

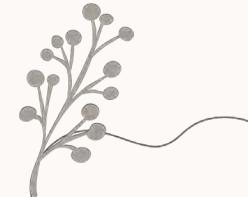
# Rabbits - The New Cat?



**Embrace Treating Rabbits with Confidence**



Zarah Hedge, DVM, MPH, DACVPM, DABVP  
(Shelter Medicine)



# Overview



Rabbits in the US



Husbandry &  
Disease



Rabbit  
Spay/Neuter

VENTURA COUNTY ANIMAL SERVICES  
SUMMER OF BUNS

Fee-Waived  
Rabbit Adoptions  
June 11 - 12  
1:00pm - 4:00pm



With the one exception, all appointments are preferred. Applications MUST be received by June 12th to qualify for the promotion. To submit an application, visit [vcasbunbungsale.com](http://vcasbunbungsale.com) for questions and to schedule an appointment.

All rabbits adopted from VCAS are either very or a LVED member of the family. Rabbits leave VCAS spayed or neutered, dewormed, microchipped, and come with a FREE bag of hay, grass mat and complementary vet visit. All other items can be purchased at our on-site store.

VENTURA COUNTY ANIMAL SERVICES  
BUNNY BONANZA

Reserves the right to terminate the promotion if it is determined that the number of applications received for the free spay/neuter services are more. Promotions do not include the cost of a pet license.

VENTURA COUNTY ANIMAL SERVICES 300 AULTON DRIVE  
[www.vcas.org](http://www.vcas.org) | (805) 488-4848

Facebook | Twitter | YouTube | Instagram

# Domestic Rabbits in the US

waived fees!  
big love,  
small package



FEES WAIVED  
FOR SMALL PETS

MAY 13-15



BUNNY  
BONANZA



MAY 12-16  
Adoption fees waived  
for rabbits

Find Some *Bunny* to Love  
**FREE** adoptions for  
ALL bunnies!



November 3 - November 9, 2021

Adoption fees for this event are generously sponsored  
by our non-profit partners, Friends of Montgomery  
County Animals (FMCA)



[Montgomerycountymd.gov/animalservices](http://Montgomerycountymd.gov/animalservices) | 240-773-590 | 7315 Muncaster Mill Rd, Derwood, MD 20855



# Poll Question



## Domestic Rabbit

- *Oryctolagus cuniculus*
- Third most common pet in the US
- Est. 3-7 million pet rabbits in US

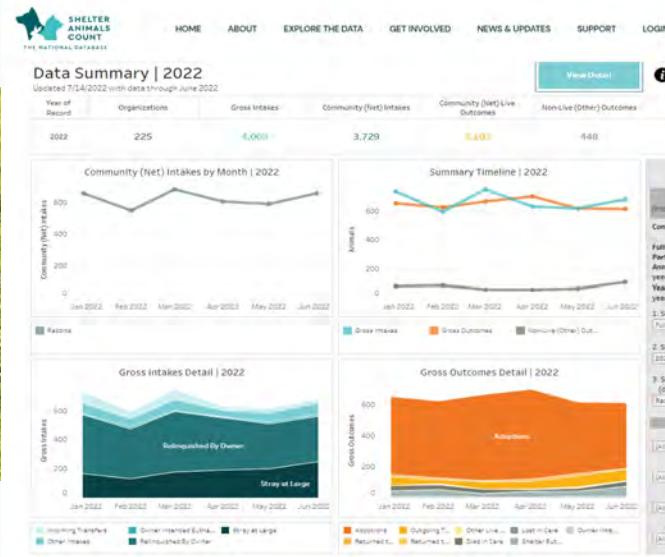
# Rabbits in Shelters



Third most common species in animal shelters

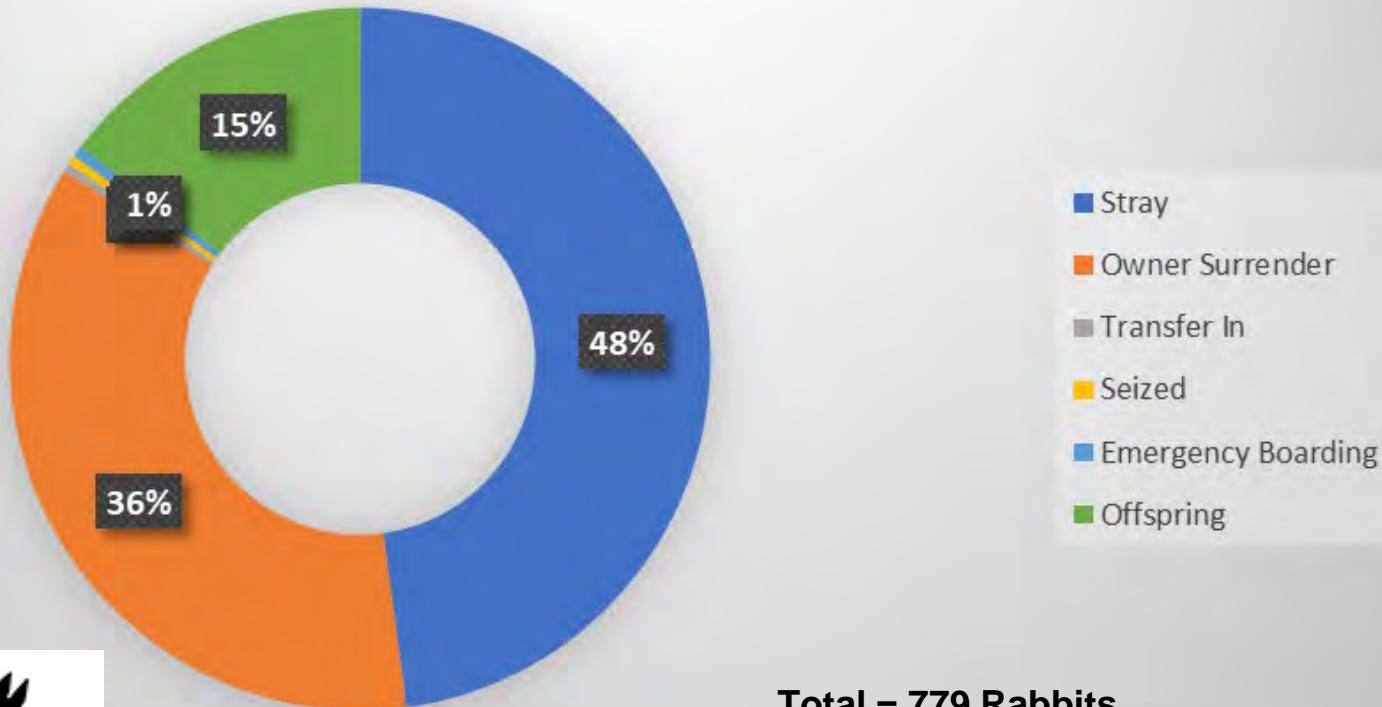
- 1-6 years old<sup>1</sup>
- Owner surrender<sup>1</sup>
- Unaltered at time of intake<sup>1</sup>

1. Amelia J Cook 1, Emily McCobb. 2012. Quantifying the shelter rabbit population: an analysis of Massachusetts and Rhode Island animal shelters. *J Appl Anim Welf Sci.* 15(4):297-312.

