



Detection and characterization of the response of growing pigs to perturbations by using feed intake

(A modelling approach)

Hieu Nguyen Ba, Masoomeh Taghipoor and Jaap van Milgen
INRA (PEGASE & MoSAR) – France



69th EAAP annual meeting
Dubrovnik, Croatia





1. Introduction

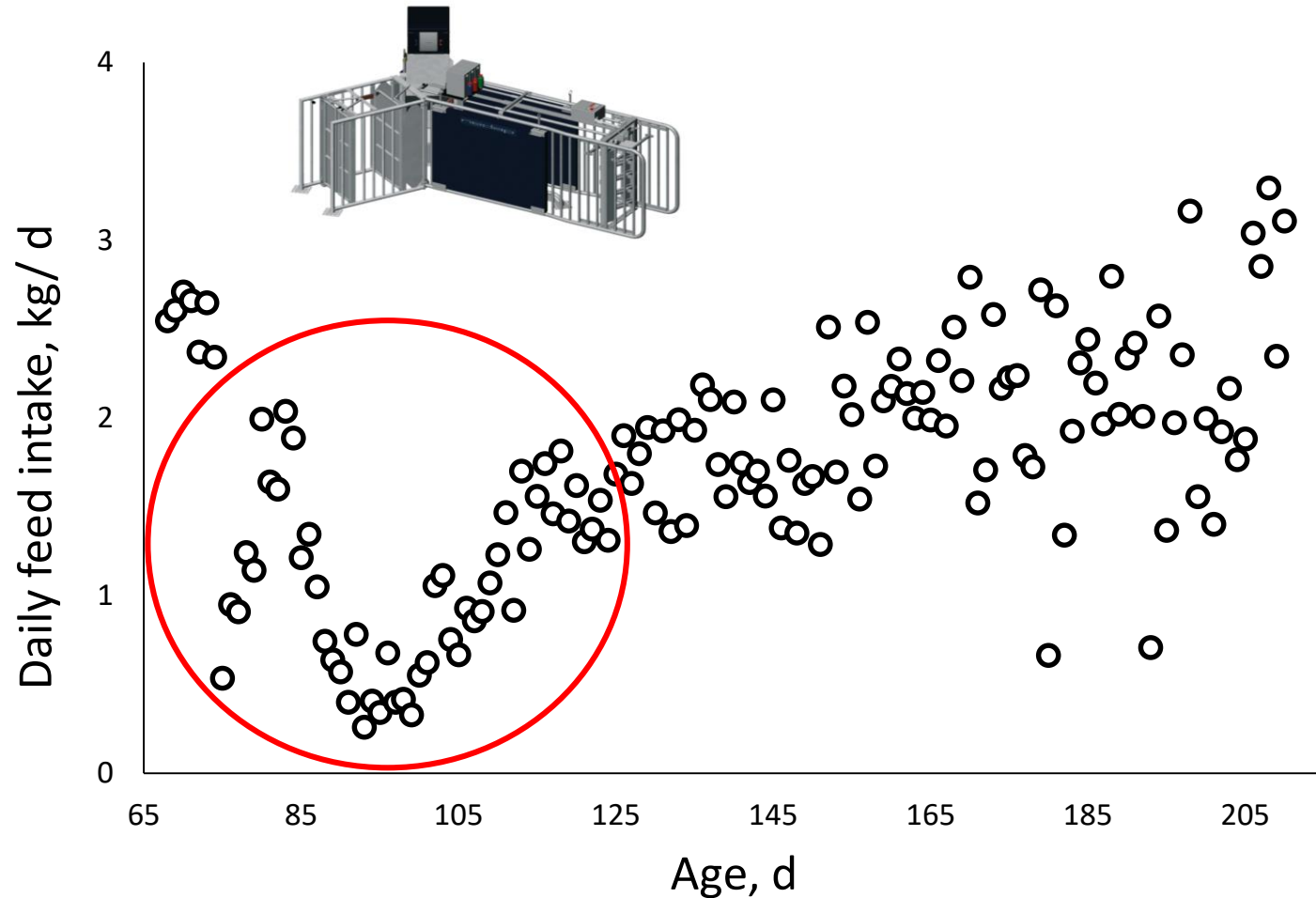


Robustness:

- Attempts were made:
 - Heat Tolerance¹
 - Disease resistance²
- Includes multiple elements^{3, 4}:
 - Response to and recover from perturbations
- Complex & difficult to quantify



Daily feed intake can be recorded automatically and frequently



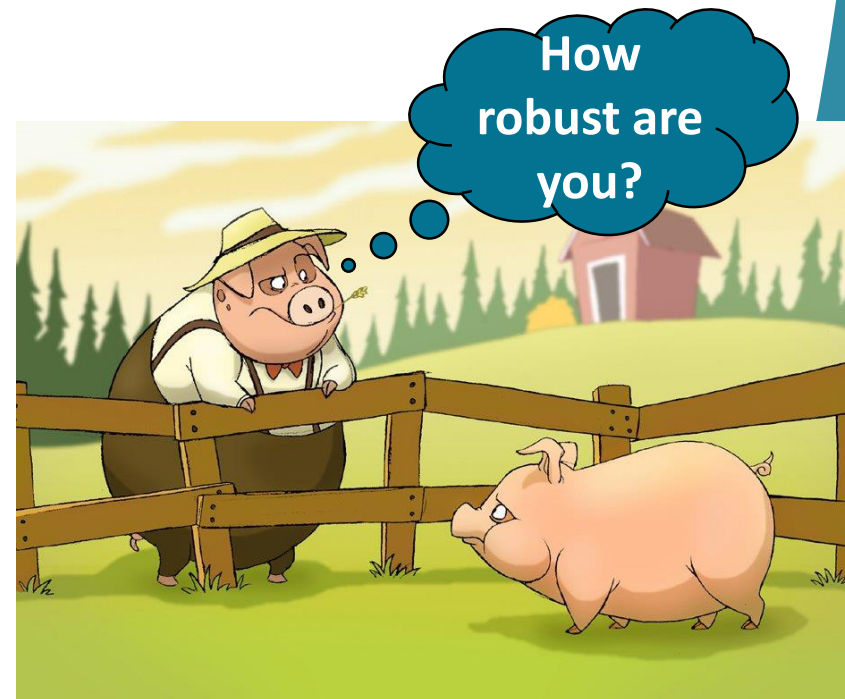


1. Introduction

► Objectives:

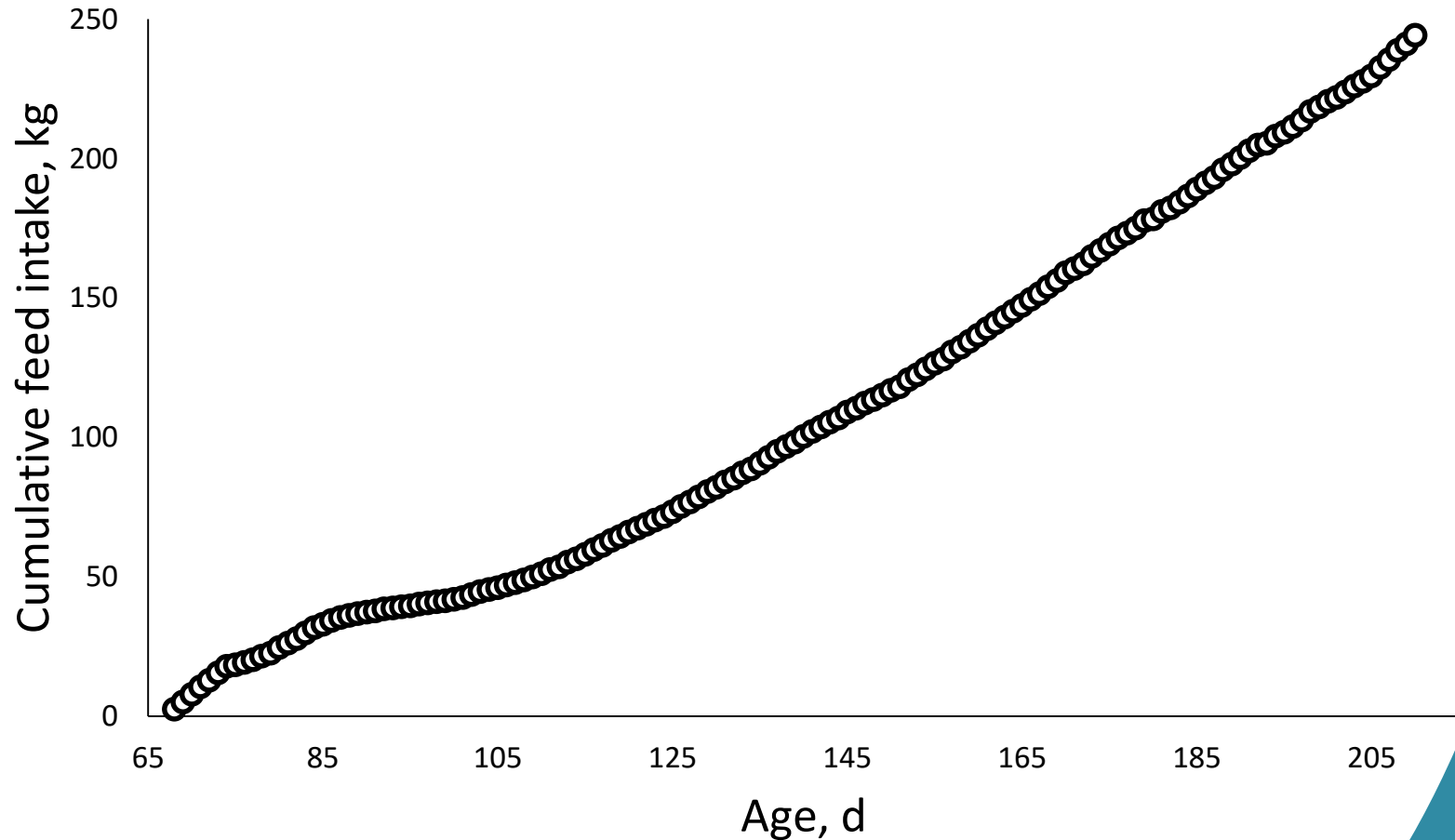
Develop a generic model to:

