Genomic prediction
NAV SAC group
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STØTTET AF
mælkeafgiftsfonden

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RDC/JER	Old model	New model 2nd July	Comments
Pedigree in genomic prediction	Sire-Maternal grandsire	Animal Model	Effect on level for candidates and cows for traits with large genetic trend
Reference population	Bulls	Bulls + cows	6800 Jersey cows and 10000 RDC Cows included
Blending method	Method developed by MTT in 2010	Revised blending method developed by MTT in 2013/14	Revised method better avoid double counting, which make it possible to include females in ref population

Reference population August 2014

	Reference population	
	Bulls	Cows
Holstein	25700[a)]	-
RDC	7800[b)]	10000
Jersey	2400[c)]	6800

a) Including NLD, FRA, DEU, ESP ref bulls
b) including NO ref bulls
c) including US ref bulls

Extra reliabilities next to pedigree information for RDC using bulls or bulls+cows in the reference population – female information is included for traits market with bold

	Reference population	
	Bulls	Bulls + cows
Milk	**0.17**	**0.23**
Fat	**0.16**	**0.23**
Protein	**0.12**	**0.18**
Yield	**0.13**	**0.18**
Fertility	0.14	0.14
Birth index	0.18	0.18
Calving index	0.02	0.02
Mastitis	**0.17**	**0.23**
Other diseases	0.14	0.14
Frame	**0.24**	**0.29**
Feet & Legs	**0.24**	**0.33**
Mammary	**0.23**	**0.30**
Milkability	**0.17**	**0.22**
Temperament	0.18	0.21
Longevity	0.07	0.07

Extra reliabilities next to pedigree information for Jersey using bulls or bulls+cows in the reference population – female information is included for traits market with bold

	Reference population	
	Bulls	Bulls + cows
Milk	**0.23**	**0.37**
Fat	**0.13**	**0.21**
Protein	**0.18**	**0.32**
Yield	**0.16**	**0.22**
Fertility	0.17	0.17
Birth index	0.00	0.00
Calving index	-0.02	-0.02
Mastitis	**0.09**	**0.16**
Other diseases	-0.11	-0.11
Frame	**0.19**	**0.30**
Feet & Legs	**0.05**	**0.13**
Mammary	**0.26**	**0.29**
Milkability	**0.15**	**0.34**
Temperament	0.00	0.00
Longevity	0.11	0.11

Reliabilities across breeds

- **Compared with Holstein the GEBV reliabilities for RDC and Jersey are still about 12-15% units lower, but significantly higher than before.**
- **In the near future more genotyped RDC and Jersey females will be lactating and be included in the reference population, and the GEBV reliabilities are expected to increase further.**

