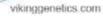
Registration system in Scandinavian countries - Focus on health and fertility traits



Red Holstein Chairman Karoline Holst





Area of VikingGenetics

 Bull stud and semen production O Bull stud with waiting bulls/quarantine facilities Pieksämäki Hollola Skara Falkenberg Assentoft Blaksmark Boylund



The breeding program – number of cows

	Denmark	Sweden	Finland	In total
Holstein	375,000	149,000	92,800	616,800
Jersey	60,000	2,000	-	62,000
Viking Red	40,000	130,500	194,300	364,800
Red Holstein	5,500	-	-	5,500
SKB/Finncattle	-	1,200	2,900	4,100
Total	480,500	282,700	290,000	1,053,200



Holstein



Viking Red



Jersey





Healthy cows

- Animal welfare
- Better economy
 - More economical production
 - Less costs for the veterinarian
- Best image for dairy production
 - Less external political regulations
- Combination of management and breeding
- How can we create healthy cows by breeding ??





Registrations are the background

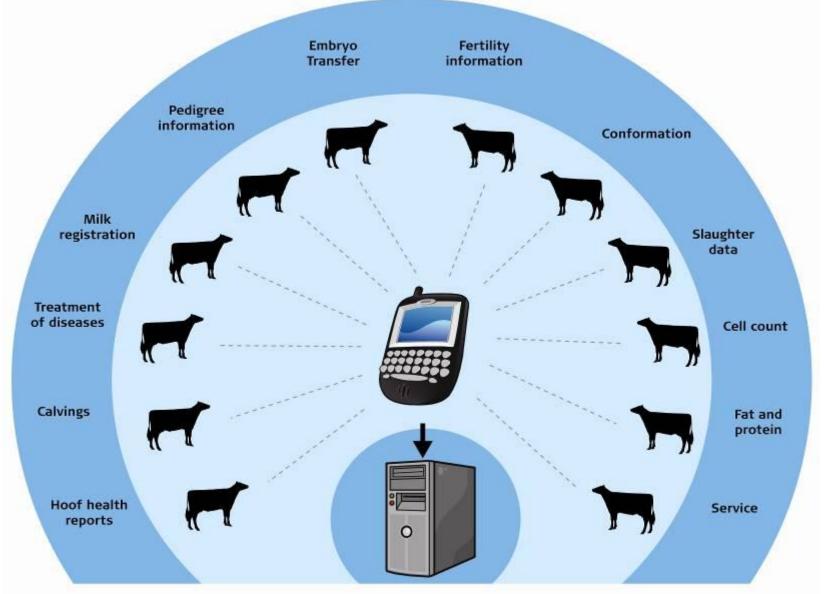
- To obtain genetic progress in traits with low heritability like health and fertility traits – you need superior registrations – and an efficient database
- Our farmers have understood the value of good registrations during years – and we have been able to convert the registrations into reliable breeding values making genetic progress
- So far most registrations have been done voluntarily and with no payments connected

vikinggenetics.cor

• Future ???



The Database – and registrations





Goal – One Nordic cattle database

- Today we have one individual cattle database in each of the three "Viking countries"
 - Denmark, Sweden and Finland
- Our general organizations are looking at different alternatives to create ONE database – like we today have ONE breeding evaluation, ONE breeding goal – and ONE Al organisation

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• But it is expensive to develop a new database



Registration

- All cows in DFS have to be registered by law
 - Present pedigree file goes back to 1960
- More than 85% of all registered dairy cows in milk recording.
 (MR) ~ 1 million cows
- More than 85% of all cows in MR contribute with registration of treatments
- App 90% of all cows in MR contribute with fertility data
- App 90% of all cows in MR contribute to information about size of calves, calf survival and calving ease.

