

**VIDENCENTRET FOR LANDBRUG**

Kvæg

# Breeding for milkability – How to use the new possibilities

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# Why calculate breeding values for milkability?

- Labour is expensive – time used for milking has to be minimized
- Equipment is expensive – AMS systems has to optimize kg fat+protein produced per hour

Breeding is an important part of improving milkability – reliable EBV for milkability is important

## What new possibilities are available?

New equipment can measure milkability

Lots of new quality data are available on central database

More reliable EBV's for milkability can be calculated

**More genetic progress can be achieved**

# Information about milkability

- **Classification**
  - original source of information in all Nordic countries
- **TrueTest Milk Meters**
  - Danish herds
  - Development project in Finland
- **AMS**
  - Danish Lely AMS herds – use for research purpose
  - Sweden DeLaval and GEA

# Present genetic evaluation for milkability

## EBVs for milking speed based on:

- Assessed by dairy farmers (DK, S, F)
- Registrations by milk meters (DK)

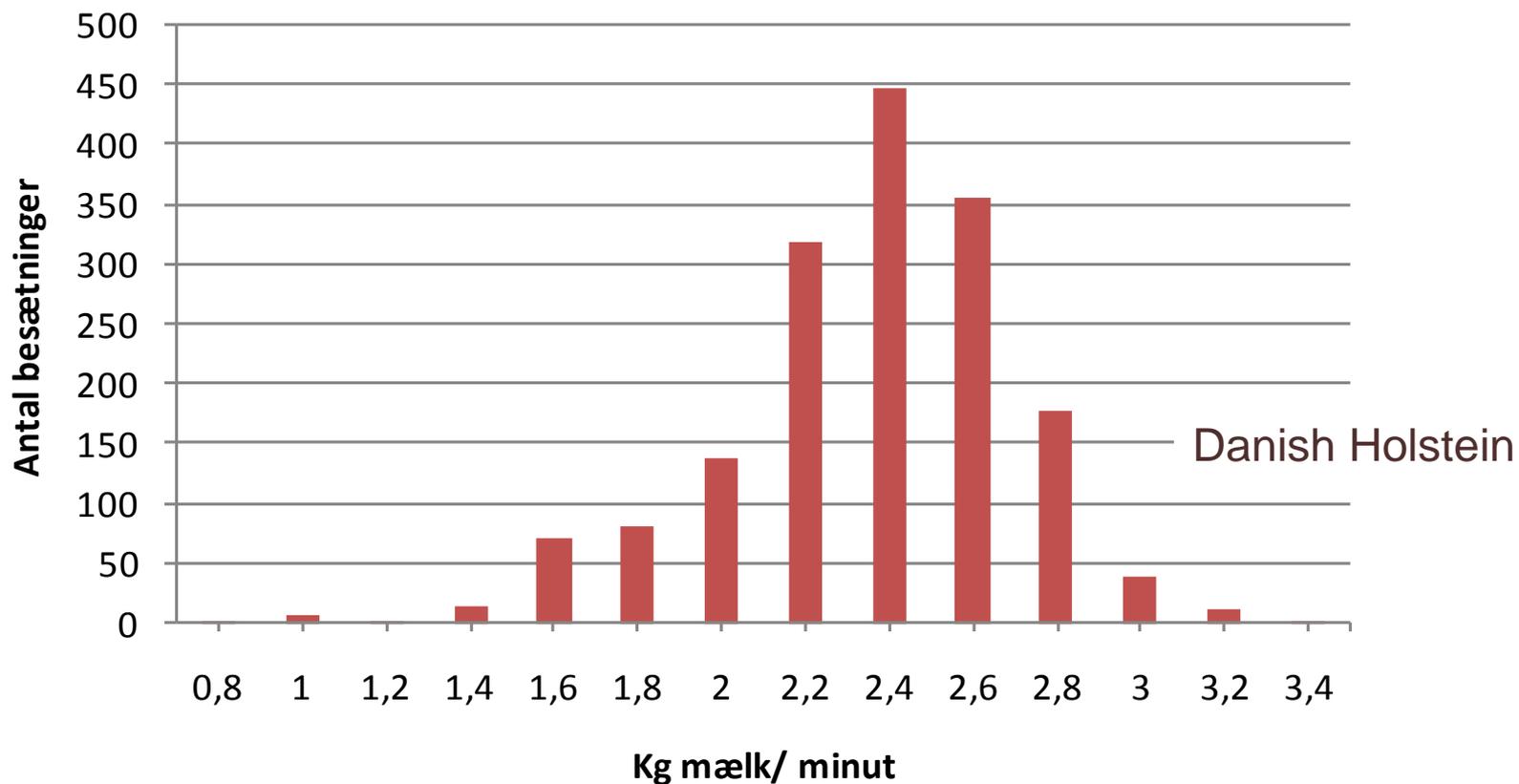
# TruTest electronic milk meters

- **60-70 % of all Danish cows in milk recording**
- **Milking; duration, volume and milk sample**
- **Collected 6/11 times a year on farm**



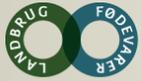
# Milk flow

## differences between herds



# How to define milkability from TruTest Milk Meters?

- Milking time, minutes
- Flow, kg/min
- Actually both had high correlation to farmers classification ( $r_g \sim 0.9$ )
  - **But using milking time would create a very negative correlation to yield traits.**



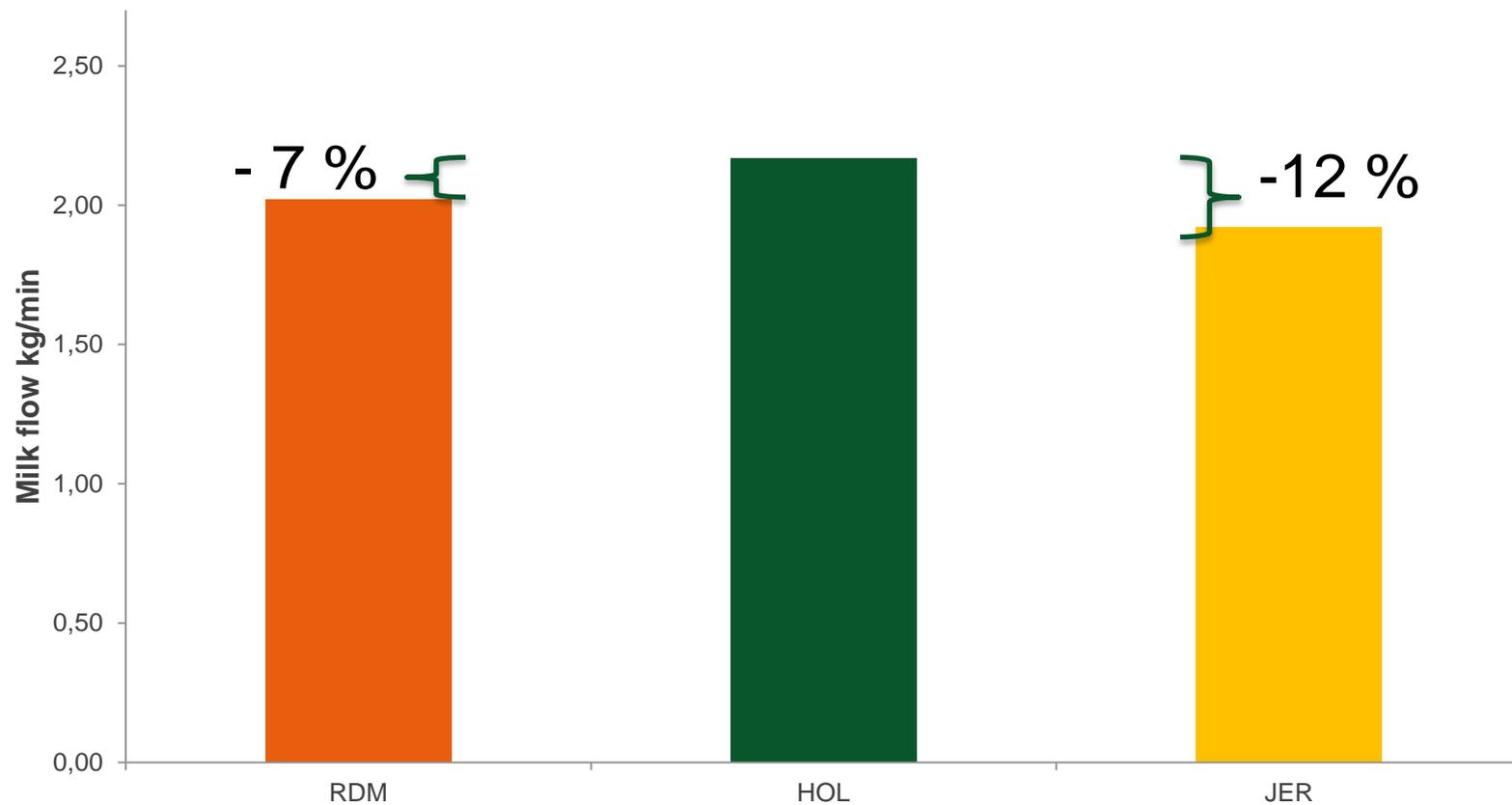
# Flow of milk or solids?

