News - NAV routine evaluation
2 February 2012

The latest NAV routine evaluation for yield, fertility, type, udder health, other diseases, calving traits, milk ability, temperament, growth, longevity, claw health and NTM took place as scheduled. NAV carried out three evaluations per trait group:

Holstein evaluation, including data from: Danish Holstein, Danish Red Holstein, Swedish Holstein, Finnish Holstein, Finnish Ayrshire and Finn Cattle.

Red Dairy Cattle evaluation, including data from: Danish Red, Swedish Red, Finnish Ayrshire, Finnish Holstein and Finn Cattle.

Jersey evaluation, including data from: Danish Jersey and Swedish Jersey (only yield and type).

Extraction dates
Dates for extraction of data from national databases are given in table 1.

Table 1. Dates for extraction of data from the national databases

Trait	**Denmark**	**Finland**	**Sweden**
Yield	20.12.2011	18.12.2011	15.12.2011
Type, milk ability and temperament	29.12.2011	18.12.2011	12.12.2011
Fertility	29.12.2011	18.12.2011	17.12.2011
Udder health and other disease	29.12.2011	18.12.2011	17.12.2011
Calving	29.12.2011	18.12.2011	17.12.2011
Longevity	29.12.2011	18.12.2011	17.12.2011
Growth	30.12.2011	18.12.2011	14.12.2011
Claw health	29.12.2011	18.12.2011	22.12.2011

Data used in genomic prediction
Genotypes were extracted from the joint Nordic SNP data base 10th January 2012. For Holstein the annual exchange of genotypes within Eurogenomics has taken place and genotypes from the last birth year of bulls with milking daughters are included in the reference population. Interbull information from December 2011 and national information according to extraction dates in table 1 were included in genomic prediction.

News in relation to NAV genetic evaluation

Yield
An improved model for yield evaluation has been implemented. The genetic parameters have been reestimated and an improved correction for heterogeneous variance is implemented. The improvements of the model create slight reranking of animals (table 2 and 3). For bull the correlations are 0.98-0.99 and 0.92-0.97 for cows. The correlations are lowest for Finnish animals and Swedish Jersey, where we have smallest herd sizes.

Tabel 2. Correlations between EBVs for yield from the new and old model for bulls

	Denmark	Sweden	Finland
Holstein	0.99	0.99	0.98
RDC	0.99	0.99	0.96
Jersey	0.99		

Tabel 3. Correlations between EBVs for yield from the new and old model for cows

	Denmark	Sweden	Finland
Holstein	0.97	0.97	0.94
RDC	0.96	0.96	0.92
Jersey	0.97	0.93	

The estimated genetic trends are somewhat steeper in the new model for RDM and for Jersey, which means very old animals on average drop in EBV. The across country genetic levels are about the same as in the old model for RDC and Holstein, whereas the genetic level for Swedish Jersey has dropped a bit (2-3 index points) compared to Danish Jersey cows

Note that the new yield model also influences the GEBVs for yield

Changes in weights in sub-indices and NTM

Jersey

Weights in yield index in changed from (Milk:Fat:Protein) -3:4:9, to -3:5:8
Weight on Udder conformation increased from 0.15 to 0.20 in NTM
Weight on Yield reduced from 0.87 to 0.82 in NTM

RDC

Optimum of rump width changed from 6 to 5 when calculating EBV for Body.
Weight on Milk ability in NTM increased from 0.06 to 0.09

In table 4 the current weights are shown. In table 5 the correlations between the single traits and the old and new NTM respectively are shown for RDC and Jersey. The effect of the changes are very small.

Table 4. Current weight factors for NTM. February 2012

	Holstein	RDC	Jersey	Red Holstein
Yield*	0.75/0.68	0.92/0.84	0.82/0.73	0.75/0.68
Growth	0.06	0.00	0.00	0.11
Fertility	0.31	0.26	0.26	0.23
Birth index	0.15	0.14	0.06	0.17
Calving index	0.17	0.12	0.06	0.17
Udder health	0.35	0.32	0.49	0.35
Other diseases	0.11	0.12	0.04	0.12
Body	0.00	0.00	0.00	0.00
Feet&Legs	0.12	0.09	0.04	0.15
Udder	0.18	0.32	0.20	0.24
Milk ability	0.08	0.09	0.10	0.08
Temperament	0.03	0.03	0.03	0.03
Longevity	0.11	0.08	0.12	0.11
Claw health	0.08	0.05	0.05	0.10

