

NAME _____

VMP 930 Lecture Exam -- #2
100 points total

There is one best answer for each question.

1. The nervous system of parasitic nematodes is the target of many highly effective anthelmintic drugs, including avermectin class drugs such as Ivermectin and Moxidectin. What in nematode survival would require the LEAST neurological function?

- A. feeding by oral ingestion
- B. movement within the host
- C. sexual reproduction
- D. hypobiosis or arrested development

2. All general of nematodes covered in this course reproduce sexually, requiring male and female adults, except one genus where parasitic adult females can produce offspring (ova) without fertilization. Which genus is that?

- A. *Strongylus*
- B. *Strongyloides*
- C. *Toxocara*
- D. *Tichuris*

3. An important route of infection for *Strongyloides* is by skin penetration by infective stage larvae. What unique feature (not found in other nematodes covered in this course) of the *Strongyloides* life cycle facilitates this route of infection?

- A. there are free-living adult stage male and female worms outside of the host that mate and produce infective larvae (ova to L3) which are present in the soil or bedding contacting the host.
- B. larvae passed in large numbers in feces of the mature female host can penetrate skin immediately.
- C. larvated ova are highly resistant in the environment and hatch when in contact with a warm body.

4. Most hosts of *Strongyloides* pass larvated ova in their feces except which two that pass first stage larvae in feces?

- A. humans and dogs
- B. humans and pigs
- C. pigs and horses
- D. dogs and horses

5. Which two superfamilies of the order Strongylida have essentially the same type of development and ecological requirements outside the host?

- A. metastrongyloidea (*Metastrongylus* and *Aelurostrongylus*) and trichostrongyloidea (*Ostertagia* and *Haemonchus*)
- B. ancylostomoidea (*Ancylostoma*) and strongyloidea (small strongyles of horses)
- C. trichostrongyloidea (*Ostertagia* and *Haemonchus*) and strongyloidea (small strongyles of horses)
- D. ancylostomoidea (*Ancylostoma*) and trichostrongyloidea (*Ostertagia* and *Haemonchus*)

6. Which one of the parasites below has the correct description of the pathology it causes?

- A. *Haemonchus* causes severe granulomatous reactions in the colon
- B. *Ostertagia* causes dedifferentiation of gastric gland cells and focal mucosal proliferation in the abomasum
- C. Cyathostomins (small strongyles) cause chronic enteritis in the small intestine
- D. *Ancylostoma* causes modular cysts in the mucosa of the colon

7. Climate and even daily weather can have an important impact on pasture transmission of trichostrongyles such as *Haemonchus* and *Ostertagia*. Why?

- A. because ova to infective larva development is dependent on moisture, oxygen and temperature
- B. because grass on pasture must be less than 3 inches in height for transmission to occur
- C. soil must remain below 50F for larvae to survive
- D. too many cloudy days will not allow stimulation of ova to infective larva development

8. Which parasitic nematode infection is associated with clinical signs of anorexia and diarrhea in grazing cattle?

- A. *Ostertagia* in first-grazing season calves
- B. *Ostertagia* in mature cows
- C. *Haemonchus* in first-grazing season calves
- D. *Haemonchus* in mature cows

9. Heavy infections with *Haemonchus* may occur acutely after rain disperses infective larvae that have developed in feces during dry weather on pasture. What clinical sign is most likely associated with a heavy prepatent infection with immature adult worms?

- A. anemia (pale mucous membranes)
- B. watery diarrhea
- C. poor body condition
- D. poor hair coat

10. Most trichostrongyles are host specific. An important exception is a trichostrongyle that infects the stomach of cattle, small ruminants and horses. It can cause disease in horses co-grazed with sheep that can tolerate higher levels of infection than horses. What trichostrongyle is this?

- A. *Haemonchus contortus*
- B. *Ostertagia ostertagi*
- C. *Trichostrongylus axei*
- D. *Cooperia oncophora*

11. Clinical signs of anorexia, poor weight gain, diarrhea and edema in calves on pasture toward the end of their first grazing season are most likely due to which parasitic nematode?

