



FIGURE 19.1. Selection coefficients can be measured as the rate of change of the ratio between two competing genotypes. (A) The frequency of a mutant strain of yeast relative to a competing wild-type strain. The ratio between the frequencies of the two strains is plotted on a logarithmic scale and so is expected to follow a straight line if fitnesses are constant; the slope of the line gives the selection coefficient. In this example, the ratio declines from 1.27:1 to 0.69:1 over 150 generations, and so the selection coefficient is estimated as $s = \ln(0.69/1.27)/150 = -0.004$ (or -0.4%) per generation. (B) The ratios between the frequencies of competing chromosomal genotypes in two replicate cages of *Drosophila melanogaster*. The slopes of the graphs give an estimate of relative fitness of 1.75, assuming a generation time of 15 days.

19.1A, modified from Thatcher J.W. et al., *Proc. Natl. Acad. Sci.* **95**: 253–257, © 1998 National Academy of Sciences, U.S.A.; 19.1B, modified from Fowler K. et al., *Proc. R. Soc. Lond. B* **264**: 191–199, © 1997 Royal Society