A NEW FERTILITY INDEX IN NORWEGIAN RED

Anne Guro Larsgard, agl@geno.no

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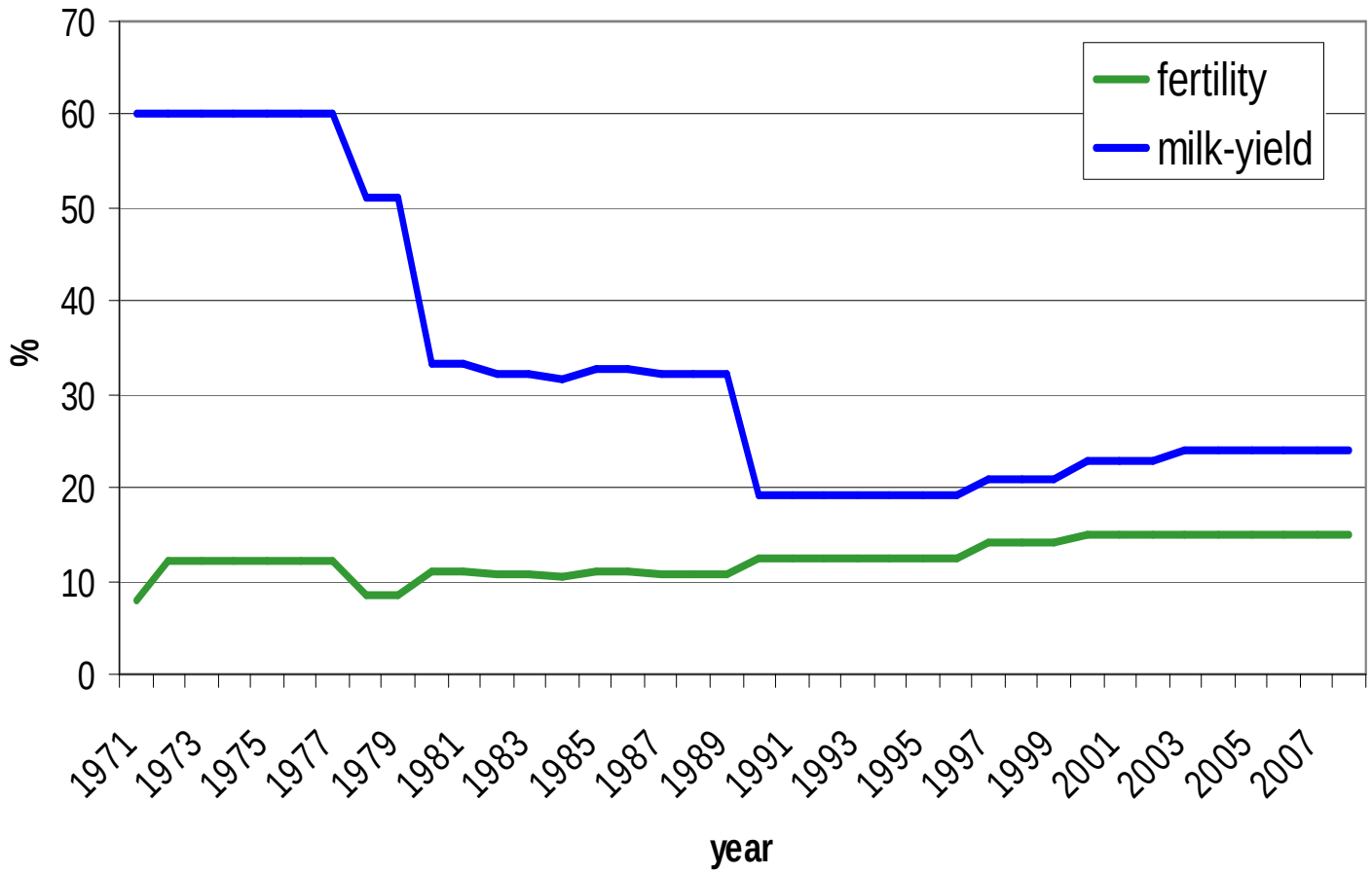
OUTLINE

