

GOD DYREHELSE BRINGER NORSKE GENER UT I VERDEN

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Norge og NRF med et bærekraftig avlsmål

A sustainable breeding programme over time has ensured a breed with excellent fertility, health and production traits.

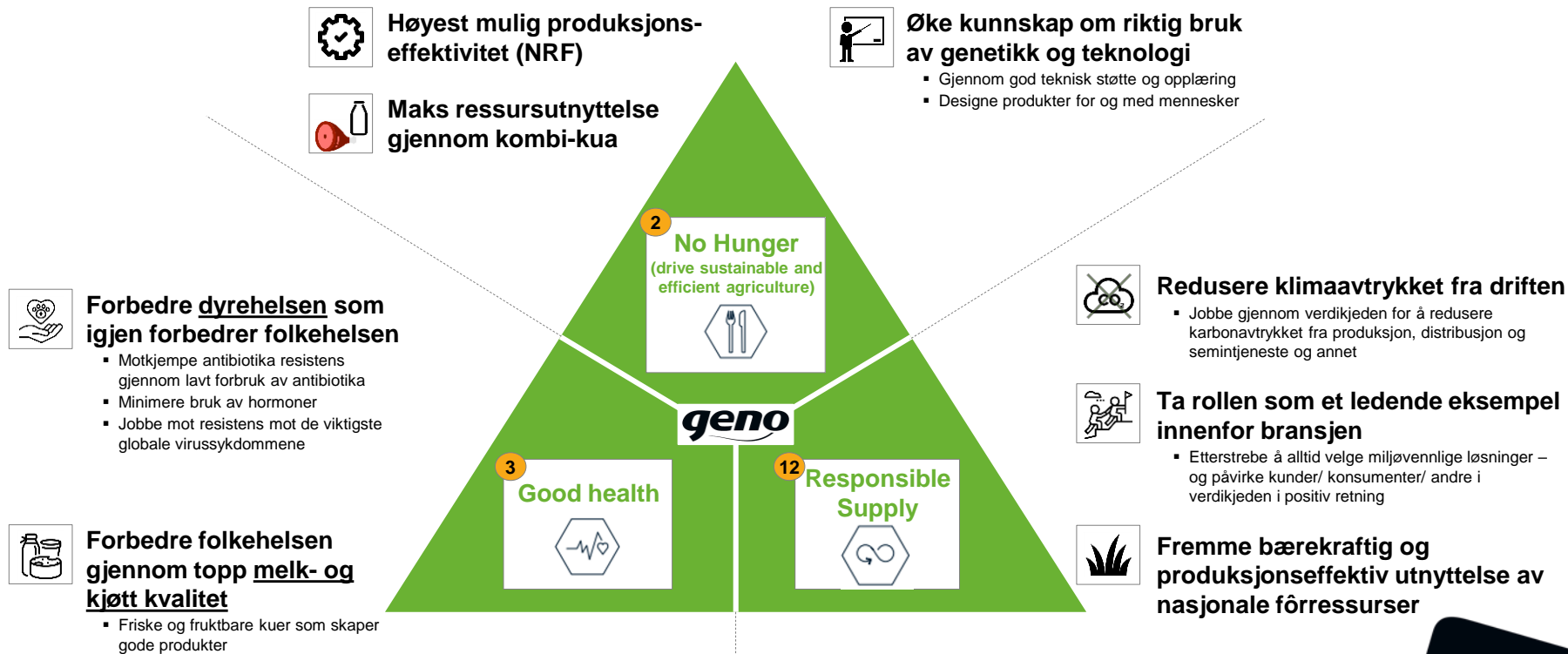


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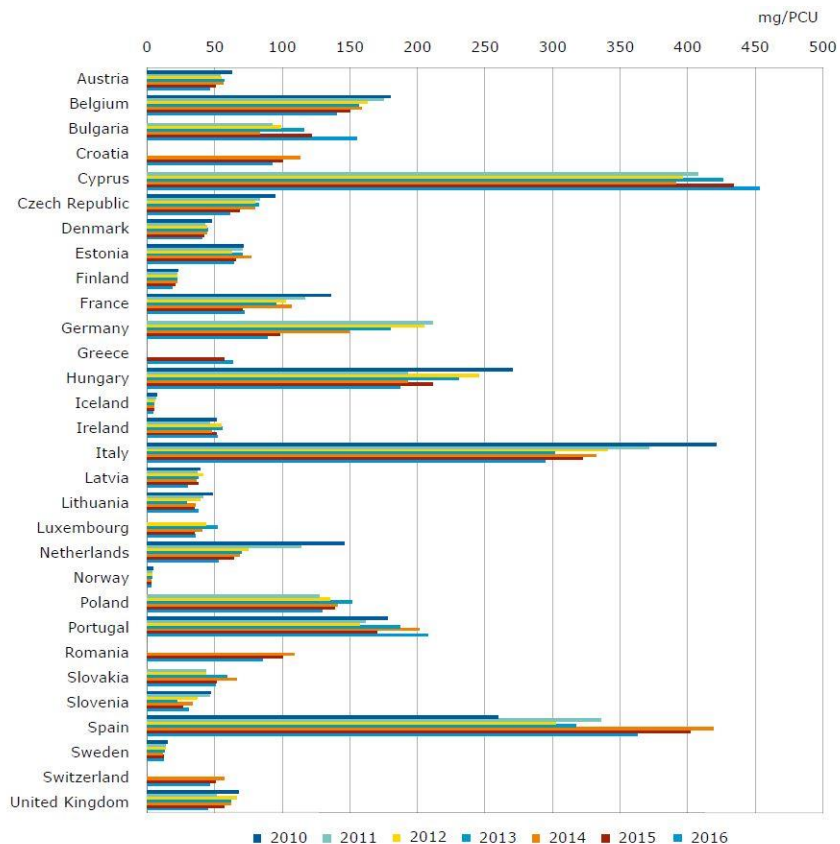
NORWEGIAN RED – selection for functional traits

- Norwegian Red (NRF) is a high-producing dairy breed in which fertility and health have been included in a selection index since the 1970s
- Norwegian Red (NRF) demonstrates that production and functional traits can be successfully balanced in a sustainable breeding program
