

# Exotic Pet

## P R A C T I C E

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### SCIENTIFIC ARTICLE

## Proper Bedding Substrates for Housing Exotic Animals

*Wm. Kirk Suedmeyer, DVM*

Housing exotic animals in a captive situation can be a laborious task. Proper husbandry is absolutely necessary to prevent problems. Many times, an improper bedding substrate leads to a variety of problems. Ingestion, toxicity, and proliferation of bacteria, fungi, and parasites are commonly encountered problems associated with improper substrate. Any bedding material can cause problems if it is not properly cleaned. Most bedding materials, regardless of the type, should be cleaned on a daily basis and should be nontoxic, allow for easy cleaning, provide proper footing, decrease the likelihood of ingestion, and lessen the proliferation of microorganisms. Pebbles, excelsior, pine shavings, shredded butcher's wrap, shredded paper towels, indoor/outdoor carpets, and vinyl shelf paper generally meet these requirements.

Recommended use of a particular substrate depends on the species of animal to be housed. Rodents and rabbits will not do well on vinyl shelf paper or indoor/outdoor carpeting because they will readily move or eat it, and it allows them to come in contact with their waste products on a daily basis. Many terrestrial snake species, however, do well on this substrate because it is easy to clean, is seldom ingested, and comes in a variety of colored patterns, making an attractive display. Commercial rabbitries commonly house rabbits within suspended wire cages with minimal bedding.<sup>1,2</sup> This allows urine and fecal material to fall out of the cage to the floor below.

Certain bedding materials can directly cause illness in exotic pets. Cedar shavings contain aromatic hydrocarbons that give this wood its characteristic smell; this compound is irritating to the respiratory epithelium. Respiratory problems will develop in gerbils, hamsters, rats, and mice commonly housed on this substrate.<sup>3</sup> If properly cleaned, pine shavings, shredded paper toweling, or excelsior work well. Pine shavings also contain aromatic hydrocarbons, but to a lesser extent than cedar. Most hardwood chips have no aromatic hydrocarbons, but these are not readily commercially available as a substrate.<sup>3</sup>

Housing on hay or straw has its advantages (inexpensive, readily available) but can predispose animals to problems if it is not cleaned daily. *Aspergillus* species and other pathogenic fungi readily grow in damp, soiled straw or hay. Straw awns and foreign materials, such as wire and metal, are commonly encountered and may be ingested. In addition, Trombiculidae mites (chiggers) contained in the straw may cause skin irritation.

Corn cob litter, a commonly used product, is relatively inexpensive and absorbent. However, it allows for rapid proliferation of microorganisms, and it is commonly ingested. Its use is discouraged in any situation.<sup>3</sup>

Sand, though inexpensive, attractive, and absorbent, is also commonly ingested with food items and over time may cause sand impactions.<sup>4</sup> When you are feeding animals housed on sand, present the food item(s) on a grocery bag or other easily cleaned substrate to lessen the chance of ingestion.

Various types of gravel can be used with certain exotic pets. Gravel is inexpensive, attractive, readily available, and easy to clean. A diluted (1:60) bleach and water solution will adequately disinfect nonporous materials. Rinsing several times in distilled water prevents any toxic reactions. This product may be adequate to house tarantulas, for instance, but housing an animal that might ingest the gravel (such as a tortoise) is not recommended.

Topsoil is required for many burrowing species such as legless

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## Proper Bedding Substrates for Housing Exotic Animals

