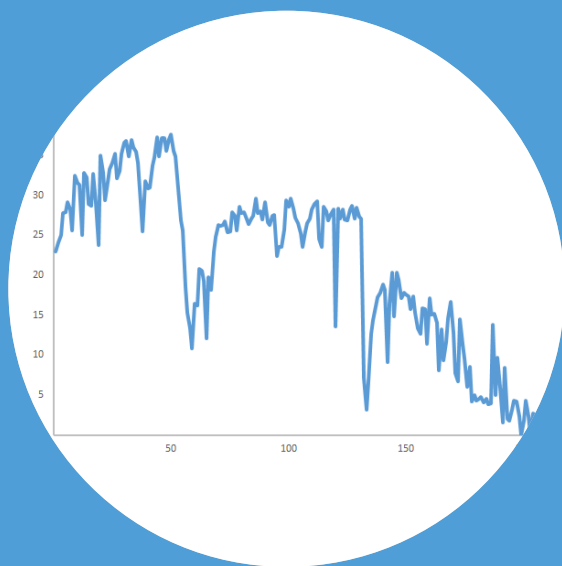


Development of resilience indicators using deviations in milk yield from the lactation curve

EAAP 28-08-2018 69th annual meeting

Marieke Poppe, Han Mulder, Roel Veerkamp





Resilience

The ability of an animal to be minimally affected in its function by an external disturbance....



.... or to quickly return to the state that it had before the disturbance



Introduction

Mastitis

Heat stress

Claw lesions

Acidosis

Highly populated barns



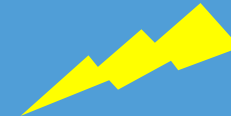
Introduction

Mastitis

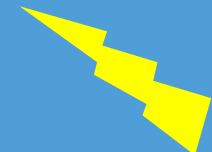
Heat stress



Claw lesion



Moving barns



Rumen acidosis



Aim

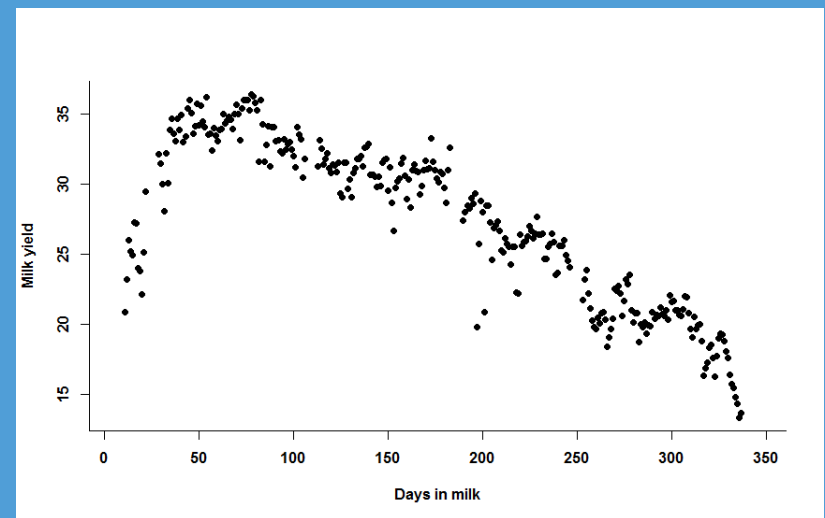
To develop indicators using deviations in milk yield that can be used to breed resilient animals



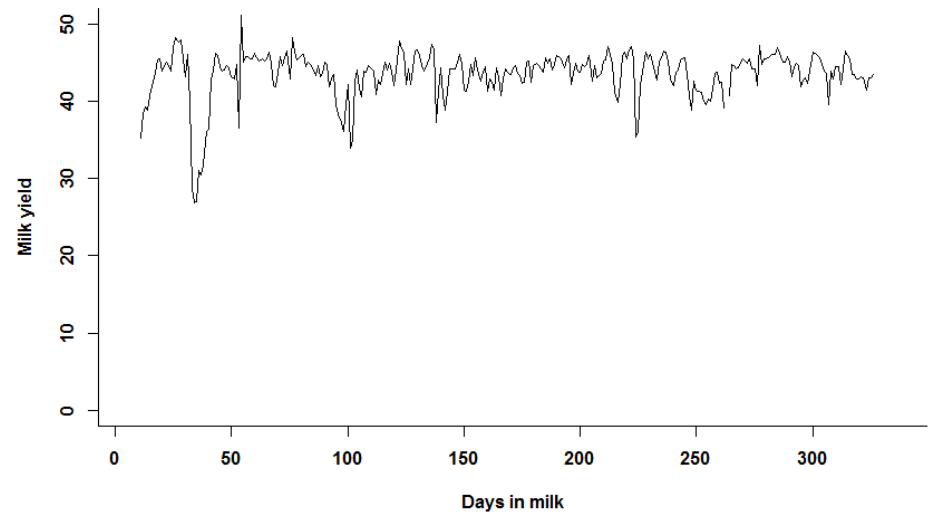
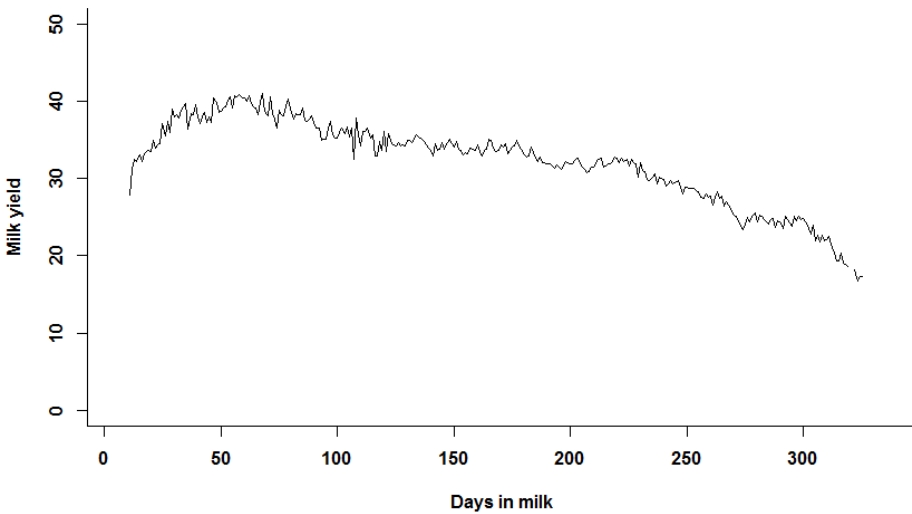
Materials & methods

