

Animal Model:

- LME
- random vector \underline{u} contains breeding values for all animals in the pedigree
- fixed effects, the same as for sire model

$$\begin{array}{c} \text{Animal} \\ \begin{matrix} 3 \\ \rightarrow 4 \\ 5 \\ 6 \end{matrix} \end{array} \begin{array}{c} \underline{y} \\ \begin{bmatrix} 4.5 \\ 2.9 \\ 3.9 \\ 3.5 \end{bmatrix} \end{array} = \begin{array}{c} \underline{X} \\ \begin{bmatrix} 1 & 0 \\ 0 & 1 \\ 0 & 1 \\ 1 & 0 \end{bmatrix} \end{array} \begin{array}{c} \underline{\beta} \\ \begin{bmatrix} \text{herd}_1 \\ \text{herd}_2 \end{bmatrix} \end{array} + \begin{array}{c} \underline{u} \\ \begin{matrix} u_1 & u_2 & u_3 & u_4 & u_5 & u_6 \\ \begin{bmatrix} 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix} \end{matrix} \end{matrix} \begin{array}{c} \underline{u} \\ \begin{bmatrix} u_1 \\ u_2 \\ u_3 \\ u_4 \\ u_5 \\ u_6 \end{bmatrix} \end{array} + \begin{array}{c} \underline{e} \\ \begin{bmatrix} e_1 \\ e_2 \\ e_3 \\ e_4 \end{bmatrix} \end{array}$$

Solutions from Mixed Model Equations