

# **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.

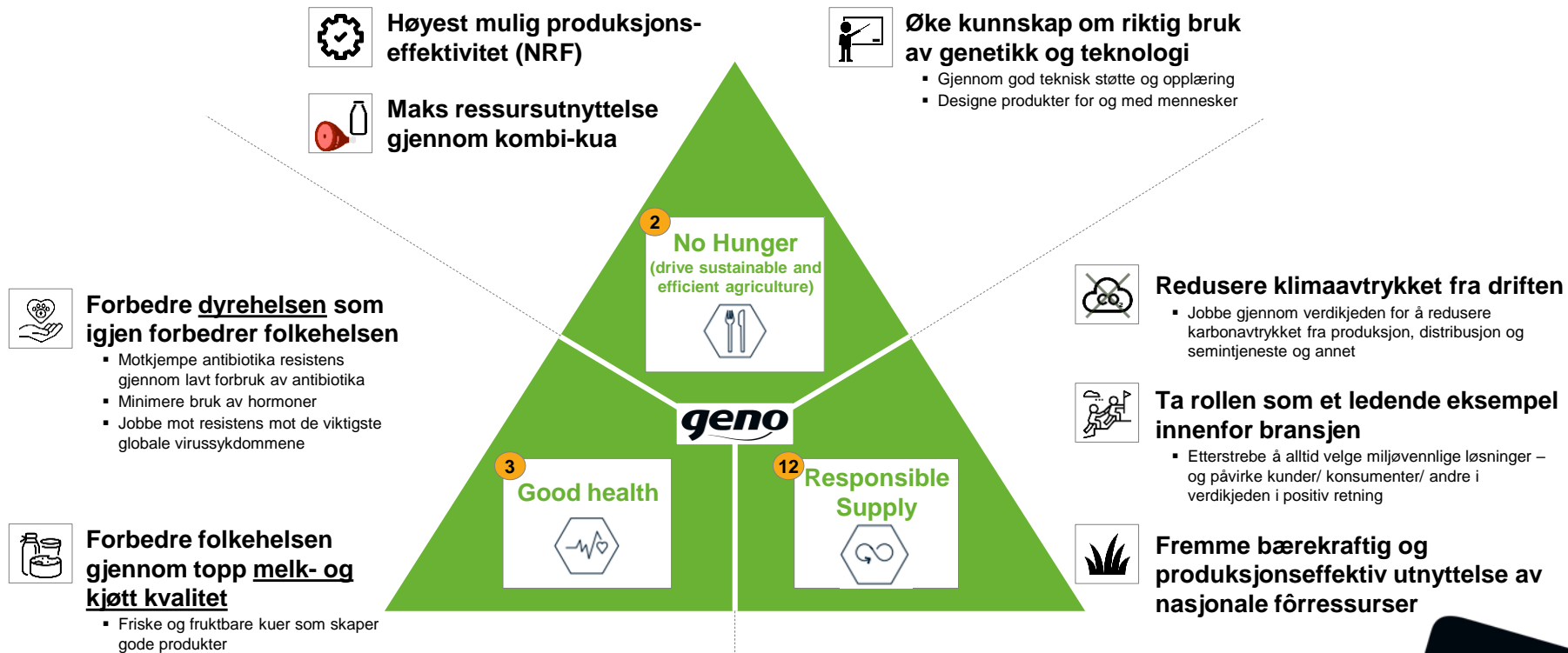


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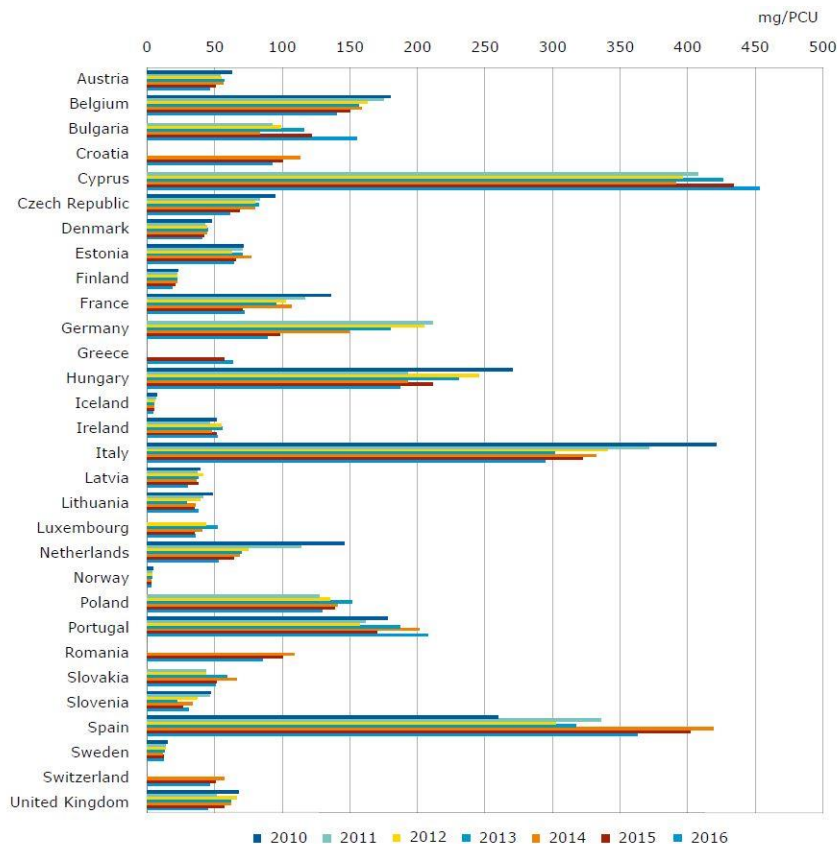
NORWEGIAN RED – selection for functional traits