- Income from solids
- Fluid is only cost

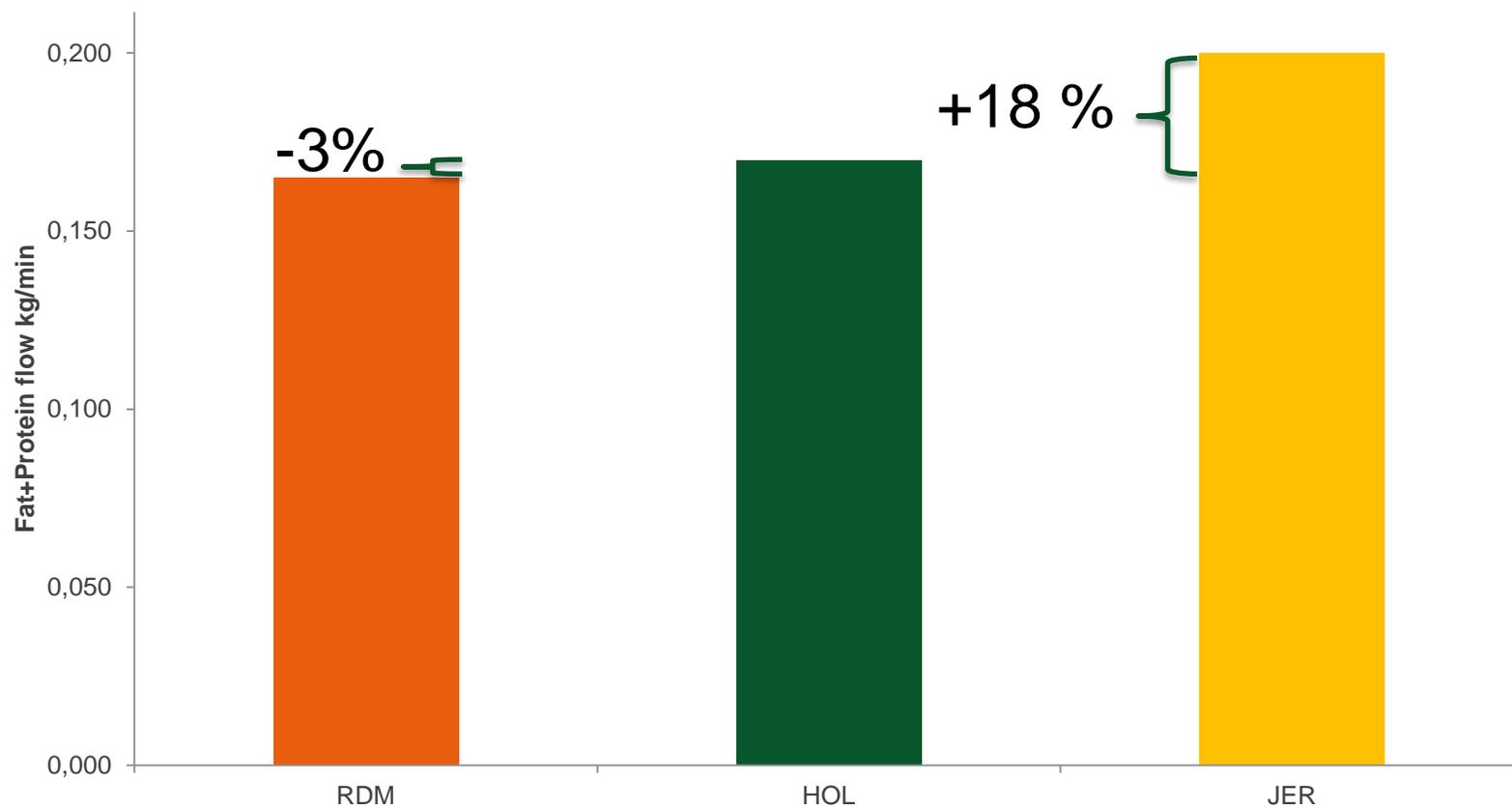
**Flow of solids is the goal!**

# Milk flow

## First lactation



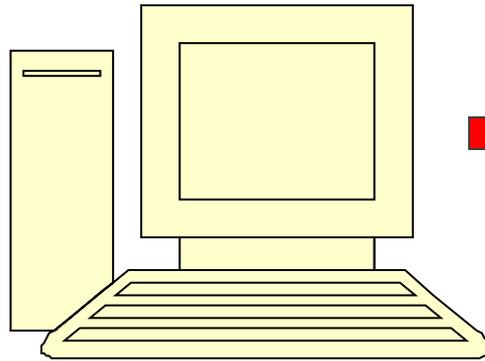
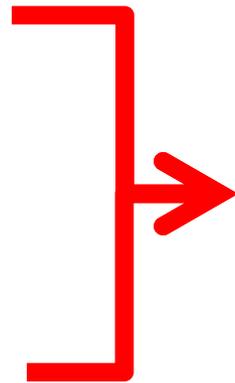
# Fat + Protein flow First lactation



# Genetic evaluation

Classification

Flow F + P



**Milkability**

**We choose flow if both sources are available !**

## Effect on $r^2$ for a cow with own performance

- Reliability, pedigree = 0,35
- Heritability milkability score  $\approx$  0,20
  - Reliability score+ped = 0,44
- Heritability avg. 5 flow obs.  $\approx$  0,50
  - Reliability flow+ped = 0,61
- For bulls equals 1 daughter with flow approx 3 daughters with milkability score!

