

Lab 2 Hardy-Weinberg

1. The frequency of two alleles in a gene pool is 0.19 (A) and 0.81 (a). What is the percentage in the population of heterozygous individuals? What is the percentage of homozygous recessives? Assume that the population is in Hardy-Weinberg equilibrium.
2. An allele W , for white wool, is dominant over allele w , for black wool. In a sample of 900 sheep, 891 are white and 9 are black. Estimate the allelic frequencies in this sample, assuming that the population is in equilibrium.
3. In a population that is in Hardy-Weinberg equilibrium, the frequency of the recessive homozygote genotype of a certain trait is 0.09. What is the percentage of individuals homozygous for the dominant allele?
4. In a population that is in Hardy-Weinberg equilibrium, 38 % of the individuals are recessive homozygotes for a certain trait. In a population of 14,500, how many of the individuals will be homozygous dominant individuals, and heterozygous individuals.
5. Allele T , for the ability to taste a particular chemical, is dominant over allele t , for the inability to taste it. At a university, out of 400 surveyed students, 64 were found to be nontasters. What is the percentage of heterozygous students? Assume that the population is in equilibrium.
6. In humans, Rh -positive individuals have the Rh antigen on their red blood cells, while Rh -negative individuals do not. Assume that a dominant gene Rh produces the Rh -positive phenotype, and the Rh -negative phenotype produces by its recessive allele rh . In a population that is in Hardy-Weinberg equilibrium, if 160 out of 200 individuals are Rh -positive, what are the frequencies of the Rh allele and the rh allele at this locus?
7. In corn, yellow kernel color is governed by a dominant allele for white color W and, by its recessive allele, w . A random sample of 100 kernels from a population that is in equilibrium reveals that 9 are yellow and 91 are white. What are the frequencies of the yellow and white alleles in this population? What is the percentage of heterozygotes in this population?
8. A rare disease which is due to a recessive allele (a) that is lethal when homozygous (aa), occurs with a frequency of one in a million. How many individuals in a town of 14,000 can be expected to carry this allele?