What efficiency and resilience gains have we actually achieved in the past century or decade?

Jan Lassen[1] and Yvette de Haas[2]

1) Viking Genetics

2) Wageningen University and Research

Short answer: almost nothing…

Trait definitions

- Not well defined
- Complex biology
- Longitudinal traits
- Strong GxE
- Limited data

Resilience

Recover from something bad

Bounce back

Bend dont break

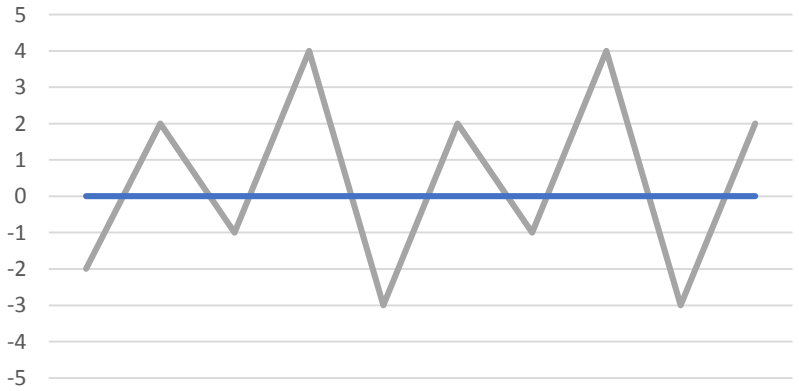
A mean management level

A general low management level

A sudden change in management level

A high variation in management

?