## Effect of index for milkability

- For all breeds the effect of difference of +10 index units between sires is +10 grams of fat and protein in total per minute
- For standard milk +10 units corresponds to 0.13 kilo more milk per minute
- For Holstein +10 index units equals about 2.37 liters of milk / min
- For a cow with daily yield of 30 kg of standard milk, milking time is 45 seconds or 5% shorter than for an average cow

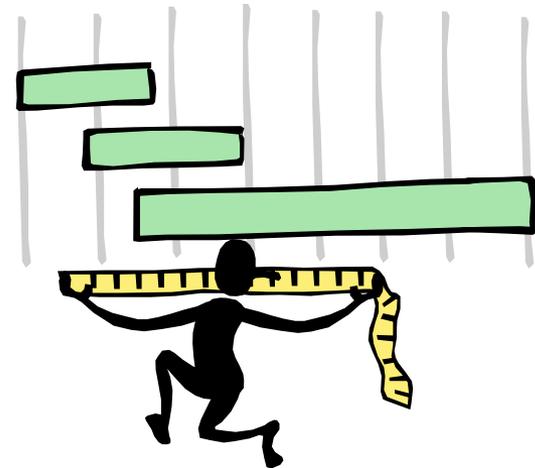
# Milkability in breeding goal

- Breeding goal expressed in NTM
- Economic optimal progress for Nordic farmers
- Weight factors reflects economic value of less work load from improving milkability with one unit

