

7.1 Estimation of breeding values, general

In a large randomly mated population, each individual should on average give birth to two offspring in order to maintain the size of the population. The distribution of the number of offspring in the population has a left skewed binominal distribution (Poisson distributed) with a average value of 2 and variance of 2. Which means that the number of offspring per individual can vary from 0 and upwards, the values 0,1,2,3,4 and 5 being the most frequent. The exact breeding value, based on the definition given in chapter 6, cannot be calculated in such a population because of the small number of offspring. An estimation is all we can get.

An estimated breeding value is often called an index (I). The index can be estimated on the basis of information of phenotype values from all possible relatives. A simple regression line or multiple regression can be used. The higher the number of relatives is the better the estimation will be. Correlation between the true breeding value (A) and the index is given the name **Accuracy** and it has the symbol r_{AI} .

The estimated breeding value is based on a theory of linear regression and correlation. The basic definition of these terms can be seen , or more detailed in statistical textbooks.