1. Chondrodystrophy in California condors is a condition that results in severe malformations (dwarfing) in the long bones and death around hatching. It is thought to be due to homozygosity for a recessive allele, as are similar conditions in domestic turkeys. Of 169 hatched eggs in condors, 5 exhibited condrodystrophy (4 from one family and another from a related individual.) Use + and \( dw \) as the symbols for the normal and chondrodystrophic alleles, and \( p \) and \( q \) for their frequencies.

As the homozygous normal and heterozyote individuals can’t be distinguished, it is not possible to obtain the allele frequencies by direct counting. However, if the assumptions of Hardy-Weinberg equilibrium are upheld, we can estimate the frequency of the \( dw \) allele.

a) What are the frequencies of the different alleles at this locus?
b) What are the frequencies of the different genotypes at this locus?
c) What is the expected frequency of normal and chondrodystrophic individuals in the population?

2. The fitness of the ++, +\( dw \) and \( dwdw \) genotypes are close to 1, 1 and 0, respectively. Using the allele frequencies from the the last question, what is the expected frequency of the \( dw \) allele in the next generation?