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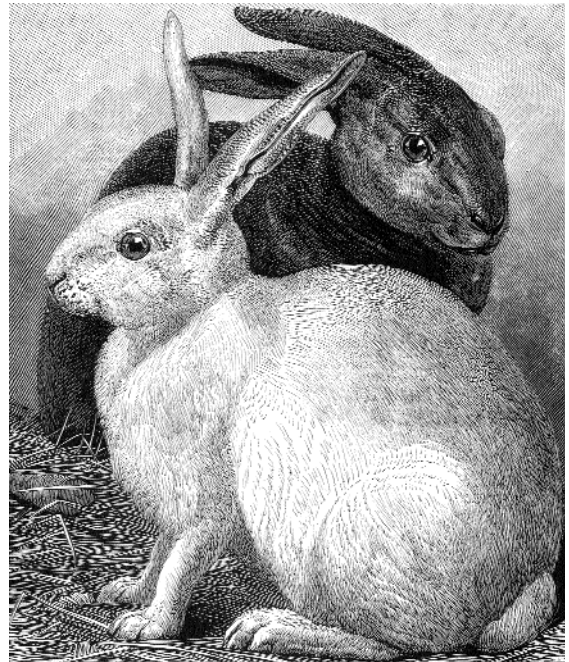
lizards (*Ophisaurus* species).<sup>4</sup> Some amphibians (*Bufo* species) thrive when provided with a soil substrate into which they can partially burrow. Plants can provide hiding areas and serve as a source of watering for those animals that lap water off leaves. The soil can be slightly dampened to maintain proper humidity for the amphibian.<sup>4</sup> Topsoil is difficult to clean, however, especially in larger cages. Removal of waste products on a daily basis and periodic replacement with fresh topsoil will work in most instances.

Toweling, such as surgery towels, can be an excellent substrate for many exotic pets, including hedgehogs, small finches, and small tortoises. The toweling is absorbent, inexpensive, readily available, and easy to remove when soiled. Toweling is not recommended for animals that may chew and ingest it. Toweling that is tattered or has loose fibers should not be used because the fibers may trap toes, causing avascular necrosis or fractures in a struggling animal.

Proper substrates are an essential component of housing for exotic animals in a captive situation. Familiarity with the natural history of the animal will help determine what substrate is necessary. Familiarity with housing used in a commercial setting may also help the practitioner discuss proper housing with the client.

**References**

1. Niederhauser U: Rabbit husbandry. Presented at the Second Annual Conference of Ferret—Rabbit Medicine and Surgery for the Practitioner. Madison, Wis, October 1989.
2. Jenkins JR: Skin disorders of the rabbit. Presented at the Third Annual Conference of Small Mammal—Reptile Medicine and Surgery for the Practitioner. Madison, Wis, October 1990.
3. Jenkins JR: Husbandry problems of small mammals. Presented at the Third Annual Conference of Small Mammal—Reptile Medicine and Surgery for the Practitioner. Madison, Wis, October 1990.
4. Mader DR: *Reptile Medicine and Surgery*. Philadelphia, WB Saunders, 1996, p 14.



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# PRACTICE TIP

Cathy A. Johnson-Delaney, DVM

## Administering Tablet or Powdered Medications to Rats

Tablet or powdered medication delivery to rats can be made easy by mixing the ground-up powder with either Sustacal (Bristol-Myers; chocolate flavor is preferred) or Ensure (Ross) brand diet supplements. The heavy flavor generally covers up the taste of the medication, and it also works well as a nutritional source for aged animals or for any in a debilitated condition. For rats, volume limitation is approximately 0.5 to 1 mL per dose; for mice, 0.25 mL.

### ROUNDTABLE

## Vaccinations for Exotic Pets

**Q. Discuss your protocol for immunization of the adult ferret.**

**Dr Campbell:** I use Fervac-D (United Vaccine, Madison, Wis) given subcutaneously once a year. Some doctors have reported an occasional anaphylactic reaction with this vaccine, although I have not experienced this. Imrab III (Merial, Athens, Ga) is used annually to prevent rabies.

**Dr Suedmeyer:** If the vaccination history is not known, I recommend 1 injection of canine distemper vaccine (avian or primate cell line origin) followed by another injection in 3 weeks.

Rabies vaccination (using Imrab) is advised annually.

**Q. Discuss immunization of the pet monkey.**

**Dr Campbell:** For New World Monkeys, I recommend tetanus (human toxoid), measles (human vaccines, modified live virus or killed), and rabies (human diploid) vaccinations. Optional vaccines include hepatitis A and B, parainfluenza type 3, and Sendai. For Old World Monkeys: tetanus, measles, and rabies with the same optional vaccines, and also Haemophilus influenzae and eastern equine encephalitis as

options. For lesser and greater apes, I recommend immunization for tetanus, measles, rabies, current human influenza, and H influenzae. The measles vaccine should not be given with other vaccines or with TB testing.

