Nordic Total Merit NTM and Longevity

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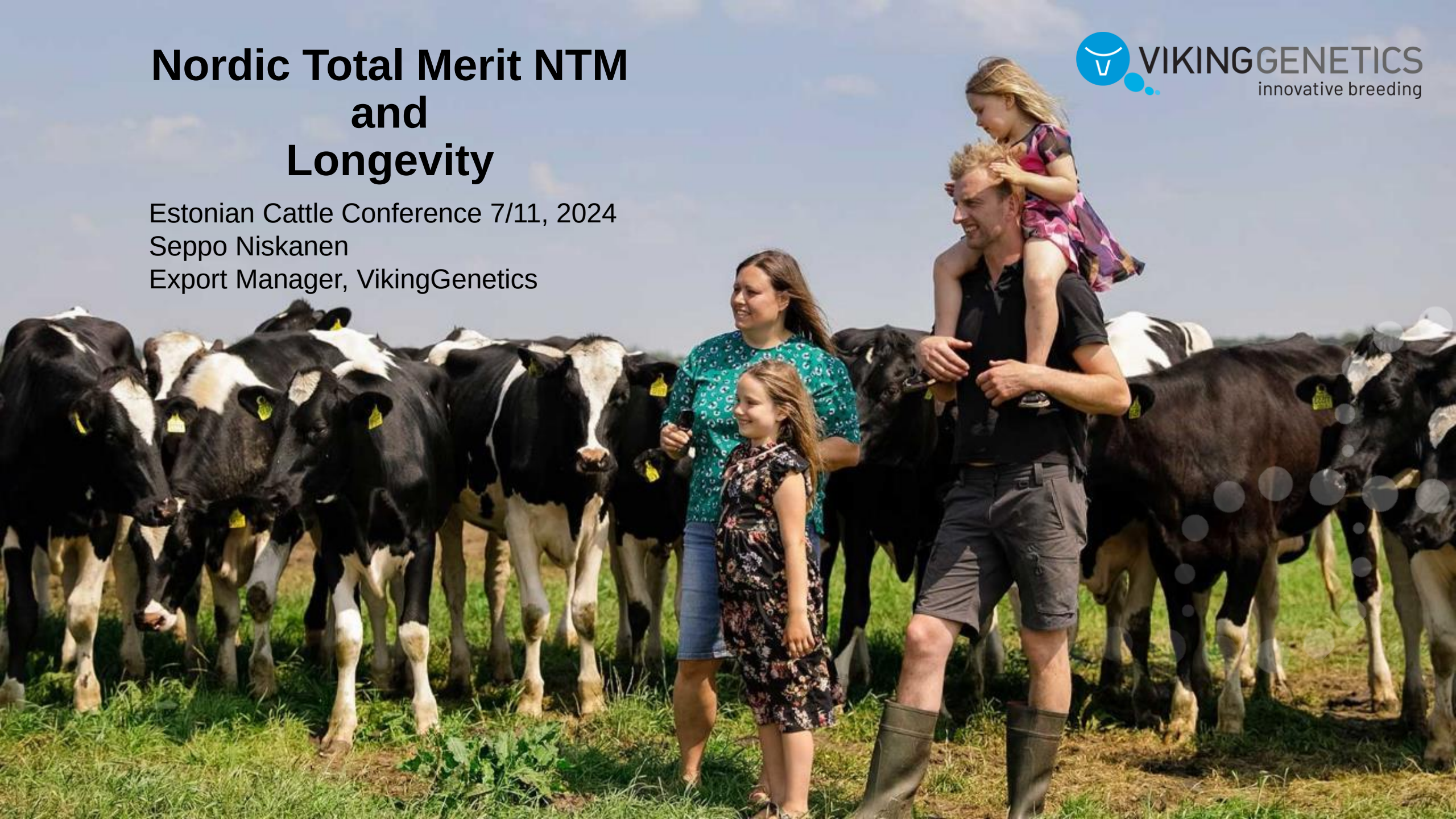
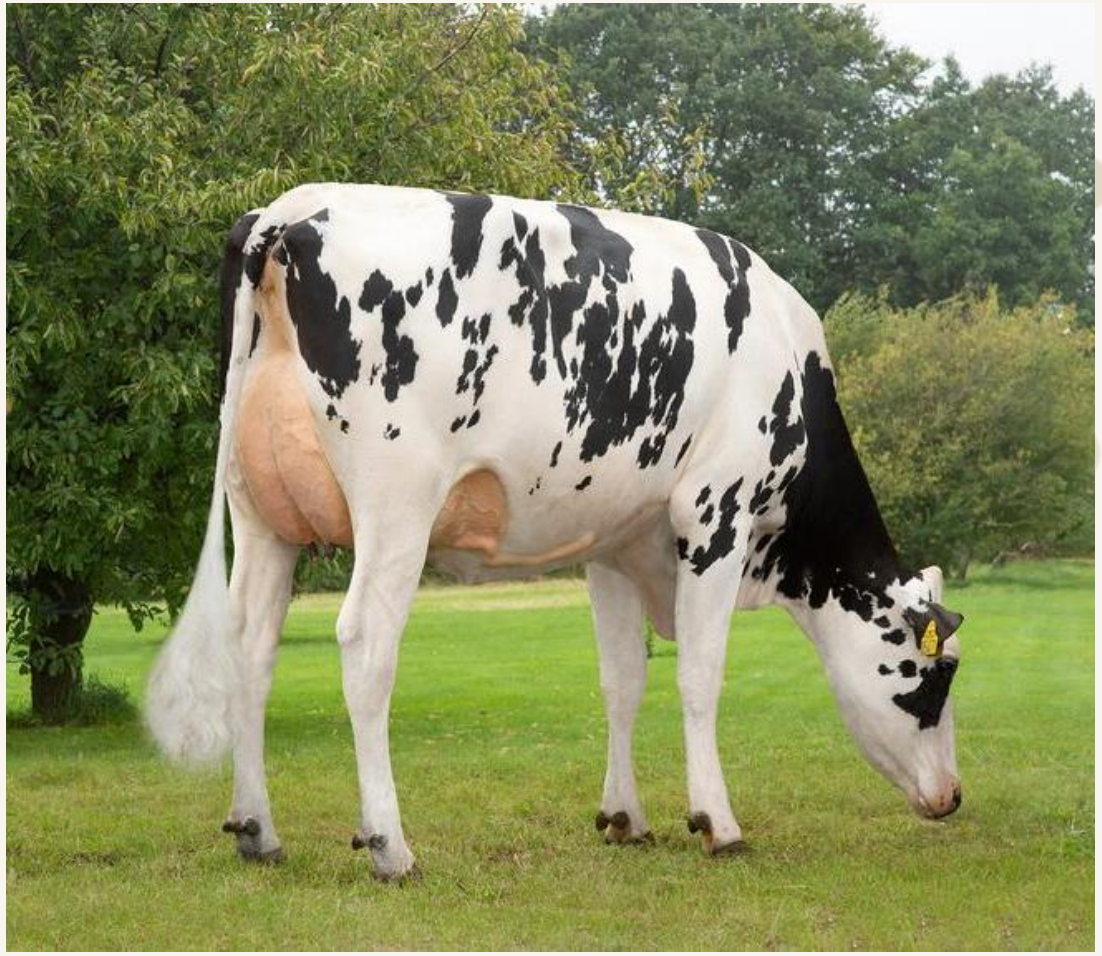