Data:

- 83,190 first parity lactations
 - ~22,000,000 daily milk yield records
 - 2,000 herds
 - AMS & CMS
 - 2016 - 2018



Materials & methods



Materials & methods

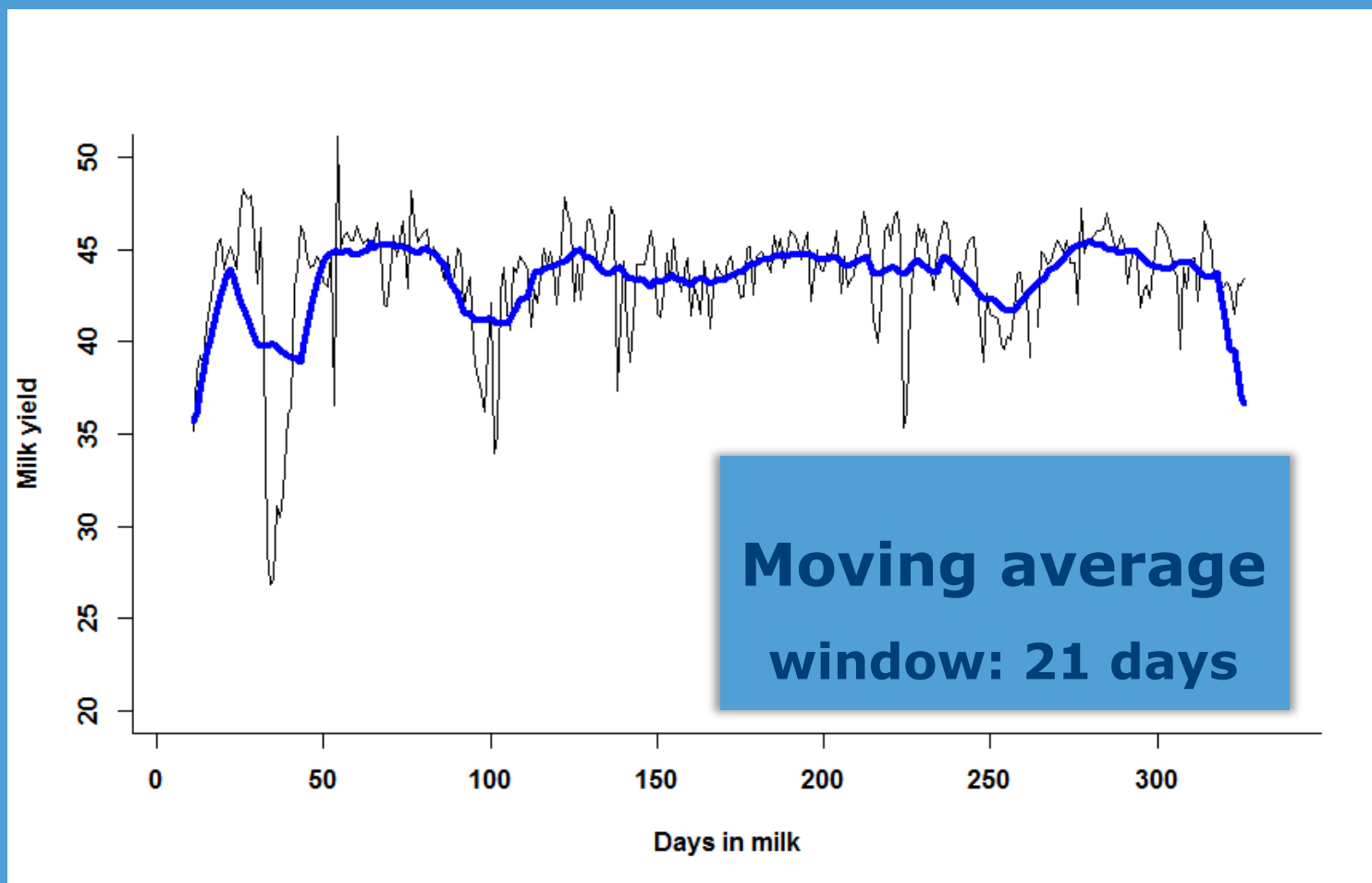
Steps to take:

