

Embryotransfer (ET) and genomic selection in practice and in Asmo nucleus

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Heifers more important

- Genomic tested females have same reliability on breeding values as GenVikPlus-bulls (GVP)
 - Females are valuable
- Screening of females
- ET activities in Nordic countries - VG
 - Offspring production of top females as fast as possible
- ASMO –nucleus program
- Simulation results for ASMO -program

Reliability of genomic evaluation

Trait	Holstein
Milk	0,61
Protein	0,55
Fat	0,62
Fertility	0,45
Udder health	0,47
Udder conformation	0,59
Longevity	0,52
Average of 16 traits	0,47

Reference group (proven bulls)

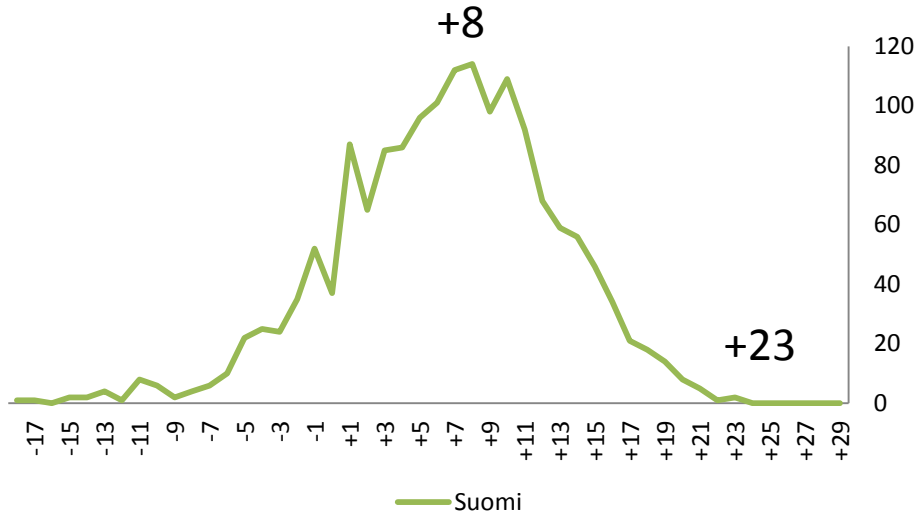
- Holstein 5600 +18400

Genomic testing of females

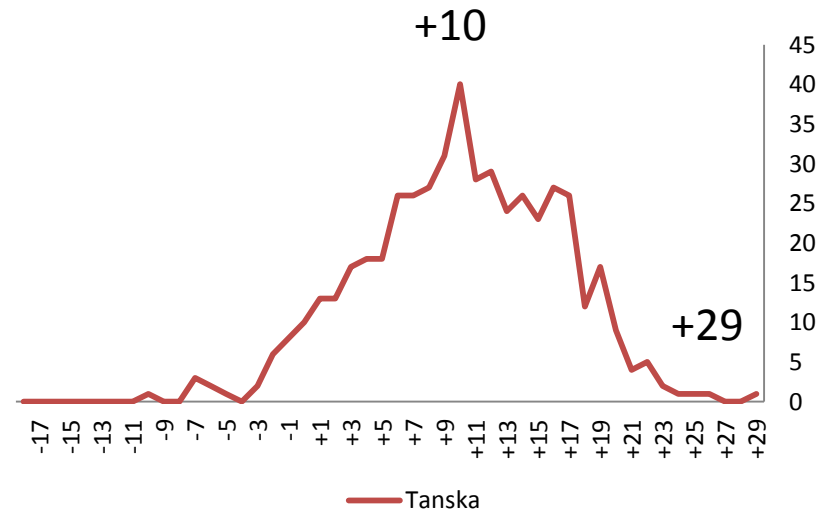
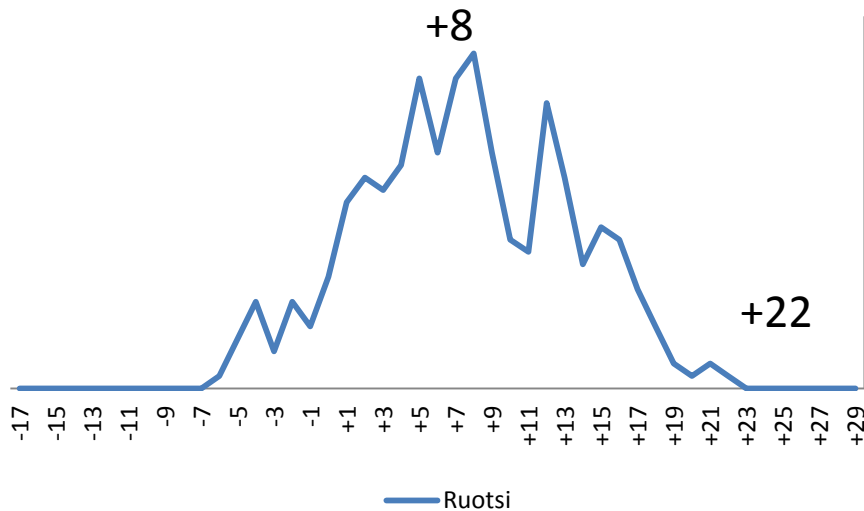
- Private testing
 - 99 e + alv
 - Order in internet
- Screening of females for genomic test (In 1-6 months age)
 - VG / ASMO breeding program
- ASMO: Agreement with farmer about genomic testing and using heifer in breeding program