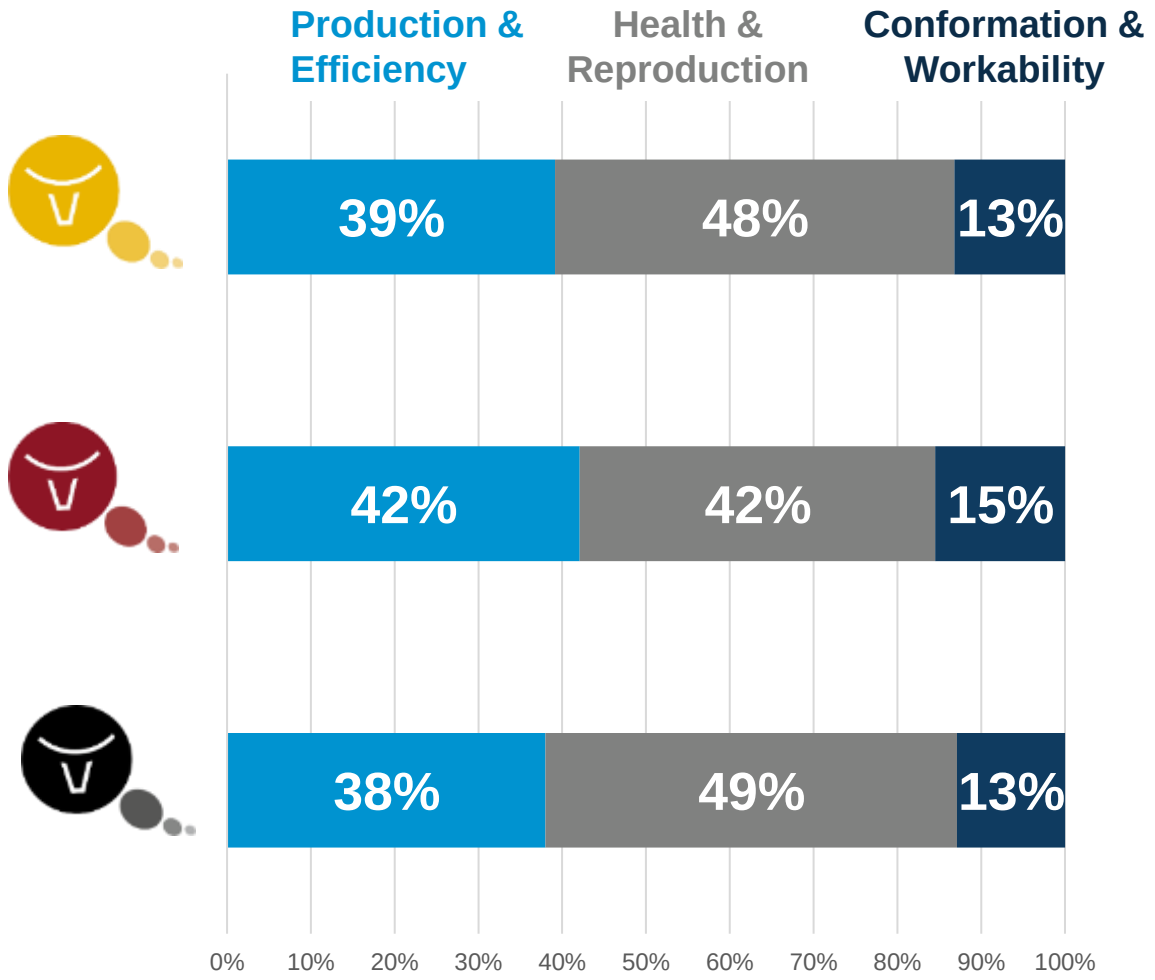
What is Total Merit Index?

