



# Nordic Red Dairy Breeds "Sustainability in breeding"

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# What breeds/populations?

- ◆ Finnish Ayrshire FAY 171.000
- ◆ Danish Red RDM 42.000
- ◆ Norwegian Red NRF 242.000
- ◆ Swedish Red&White SRB 146.000
- ◆ *50% of all Nordic dairy cows*
- ◆ German Angler 12.000
- ◆ *In "cluster" also Estonian Red, Lithuanian Red, Aussi Red, S.African Red and more - Ay ancestry*  
*Breeding: 400 test sires each yr. 100-250 daus pr sire. > 30% of all ai*



# Short characteristics:

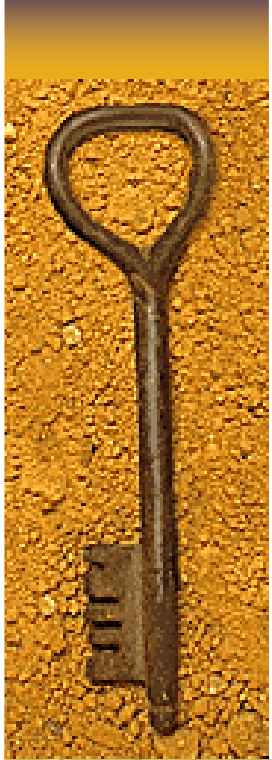
	Milk/Fat/Protein	National Av.
◆ <b>FAY</b>	8472/363/293	8639/361/297
◆ <b>RDM</b>	8560/364/300	8778/378/301
◆ <b>NRF</b>	6541/275/218	=
◆ <b>SRB</b>	8633/373/301	9107/376/310

- ◆ > 90% in milk recording/registered
- ◆ Cooperative structure of breeding



# Nordic Reds vs Holstein characteristics

- ◆ - 700-900 kg milk, - 5-15 kg fat, - 10-20 kg protein
- ◆ - 4-6 cm in stature
- ◆ 2-3% less mastitis
- ◆ 15 days shorter calving interval
- ◆ 3-5% less stillborn calves



# Dairy Breeds are narrowing the base!

- ◆  $N_e$  often  $< 100$
- ◆ Genetic possibilities decided by  $N_e$
- ◆ Effective breeding gives inbreeding!  
 $\Delta F = 1 / N_e$
- ◆ Management of the *breeding* population *can* balance inbreeding/ selection/diversity

Swedish Reds  $< 0.7\%$  pr. gen.      2% level

Swedish Holstein  $< 0.5\%$  pr. gen.    4,5 level



# Nordic Dairy Cattle

## - together in operation-

- ◆ Enlarged population, mainly bull sires in common from 60's
- ◆ Joint & int. breeding evaluation (NAV & Interbull)
- ◆ Similarity/Harm. in registrations - rg 0.7 - 0.9
- ◆ Total Merit Indexes stressing functional traits
- ◆ Early start-up use of breeding values from reg. for fertility, mastitis, diseases and hoofs.
- ◆ Breeding goals - rg 0.8 approx.
- ◆ Use of Optimal selection procedures
- ◆ **"NORDIC BREEDING PROFILE"**

2008 joint Swe-Dan breeding comp. - others to follow?



