News - NAV routine evaluation
15 May 2009

The latest NAV routine evaluation for yield, fertility, type, udder health, other diseases, calving traits, milk ability, temperament 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).

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	25.03.2009	05.04.2009	25.03.2009
Type, milk ability and temperament	22.04.2009	05.04.2009	06.04.2009
Fertility	03.04.2009	05.04.2009	05.04.2009
Udder health and other disease	20.04.2009	05.04.2009	05.04.2009
Calving	20.04.2009	05.04.2009	05.04.2009

News in relation to NAV genetic evaluation
Calving and birth traits for Jersey
Breeding values for calving and birth traits for Jersey are estimated from a model similar to the model, which is used for RDC and Holstein. Altogether, twelve traits – Survival, Calving Ease, and Size of Calf for first and later lactations with a maternal and direct effect each – were simultaneously analyzed. So far only Danish data are used for Jersey.

Table 2. Calving Traits in the three Nordic countries

	Denmark	Finland	Sweden
For all traits	1st and later calvings direct and mat. effect	1st and later calvings direct and mat. effect	1st and later calvings direct and mat. effect
Survival	Since 1985 categories 0 – 1	Since 1992 categories 0 - 1	Since 1982 categories 0 – 1
Calving Ease	Since 1985 categories 1 - 4	Since 2004 categories 1 - 4	Since 1982 categories 1 – 2
Size of Calf	Since 1985 categories 1 – 4	none	none

The EBVs for the four direct traits – survival 1st, survival later calving, calving ease 1st, and calving ease later calving are weighted together in a Birth index. The EBVs for the four maternal traits – survival 1st, survival later calving, calving ease 1st, and calving ease later calving are weighted together in a Calving index. The economic weights are based on results from the NAV Total Merit Index project. Maternal and direct effect of size of calf is used as an information trait only. Beside the EBVs for maternal effects EBVs for Maternal grandsire (MGS)

effects are expressed. MGS effects include beside the maternal effect also 50% of the direct effect. Correlations between EBVs from the new and old Jersey model are about 0.90 for both the birth and the calving trait.

No changes for all other traits

Interbull evaluation
The international evaluation takes place for the different traits according to table 3.

Table 3. International evaluation

International trait	Breed	NAV data
Milk ability	Holstein, RDC and Jersey	NAV Milking speed EBVs
Temperament	Holstein and RDC	NAV Temperament EBVs
Body Condition Score	Holstein	Danish BCS EBVs
Locomotion	Holstein	NAV Rear legs rear view EBV

International EBVs for milk ability and temperament were estimated for the first time in January 2009. The international EBVs for milk ability and temperament are included in the NTM index for females and bulls following the same rules as other Interbull EBVs

Genetic base
EBVs for bulls and females are expressed on the same cow base. This genetic evaluation included cows born from 15.05.2004 to 15.05.2006 in the genetic base (average 100).

For functional traits, sire models are used and EBVs for cows are not estimated. For functional traits, the genetic base includes bulls, which are sires of present cows – see table 4.

Table 4. Definition of genetic base for cows and bulls

Trait	Genetic base
Yield, type, milk ability and temperament	Cows born 15.05.2004 -15.05.2006
Fertility, calving, mastitis resistance and resistance against other diseases	Bulls born 15.05.2000 -15.05.2002

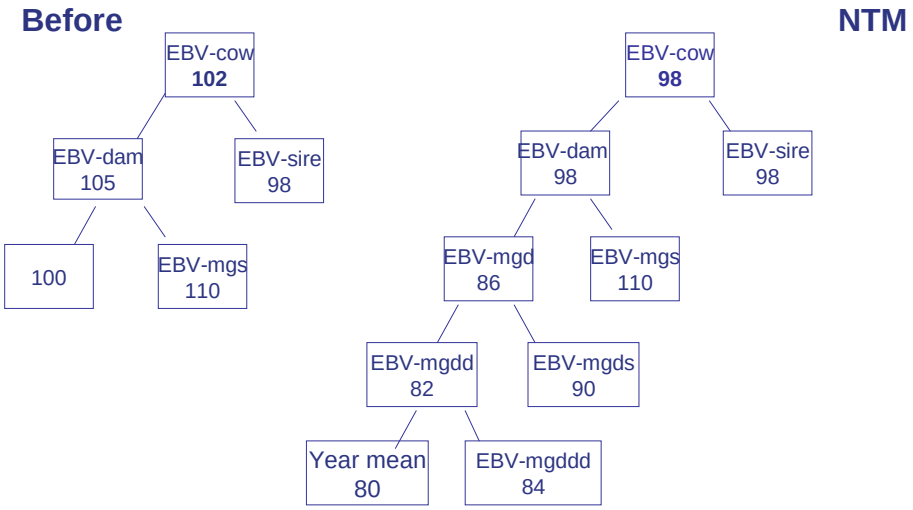
NTM – Nordic Total Merit Index
NTM - Nordic Total Merit - is the name of the total economic index for dairy cattle in Finland, Sweden and Denmark. This means that bulls and cows in all three countries have a NTM breeding value calculated the same way. It also means, for example, that a bull which is used in more than one country will have exactly the same NTM, independent of whether he is used in Finland, Sweden and Denmark. Table 5 - 8 give the weight factors for the different breeds used when calculating NTM. Weight factors are slightly different for cows and bulls due to an approximate multi trait method used for cow NTM.

