

Results so far:

Genotype	BV	V	D
$G_1G_1$	$2q\alpha$	$a$	$-2q^2d$
$G_1G_2$	$(q-p)\alpha$	$d$	$+2pqd$
$G_2G_2$	$-2p\alpha$	$-a$	$-2p^2d$

• In general genotypic values ( $V_{ij}$ ) are not the same as Breeding values ( $BV_{ij}$ )

• Difference:  $V_{ij} - B_{ij}$

$$\begin{aligned}
 G_1G_1: \quad V_{11} - BV_{11} &= a - 2q\alpha \\
 &= a - 2q[a + (q-p)d] \\
 &= a - 2qa - 2q^2d + 2pqd \\
 &= a(1-2q) - 2q^2d + 2pqd \\
 &\stackrel{*}{=} \underline{q(p-q) + 2pqd} - 2q^2d \\
 &\quad = \mu \text{ Population mean} \\
 &= \mu - 2q^2d
 \end{aligned}$$

\*  $p+q=1$