- A. *Cooperia oncophora*
- B. *Haemonchus placei*
- C. *Dictyocaulus viviparus*
- D. *Ostertagia ostertagi*

12. Large numbers of trichostrongyle infective larvae on pasture is due to what?

- A. large numbers of adult worms in grazing hosts
- B. replication of infective stage larvae in fecal pats
- C. adult stage worms outside of the host

13. Calves grazed in Louisiana or Mississippi (southern states with dry, hot summers) in the fall, winter and spring and then shipped as long yearlings to northern (Iowa) feedlots in early Fall often develop clinical signs of diarrhea and anorexia. The feedlots are dirt with no ability to transmit trichostrongyle infection. What is the probable cause of these clinical signs?

- A. Type I ostertagiasis
- B. Type II ostertagiasis
- C. haemonchosis
- D. *Trichostrongylus axei* infection

14. Arrested development by *Ostertagia* larvae in the abomasum occur at what time for calves grazing winter – spring pastures in southern states with semi-arid summer pastures?

- A. during the Spring
- B. during the Summer
- C. during the Fall
- D. during the Winter

15. Strong age resistance to pasture-borne trichostrongyle or strongyle infections is found in what host?

- A. horses
- B. sheep
- C. cattle
- D. goats

16. Unlike other trichostrongyle infections, *Dictyocaulus* infections in cattle, small ruminants and horses are not commonly found even in grazing animals. What pasture conditions are associated with these infections?

- A. dry, well-drained pastures
- B. tropical locations
- C. low lying, wet pastures
- D. clover pastures

17. *Strongylus vulgaris* (large strongyle) can cause severe pathology in horses and historically it was a major, common cause of potential lethal disease. Since the advent of modern anthelmintics this is no longer the case. Why?

- A. *Strongylus vulgaris* has a long prepatent time (6 months) requiring only one treatment every 6 months
- B. *Strongylus vulgaris* has a short prepatent time (1 – 2 months), but almost all horses are treated every two months at all ages
- C. *Strongylus vulgaris* has evolved to a form that does not migrate in the host
- D. current drugs have a residual killing effect on larva outside the host

18. *Strongylus vulgaris* (large strongyle) causes what major pathological lesions before adult worms are present in the intestinal lumen and the infection is patent?

- A. respiratory disease due to larval migration
- B. thrombo-embolism and vascular damage to the large intestine due to ischemia and infarction
- C. peritonitis and septicemia from blockage and rupture of the intestine
- D. spinal cord nerve damage due to larval migration

19. Why is it difficult to control cyathostome (small strongyle) infections in horses?

- A. horses can acquire infection from dirt paddocks
- B. at least one class of drugs and elevated dosage of other drugs are effective against adult worms but arrested larval stages are often not efficiently killed
- C. cyathostomes can infect by skin penetration
- D. foals can be infected by the lactogenic route of infection

20. Larval and adult stages of cyathostomes in horses are found where?

- A. both are in the small intestine
- B. adults are found in the large intestine, larvae in the small intestine
- C. both are found in the large intestine
- D. adults are found in the small intestine and larvae are found in muscle tissue

21. Pathology and clinical signs are most often associated with what stage of cyathostomes in horses?

- A. adult worms in the small intestine
- B. larvae emerging from the large intestinal submucosa
- C. larvae migrating in the cranial mesenteric artery
- D. adult worms in the large intestine

22. What age horse can be a source of pasture contamination by high cyathostome ova numbers in feces?

- A. only 6 to 12 month olds
- B. older than 10 years
- C. only 1 to 5 month olds
- D. all ages grazing pasture

23. Only about 20% of horses in a herd are the source for 80% of the cyathostoma ova deposited on pasture. This supports what approach to deworming horses?

- A. selective deworming on a more frequent basis of high ova shedders based on McMasters test
- B. deworming all in the herd every 2 months during grazing season
- C. deworming all in the herd 4 times a year
- D. deworming based on age of the horse on pasture

24. Why is *Oesophagostomum* in ruminants and pigs called “nodular worm”?

- A. the anterior end of the adult has a nodular appearance
- B. the host reaction to the larval stage in the wall of the intestine creates a nodular calcified or pus-filled nodule
- C. migration of the larval stage into the liver leaves a white mark
- D. adult male worms have a nodular-like copulatory bursa

25. A five-year-old neutered male indoor/outdoor cat is presented to your clinic with respiratory signs of a chronic cough, anorexia and wasting (poor body condition). Thoracic radiographs show areas of density in the parenchyma of the lungs. If you suspected *Aelurostrongylus abstrusus* infection how would you confirm this suspicion?