- The history of breeding for fertility in Norwegian Red
- Changes in the new index
- Phenotypic and genetic trends

HISTORICAL DEFINITION OF THE TRAIT

- From 1971 to 2002:
  - **Non-return rate 56 days past 1st insemination on heifers**
- From 2002-2008:
  - **Non-return rate 56 days past 1st insemination on heifers** **2/3**
  - **Non-return rate 56 days past 1st insemination on 1. lactation cows** **1/3**

THE RELATIVE WEIGHT OF FERTILITY AND MILK YIELD IN THE BREEDING GOAL OF NORWEGIAN RED



CHANGES IN NEW INDEX

- **New traits included**
  - **Ability to recycle**
    - Intervall from calving to 1st insemination
- **Information from later lactations**
  - **2nd and 3rd lactation**
- **Replacing sire model by animal model**

FIVE TRAITS

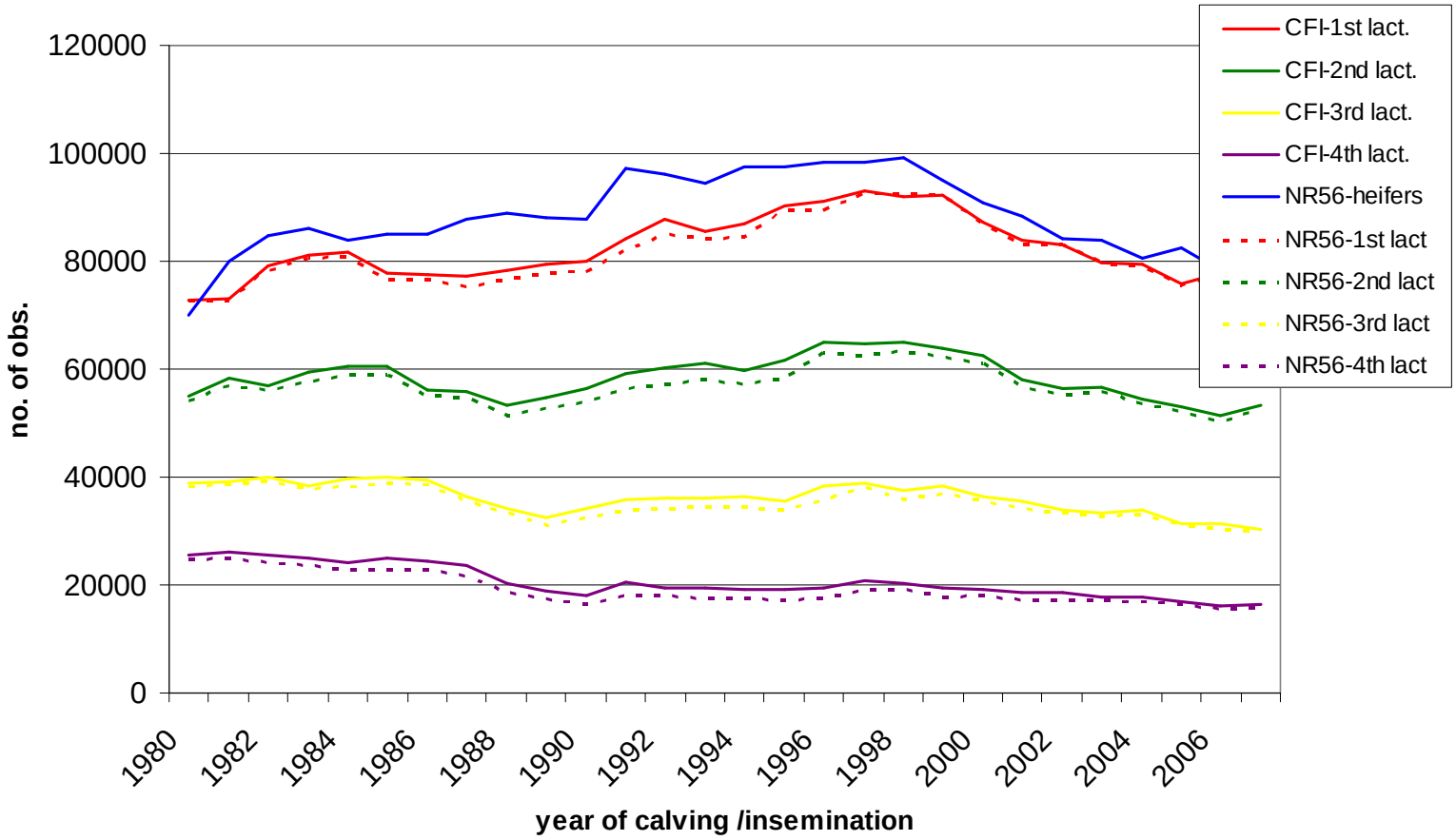
- NR 56 days past 1st insemination
  - **NR56 – heifers**
  - **NR56 – 1st lact**
  - **NR56 – 2nd-3rd lact – repeatability model**

