Mating: Parents have genotype frequencies according to Hardy-Weinberg Equilibrium

$$f(G_1G_1) = p^2$$
$$f(G_1G_2) = 2pq$$
$$f(G_2G_2) = q^2$$

$$f(G_1) = f(G_1G_1) + \tfrac{1}{2} f(G_1G_2)$$
$$= p^2 + \tfrac{1}{2} \cdot 2pq$$
$$= p^2 + pq = p(p+q)$$
$$= p$$

$$f(G_2) = q^2 + pq$$
$$= q(q+p)$$
$$= q$$

allele freq in sperm

$f(G_1) = p$ $\quad$ $f(G_2) = q$

♀ $\quad$ G_1 $\quad$ G_2

$f(G_1) = p \leftarrow G_1$

$f(G_2) \leftarrow G_2$
$= q$

$f(G_1G_1) = p \cdot p = p^2$ $\quad$ $f(G_1G_2) = pq$

$f(G_2G_1) = q \cdot p$ $\quad$ $f(G_2G_2) = q^2$

allele freq. in egg

genotype frequencies in offspring