**Dr Suedmeyer:** My only routine immunization is tetanus toxoid every 5 to 10 years, as for humans. I do not advise vaccine for polio or pertussis, although I do immunize the younger greater apes for polio. Since the vaccine is a live virus product, owners may be at risk if they are not currently immunized. It is advised to vaccinate most monkeys for measles using the human product and schedule.

### WHAT'S YOUR DIAGNOSIS ???

## Netherland Dwarf Rabbit With Neurologic Problems<sup>1</sup>

Shawn Messonnier, DVM

A 2-year-old intact male Netherland Dwarf rabbit (*Oryctolagus cuniculus*) was brought in with a 2-day history of progressive neurologic problems. Multiple episodes of twitching, some of which were possibly seizures, occurred. Weakness on the animal's left side and occasional falling to the left was observed, as well as increasing respiratory distress.

Physical examination showed a rabbit estimated to be thin and 10% dehydrated. The rabbit was bright, alert, and responsive. Normal body temperature, heart rate, and respiratory rate were detected. Blood testing showed a mild leukocytosis and lymphocytosis. The alkaline phosphatase level was elevated, and decreased alanine aminotransferase and phosphorus levels were reported. Hyperalbuminemia was attributed to dehydration. Finally, hypercalcemia was also detected. Radiographs showed a large cranial mediastinal mass.

### Questions

1. What is the cause of the mediastinal mass?
2. What is the cause of the neurologic signs?

**Q. Discuss immunization of other common exotic pets.**

**Dr Campbell:** Nondomestic felines should be immunized for the typical cat diseases, including leukemia. Exotic canids require rabies (Imrab III) and distemper. No vaccines are given for lab animals because serological testing is important in the identification of diseases in this group of animals.

**Dr Suedmeyer:** We vaccinate susceptible animals, according to species, for canine distemper, tetanus, clostridial disease, and feline viral diseases. In general, we follow the same regimen as for domestic pets. Practitioners need to check with experienced exotic pet veterinarians on recommended uses of modified 1 vaccines.

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## Netherland Dwarf Rabbit With Neurologic Problems

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### Answers

1. Differential diagnoses for a cranial mediastinal mass include thymoma, thymic hyperplasia, metastatic carcinoma, aortic body tumor, ectopic thyroid tissue, and lymphosarcoma (thymic lymphoma). The owners chose to have this rabbit euthanized.

Necropsy and subsequent histopathology showed replacement of normal thymic tissue with round-to-oval neoplastic

cells. A diagnosis of thymoma was made.

Thymoma is a rare tumor usually found in older animals. Clinical signs may be absent or may occur as respiratory signs (coughing, tachypnea, dyspnea) because of compression of the trachea. Esophageal compression could result in regurgitation. Other signs can include hypercalcemia, polymyositis, cranial vena caval syndrome (anasarca of the head, neck, forelimbs, and cranioventral thorax), bilateral exophthalmos and respiratory distress, or autoimmune disease such as myasthenia.

2. Neurologic disease in rabbits is most often associated with pasteurellosis or encephalitozoonosis. In this rabbit, encephalitozoonosis was the cause of a non-suppurative meningoencephalitis. Lesions require at least 30 days after exposure to develop. Serology can be diagnostically helpful. The prognosis is grave.

### Reference

1. Adapted from Bowenkamp K, Roth L: Cranial mediastinal mass in a Dwarf rabbit. *Lab Anim* 28:19-21, 1999.

## WHAT'S YOUR DIAGNOSIS ???

### Wallaby with Chronic Diarrhea

Cathy A. Johnson-Delaney, DVM

*An adult male Tammar wallaby (Macropus eugenii) is brought in because of chronic diarrhea (2 years' duration). The stool is a soft, pasty, mounded consistency rather than the normal dry pellets. Periodically, the animal will pass a few normal pellets. The animal is well hydrated, has a normal appetite, and is slightly overweight (8.5 kg; normal average, 7.5 kg). The diet consists of a commercial kangaroo feed, alfalfa hay cubes, lawn grass, various fruits and vegetables, bread, and occasional cookies. A fecal flotation was done and several oocysts approximately 25 × 25 μm were seen.*

### Questions

1. What is your diagnosis?
2. What else would be in your list of differential diagnoses?
3. How would you treat this?
4. Comment on the diet.

