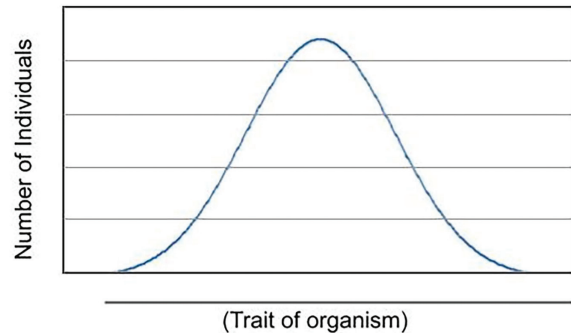


Selection Stories

Bacteria

Some bacteria have structures called efflux pumps that can pump antibiotic chemicals out of the cell before it has time to destroy it. The number of efflux pumps a bacteria has is an inherited trait. Some bacteria within a population may have few or many efflux pumps.

Having more efflux pumps is an advantage for bacteria during times when the environment has antibiotics present. The more efflux pumps, the less likely the bacteria cell is destroyed by antibiotics. Fewer efflux pumps on bacteria are selected against when antibiotics are in their environment.

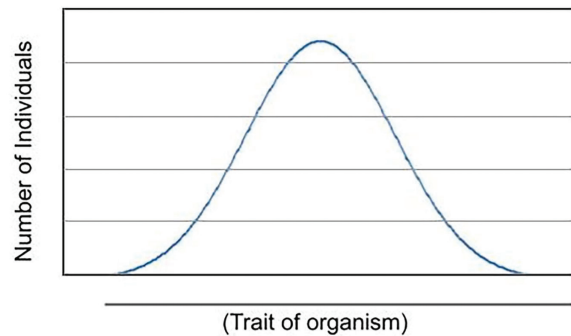


Draw a curve using a dashed line that would show how the distribution of the trait for efflux pumps would change when antibiotics are present in the environment for a population of bacteria. Also label the x-axis of the graph with the trait being studied.

Yellow-shafted flickers

How many eggs a bird lays in the nest is known as clutch size. As mother birds sit on their eggs, a patch of skin detects the number of eggs and chemical signals trigger hormones to stop or continue egg laying. Clutch size is an inherited trait in birds.

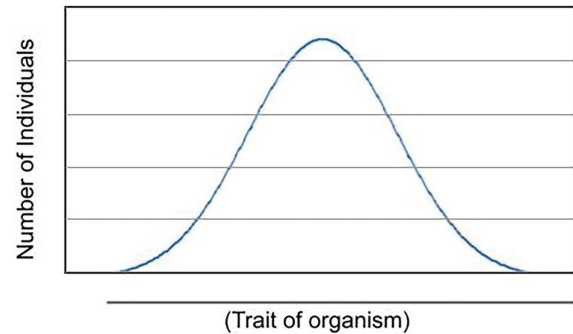
Having too many eggs in a clutch could mean lower survival as chicks compete for food. Having too few eggs in a clutch could mean not enough chicks survive to reproduce. For yellow-shafted flicker woodpeckers, having 7 or 8 eggs per year is an advantage.



Draw a curve using a dashed line that would show how the distribution of the trait for clutch size for yellow-shafted flickers would change in years of normal food availability. Also label the x-axis of the graph with the trait being studied.

Fingered poison frogs

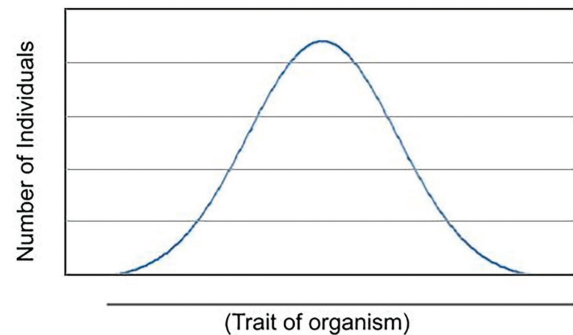
On the island of Trinidad in the Caribbean, most of these tiny frogs lay their eggs in nests on the forest's damp floor in July. When they hatch, adult frogs transport the tadpoles to seasonal pools of water. The timing of when they spawn (lay eggs) is a trait that is inherited. As climate change increases the occurrences of drought conditions, some scientists predict that the southern population of frogs that lay their eggs in April and May will be at an advantage due to more moisture in the forest. They also predict that the northern population frogs that lay their eggs in September and October will have access to more seasonal ponds so they are also at an advantage.



Draw a curve using a dashed line that would show how the distribution of the trait for spawning time will be impacted in the frog population as drought conditions increase. Also label the x-axis of the graph with the trait being studied.

Pygmy mammoths

Columbian mammoths survived for more than 2 million years. They along with other large herbivores competed for vegetation. A population of mammoths swam to the Channel Islands off the coast of California. With no predators like the dire wolf or saber-toothed cats, this population survived nearly 50,000 years. With less food available on the island, smaller mammoths were at an advantage. While mammoths on the mainland could reach 14 feet at the shoulder and 20,000 pounds, the mammoths of the Channel Islands were much smaller: about 6 feet at the shoulder and 1,500 pounds.



Draw a curve using a dashed line that would show the distribution of the trait for size in the population over time on an island. Also label the x-axis of the graph with the trait being studied.