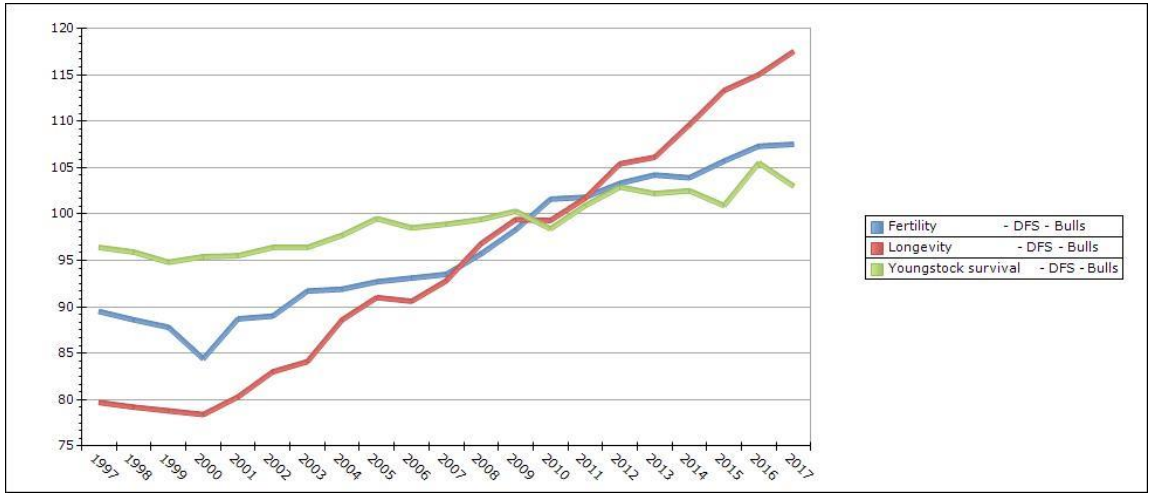


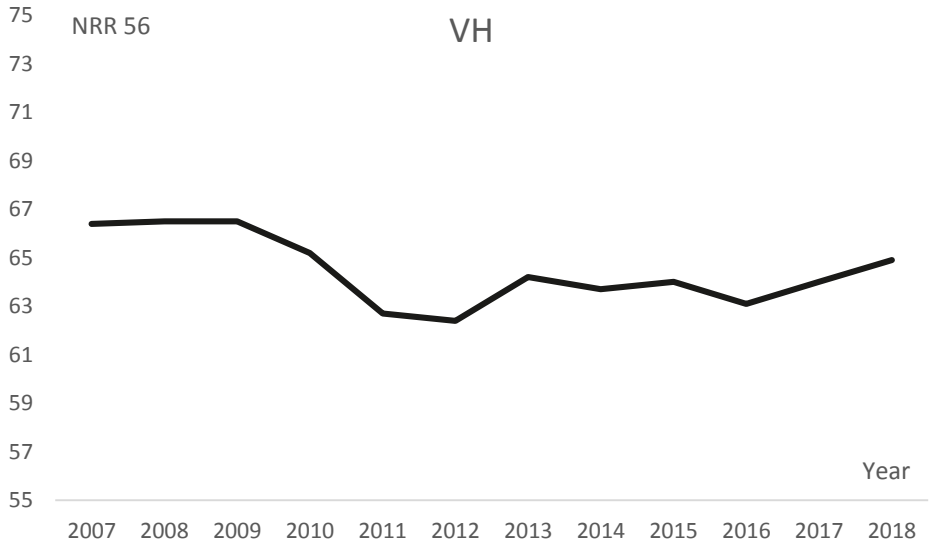
How can we quantify resilience?

- Longevity
- Reproduction
- Health

”Residual Longevity”

Genetic trends





Sum up

- No evidence of improvement of resilience
- Genetic improvement of longevity and reproduction
- Trait definition, model work and data collection is needed
- Will be initiated in GenTORE

