Data collection and data use. The foundation for genetic progress

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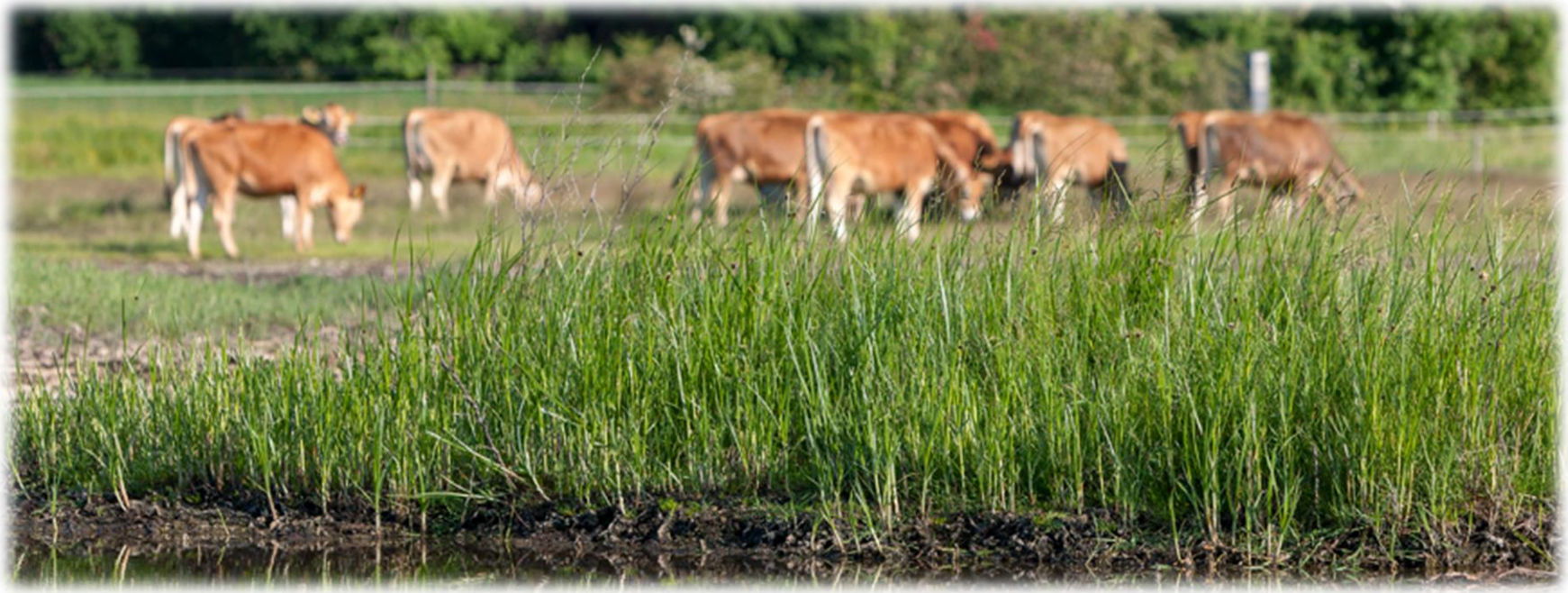
Agenda

- Danish Cattle database
- Traits in genetic evaluation – today and tomorrow
- Nordic Total Merit – the most economic cow



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Huge amounts of high quality data is essential to Danish Cattle production

- Long history of collecting data on central databases
- Used for management and breeding
  - Value of common storing (management tools, genetic evaluation, data security, benchmark etc.)
  - Can’t manage, what you can’t measure
- Large amounts of high-quality data

