LME: $y_{ijk} = \mu + \beta_j + u_i + e_{ijk}$

With BLUP:

- estimate fixed effect (BLUE) and random effect at the same time from same data

- $\hat{u}_i$ as conditional expectation of u given y:
$$\hat{u}_i = E(u_i | y)$$

Properties of $\hat{u}_i$:

Best linear predictor: $var(u_i - \hat{u}_i) \longrightarrow$ minimal

Linear in observations

U : unbiased $E(\hat{u}) = E(u)$

P : Prediction (used for estimates of random effects.)

Schätzung

For fixed effects, the method is called BLUE $\longrightarrow$ estimate