- Detect perturbations
- Quantify the response:
 - Resistance
 - Resilience
- Uses daily feed intake as (the only) response variable



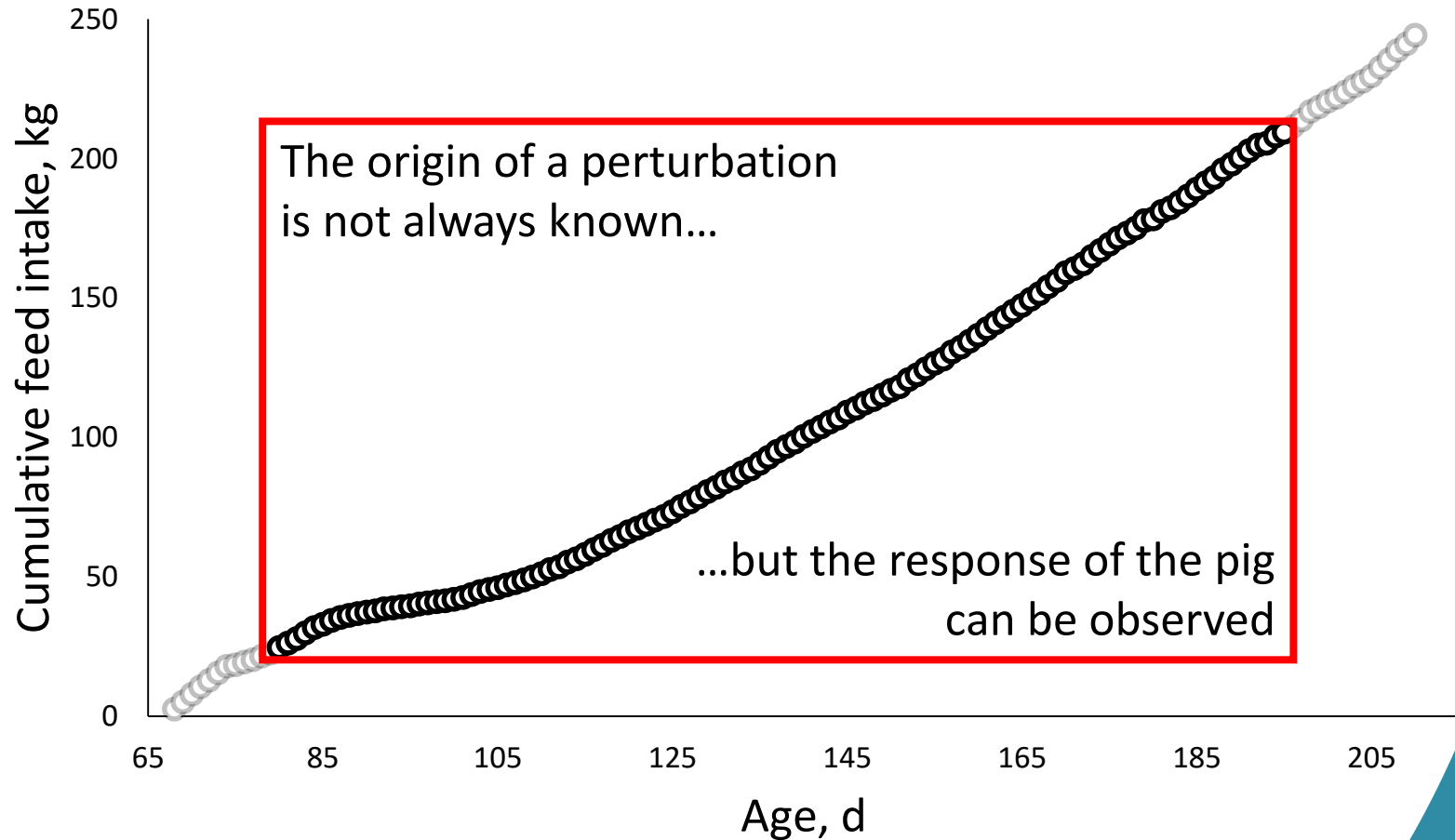


2. Detecting perturbations



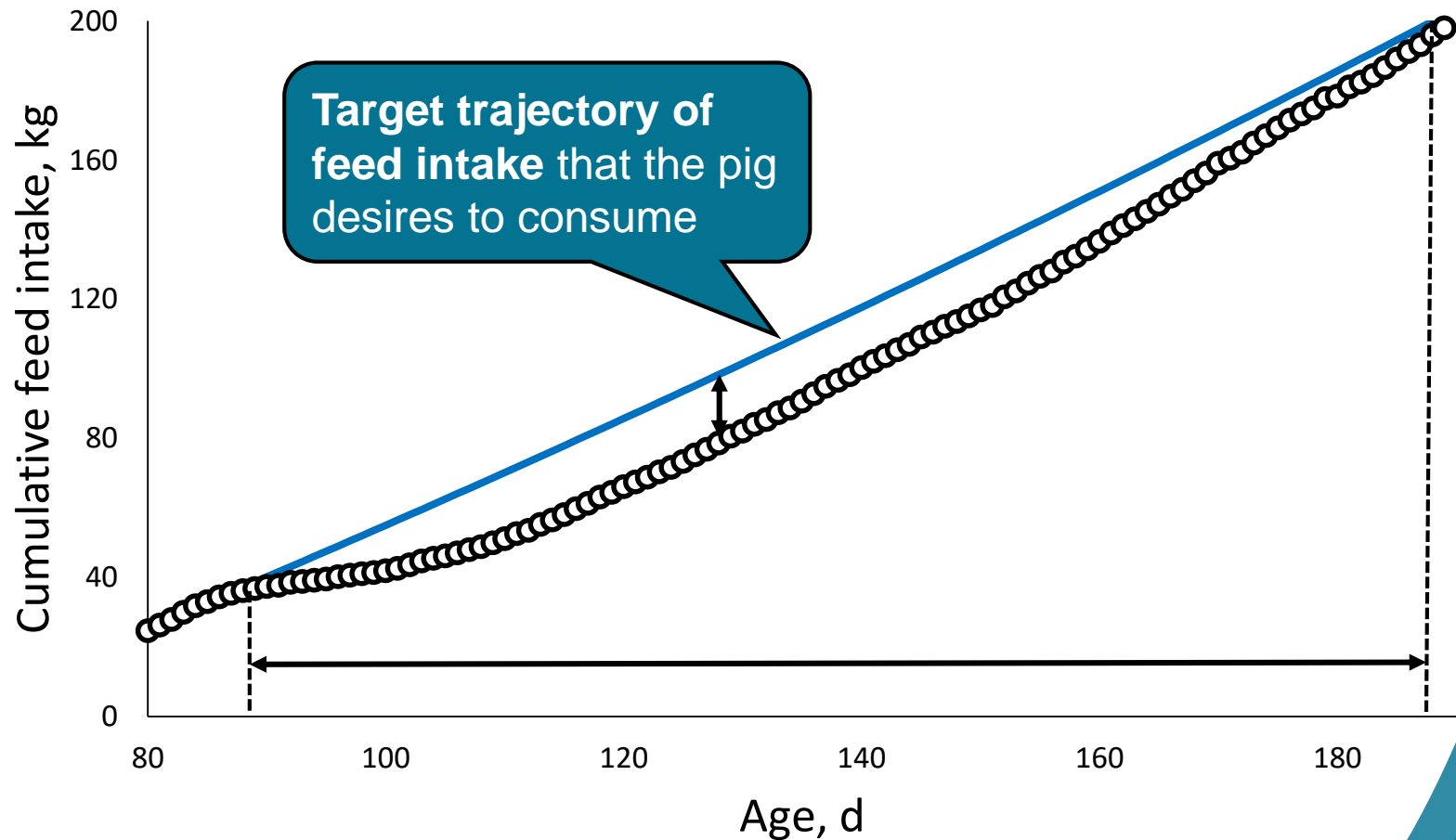


