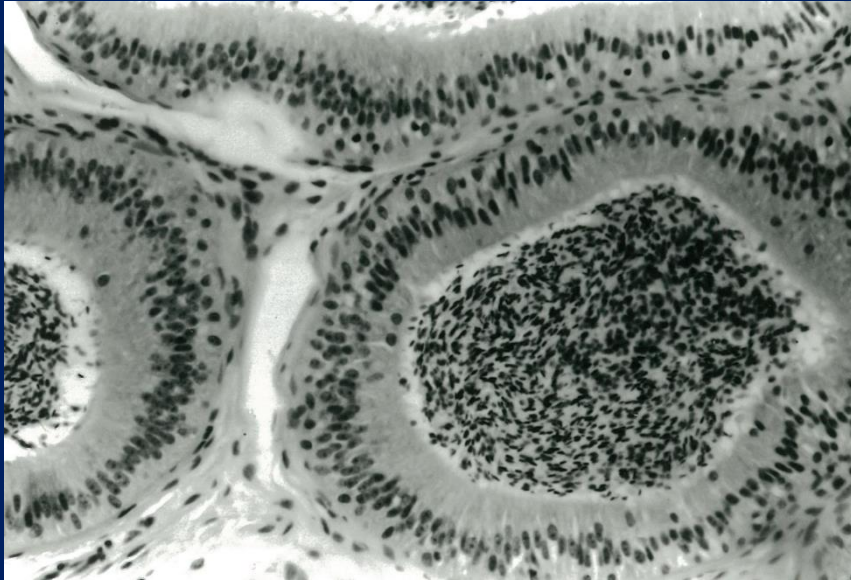


At 30 days post-injection

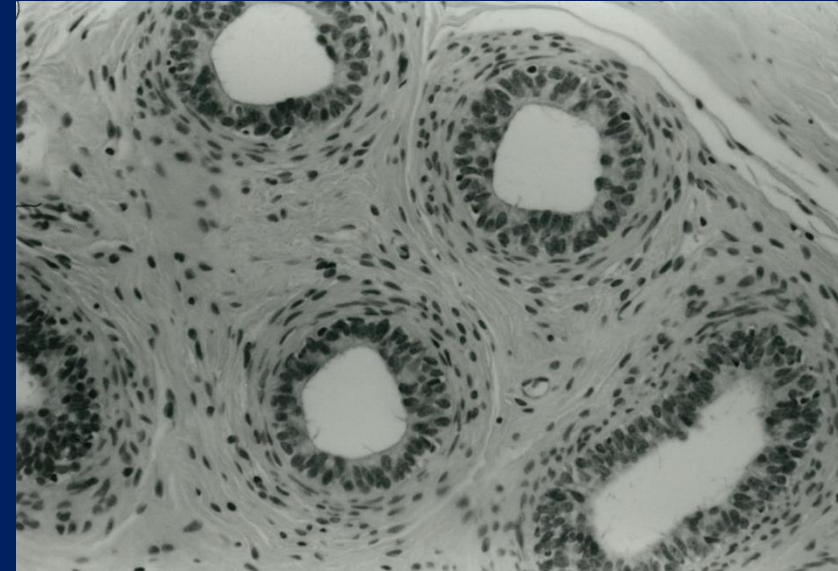
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Epididymis from untreated  
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Epididymis from Zeuterin  
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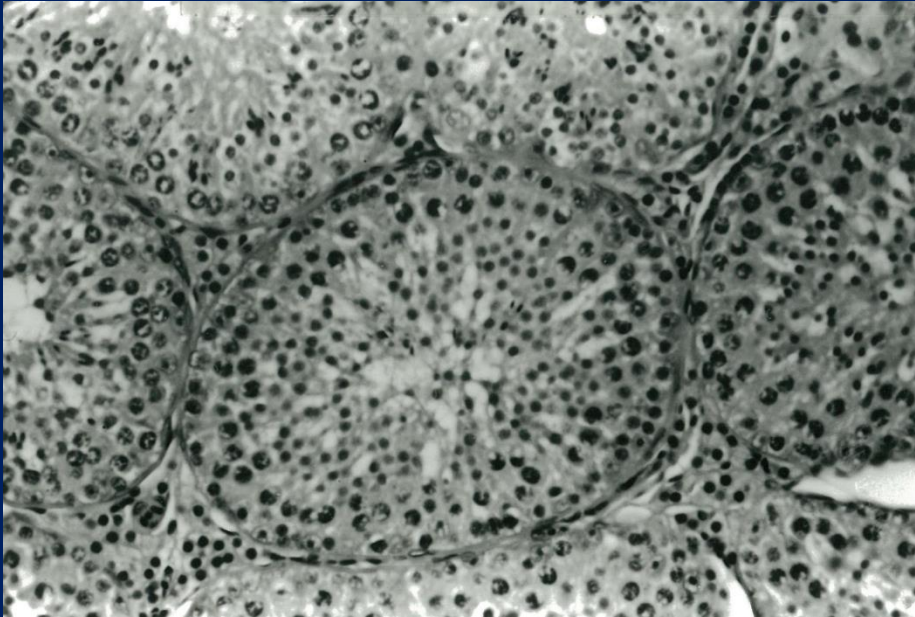


