



## Workshop in Laboratory Animal Medicine

Charles Louis Davis Foundation  
May 2011



Division of Laboratory Animal Resources

<http://www.aclam.org/certification/faqs>

- **A MUST READ!**
- **Does the reuse of test items to a greater extent mean that there will be no questions, or fewer questions, covering recent journal articles?**  
Recent retrospective analysis indicates that the 2005 exam contained 41.6% new questions, the 2006 exam contained 23% new questions, and the 2007 exam contained 25.5% new questions. Often, these new questions are drawn from current literature and recent publications. New questions may also be added from standard laboratory animal resources (such as textbooks and regulations). We attempt to focus all questions to the important topics of laboratory animal medicine as highlighted in the ACLAM Role Delineation Document. Depending on the significance of new publications in the field, new questions will certainly be included in future exams to cover material appropriately linked to the RDD. The candidate should continue to study new publications with a critical eye on the RDD. The consultant's strong recommendation was that no new questions be used for scoring on the exams. Although we are not yet able to follow this recommendation, future Exam Committees will build a database of "test items" (also known as test market items or preliminary test items) used to gather statistics for evaluation of future use; such items will not count toward candidates scores. This test item database could potentially add a number of questions to future exams, making them slightly longer. The 2006 exam did not contain any new items that were scored only for statistical purposes; the 2007 exam contained only four test items. **The consultant also recommended that there be no questions based solely on new research that does not form part of our professionally accepted body of knowledge; asking a question based on recent research which was subsequently shown to be invalid would jeopardize the validity of the examination. We have thus removed questions that simply require rote memorization from a recent journal article.**



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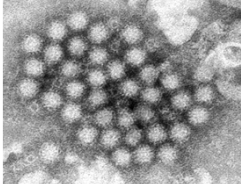
## Literature Review: 2010 JAALAS

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- Mouse parvovirus is a small nonenveloped (DNA or RNA, pick one) virus?
- Mouse norovirus is a small nonenveloped (DNA or RNA, pick one) virus?





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### Disclaimer

- This is not an ACLAM sanctioned presentation
- All information is deemed reliable and correct
- No warranty for accuracy
- No information presented is known to be specifically included in the ACLAM Board Certification Exam

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### Effect of Murine Norovirus Infection on Mouse Parvovirus Infection. JAALAS , vol 49, No.1

- Mouse parvovirus is a small nonenveloped DNA virus. MPV DNA levels are consistently high in the intestine, mesenteric lymph nodes and spleen.
- Murine norovirus is a small nonenveloped RNA virus that targets dendritic cells and macrophages.
- Authors conclusion: MNV infection increased the duration of MPV shedding and increased MPV DNA levels in tissues of BALB/c mice.

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What is being shown below?

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Coagulation Profiling of Random Source Cat. JAALAS Vol 49. No. 1

- Prothrombin time: screen for extrinsic pathway ( factors X, VII, V, prothrombin and fibrinogen)
- Activated partial thromboplastin time screens for intrinsic pathway (factors XII, XI, X, IX, VIII, V, prothrombin and fibrinogen)

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Malocclusion in Aging Wistar Rats. JAALAS Vol. 49, No.1

- Malocclusion. Class II, incisor overbite with deviation of the lower incisors. Radiograph shows jaws are in alignment.
- Malocclusion Class I?
- Class III?

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Coagulation Profiling of Random Source Cat. JAALAS Vol 49. No. 1

- Authors conclusion: Study suggests that class B cats exhibited sufficiently wide variations in their coagulation parameters that they may not be optimal subjects for vascular or cardiovascular research.
- Prolonged prothrombin time and aPTT can be associated with hypertrophic cardiomyopathy, neoplasia, diabetes, other underlying conditions.

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- Prothrombin time is used to screen which part of the coagulation pathway? (extrinsic or intrinsic)
- Activated partial thromblastin time is used to screen which part of the coagulation pathway? (extrinsic or intrinsic)

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- Mongolian Gerbil. Genus and species?

- Animal welfare regulations state that (pick one: dog, rabbit, guinea pig, hamster, or gerbil) can be fed pelleted feed on the floor of a primary enclosure?