- 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



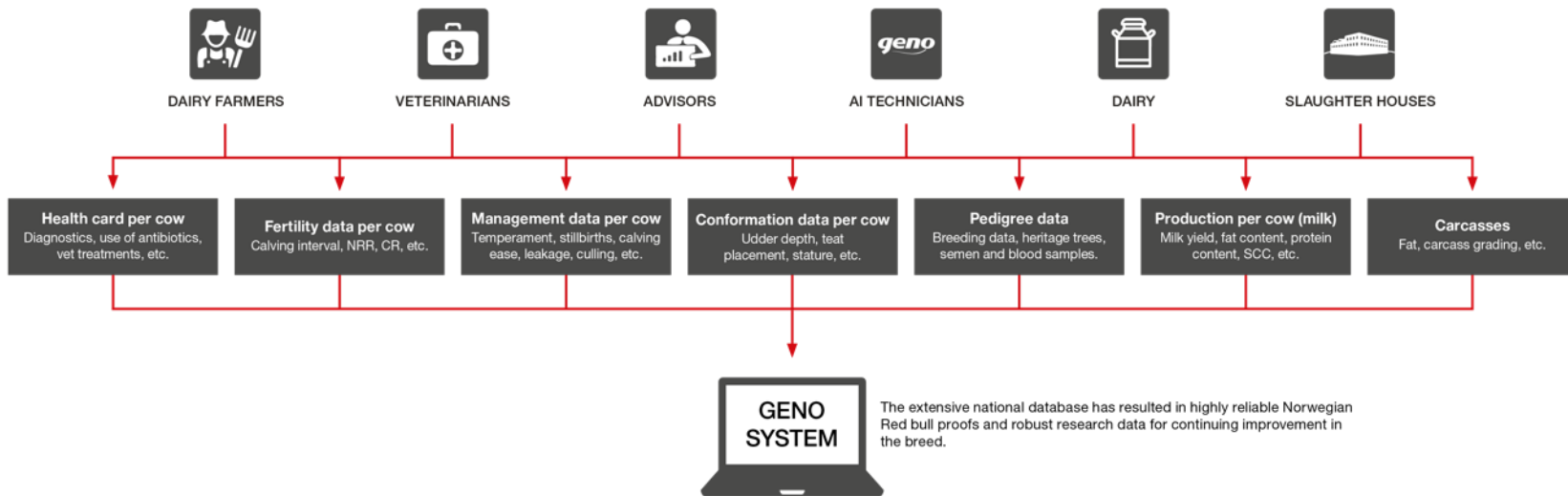
# Norge i en svært gunstig situasjon ift bruk av antibiotika



- 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

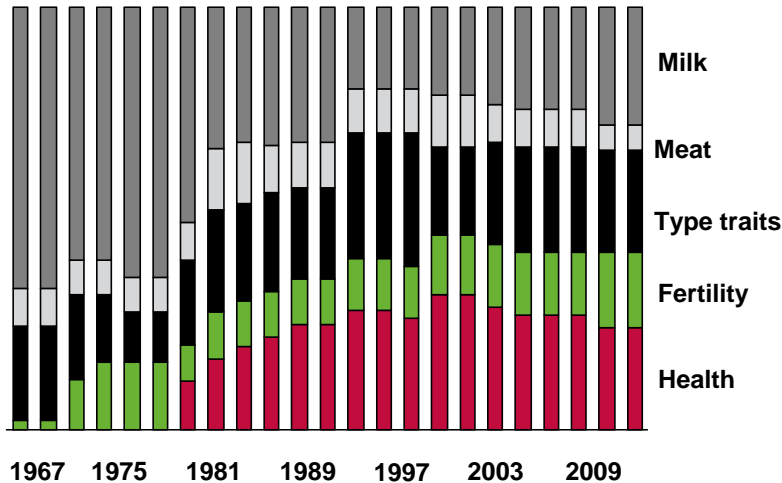
The Norwegian Dairy Herd Recording System in operation since the 1960s



