

Homework 7

Use the information below to answer all homework questions.

The long-nosed agouti has a relatively long snout, that it uses to find food, but there is variation in snout length among the individuals in a population. You have measured the snout length of males and of their offspring. By using genetic markers you are able to determine which male is the father of each offspring. The males do not associate with the females after they have mated; therefore any resemblance between males and their offspring is due only to genetics—not environment. The phenotypic variance of the males is 0.8, while the phenotypic variance of the offspring is less—0.6. The covariance in snout length between males and their offspring is 0.2.

During your study, a drought caused the agoutis' food to burrow more deeply underground. Because of this, only those agoutis that had snouts that averaged 4 cm longer than the population mean could survive and breed.

Question 1. What is the heritability of snout length?

- A. 0.2
- B. 0.25
- C. 0.5
- D. 0.6

Question 2. Relative to the original population, how much longer will snout length be in the next generation?

- 1) 0.5 cm longer
- 2) 1.0 cm longer
- 3) 2.0 cm longer
- 4) 4.0 cm longer

Question 3. What type of selection is operating on snout length?

- A. directional
- B. stabilizing
- C. disruptive

Question 4. If selection persists, what will happen to the phenotypic variance of the population?

- A. it will increase
- B. it will decrease
- C. it will stay the same