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Method of Feed Presentation Affects the Growth of Mongolian Gerbils (*Meriones unguiculatus*)

- Genus and Species; *Meriones unguiculatus*
- Animal Welfare Regulations 9Cfr Ch.1, 3.29 e, "Hamsters may be fed pelleted feed on the floor of a primary enclosure."
- Gives allowance for the hamster's natural hoarding and feeding behavior.
- Author conclusion: method of feed presentation affects rate of growth of gerbils but not reproduction. Feeding from floor and J-feeder were comparable to each other and had higher weight gain than feeding from wire-bar lid.

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Anomer-Equilibrated Streptozotocin Solution for the Induction of Experimental Diabetes in Mice (*Mus musculus*)

- Author conclusion: alpha and beta anomers of streptozotocin have different toxicities so they recommend diabetes induction should be accomplished by using anomer-equilibrated solutions.

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- Streptozotocin has selective cytotoxicity for what cell type?
- Used medically to treat what?
- Application in medical research to generate what model?

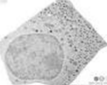
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- Common name for *Aplysia californica*?
- Across species, as referenced by authors, use of silk sutures as compared to other suture types is reported to have more or less tissue reaction?


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Anomer-Equilibrated Streptozotocin Solution for the Induction of Experimental Diabetes in Mice (*Mus musculus*). JAALAS Vol 49, No 1.

- Streptozotocin (2-deoxy-2-[methyl-3nitrosourea] 1-D-glucopyranose) has selective cytotoxicity for pancreatic B cells.
- Used to treat islet cell tumors of the pancreas and some neuroendocrine tumors.
- Used to generate models of diabetes mellitus.



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- Common name for *Aplysia californica* is the California Sea Hare.
- Across species use of silk sutures as compared to other suture types is reported to have **more** tissue reaction.
- However these authors concluded that comparing histology, edema, inflammation, and granuloma formation between silk, polydioxanone, polyglactin 910, nylon, and polyglactone, SILK had the least granuloma formation. There were not any statistically superior suture materials in the other categories.

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- What is the causative agent for 'scaly skin disease'?
- What is the causative agent for pseudotuberculosis?

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Suppurative Adenitis of Preputial Glands Associated with *Corynebacterium mastitidis* Infection in Mice. JAALAS Vol 49. No.1

- Numerous gram-positive bacillary to rod-shaped (coryneform-irregular morphology) within the keratosebaceous and suppurative collection in the preputial gland.

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- Scaly skin-Corynebacterium bovis
- Pseudotuberculosis-Corynebacterium kutscheri
- What gram stain does Corynebacterium take?

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Vol 49, No. 2  
Journal of the American Association for Laboratory Animal Science  
March 2010



RESEARCH REPORT

- What is the common name of *Graphiurus kelleni*? (Hint: what continent are they found on)
- What family are they in?
- True or false? The CDC has banned the importation of African Dormice
- From the study which two foods were most preferred by their captive colony? (Pick two: parmesan cheese, sunflower seeds, waxworm larvae, canned chicken, peanut butter, soy nuts, black walnuts, cottage cheese, eggs)

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Suppurative Adenitis of Preputial Glands Associated with *Corynebacterium mastitidis* Infection in Mice. JAALAS Vol 49. No.1

Vol 49, No. 1  
Journal of the American Association for Laboratory Animal Science  
January 2010

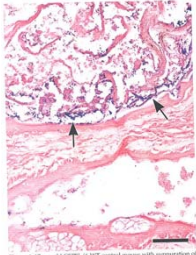


Figure 4. (Continued) C57BL/6 WT control mouse with suppurative ad

- Preputial gland of 17mo old C57BL/6 WT. Bar 50um. What do the black arrows point to?



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Management and Care of African Dormice (*Graphiurus kelleni*). Vol 49, No. 2



- *Graphiurus kelleni* are commonly known as African dormice.
- Family Gliridae.
- True. CDC has banned importation of African dormice.
- From the study which two foods were most preferred by their captive colony? (waxworm larvae and soy nuts)

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- What is the Guide recommendation for humidity range?
- HEPA filters capture particles down to what size and percentage?
- 8<sup>th</sup> Edition Guide changes recommended dry bulb temperature range for mouse, rat, hamster, gerbil and guinea pig from 18-26 degrees C to what?