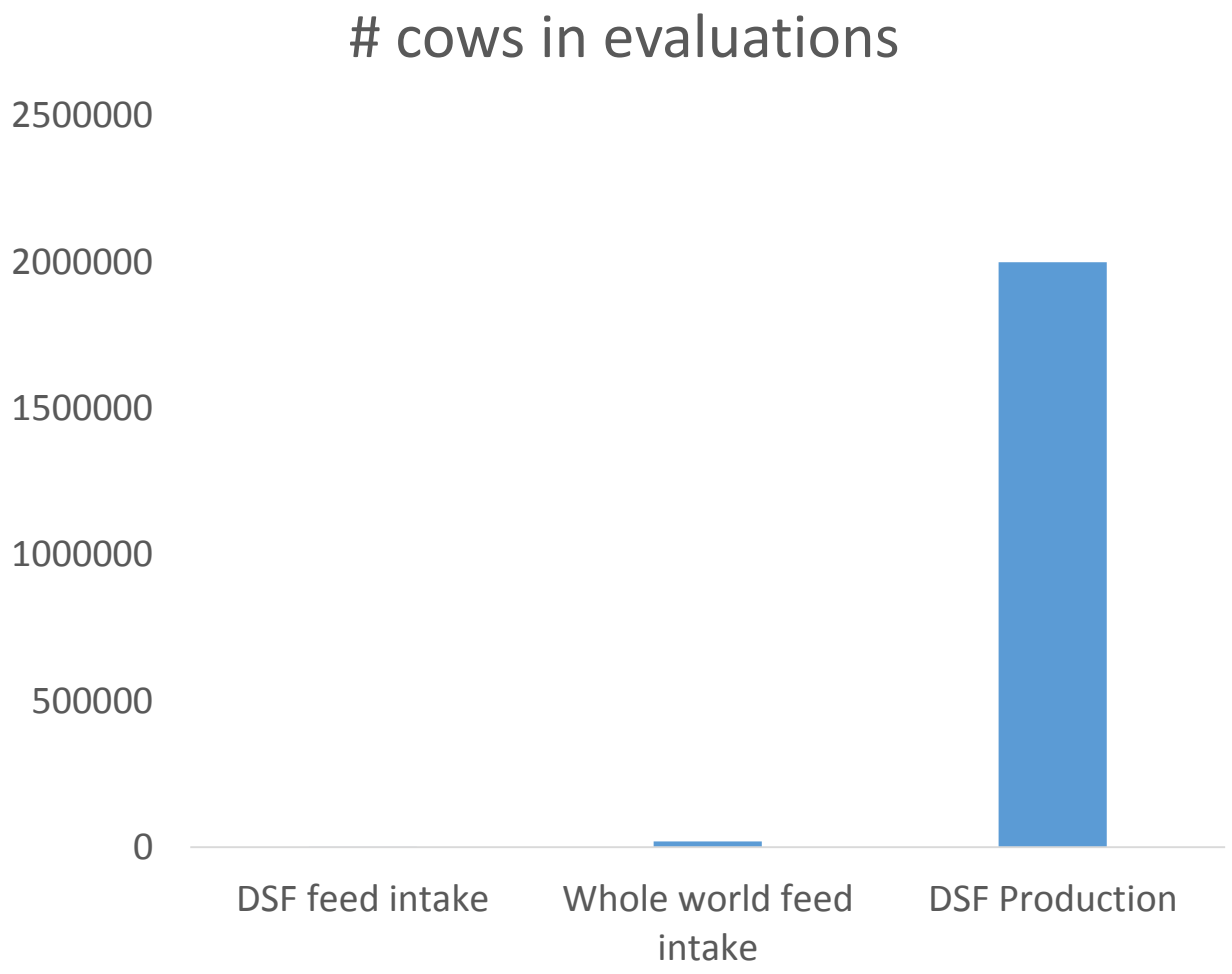
Efficiency

Current status

- VERY limited data all over the world
- Almost all Holstein
- Very complex biology
- Huge interest

The genomics revolution

”With genomic selection we will be able to select for scarsely measured traits such as efficiency.”



RFI models

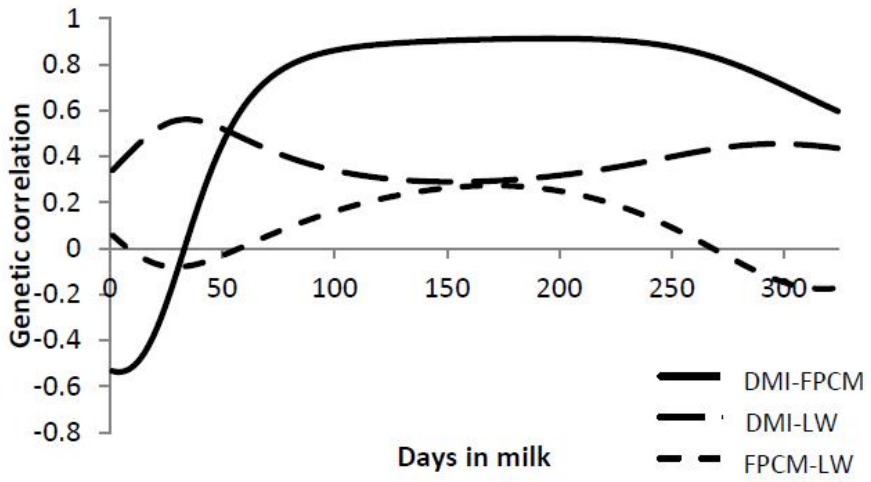
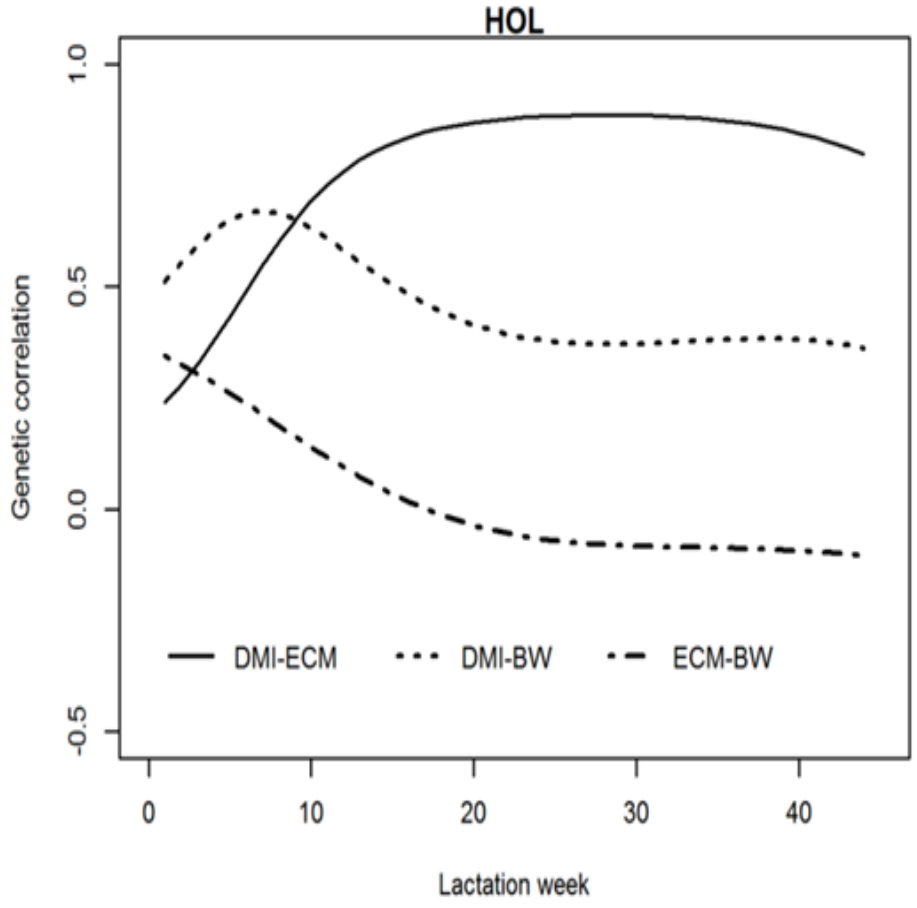