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## CASE REPORT

### Neural Tube Defects in a Litter of Ferrets

Terry W. Campbell, DVM, PhD

A 3-year-old ferret (*Mustela putorius furo*) jill delivered a litter of 3 stillborn kits. The jill was a "Silver Mitt Panda" and the sire was a "Cinnamon." Each of the 4- to 5-cm long kits exhibited anencephaly and marked cervical retroflexion (a symmetrical opening in the skull). The sagittal section of each kit revealed a kyphotic deviation of the atlanto-occipital joint. One of the kits had a cleft palate. The viscera of each kit appeared to

be normal. The kits were of a term delivery.

This was the second litter for this jill. Her first litter from 1 year earlier consisted of 8 kits. Five of these 8 kits survived. One was stillborn and exhibited the same features described in the kits of her second litter. A second kit died less than a week after birth and was found to have a cleft palate. A third kit from the first litter died at 6 weeks of age, presumably from cardiomy-

opathy. The sire of the first litter was an albino hob. The black-eyed, white sibling of this jill delivered a litter of 7 healthy kits the year the first litter was born.

This colony of 14 ferrets experienced an outbreak of epizootic catarrhal enteritis when this jill was pregnant with her second litter. This jill and the other ferrets had the typical "green slime diarrhea" associated with that disease. All but 1 of the ferrets survived the outbreak. Another jill died several weeks after an apparent recovery from the disease. She had severe, acute, diffuse, hemorrhagic enteri-

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## FROM THE LITERATURE

**Don't Feed Fireflies to Herps**

Shawn Messonnier, DVM

Ingestion of fireflies (lightning bugs) is potentially toxic and can be lethal to lizards. This report describes the death of 2 bearded dragons (*Pogona vitticeps*) and 1 leopard chameleon (*Chamaeleo pardalis*) that died shortly after ingesting 1 to 6 fireflies. The fireflies of the genus *Photinus* contain protective poisons called lucibufagins, which may have been responsible for the deaths. These poisons are related to cardenolides, which can be cardiotoxic and can, in low doses, be fatal to mammals.

*Bull Chicago Herp Soc* 34:21, 1999.

**Editor's Note:** This report suggests that the ingestion of certain insects, namely fireflies, can be toxic and even fatal to reptiles. It also suggests that insects (such as monarch and queen butterflies) that feed on plants such as milkweed plants (which contain toxins similar to the lucibufagins) should be excluded from the pet reptile diet. At this time, it probably makes sense to caution clients against feeding fireflies to their pets. It may be prudent to caution against feeding moths and butterflies, also, unless the insects are raised on known "safe" plant sources.



## HOW I . . .

**Place an Indwelling Urinary Catheter in a Ferret**

James K. Morrissey, DVM

Placing an indwelling urinary catheter in a male ferret (*Mustela putorius furo*) may be a necessary therapeutic option in ferrets with urinary obstruction. I use a 3.5 French rubber catheter and a sterile guitar string or stylet from a jugular catheter. The sterile guitar string or stylet is lubricated and passed into the rubber catheter to support the thin catheter. The urethral opening is located on the ventral aspect of the penis, approximately 5 mm from the tip of the penis. A short 24- or 22-gauge IV catheter can be used to locate the urethral opening

and stretch it slightly to allow the larger rubber catheter to enter the urethral opening. Once the rubber catheter is placed in the opening, it should be advanced slowly 2 cm at a time. Each time the rubber catheter is advanced, the stylet (sterile guitar string or jugular stylet) is pulled back 2 cm. This is to avoid damaging the urethra with the rigid stylet as it curves into the pelvis. Once the catheter is in place, I suture the catheter in place (using tape tabs) cranial to the penis, bend it around and suture it again cranial to the tail, and then

tape it to the tail itself. Multiple sutures help to assure that the catheter is not pulled out by the ferret when it awakens. The catheter end is then attached to a urinary collection system.