At 24 months post-injection

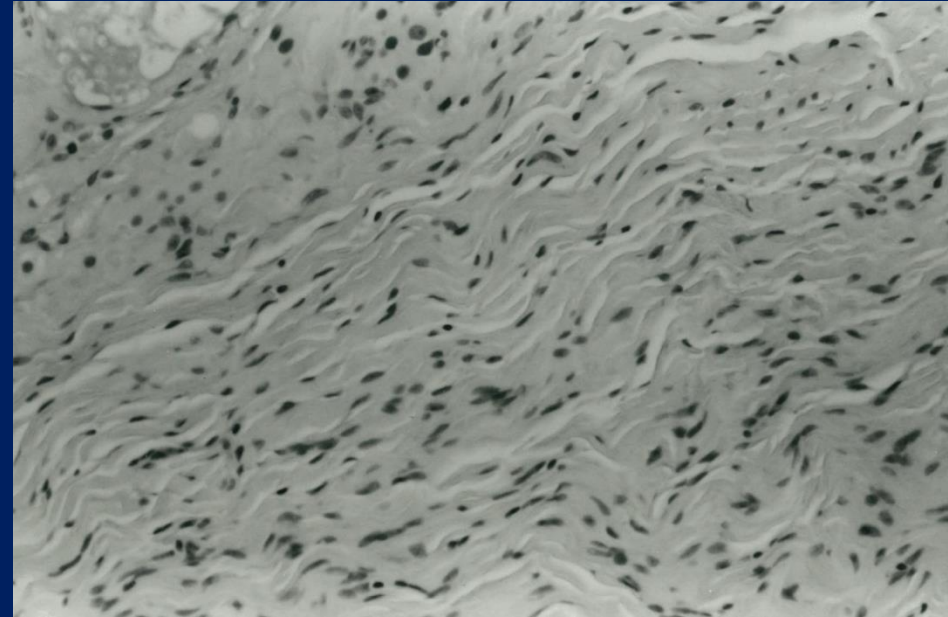
# How do we know Zeuterin is permanent?

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Testicle from untreated dog  
(100x)



Testicle from Zeuterin  
treated dog (100x)



At 24 months post-injection

# Research Behind FDA Approval

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- ❑ Twelve years of scientific research
- ❑ Dosage determination study
- ❑ Animal Safety Study
- ❑ Clinical Trial 224 dogs 3-10 months old
- ❑ Follow-up of dogs in original study

# Adverse Reactions Observed During FDA Trial

Local Reactions	No. of Dogs (n = 270)	Percent (%)		Systemic Reactions	No. of Dogs (n = 270)	Percent (%)
Scrotal Pain*	17	6.3%		Neutrophilia	17	6.3%
Scrotal Irritation	3	1.1%		Vomiting**	12	4.4%
Biting and Licking	2	0.7%		Anorexia	11	4.1%
Scrotal Swelling	2	0.7%		Lethargy	6	2.2%
Scrotal Irritation/Dermatitis	2	0.7%		Diarrhea	5	1.9%
Scrotal Ulceration	1	0.4%		Leukocytosis	2	0.7%
Scrotal Infection	1	0.4%				
Dry Scrotal Skin	1	0.4%				
Scrotal Bruising	1	0.4%				
Preputial Swelling	1	0.4%				
Scrotal Sore	1	0.4%				

Courtesy Ark Sciences

\* No NSAIDs were used and most scrotal pain was reported on the first two days after injection.

