

## *Polygenic Inheritance*

1. What is a trait called that is affected by one pair of alleles so the phenotypes can be easily placed into specific classes?
  - a. Continuous
  - b. Quantitative
  - c. Qualitative
  - d. Polygenic
  - e. Additive
2. What is a continuously measured trait influenced by polygenes and the environment called?
  - a. Quantitative
  - b. Qualitative
  - c. Discontinuous
  - d. Mendelian
3. Define mean.
  - a. Addition of all measurements divided by the number of measurements
  - b. Sum of deviations squared
  - c. Sum of all measurements
  - d. Sum of squares divided by the number of observations
4. Choose the best definition of a threshold trait:
  - a. Affected by several genes and the environment
  - b. Provides different degrees of expression when the trait appears in the phenotype
  - c. An all-or-none trait influenced by several genes and the environment
  - d. An all-or-none trait with 100% incidence
5. Define variance.
  - a. Sum of squares of the deviations from the mean divided by degrees of freedom
  - b. Sum of squares divided by degrees of freedom
  - c. Sum of the observations divided by the number of observations
  - d. Sum of deviations from the mean divided by number of observations minus one
6. The variance of a population is 16. What is the standard deviation?
  - a. 2
  - b. 4
  - c. 16
  - d. 32

e. 256

7. Define heritability

- a. The additive genetic value divided by the phenotypic value
- b. Non-additive genetic variance divided by the phenotypic variance
- c. Ratio of additive plus non-additive genetic variance to total variance
- d. The additive genetic variance divided by the total variance

8. What circumstances cause a low heritability?

- a. Environmental variance is large, additive variance is small
- b. Environmental variance is small, additive variance is large
- c. Environmental variance and additive variance are the same
- d. Phenotypic variance is equal to additive variance

9. In a dairy herd the combined dominance variance for milk production was 200, the environmental variance was 49,800 and the phenotypic variance 55,000. What is the heritability?

10. A farmer measures the number of pounds of weight gained by each of 5 pigs over a 20-day period. The values he obtains are? 15, 20, 25, 30, 40. What is the variance of weight gain?

- a. 74.0
- b. 92.5
- c. 122.3
- d. 185.0
- e. 370.0

11. The standard deviation of 12-week body weight of chickens was 70 in a specific flock. The heritability was 0.20. What was the additive genetic variance?

- a. 14
- b. 70
- c. 980
- d. 1960
- e. 4900

12. There is a delayed feathering gene in chickens  $k^n$  phenotypically recessive to  $K^n$ . The comb weights in grams were determined for each of the three genotypes as follows:  $K^nK^n$  .0469;  $K^nk^n$  .4239;  $k^nk^n$  .468. What are the a and d values for comb weight at this locus?