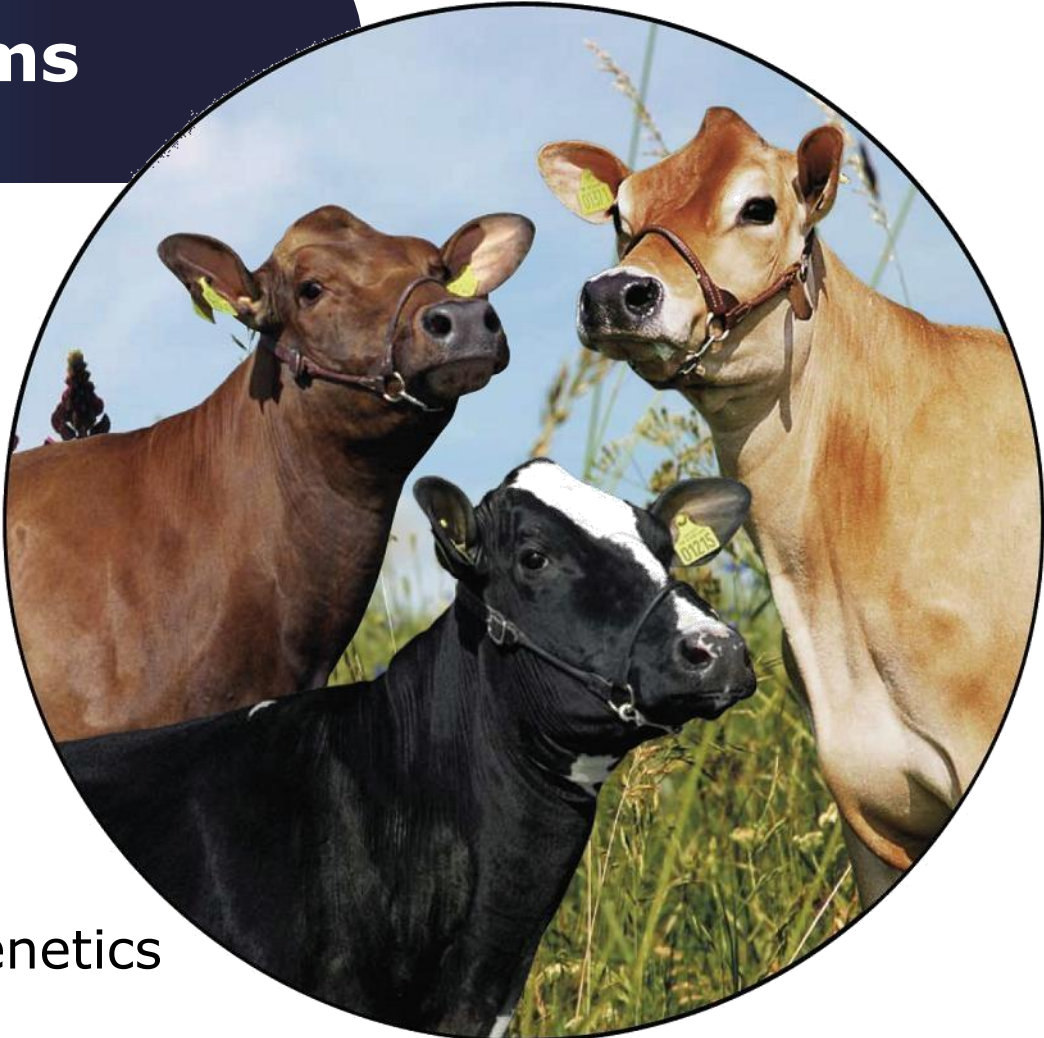




# Genomic selection & Breeding Programs in Nordic countries




Lars Nielsen  
Head of Breeding, VikingGenetics



# Viking Dairy breeding programs

 VIKINGHOLSTEIN® The world breed

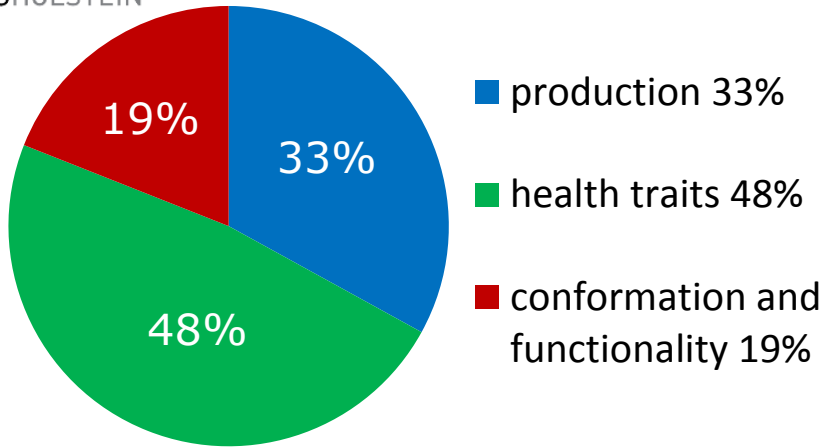
 VIKINGRED® The choice in all cross breeding programs