Breed	Weight factor
Red breeds	0,10
Holstein	0,08
Jersey	0,10

# Collection of data from electronic equipment gives new possibilities

- Registration of data exposing new traits and registrations complementary to existing registrations
- Repeated measurements
- Objective measurements
- Measured on all cows in milk
- Measured over more lactations

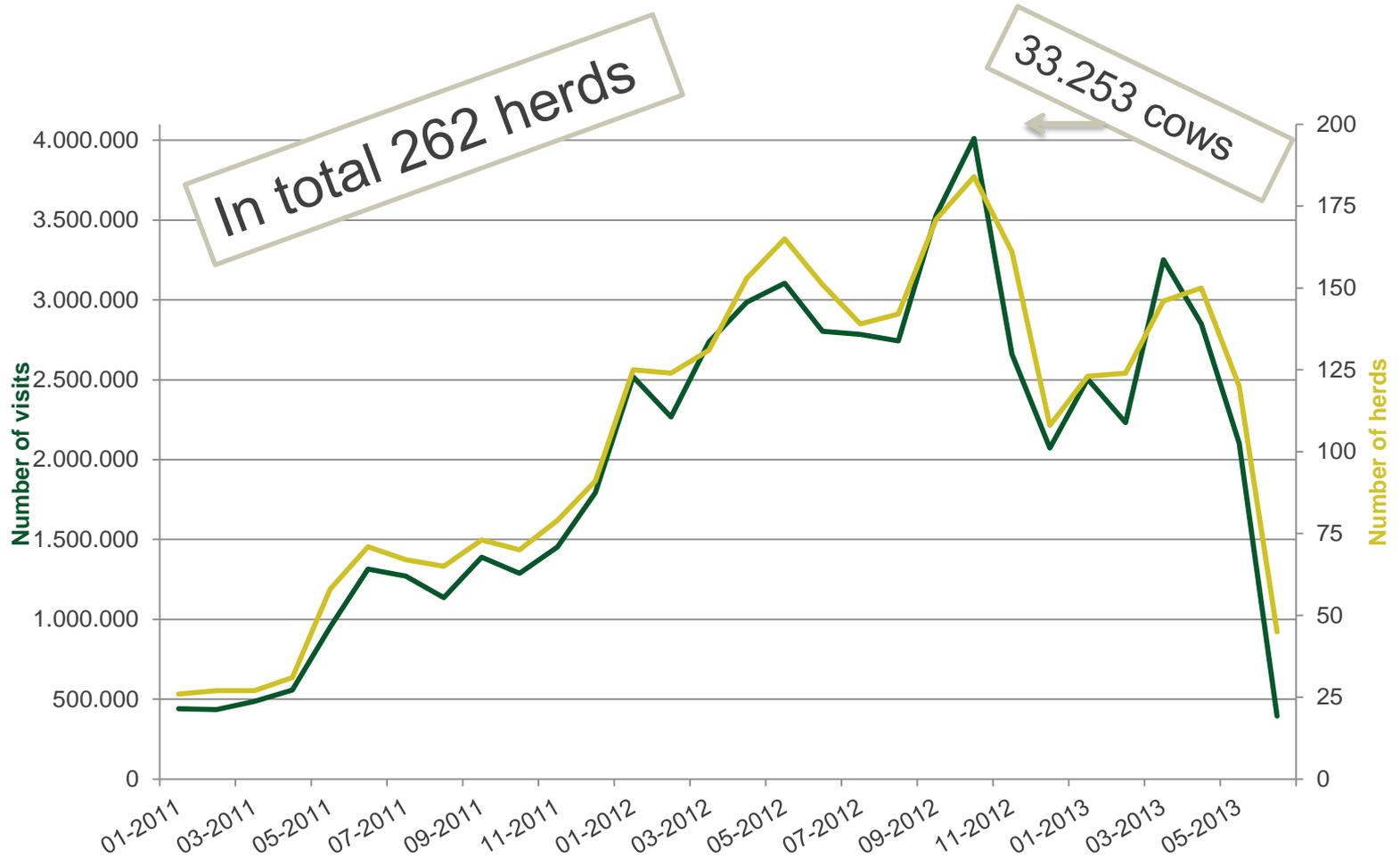


# Lely robots

- **10-15 % of all Danish cows**
  - **Data collected routinely since Nov. 2011**
  - **Collection done by milk recording technician**
  - **Collected 6/11 times a year**
- 
- **Data from DeLaval and GEA in Sweden**



# Data collection



# Pilot study – Genetic parameters, flow

- $h^2$  for flow<sub>AMS</sub> is higher than for traditional classifications and flow<sub>TruTest</sub>
  - Avg. of 14 days.
  