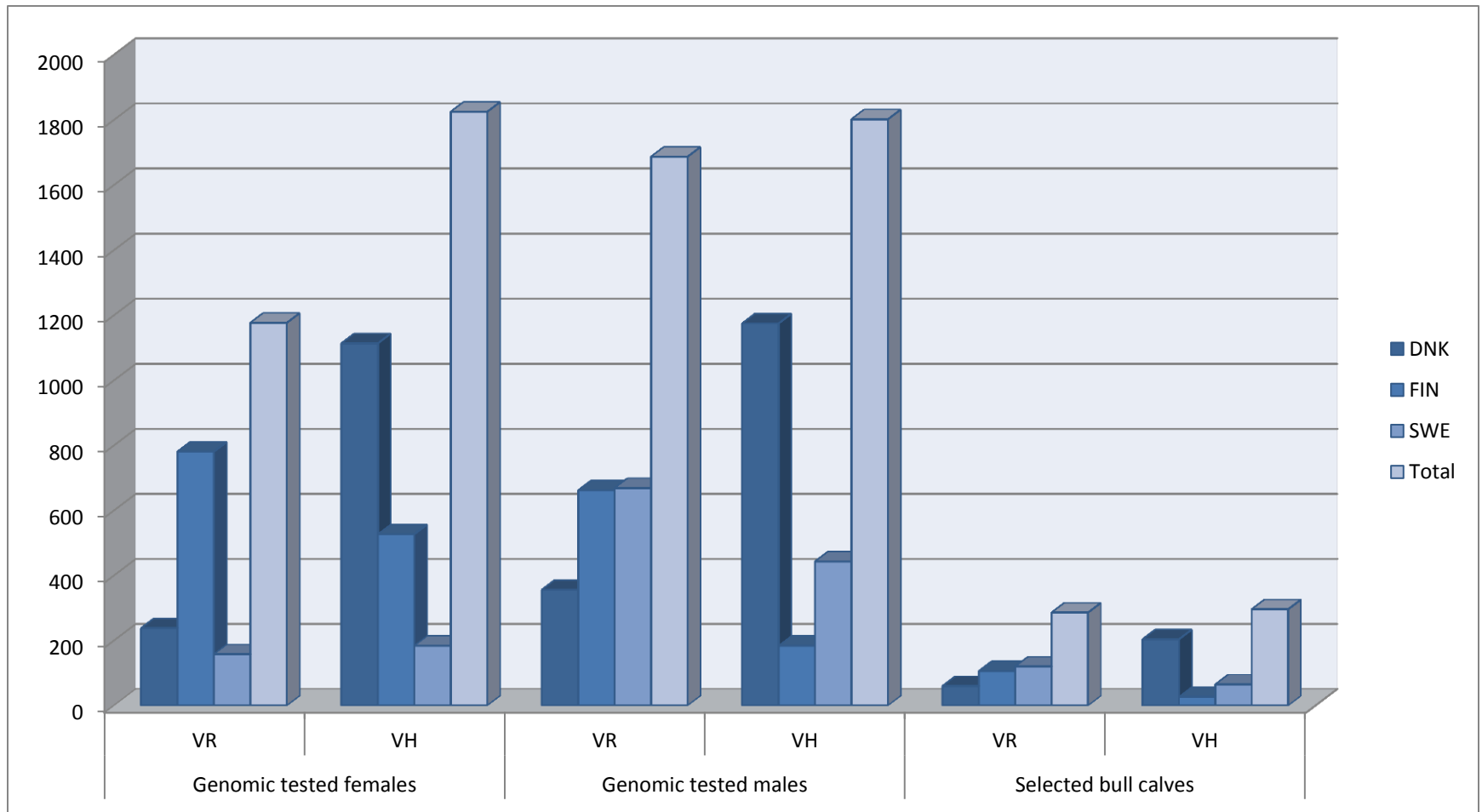
More heifers to genomic testing VR



2011:
Finland 781
Denmark 238
Sweden 158



Genomic selection 2011 VR + VH



