Ohio Vector Practice Exam (Sample)

Study Guide

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Questions

1. Which mosquito species is involved in the transmission of Eastern Equine Encephalitis (EEE) and West Nile virus?

A. Culex pipiens

B. Aedes aegypti

C. Coquillettidia mansonia perurbans

D. Psorophora ciliate

2. Which of the following is true about chiggers?

A. They can transmit diseases

B. They are parasites that inject secretion into the skin

C. They have eight legs in their parasitic stage

D. They are beneficial for human health

3. Which of the following best describes arboviruses?

A. Viruses caused by washing fruits

B. Viruses caused by arthropods

C. Viruses from contaminated water

D. Viruses from food poisoning

4. What notable feature distinguishes the female Lone Star Tick?

A. A distinct silvery spot

B. Red markings on the back

C. A textured shell

D. Large size compared to males

5. What characteristic distinguishes pellets from granular formulations?

A. They are smaller in size

B. All particles are uniform

C. They must be mixed with water

D. They are not used for precision planting

6. What health hazard is associated with birds, specifically pigeons and starlings?

A. Cryptococcosis

B. Avian flu

C. Histoplasmosis

D. West Nile virus

7. What are common symptoms of the LaCrosse encephalitis?

A. Severe headache and rash

B. Fever with potential illness

C. Muscle pain and fatigue

D. Coughing and throat pain

8. What disease is caused by the nematode Dirofilaria immitis?

A. Leptospirosis

B. Heartworm

C. Filariasis

D. Malaria

9. Which mosquito species is known to feed on farm animals in addition to humans?

A. Anopheles quadrimaculatus

B. Aedes triseriatus

C. Aedes canadensis

D. Aedes vexans

10. What can result from the unchecked spread of vector populations?

A. A decrease in the number of vector-borne diseases

B. An increase in vector-borne diseases

C. A more diverse ecosystem

D. Improved public health outcomes

Answers

1. C
2. B
3. B
4. A
5. B
6. C
7. B
8. B
9. A
10. B

Explanations

1. Which mosquito species is involved in the transmission of Eastern Equine Encephalitis (EEE) and West Nile virus?

A. Culex pipiens

B. Aedes aegypti

C. Coquillettidia mansonia perurbans

D. Psorophora ciliate

The species involved in the transmission of Eastern Equine Encephalitis (EEE) and West Nile virus is Culex pipiens. This mosquito is well-known for its role as a vector for various viruses, including West Nile. In regions where EEE and West Nile virus are present, Culex pipiens is particularly prevalent and has been identified in many cases involving the transmission of these diseases to humans and other animals. Understanding the ecology and behavior of Culex pipiens is crucial for public health efforts focused on controlling the spread of these viruses. While other mosquito species may play roles in the life cycle of EEE or have ecological relevance, Culex pipiens specifically stands out in vector competence for these diseases. This knowledge is vital in managing and mitigating the risks associated with these mosquito-borne illnesses.

2. Which of the following is true about chiggers?

A. They can transmit diseases

B. They are parasites that inject secretion into the skin

C. They have eight legs in their parasitic stage

D. They are beneficial for human health

Chiggers are known for their role as parasites that cause skin irritation. In their larval stage, chiggers attach to their host and inject enzymes into the skin. These enzymes break down skin cells, which the chiggers then consume. This injection process leads to the intense itching and irritation often associated with chigger bites. Understanding this mechanism helps clarify the nature of their interaction with humans and the resultant discomfort. In contrast, while some might believe that chiggers could have a role in transmitting diseases, current research indicates that they do not vector any pathogens that cause illness in humans. When considering their leg count, it is important to note that while adult mites have eight legs, chigger larvae have only six legs and are not technically in the adult parasitic stage. Lastly, chiggers do not provide any benefits to human health; rather, they are typically viewed as nuisances due to the discomfort they cause.

3. Which of the following best describes arboviruses?

A. Viruses caused by washing fruits

B. Viruses caused by arthropods

C. Viruses from contaminated water

D. Viruses from food poisoning

Arboviruses, or arthropod-borne viruses, are primarily transmitted to humans and other animals through the bites of infected arthropods, such as mosquitoes and ticks. This mode of transmission is crucial because it indicates how these viruses spread in nature and cause diseases, such as West Nile virus, Zika virus, and dengue fever. The lifecycle of arboviruses involves both vertebrate hosts and arthropod vectors, which is why option B accurately describes their nature. Understanding that these viruses utilize insects for transmission is fundamental in public health, especially for implementing prevention strategies like vector control. The other options relate to different causes of diseases: washing fruits typically pertains to preventing contamination from pathogens, while contaminated water refers to waterborne diseases. Food poisoning specifically involves toxins or pathogens consumed through food. None of these options relate to the specific transmission method and lifecycle intrinsic to arboviruses, making B the only correct choice.

4. What notable feature distinguishes the female Lone Star Tick?

A. A distinct silvery spot

B. Red markings on the back

C. A textured shell

D. Large size compared to males

The distinguishing feature of the female Lone Star tick is the presence of a distinct silvery spot located in the center of its back. This characteristic is a key identification marker that helps differentiate the female from other similar tick species. The silvery spot is a recognizable trait that can often be observed in adult females, aiding in effective identification during field observation. The other options do not accurately describe this particular tick. While red markings on the back may be present in some ticks, they are not a definitive feature of the Lone Star tick. The texture of the shell can vary among different species, and while the size of female ticks is generally larger than males, this is not a unique feature that distinguishes the Lone Star tick. The notable silvery spot on the female is what makes it particularly identifiable in various settings, especially in regions where these ticks are more prevalent.