Nordic farmers are excellent in phenotyping

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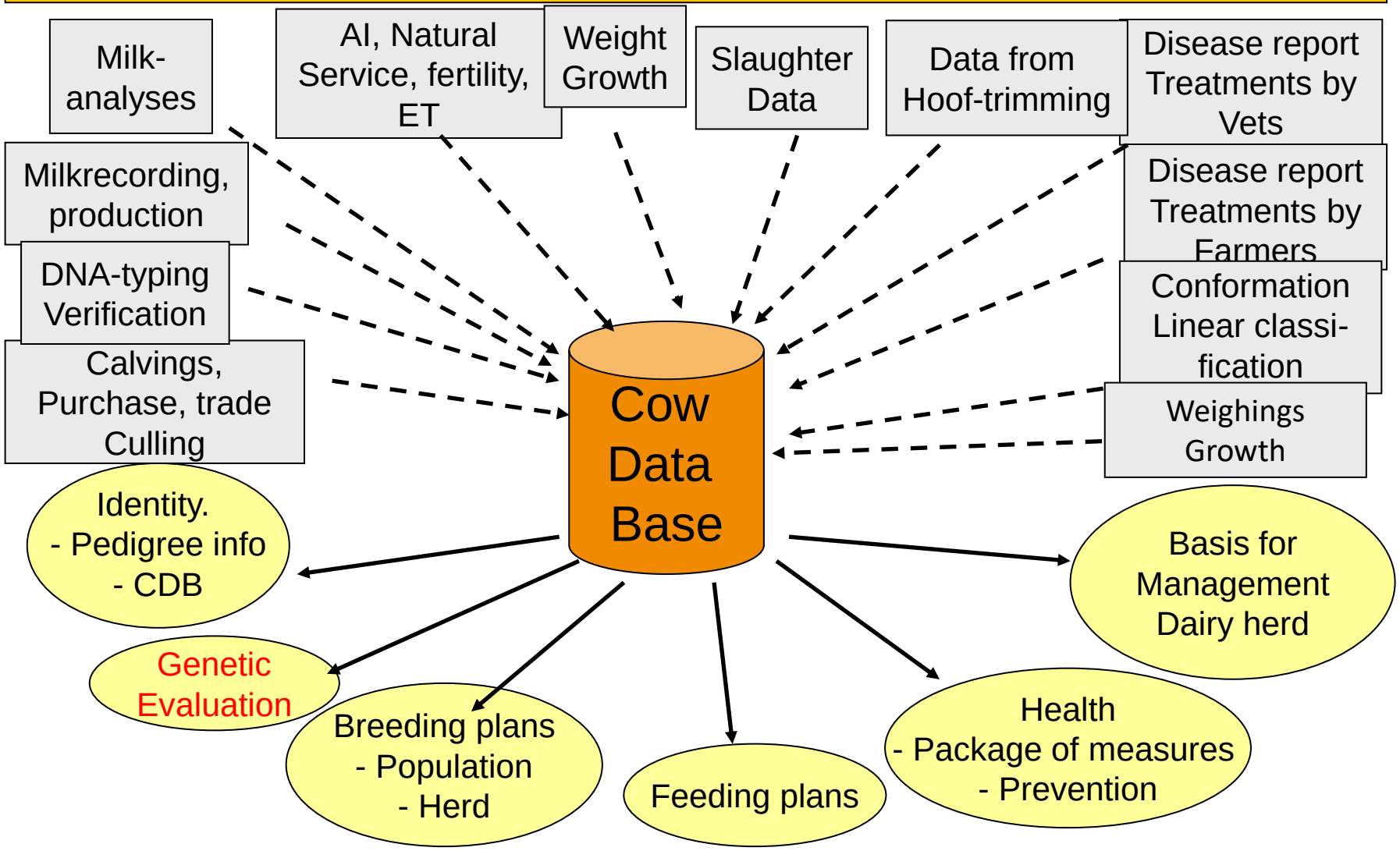
Dataflow – Cow data base, milk recording



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Daily management use

Update on milk production, reproduction, health and feeding. Giving an important overview.

Key Performance Indicators

Topic	Status	Key figure (unit)	Achieved	Alarm limit	Reporting period
Milk	✔	ECM delivered (kg/day)	11,713	Min 10,942	Latest measurement
	✔	Milk yield per lactating cows (kg ECM/day)	37.1	Min 35.1	Latest measurement
	●	Milk quality (numbers of deductions)	1		Last 7 days
Reproduction	✔	Inseminations of cows (numbers)	14	Min 4	Last 7 days
	●	Inseminations of heifers (numbers)	1	Min 2	Last 7 days
	✔	Not pregnancy examined cows (numbers)	0	Max 0	Last day
Health	✔	Disease treatment, cows (numbers)	5	Max 5	Last 7 days
	✔	Dead animals (numbers)	0	Max 0	Last 7 days
Feeding	✔	Energy efficiency (%)	103	Min 93	Last feed control

