



Genomic selection & Breeding Programs in Nordic countries




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Viking Dairy breeding programs

 VIKINGHOLSTEIN[®] The world breed

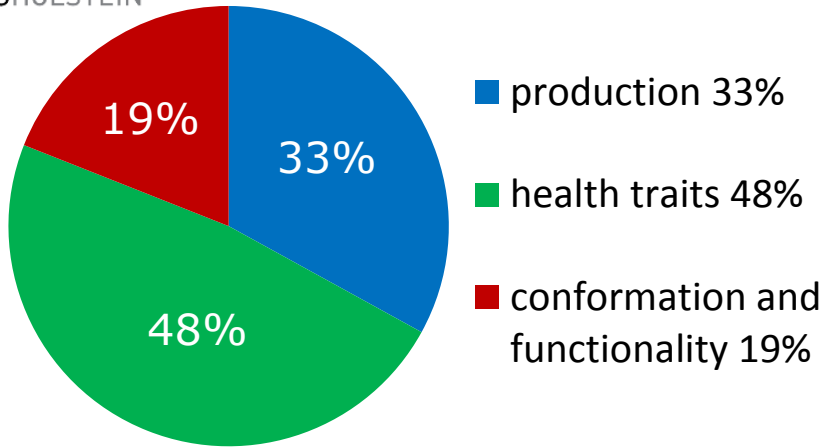
 VIKINGRED[®] The choice in all cross breeding programs

 VIKINGJERSEY[®] The "efficient choice"