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Endotoxin, Coliform, and Dust levels in Various Types of Rodent Bedding. Vol 49, No. 2

- LPS is derived from the outer cell wall of gram-negative coliform bacteria.
- The authors concluded that:
  - D. paper bedding had lower coliform and endotoxin levels than corncob
- Authors felt that rodent bedding containing high levels of endotoxin may alter the results of respiratory and immunologic studies in rodents. The study suggested that paper bedding would have the least interference.



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Disparities in Ammonia, Temperature, Humidity, and Airborne Particulate Matter between the Micro- and Macroenvironments of Mice in Individually Ventilated Caging. JAALS Vol 49, No 2.

- What is the Guide recommendation for humidity range? 30-70%.
- HEPA filters capture particles down to what size and percentage? 99.97% rating for 0.3um particles.
- 8<sup>th</sup> Edition Guide changes recommended dry bulb temperature range for mouse, rat, hamster, gerbil and guinea pig from 18-26 degrees C to 20-26 C?



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- What does RODAC stand for?
- Microbiologically, what are you able to grow on RODAC plates?
- Do ATP detection systems detect residual ATP in live organisms, dead organisms, or both?



Division of Laboratory Animal Resources

Endotoxin, Coliform, and Dust levels in Various Types of Rodent Bedding. Vol 49, No. 2

- LPS is derived from?
- The authors concluded that:
  - A. paper bedding had higher coliform but lower endotoxin levels than corncob
  - B. paper bedding had lower coliform but higher endotoxin levels than corncob
  - C. paper bedding had higher coliform and endotoxin levels than corncob
  - D. paper bedding had lower coliform and endotoxin levels than corncob

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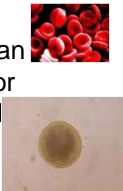
Efficacy and Limitations of an ATP-Based Monitoring System. JAALAS Vol 49, No. 2

- What does RODAC stand for? Replicate Organism Direct Agar Contact.
- Microbiologically, what are you able to grow on RODAC plates? Cultivable aerobic bacteria and some fungi.
- ATP detection systems detect residual ATP in both live organisms and dead organisms.

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Efficacy and Limitations of an ATP-Based Monitoring System. JAALAS Vol 49, No. 2

- Authors concluded that ATP system robustly detected rodent RBC's, human epithelial cells, feces to represent poor cleaning and presence of fomites and Toxocara eggs, and Toxoplasma tachyzoites to represent parasites.
- As stated before RODAC plates would not grow any of these types of contaminants. Urine was poorly detected by the system.




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*Aeromonas*, *Mycobacterium*, and *Batrachochytrium* spp. In *Xenopus laevis*. JAALAS Vol 49, No. 2

- Reported signs of *B. dendrobatidis* infection include obtundation, dysecydysis, and erythema and ulceration.
- Life cycle: waterborne **zoospores**->attach, enter host epithelial cells and form **thallus**
- ->**zoosporangium**->release **zoospores**


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- Describe the morphological presentation shown. Differentials?
- Genus and species?
- How many chambers of heart?
- To eliminate waste, they excrete ammonia or urea?
- Which gender is usually larger?
- Causative agent of chytridiomycosis?



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- What are possible causes of false negative reactions to the tuberculin skin test?
- What are possible causes of false positive reactions to the tuberculin skin test?



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*Aeromonas*, *Mycobacterium*, and *Batrachochytrium* spp. In *Xenopus laevis*. JAALAS Vol 49, No. 2

- Cutaneous, erythematous, ulcerations on the upper lip and ventral chest. *Aeromonas*, *Batrachochytrium*, trauma, ectoparasite, ranavirus
- Genus and species? *Xenopus laevis*.
- How many chambers of heart? 3, paired atria and a single ventricle.
- To eliminate waste, they excrete ammonia or urea? Ammonia, but in times of drought can adapt to produce urea.
- Which gender is usually larger? Females.
- Causative agent of chytridiomycosis? *Batrachochytrium dendrobatidis*.