1. Model lactation curves
2. Calculate residuals
3. Calculate resilience indicators
4. Genetic analysis



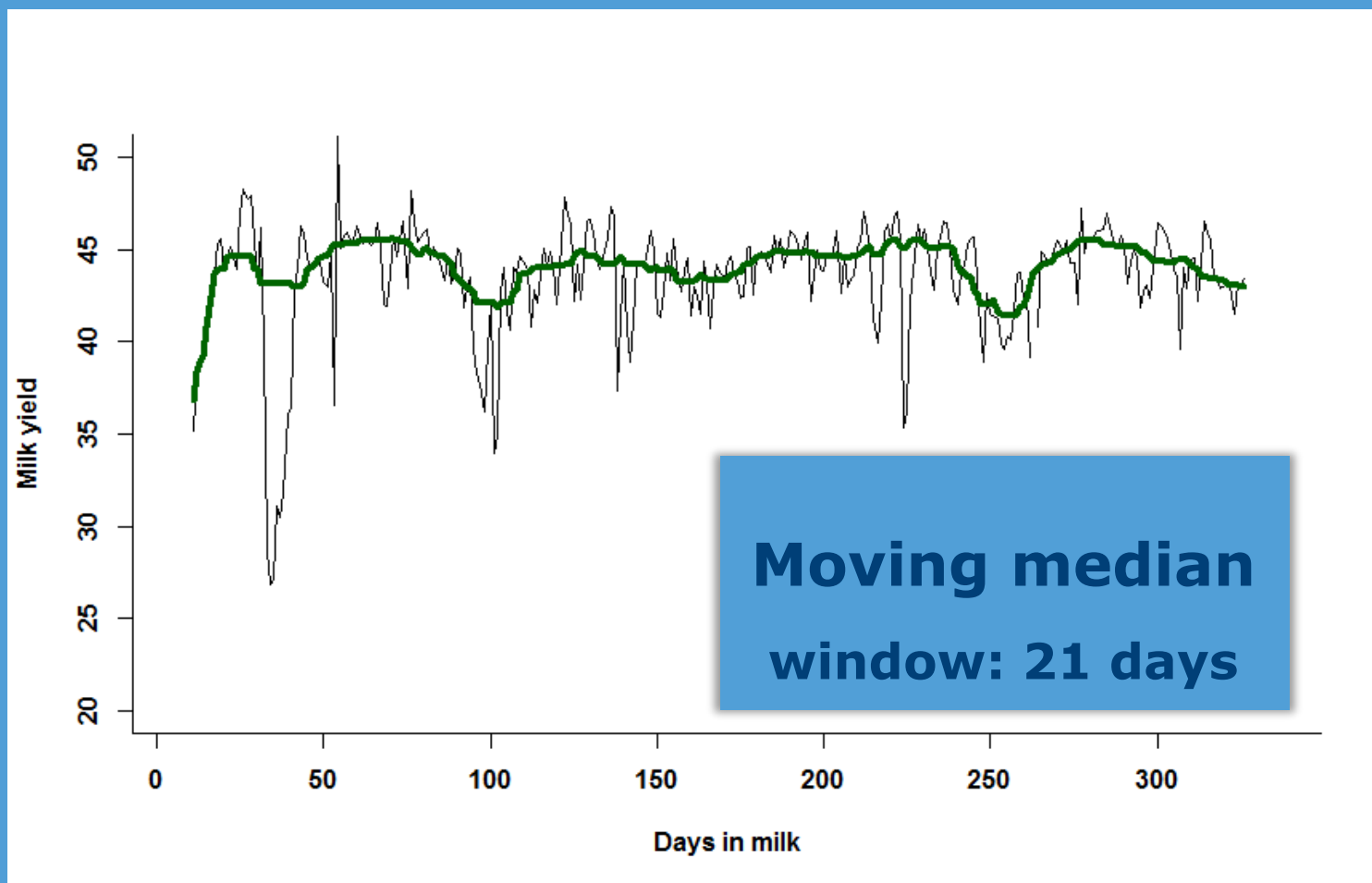
Materials & methods