2. Detecting perturbations





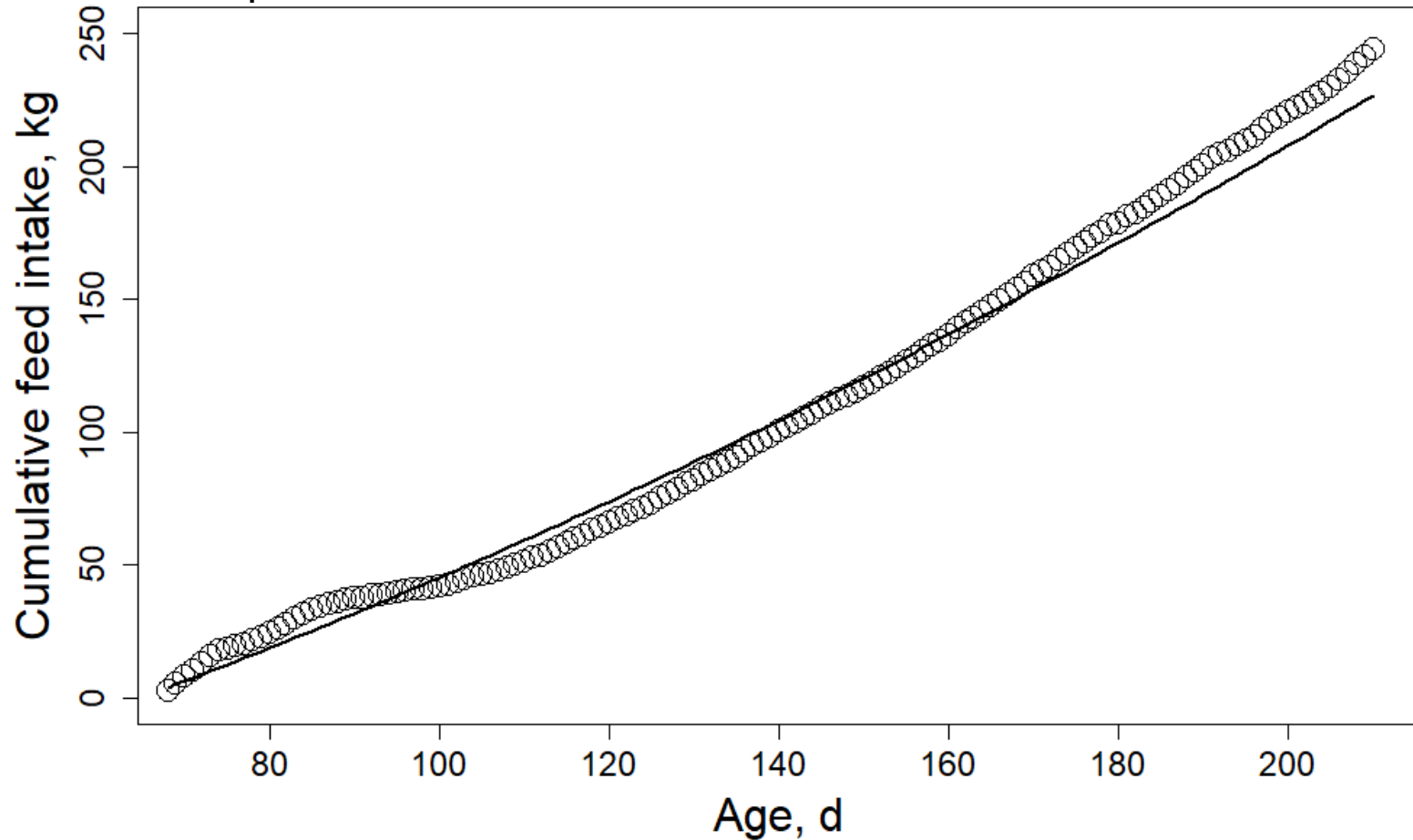
2. Detecting perturbations





2. Detecting perturbations

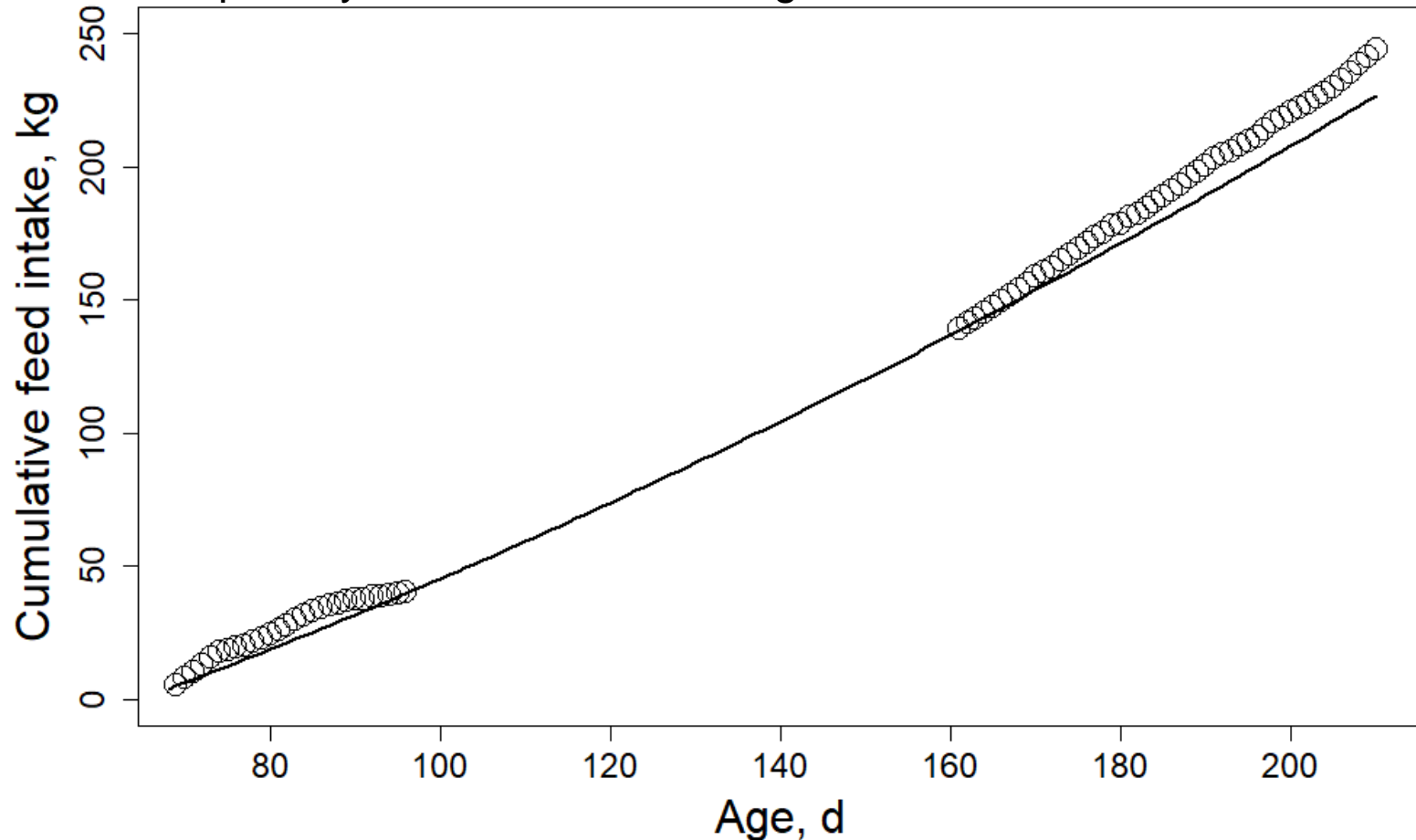
Fit a quadratic function to CFI data