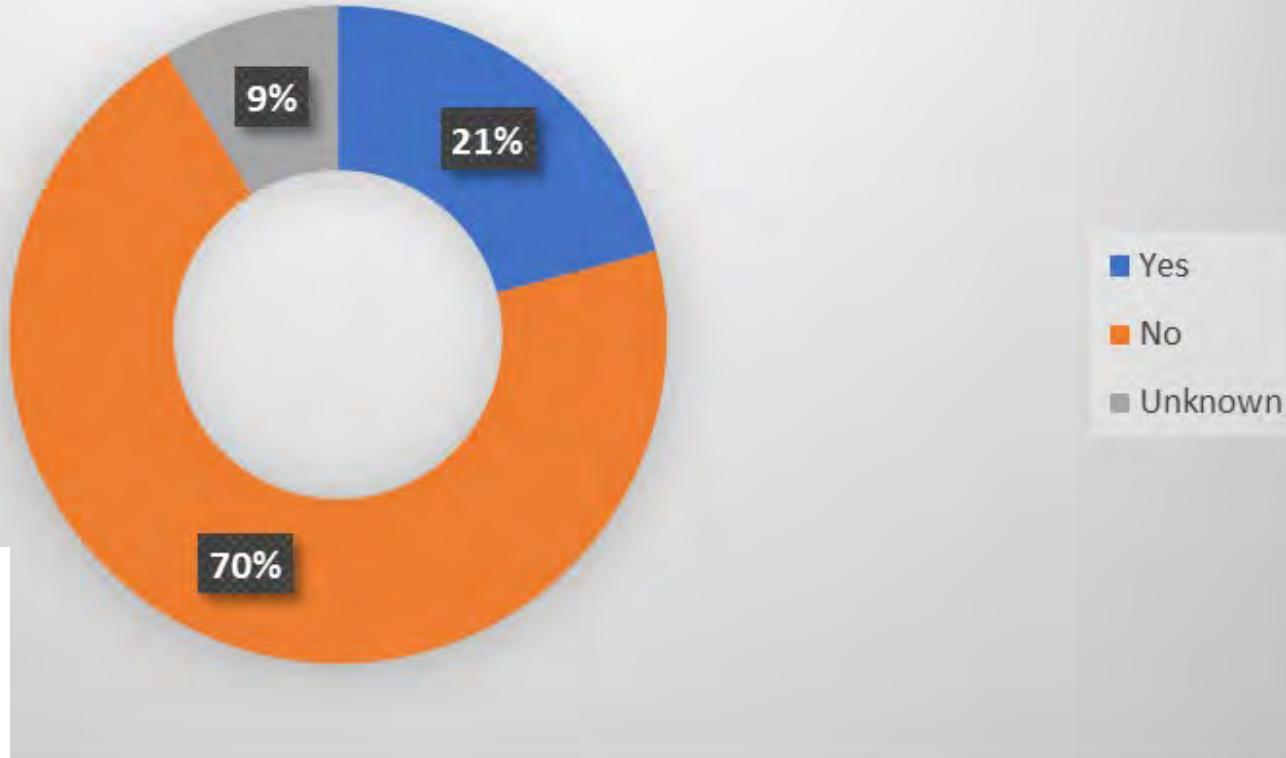


Shelter Animals Count - included rabbits in 2021

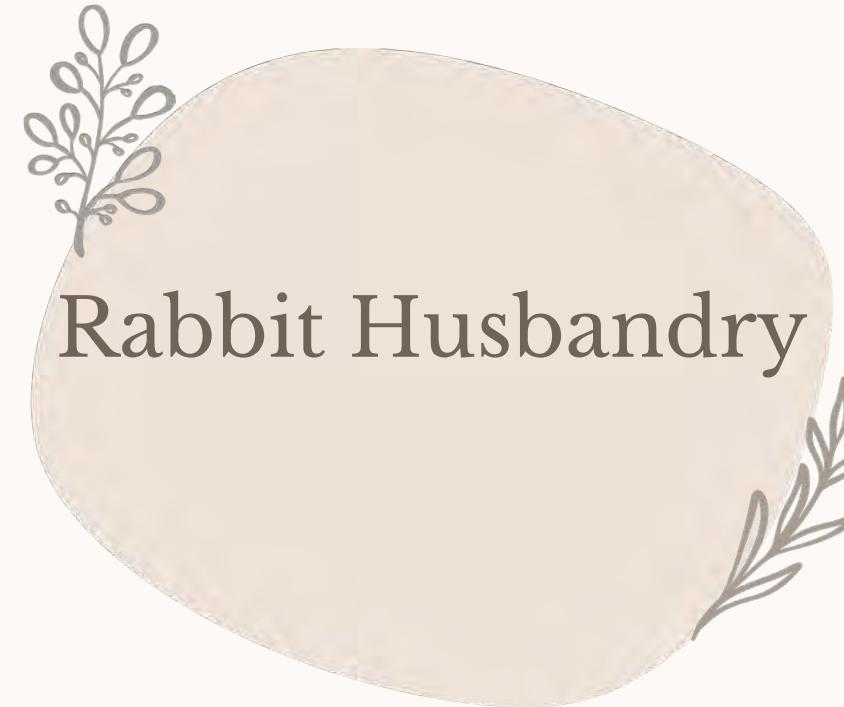
## FY 2022 SDHS Rabbit Intakes



# Spayed/Neutered at Time of Intake, SDHS FY 2022



Oddie  
Oceanside Campus  
759635



# Rabbit Husbandry

## Housing



## Behavioral Well-being



## Diet





# Rabbit Housing

- Housing to enable natural behaviors
  - Chew
  - Dig
  - Perch
  - Play
  - Hide
- Outdoors vs. Indoors – heat intolerant
- Solid floor to prevent pododermatitis
- Rabbit proofing



<https://www.sandiegorabbits.org/housing.php#xpen>



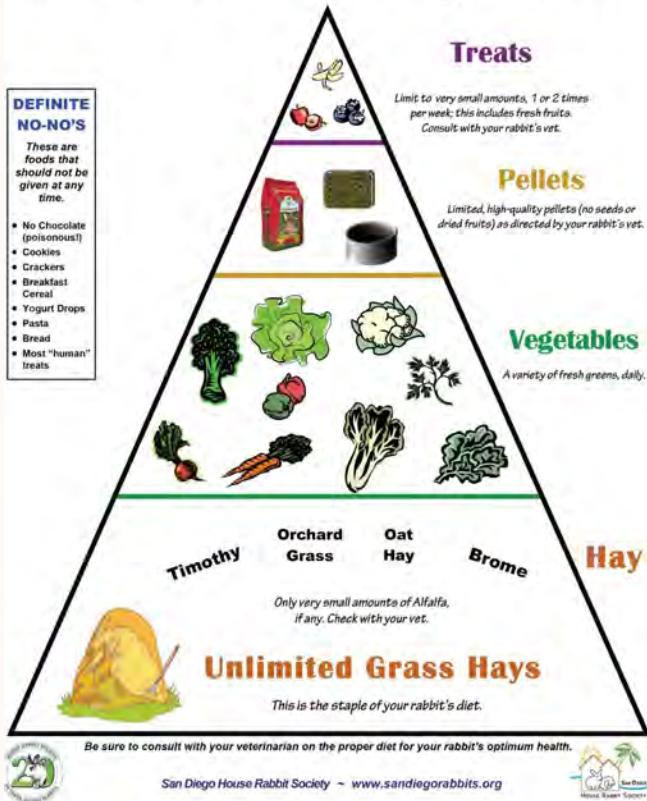
# Rabbit Well-Being

- Exercise
- Enrichment
- Companionship



# Poll Question

# Rabbit Food Pyramid



## Rabbit Diet

- Single most important thing you can do to keep your rabbit healthy
- Unlimited high quality grass hay
- Leafy green veggies daily



