

1. A farmer wants to increase the average body weight in a herd of cattle. He begins with a herd having mean weight of 595kg and chooses individuals to breed that have a mean weight of 625kg. Twenty offspring were obtained, having the following weights in kilograms: 612, 587, 604, 589, 615, 641, 575, 611, 610, 598, 589, 620, 617, 577, 609, 633, 588, 599, 601, and 611. Calculate the realized (narrow-sense) heritability for body weight in this herd. (40 points)
2. Please explain the following important terms:
 - a. Broad-sense heritability (20points)
 - b. Average effect (20points)
 - c. Linkage disequilibrium in QTL analysis (20points)