Step 1: Model lactation curves



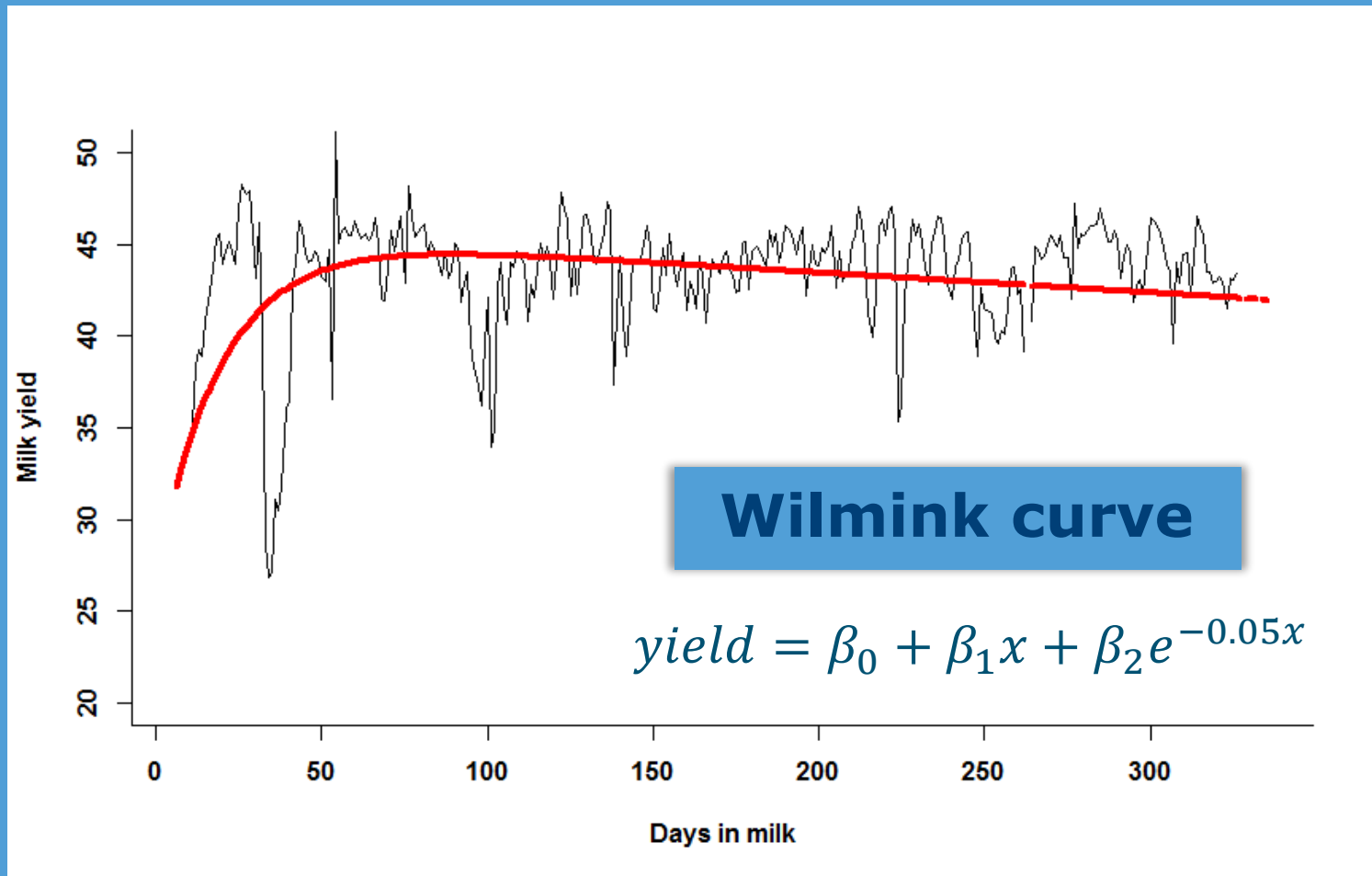
Materials & methods

Step 1: Model lactation curves



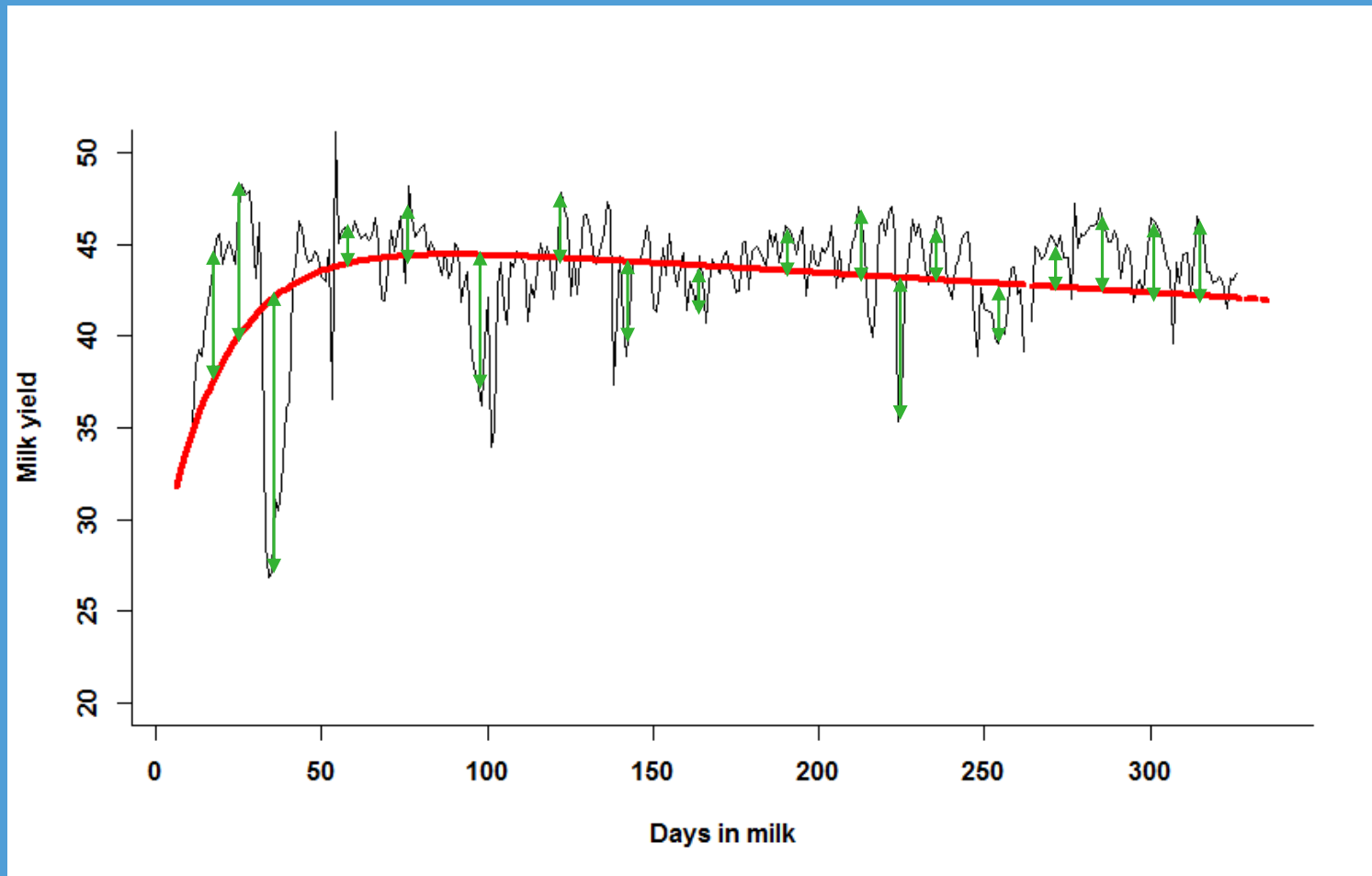
Materials & methods