# Top 8 List Rabbit Diseases



## 1. Ectoparasites

- Ear Mites
- *Psoroptes cuniculi*
- Mite can survive up to 21 days off the host, re-infection

# Ectoparasites

- Fur Mites (walking dandruff)
- *Cheyletiella parasitovorax*
- Zoonotic potential



Courtesy of Dr. Margaret Bury © 2010



# Poll Question

# Ectoparasites

- DO NOT use Fipronil in rabbits
- Narrow safety margin
- Anorexia, lethargy, tremors, seizures
- Safer options available
  - Selamectin 6-8 mg/kg topical
  - Fluralaner 25 mg/kg PO
  - Ivermectin 0.4 mg/kg SQ q 10-14 days

TABLE 1

## Commonly reported clinical signs in rabbits exposed to fipronil\*

Clinical sign	No. of rabbits exhibiting sign	Percentage of rabbits exhibiting sign
Seizures	45	58
Anorexia	44	57
Lethargy	36	47
Hypothermia	7	9
Tremors	5	6
Adipsia	5	6
Ileus	2	3
Agitation	2	3
Hypersalivation	2	3

\*Source: AnTox Database. Urbana, Illinois: ASPCA Animal Poison Control Center, 2003-2014.

- <https://www.sciencedirect.com/science/article/abs/pii/S0304401722000474?via%3Dihub>
- <https://pubmed.ncbi.nlm.nih.gov/33548547/>



## 2. Respiratory Infection

- “Snuffles”
- Sneezing, nasal discharge
- DDx: infectious, trauma (FB), dental disease, neoplasia
- Mixed bacterial infection (*Pasteurella*, *Bordetella*, *Pseudomonas*, *Staph*)



# Respiratory Infection

- Diagnostics
- Treatment
  - Trimethoprim-sulfa 30 mg/kg PO q 12 h
  - Tetracyclines (Doxy) 2.5-4 mg/kg PO q 24 h
  - Azithromycin 30 mg/kg PO q 24 h
  - Fluoroquinolones (Enro) 5 mg/kg PO q 12 h

<https://rabbits.world/en/2019/01/06/respiratory-problems-rabbits/>

# Antibiotics and Rabbits

- Limited antibiotics
- Judicious antimicrobial use
- Establish if a bacterial infections is actually present

## Box 1: Antibiotics that may result in serious side effects in small herbivores

### The 'PLACE' rule

Penicillins

Lincosamides

Aminoglycosides (possibly)

Cephalosporins

Erythromycin

## Box 2: Antibiotics that may be used in small herbivores

### 'Medications For Treating Small Mammals'

Metronidazole

Fluoroquinolones (except pradofloxacin)

Tetracyclines

Sulfonamides

Macrolides (most, except for a few notable exceptions such as erythromycin)

# Prevention & Control

- Optimal husbandry
- Proper sanitation, stress reduction, proper diet and exercise

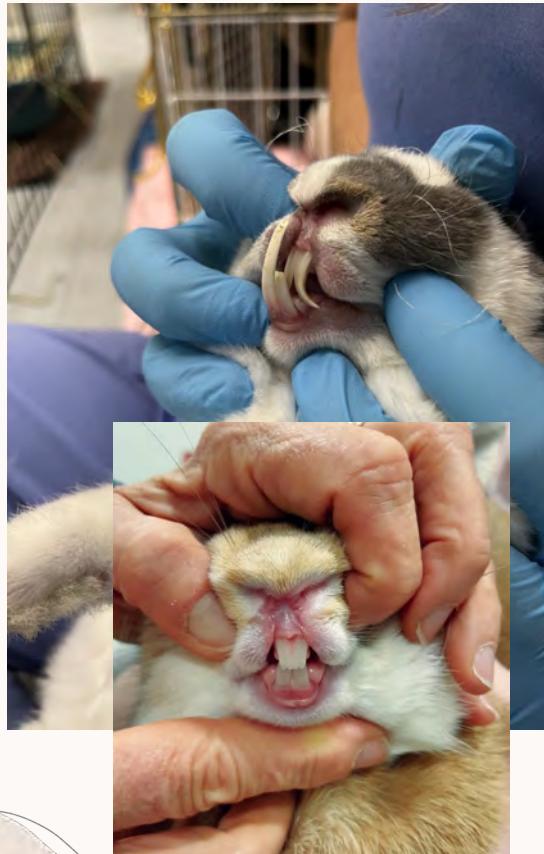




[https://www.mspca.org/angell\\_services/management-of-head-tilt-in-rabbits/](https://www.mspca.org/angell_services/management-of-head-tilt-in-rabbits/)

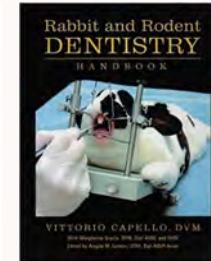
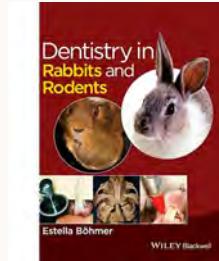
### 3. Encephalitozoonosis

- *Encephalitozoan cuniculi*
- Affects primarily neurologic, ocular, renal systems
- Testing
- Treatment
  - Fenbendazole 20 mg/kg PO SID x 28 d
- Prognosis
- Potentially zoonotic for immunosuppressed individuals