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A Naturally Occurring Outbreak of Tuberculosis in a Group of Imported Cynomolgus Monkeys (*Macaca fascicularis*) JAALAS Vol 49, No 2.

- What are possible causes of false negative reactions to the tuberculin skin test? Anergy-absence of normal immune response
- (malnutrition, trauma), vaccination (i.e. measles)
- What are possible causes of false positive reactions to the tuberculin skin test? Exposure to nontuberculous bacteria, vaccination with complete Freund's adjuvant.

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- Common name?
- Genus?
- What is housing consideration if Owl monkeys are nearby in facility?
- Gestation length?

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Physiologic Reference Ranges for Captive Blacktailed Prairie Dogs (*Cynomys ludovicianus*). JAALAS Vol 49 No 3.

- Prairie dogs Genus, Species? Order, Family? *Cynomys ludovicianus*. Order Rodentia; family Sciuridae.
- A facultative hibernator will enter shallow torpor when stressed by cold and food deprivation ?

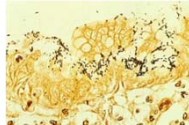
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Uterine Leiomyoma in a Guyanese Squirrel Monkey (*Saimiri sciureus sciureus*). JAALAS Vol 49. No 2.

- Common name? Squirrel monkey.
- Genus? Saimiri
- What is housing consideration if Owl monkeys are nearby in facility? Owl monkeys can be an aberrant host of Saimirine herpesvirus 1. Clinical signs include: vesicular oral and dermal lesions, pruritis, death.
- Gestation length-150 days.
- Other 'Blue book' facts:
  - Circulating cortisol ~100x in humans or Old World
  - Naturally occurring atherosclerosis
  - Males do not participate in infant care
  - Exhibit 'fattening'
  - Have a high dietary requirement for folic acid.

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- The use of what type of stain may increase the sensitivity of diagnosis *Helicobacter* species with histopathology?



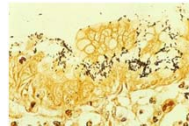
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- Prairie dogs Genus, Species, Order, Family?
- A facultative hibernator will enter shallow torpor when stressed by \_\_\_\_\_ and \_\_\_\_\_?



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Eradication of *Helicobacter* spp. By Using Medicated Diet in Mice Deficient in Functional Natural Killer Cells and Complement Factor D. JAALAS Vol 49. No 3.

- The use of what type of stain may increase the sensitivity of diagnosis *Helicobacter* species with histopathology?
- Warthin-Starry silver stain. Blue book.





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- What best describes buprenorphine's opioid properties?
  - A) Mixed delta and kappa agonist
  - B) Partial mu agonist
  - C) Full mu agonist
- What schedule class is buprenorphine?



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Environmental-Enrichment-Related Variations in Behavioral, Biochemical, and Physiologic Responses of Sprague-Dawley and Long Evans Rats. JAALAS Vol 49, No 4.

- Historically, the forced swim test has been used to assess what condition? Depression. Commonly tests for anti depressants.
- Define anhedonic: An inability to experience pleasure from normally pleasurable life events.
- Authors concluded that the environmental enrichment experience has measurable effects on several physiologic and behavioral indices in rats



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The Effects of Perioperative Analgesia on Litter Size in Crl:CD1(ICR) Mice Undergoing Embryo Transfer. JAALAS Vol 49, No 4.



- What best describes buprenorphine's opioid properties?
  - B) Partial mu agonist
- What schedule class is buprenorphine?
- Class III controlled drug.
- Authors concluded that neither flunixin or buprenorphine had effect on pregnancy rate or number of pups born in mice undergoing embryo transfer.

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- According to the 2007 AVAMA Guidelines on Euthanasia what is the optimal displacement of air per minute when using CO2 for euthanasia?
- According to the 2007 AVMA Guidelines on Euthanasia, CO2 gas dissolving in moisture on the nasal mucosa produces \_\_\_\_\_ that may stimulate nociceptors in the nasal mucosa.
- According to another recent article another potential source of distress during the CO2 experience is what?



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- Historically, the forced swim test has been used to assess what condition?
- Define anhedonic.



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Comparison of Carbon Dioxide and Argon Euthanasia: Effects on Behavior, Heart Rate, and Respiratory Lesions in Rats. JAALAS Vol 49, No 4.