2. Detecting perturbations

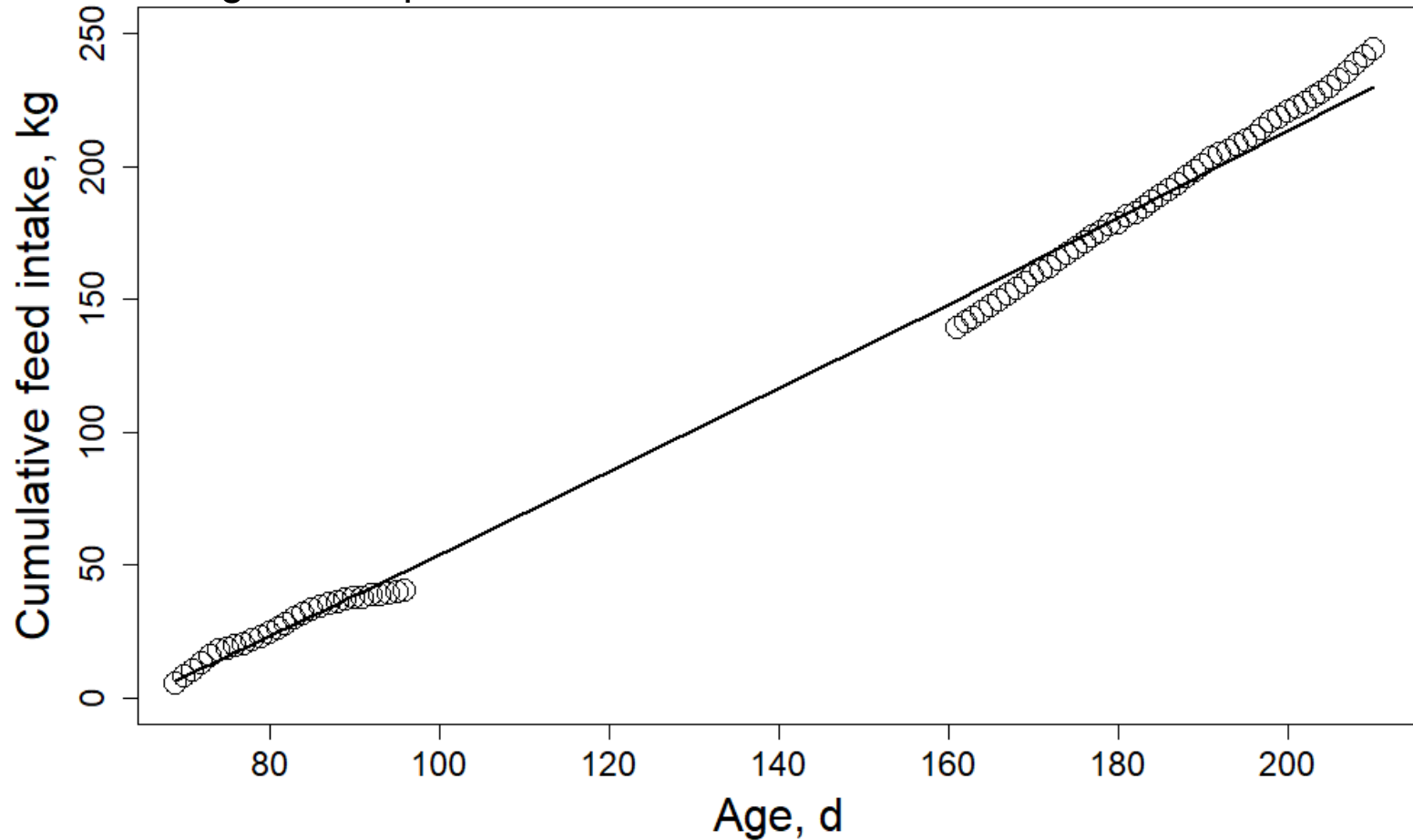
Temporarily exclude data with negative residuals





2. Detecting perturbations

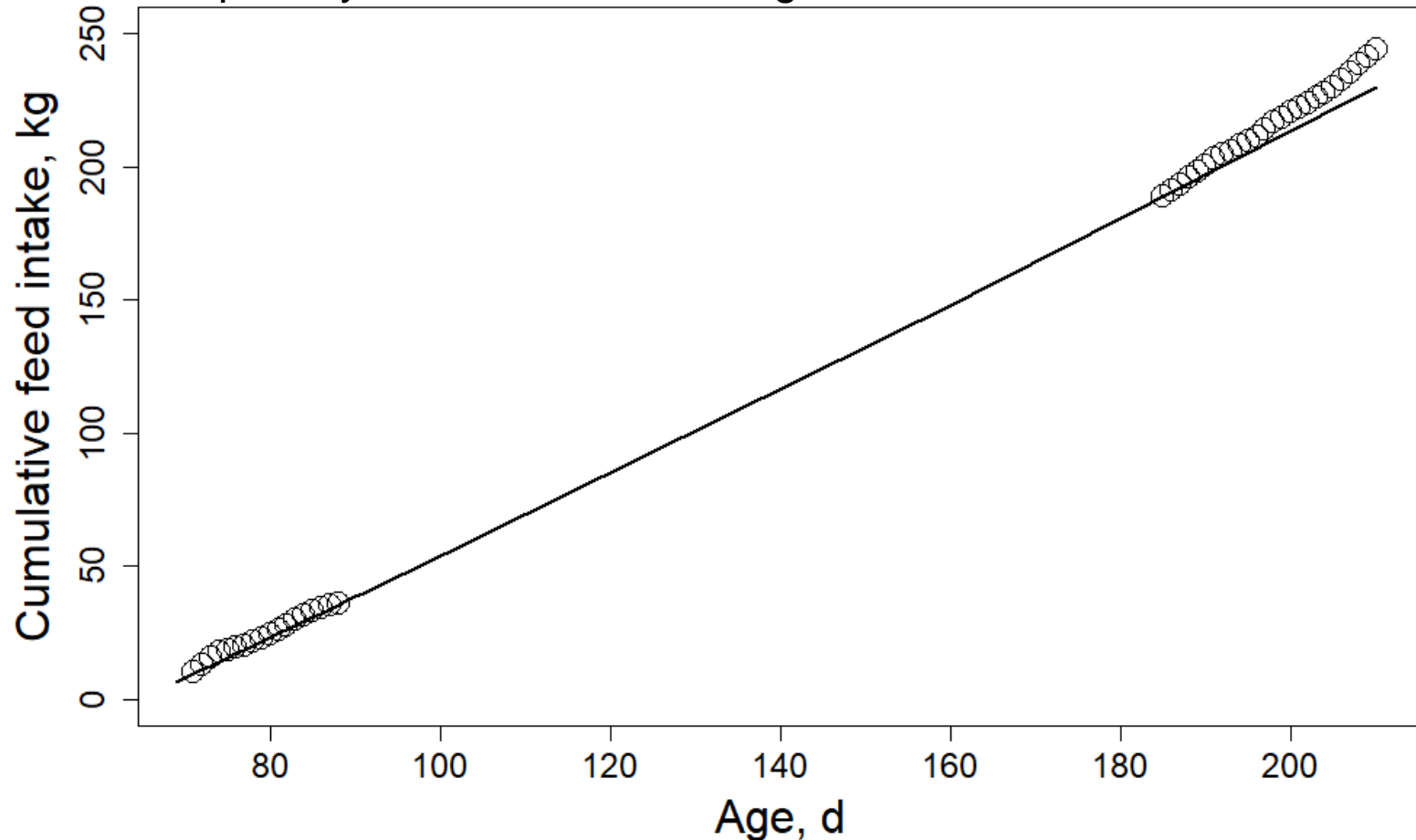
Fit again the quadratic function to new dataset





