□ <u>With repeated measurements</u>

- Separation of environment into permanent environment (pe) and into non-permanent environment (te)

$$y_{ik} = \mu + u_i + e_{ik}$$

pe$_i$ te$_{ik}$ → change with every measurement.

constant over all measurements for animal i
e.g. the same herd

$$\tilde{y}_i = \frac{1}{M} \sum_{k=1}^{M} y_{ik} = \frac{1}{M} \sum_{k=1}^{M} \left[\mu + u_i + pe_i + te_{ik} \right]$$

$$= \frac{1}{M} \left\{ \sum_{k=1}^{M} \mu + \sum_{k=1}^{M} u_i + \sum_{k=1}^{M} pe_i + \sum_{k=1}^{M} te_{ik} \right\}$$

$$= \mu + u_i + pe_i + \frac{1}{M} \sum_{k=1}^{M} te_{ik}$$