ET activities in VikingGenetics 2011

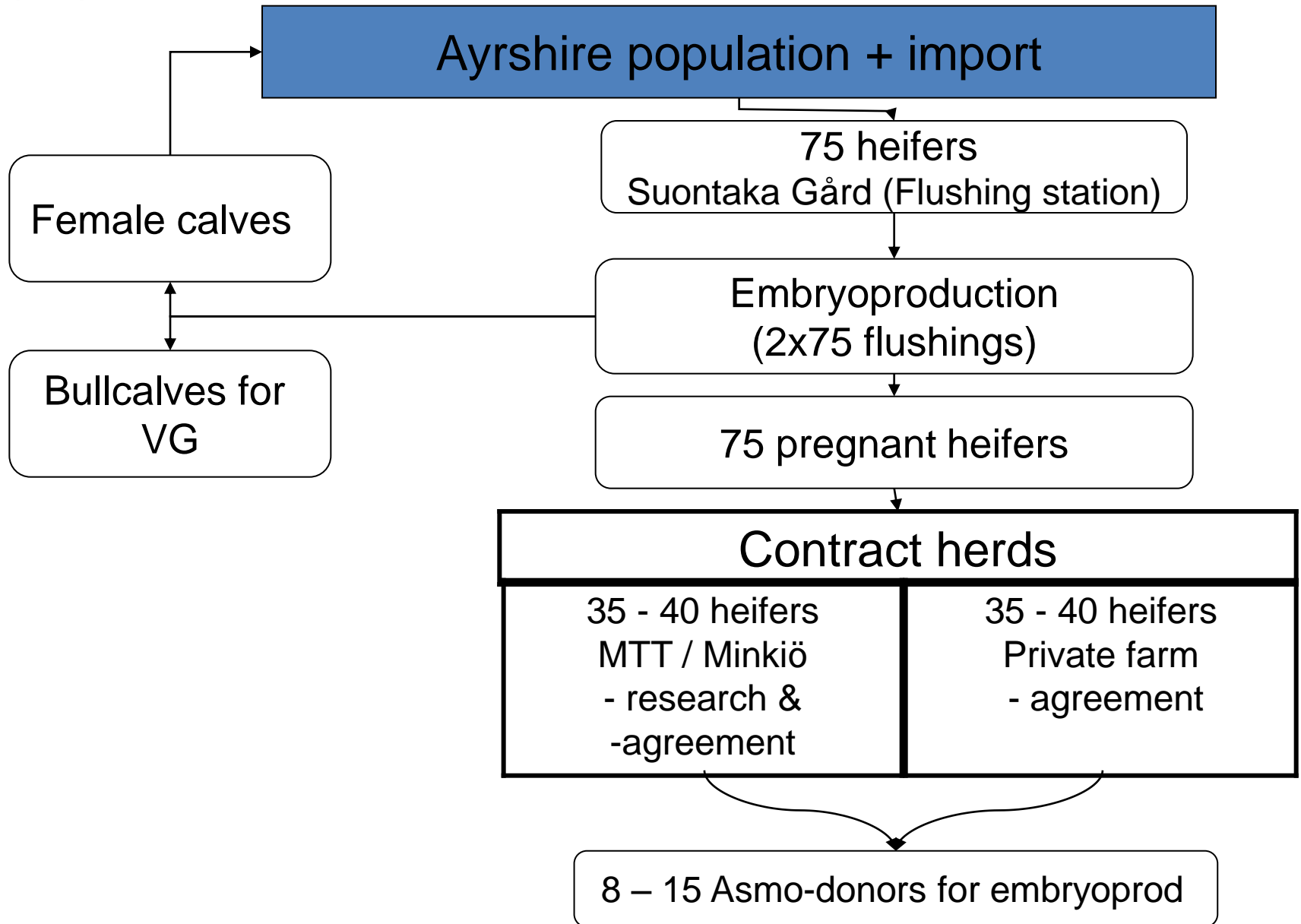
Viking Red	DNK	FIN	SWE	total
Flushings	34	220	8	262
Transferable embryos	306	1267	27	1600