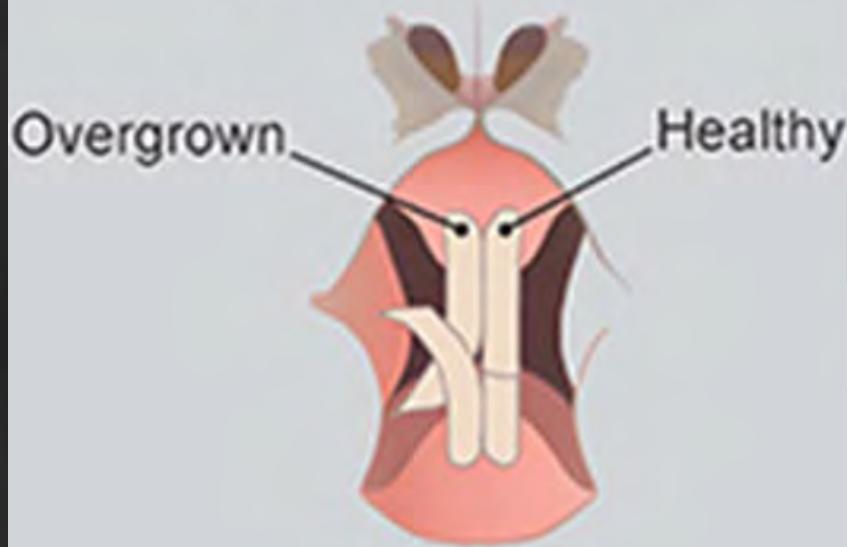


## 4. Dental Disease

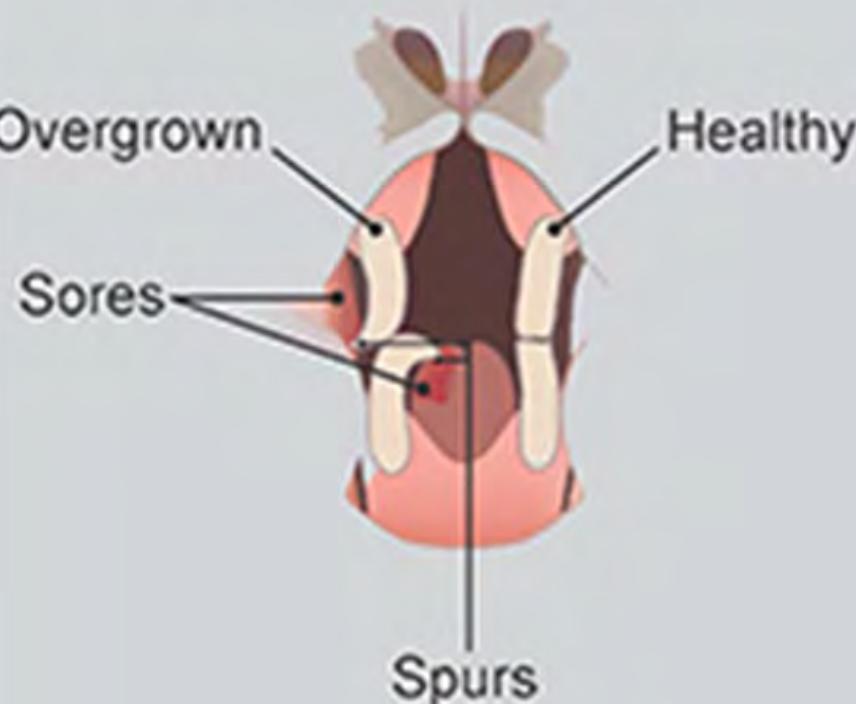
- Teeth continually grow
- Congenital vs. acquired
- Clinical Signs
- Thorough exam requires sedation



## Incisors (front teeth)



## Molars (cheek teeth)



# 5. Rabbit Hemorrhagic Disease



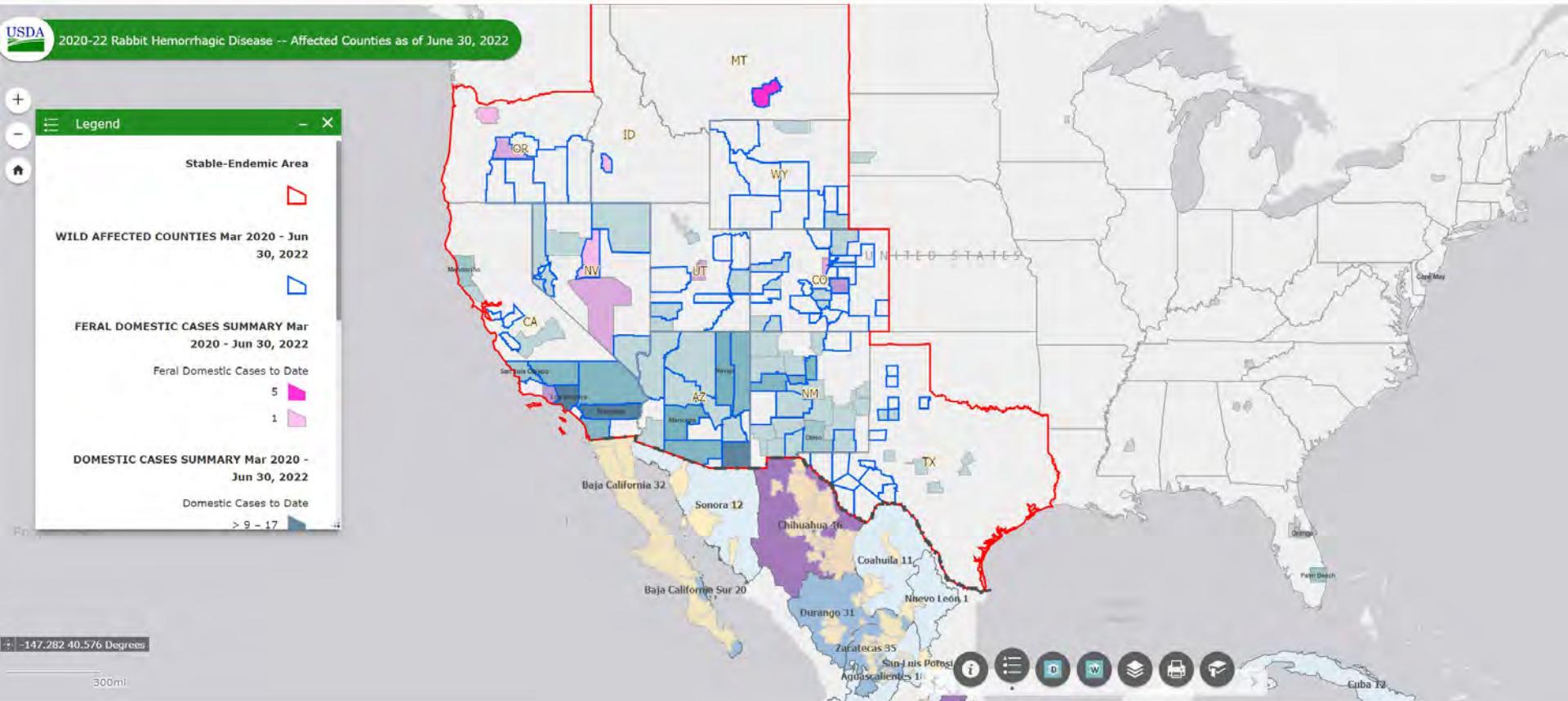
- Causes by rabbit hemorrhagic disease virus
  - RHDV (Classical RHDV, RHDV1, RHDVa)
  - RHDV2
  - EBHSV
- Highly contagious
- Order Lagomorpha
  - Family Leporidae (hares and rabbits)
  - Family Onchotonidae (pikas)

# RHDV2



- Wild and domestic European rabbit (*Oryctolagus cuniculus*), cottontails (*Sylvilagus spp.*), hares & jackrabbits (*Lepus spp.*), pikas? (*Onchotonidae*)
- 11 days old
- Seasonality – Fall/Spring
- Clinical signs
  - Sudden death
  - Pyrexia
  - Seizures
  - Jaundice
  - Epistaxis/hemorrhage

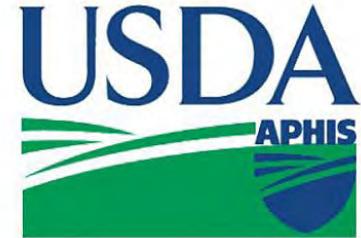
## USDA RHDV2 Map <https://www.aphis.usda.gov/aphis/maps/animal-health/rhd>





# Poll Question

# Reporting Suspicious Cases



- RHDV2 is a Foreign Animal Disease
  - Reportable
- USDA APHIS Area Veterinarian
  - [https://www.aphis.usda.gov/animal\\_health/contacts/field-operations-districts.pdf](https://www.aphis.usda.gov/animal_health/contacts/field-operations-districts.pdf)
- State Veterinarian
  - [https://www.usaha.org/upload/Federal%20and%20State%20Health/State\\_Animal\\_Health\\_Officials.pdf](https://www.usaha.org/upload/Federal%20and%20State%20Health/State_Animal_Health_Officials.pdf)
- Department of Fish & Wildlife
  - <https://www.fws.gov/offices/statelinks.html>