- Total merit index is a tool to help animal selection
- If you select only for one trait, there are also changes in other traits because of genetic correlations
    - The single genes are located close to each other
- The number of traits is different in every TMIs
- Economically the most important traits have the highest weights
- VikingGenetics uses NTM – Nordic Total Merit



Nordic Total Merit NTM is profitability

- NTM is composed by all the traits that have an economical impact on the dairy business
  - High production
  - Focus on health & fertility
  - Functional conformation
- All this is included in NTM!
- Also animal welfare



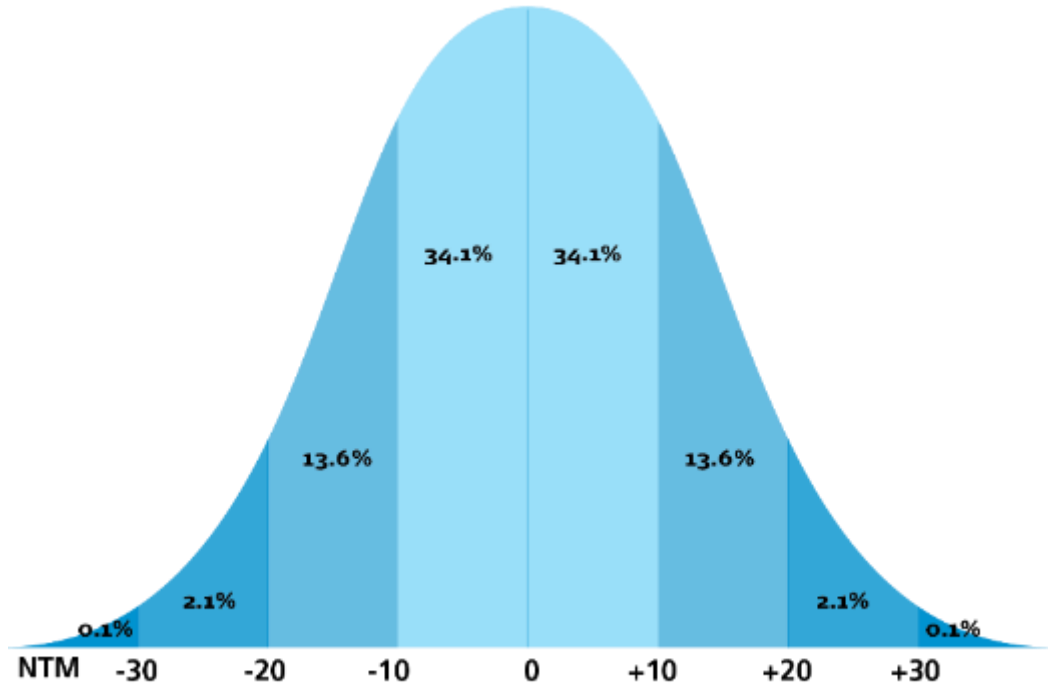
NTM – weight factors

Trait	Red Cattle	Holstein
Production	1.02 / 0.93	0.90 / 0.81
Growth	0.10	0.08
Fertility	0.36	0.36
Birth index	0.11	0.14
Calving index	0.10	0.14
Udder health	0.11	0.14
Hoof health	0.07	0.10
General health	0.11	0.14
Frame	0.00	0.00
Feet & Legs	0.06	0.05
Udder	0.26	0.18
Milkability	0.11	0.09
Temperament	0.03	0.04
Longevity	0.06	0.06
Youngstock survival	0.19	0.13
Saved feed	0.13	0.08

Expression of NTM

- Breeding values are estimated by the independent scientific breeding institute NAV (Nordic Cattle Genetic Evaluation)
- Rolling base, cows 3-5 years old
- Average 0 for NTM, average 100 for breeding values. Standard deviation 10

Average	Good	Super	Superior
NTM=0 EBV=100	NTM>+10 EBV>110	NTM>+20 EBV >120	NTM>+30 EBV>130