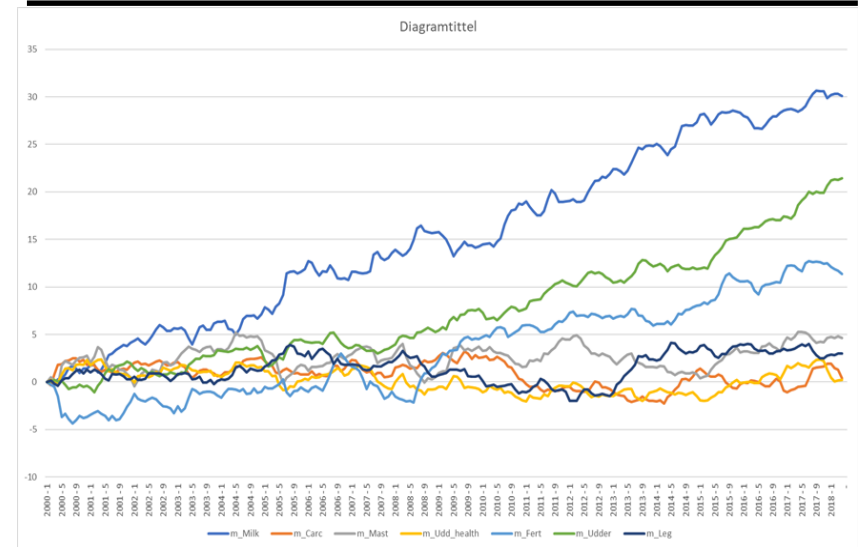
# Breeding program that is based on science and a willingness to implement new traits, technologies and knowledge