## Client Teaching Guide

# Bird

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## CARE SHEET

Thomas P. Ryan, DVM, Feathers, Scales and Tails Veterinary Hospital, Westminster, Md

### Society Finches (*Lonchura domestica*)

- ✓ **Other Name:** Society finches, also called Bengalese finches, rival the zebra finch as the most popular finch.
- ✓ **Place of Origin:** This species does not nor did it ever exist in the wild. Although developed in China, its origins are obscured in antiquity. They now exist in a variety of color mutations.
- ✓ **Diet**
  - Fresh water should always be provided and should be changed once or twice a day.
  - The diet should consist of a mixture of fruits, vegetables, crumbled pellets, and high-quality finch seed. They seem to enjoy freshly sprouted seeds and the occasional finely diced hard boiled egg.
- ✓ **Environment and Housing:** A cuttlebone should be provided. These birds must be kept in finch cages because they can squeeze through the bars of many parakeet and canary cages. All new birds should be isolated for 45 days before mixing with other birds. A thorough physical examination is recommended.
- ✓ **Nesting:** Do not use fine fiber or hair for nest building. This often wraps around a bird's toe or foot, resulting in amputation.
- ✓ **Reproduction:** These finches can and do breed with other finches. They are excellent parents and will even hatch or raise babies of other finch breeds.
- ✓ **Common Medical Problems**
  - Gastrointestinal problems caused by *Campylobacter* species and other bacteria.
  - Parasites, especially giardia, cochlosoma, and coccidia.
  - Viruses, polyomavirus being the most frequent, and yeast.
  - Poor feathering may be caused by mites, poor diet, any internal illness, or another aggressive bird pulling out the feathers.
- ✓ **Temperament:** Society finches are sociable birds. Although they are not aggressive, their curious nature may disturb more timid species. They do not like to be touched or handled, but they can provide hours of fascination with their active curious nature.

**To ensure a long, healthy life for your bird, it is essential to provide plenty of fresh water, a balanced diet, regular medical checkups, a large cage to allow for sufficient exercise, and toys for mental stimulation.**

## Neural Tube Defects in a Litter of Ferrets

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tis, and her uterus had lesions indicative of pseudopregnancy. A third jill in the colony also had a pseudopregnancy after the disease outbreak. A fourth jill delivered a single-term stillborn kit that was nearly twice the size of a normal newborn ferret kit. This newborn appeared normal except for its unusual size. Pseudopregnancy and small litter sizes commonly occur in ferrets after an outbreak of epizootic catarrhal enteritis, a disease of unconfirmed etiology presumably caused by a virus.

The deformities observed in this litter of ferret kits was indicative of a neural tube defect. The kits exhibited iniencephaly, a type of neural tube defect characterized by a deficiency of the occiput, cervical retroflexion, and congenital fissure of the spinal column (rachischisis).<sup>1</sup> The kits also had craniorachischisis,

a condition of an open defect in the spinal canal and a cranial defect. In ferrets with normal gestation of 42 days, the neural tube closes between days 16 and 17.<sup>1</sup> Therefore, the defect observed in this litter of ferret kits most likely occurred during that time.

Neural tube defects in human beings can occur with hypervitaminosis A, folic acid deficiencies, or the administration of certain drugs such as tetracycline, sulfonamide, and salicylates during pregnancy.<sup>2</sup> However, this has not been documented in ferrets, and there was no history supporting nutritional supplementation or drug therapy in this jill. It was tempting to conclude that the fetal insult occurring at the time of neural tube closure may have resulted from a fever or toxemia in the dam associated with the epizootic catarrhal enteritis during pregnancy. However, neural tube defects observed in this litter have been described in ferrets and may be a genetic condition associated

with selective breeding for color dilution in ferrets, as occurred in this case. Also, 2 consecutive litters from this jill sired by hobs of diluted color were affected with the neural tube defects. A significant correlation between the number of previous litters and congenital malformations, especially cranioschisis, has been reported in ferrets. Therefore, the neural tube defects observed in this litter of ferret kits most likely resulted from a congenital defect. The pseudopregnancies and small litter sizes resulted from the outbreak of the epizootic catarrhal enteritis.

### References

1. Williams BH, Popek EJ, Hart RA, et al: Iniencephaly and other neural tube defects in a litter of ferrets (*Mustela putorius furo*). *Vet Pathol* 31:260-262, 1994.
2. McLain D, Harper SM, Roe DA, et al: Congenital malformations and variations in reproductive performance in the ferret: Effects of maternal age, color, and parity. *Lab Anim Sci* 35:251-255, 1985.