- This achievement has been based on an effective recording system and a willingness to place sufficient weight on the functional traits
- The program is run by Geno, a cooperative owned and managed by Norwegian dairy farmers

Vårt avlsarbeid også i tråd med noen av FN's nyeste bærekraftsmål



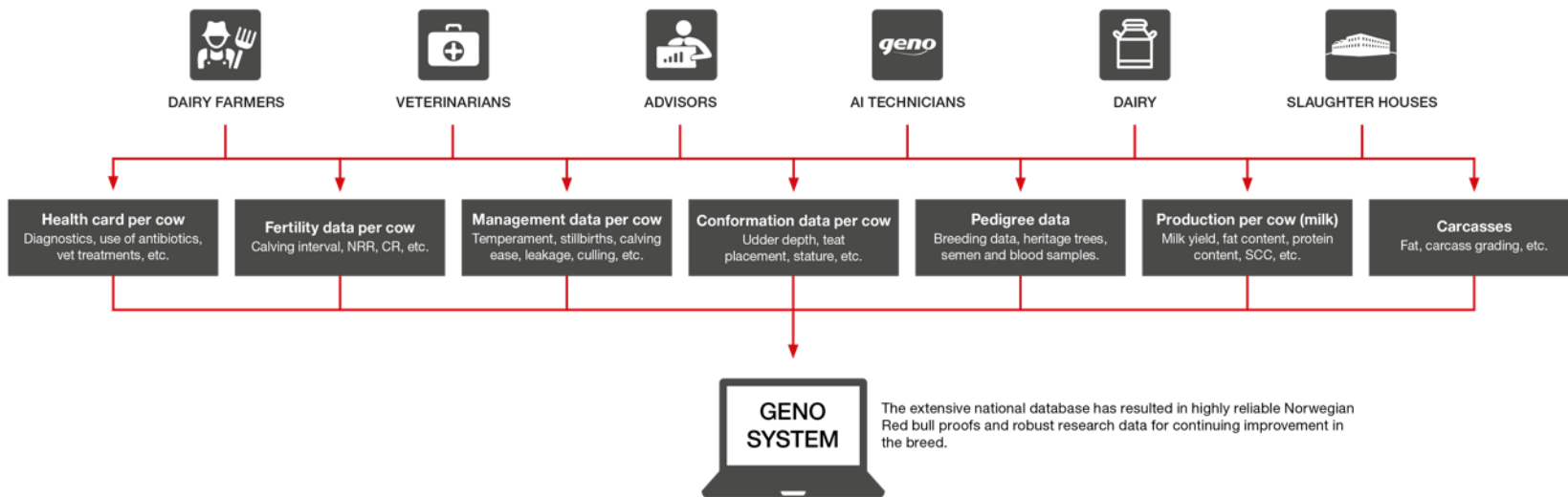
Norge i en svært gunstig situasjon ift bruk av antibiotika



- Figuren viser totalt salg av veterinære antibiotikapreparater til matproduserende dyr i perioden 2010-2016, sett i forhold til biomasse (mg/PCU)
- Norge best i Europa og Norden!
- Lite eller ingen bruk av de kritisk viktige typene antibiotika