Holstein	DNK	FIN	SWE	total
Flushings	315	180	< 15	> 500
Transferable embryos	2142	1206		> 3350

	Flushes	Transf embryos	Nr of tr embryos /flush	Average NTM
Asmo	157	816	5,2	12,6



Asmo – embryobreedingprogram 2010



ASMO program 2009-

- Genomic selection
- Only genomic tested heifers to ASMO program both FAY and Holstein
- Only best heifers / sire group
- All top heifers to be flushed (2-3 x)
 - At home farm or at ASMO flushing station
- Using also top genomic tested young bulls (=GVP bulls)



ASMO Rötös ET – produced 29 embryos as heifer (2 flushes) and 109 embryos as ASMO donor (5 flushes)

Best genomic tested heifers to ASMO

Name	NTM	ranking	Sire	MGS	Dam	City	owner
ASMO Irma ET	22	1/32	ASMO Ullimulli ET	Viikin Record	Korkiakosken Elena	Nurmijärvi	Private
ASMO Ieva	21	2/32	ASMO Ullimulli ET	ASMO Prunni ET	Koskentaustan Ässä	Jokioinen	ASMO
Lakialan Ilmatar	21	3/32	ASMO Ullimulli ET	Niemelän Ooppium	Lakialan Ysikymppi	Somero	ASMO
Pohjolan Imelä	20	3/55	Föske	Niemelän Ooppium	Pohjolan Ykä	Kouvola	ASMO
Hiukkalan Indeks	17	3/29	Aholan Unyrkki ET	Kilpialon Toivo	Hiukkalan Vappu	Nivala	ASMO
Kangastalon Ikkunaluutu	19	1/81	Kilpialon Toivo	Viikin Record	Kangastalon Eiffel	Kokkola	ASMO
Lähteenmäen Ihka	23	1/16	Buckarby	Niemelän Ooppium	Lähteenmäen Älli	Rusko	ASMO
Ylikosken Ira	19	1/2	VR Alavire ET	Luoma-Tokoin Viikari	Ylikosken Ajatar	Kokkola	ASMO
Kiviniemen Iltausva	20	3/149	ASMO Tosikko ET	Hyötylän Piuha	Aamukaste	Nurmes	ASMO
Sammatin Italianrai	21	1/34	Nora Prästgård	Kaappolan Sahara	ASMO Englanninraiheinä ET	Ylöjärvi	ASMO
Tupalan Ilvas	20	4/305	Facet	Niemelän Ooppium	Yyteri	Hämeenlinna	ASMO
Koivikon Helga	17	3/118	Linne	Purolan Orkko	Koivikon Volga	Muhos	ASMO
Hiltulan Imikkä	18	2/16	Hällom	Viikin Record	Hiltulan Esikko	Kuhmo	ASMO
Haapalan Helinä	19	1/96	Adam	Larsgård	Haapalan Uppa	Ranua	ASMO
ASMO Ingrid ET	15	1/37	Signal	Heisalan Ponnistus	ASMO Amelie ET	Hämeenlinna	ASMO
Murtolan Hieno	18	1/54	Hallebo	Tyrisevän Miqur	Murtolan Upea	Nilsä	ASMO
ASMO Iffy	18	1/10	VR Gibson	Mäkelän Royal	ASMO Africa	Jokioinen	ASMO

The first Holsteins to ASMO

Rantalan Honda +25 (Sire; Orange)

– 29 transf embryos / 3 flushings

Coming during summer				
Name	Sire	MGS	NTM	ranking
Pakaraisen Ilona	VH Cup	V Whisky TV	27	1/8
Illanvarjo	Dansire Oman Justi Ole	M. Rakuuna TV	26	2/58