- According to the 2007 AVAMA Guidelines on Euthanasia what is the optimal displacement of air per minute when using CO2 for euthanasia? 20%
- According to the 2007 AVMA Guidelines on Euthanasia, CO2 gas dissolving in moisture on the nasal mucosa produces **carbonic acid** that may stimulate nociceptors in the nasal mucosa.
- According to another recent article another potential source of distress during the CO2 experience is what? Dyspnea.
- Authors concluded that argon as a sole euthanasia agent is aversive to rats. Argon is an inert gas and results in death when O2 is displaced as opposed to CO2 which directly depresses the central nervous system, which causes cardiac suppression and loss of consciousness.
- They also found that with argon, rats experienced convulsive muscle spasms and arching of the back suggestive of distress.
- Heart rates of rats euthanized with CO2 displacing 10% volume per minute did not increase, although the authors were clear to state that they did not interpret this to signify a lack of distress.
- Both argon and CO2 euthanasia resulted in pulmonary lesions (hemorrhage into alveoli), consistent with terminal asphyxiation.

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**Match the drug to its category**

- A. Fentanyl
- B. Dexmedetomidine
- C. Propofol

- 1. Alpha agonist
- 2. Opiate
- 3. Hypnotic

- Propofol given rapidly has a high incidence of what complication?

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Eugenol Anesthesia in African Clawed Frogs (*Xenopus laevis*) of Different Body Weights. JAALAS Vol 49, No 4.

- Eugenol is a clove oil extract the authors believed to have effect on central nervous system receptors by blocking sodium voltage-gated channels and the vanilloid receptor which is implicated in the transmission of painful stimuli.
- *Xenopus laevis* is commonly known as the African Clawed Frog.

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Anesthesia with Intraperitoneal Propofol, Medetomidine, and Fentanyl in Rats. JAALAS Vol 49, No. 4

- A. Fentanyl-Opiate
- B. Dexmedetomidine-Alpha agonist
- C. Propofol-Hypnotic

- Propofol given rapidly has a high incidence of what complication? Apnea.

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- Genus species?
- Common name?



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- What is eugenol?
- What is the common name for *Xenopus laevis*?

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- Genus species? *Macaca fascicularis*
- Common name? Cynomolgus (crab-eating, long-tailed macaque)

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Modified Skin-Window Technique in Cynomolgus Macaques (*Macaca fascicularis*) for Assessing Neutrophil Extravasation. JAALAS Vol 49, No 4.

- The skin-window model has been used to investigate neutrophil extravasation and the acute inflammatory response and to measure how diseases and therapeutics affect those responses. There are a variety of techniques that basically remove the top layer of skin and allow examination of the immune response with a diminished barrier.
- In this article to create the skin-window, cynos were anesthetized, forearms clipped and skin abraded with 60 grit sandpaper until slight capillary bleeding occurred. The skin window area was then covered with sterile filter paper and bandaged.

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- Methotrexate has been used to treat \_\_\_\_\_.
- A) Neoplasms
- B) Acute trauma
- C) Baldness
- D) Chronic inflammatory diseases

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- Methotrexate \_\_\_\_\_ neutrophil chemotaxis and extravasation in some human and animal models.
- A) Enhances
- B) Inhibits

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Modified Skin-Window Technique in Cynomolgus Macaques (*Macaca fascicularis*) for Assessing Neutrophil Extravasation. JAALAS Vol 49, No 4.

- Methotrexate has been used to treat chronic inflammatory diseases including rheumatoid arthritis, asthma, inflammatory bowel diseases, and psoriatic arthritis.
- In this study, methotrexate was used against saline controls at different time points to assess neutrophil extravasation times and concentration.

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- Methotrexate inhibits neutrophil chemotaxis and extravasation in some human and animal models.

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A. Genus, species?

B. Genus, species?


- Source <http://parasitology.cvm.ncsu.edu>
- Both can be found on the skin of the equine

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A. *Damalinia equi*



B. *Haematopinus asini*

- Source <http://parasitology.cvm.ncsu.edu>

- Both can be found on the skin of the equine




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- New World monkeys cannot harbor cercopithecine herpesvirus 1. True or False?
- What is the genus of the Owl monkey?
- The Owl monkey is nocturnal and lacks a tapetum lucidum. True or False?
- Owl monkeys are scent markers. True or False?
- What measurement is taken to obtain biparietal diameter (BPD)?