} multitrait

- Intervall from calving to first insemination
  - **CFI – 1st lactation**
  - **CFI – 2nd- 3rd lactation - repeatability model**

} multitrait

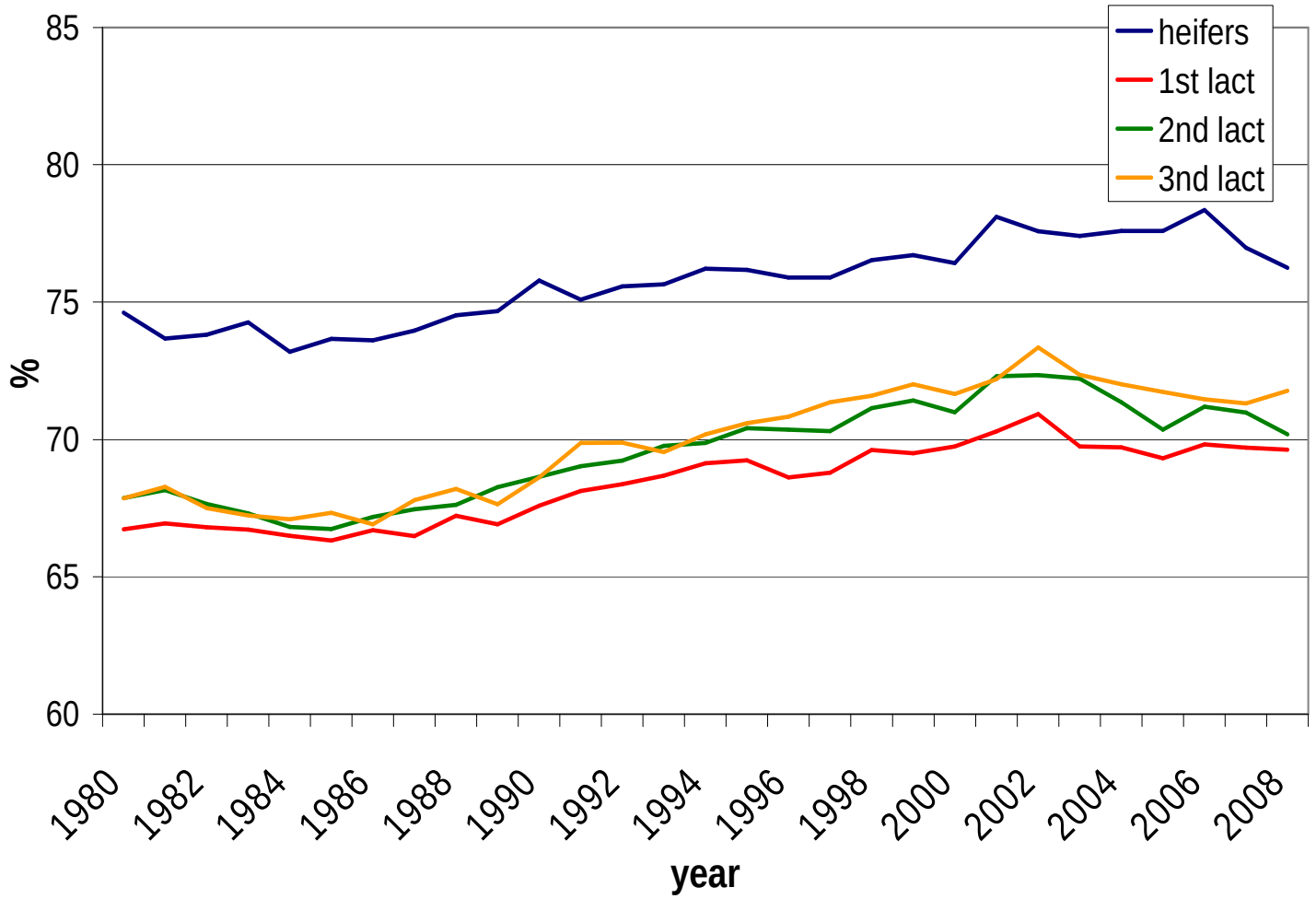
No. of obs. per year and lactation



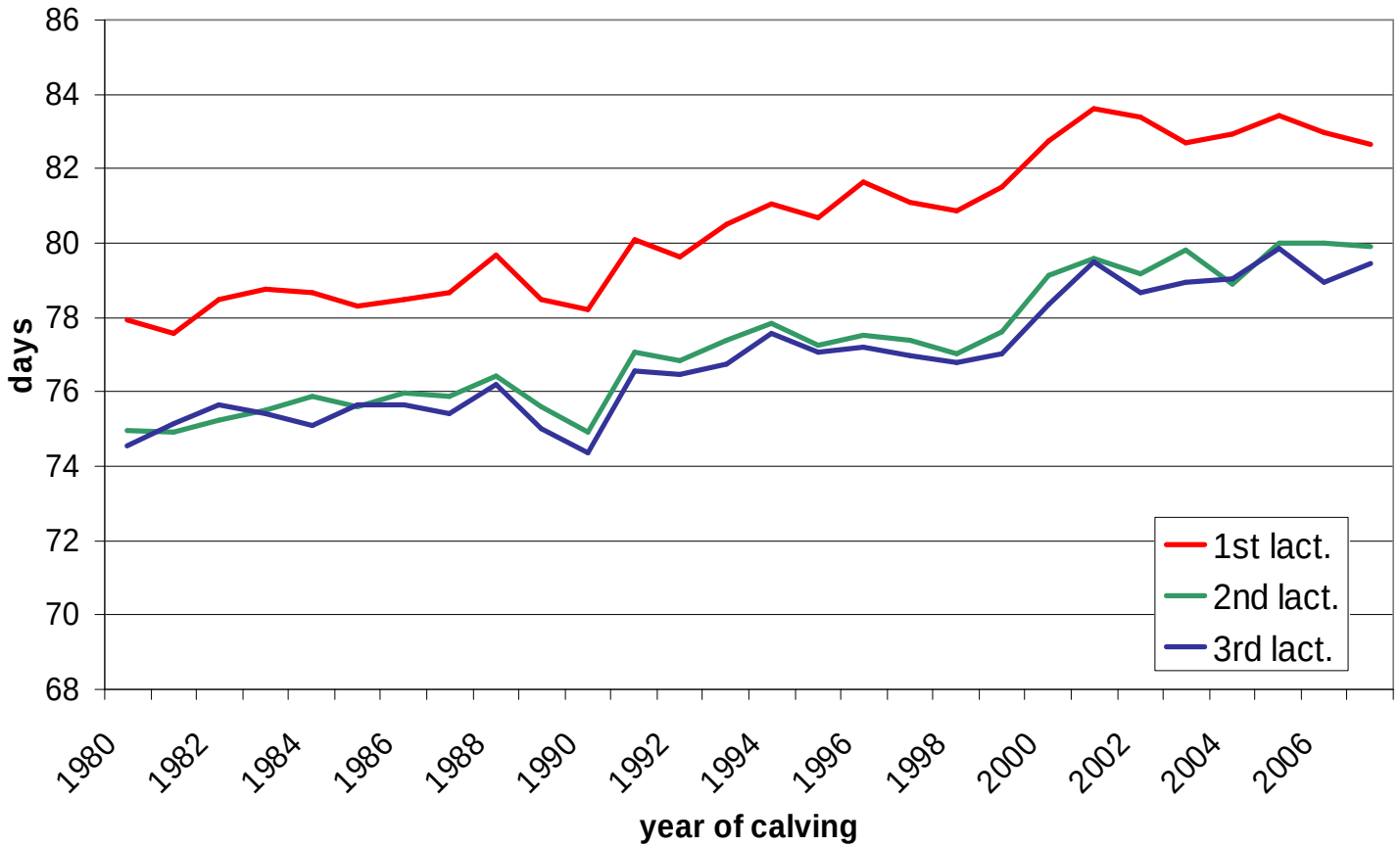
No. of observations and means

	Mean	No obs.
NR56-heifers	75,7 %	2 547 929
NR56-1st lact.	68,4 %	2 303 151
NR56-2nd-3rd lact	69,7 %	3 202 617
CFI-1st lact.	80,6 days	2 335 815
CFI-2nd-3rd lact.	77,0 days	3 285 616

PHENOTYPIC TREND OF NR56



PHENOTYPIC TREND FOR CFI



GENETIC PARAMETERS

	NR56			CFI	
	heifers	**1st lact**	**2nd-3rd lact**	**1st lact**	**2nd-3rd lact**
heifers	0.030				
1st lact	0.648	0.037		0.083	
2nd-3rd lact	0.556	0.915	0.029	0.830	0.062

Heritabilities and genetic correlations

STATISTICAL MODELS USED

NR56 heifers=

HerdYear **+ Age at 1.ins. + Mo*Dblins +** ***Animal*** **+** ***Residual***

NR56 cows=

HerdYear **+ Age at 1.ins. + Mo*Year*Dblins +** ***Animal*** **+** ***Perm. env. eff*** ****)*** **+** ***Residual***