- High genetic correlations between traits

## Heritabilities og genetic correlations (S.E.)

	$h^2$	classifications	Flow, TruTest
Flow (F+P), AMS	0,63 (0,07)	<b>0,91</b> (0,05)	<b>0,94</b> (0,03)
Classifications	0,20 (0,02)	-	<b>0,91</b> (0,02)
Flow (F+P), TruTest	0,41 (0,01)	-	-

## Conclusion - Flow

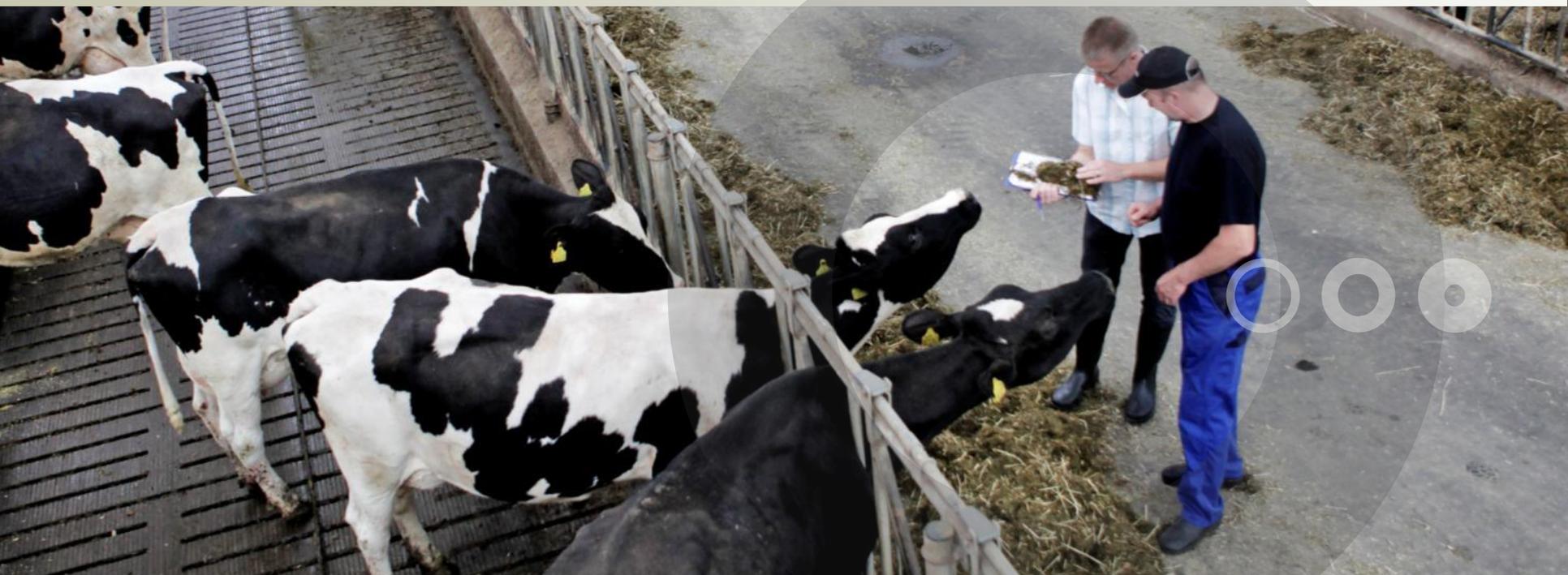
- It is possible to utilize data from AMS in routine evaluation for milking speed.
- Limited effect for bulls
  - Already a lot of data from TruTest-meters.
- Cows from AMS-herds get own performance included.



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# Thank you for your attention



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