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- With permission from
- Dr. Rick Fish. NCSU CVM.

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DIAR  
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Measurement of Fetal Biparietal Diameter in Owl Monkeys (*Aotus nancymaae*). JAALAS Vol 49, No 5.

- New World monkeys cannot harbor cercopithecine herpesvirus 1. True.
- What is the genus of the Owl monkey? *Aotus*
- The Owl monkey is nocturnal and has a tapetum lucidum. False.
- Owl monkeys are scent markers. True.
- Biparietal diameter is the diameter of the fetal head made when the outer perimeter of the calvarium is clearly visible. Authors felt that biparietal diameter could be used to accurately predict gestational age in owl monkeys.

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DIAR  
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Pediculosis in Two Research Ponies (*Equus caballus*)

- Authors reported 2 cases of ponies that presented with an erythematous area of alopecia.
- Closer examination revealed 3-5mm insects moving quickly through the hairs.
- Authors report that they treated with a combination of permethrin for the whole animal, topical wound care for the lesion and cleaning/disinfection of the stalls. A repeat treatment in 2 weeks was recommended. References were give for other treatments such as imidacloprid, phoxim, fipronil, selenium sulfide shampoo and triflumuron.

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DIAR  
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Source: <http://www.radii.missouri.edu/info/dora/dora.htm>

- Can you identify the mouse furmites shown above?

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A. Mycoptes-oval profile with heavily chitinized body, pigmented 3<sup>rd</sup> and 4<sup>th</sup> legs and tarsal suckers.

B. Myobia-similar to Radfordia with elongated profile, bulges between the legs. Myobia has single tarsal claw on second pair of legs. Up to 23 day life cycle.

C. Radfordia-has 2 claws of unequal size on the second pair of legs.

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Operation of an Air Filtration Device Results in Morbidity and Mortality in Growing Chickens (*Gallus gallus domesticus*). JAALAS Vol 49, No 5.

- Authors hypothesized that sustained, increased ambient sound level negatively affected morbidity, mortality, and organ weights in growing chickens.
- Referenced other articles that have shown electromagnetic fields adversely affected weight gain and embryo survival.

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- What class of anti-parasitics acts by binding GABA-gated chloride and invertebrate-specific glutamate-gated anion channels in neuromuscular synapses to supress nerve impulse conduction.
- Ivermectin is not lipophilic and won't concentrate in the milk. True or false?

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Noise in a Laboratory Animal Facility from the Human and Mouse Perspectives. JAALAS Vol 49, No 5.

- Authors provide references that human hearing is most sensitive at 4kHz and mouse hearing is most sensitive at 16kHz.
- Authors tested sounds levels from different construction and housing equipment.
- Much of the sound generated by the ventilated rack and transfer station was at frequencies too low for mice to hear and likely would not induce stress.
- Similarly so for construction equipment.

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Treatment and Eradication of Murine Fur Mites: I. Toxicologic Evaluation of Ivermectin-Compounded Feed. JAALAS Vol 49, No 5.

- What class of anti-parasitics acts by binding GABA-gated chloride and invertebrate-specific glutamate-gated anion channels in neuromuscular synapses to supress nerve impulse conduction. Avermectins.
- Ivermectin is not lipophilic and won't concentrate in the milk. False?
- Authors did not observe any adverse effects of ivermectin exposure on the fertility or fecundity of offspring of C57BL/6NTac mice. Actually saw more litters and pups.

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- Observing the stretch-walk sequence may be one behavioral indicator of what in rodents?

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Assessment of Carprofen and Buprenorphine on Recovery of Mice after Surgical Removal of the Mammary Fat Pad. JAALAS Vol 49, No 5.

- Observing the stretch-walk sequence may be one behavioral indicator of what in rodents? Pain.
- Authors found that all surgical groups had similar decrease in food intake and activity. Visual assessment scores and fecal corticosterone did not differ between groups. Care should be taken when using visual assessments as analgesics could elevate score.