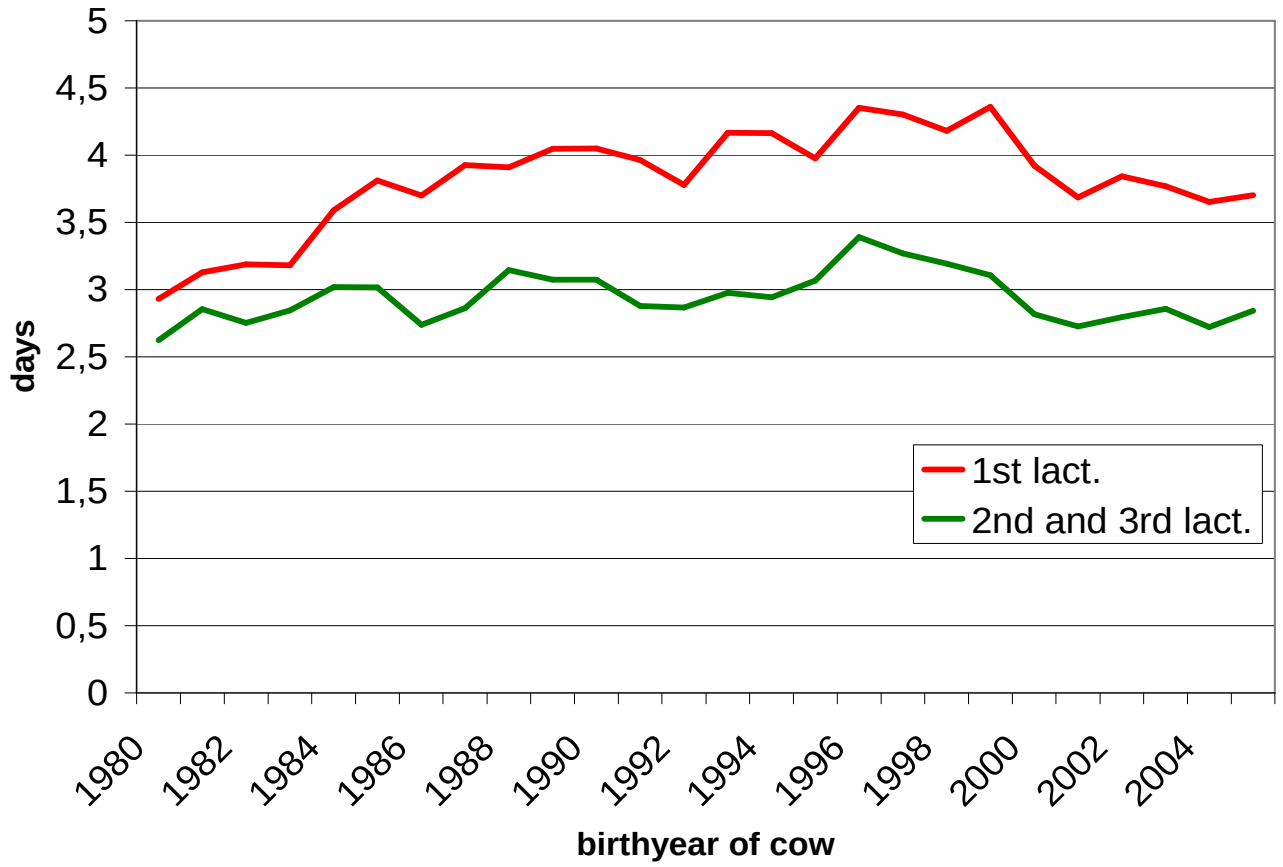
CFI=

HerdYear **+ Age at calving + Mo*Year +** ***Animal*** **+**

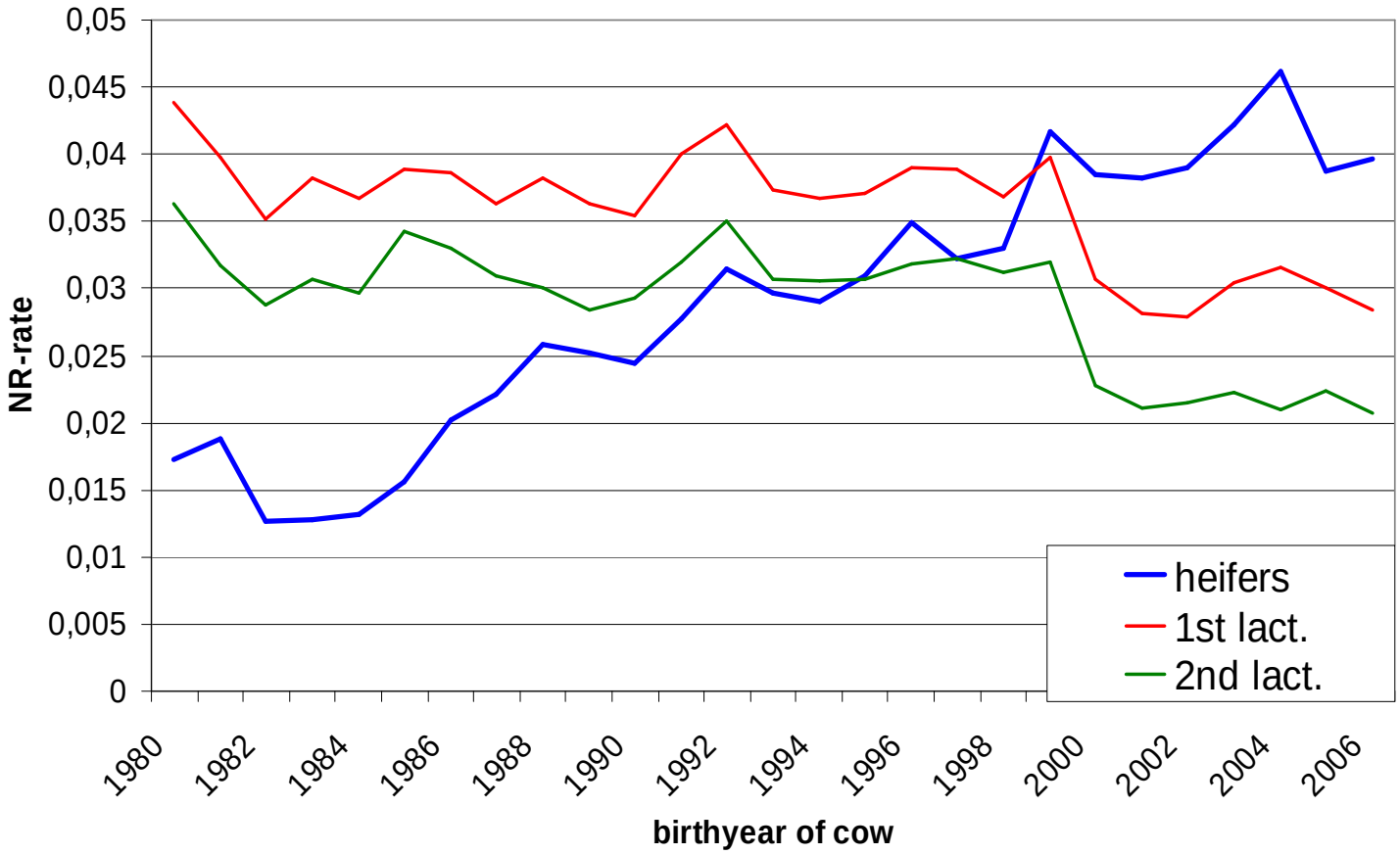
Perm. env. eff*) **+** ***Residual***

****) only on 2nd and 3rd lact data***

GENETIC TREND FOR CFI



GENETIC TREND FOR NR56



THE CONTENT OF THE NEW FERTILITY INDEX

(1/3 * NR56-heifers) + (1/3 * NR56-cows) + (1/3 * CFI)

where

- **NR56-cows = (2/3*NR56-1.lact) + (1/3*NR56-2nd-3rd lact)**
- **CFI = (2/3*CFI-1.lact) + (1/3*CFI-2nd-3rd lact)**