2. Detecting perturbations

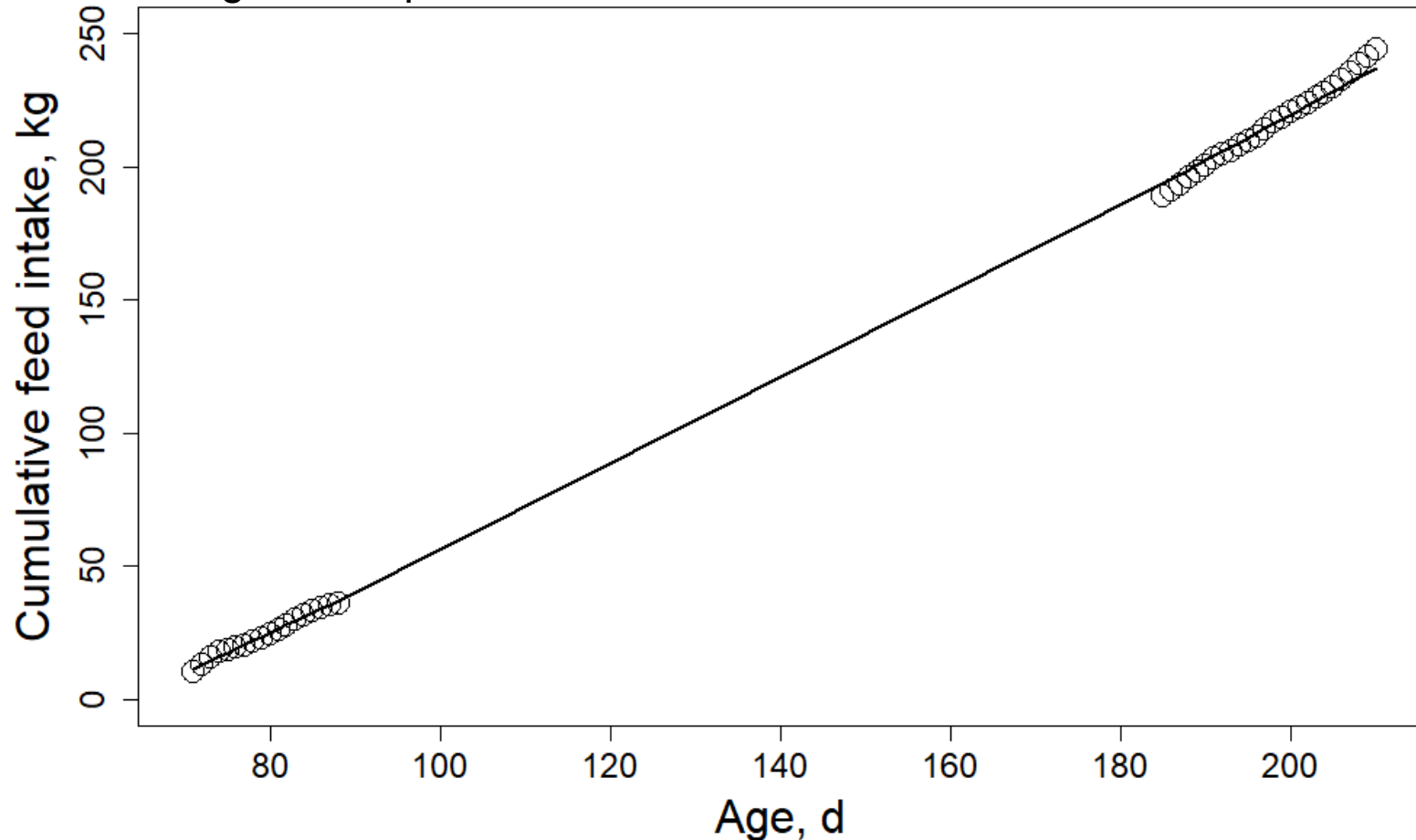
Temporarily exclude data with negative residuals





2. Detecting perturbations

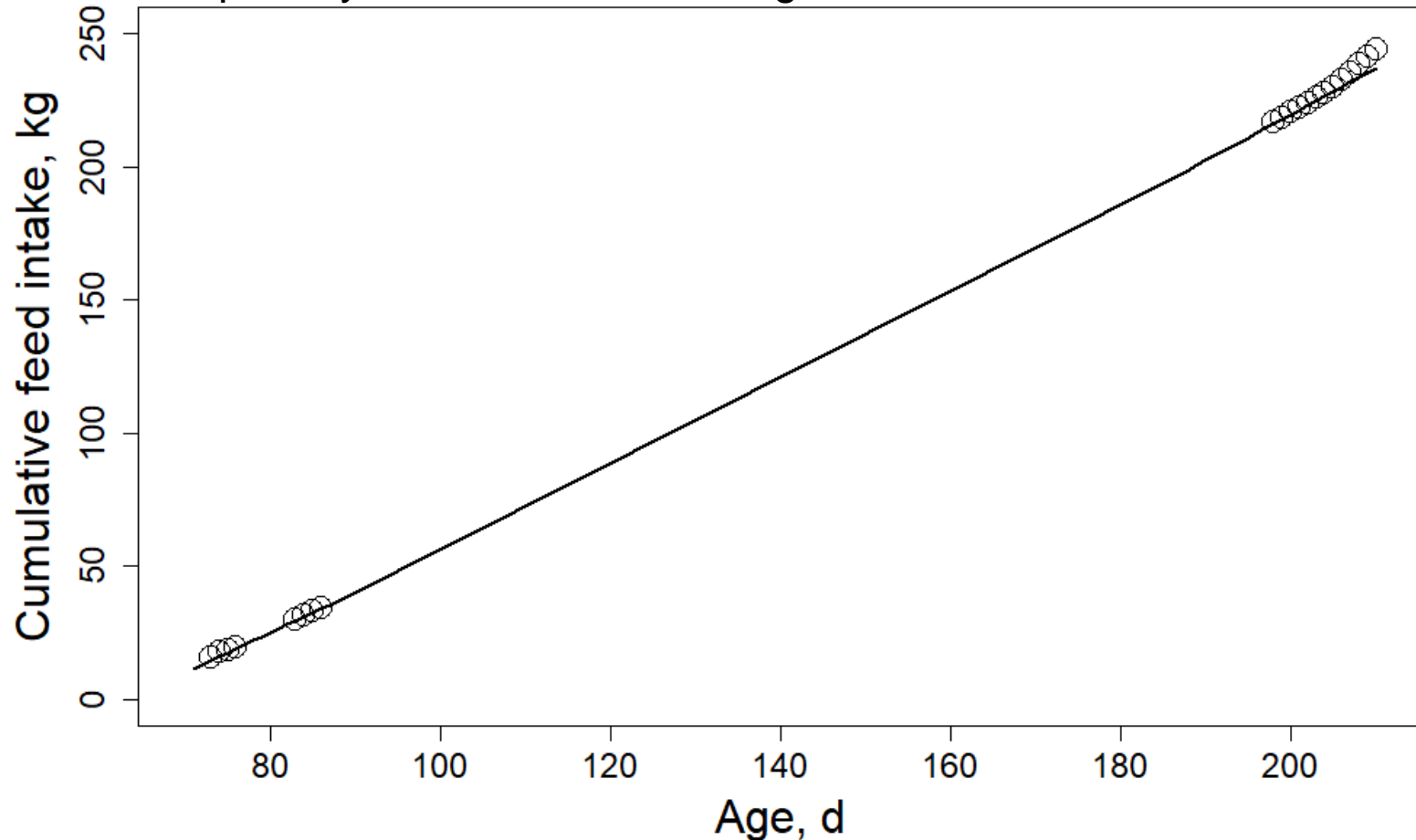
Fit again the quadratic function to new dataset





2. Detecting perturbations

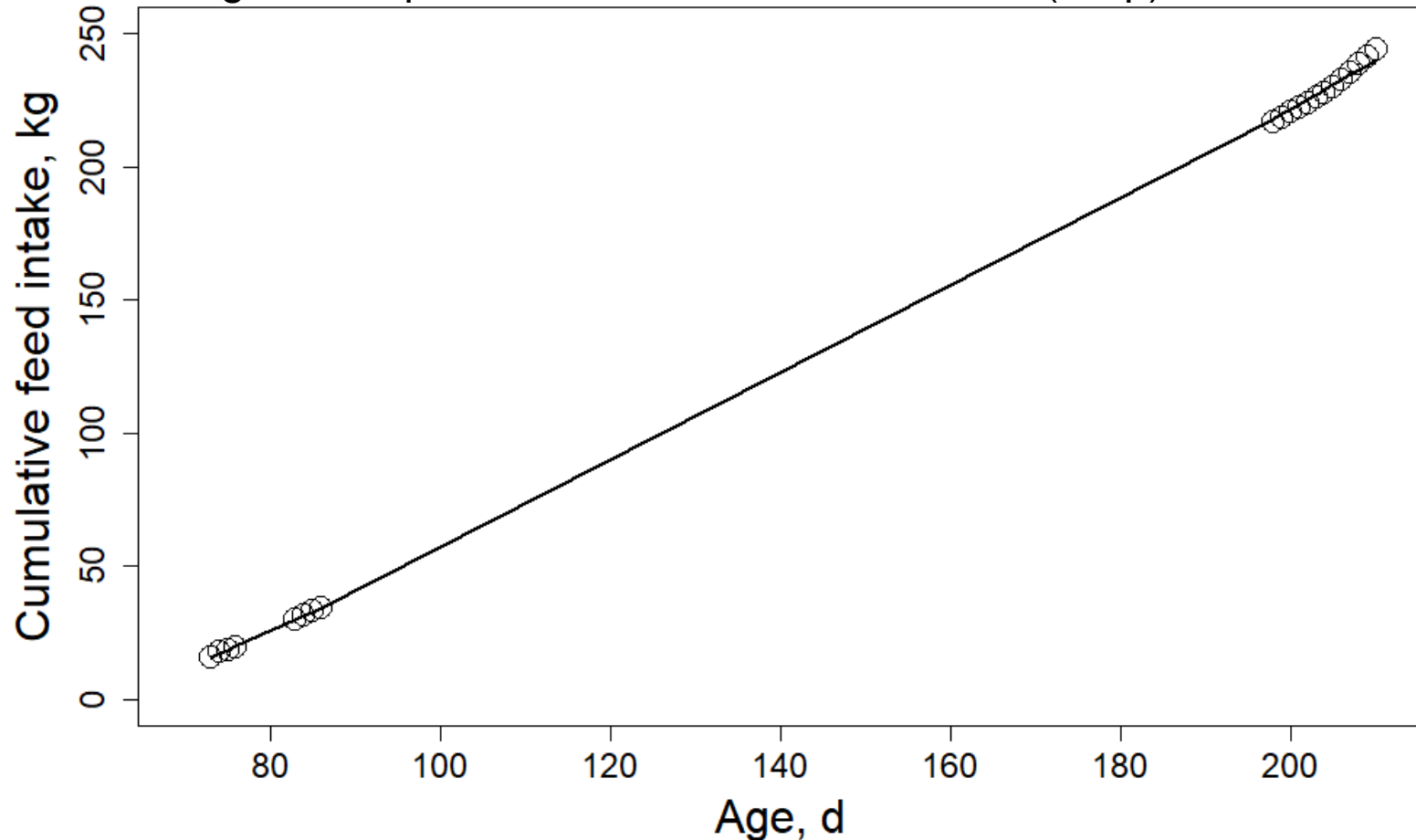
Temporarily exclude data with negative residuals