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- *Suncus murinus* common name?
- Raccoon genus and species?
- *Taeniopygia guttata* common name?

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- Some unwanted effects that have been associated with buprenorphine use are...?

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- *Suncus murinus* common name? Shrew.
- Raccoon genus and species? *Procyon lotor*.
- *Taeniopygia guttata* common name? Zebra finch.



From: backyardstriper.com

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Comparison of Buprenorphine and Meloxicam for Postsurgical Analgesia in Rats: Effects on Body Weight, Locomotor Activity and Hemodynamic Parameters. JAALAS Vol 49, No 5.

- Some unwanted effects that have been associated with buprenorphine use are:
  - Hyperalgesia
  - Variability between sexes and strains of rodents
  - Anorexia
  - Pica
- Authors concluded that rats treated with buprenorphine showed greater reductions in body weight, food consumption, locomotor activity, and nighttime heart rates than meloxicam treated rats.

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- What is the metabolically active metabolite of enrofloxacin?
- What class of antibiotic are enrofloxacin?
- What function does the lateral line system serve in xenopus?

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The Pharmacokinetics of Enrofloxacin in Adult African Clawed Frogs (*Xenopus laevis*). JAALAS Vol 49, No 6.

- What is the metabolically active metabolite of enrofloxacin? Ciprofloxacin
- What class of antibiotic are enrofloxacin? Fluoroquinolone.
- What function does the lateral line system serve in xenopus? Arrangement of neuromasts that detect changes in water pressure and currents. Can help in locating prey.
- Authors concluded that enrofloxacin was absorbed rapidly by *Xenopus* through either SQ or IM routes without signs of toxicity.
- Small amounts of ciprofloxacin were found in plasma and water after injection with enrofloxacin.

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- Name the two morphologic forms of *Giardia*.
- Genus and species of sheep?

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- Cefovecin is what class of antibiotic agent?
- In dogs, cefovecin is primarily excreted by liver or kidney?

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Evaluation of an Inhouse Rapid ELISA Test for Detection of *Giardia* in Domestic Sheep (*Ovis Aries*). JAALAS Vol 49, No 6.

- Name the two morphologic forms of *Giardia*. Trophozoites and cysts.
- Genus and species of sheep? *Ovis aries*.

Source: www. Division of Laboratory Animal Resources

Pharmacokinetics of Cefovecin in Squirrel Monkey (*Saimiri sciureus*), Rhesus Macaques (*Macaca mulatta*), and Cynomolgus Macaques (*Macaca fascicularis*). JAALAS Vol 49, No 6.

- Cefovecin is what class of antibiotic agent? Cephalosporins.
- In dogs, cefovecin is primarily excreted by liver or kidney? Kidney.
- Authors concluded that cefovecin pharmacokinetics in Squirrel monkey, Rhesus and Cynomolgus were shown to have shorter plasma half-life attributed to higher elimination rate. They felt that higher doses and/or more frequent administration would be required for use in these NHP species.

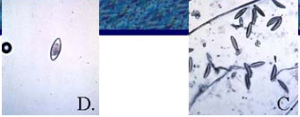
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Evaluation of an Inhouse Rapid ELISA Test for Detection of *Giardia* in Domestic Sheep (*Ovis Aries*). JAALAS Vol 49, No 6.

- Authors concluded that:
- Testing on 2 consecutive days was beneficial because of intermittent shedding.
- Clinical signs (diarrhea) often did not match positive samples of *Giardia*.
- Direct microscopy of fecal samples was more consistent for identifying true positives than ELISA. Did not compare PCR.

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- What are 3 common rule outs for infectious causes of rectal prolapse?
- What are the two most common pinworms and their respective life cycles lengths (in days)?
- What is the mechanism of action for fenbendazole?
- Fenbendazole is without research complications. True or false?
- What does the rotarod test? Open field test?

Efficacy of Soaking in 70% Isopropyl Alcohol on Aerobic Bacterial Decontamination of Surgical Instruments and Gloves for Serial Mouse Laparotomies. JAALAS Vol 49, No 6.