GVP bulls from ASMO

3 GVP bulls from ASMO

- VR Alavire ET
- VR Safari ET
- ASMO Aikomus



Simulation by Alban Bouquet University of Helsinki (unpublished 4.7.2012)



Current-state knowledge gained from research

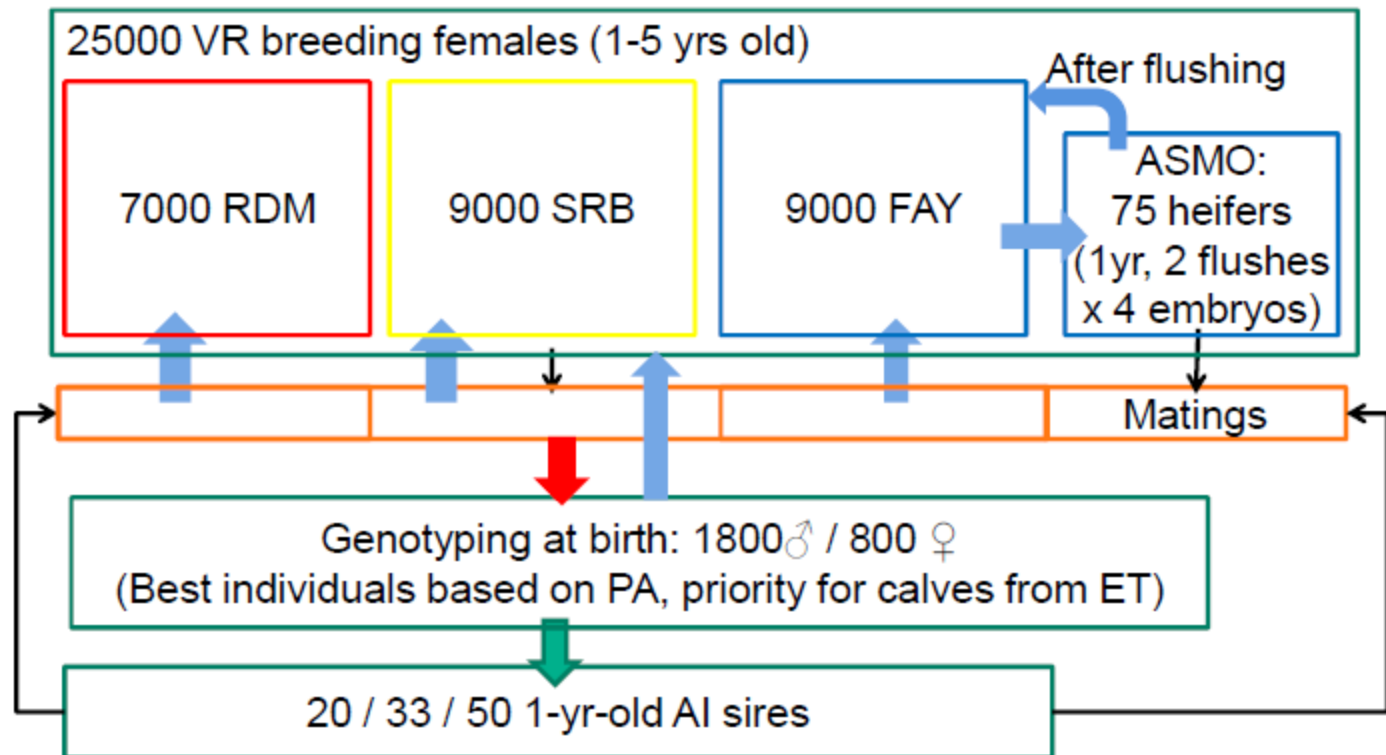
Large benefits from using GS on females

⇒ When MOET is used, larger benefits are expected from genotyping females than males (Sørensen and Sørensen, 2010)

⇒ Larger benefits when GS and MOET used on young heifers (Pryce et al., 2010)