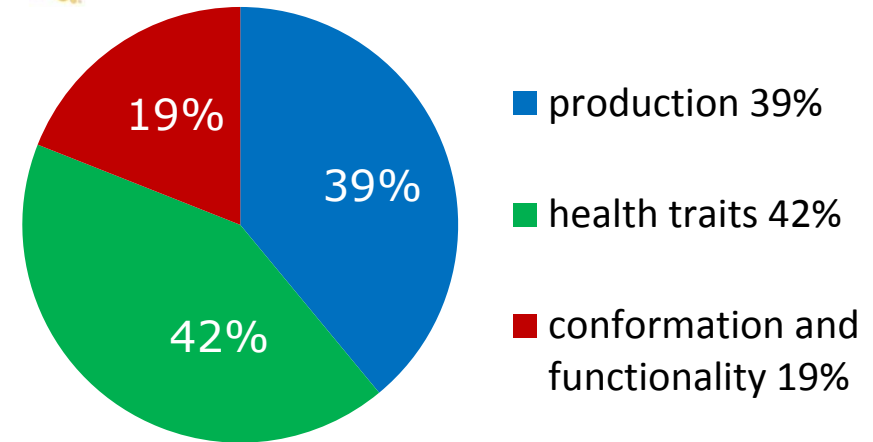
NTM – Nordic Total Merit



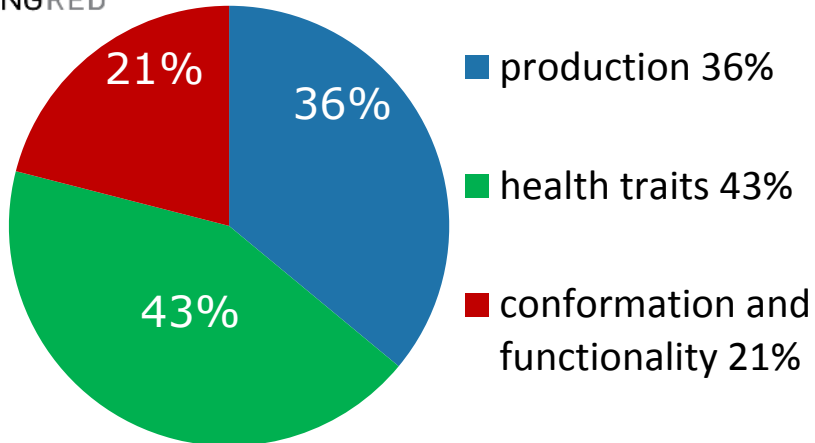
 VIKINGHOLSTEIN*



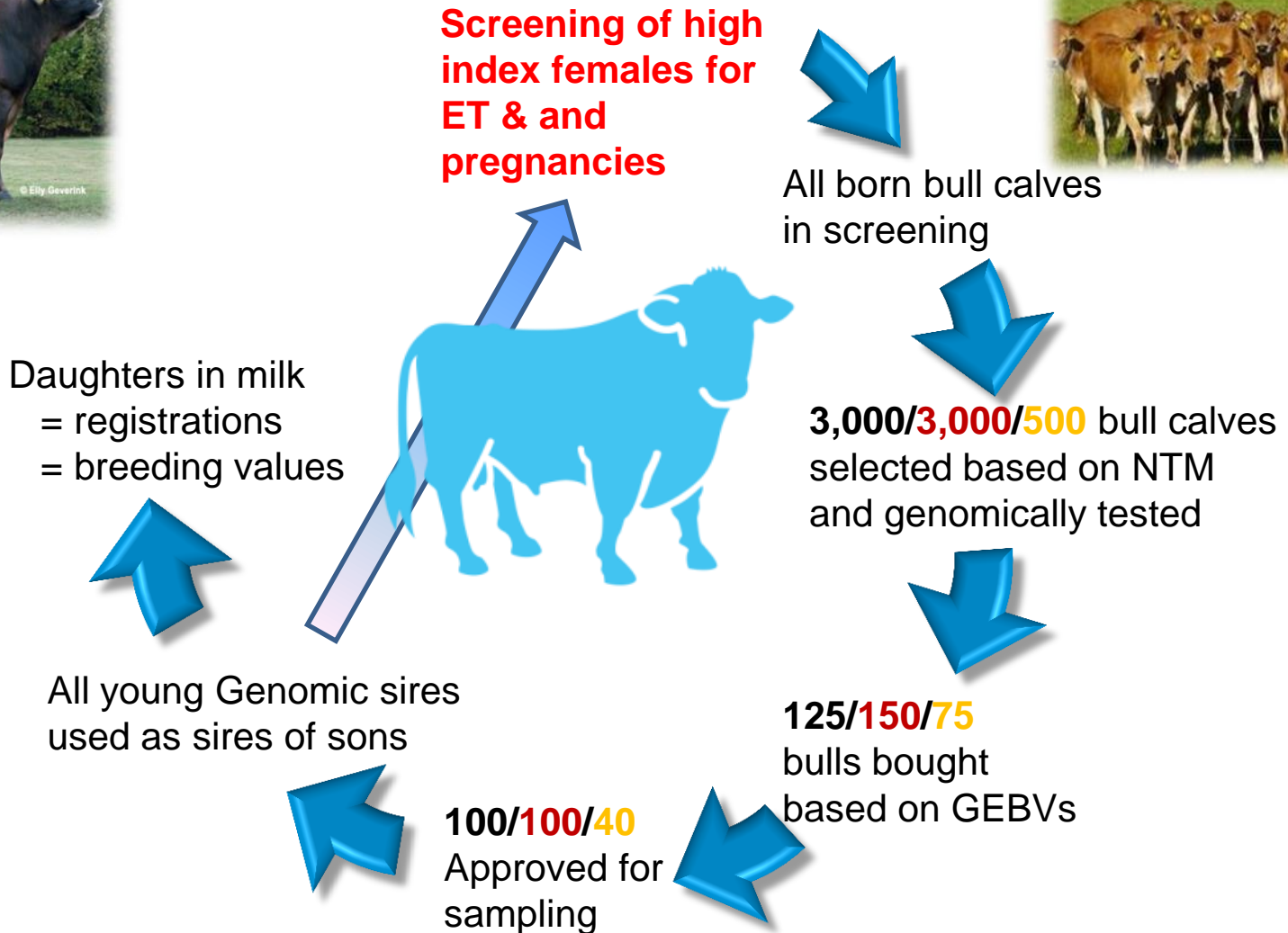
 VIKINGJERSEY*



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

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