- Alcohol is neither a sterilant nor a high-level disinfectant. 7<sup>th</sup> edition.
- Alcohol is neither a sterilant nor a high-level disinfectant but may be acceptable for some procedures if prolonged contact times are used. 8<sup>th</sup> edition.
- Authors concluded that, recognizing alcohols as rapidly bactericidal and damaging to rubber and plastics, use of 70% isopropyl alcohol soaking of instruments between animals (up to 5) prevented aerobic bacterial contamination of instruments and gloves.

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Effect of Fenbendazole on Three Behavioral Tests in Male C57Bl/6N Mice. JAALAS Vol 49, No 6.

- What are 3 common rule outs for infectious causes of rectal prolapse? *Helicobacter*, *Citrobacter*, pinworms.
- What are the two most common pinworms and their respective life cycles lengths (in days)? *Aspicularis tetraptera* (23-25 days) and *Syphacia muris* (12-15 days)
- What is the mechanism of action for fenbendazole? Microtubule polymerization inhibitor that binds to the structural protein B tubulin with greater affinity to helminth tubulin.
- Fenbendazole is without research complications. False. Recently a number of papers; inhibit tumor, decrease reproduction, reduced B lymphocyte activity, etc.
- Rotarod tests motor coordination and balance. Open field tests locomotor/exploratory activity, fear/anxiety.
- Authors concluded that motor ability/balance tests such as rotarod may be affected by fenbendazole in C57Bl/6N mice.

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- Ligature of the left circumflex is a model of what?
- Masson trichrome staining can help distinguish between \_\_\_\_\_ and \_\_\_\_\_?

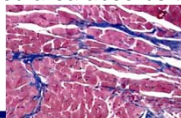
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- Alcohol is neither a sterilant nor a high-level disinfectant.
- Alcohol is neither a sterilant nor a high-level disinfectant but may be acceptable for some procedures if prolonged contact times are used.
- Which is from the 7<sup>th</sup> edition Guide? 8<sup>th</sup>?



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Ligation of the Left Circumflex Coronary Artery with Subsequent MRI and Histopathology in Rabbits. JAALAS Vol 49, No 6.

- Ligature of the left circumflex is a model of what? Myocardial ischemia (left ventricle)
- Masson trichrome staining can help distinguish between collagen and muscle?
- Cytoplasm of muscle is less dye-permeable than collagen, the ventricle retains most of the red dye whereas the decolorized infarcted area absorbs the collagen dye (aniline blue).





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- What is the Genus, species of the common rabbit?
- Do rabbit kits receive most of their passive immunity via the yolk sac or colostrum?
- What are Cecotrophs?
- What is the Pelger-Huet anomaly?
- What is gestation length?

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Successful Treatment of Cryptosporidiosis in 2 Common Marmosets (*Callithrix jacchus*) by Using Paromycin. JAALAS Vol 49, No 6.

- Genus and species of common marmosets? *Callithrix jacchus*.
- The unique dental arrangement of marmosets (procumbent incisor teeth that are the same length as the canine teeth) allows them to gnaw holes in trees and...?
- C) Eat gums and exudates
- Paromycin, an aminoglycoside
- was successful to treat crypto.




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Ligation of the Left Circumflex Coronary Artery with Subsequent MRI and Histopathology in Rabbits. JAALAS Vol 49, No 6.

- *Oryctolagus cuniculus*.
- Rabbit kits receive most of their passive immunity via the yolk sac rather than from colostrum.
- Cecotrophs (night feces) is high in B vitamins.
- Neutrophil is sometimes referred to as a heterophil or pseudoeosinophil.
- Some exhibit Pelger-Huet anomaly-heterophil nucleus is hyposegmented due to incomplete differentiation of the granulocyte.
- Gestation is 30-33 days.
- Tricuspid valve has only 2 cusps.
- Kidney is unipapillate.
- Ovulation is induced.


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GOOD LUCK!





NCSU Bell tower



NCSU CVM

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- Genus and species of common marmosets?
- The unique dental arrangement of marmosets (procumbent incisor teeth that are the same length as the canine teeth) allows them to gnaw holes in trees and...?
  - A) Eat insects
  - B) Obtain water
  - C) Eat gums and exudates
  - D) Eat seeds

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