2. Detecting perturbations

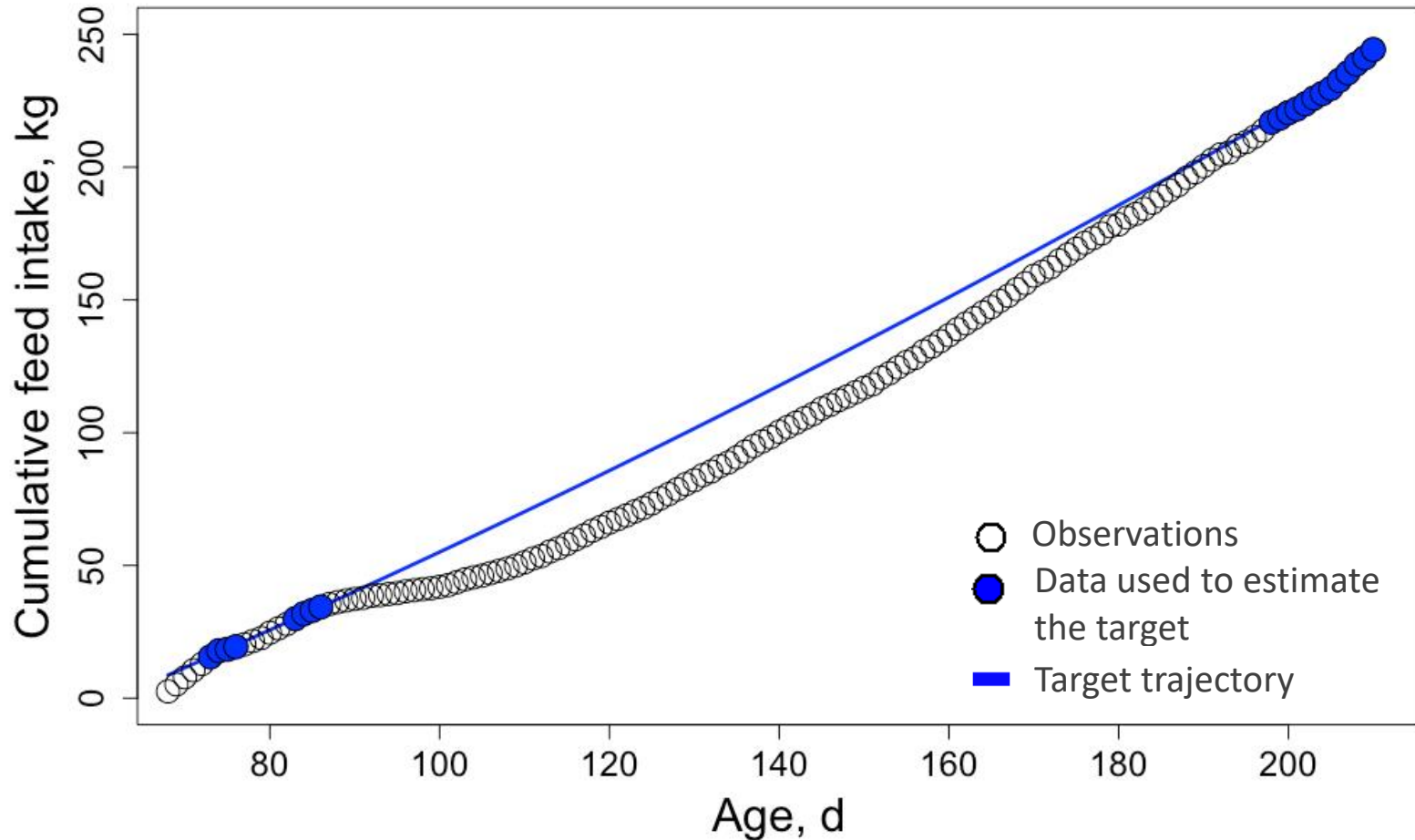
Fit again the quadratic function to new dataset (Stop)