## Breeding goal

Weight in breeding goal over time

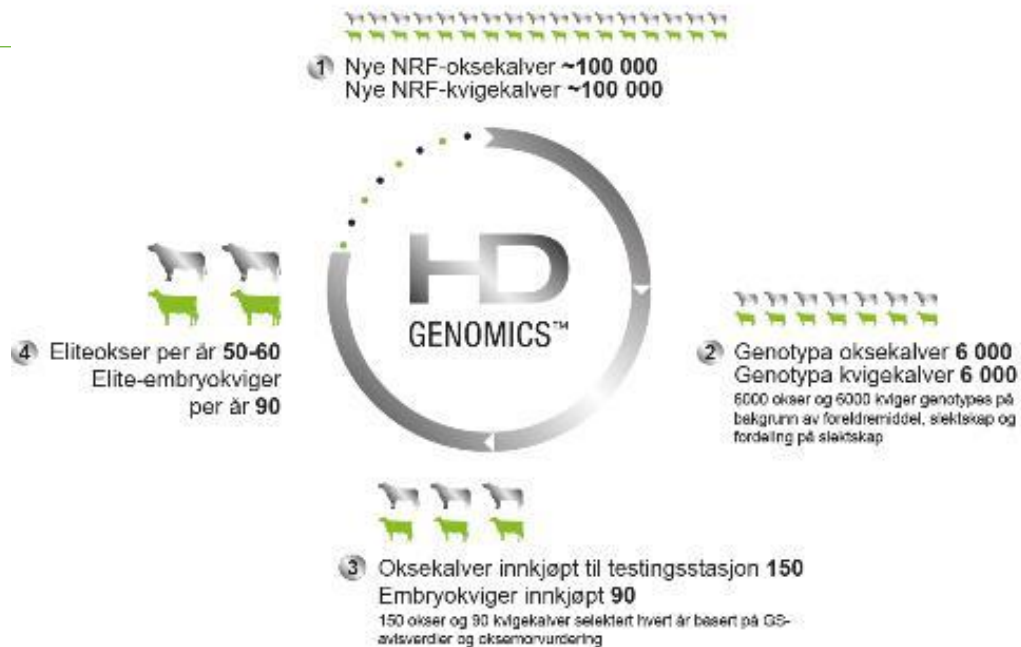


## Development of key traits



## The road to success for Norwegian Red

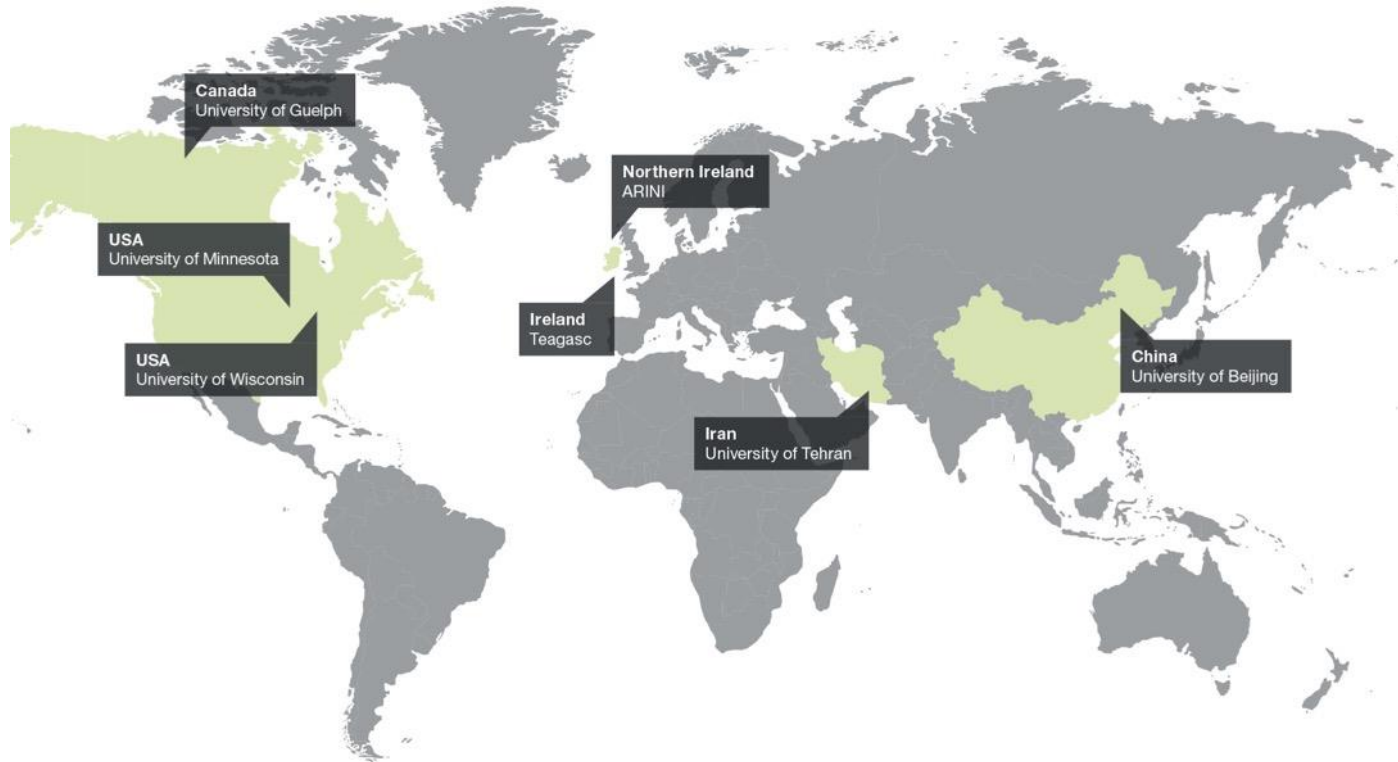
- **For farmers, by farmers:** Geno is a farmer cooperative and breeding organization owned by 9,400 dairy farmers in Norway
- **Balanced breeding goal and long term selection:** Geno has overcome the negative correlation between production and fertility/health traits by keeping a balanced breeding goal 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 avispopulasjon. Det blir født om lag 100 000 oksekulver 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). Produsentene som har disse får tilsendt prøvematenell for uttak av DNA-prøve som sendes tilbake til Geno for beregning av genomiske avisverdier. Geno kjøper om lag 150 av disse basert på genomiske avisverdier 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?

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# Evidence summary

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## HIGHER FERTILITY

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

## IMPROVED HEALTH

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

## IMPROVED EFFICIENCY

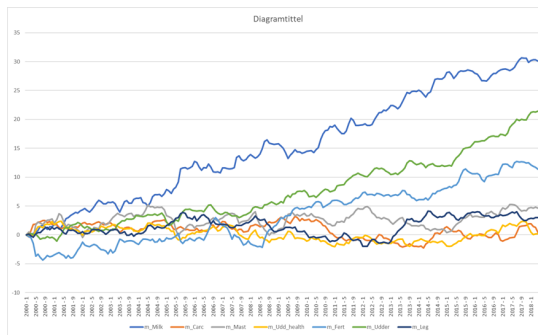
- (MN, USA) 1<sup>st</sup> calving NR x HO crosses had 14.0% fewer instances of dystocia and 8.9% fewer stillbirths than HO herdmaters.
- (CAN) 5% less stillbirths in heifers for NR x HO crosses compared to HO herdmaters
- (N. IRE) Purebred NR had a higher % of unassisted calvings in lactations 1-4 than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

# 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