\*\* Vomiting was most commonly seen on the day of the injection, between 1 minute and 4 hours post-injection

# Expected Reactions

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- ❑ Injection technique is critical to prevent adverse reactions
- ❑ Normal reactions include:
  - ❑ Generally non-painful swelling for 24-48 hours
  - ❑ Listlessness for the first 24 hours
  - ❑ May or may not vomit during the first 24 hours
- ❑ Should return to normalcy within 24 hours

# How do we know Zeuterin is painless?

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“Pain receptors are considered to be present in the tunicae testis and it would seem reasonable to suppose that, as in other solid organs, the acute pain experienced in testicular injury is due in part to stretching of the capsule.”

*The Testis, Volume 1, Development, Anatomy, and Physiology.* Academic Press, New York and London, 1970; p. 80-81 Chapter 2, Subchapter 5. Hodson, N. Nerves of the Testis, Epididymis, and Scrotum.

# Long Term Effects

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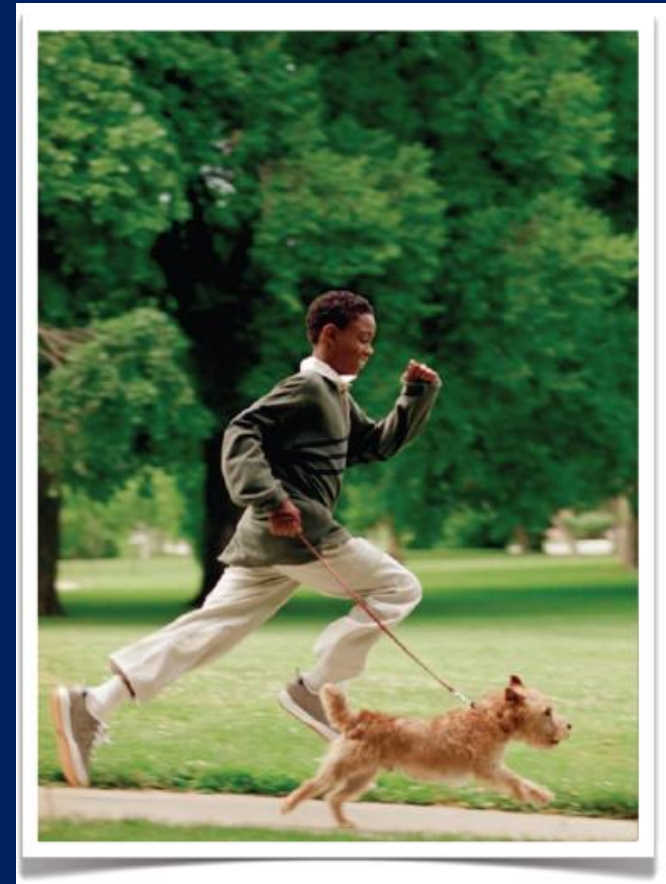
- ❑ 30 six-month old dogs treated with Zeuterin were followed for 2 years
- ❑ 2 years of routine observations and clinical evaluations
- ❑ Permanent reduction of circulating testosterone of 41-52%
- ❑ 24 months post injection - necropsy concluded all vital organs normal
- ❑ Epididymides, testicles and prostate had all reduced in size

# Long Term Effects

Zinc Neutering spares the testosterone producing function of Leydig cells, keeping the critical endocrine system intact.

Without spermatogenesis, the testosterone production goes down by 41-52%

Testosterone production remains available for other metabolic functions of the dog



# Long Term Effects of Surgical Neutering Show Benefits and Detriments

(Source: Determining the optimal age for gonadectomy of dogs and cats, Margaret V. Root Kustritz, DVM, PhD, DACT)

<i>Condition</i>	<i>Incidence</i>	<i>Substantial morbidity?</i>	<i>Specific breeds at risk?</i>
<b>Benefits</b>			
Testicular neoplasms	0.9%	No	No
BPH or prostatitis	75%–80% by 6 years of age	No	No
<b>Detriments</b>			
Complications of surgery	6.1%	No	No
Prostatic neoplasms	0.2%–0.6%	Yes	No
TCC	1.0%	No	Yes*
Osteosarcoma	0.2%	Yes	Yes†
Hemangiosarcoma	0.2%	Yes	Yes‡
CCL rupture	1.8%	Yes	Yes§
Obesity	2.8%	No	Yes
Diabetes mellitus	0.5%	No	Yes¶

\* Airedale Terrier, Beagle, Collie, Scottish Terrier, Shetland Sheepdog, West Highland, White Terrier, and Wire Fox Terrier.

