Variance and Inbreeding

- Variance $var(u_i)$ of breeding value u_i of animal i:

$$var(u_i) = (1 + F_i)\sigma_u^2$$

where F_i : inbreeding coefficient of animal i

$F_i = \frac{1}{2}(A)_{sd}$ where s and d are known parents of i

- Because : $var(u_i) = (A)_{ii}\,\sigma_u^2 = (1+F_i)\sigma_u^2$

$$\Rightarrow (A)_{ii} = 1 + F_i$$

- Inbreeding is related to the probability of two alleles at one given locus in a given animal i are identical by descent.