for a given population (Original Braunvieh versus Brown Swiss)

Population mean: (Genetics)

$$\mu = V_{11} \cdot f(G_1G_1) + V_{12} \cdot f(G_1G_2) + V_{22} \cdot f(G_2G_2)$$

$$= a \cdot p^2 + d \cdot 2pq + (-a) \cdot q^2$$

$$= (p^2 - q^2)a + 2pq \cdot d$$

$$= (p-q)\underbrace{(p+q)}_{=1} a + 2pq \cdot d = (p-q) \cdot a + 2pq\,d$$

Statistics:

- Random variable V for genotypic values
- Population mean corresponds to the expected value $E[V] = \mu$