# RHDV2 Vaccination

- Medgene lab
- Emergency use authorization in 45 states
- RHDV2 specific-10 dose vials
- Killed recombinant subunit vaccine
- 2 dose regimen, 21 days apart
- Onset of immunity: 35 days
- Duration of immunity: n/a
- Youngest age to vaccinate: 4 weeks
- <https://medgenelabs.com/rhdy2/>



# 6. Rabbit Gastrointestinal Syndrome

- Multifactorial
  - Low fiber diet
  - Stress
  - Pain
  - Underlying disease, dehydration
- GI stasis\*
- Acute GI blockage
- Enterotoxemia



# Rabbit Gastrointestinal Syndrome

- History
- Physical Exam
- Diagnostics
  - Radiographs
  - +/- CBC, Chemistry panel



**RABBIT AND GUINEA PIG FECAL CHART**

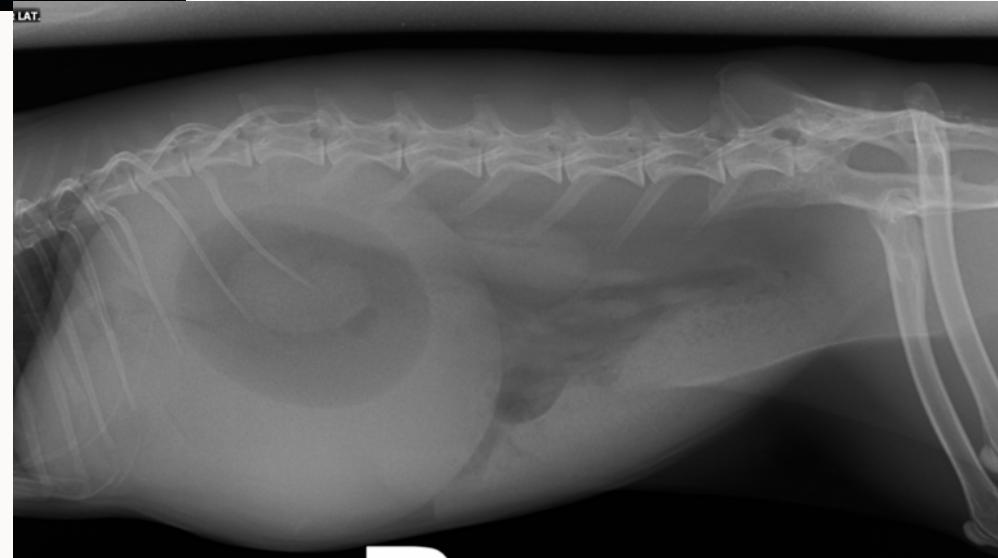
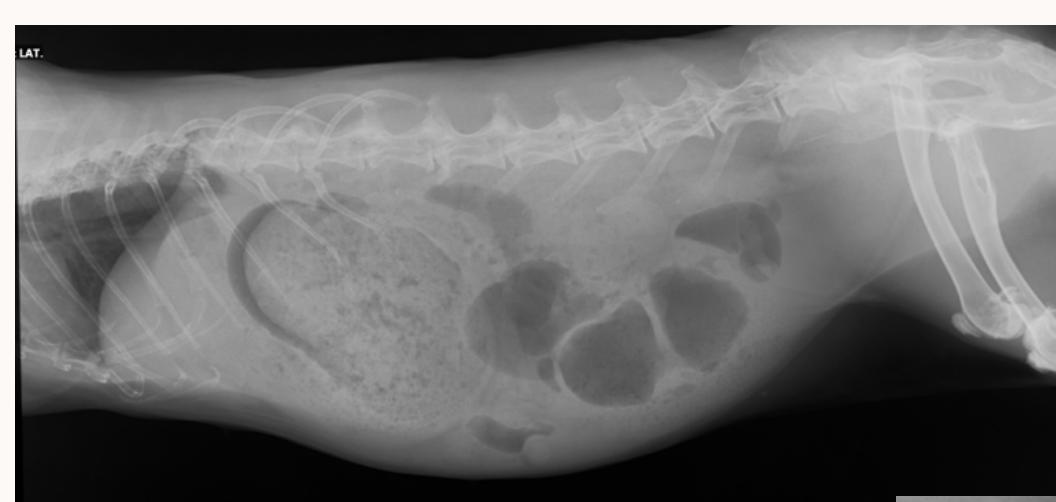
DESCRIPTION	RABBIT	GUINEA PIG
HEALTHY		
HEALTHY CECO-TROPHES		
ABNORMAL: SHAPE		
ABNORMAL: COLOR		
ABNORMAL: SIZE		
ABNORMAL: SLIMY		
ABNORMAL: SOFT OR UNFORMED		
ABNORMAL: DIARRHEA		

## GI Stasis

- Most common\*
- History of several day duration
- Anorexia, reduce fecal pellets, dehydration, alert or depressed, weight loss, pain
- Treatment: fluid therapy, pain control, nutrition

## GI Obstruction

- Rare
- History of quick onset
- Severe depression, lethargy, severe bloating, dehydration, hypothermia, shock
- Treatment: aggressive treatment of shock and hypothermia, pain



# Treatment of GI Stasis

## ■ Fluid Therapy

- IV or SQ (100-120ml/kg/d)

## ■ Nutrition

- Syringe feed or nasogastric tube
- 10-15 ml/kg q 6-8 hr.
- Provide fresh food and water
- Critical Care for Herbivores