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- Nearly 200,000 cows classified by classifiers every year in DSF
- App. 500,000 cows contributed with hoof trimming data in 2011



Breeding values for all important traits

- Production
- Health
- Conformation

		70	80	90	100	110	120	130 No or dans
Production traits (Reliab	ility: 94 %)							155
Prod. Index	127							
M lik, kg	111					•		
Proteini, kg	125							
Protein %	114							
Fat.kg	117					Τ.		
Fat%	105							
Growth	94							162
	94				-			162
Health traits								
Fertility days	95							
Calulog Index: - Sire	105							
-MGS	127							
- Matemat	127							
mastitik resistance	90							2789
Otherdiseases	105							
	110							102
Longeutly								102
Hootictaw kealth	91							
Linear composite index								82
Body	93							
Legs	103							
Udder	98							
Wiking speed	122							
Temperament	109						Т	
Conformation, linear assessment		70	80	90	100	110	120	130
Statu re	89 short							tall
Dairyness	109 coarse							algitar
Chestwidth	86 sarrow							wide
Body depta	107 sitation							deep
R ump width R ump augle	101 marrow 99 high pins				1			wide textector
Top line	106 weak							low plas strong
Legs side	113 posty						-	sickled
Legs rear ulew	98 toes out					Τ.		parallel
Footalgle	96 low							steep
Bose quality	109 coarse							the
Hock quality	113 coarse							the
Fore adder	112 loose							strong
Rear (der lieigilt	107 low							ligi
Rear adder width	97 karrow							wide
Stispensory lig Udder depti	86 weak 97 deep							strong shallow
Udder balance	115 low rear				1			sinanow high rear
Teatlength	92 short							long
Teattickness	96 till							thick .
The second second second second	A second s							a la su

The breeding values are calculated by

103 wide

108 wide

ensk**mjolk**

Teatplacement front

Teatplacement rear

SWEDISH DAIRY ASSOCIATION

Breeding values from 2009-11-29

close

close



NTM – Nordic Total Merit

- Compares all economically important traits
- Takes genetic correlations into consideration
- Best tool for selection of bulls and cows for the breeding programme
- Permits comparison of cows and bulls directly in Sweden, Denmark and Finland





Traits in NTM

	Index	<u>Data</u>
	Yield	Milk, protein & fat yield
	Female fertility	Days from calving to first insemination Days from first to last insemination Number of insemination Fertility diseases
	Calving & birth	Vitality of calf Calving ease Size of calf
	Meat production	Carcass weight & carcass classification
	Udder health	Diagnoses of mastitis Somatic cell count, Conformation traits
VIK	ING GENETICS	

Traits in NTM (continued)

<u>Index</u>	<u>Data</u>
Longevity	Days in herd (1 st calving to culling)
Other health traits	Reproduction diseases Feet & leg diseases Digestive diseases
Conformation	22 conformation traits
Milking speed	Direct data from recording system L/minute
Temperament	Registrated by farmers / classifiers
Hoof health	Registrations made by hoof trimmers

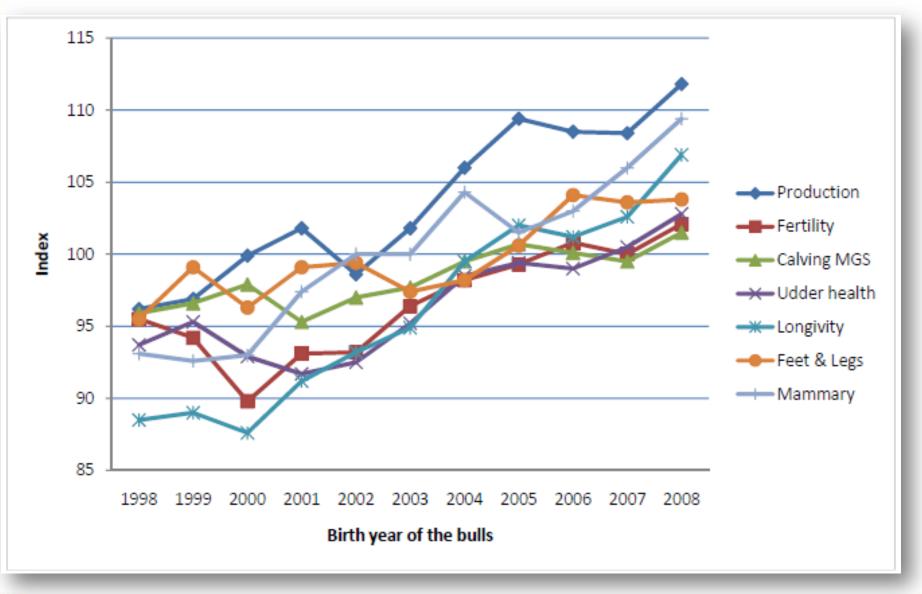


NTM-index – economical weights

	HOL	RED HOL
Production	0.75	0.75
Growth	0.06	<u>0.11</u>
Female fertility	0.31	0.23
Birth	0.15	0.17
Maternal calving ease	0.17	0.17
Udder health	0.35	0.35
Other health traits	0.11	0.12
Body	0.00	0.00
Feet / Legs	0.12	<u>0.15</u>
Mammary	0.18	<u>0.24</u>
Milking speed	0.08	0.08
Temperament	0.03	0.03
Longevity	0.11	0.11
Hoof health	0.08	<u>0.10</u>



