



# ***Estimation of genetic parameters of fertility traits, for virgin heifers in The Netherlands***

Pedro Vessies, Lydia de Haer

CRV – The Netherlands

# Contents

- **Introduction**
- **Materials and methods**
- **Results**
- **Conclusions**
- **Discussion**



# Introduction

Currently, no virgin heifer trait in The Netherlands and Flanders for international evaluation

Candidate traits:

- Conception Rate (CR)
- Non-return at 56 days (NR56)
- Interval between first and last insemination (IFL)
- Age at first insemination (AFI)

# Materials

- Herdbook registered animals of least 87.5% HF
- Animals should at least have inseminations as virgin heifer and/or in lactation 1
  - First inseminations of virgin heifers ranged from Jan 2002 to Dec 2003
  - Calvings in lactation 1 ranged from Sep 2002 tot Aug 2004
- Data till lactation 3 were used

## In total:

- 456,622 animals (heifers and cows)
- 6,170 sires
- 22,854 herds

# Definition of traits

- CR = 1 / number of inseminations
  - no next calving: cr=0
  - gestation length < 45 days: cr = missing
  - gestation length > 300 days: cr =0
- AFI = number of days between birth and first insemination (virgin heifers (VH))
- NR56 = 1 when pregnant / 0 not pregnant
- ICI = number of days between calving – first insemination
- IFL = number of days between first – last insemination.  
57 penalty days are added when:
  - gestation length < 265 or > 300 days
  - no next calving
  - interval between two inseminations > 150 days
- CI = number of days between two calvings

# Heritabilities

	VH	Lact. 1	Lact. 2	Lact. 3
AFI	0.23			
NR56	0.01	0.02	0.02	0.02
IFL	0.02	0.03	0.04	0.04
CR	0.01	0.03	0.03	0.03
ICI		0.08	0.09	0.11
CI		0.07	0.07	0.08

*St.errors 0.001 to 0.011*

# Genetic correlations between virgin heifers and lactation 1

		AFI	NR56	IFL	CR
VH	NR56	0.29			
	IFL	0.08	-0.59		
	CR	0.08	0.81	-0.90	
Lact. 1	NR56	0.39	0.68	-0.31	0.55
	IFL	0.12	-0.36	0.66	-0.53
	CR	0.11	0.61	-0.57	0.64
	ICI	0.25	0.25	0.27	-0.01
	CI	0.20	-0.10	0.42	-0.29

St.errors: 0.005 to 0.010

# Genetic correlations with lactations 2 and 3

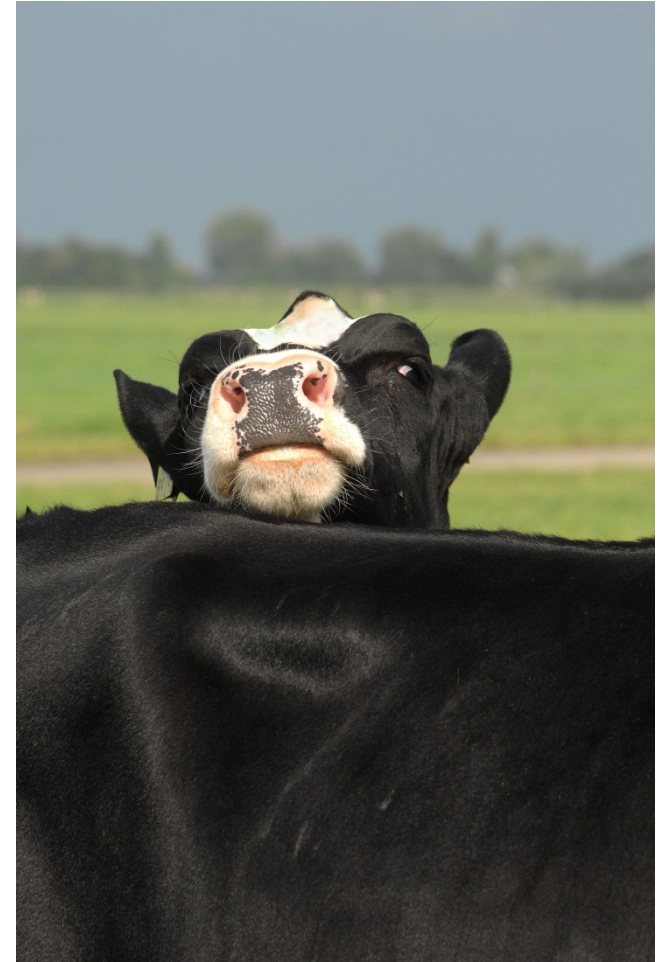
		AFI	NR56	IFL	CR
<b>Lact. 2</b>	<b>NR56</b>	0.29	0.66	-0.26	0.47
	<b>IFL</b>	0.25	-0.27	0.52	-0.43
	<b>CR</b>	-0.05	0.48	-0.43	0.49
	<b>ICI</b>	0.42	0.22	0.17	-0.00
	<b>CI</b>	0.38	0.00	0.38	-0.22
<b>Lact. 3</b>	<b>NR56</b>	0.21	0.48	-0.28	0.38
	<b>IFL</b>	0.44	-0.22	0.47	-0.37
	<b>CR</b>	-0.22	0.36	-0.43	0.41
	<b>ICI</b>	0.48	0.22	0.17	0.00
	<b>CI</b>	0.50	-0.01	0.32	-0.21

*St.errors: 0.005 to 0.010*



# Conclusions

- Fertility traits for virgin heifers are heritable
  - heritabilities: 0.01 to 0.02
  - heritability for AFI: 0.23
- Moderate to strong correlations within virgin heifer traits
- Moderate correlations between same traits measured in virgin heifers and in cows
  - > virgin heifer traits are different traits than cow traits



# Interbull correlations between countries

For trait T1 (heifer fertility):

- NR56 used by: Canada, Germany/Austria, Denmark, Sweden, Norway and Poland.
- CR used by: USA, France, Czech Republic.

	<b>Avg. Corr.</b>
NR56 - NR56	0.89
CR - CR	0.88
NR56 - CR	0.79

-> Correlations between countries are not depending on trait

# Discussion

How to proceed?

- NR56 and CR possible T1 traits
- CR is a more continuous trait

We will use CR, as we will use CR for cows in  
stead of NR56

Harmonisation across countries necessary?

