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Science

Released Life Science Task

White-Tailed Deer

White-tailed deer are one of Missouri’s most valuable wildlife resources because they provide visual, economic, and educational value.

In the summer, white-tailed deer are reddish brown and they turn a gray to grayish brown in the winter. However, there are reports of albino deer also existing in Missouri. Albinism is a recessive trait in which a deer lacks the gene for normal coloration and does not produce the enzyme responsible for skin, hair, and tissue coloration.

Bucks (male deer) normally shed their antlers during the late winter each year. Once a buck sheds its antlers, new growth starts immediately. The antlers are equipped with a rich blood supply and have a thick, hair like covering commonly known as velvet. While “in velvet,” antlers are a living organ and are vulnerable to injury. By early September, the velvet dries and is rubbed off, leaving antlers that are solid and hard. Several theories attempt to explain the purpose of antlers in the deer family. These theories suggest that antlers are used as a means of defense, as a sign of genetic superiority, and to show social dominance.

White-tailed deer are browsers, eating twigs, leaves, bark, grasses, weeds, and soft-stemmed plants. Deer may also eat acorns and other nuts, fruits, mushrooms, algae, and mosses when available. Males require high-protein food during antler growth. Females need a high-protein diet during pregnancy and while nursing young.

As a deer herd increases in number, it can eventually exceed an area’s biological carrying capacity—the maximum number of deer a habitat can support. When deer numbers exceed the carrying capacity, the physical condition of the deer decline resulting in lower reproductive and survival rates. In addition, large deer herds can strip the forest of young trees and shrubs, reducing resources available to other species. The Missouri Department of Conservation estimated that the white-tailed deer population was greater than one million statewide in 2014.

1. The typical incidence of albinism in white-tailed deer is less than one animal for every 30,000 deer. A small population of white-tailed deer carries the genetic mutation that causes albinism.

Use the drop-down menus to complete the statements.

For a deer to express true albinism, the gene must be carried by

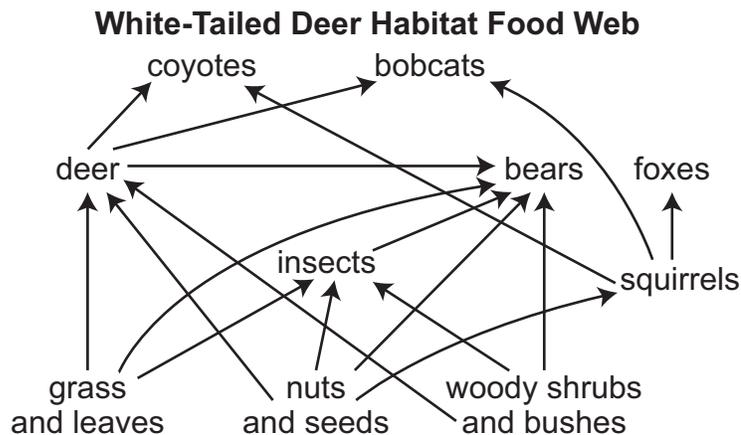
Deer that express albinism are to survive in a natural habitat as they are more easily seen by predators.

only the mother
only the father
both parents

more likely
less likely

2. Even though antlers eventually harden and fall off, what is the **best** evidence that antlers are a living part of a deer?
- A. They perform life processes necessary for growth and development of a male deer.
 - B. They are part of a living organism and are necessary for the organism to successfully mate.
 - C. They contain a vascular network that provides nutrients to cells, and the cells reproduce, resulting in antler growth.
 - D. They contain cells that require specific nutrients to form the antlers, and the cells remain living after the antlers harden.

3. A food web of a white-tailed deer habitat is shown.



Select **two** statements that are supported by the food web shown.

- A. The coyotes and the foxes are competitors for some resources.
- B. The deer population is not affected by the squirrel population.
- C. The bobcats will not obtain any energy from the woody shrubs and bushes.
- D. Deer and bear populations are in direct competition for nuts and seeds.
- E. More energy is passed from the squirrels to the bobcats than from the squirrels to the foxes.

4. The chart shows the protein concentration and the seasonal availability of plants that deer consume.

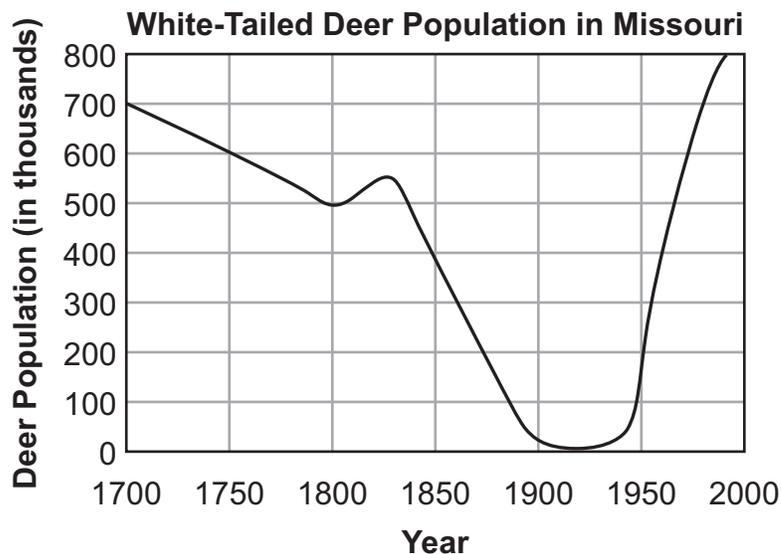
Protein Concentration and Seasonal Availability of Food

Plant	Spring	Summer	Fall	Winter
red clover	15%–30%			
soybeans		25%–35%		
smooth sumac	10%–20%			
greenbrier	10%–35%		4%–6%	

Which food would be **best** in the early fall for bucks that are still growing antlers?

- A. red clover
- B. soybeans
- C. smooth sumac
- D. greenbrier

5. A student investigating the status of the white-tailed deer population in Missouri found the graph shown below.



What change **most likely** occurred in the ecosystem and resulted in the declining deer population from the mid-1800s to the early 1900s?

- A. Wildlife management practices were put into place to control the white-tailed deer population.
- B. Increased farming activities led to a loss of resources for the white-tailed deer.
- C. The reproductive and survival rates of the white-tailed deer population increased.
- D. The predator population of the white-tailed deer decreased.

6. In some areas humans hunt white-tailed deer.

Part A: Predict how government-regulated hunting of white-tailed deer by humans could have a positive impact on an ecosystem that includes a deer population.

Humans have reintroduced large predator species such as wolves and bobcats to ecosystems that are overcrowded with deer.

Part B: Predict **one** possible impact on the biodiversity of an ecosystem with an overcrowded deer population after the reintroduction of a large predator species.

ATTENTION!

**Do NOT go on
until you are
told to do so.**



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