 VIKINGJERSEY® The "efficient choice"

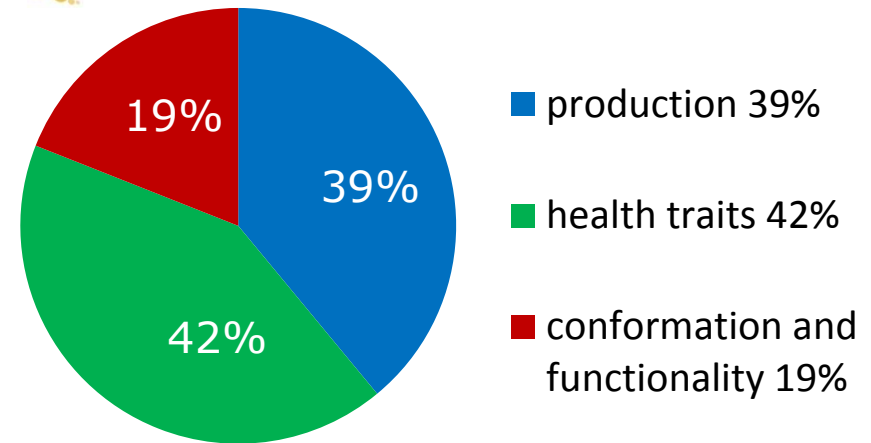
# NTM – Nordic Total Merit



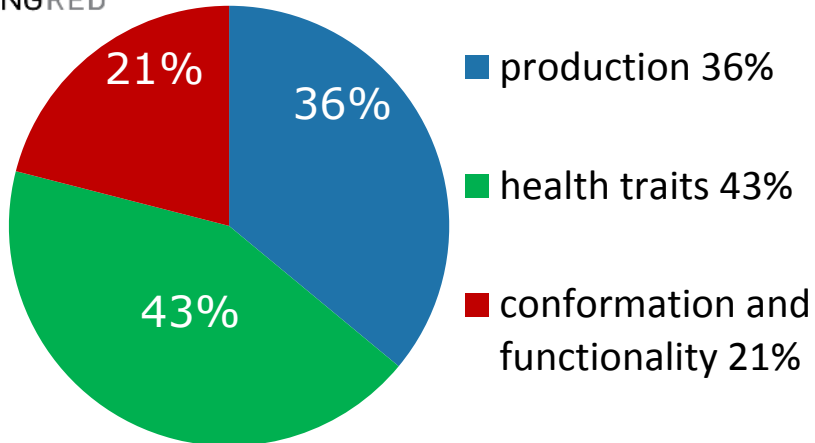
VIKINGHOLSTEIN\*



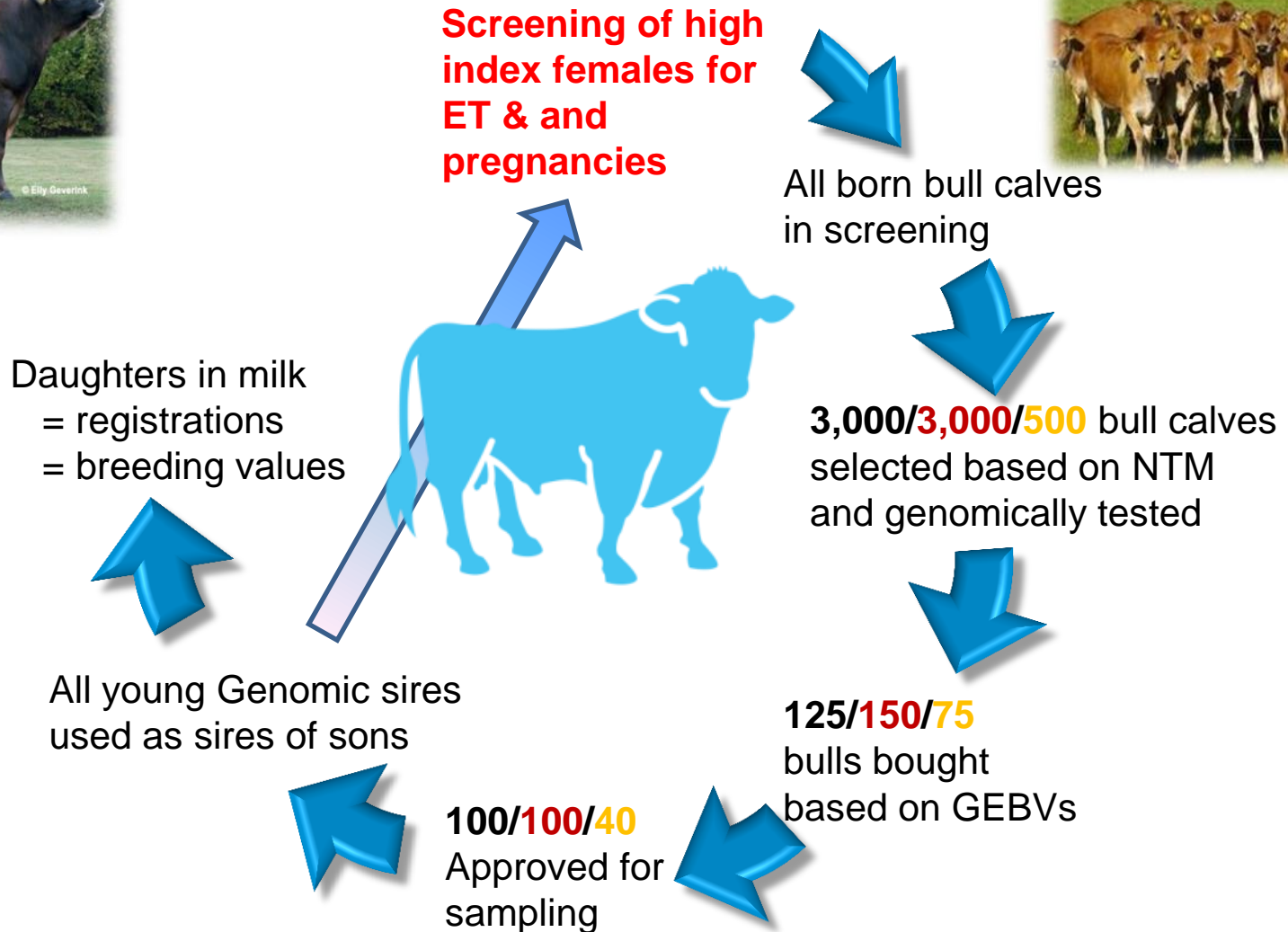
VIKINGJERSEY\*



VIKINGRED\*



# VikingGenetics Breeding Program



# Females and embryo production



- ➔ Focus on superior females & embryo production increased after GS
- ➔ Less AI bulls on stations converted to female programs

$$\Delta G = \frac{i \cdot r_{IA} \cdot \sigma_A}{L}$$

- ➔ Reliability on females = reliability on bulls
- ➔ Possible to lower generational interval

# MOET in Viking breeding scheme



- ➔ Combination of station & field activities
- ➔ SWE and FI: High proportion of station flushes
- ➔ DK: High proportion of field flushes

	VikingHolstein	VikingRed	VikingJersey	Total
Embryos – Goal	4,000	4,000	500	8.500
ET calves	2,000	2,000	250	4,250
Bull candidates	1,000	1,000	125	2,125

# ET or OPU ?



## ➔ Financial calculations

- OPU more expensive: Factor 5 ? (so far)
- Fixed money to MOET:
  - More OPU -> less embryo calves -> less lottery tickets 😞
  - Mendel is still working on ET and OPU calves

# ET or OPU ?



- ➔ ET: Cheapest way to produce big volume of embryos
- ➔ OPU: A supply on problem donors and unique donors
- ➔ Challenge: This strategy keeps OPU volume down and price up
- ➔ OPU: Advantage regarding inbreeding
- ➔ OPU available in DNK & FI



# OPU 2015-16 (ex from VG Hollola)



MOET	2015	OPU	2015	2016