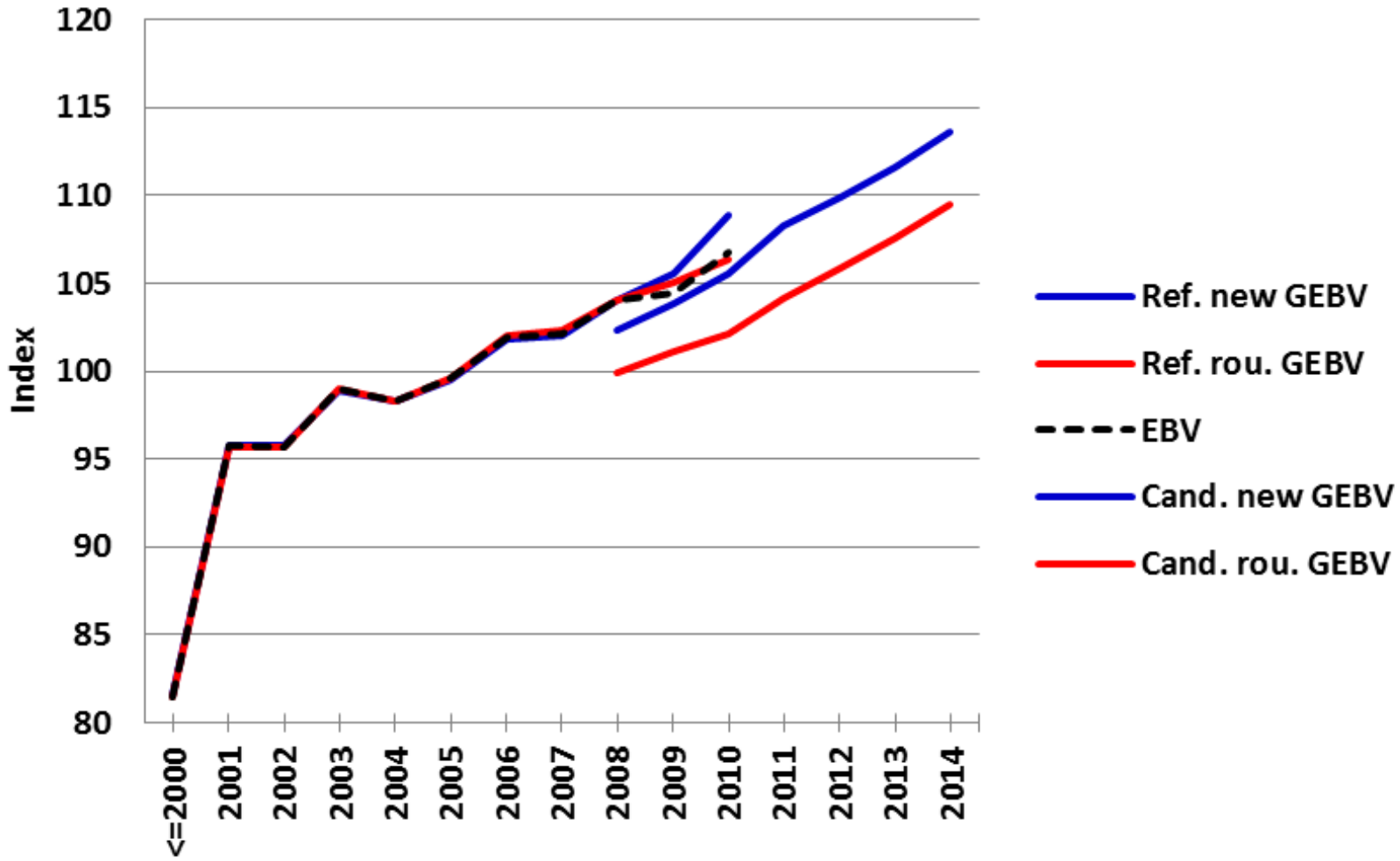
Underestimation has been removed

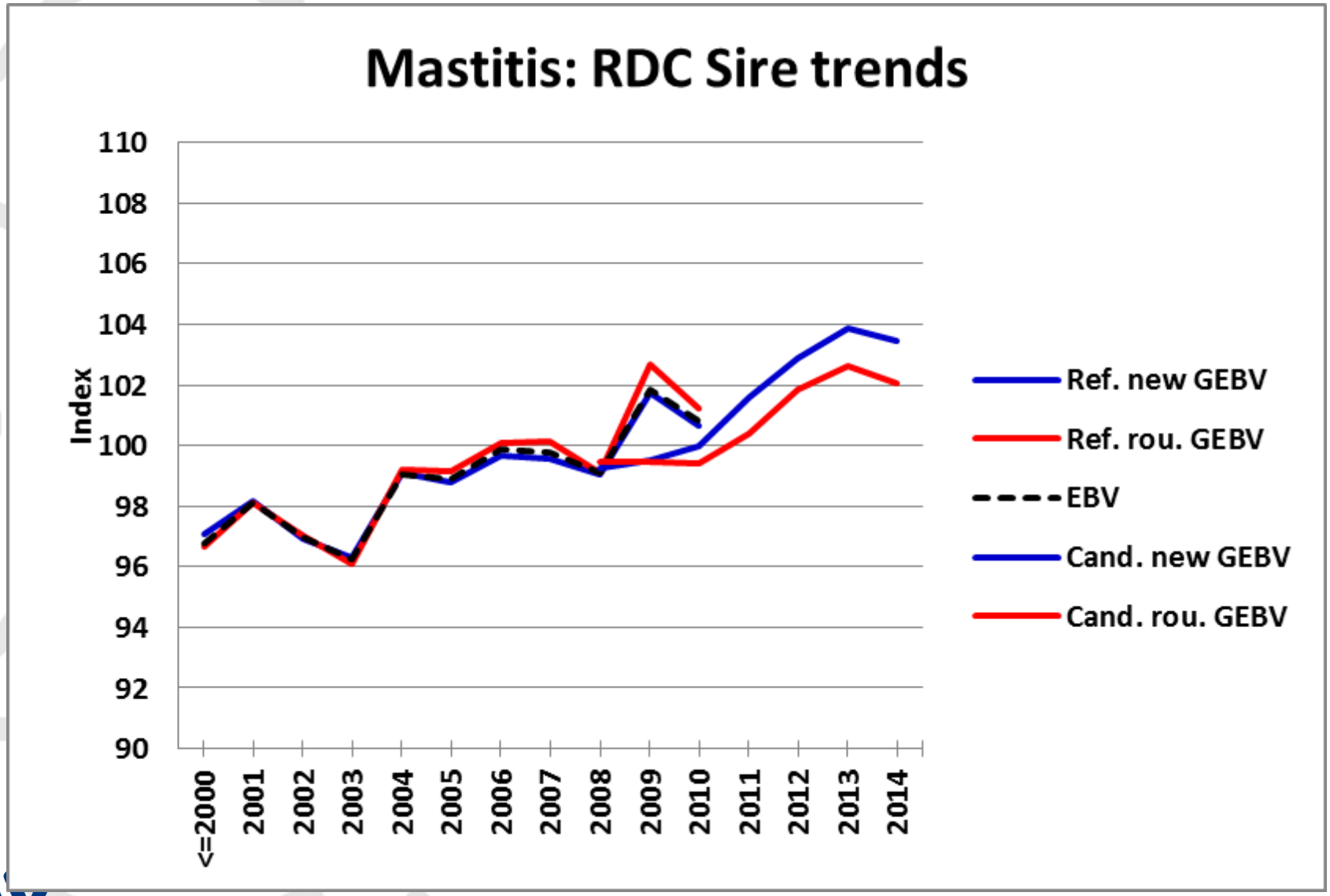
- RDC the genotyped young bulls and heifers increase on average 4 index point for yield index and NTM, and between 0-2 index point for the other traits where cow information contribute to the reference population.
- Jersey the corresponding results show an increase of 2 index point for Y-index and NTM, and 0-1 index point for the other traits where cow information contribute to the reference population.