Step 1: Model lactation curves



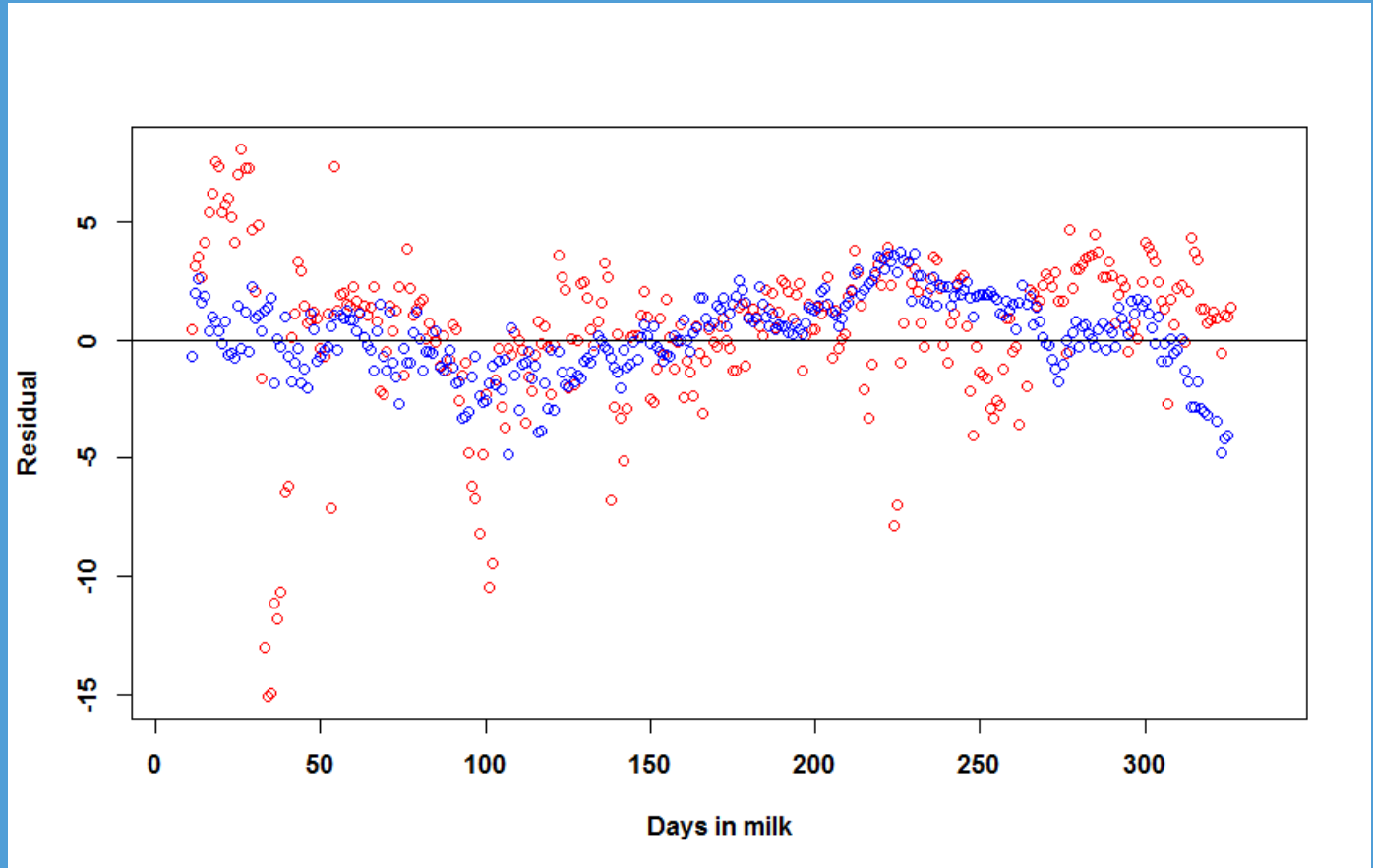
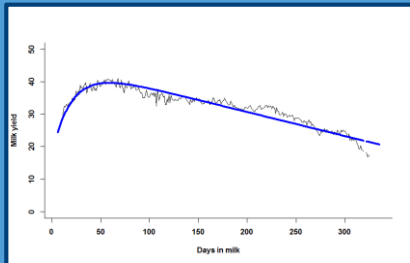
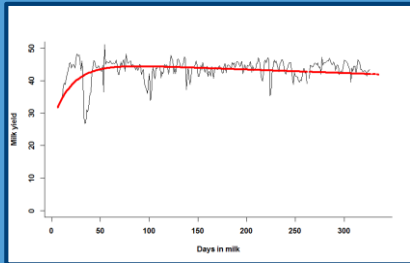
Materials & methods