- A. find double-operculated ova on fecal flotation
- B. do a serum antibody test for *Aelurostrongylus*
- C. find larvated ova on fecal flotation
- D. find larvae with a “s”-shaped spine at the posterior end in sputum or feces

26. On post mortem exam of a 6-week-old puppy that showed signs of severe anemia before death you find nematodes about 15mm long attached to the mucosa of the small intestine. What nematode is this likely to be?

- A. *Ancylostoma caninum*
- B. *Ancylostoma tubaeformae*
- C. *Toxocara canis*
- D. *Toxocara cati*

27. Fecal flotation survey of samples from 20 – 40% of shelter dogs show adult dogs as well as puppies passing *Ancylostoma* ova. How does this compare with *Toxocara canis* ova presence in shelter dogs?

- A. older dogs (>2 years) will have many more *Toxocara* ova than *Ancylostoma* ova
- B. older dogs will show little or no *Toxocara* ova
- C. puppies less than 8 weeks of age show no *Toxocara* ova
- D. puppies less than 8 weeks of age show no *Ancylostoma* ova

28. Recently it is being reported that mature Greyhounds retired/rescued from racing tracks continue to pass *Ancylostoma* ova after treatment with several different anthelmintic drugs. These dogs are often kept indoors and walked on a leash. What is the most likely source of these ova?

- A. reactivation after deworming of arrested larvae in tissues that repopulate the small intestine with adult worms
- B. skin penetration by infective larvae that do tracheal migration to populate the small intestine with adult worms
- C. drug failure to kill adults due to nematode resistance to three different classes of anthelmintics
- D. transuterine route of infection

29. The lactogenic route of transmission by *Ancylostoma* occurs in which host?

- A. cat
- B. dog
- C. ferrets
- D. guinea pigs

30. Skin penetration by the infective larvae of *Ancylostoma* is a common route of infection for mature dogs. What conditions for a backyard facilitate transmission of these infective larvae where feces are not removed.

- A. cold weather
- B. hot and dry weather
- C. warm and moist conditions
- D. warm and dry conditions

31. In puppies less than 2 weeks old showing signs of anemia you suspect per acute *Ancylostoma* infection. How should you treat these puppies?

- A. treat with anthelmintic drug immediately even without seeing ova in feces
- B. wait until you see ova in feces about 1 week later to confirm diagnosis before treating
- C. treat with iron supplement and wait for positive fecal ova exam before giving anthelmintic drug
- D. anthelmintic drugs will not be effective, consider euthanasia

32. *Oxyuris equi* infection in horses is usually diagnosed unambiguously by what circumstances?

- A. flotation of fecal sample collected from the rectum
- B. seeing clinical signs of poor body condition
- C. seeing clinical signs of colic
- D. owner presenting large white worm with tapered posterior end collected from feces

33. A 5 year old male hound that you have seen in your clinic since its adoption from a shelter almost a year ago presents with a large subcutaneous swelling under a skin ulcer on the lower front leg. Prior to being in the shelter the dog was kept in a coon-hunting pack. What parasitic nematode would be on your differential list for this case?

- A. *Dracunculus insignis*
- B. *Onchocerca cervicalis*
- C. *Physaloptera*
- D. *Habronema*

34. What is an important aid in diagnosing *Trichinella spiralis* infection in humans (and dogs)?

- A. presence of bipolar ova in feces
- B. presence of bipolar ova in sputum
- C. clinical signs of anemia
- D. serum with antibody titers specific for *Trichinella*

35. *Trichuris vulpis* infections are often difficult to treat because of what two factors?

- A. reinfection from long-lived ova in the environment, and a long prepatent time with larvae in the host that are not easily killed
- B. female worms produce large numbers of ova continuously, and a long prepatent time with larvae in the host that are not easily killed
- C. reinfection from long-lived ova in the environment, and a very rapid development with 2 – 3 days of infective larvae in ova
- D. adult stage *Trichuris* has developed resistance to most current anthelmintic drugs, and infective larvae in the soil can infect by skin penetration

36. *Trichuris vulpis* and *Capillaria (Eucoleus) bohmi* have a very similar appearing appearing ova, but the adult worms are located at different sites in the dog and cause different clinical signs. What are these signs?