Figure 2.6 Pairwise genetic correlations when two traits are measured on the same day from 1 to 324 days in milk (DIM) between 1. dry matter intake and fat and protein corrected milk (DMI-FPCM, SE of median=0.06, of 3rd quartile=0.09), 2. dry matter intake and live weight (DMI-LW, SE of median=0.11, of 3rd quartile=0.10), and 3. fat and protein corrected milk and live weight (FPCM-LW, SE of median=0.12, of 3rd quartile=0.13).

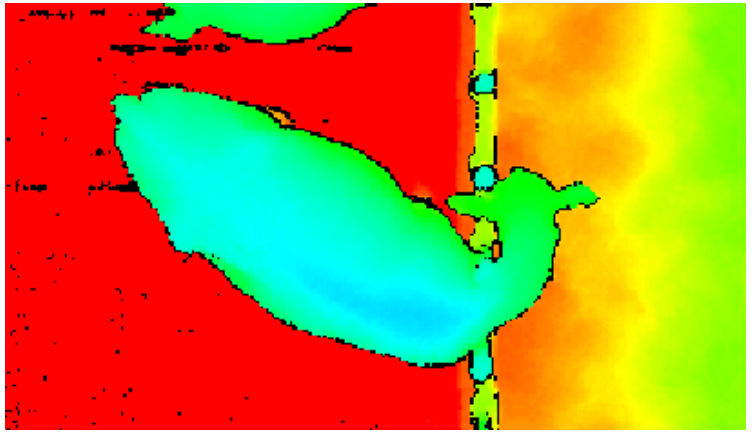
Manzanilla Pech et al., 2016 JDS



Li et al., 2018 JDS

Efficiency

- More data is needed
- Not sure indicators will help
- Biology is hardly adequately described
- How to quantify progress
- Direct measures



Breeding goal

- Total merit is main priority
- No selection for single traits
- Economic value, well defined trait and accuracy is needed

Inbreeding and crossbreeding

- Inbreeding will neither improve resilience nor efficiency
- Crossbreeding will lead to more robust animals

Take home message

- GenTORE will initiate work related to resilience and efficiency
- Not well defined traits
- Doubtfull that any progress has been achieved for the two traits