Embryo flushes	<b>156</b>	OPU-sessions	<b>148</b>	<b>114</b>
Heifers	<b>74</b>	Heifers	<b>39</b>	<b>27</b>
Flushes per heifer	<b>2.1</b>	OPUs / heifer	<b>3.8</b>	<b>3,7</b>
Embryos	<b>1,492</b>	Embryos	<b>706</b>	<b>545</b>
Transferable embryos	<b>905 (61%)</b>	Transferable embryos	<b>235 (33%)</b>	<b>224</b>
Transferable embryos per flush	<b>5.8</b>	Transferrable / OPU session	<b>1.6</b>	<b>2.0</b>

# Genomic selection of embryos



- ➔ VG has so far not used sexing and GS test of embryos
  - Decision tool
- ➔ Interesting if recipients are in low supply
- ➔ Pilot project:
  - Own managed recipient herd with embryo sexing and GS test of male embryos

# Recipients & embryo logistics



- ➔ Value of recipient work underestimated
- ➔ How to optimize pregnancy rate
  - Fresh versus frozen embryos
  - 45-50 % PR versus 65-70 %
- ➔ How to make fresh embryos live longer

# Sexed embryos & semen sexing



- ➔ Breeding purpose: 0.5 bull & 0.5 heifer is ok
  - Production purpose: semen sexing or embryo sexing an advantage
- ➔ What is most efficient ?
  - Flush with sexed semen
  - Flush with conventional semen supplied with embryo sexing
- ➔ Today VG uses Y-Vik (male semen) to produce embryos for export
  - Intact zona pellucida

# Future scenarios



- ➔ Mega trend:
- ➔ More GS tests -> more sexed semen -> less replacement heifers -> more beef semen
- ➔ Future ET/OPU
  - Continue as a breeding tool
  - VG will follow demand and will produce embryos as a sales object if demand appears