Et effektivt og komplett registreringsystem

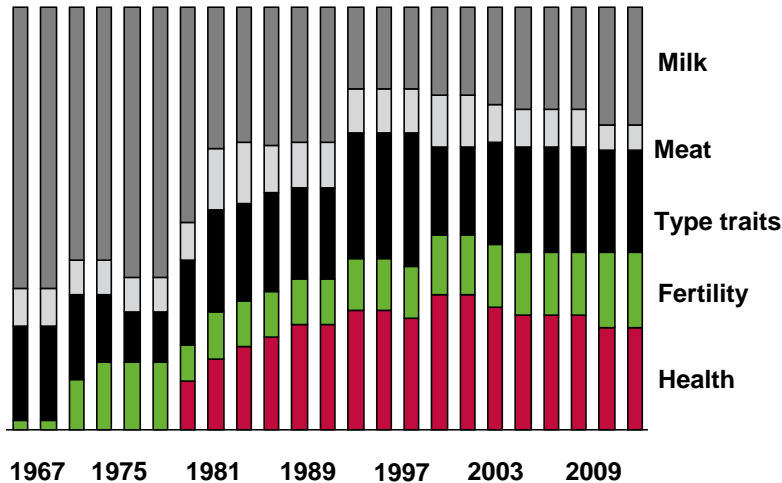
The Norwegian Dairy Herd Recording System in operation since the 1960s



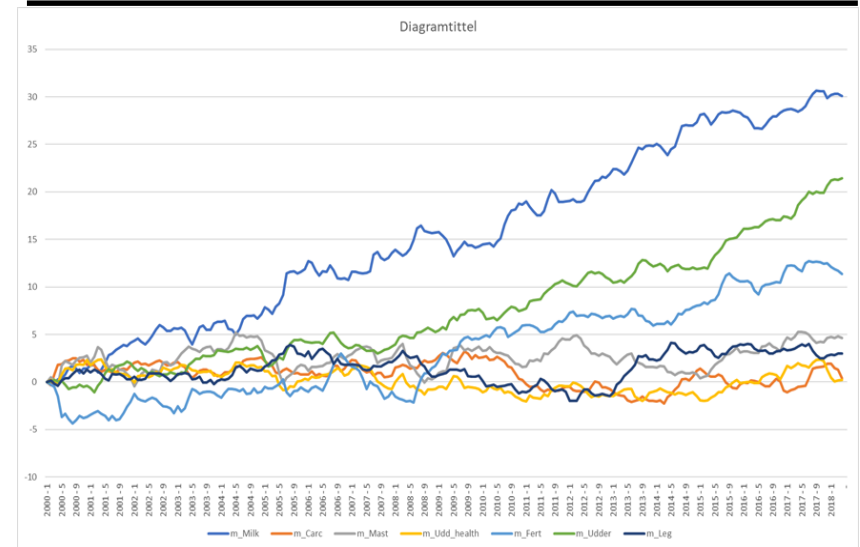
Breeding program that is based on science and a willingness to implement new traits, technologies and knowledge