## Wallaby with Chronic Diarrhea

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### Answers

1. They are coccidia oocysts, *Eimeria* species. Coccidiosis is a common disease of macropods (eg, kangaroos, wallabies). In most, it is limited to the small intestine, but a hepatic coccidiosis has been diagnosed in wild tammar wallabies. Most enteritis produced is mild. In captive joeys, the diarrhea can be watery to dark and tar-like. It may be accompanied with gut pain, lethargy, dehydration, and weakness.
2. Other differential diagnoses include diet-induced colibacillosis, diarrhea/gastroenteritis, and intestinal nematodes including *Hypodontus macropi* and *Macropoxyzuris* species.
3. Treatment should consist of sulfadimethoxine or sulfamethazine at 50 mg/kg every 24 hours for

- 10 days; repeat treatments as necessary. Sanitize the environment as much as possible, because the spread of protozoa is fecal-oral. Oocysts may persist outdoors in cool conditions—removal of feces as frequently as possible is advantageous. A probiotic lactobacillus may be given as an adjunct. Macropods are foregut fermenters, and maintenance of healthy gastrointestinal tract flora must be considered when using any antimicrobial.
4. This animal's diet is not appropriate and may actually be the cause of the clinical diarrhea. Wallabies are grazers and in the wild eat abrasive, siliceous grasses with high fiber content as well as various fibrous plant materials, such as bark. The roughage is necessary not only for the health of the gastrointestinal tract, but for the functioning of the dental mill. Worn molars are shed anteriorly and are replaced

from the posterior. Without sufficient fibrous material, the teeth cannot move properly, predisposing the animal to necrobacillosis and osteomyelitis ("lumpy jaw"). An appropriate diet for captive wallabies includes timothy or grass hay, some alfalfa hay, and a commercial kangaroo pellet (Mazuri brand Kangaroo/Wallaby Diet 5Z88, PMI Feeds, St Louis, Mo). Fresh grass can be offered as well, particularly when converting the animal to more fibrous foods. This will help to toughen the gums gradually. The diet should not contain sharp items such as oat awns or overdried hays. Bark from the vine maple or apple tree can be provided for chewing; many wallabies enjoy chewing on bark once they are adapted to the more fibrous diet. In lieu of the commercial diet, a 50:50 mix of horse and rabbit pelleted food has been used.





**Editor's Note:** We appreciate readers submitting questions for *Exotic Pet Practice*. However, there are times when we don't have a backlog of questions waiting to be answered. In these instances, we'd like to share with you some questions that will help you review important information. For those of you studying for board examinations, these questions may be helpful. They are taken from Pratt PW: *Review Questions and Answers for Veterinary Boards: Ancillary Topics*, ed 2. St Louis, Mosby, 1998.

**Mammals have 2 ovaries. During endoscopy on a female scarlet macaw, a lesion is noted in the area of the gonad. How would you describe the gonad(s) in this bird?**

- A. There is only 1 functional ovary located adjacent to the cranial pole of the left kidney.**
- B. There are many ovaries seen adjacent to the cloaca.**
- C. There are no true ovaries, but rather a unisex ZW gonad that produces eggs or sperm, depending on hormonal influences.**
- D. There is only 1 functional ovary adjacent to the cranial pole of the right kidney.**
- E. There is only 1 ovary, either left or right, located adjacent to the cloaca.**

*(A.) The gonad is a true ovary. Only 1 is found on the left side adjacent to the cranial aspect of the kidney.*

**Readers:** We welcome your questions, practice tips, and case reports. Please submit any materials to Susan Sibiski, Mosby, Inc., 7250 Parkway Drive, Suite 510, Hanover, MD 21076; [susan.sibiski@mosby.com](mailto:susan.sibiski@mosby.com); (800) 345-8738; fax (410) 712-4424.

## UPCOMING MEETINGS

### American Association of Equine Practitioners,

Nashville, TN; December 5.  
For information, call (606) 233-0147.

### State Veterinary Medical Association Meetings:

**Delaware VMA**, Dover, DE; December 8. For information, call (302) 737-1098.  
**New Mexico VMA**, Taos, NM; December 2. For information, call (505) 294-1351.

**Rhode Island VMA**, Newport, RI; December 1. For information, call (401) 521-0101.



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