Longevity

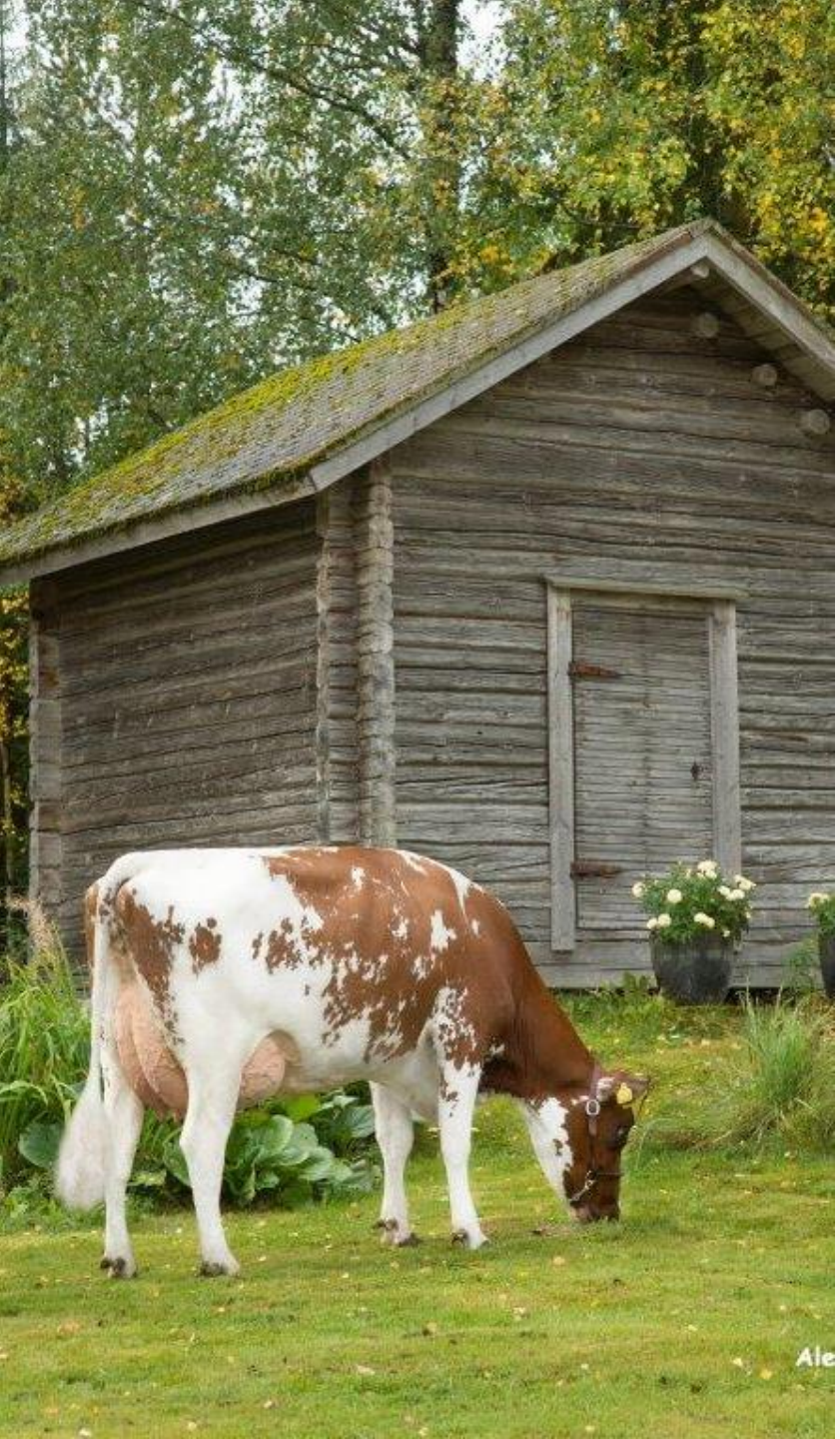
- We all want long living cows
- What does longevity mean? Only to stay long time in the herd? Or is it lifetime production? What do we want to measure?
- Longevity is not only one trait – it is a combination of many different traits
  - It is also a combination of genetics and environmental effects

Traits for better longevity - production

- What is the base for milk price: volume of milk, components or solids?
- The price of milk is based more and more on solids and components
- Components and udder health have a positive genetic correlation
- Higher components mean better udder health

Traits for better longevity – health and fertility

- What is the value of health and fertility? If problems with health
  - More costs (treatments, inseminations etc.)
  - Less income (less milk, fewer calfs)
  - Higher culling rate
  - Less profit
- We all understand the value of health and fertility – so select the animals using this information



Traits for better longevity – size

- What is the value of size of the cows?
  - Bigger cows can have little more milk but in the same time problems with feet & legs
  - Small cows can be easily too fat
- Good capacity is of course important (body depth and chest width)
- Average size cows have the best longevity – avoid too small or too tall

Stature and lifetime production of fat & protein kg Holstein

Stature	1	2	3	4	5	6	7	8	9
% of cows	2%	7%	**13%**	**36%**	20%	16%	4%	1%	–
Kg fat + protein	-31	+2	**+32**	**+30**	-5	-43	-99	-193	–