Genetic trends on selected traits - Holstein

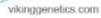




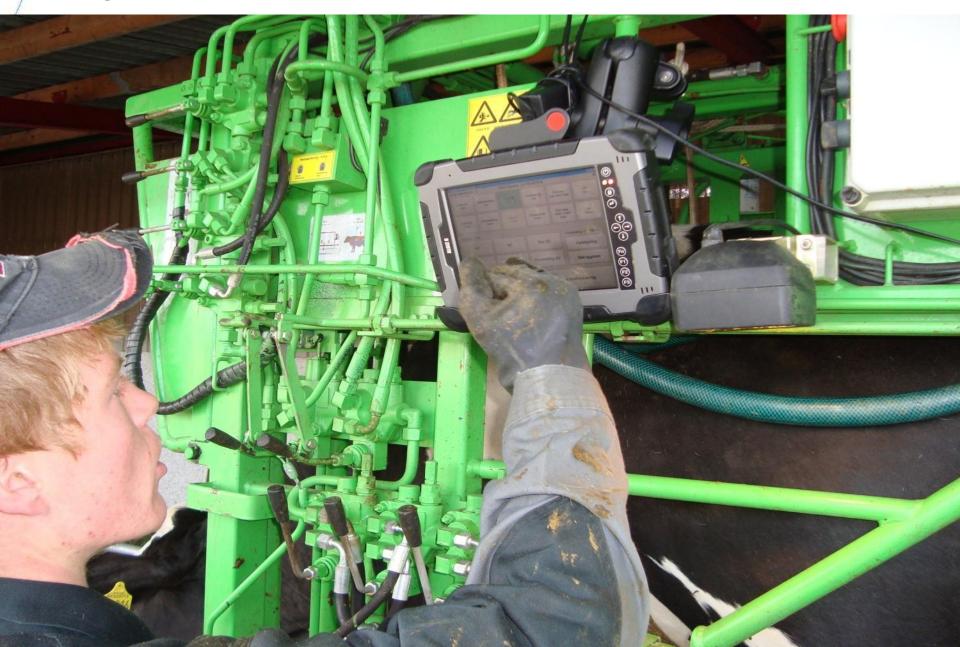
How to breed for improved claw health

- Registrations are the key !!
- Registrations have to be easy to handle especially in larger herds
 - Otherwise too time consuming and not done
- The claw health registrations are valuable management tools at farm level
 - Important message to farmers
 - Convince hoof trimmers
- Information have to go to a common database