## ■ Pain Management

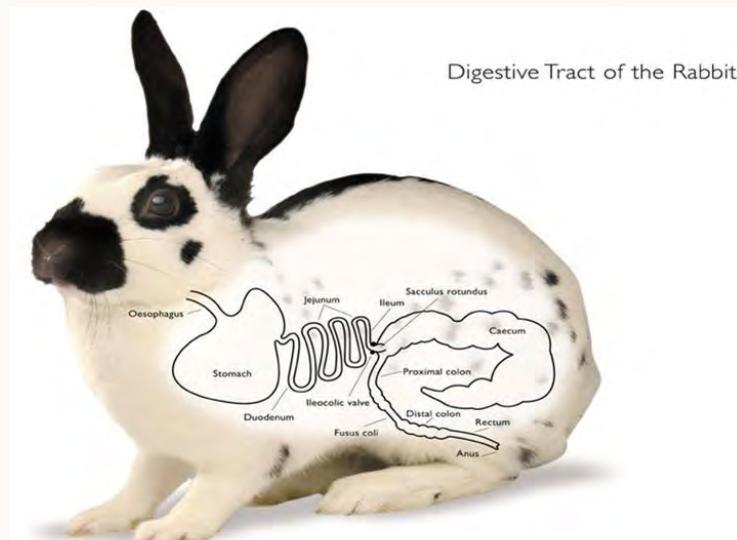
- Opioids, NSAIDs\*

## ■ Additional Treatments

- Anxiolytics - midazolam
- Motility modifiers

# Rabbit Gastrointestinal Syndrome

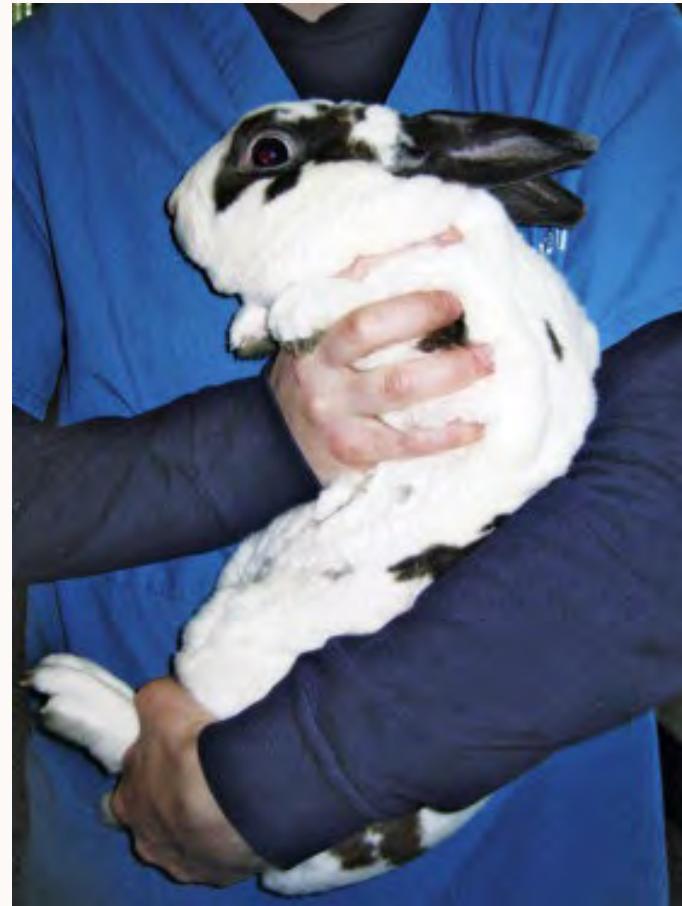
- Always important to identify and treat/correct the underlying cause of the condition
- If surgery is needed, guarded prognosis



# 7. Trauma

- Very powerful musculature in hind limbs
  - Spinal trauma
  - Limb fractures
- Proper handling techniques





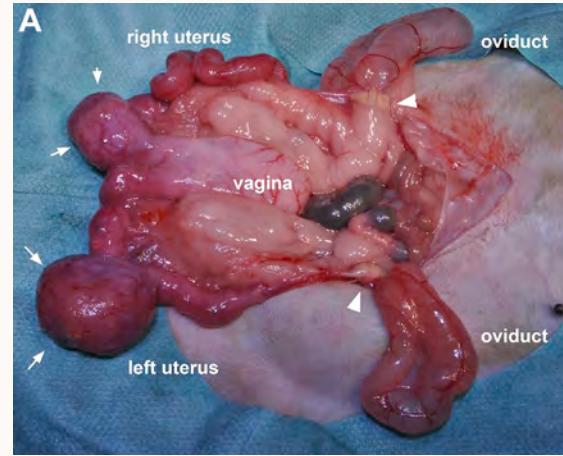
Quesenberry K, Carpenter J. Ferrets, Rabbits, and Rodents,  
3<sup>rd</sup> Ed.



Quesenberry K, Carpenter J. Ferrets, Rabbits, and Rodents,  
3<sup>rd</sup> Ed.

# 8. Uterine Adenocarcinoma

- Most common rabbit neoplasia
- Large percentage of intact female rabbits, risk increases with age
- Clinical signs: none, hematuria, vaginal discharge, mammary tumor, aggression
- Treatment: spay



[https://www.vetexotic.theclinics.com/article/S1094-9194\(16\)30088-3/fulltext](https://www.vetexotic.theclinics.com/article/S1094-9194(16)30088-3/fulltext)



# Rabbit Anesthesia & Spay/Neuter

# Physical exam

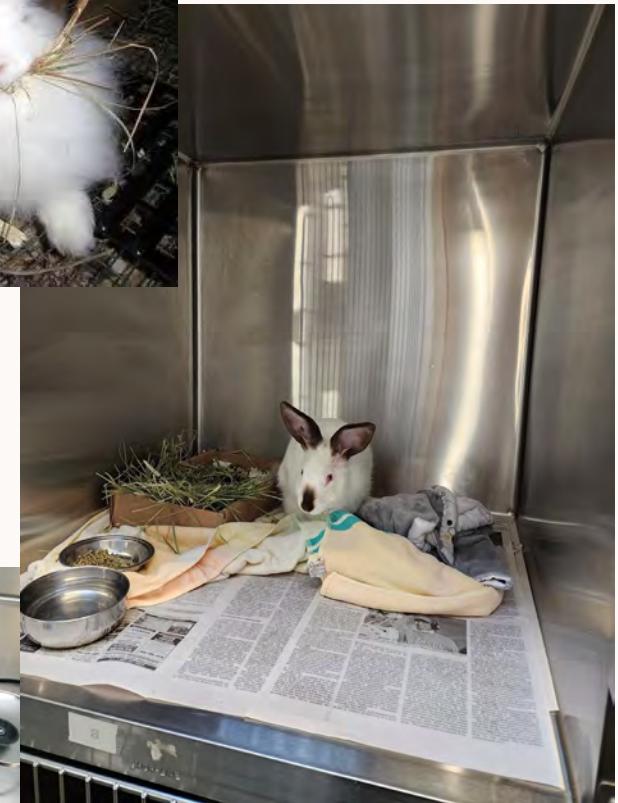
- BCS & Weight
- Sex
- Underlying disease





# Peri-Operative Care

- Do not fast rabbits
- Thermoregulation
- Reduce stress
- Induction
- Pain Management
- Inappetence or anorexia
- Hunched abdominal posture
- Reluctance to move
- Bruxism



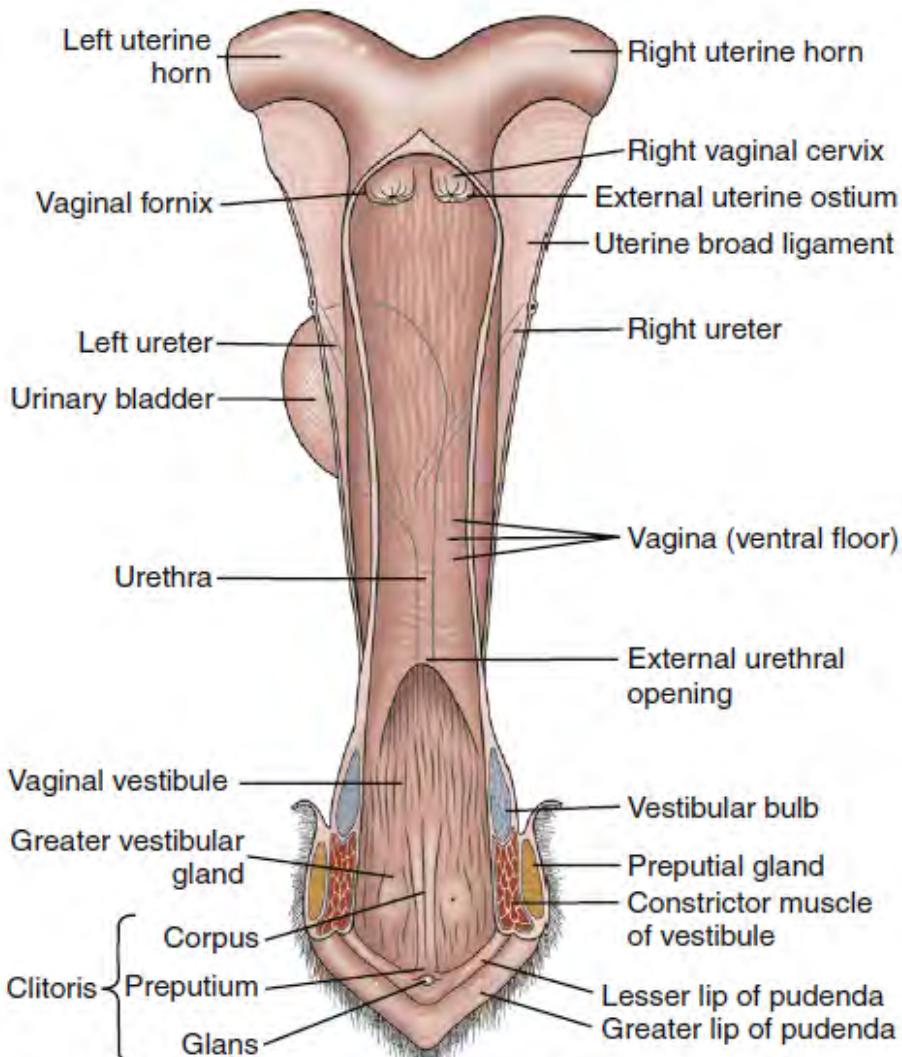
# Anesthetic & Analgesic Protocol for Rabbits