Manage your production like you manage other business

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Health recordings

- Started in 1990
- Most recording done by veterinarians
- More than 80 different disease codes are used to describe the diagnoses
- For breeding purposes, the codes are pooled within four categories:
  - Udder diseases
  - Reproductive diseases (retained placenta, metritis)
  - Metabolic diseases (ketosis, displaced abomasum)
  - Feet and leg diseases (foot root)
- 90 % of all cows are in disease registration
- Only data from herds complying with strict rules are used in genetic evaluation

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Claw recordings

- Started in 2010
- Around 40-50 % of all cows are in registration
- Infection related
  - Dermatitis
  - Heel Horn Erosion
  - Skin Proliferation
- Metabolic related
  - Sole Haemorrhage
  - Sole Ulcer
  - White line separation + double sole
- Malformation
  - Cork screw claws

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Conformation

Classification

- 23 traits (body, F&L and udder)
- Flexible classification software from 2014
- 30 % of herds use ”whole-herd” classification

Teat coordinates from AMS

- Udder depth
- Teat placement (front and rear)
- Udder balance

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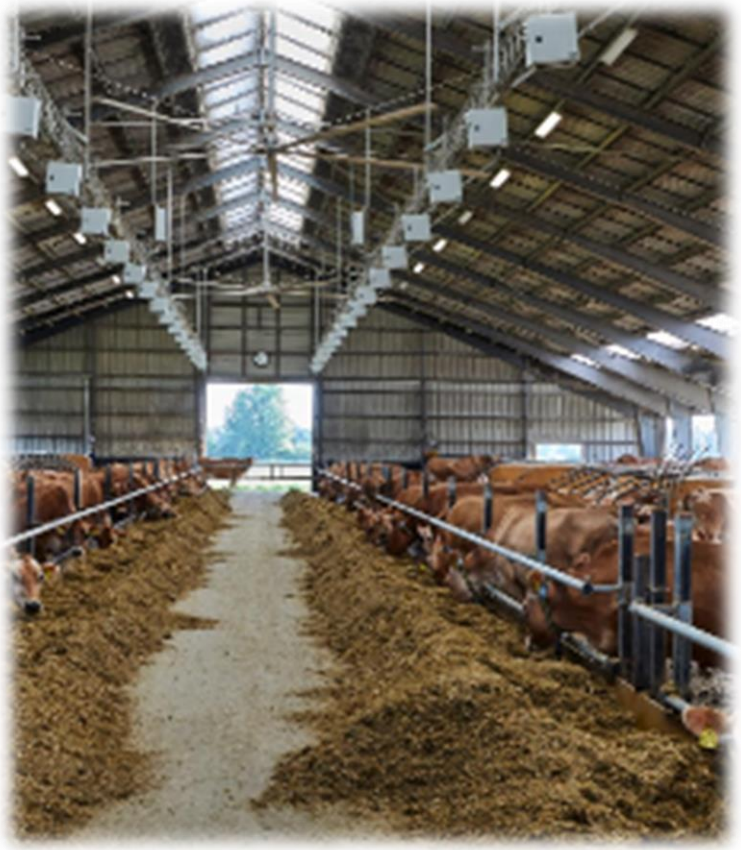
Feed intake

- Developed by VikingGenetics (CFIT)
- Data from 6 Jersey herds[1]
- More than 2,400 cows[1]
- Used in both management and genetics