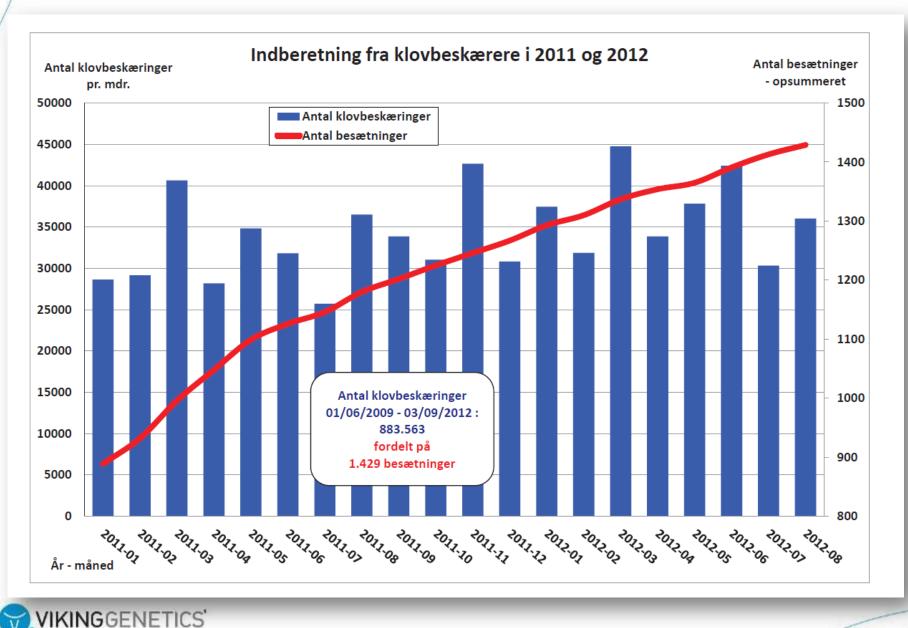




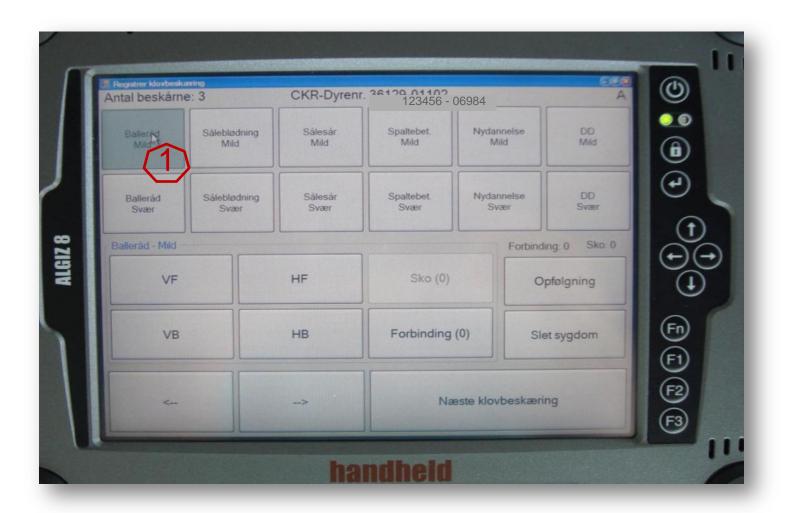
Registration unit in Denmark



Data collection in Denmark – hoof trimmers



Claw disease registration. One claw disease and the severity can be registered in one touch





Nordic Cattle Genetic Evaluation

Trait definition – genetic evaluation

Trait

Dermatitis (DE)

Heel Horn Erosion (HH)

Sole Haemorrhage (SH)

Sole Ulcer (SU)

Cork screw claws (CSC)

Skin Proliferation (SP)

White line separation+ double sole (WLS)





Digital dermatitis

Infection related

Mild



Severe

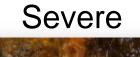




Interdigital dermatitis

Infection related

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Heel horn erosion

Infection related

Mild









Interdigital hyperplasia/Skin proliferation

Infection related

Mild







Sole haemorrhage

Metabolic related

Mild



Severe





Sole ulcer

Metabolic related



Severe



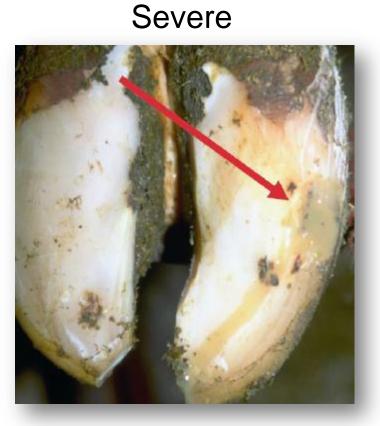


White line disease

Metabolic related

Mild







Double sole

Metabolic related

Mild



Severe





Cork screw claw

Malformation claw diagnosis

Mild



Severe





Correlation between claw health and NTM traits

	HOL	<u>RDC</u>
 Longevity 	0.25	0.20
• NTM	0.20	0.05
 Other disease 	0.15	0.15
 Udder health 	0.15	0.10
 Feet&Legs 	0.05	0.15
 Temperament 	-0.05	-0.15



Breeding for health and fertility - conclusion

- It is possible to obtain genetic progress even on low heritability traits
- You need reliable registrations even when you use genomic selection !
- Important that data is stored in a system so we can get access from the evaluation system
- ...and also important to include these traits in the breeding goal with the weight it deserves.