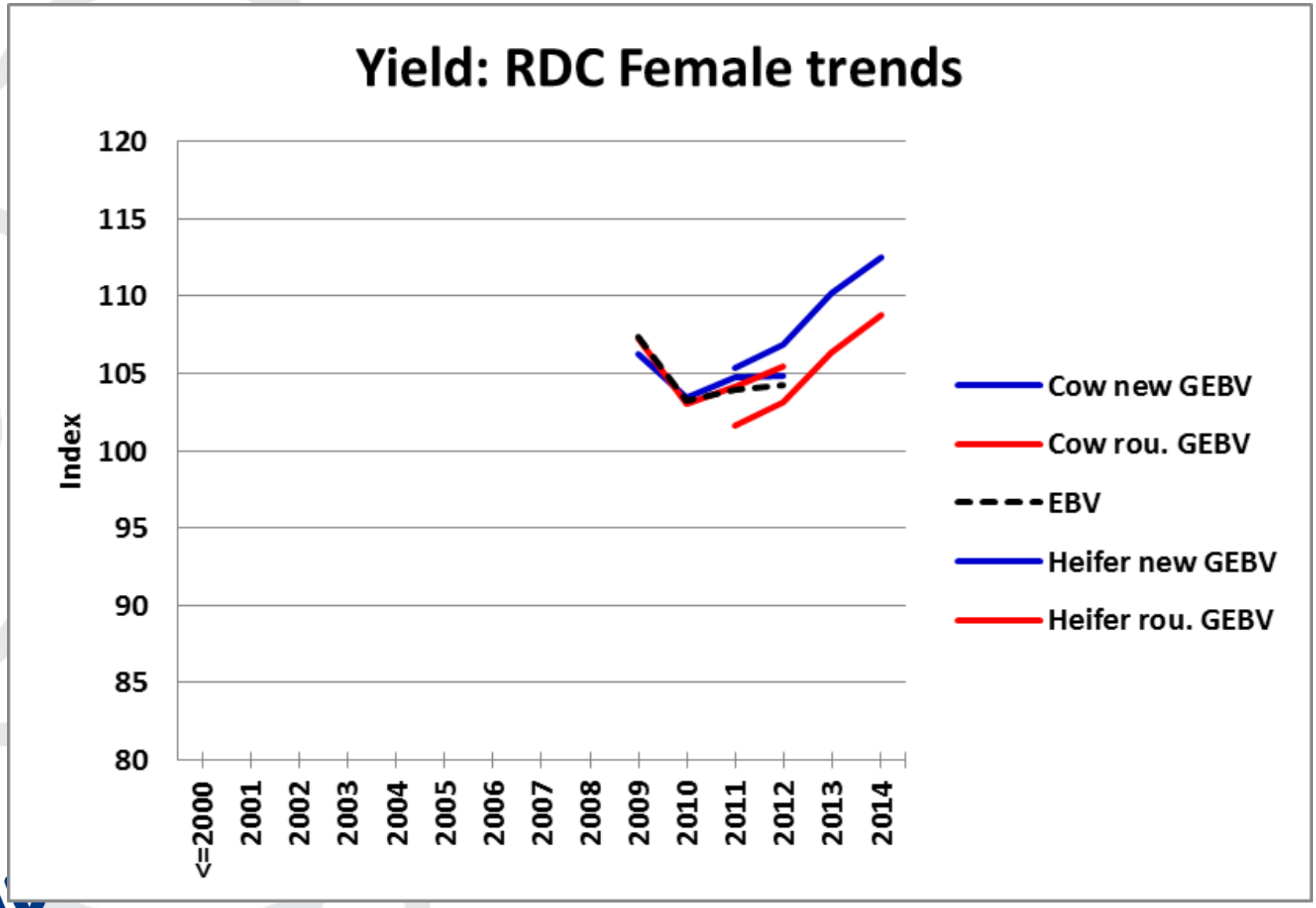
Correlations new-old

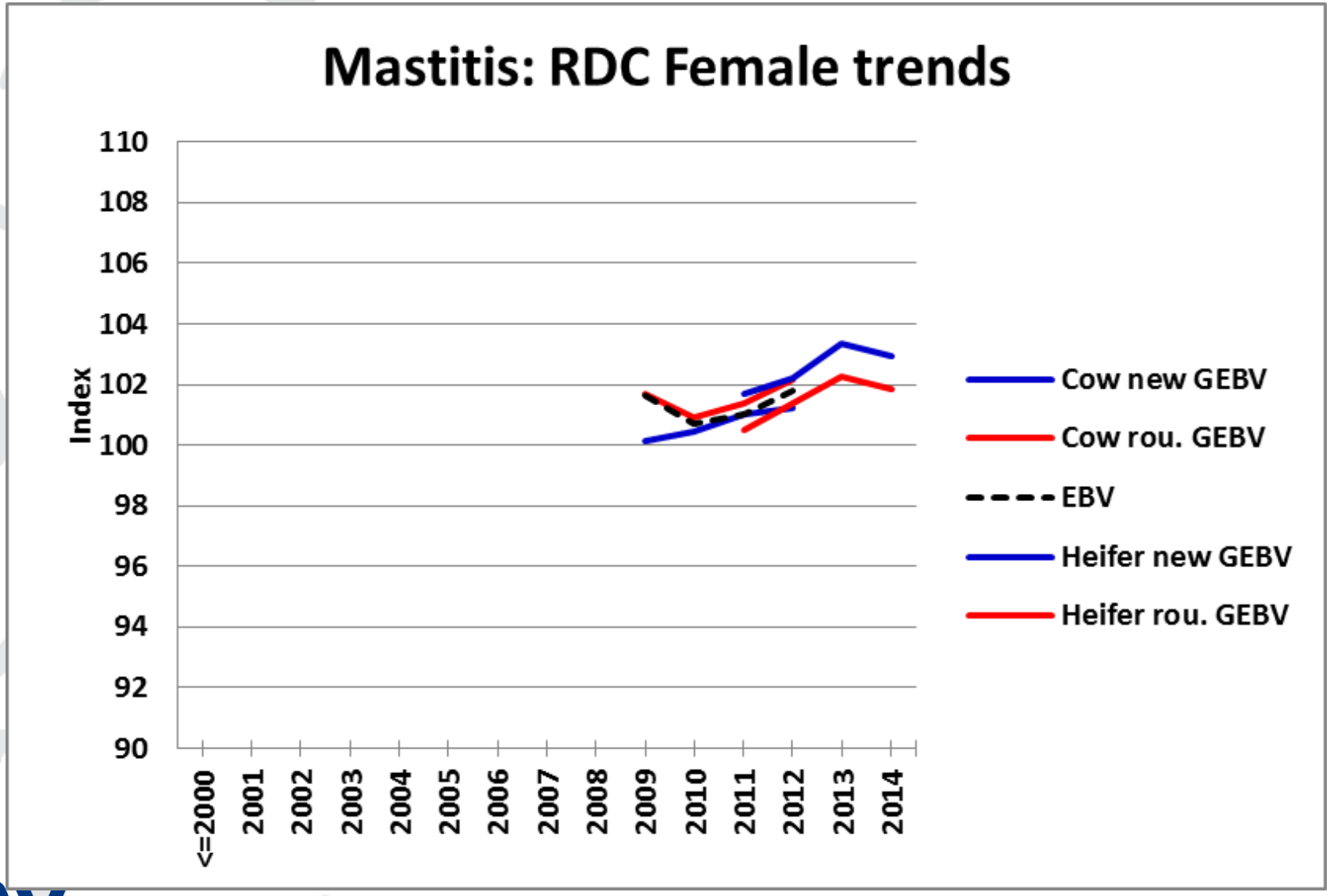
	RDC		Jersey	
	Genotyped young bulls and heifers	Genotyped cows	Genotyped young bulls and heifers	Genotyped cows
Traits without genotyped cows in reference population	0.97-0.99	0.97-0.99	0.94-0.96	0.94-0.96
Traits with genotyped cows in reference population	0.88-0.93	0.89-0.92	0.77-0.85	0.87-0.90

Yield: RDC Sire trends




Mastitis: RDC Sire trends
Index
110
108
106
104
102
100
98
96
94
92
90
<=2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Ref. new GEBV
Ref. rou. GEBV
EBV
Cand. new GEBV
Cand. rou. GEBV


Yield: RDC Female trends
Index
120
115
110
105
100
95
90
85
80
<=2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Cow new GEBV
Cow rou. GEBV
EBV
Heifer new GEBV
Heifer rou. GEBV


Mastitis: RDC Female trends
110
108
106
104
102
100
98
96
94
92
90
Index
<=2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Cow new GEBV
Cow rou. GEBV
EBV
Heifer new GEBV
Heifer rou. GEBV

Status

- **New model was introduced 2 July for RDC/JER**
- **Results for RDC and JER positive received in practice, but we have to more improvements**
- **HOL: Currently still old model, but :**
- **New model for HOL production has been sent to Interbull test.**
- **Implementation is planned for HOL in the coming 6 months**

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