*Weight factor for bulls/weight factor for cows with own yield record

Table 5. Correlations between single traits and old and new NTM. Bulls born 2004-2006

	Jersey		RDC	
	Old NTM	February 2012 NTM	Old NTM	February 2012 NTM
Yield	0.66	0.61	0.63	0.62
Growth	-0.09	-0.10	0.04	0.03
Fertility	0.48	0.49	0.21	0.20
Birth index	0.12	0.11	0.18	0.18
Calving index	0.21	0.21	0.20	0.19
Udder health	0.40	0.44	0.37	0.36
Other diseases	0.24	0.24	0.25	0.24
Body	0.09	0.07	0.04	0.04
Feet&Legs	0.17	0.19	0.16	0.16
Udder	0.03	0.10	0.28	0.29
Milk ability	0.03	0.04	0.17	0.21
Temperament	-0.02	-0.02	0.17	0.18
Longevity	0.41	0.45	0.47	0.47
Claw health	0.10	0.11	0.01	0.01

Genetic base
EBVs for bulls and females are expressed on the same cow base. This genetic evaluation included cows born from 02.02.2007 to 02.02.2009 in the genetic base (average 100).

Genomic EBVs (GEBVs)
GEBVs combine genomic and phenotypic information. GEBVs are estimated for all combined traits in NTM, single type traits, and NTM. Table 6 describes how different categories of genotyped animals are handled in the evaluation. All non genotyped animals get traditional EBVs.

Table 6 Publication of Genomic breeding values (GEBVs) for different categories of animals

Category of animals		**Status**	**Published Breeding value**
Genotyped males	Bulls without a progeny test	Culled	None
		AI bulls with a Nordic herd book number	**GEBV** when at least 20 month old at publication date
	Bulls with a Nordic or a progeny test abroad	AI bulls with a Nordic progeny test	EBV
		Foreign AI bulls with a Nordic herd book number and a progeny test abroad	IB EBV for all international traits available. **GEBV** for traits with pedigree information only
Genotyped females	Heifers		**GEBV**
	Cows		**GEBV** for traits with pedigree information only (e.g. Other disease, fertility, calving) and EBVs for all other traits

- EBV=Estimated breeding value based on phenotypic data only
- IB EBV = Interbull breeding value based on phenotypic data only
- GEBV=Genomic Enhanced breeding value – based on phenotypic data and genomic information

For animals having a GEBVs the GEBV is published as the official index instead of the EBV

NAV will in the coming months work with:

- GEBVs for genotyped bulls with daughters
- Genotyped cows with own records

Reliabilities
The reliability of genomic information varies between traits and breeds. Table 7 give a general picture of the reliability of the genomic information used when weighting genomic information and phenotypic information together in GEBV.

Table 7 Reliability of genomic information

	Reliability genomic information
RDC	0.30-0.40
Holstein	0.40-0.50
Jersey	0.20-0.30

Publication of NTM for Nordic and foreign bulls
A NTM is published if the bull has official EBVs (NAV EBV or international EBV) for Yield, Mastitis and Type. By official means for NAV EBVs that the NAV thresholds are met and for international EBVs (IB EBVs) that Interbull estimates EBVs for the single bull. EBVs are used in the following priority NAV EBVs, IB EBVs and Pedigree index. For traits without a NAV EBV or an IB EBV a NAV pedigree index is calculated.

For bulls with a Nordic herd book number the pedigree index follows the principles described in the October 2008 routine information. For foreign bulls without a Nordic herd book number the pedigree index is calculated in as ½(EBVsire-100) +1/4(EBVmgs-100) +100. If EBVsire or EBVmgs is not official NAV EBVs then 100 is used.

NAV – frequency and timing of routine runs
NAV has 4 evaluations per year including all phenotypic data. In Table 8 the future NAV and INTERBULL release dates are shown. NAV does four extra genomic predictions to get GEBVs based on the newest information for all genotyped bull calves and females. The extra runs take place 15.3, 15.6, 15.9 and 15.12. After the extra runs GEBVs for females are published on national data bases

Table 8. NAV and INTERBULL release dates in 2012. EBVs released at NAV dates in bold will be delivered to international genetic evaluation.

	2012	
Month	NAV	INTERBULL
January 2012		
February 2012	**2**	
March 2012		
April 2012		3
May 2012	2	
August 2012	**14**	14
September 2012		
October 2012		
November 2012	**2**	
December 2012		4

You can get more information about the joint Nordic evaluation:

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