# Total Merit Index - NRF

## Partial weights%

- ◆ Kg protein 24
- ◆ Mastitis 22
- ◆ Fertility 15

*Function:*

*Udder 15*

*Growth 9*

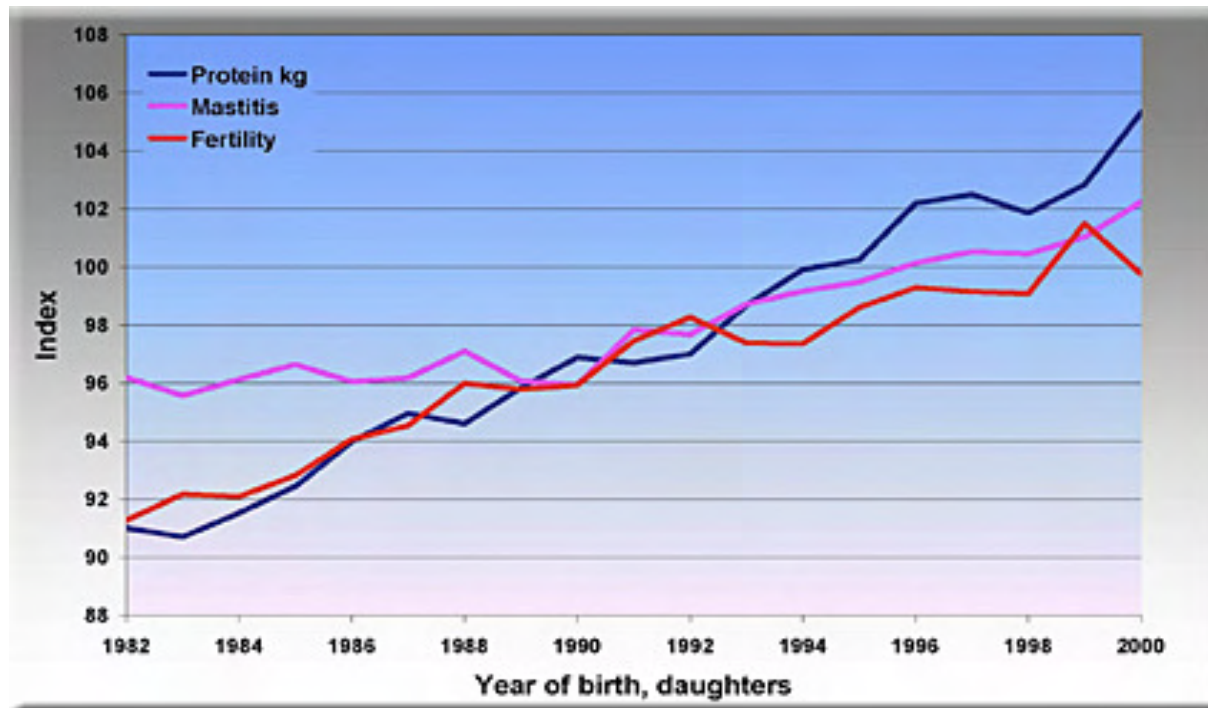
*Legs 6*

*Temperament 4*

*Other diseases 3*

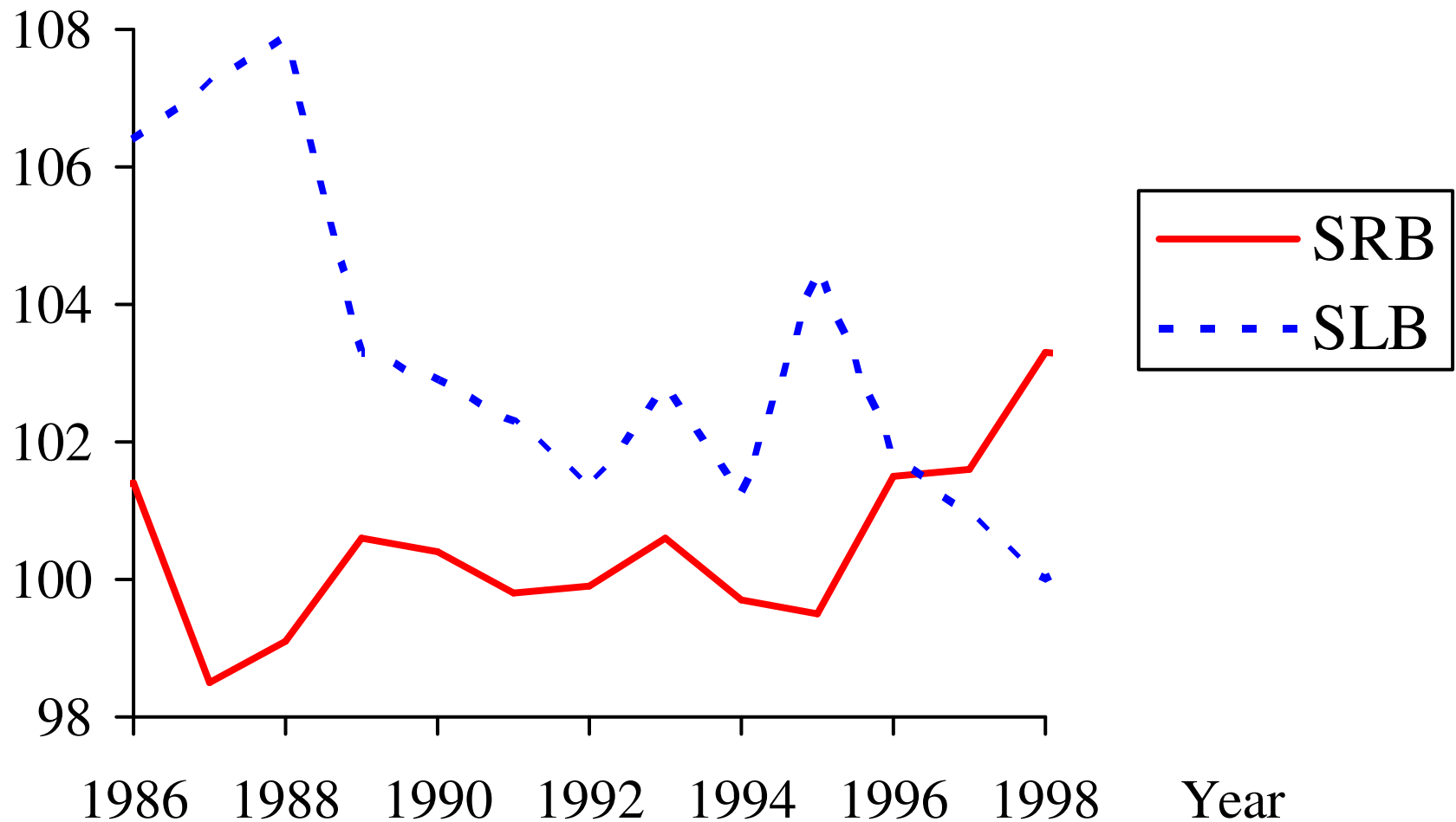
*Calving ease 1*

*Stillbirths 1*





## Fertility index



**Genetic trends in female fertility for Sw. Red & White and Sw. Holstein. Average EBVs for young bulls**

# Making the alternative to Holstein

- ◆ Competitive in pure breeding

  - \* *Analysis (Swe) 2007: SRB economy = Holstein*

- ◆ Competitive in cross breeding

  - \*\* *Studies from California, Ireland:*

- ◆ *Fat+prot > Hol, better calving and fert. characteristics*

- ◆ Independence of imports

  - \* Excl. of earlier holstein influence

- ◆ Alternative in rot. crossing

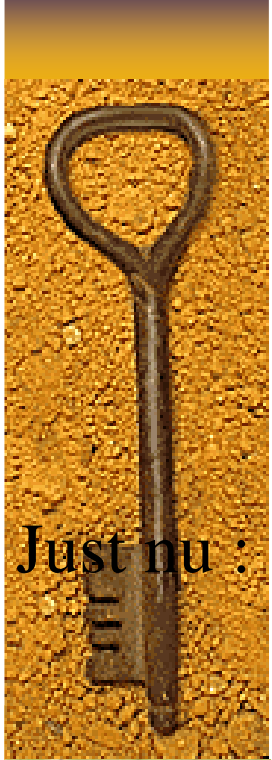
- ◆ Considering G\*E interactions

  - Int. use increases "global Ne" - sustainability



# Check list sustainability in operation:

- ◆ Market situation well defined
- ◆ Breeding goals well defined and accepted
- ◆ Technical, economical and human resources in place
- ◆ Inbreeding monitored and controlled
- ◆ Genetic trends and correlations calculated and monitored
- ◆ Check points evaluated over time



# Supervising sustainability!

- ◆ Sweden 2006: Monitoring and publication on sustainability requested from breeding organisations by law (effective population, rate of inbreeding etc.)
- ◆ Norway 2005: Notes on sustainability included in yearly statistics and reports from major breeding companies on a voluntary basis
- ◆ Cryo gene bank (semen) storing since 60's



# *Commercial populations can manage sustainable breeding programs:*

- 1. Competitive on market*
- 2. Breeding goal incl. Production + functional and health traits - TME*
- 3. High participation in registrations*
- 4. Smaller populations are enlarged ("clustered") with similar breeds*
- 5. Optimal selection is applied*
- 7. Transparent and well accepted by the farmers*
- 8. Resources for both running and investment*  
*Nordic Reds meet all these demands*

Strong International Position and Success =

**Verdict of Sustainable  
& Competent Breeding**