- Selection depends on:
  - Vet and staff knowledge and comfort level with various drugs
  - Staff skill level
  - Drug availability & cost
- Analgesia\*\*
  - Opioids
  - NSAID – meloxicam 0.5-1mg/kg q 24
- Total IM vs. IV
- Reduce stress
- Avoid using high iso/sevo rates
- Reversible drug options
- Parasympatholytics
  - Glycopyrrolate

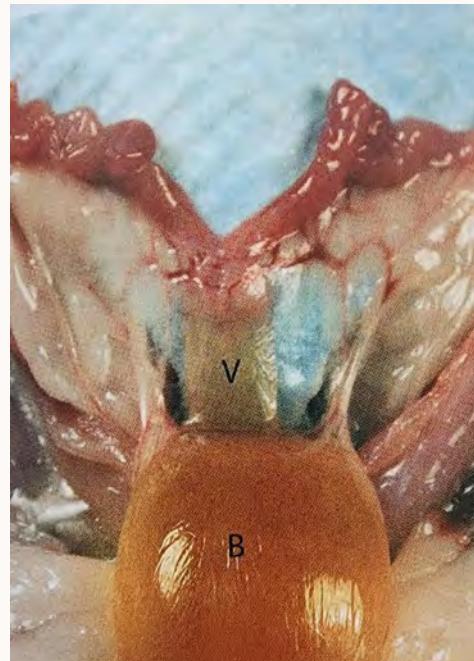
# Anesthetic Monitoring of Rabbits

- Vigilant hands on observation
- Monitoring anesthetic depth
- Monitoring devices
- Monitoring trends





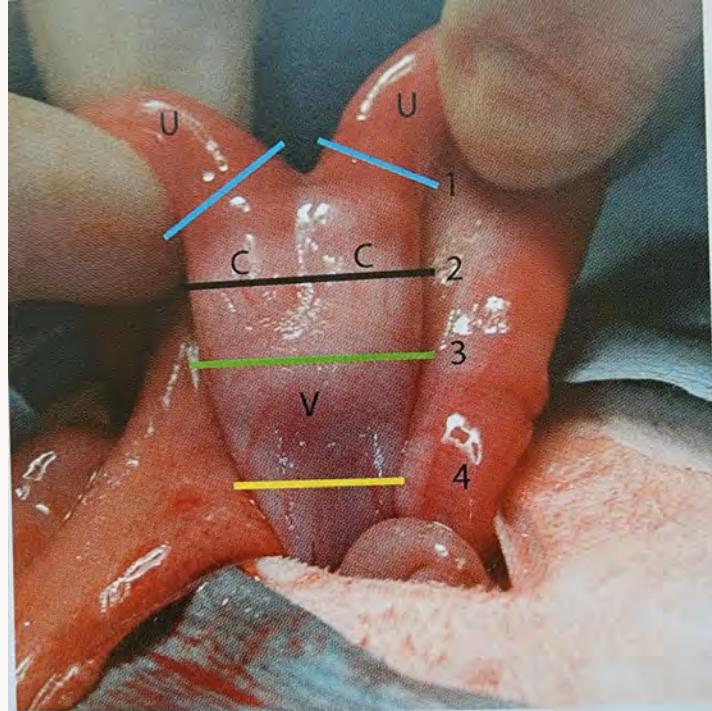
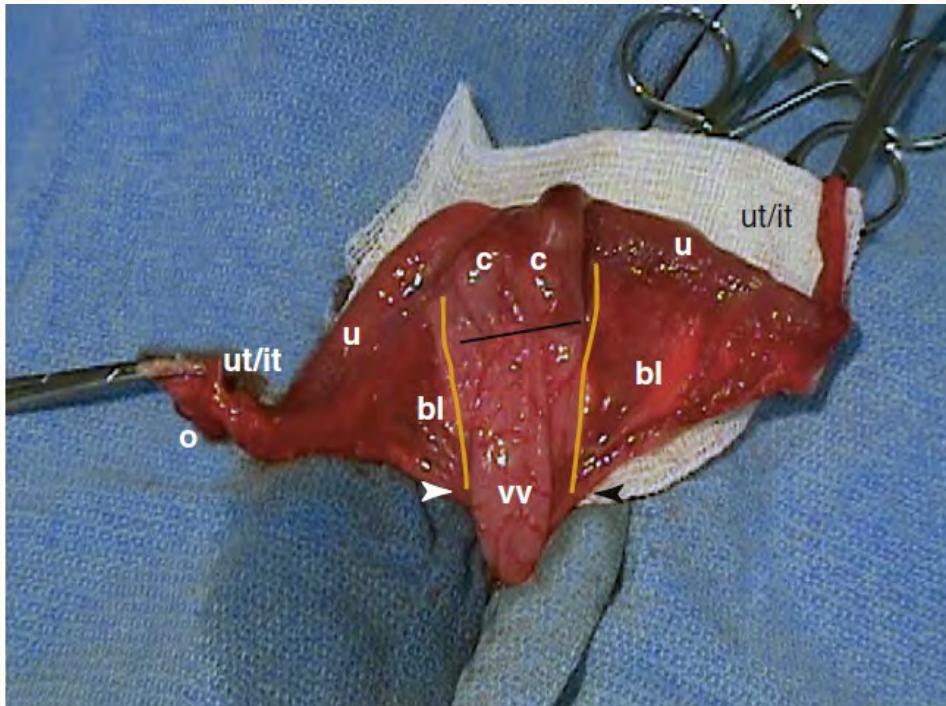
# Rabbit Spay



White, S. High-Quality, High-Volume Spay and Neuter and Other Shelter Surgeries. 1st Ed.