Step 2: Calculate residuals



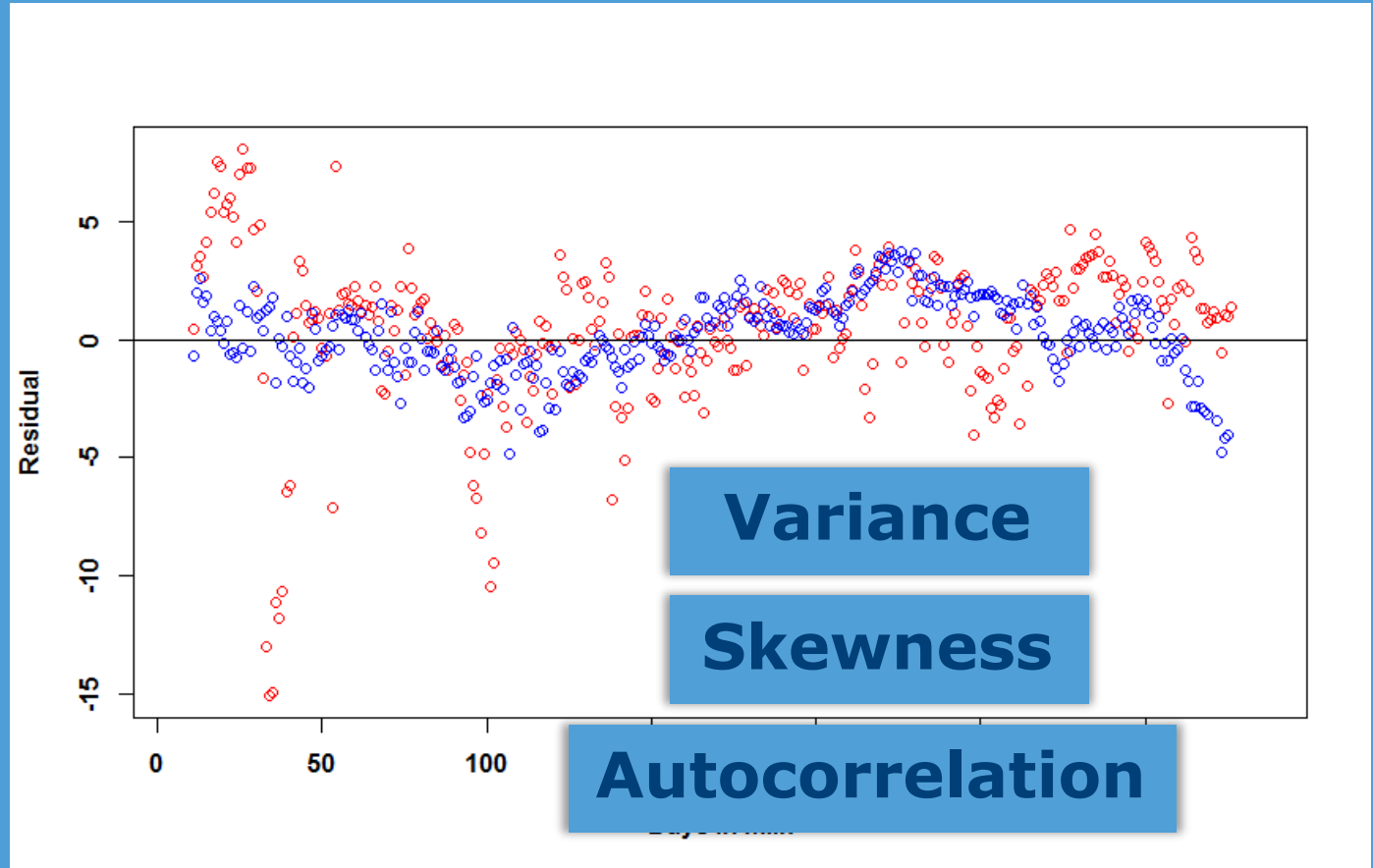
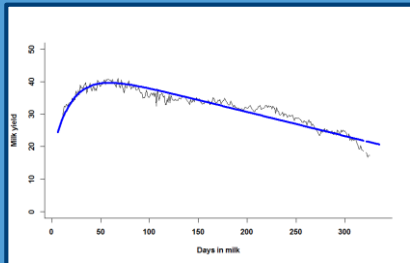
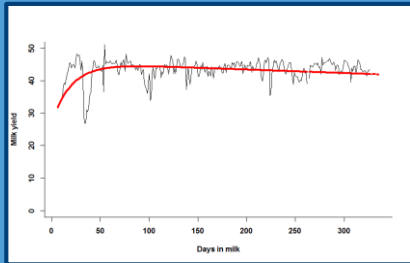
Material & methods