† Doberman Pinscher, Great Dane, Irish Setter, Irish Wolfhound, Rottweiler, and Saint Bernard.

‡ Boxer, English Setter, German Shepherd Dog, Golden Retriever, Great Dane, Labrador Retriever, Pointer, Poodle, and Siberian Husky.

§ Akita, American Staffordshire Terrier, Chesapeake Bay Retriever, German Shepherd Dog, Golden Retriever, Labrador Retriever, Mastiff, Neapolitan Mastiff, Newfoundland, Poodle, and Saint Bernard.

|| Beagle, Cairn Terrier, Cavalier King Charles Spaniel, Cocker Spaniel, Dachshund, Labrador Retriever.

¶ Airedale Terrier, Cocker Spaniel, Dachshund, Doberman Pinscher, Golden Retriever, Irish Setter, Miniature Schnauzer, Pomeranian, and Shetland Sheepdog.

# Does Zeuterin™ Change Behavior?

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## **Behavior changes may be observed after zinc neutering:**

“My observation as an Animal Caretaker for the dogs is that the male dogs treated with Zinc Gluconate are much calmer than as compared to the intact male dogs.”

– FDA Clinical Trial, Progeny Testing and Sexual Behavior Study

“Max stopped urine marking and now sits on my lap”

– Dee Ann, Dog Owner

“Tank stopped digging the garden and became cuddly”

– Kari, Dog Owner

# What We Think We Know

(Quotes from websites of veterinary clinics, humane societies, trainers & animal shelters)

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“Spaying and neutering makes pets better, more affectionate companions.”

“Unsterilized animals often exhibit more behavior and temperament problems than do those who have been spayed or neutered.”

“Female dogs, like males, have an increased risk of aggression if left intact.”

“Unneutered dogs are often more aggressive and territorial (urine marking, fighting), but these traits should not be confused with loyalty and protection of their home and family.”

“Altered pets are less aggressive toward other dogs and cats, are less likely to urine mark and wander, and generally have better personalities.”

# Behavior Conclusions

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- Surgical neutering may reduce specific male hormone-dependent behaviors (e.g. sexual mounting, roaming, urine-marking, and aggression directed toward other (intact) males) in dogs that have already learned these behaviors.
- Surgical spay/neuter may increase other undesirable behaviors (e.g. owner-directed aggression, touch sensitivity, fearfulness, etc.) in otherwise behaviorally normal dogs.
- Definitive conclusions will require prospective, controlled studies.

# Does Zeuterin™ Change Behavior?

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## **The FDA behavior position statement:**

“As with surgical castration, secondary male characteristics (roaming, marking, aggression, or mounting) may be displayed.”



Courtesy Ark Sciences

# Zeuterin Administration

Measure the testicular width

Gently cleanse and disinfect the scrotum



# Zeuterin Administration

Pass the needle from the cranial aspect of the testicle, just ventral to the head of the epididymis

Position the needle along the long axis of the testicle in the center of the testicular parenchyma



# Zeuterin vs. Neutersol

## What has changed?

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Injection technique modified – strict adherence to protocol is important to minimize potential adverse reactions

- ✓ Three 28 gauge needles, ½ to 1 inch length
- ✓ 1 needle to draw solution – 2 needles to inject
- ✓ Timed injection (slow)

# Zeuterin vs. Neutersol

## What has changed?

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Injection technique modified – strict adherence to protocol is important to minimize potential adverse reactions

- ✓ Do not aspirate prior to injecting
- ✓ Wait when done injecting prior to withdrawal
- ✓ Do not massage the testicles after injecting

# How Do We Identify a Zinc Neutered Dog?

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## Microchipping

- Microchip tracking companies will record the Zinc Neutered status of dog

## Tattooing

- A “Z” tattoo between the genitals and inner thigh is the standard sign for zinc neutering

## Unique Collar Tag

- Every dog is given a unique identification number collar tag with the website address to verify neutering status

# Changing Perception

## Evidence-based decision making



- Conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients.
- De-emphasizes intuition, unsystematic clinical experience, and pathophysiologic rationale as sufficient grounds for clinical decision making and stresses the examination of evidence from clinical research.