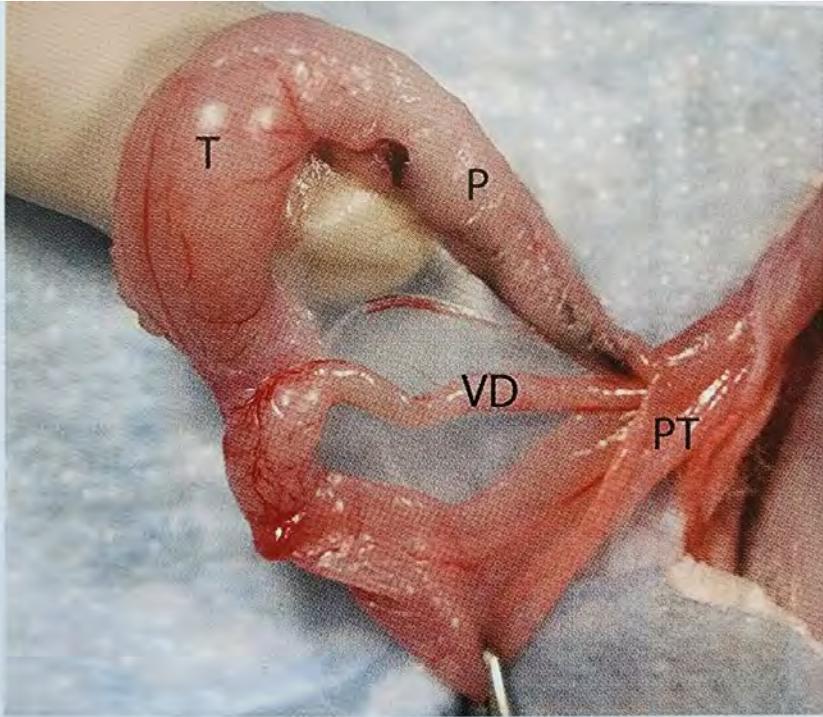
Quesenberry K, Carpenter J. Ferrets, Rabbits, and Rodents, 3rd Ed.

# Rabbit Spay

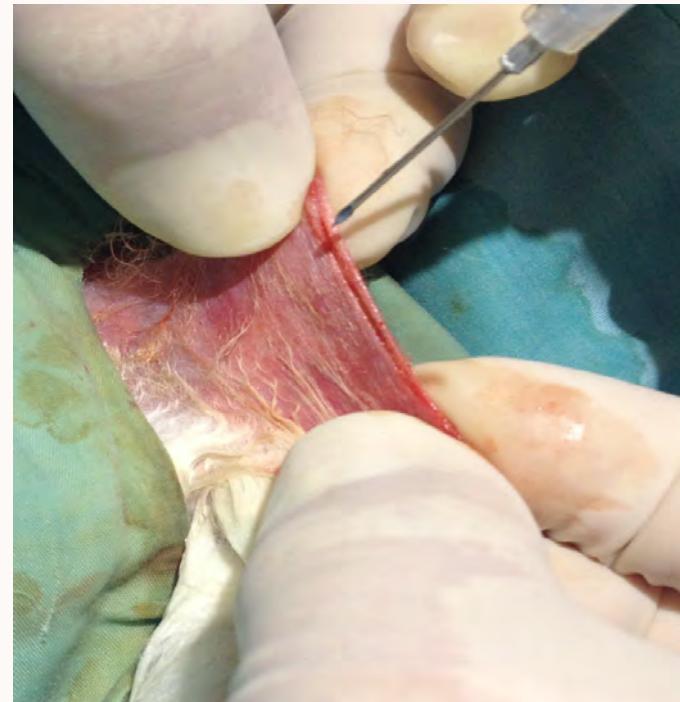


**Figure 15.19** Ligature placement sites in the female rabbit reproductive tract: distal to the cervices (1); proximal to the cervices (2); through the vaginal body (3); and proximal to the vaginal body (4). C, cervix; U, uterus; V, vaginal body.

# Rabbit Neuter



**Figure 15.20** The spermatic cord of the male rabbit. Shown are the pampiniform plexus (P), testes (T), vas deferens (VD), and parietal tunic (PT).



# Spay/Neuter Tips

- Synthetic monofilament suture material
  - Caseous reaction to foreign material = adhesions
- Intradermal to appose skin in spay
- Post-op pain control is crucial
- Tattoo, tattoo, tattoo



➤ *Vet J.* 2022 Jul;285:105856. doi: 10.1016/j.tvjl.2022.105856. Epub 2022 Jul 3.

**Identification of spayed and neutered cats and dogs:  
Veterinary training and compliance with practice  
guidelines**



# Q&A

[zhedge@sduhumane.org](mailto:zhedge@sduhumane.org)



## Resources

- Rabbit Husbandry
  - <https://rabbit.org/care/housing/>
  - <https://rabbit.org/faq-rabbit-proofing/>
  - <https://spca.bc.ca/wp-content/uploads/rabbit-care-guide.pdf>
- Rabbit Dentistry
  - <https://www.pdsa.org.uk/pet-help-and-advice/looking-after-your-pet/rabbits/feeding-your-rabbits>
  - <https://todaysveterinarynurse.com/dentistry/rabbit-dentistry/>
  - [http://www.rabbitdentistry.com/Contents\\_files/Preview.pdf](http://www.rabbitdentistry.com/Contents_files/Preview.pdf)
  - <https://www.capello.vet/assets/intraoral-treatment-of-dental-disease-in-pet-rabbits.pdf>
  - <https://www.pdsa.org.uk/pet-help-and-advice/pet-health-hub/symptoms/dental-problems-in-rabbits>
  - <https://www.mypetsdentist.com/rabbit-rodent-dental-care.pml>
  - Rabbit Dentistry <https://www.youtube.com/watch?v=jTYc3wl7rzA>
  - Oral Exam <https://lafeber.com/vet/oral-examination-of-small-herbivores/in Rabbits and Rodents> <https://lafeber.com/vet/oral-examination-of-small-herbivores/>

## Resources

- Rabbit Diseases
  - Ectoparasites - [https://www.cliniciansbrief.com/article/ectoparasites-rabbits?utm\\_medium=email&utm\\_source=Clinician%27s+Brief+Newsletter&utm\\_campaign=Global+200320](https://www.cliniciansbrief.com/article/ectoparasites-rabbits?utm_medium=email&utm_source=Clinician%27s+Brief+Newsletter&utm_campaign=Global+200320)
  - E. cuniculi - <https://www.vetfolio.com/learn/article/encephalitozoon-cuniculi-infection-in-rabbits>
  - RHDV2
    - [https://www.aphis.usda.gov/publications/animal\\_health/fs-rhdv2.pdf](https://www.aphis.usda.gov/publications/animal_health/fs-rhdv2.pdf)
    - <https://rabbit.org/resources/rhdv/>
  - RGIS -  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7258705/#:~:text=Gastrointestinal%20Motility%20Disorders-,Gastrointestinal%20Stasis%20Syndrome,caused%20by%20an%20inappropriate%20diet.>

## Resources

- Rabbit Spay/Neuter
  - Dr. Sara White – Rabbit Spay <https://www.youtube.com/watch?v=LTwqyHGA-mE>
  - Dr. Sara White – Rabbit Pre-Scrotal Castration <https://www.youtube.com/watch?v=qumGcic9QXk>
  - Dr. Rachel, Exotic Pet Vet – Rabbit Closed Scrotal Castration <https://www.youtube.com/watch?v=MFWYJPu8jXQ>
- Rabbit Anesthesia
  - <https://www.theveterinarnurse.com/review/article/principles-of-rabbit-anaesthesia-for-veterinary-nurses>
  - Development of the Bristol Rabbit Pain Scale - [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8195426/#:~:text=The%20Rabbit%20Grimace%20Scale%20\(RbtGS, and%202%20is%20extreme%20pain](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8195426/#:~:text=The%20Rabbit%20Grimace%20Scale%20(RbtGS, and%202%20is%20extreme%20pain)