Step 2: Calculate residuals



Material & methods

Step 3: Calculate resilience indicators



Materials & methods

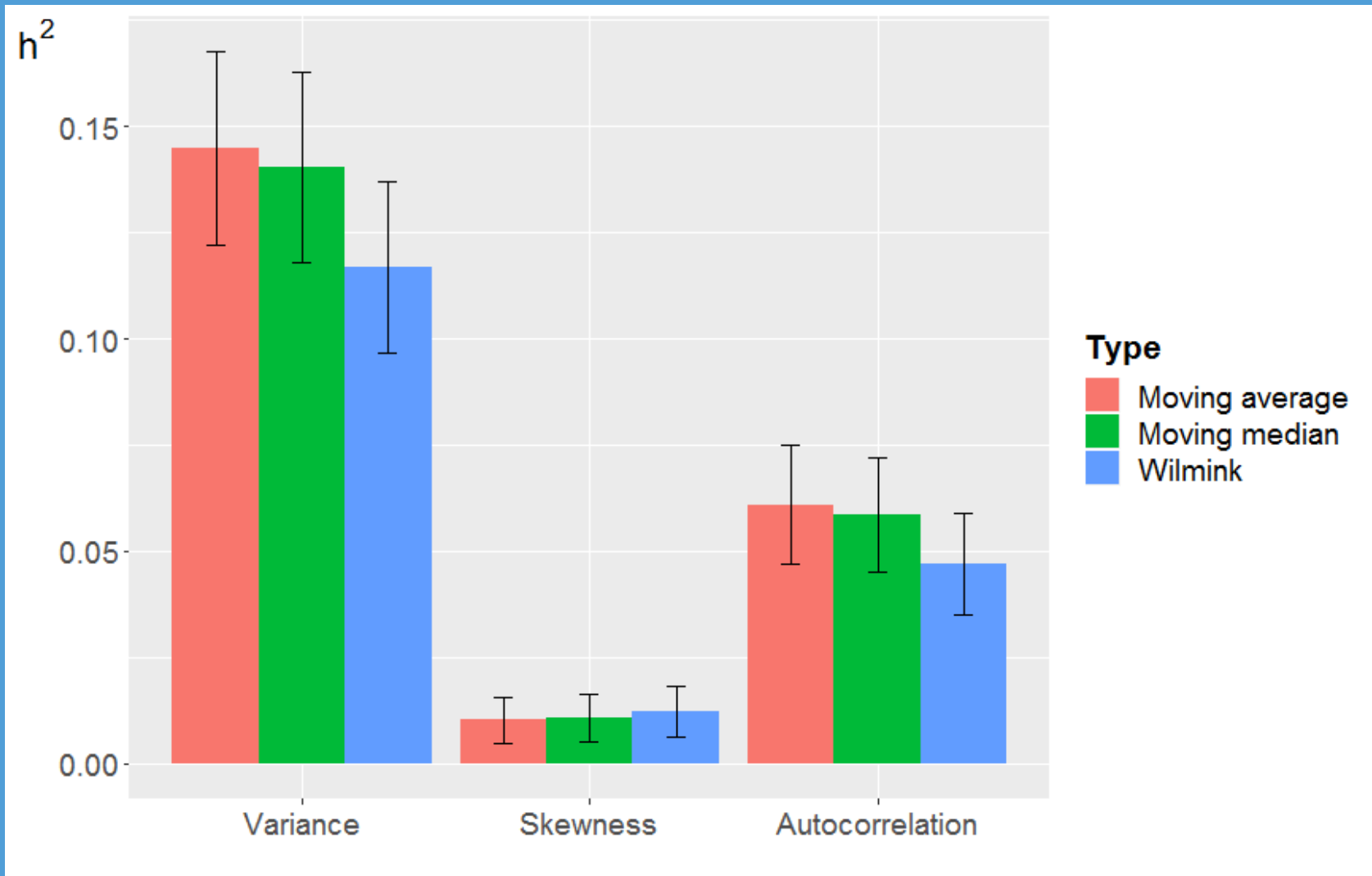
Step 4: Genetic analysis

- ASReml 4.1.0

$$\text{trait}_{ijk} = \mu + HYS_i + \text{calving age}_j + \text{animal}_k + e_k$$