# Changing Perception

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When I was in vet school, I was told, "Half of what you learn here will turn out to be wrong. But no one knows which half."

So true! One of the things we may have gotten wrong was in looking at the health impacts of neutering.

*Dr Marty Becker*  
*"America's Veterinarian"*

# The Evolution of Neutering

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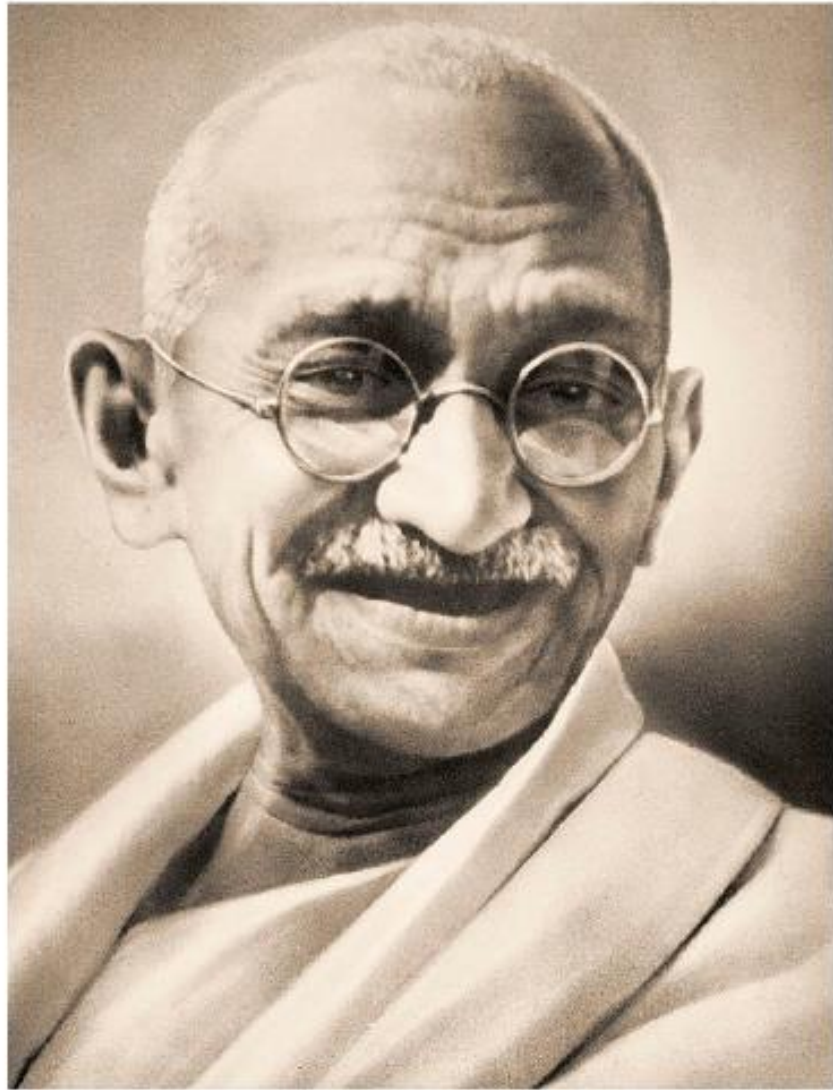


# **Zinc Gluconate Neutralized by L-Arginine is the only FDA Approved Non-surgical Sterilant**

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A single, virtually painless injection into each testicle  
will sterilize a male dog, permanently.



“The greatness of a nation and its moral progress can be judged by the way its animals are treated.”

