Analysis of Information Content of a predicted breeding value using BLUP animal model

- Decomposition of predicted breeding value

$$\begin{bmatrix} X^TX & X^TZ \\ Z^TX & Z^TZ + A^{-1}\lambda \end{bmatrix} \begin{bmatrix} \hat{\beta} \\ \hat{u} \end{bmatrix} = \begin{bmatrix} X^Ty \\ Z^Ty \end{bmatrix}$$

$$M \cdot s = r$$

with $s = \begin{bmatrix} \hat{\beta} \\ \hat{u} \end{bmatrix}$ where $s = \begin{bmatrix} \hat{s}_1 \\ \vdots \\ s_p \\ s_{p+1} \\ \vdots \\ s_{q+p} \end{bmatrix}$ $\left.\begin{matrix} \\ \\ \\ \end{matrix}\right\} \hat{\beta}$ $\left.\begin{matrix} \\ \\ \\ \end{matrix}\right\} \hat{u}$

- Simplified Model:

$$y_i = \mu + u_i + e_i$$

observation for animal i