Pedigree index
A pedigree index is calculated for all traits without an official EBV based on daughter or own records for both cows and bulls. The pedigree index is calculated as an average of sire and dam EBVs for both bulls and females - starting from the oldest animal

$$\text{Pedigree Index} = ½\ EBV_{sire} + ½\ EBV_{dam}$$

The pedigree index is calculated based on all information in the pedigree as illustrated for fertility for a female in figure 1. When the pedigree index is traced back to an unknown animal

the EBV is set to a birth year mean. Birth year mean is calculated per country breed. This method is applied for all traits. The principles are illustrated in figure 1 for a female for fertility.



Figur 1 Example - female pedigree index for fertility

Table 5. Weights factors for bulls and cows in NTM for Holstein

Trait	**NTM weight**	**NTM cow weights considering approx Multi Trait**	
	Bulls	**Cow with own yield records**	**Cow with yield records and own udder conformation records**
Yield index	0.75	**0.68**	**0.68**
Growth	0.06	0.06	0.06
Fertility	0.31	0.31	0.31
Birth index	0.15	0.15	0.15
Calving index	0.17	0.17	0.17
Udder health	0.35	0.35	0.35
Other disease	0.12	0.12	0.12
Body	0.00	0.00	0.00
Feet & legs	0.15	0.15	0.15
Udder	0.18	0.18	**0.23**
Milk ability	0.08	0.08	0.08
Temperament	0.03	0.03	0.03
Longevity	0.11	0.11	0.11

Table 6. Weights factors for bulls and cows in NTM for RDC

Trait	**NTM weight**	**NTM cow weights considering approx Multi Trait**	
	Bulls	**Cow with own yield records**	**Cow with yield records and own udder conformation records**
Yield index	0.92	**0.84**	**0.84**
Growth	0.00	0.00	0.00
Fertility	0.26	0.26	0.26
Birth index	0.14	0.14	0.14
Calving index	0.12	0.12	0.12
Udder health	0.32	0.32	0.32
Other disease	0.12	0.12	0.12
Body	0.00	0.00	0.00
Feet & legs	0.09	0.09	0.09
Udder	0.32	0.32	**0.37**
Milk ability	0.06	0.06	0.06
Temperament	0.03	0.03	0.03
Longevity	0.08	0.08	0.08

Table 7. Weights factors for bulls and cows in NTM for Jersey

Trait	NTM weight	NTM cow weights considering approx Multi Trait	
	Bulls	Cow with own yield records	Cow with yield records and own udder conformation records
Yield index	0.87	**0.78**	**0.78**
Growth	0.00	0.00	0.00
Fertility	0.26	0.26	0.26
Birth index	0.06	0.06	0.06
Calving index	0.06	0.06	0.06
Udder health	0.49	0.49	0.49
Other disease	0.04	0.04	0.04
Body	0.00	0.00	0.00
Feet & legs	0.05	0.05	0.05
Udder	0.15	0.15	**0.22**
Milk ability	0.10	0.10	0.10
Temperament	0.03	0.03	0.03
Longevity	0.12	0.12	0.12

Table 8. Weights factors for bulls and cows in NTM for Red Holstein

Trait	NTM weight	NTM cow weights considering approx Multi Trait	
	Bulls	Cow with own yield records	Cow with yield records and own udder conformation records
Yield index	0.75	**0.68**	**0.68**
Growth	0.11	0.11	0.11
Fertility	0.23	0.23	0.23
Birth index	0.17	0.17	0.17
Calving index	0.17	0.17	0.17
Udder health	0.35	0.35	0.35
Other disease	0.12	0.12	0.12
Body	0.00	0.00	0.00
Feet & legs	0.15	0.15	0.15
Udder	0.24	0.24	**0.29**
Milk ability	0.08	0.08	0.08
Temperament	0.03	0.03	0.03
Longevity	0.11	0.11	0.11

Publication of NTM

A bull gets an official NTM, when the bull has official EBVs for yield, type and mastitis. For traits without an official EBV, a pedigree index is used.

NAV – frequency and timing of routine runs

NAV performs 6 evaluations per year for all traits. The NAV evaluations are timed in a way so NAV can deliver updated EBVs to all the international evaluations. In Table 9, the current and future NAV and INTERBULL release dates are shown.

Table 9. NAV and INTERBULL release dates in 2009. EBVs released at NAV dates in bold will be delivered to international genetic evaluation. Note the publication date in August is 18th.

	2009	
Month	NAV	INTERBULL
January	15	13
February		
March	**13**	
April		7
May	15	
June		
July		
August	**18**	18
September		
October	15	
November		
December	**1**	

You can get more information about the joint Nordic evaluation:

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