Mahatma Gandhi

*Projects to  
pave the way...*

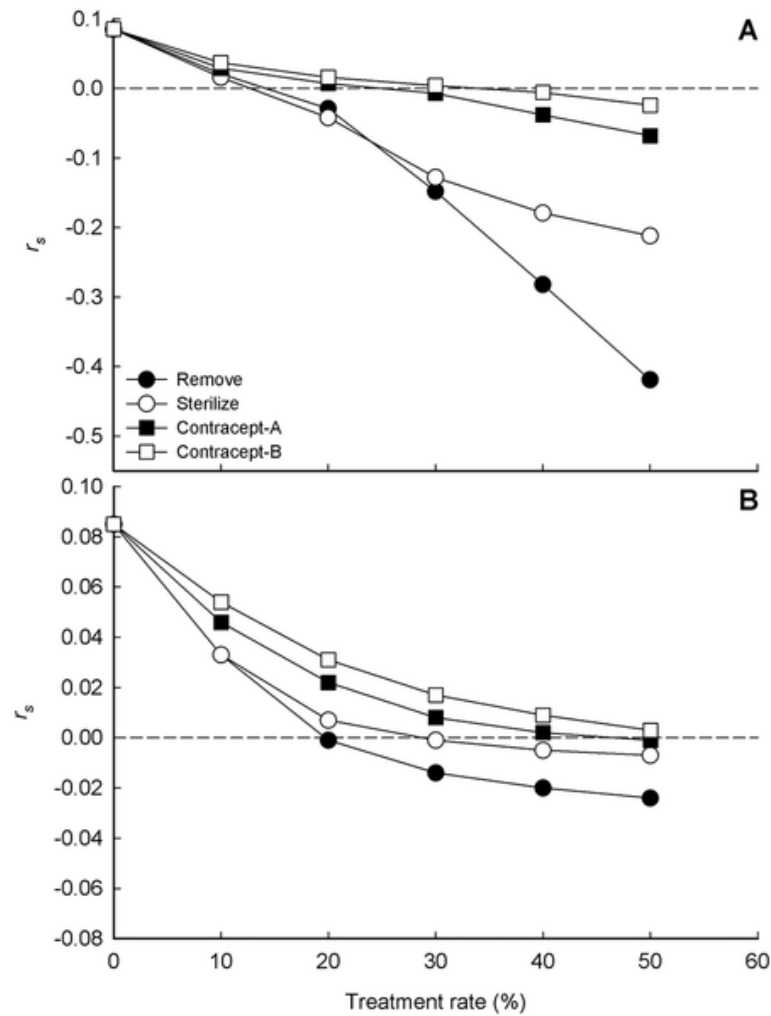


# Population Models for Free-Roaming Cats

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Miller PS, Boone JD, Briggs JR, Lawler DF, Levy JK, et al. (2014)  
**Simulating Free-Roaming Cat Population Management Options in  
Open Demographic Environments.** PLoS ONE 9(11): e113553.  
doi:10.1371/journal.pone.0113553

**Figure 6. Stochastic population growth rate under different FRC management strategies.**



Miller PS, Boone JD, Briggs JR, Lawler DF, et al. (2014) Simulating Free-Roaming Cat Population Management Options in Open Demographic Environments. PLoS ONE 9(11): e113553. doi:10.1371/journal.pone.0113553  
<http://www.plosone.org/article/info:doi/10.1371/journal.pone.0113553>

# Marking and identification of free-roaming populations of dogs and cats

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Cornell University  
David R. Atkinson Center for a Sustainable Future

# International Society of Feline Medicine 2015 Feline Veterinary Congress

- Pre-Congress Day: “Feline Fertility and Population Control”
- Special issue of Journal of Feline Medicine and Surgery



# acc-d.org

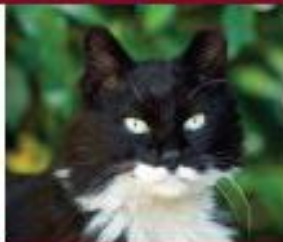
- ✓ E-book
- ✓ Product profile & position papers
- ✓ Legislative information
- ✓ FAQs
- ✓ Much more



*Thank you for exploring the  
options with us.*



[acc-d.org](http://acc-d.org)



**imagine...**  
preventing unwanted litters without surgery



## Surgery Not Required: Current and Future Options in Fertility Control of Dogs and Cats

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