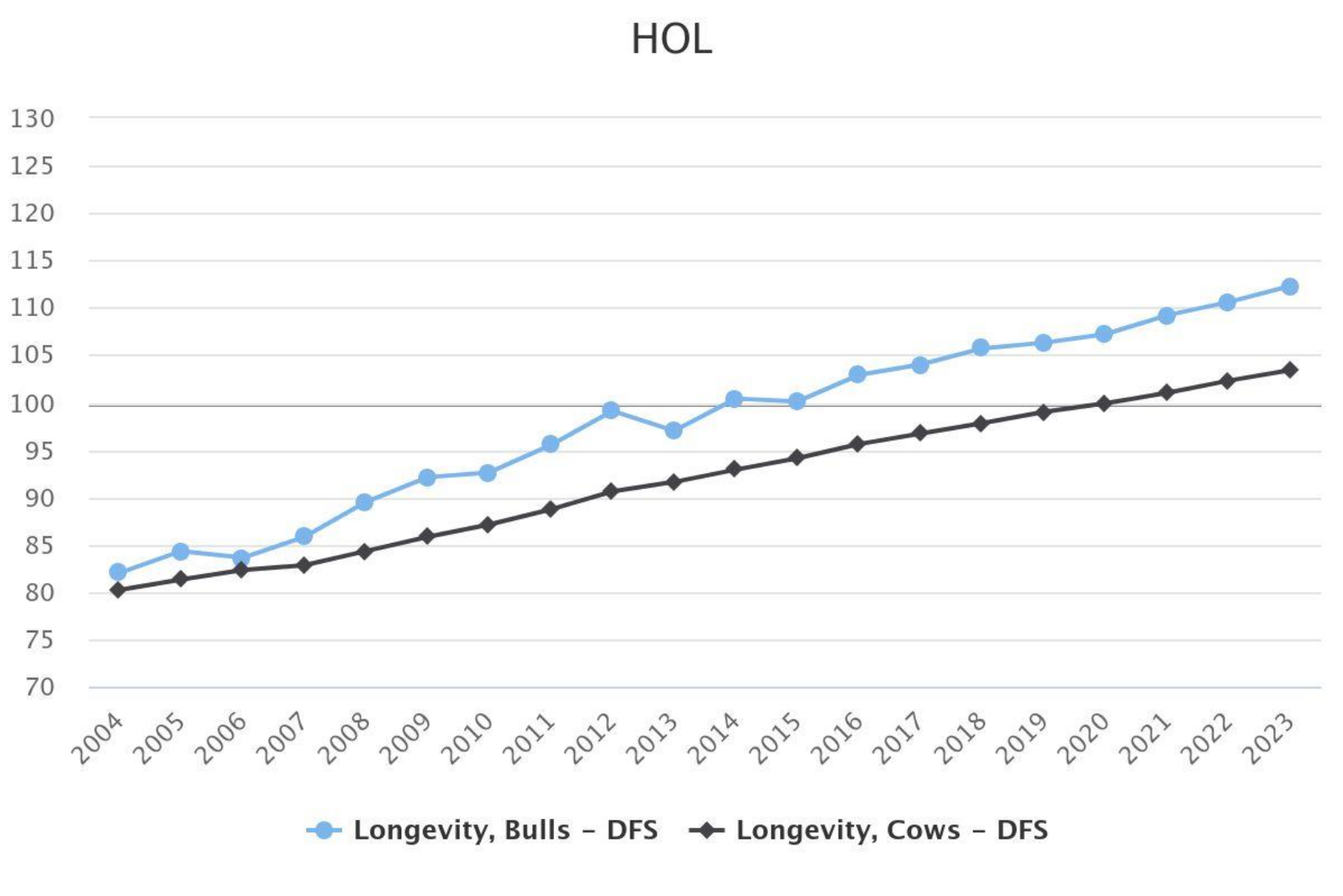
Traits for better longevity – conformation

- What is the economical value of conformation? Not so easy to measure, but we all want functional conformation
- Udder
  - Good, strong attachments and ligament
  - Teat size is important for milking
  - Udder texture
- Feet and legs
  - Good angles – not too straight, not too sickled
  - Dry hocks

