Session 25

Robustness – selection for optimum traits

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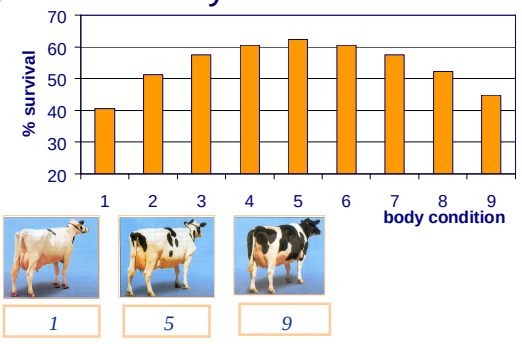
The cow of the future

- Cow could have more body weight
- More functional and less problems
  - frame - more attention for rump angle
  - **type - body condition more important angularity less important**
  - udder and F&L - same weight in final score

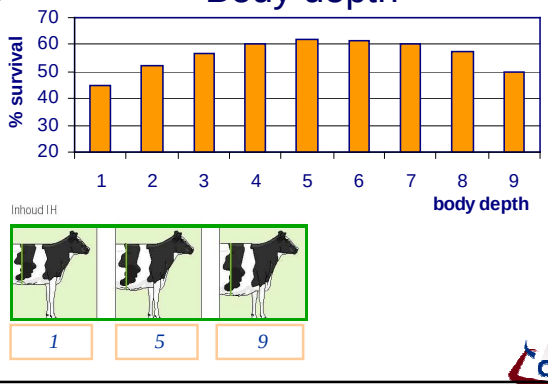
What is robustness ?

- Cow
  - Produces milk without problems
  - Stays long in the herd
  - Scores above average for BCS, body depth, chest width and rump width
    - in relation with survival (starting 3rd lactation)

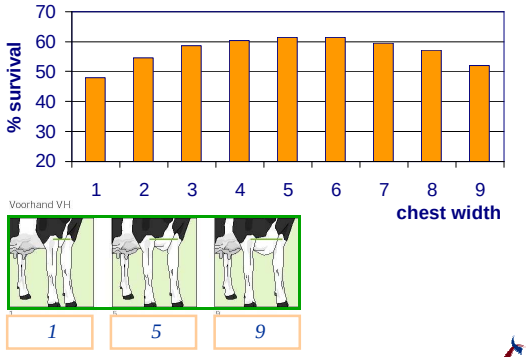
Body condition score



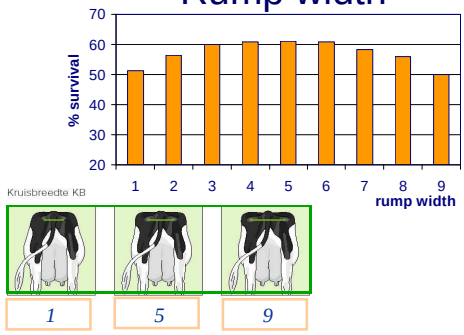
Body depth



Chest width



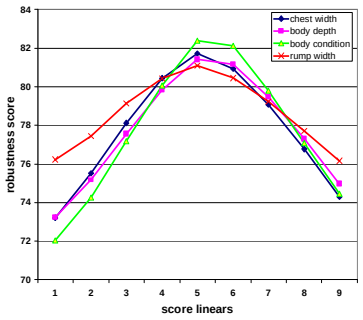
Rump width



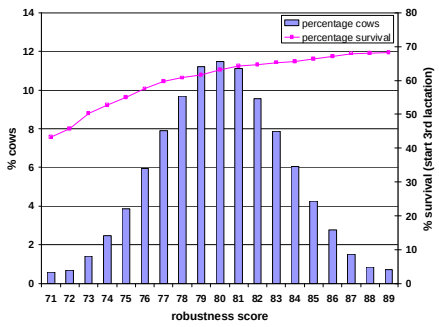
Scoring Robustness in practice

- Scoring linear traits
- Handheld of classifier contains module with formula to calculate Robustness
  - guideline for his score
  - score 71-89 points

Relations linears and score robustness



Robustness score and survival



Aim of this study

- Is robustness heritable?
- What is the genetic relation of robustness with the underlying traits?

Genetic analysis

- Robustness scores from classifiers (May 2007 - January 2008)
- 92,113 scores
  - at least 75% HF
  - Black and White & Red and White
- Animal model (PEST/VCE)
  - date x herd
  - age at classification
  - lactation stage
  - additive genetic effect
- 272,575 animals in pedigree

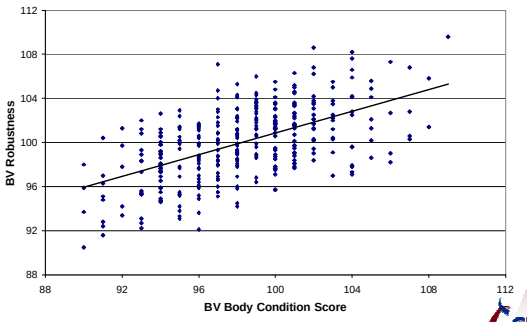
Genetic analysis

- Single trait analysis
  - heritability
  - check of data
- Bivariate analysis
  - genetic correlations
- Breeding value estimation
  - robustness
  - standardized to relative scale
    - mean 100 and SD 4

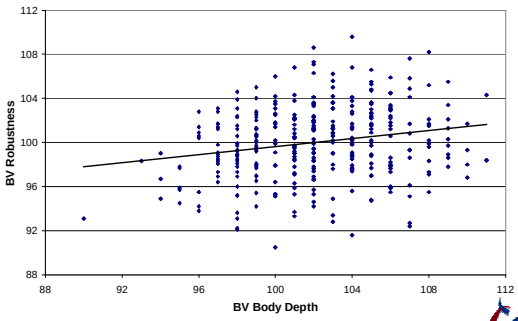
Results - genetic correlations

	h^2	r_g
Robustness	0.11	
Chest width	0.27	0.72
Body depth	0.31	0.41
Body condition score	0.35	0.70
Rump width	0.39	0.16

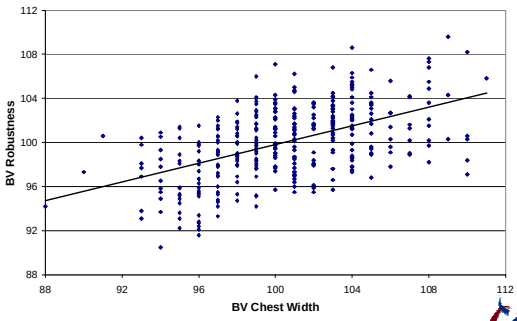
Results - Body condition score



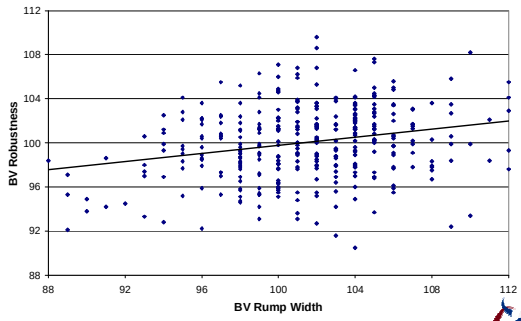
Results - Body depth



Results - Chest width



Results - Rump width



Conclusions

- Robustness is heritable (0.11)
- Phenotypic - optimum trait
- Genetic relation with underlying traits is linear
  - Underlying traits are linear on BV-scale
- Breeding for Robustness leads to cows with
  - more body condition
  - wider chests
  - more body depth
  - wider rumps