- A. *Trichuris vulpis* – diarrhea with and without blood; *Capillaria bohmi* – signs of gastritis, vomiting
- B. *Trichuris vulpis* – signs of gastritis, vomiting; *Capillaria bohmi* – rhinitis, itching nose like nasal allergy
- C. *Trichuris vulpis* – diarrhea with and without blood; *Capillaria bohmi* – rhinitis, itching nose like nasal allergy

37. *Dracunculus*, *Physaloptera*, *Habronema* and *Dirofilaria* are classified in the Order Spirurida. What do they have in common?

- A. all require arthropods as intermediate hosts
- B. all adult females produce microfilariae instead of ova
- C. all adults live outside the digestive tract
- D. all use mosquitoes as intermediate hosts

38. Cutaneous habronemiasis in horses, caused by *Habronema*, presents as an eosinophil containing granulomatous lesion of the skin. What control measure would be most effective for preventing this infection?

- A. use fly repellent on abrasions and control flies indoors
- B. take horses off pastures at dawn and dusk
- C. remove *Gastrophilus* fly nits from horses' legs and face
- D. do McMaster fecal egg count and treat high egg shedders

39. Prophylaxis treatments to prevent *Dirofilaria immitis* in dogs and cats use a variety of drugs that target what stage(s) of this parasite?

- A. microfilariae only
- B. adults and immature adults
- C. larval stage two in the mosquito
- D. infective larvae in the skin and migrating fourth stage larvae

40. For all dogs having the possibility of patent infection with *Dirofilaria* the Heartworm Guidelines state that "all dogs should be testing for microfilariae". Which one below is NOT a valid reason to do microfilaria tests?

- A. microfilaremia validates antigenemia serological results
- B. microfilaremia identifies the patient as a reservoir infection
- C. microfilaremia alerts you to a high microfilaria burden that may precipitate a severe reaction following administration of a microfilaricidal preventative
- D. the number of microfilariae is high correlated with lung pathology

41. In heartworm infected dogs during adulticide treatment there is a correlation between activity level of the dog and severity of heartworm disease.

- A. true
- B. false

42. Which method would you use to detect microfilariae when there is a low microfilaremia?

- A. modified Knott test
- B. drop of blood under a coverslip
- C. McMasters test
- D. seeing microfilariae in the buffy coat on hematocrit assay

43. Heartworm associated respiratory disease (HARD) is a syndrome in which host?

- A. dogs
- B. cats
- C. ferrets
- D. coyotes

44. Diagnosis of heartworm disease in cats relies most often on which of the following?

- A. detecting microfilariae by blood drop on slide
- B. detecting antigenemia by an antigen test
- C. history, clinical signs and thoracic radiographs
- D. detecting antibodies against *Dirofilaria*

45. A farm dog with the habit of eating freshly passed horse feces might be mistakenly diagnosed by fecal flotation with what parasitic nematode if the horse was infected with small strongyles?

- A. hookworm (*Ancylostoma* or *Uncinaria*)
- B. *Toxocara canis*
- C. *Trichuris vulpis*
- D. *Dirofilaria immitis*

46. A client brings in a nematode passed by her 2-year-old cat that roams outside at night. The worm is about 4 inches long. You examine it carefully and see that the anterior end looks like an arrowhead or cobra's head with a hood. What is the nematode?

- A. *Toxocara cati*
- B. *Ancylostoma tubaeformae*
- C. *Physaloptera nana*
- D. *Aeleurostrongylus abstrusus*

47. Which nematode parasite of horses has demonstrated zoonotic disease potential for infection in humans?

- A. *Oxyuris equi*
- B. small strongyles
- C. *Dictyocaulus arnfeldi*
- D. none of the above

48. Which nematode parasite of cattle has demonstrated zoonotic disease potential for infection of humans?

- A. *Ostertagia ostertagi*
- B. *Haemonchus placei*
- C. *Habronema*
- D. none of the above

49. Which nematode parasite of dogs has demonstrated zoonotic disease potential for infection of humans?

- A. *Toxocara canis*
- B. *Trichuris vulpis*
- C. *Uncinaria stenocephala*
- D. none of the above

50 The time required for the development of the infective larva in an ascarid ovum (example *Toxocara canis*) in the environment is how long?

- A. 24 hours
- B. about 3 days
- C. less than 1 week
- D. about 4 weeks