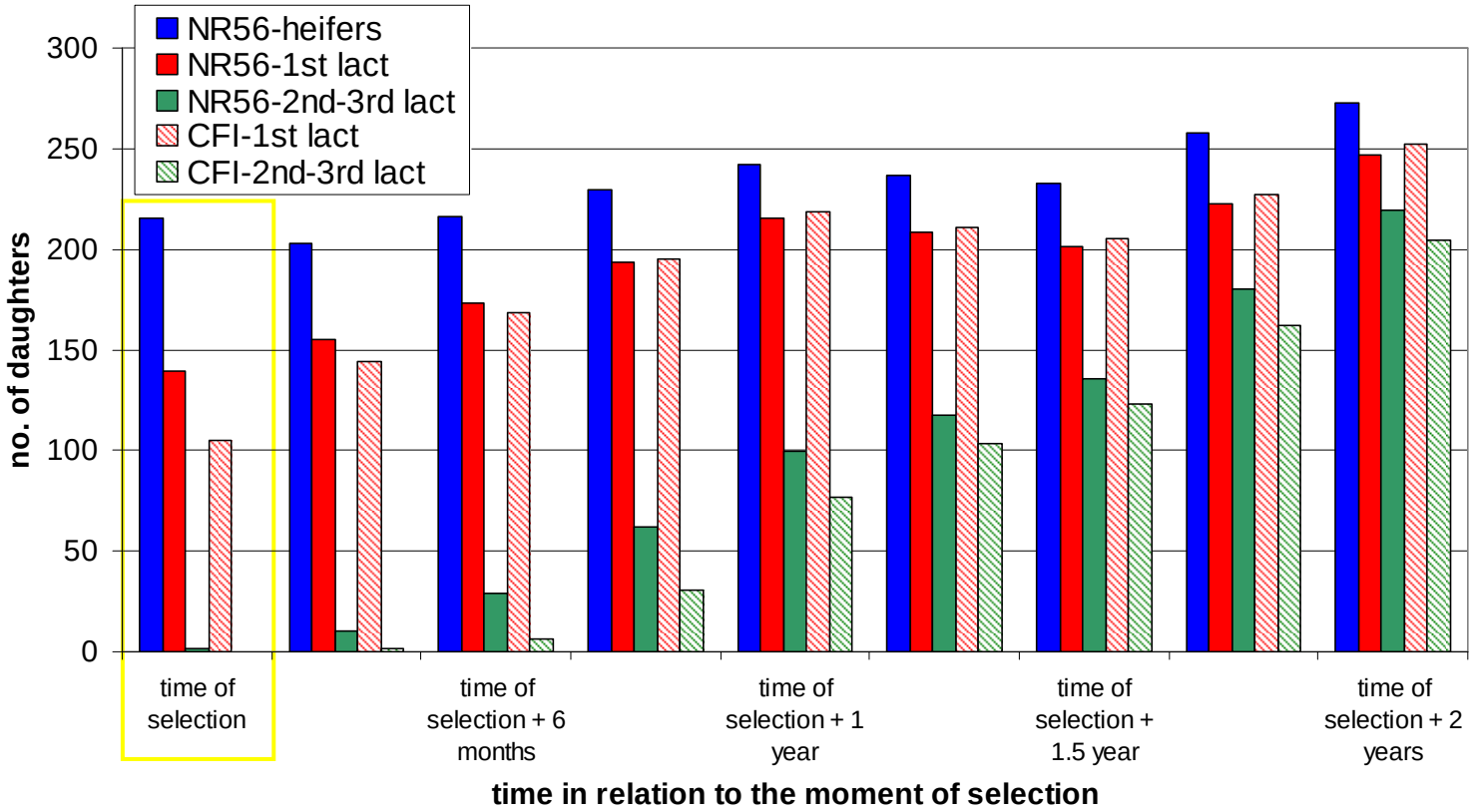
DECIDING THE COMPOSITION OF THE FERTILITY INDEX

The arguments for choosing this actual weighting:

1. Fertility problems is most pronounced in 1st lactation

2. By the time a bull is progeny tested for the first time and the selection of elitesire is performed, there is only minor information on 2nd and 3rd lact cows. That means that the genetic solutions for 2nd and 3rd lactation fertility is based on
   - **Information on heifer and first lactation results through the genetic correlations between traits**
   - **Information on distant relatives**

DAUGHTERGROUPS IN RELATION TO MOMENT OF SELECTION OF ELITE BULLS



FURTHER WORK ON FERTILITY

- All five fertility traits run multitrait
- Run fertility traits multitrait with milk yield
- Include more fertility traits