Breeding goal

Weight in breeding goal over time

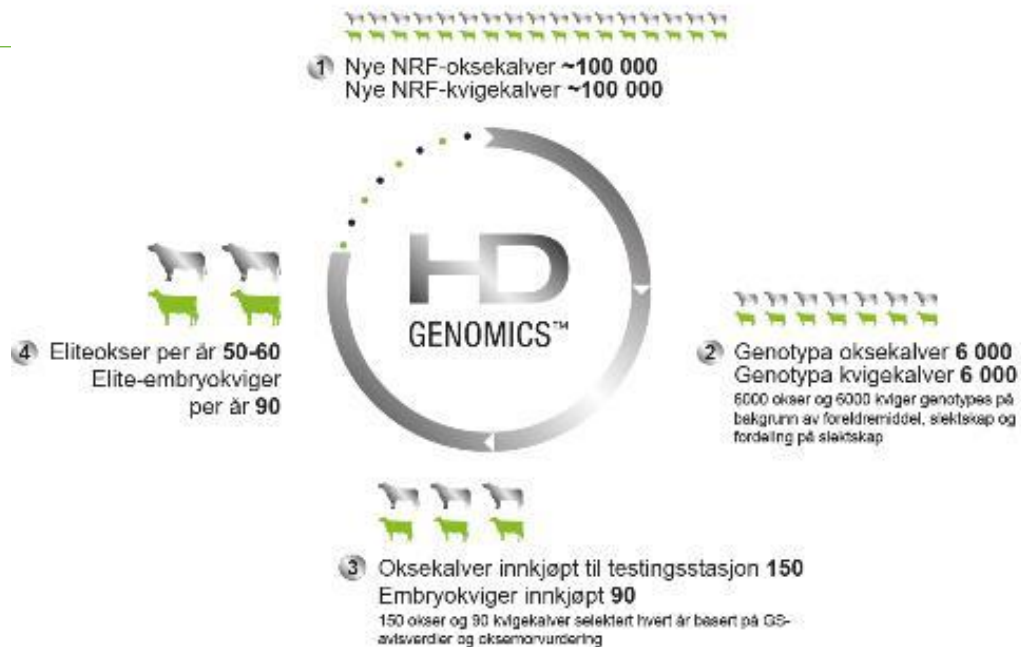


Development of key traits



The road to success for Norwegian Red

- **For farmers, by farmers:** Geno is a farmer cooperative and breeding organization owned by 9,400 dairy farmers in Norway
- **Balanced breeding goal and long term selection:** Geno has overcome the negative correlation between production and fertility/health traits by keeping a balanced breeding goal in a large and robust selection program over the last 30 years
- **Unmatched fertility, health and production traits:** The result is excellent production performance in combination with the world's best performance on fertility and health traits



GENOS AVLSOPPLEGG: Geno bruker nesten hele NRF-populasjonen som avlspopulasjon. Det blir født om lag 100 000 oksekalver i NRF-populasjonen per år (1). Av disse er det ca. 6 000 som kvalifiserer seg videre basert på gjennomsnittet av mor og far, slektskap og fordeling på slektskap (2). Produzentene som har disse får tilsendt prøvematenell for uttak av DNA-prøve som sendes tilbake til Geno for beregning av genomiske avlsverdier. Geno kjøper om lag 150 av disse basert på genomiske avlsverdier og okseanvurderinger (3). Om lag 50-60 okser blir valgt som eliteokser hvert år, fordelt på tre eliteokseuttak (4).

NRF ute i verden. Hvordan virker det?



Evidence summary

HIGHER FERTILITY

- (USA) NR x HO averaged 12 less days open than HO herdmates.
- (CAN) NR x HO crosses had a 5% higher non-return rate in heifers and 8% higher in cows compared to HO herdmates.
- (IRE) Average 1st service conception rates were 9% higher for NR x HF crosses than HF herdmates.
- (N. IRE) NR had dramatically higher average conception rates than HF herdmates in lactations 1-3: **1st** (13.5% higher), **2nd** (21% higher) and **3rd** (29.9% higher)

IMPROVED HEALTH

- (WI, USA) NR x HO in commercial herds had a 22% greater survival rate to 4th lactation than Holstein herdmates.
- (IRE) Average mastitis incidence is 3.3% less in NR x HF crosses than HF herdmates.
- (IRE) NR x HF crosses had a 6% greater survival rate to the 3rd lactation than HF herdmates.
- (N. IRE) Purebred NR maintained a lower Somatic Cell Count (SCC) and comparable fat and protein levels in lactations 1-5 compared to HF herdmates.

IMPROVED EFFICIENCY

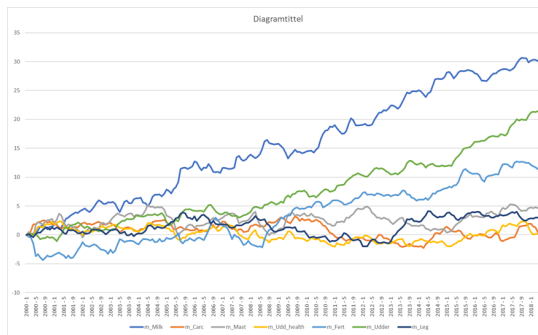
- (MN, USA) 1st calving NR x HO crosses had 14.0% fewer instances of dystocia and 8.9% fewer stillbirths than HO herdmates.
- (CAN) 5% less stillbirths in heifers for NR x HO crosses compared to HO herdmates
- (N. IRE) Purebred NR had a higher % of unassisted calvings in lactations 1-4 than HF herdmates.
- (WI, USA) 5.9% less stillbirths in heifers for NR x HO crosses compared to HO herdmates

Hvordan påvirker avlsarbeidet dyrehelsen og samfunn?



SUSTAINABILITY

- Balanced breeding goal
- Reduced use of antibiotics
- Minimize the rate of inbreeding (N_e)
- Improve feed efficiency
- New phenotypes
- Use of sexed semen
- Use of whole genome sequence data



GENETIC TRENDS

- Important for monitoring genetic progress
- Shows the potential/actual target
- See if the traits develop in the right direction
- Documentation



IMPACT OF GENETICS

- Improved efficiency
- Profitability
- Increase animal welfare
 - Better health
 - Better fertility
- Consumer impact



NORWEGIAN RED

Since 1935