[1]In genetic evaluation



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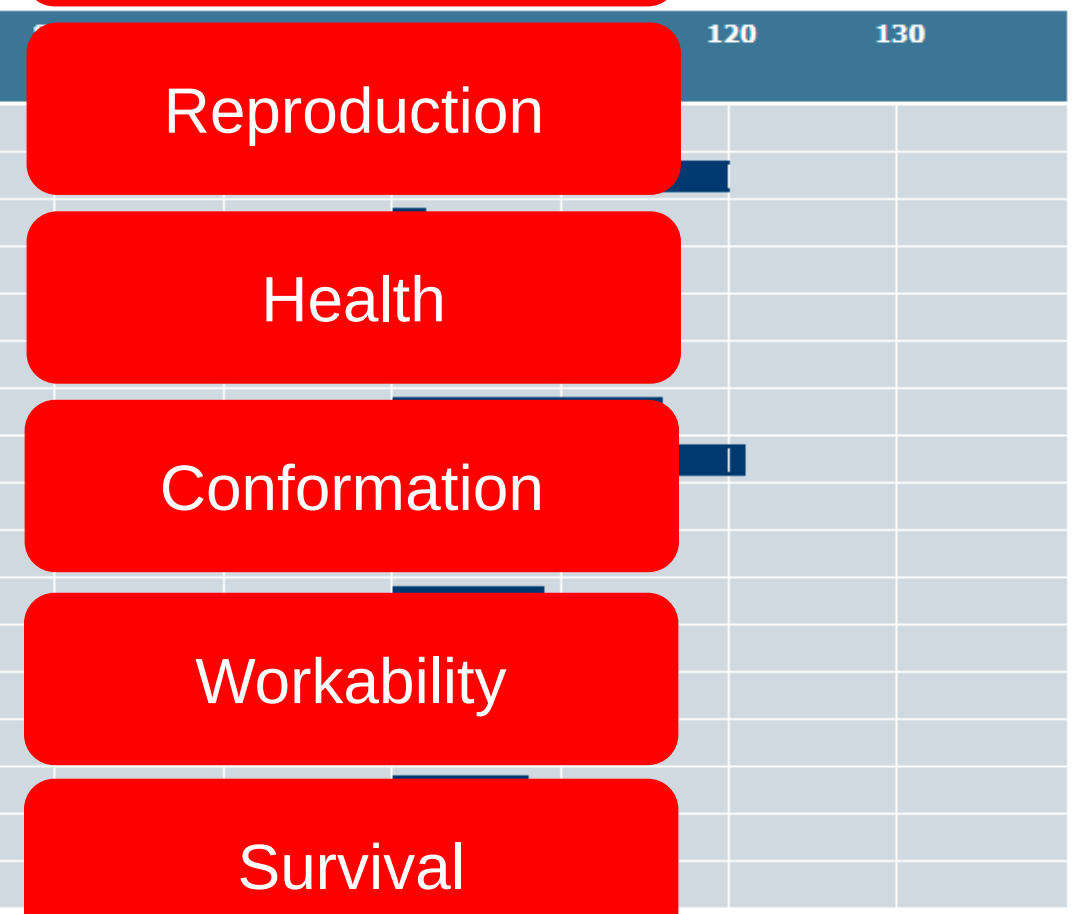
VJ Sultan NTM 34

Trait	Current evaluation
NTM	34
Yield	120
Growth (not in NTM)	102
Fertility	111
Birth	98
Calving	104
Udder health	116
General health	121
Claw health	98
Frame (not in NTM)	105
Feet & legs	109
Udder	115
Milkability	114
Temperament	114
Longevity	108
Youngstock survival	
Saved feed	98



Production

Reproduction

Health

Conformation

Workability

Survival

Efficiency

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Novel traits: Saved feed

$EBV_{saved\ feed} = EBV_{maintenance} + EBV_{metabolic}$

- Maintenance: weight data + conformation data as correlated traits (stature, body depth og chest width)
- Metabolic efficiency: data from CFIT herds
- Published since 2020

VJ Gong NTM 20

Saved feed	112	
Maintenance efficiency	109	
Metabolic efficiency	103	

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Novel phenotypes: Eating quality

- Intramuscular fat is good indicator of tast and tenderness
- Expensive lab tests – need to find inexpensive indicators

Q-FOM Beef™

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Improved data quality: Claw diseases

- Difficult to register objective
  - Improved accuracy
- Camera on claw trimmers box

Sole haemorrhage

Mild

Overfladisk blødning eller let misfarvning af hornet i sålen og/eller den hvide linje. Kan forsvinde ved normal beskæring

Svær

Blødninger, der strækker sig dybt i sålehornet og/eller i den hvide linje. Er stadig til stede efter normal beskæring.

Breeding values for traditional and unique traits

- ”World wide” traits (yield, conformation, longevity)
- Special traits (health, fertility, feed efficiency)
- Next level traits (methan emission, eating quality)
- Best techniques available (genomic information, models, genetic parameters ect..)

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NTM – towards the most economical cow

Costs are as important as income – balanced breeding gives the most economical cow

- Front runner in using broad breeding goal – since 1982
- Most comprehensive breeding goal in the world
- Based on solid calculations and farmer expectations

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Key message on data and breeding

- One central database in Denmark
- Registration on traits related to yield, conformation, welfare and health ect.
- Fokus on innovation and new technologi in breeding
- Comprehensive breeding goal

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