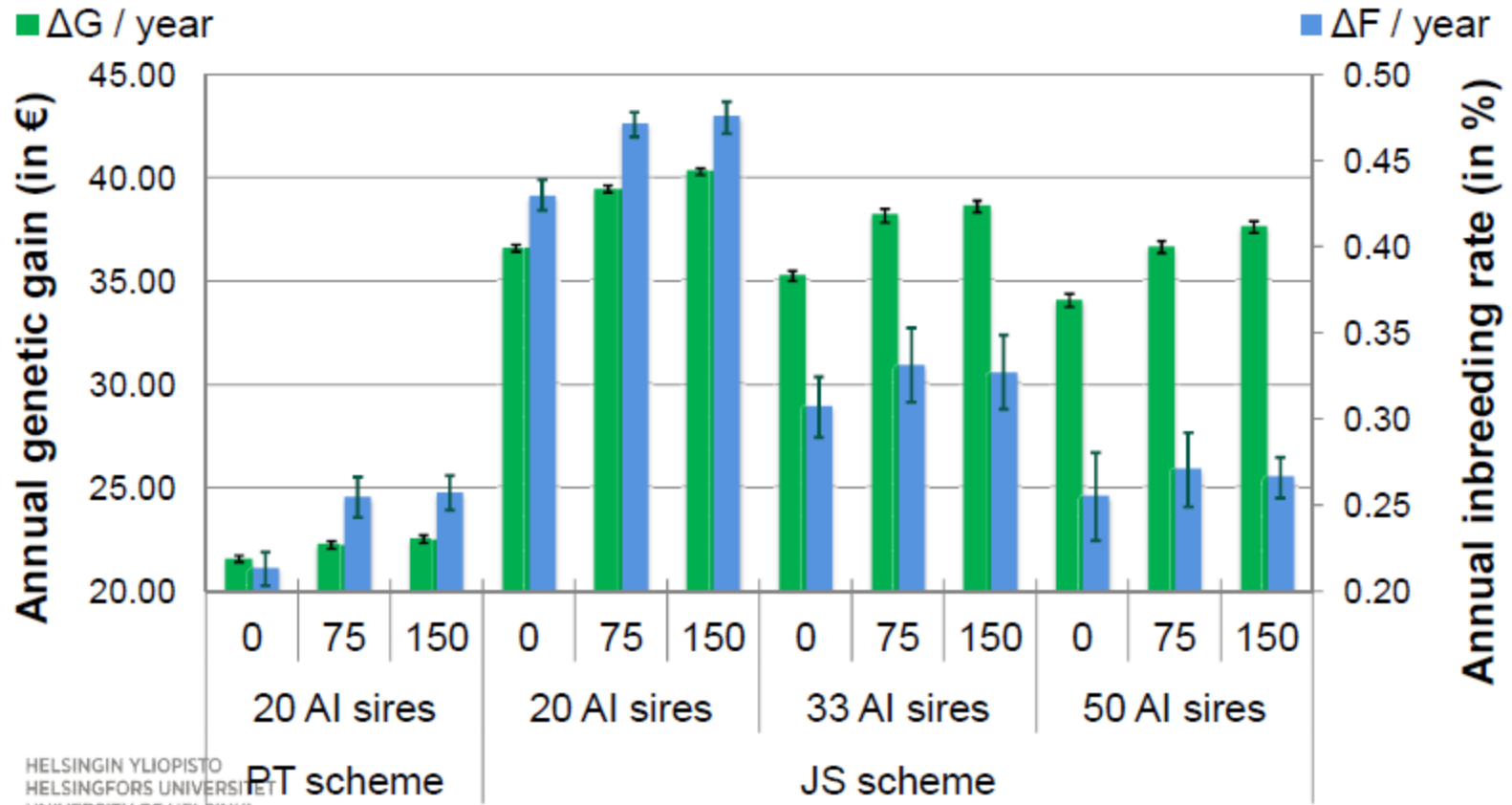


Juvenile genomic scheme (JS)





Effect of varying ASMO herd size (0, 75 & 150 heifers)





Possible evolutions of the nucleus

No real “optimum”: the largest benefits are obtained for

- The largest MOET nucleus size (if > 800 ♀ genotyped)
- The biggest genotyping capacities
- The largest numbers of flushings

The constraints are rather technical (herd size, # flushing, # recipients) and economical

- ⇒ Allocate more genotypings to females (1800 seems achievable)
- ⇒ Keep at least 75 heifers and increase the # flushings
- ⇒ If possible, increase the number of heifers: 113 ~ a good compromise
- ⇒ Enhance collaboration with DK and SWE for ET or develop MOET there

Thank you!