5. What characteristic distinguishes pellets from granular formulations?

A. They are smaller in size

B. All particles are uniform

C. They must be mixed with water

D. They are not used for precision planting

The distinguishing characteristic of pellets compared to granular formulations is that all particles in a pellet formulation tend to be uniform in size and shape. This uniformity enhances their behavior during application, allowing for more consistent distribution and effectiveness in various agricultural or pest control scenarios. Uniformity in particle size can aid in the precise targeting of the application, improving efficacy and reducing waste. In contrast, granular formulations can vary significantly in particle size, which could lead to uneven distribution when spread, affecting the overall effectiveness of the product. The other characteristics mentioned are not necessarily inherent to pellets. For instance, not all pelletized formulations are required to be mixed with water, and the idea of them being smaller in size doesn't apply since pellets can be larger than granules. Additionally, while both types can potentially be used for precision planting, pellets are often designed for specific applications and may not always be the best choice for that purpose.

6. What health hazard is associated with birds, specifically pigeons and starlings?

A. Cryptococcosis

B. Avian flu

C. Histoplasmosis

D. West Nile virus

The health hazard associated with birds, particularly pigeons and starlings, is histoplasmosis. This disease is caused by a fungus called Histoplasma capsulatum, which can thrive in environments contaminated with bird droppings. When these droppings dry out, they become airborne, and individuals who inhale the spores can develop respiratory issues and infection. Pigeons and starlings are frequently found in urban and suburban areas, where they often roost and nest in large numbers, leading to the accumulation of droppings. Therefore, people who work in environments with high bird populations or engage in activities like cleaning out bird nests are at a greater risk of exposure to histoplasmosis. Other options represent different health hazards associated with birds, but they are not as closely linked to pigeons and starlings. Cryptococcosis is primarily associated with the fungus Cryptococcus neoformans, often linked to pigeons but is less common as a health risk. Avian flu, while significant, primarily affects specific bird species and does not predominantly involve pigeons and starlings. West Nile virus is transmitted by mosquitoes and is not directly associated with birds in the same way as histoplasmosis is. Thus, histoplasmosis

7. What are common symptoms of the LaCrosse encephalitis?

A. Severe headache and rash

B. Fever with potential illness

C. Muscle pain and fatigue

D. Coughing and throat pain

LaCrosse encephalitis is a viral infection transmitted by mosquitoes that primarily affects children. Common symptoms associated with this disease include fever, which can vary in intensity, along with signs of potential illness such as fatigue and lethargy. The fever is a hallmark symptom that often precedes more severe manifestations of the disease, including neurological symptoms. While other symptoms like severe headache, rash, muscle pain, and fatigue can occur, the defining aspect of the early stage of the illness is generally the fever combined with nonspecific signs of illness, which may include loss of appetite, irritability, and overall unwellness. Identifying fever as a symptom is crucial for diagnosis and proper management of the infection. Other choices, although they may occur in various illnesses, do not capture the most characteristic features of LaCrosse encephalitis specifically.

8. What disease is caused by the nematode Dirofilaria immitis?

A. Leptospirosis

B. Heartworm

C. Filariasis

D. Malaria

Dirofilaria immitis is a parasitic nematode that primarily affects dogs, but it can also infect other animals, including cats and ferrets, as well as occasionally humans. The condition caused by this parasite is commonly known as heartworm disease. Heartworm disease occurs when the larvae of Dirofilaria immitis are transmitted to a host through the bite of an infected mosquito. Once inside the host, the larvae develop into adult worms that typically reside in the heart, lungs, and associated blood vessels. This can lead to serious cardiovascular issues, respiratory problems, and can ultimately be fatal if not treated. In contrast, other options refer to diseases caused by different pathogens. Leptospirosis is caused by spirochete bacteria, filariasis is caused by different species of filarial worms transmitted by insect vectors, and malaria is caused by protozoan parasites transmitted by Anopheles mosquitoes. These distinctions clarify why heartworm is the correct association with the nematode Dirofilaria immitis.

9. Which mosquito species is known to feed on farm animals in addition to humans?

A. Anopheles quadrimaculatus

B. Aedes triseriatus

C. Aedes canadensis

D. Aedes vexans

The correct answer is based on the feeding habits and host preferences of the mosquito species. Anopheles quadrimaculatus is known to feed on a variety of hosts, including both humans and farm animals. This versatility in feeding makes it an important vector in agricultural settings, as they can transmit diseases not only to humans but also to livestock, potentially impacting both human health and animal husbandry. In contrast, other species listed, like Aedes triseriatus, primarily target human hosts and are more specialized in their feeding preferences. Aedes canadensis and Aedes vexans also share feeding behaviors that focus predominantly on humans and certain wildlife, limiting their interactions with farm animals. Thus, the ecology of Anopheles quadrimaculatus, with its adaptability to multiple hosts, underscores its significance in both medical and veterinary contexts when considering mosquito species that feed on farm animals alongside humans.

10. What can result from the unchecked spread of vector populations?

A. A decrease in the number of vector-borne diseases

B. An increase in vector-borne diseases

C. A more diverse ecosystem

D. Improved public health outcomes

The unchecked spread of vector populations typically leads to an increase in vector-borne diseases. This occurs because as these vectors, such as mosquitoes, ticks, and fleas, proliferate, they are more capable of transmitting pathogens to humans and animals. A larger vector population increases the likelihood of disease transmission and can lead to outbreaks of illnesses such as West Nile virus, Zika virus, Lyme disease, and more. Given that these vectors can thrive in various environments, their unchecked growth can also facilitate the spread of diseases into new areas, further exacerbating public health concerns. Thus, the direct correlation between a burgeoning vector population and the rise in vector-borne diseases makes this answer the most accurate reflection of the potential consequences.