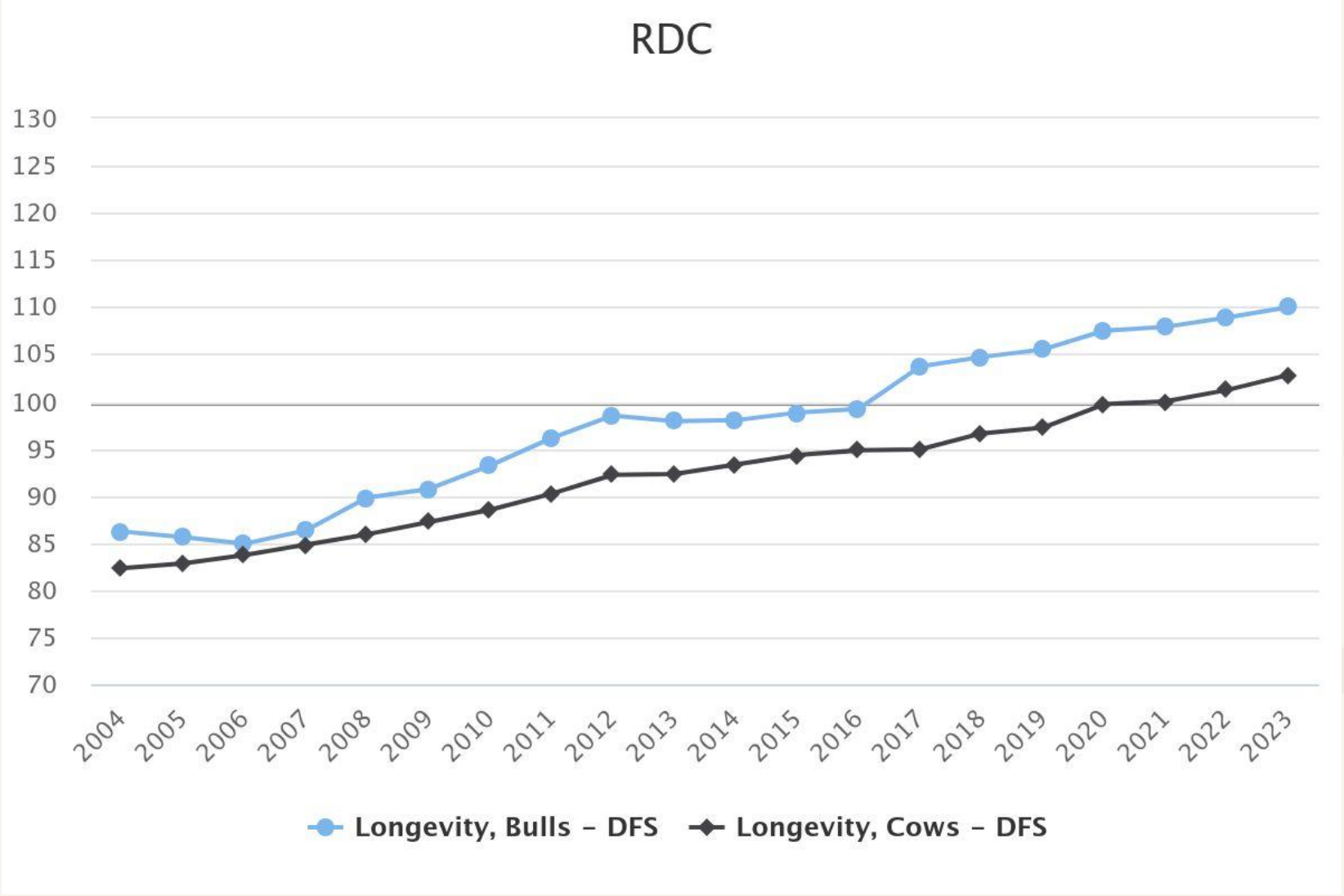
Correlations between longevity and other traits

Trait	Correlation
Production	-0.12
Fertility	0.39
Calving Sire	0.18
Calving MGS	0.18
Udder health	0.41
Hoof health	0.22
Udder	0.18
Feet & Legs	0.09
Other diseases	0.36

Genetic trend for longevity Dnk/Fin/Swe Holstein



Genetic trend for longevity Dnk/Fin/Swe Red Cattle

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Thank you
Have a nice winter!