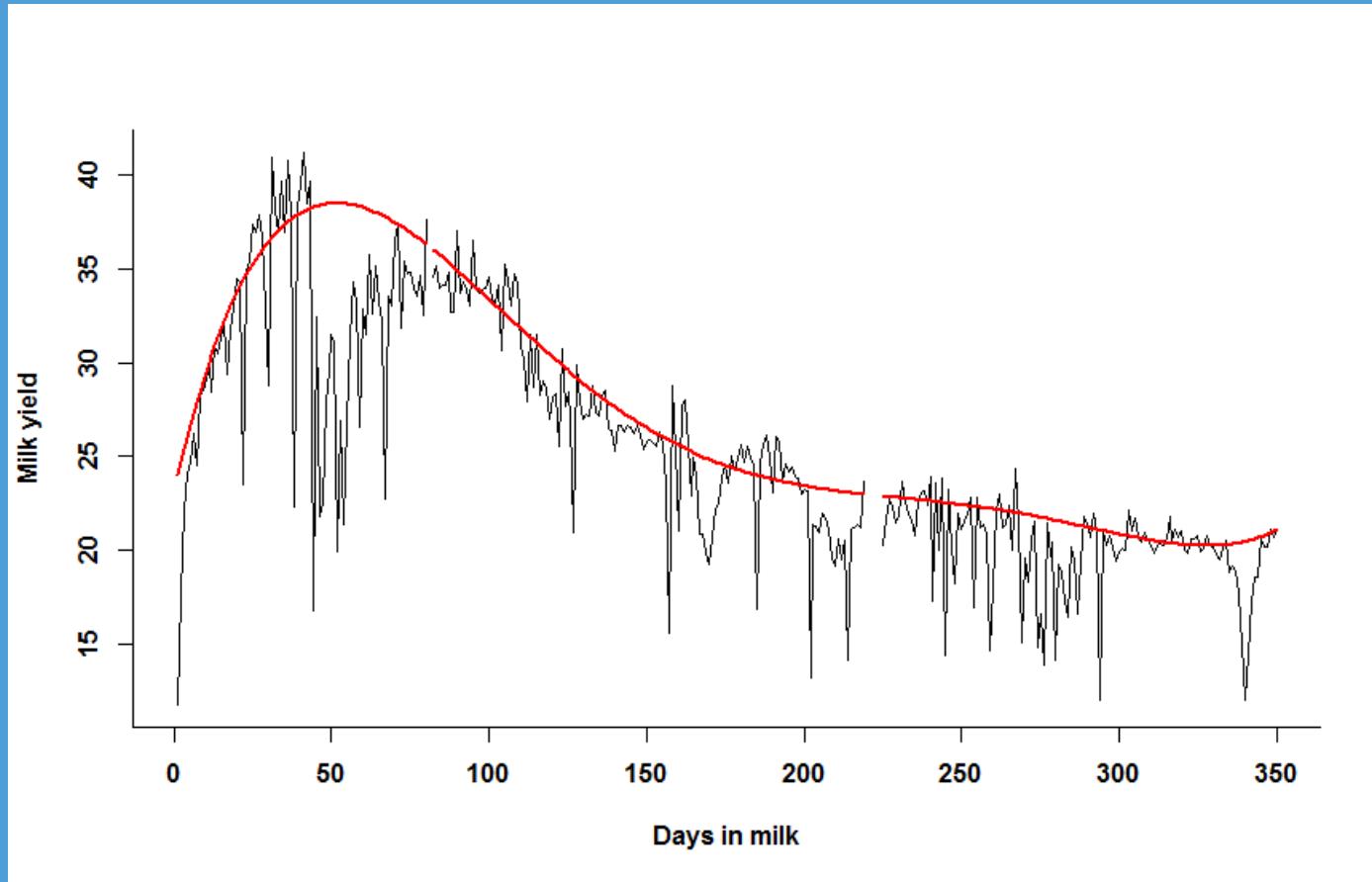


Results



How to continue

- Lactation curve fitting



How to continue



Relations to functional & production traits



Take home message



- Developed resilience indicators
 - Fluctuations in milk yield
 - Heritable

- Correlations to functional traits to be determined