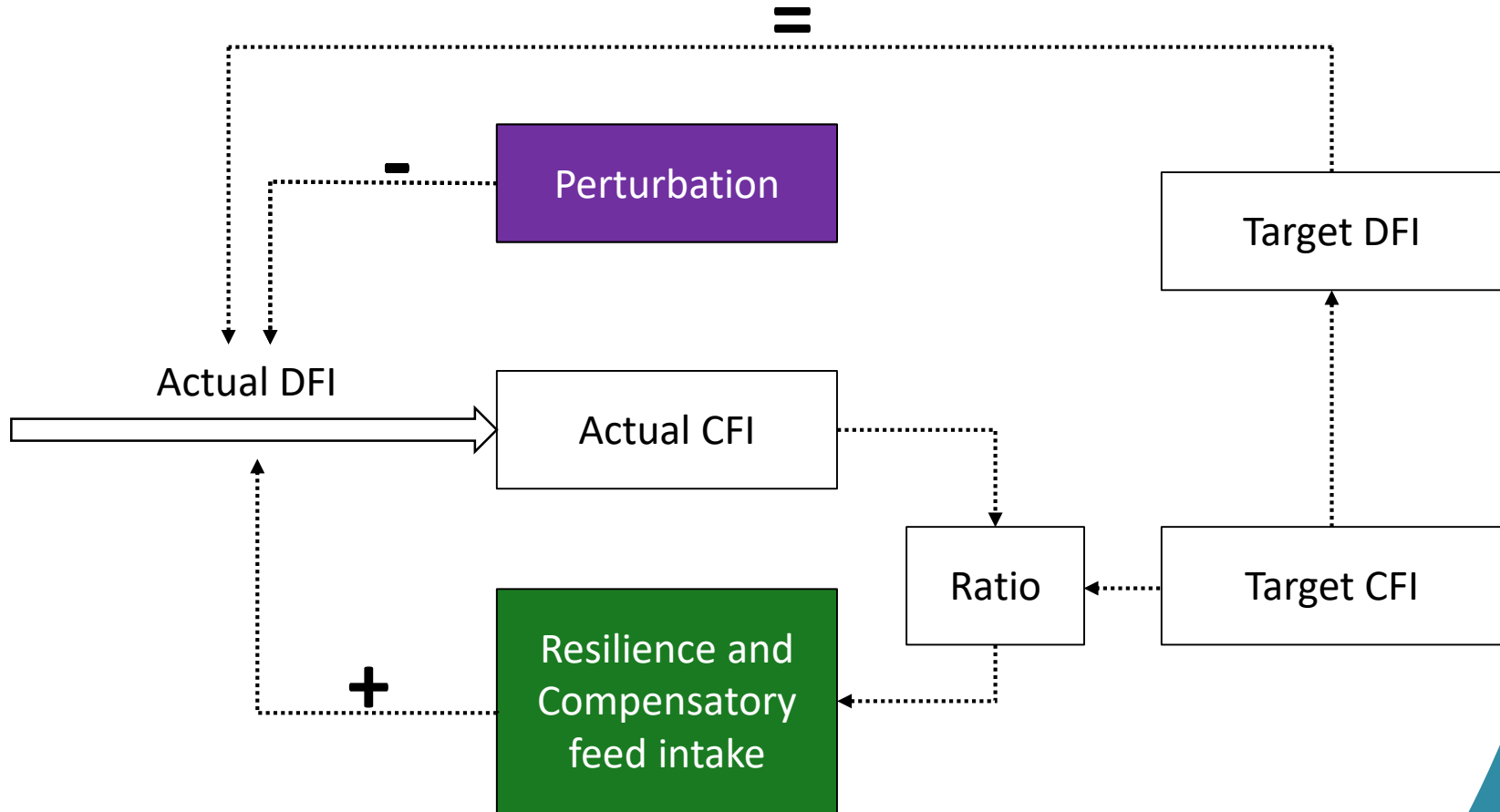
2. Detecting perturbations

Fit the chosen function to all data



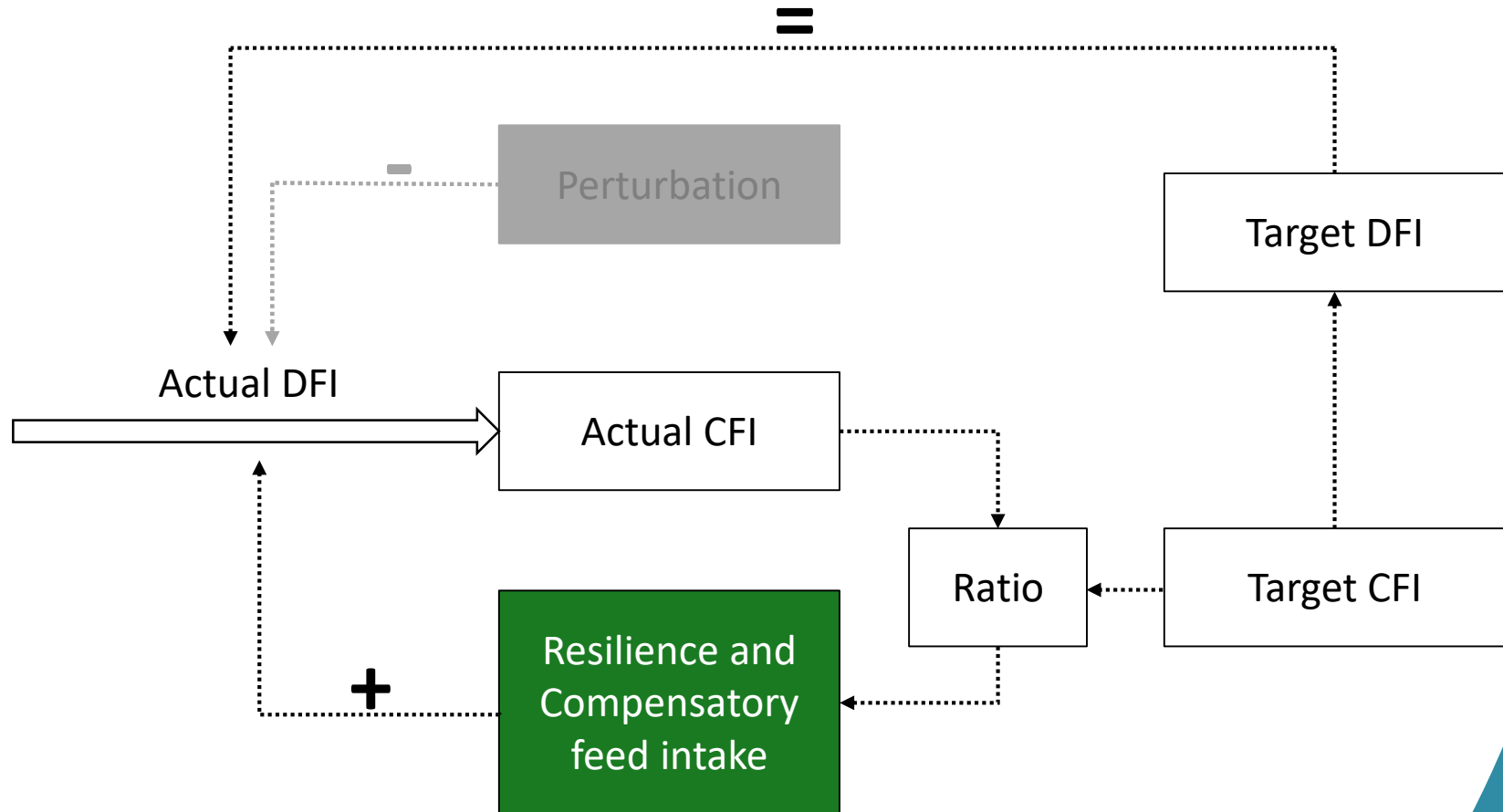


3. Modelling the response to a perturbation



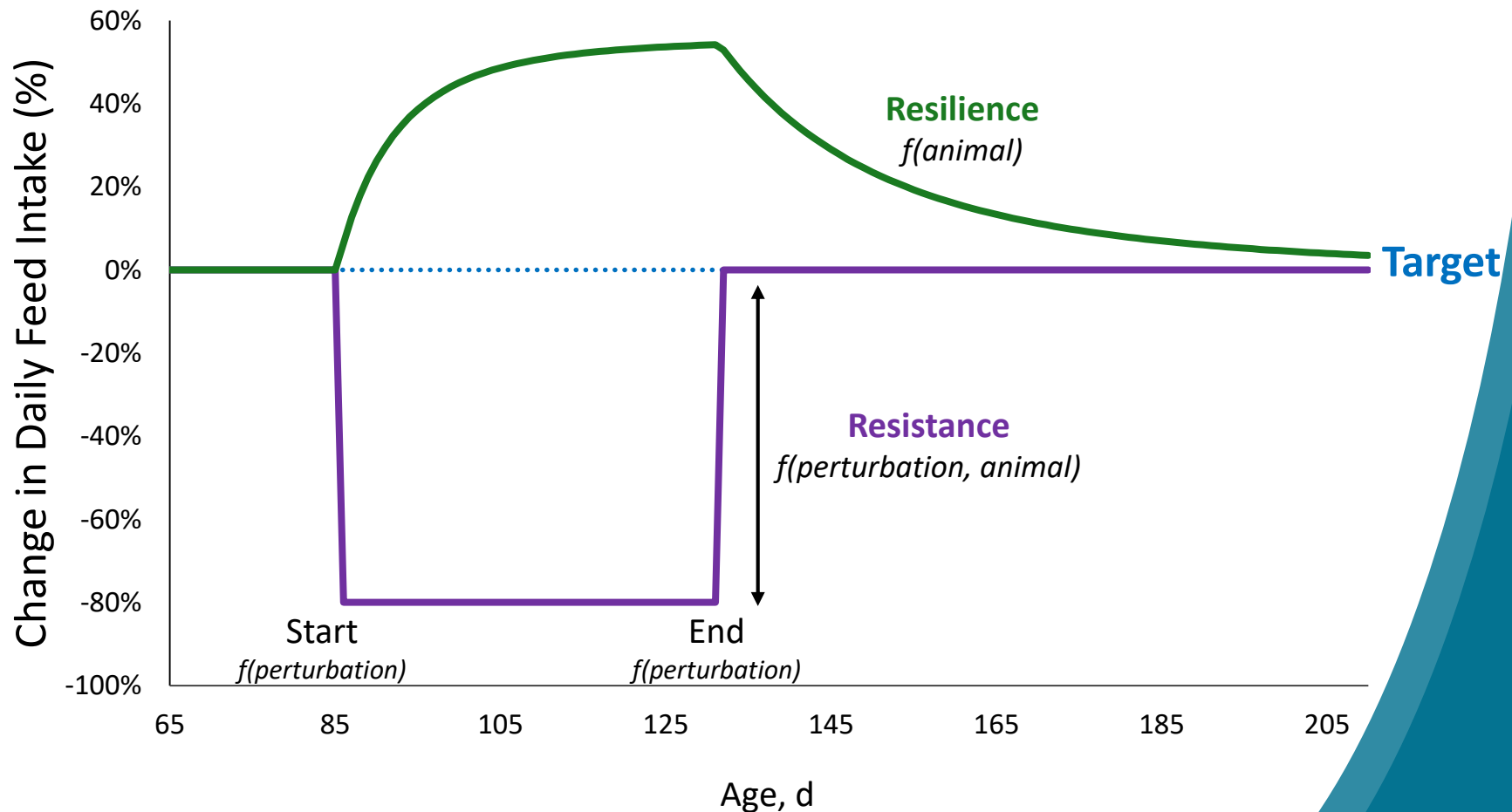


3. Modelling the response to a perturbation





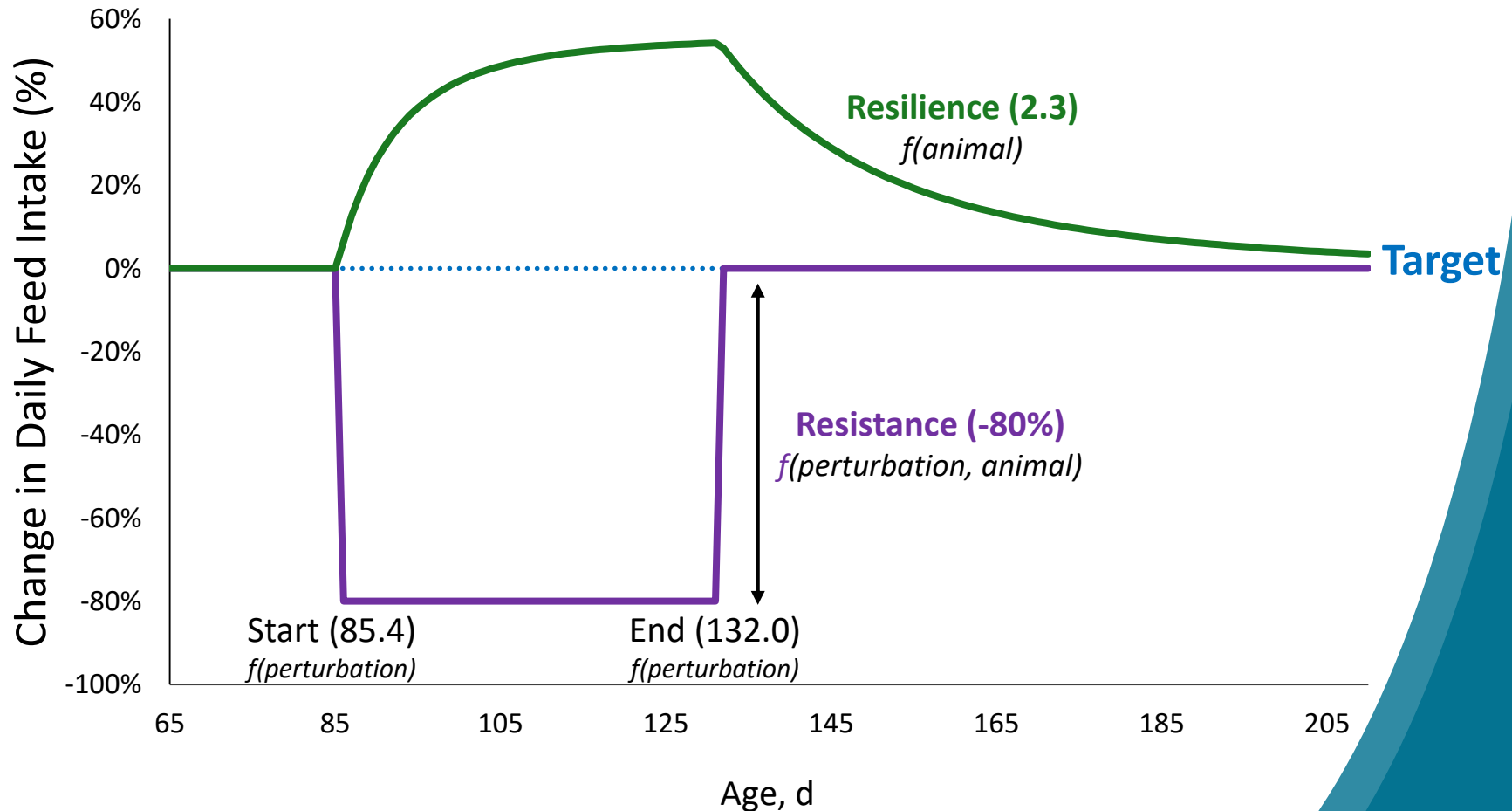
3. Modelling the response to a perturbation





3. Modelling the response to a perturbation

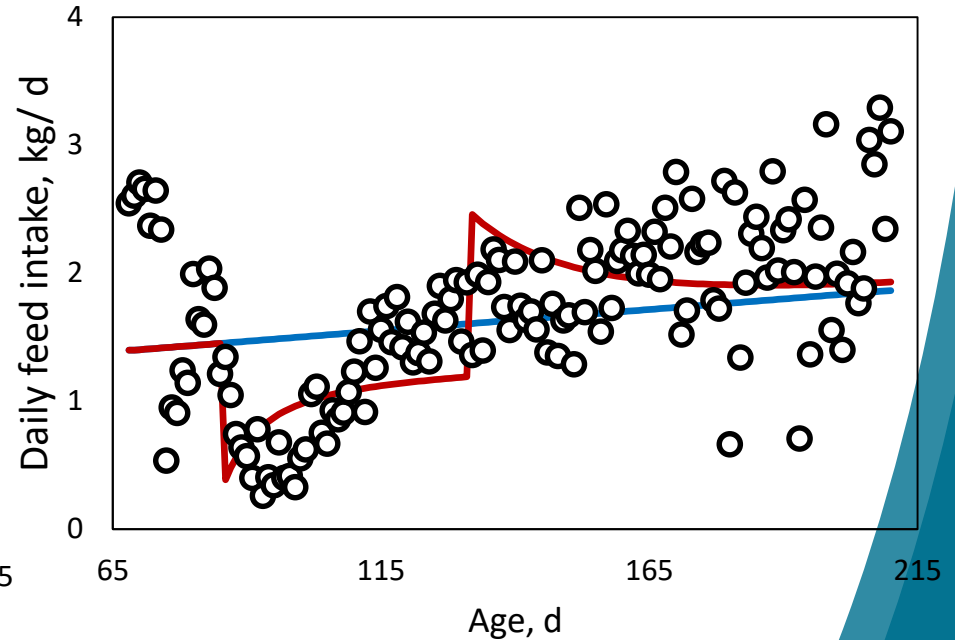
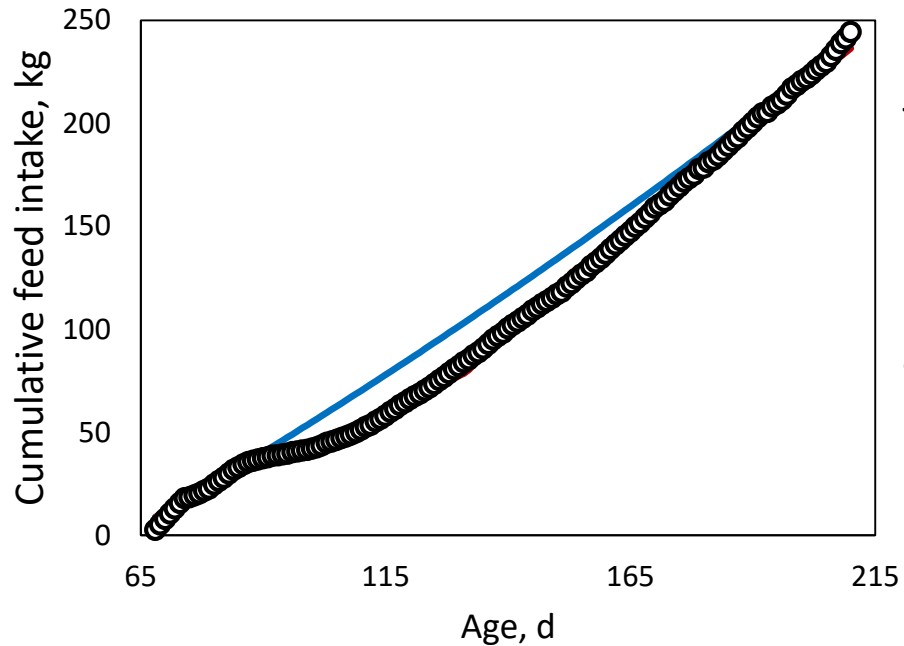
Results:





3. Modelling the response to a perturbation

Results:





4. Discussion and conclusion

► The model:

- Is able to detect perturbations from changes in feed intake
- Quantifies resistance and resilience

► The future?

- Compare the response of pigs in the same environment
- Estimate heritability of resistance and resilience



Feed-a-Gene stakeholder workshop

11 October 2018
Budapest, Hungary



Discover **FeedUtiliGene**
an innovative Decision Support System
for monogastric livestock production

THANK YOU FOR YOUR ATTENTION

hieu.nguyen-ba@inra.fr