News - NAV routine evaluation
November 2nd 2013

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	26.09.2013	17.09.2013	13.09.2013
Type, milk ability and temperament	30.09.2013	17.09.2013	09.09.2013
Fertility	30.09.2013	17.09.2013	13.09.2013
Udder health and other disease	30.09.2013	17.09.2013	22.09.2013
Calving	30.09.2013	17.09.2013	22.09.2013
Longevity	30.09.2013	17.09.2013	13.09.2013
Growth	25.09.2013	17.09.2013	22.09.2013
Claw health	30.09.2013	17.09.2013	13.09.2013

Data used in genomic prediction
Genotypes were extracted from the joint Nordic SNP data base October 21st 2013. Interbull information from August 2013 and national information according to extraction dates in table 1 were included in genomic prediction.

News in relation to NAV genetic evaluation
Traditional evaluation
Pedigree
From Sweden more pedigree information about old widely used NRF animals has been added to the NAV pedigree file used in the RDC evaluation. The added pedigree information had a minor effect on the EBVs. It also means that the NAV pedigree file should contain all the available national information about gene proportions.

Type traits

Optimum has been adjusted for Dairy form in Jersey (table 2). The change has a very minor effect on Body EBVs within Jersey.

Table 2. Optimum for Body, Feet & Legs, and Mammary for Holstein, RDC, Red Holstein, Jersey and Finn Cattle

	Holstein	RDC	Jersey old	**Jersey 2.11 2013**	Red Holstein	Finncattle
1. Stature	148	142	129	129	146	136
2. Body depth	6	6	6	6	6.5	6
3. Chest width	5	5.5	5	5	6	5
4. Dairy form	6	5.5	7	**6**	5.5	5.5
5. Top line	7	7	7	7	7	7
6. Rump width	5.5	5	6	6	6	4.5
7. Rump angle	5	5	5	5	5.2	5
8. Rear legs, side view	5	5	5	5	5	5
9. Rear legs, back rear view	8	8	9	9	9	8
10. Hock quality	9	9	9	9	9	9
11. Bone quality	8	7.5	9	9	7	7.5
12. Foot angle	6.5	7	6.5	6.5	6.5	5
14. Fore udder attachment	9	9	9	9	9	9
15. Rear udder height	9	9	9	9	9	9
16. Rear udder width	9	9	9	9	9	9
17.Udder cleft/support	8	9	9	9	9	9
18. Udder depth	9	9	9	9	9	9
19. Teat length	5.5	5.5	5.5	5.5	4.5	5
20. Teat thickness	5	6	6	6	5.5	5
21. Teat placement (front)	8	8	7.5	7.5	8	6
22. Teat placement (back)	5	5	5	5	5	5
23. Udder balance	5	5	5	5	-	5

Weights have been adjusted for Mammary in RDC (table 3). The changes have a very minor effect on Mammary EBVs within RDC.

Table 4. Weight factors for Body, Feet & Legs, and Mammary for Holstein, RDC, Red Holstein, Jersey and Finncattle

	Holstein	**RDC old**	**RDC-2.11.2013**	Jersey	Red Holstein	Finncattle
1. Stature	3	10	10	6	10	10
2. Body depth	15	15	15	14	20	15
3. Chest width	15	20	20	13	16	15
4. Dairy form	20	10	10	10	15	15
5. Top line	12	10	10	25	10	15
6. Rump width	15	15	15	11	11	20
7. Rump angle	20	20	20	11	8	10
8. Rear legs, side view	10	15	15	20	10	25
9. Rear legs, back rear view	30	25	25	20	15	25
10. Hock quality	18	25	25	20	25	20
11. Bone quality	17	15	15	15	20	15
12. Foot angle	25	20	20	25	30	15
13. Fore udder attachment	17	20	20	25	18	14
14. Rear udder height	10	8	8	5	10	9
15. Rear udder width		5	5			5
16. Udder cleft/support	10	12	12		10	9
17. Udder depth	24	20	20	35	18	12
18. Teat length	5	5	**10**	3	6	4
19. Teat thickness	5	5	**10**	12	6	4
20. Teat placement (front)	7	7	**10**	15	14	30
21. Teat placement (back)	12	8	**5**		6	4
22. Udder balance	10	10	**0**			9
23. Codes for body				10	10	
24. Codes for udder				5	12	

Genomic prediction

For RDC and Jersey GEBVs it has been observed that:

- Bulls increase on average in breeding value when they get an EBV based on milking daughters
- Pedigree index is on average higher than GEBV for genomic tested heifers

The discrepancy was primarily observed in yield index. NAV has during the last months analysed what is causing this problem, and has found that a part of the problem was caused by the standardization of DGVs to avoid inflation. It means that the standardization has to take place within birth year instead of across birth year, which has been practice so far.

The standardization within birth year is introduced in the November 2nd routine evaluation for all breeds. In table 5 the results are shown for protein from a test run.

Table 5 Effect of changed standardization on GEBV for protein.

	RDC		Jersey		Holstein	
	Old	New	Old	New	Old	New
2009	101.2	102.0	103.1	103.7	104.9	105.5
2010	102.4	102.7	103.5	103.7	106.6	107.5
2011	104.0	104.9	104.7	105.5	107.6	108.5
2012	104.4	105.9	105.9	107.1	110.2	111.6
2013	105.4	107.7	105.7	107.6	110.9	112.5

The changes in standardisation increase the GEBV level for candidates for all three breeds and have the largest effect for RDC and Jersey, but it does only describe a part of the discrepancy.

NAV is at the moment doing some additional analyses comparing the DGV levels based on different datasets. NAV hopes in the near future to be able to solve the final part of the observed problem. Further analyses are combined with on-going investigations of the value of adding cows to the reference population. As along as the discrepancy exists it also means that we do not have a 100% fair ranking across genotyped and not genotyped animals for Jersey and RDC, which has to be taken into account in the selection process in practice.

NTM
Current weight factors NTM (table 6)

Table 6. Current weight factors for NTM

	Holstein	RDC	Jersey	Red Holstein
Yield*	0.75/0.68	0.92/0.84	0.87/0.78	0.75/0.68
Growth	0.06	0.00	0.00	0.11
Fertility	0.31	0.26	0.20	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	0.44	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	0.25	0.32	0.26	0.24
Milk ability	0.08	0.10	0.10	0.08
Temperament	0.03	0.03	0.03	0.03
Longevity	0.11	0.07	0.08	0.11
Claw health	0.08	0.05	0.05	0.10

*Weight factor for bulls/weight factor for cows with own yield record, but without genomic information

Genetic base
EBVs for bulls and females are expressed on the same cow base. This genetic evaluation included cows born from 02.11.2008 to 02.11.2010 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 7 describes how different categories of genotyped animals are handled in the evaluation. All non genotyped animals get traditional EBVs.

Table 7 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 17 month old at publication date
	Bulls with a Nordic progeny test 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 & cows		**GEBV**

- 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 GEBV the GEBV is published as the official index instead of the EBV

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 eight extra genomic predictions to get GEBVs based on the newest information for all genotyped bull calves and females. The coming extra runs in 2013/14 takes place 3.12, 2.1, 3.3, 2.4, 2.6, 2.7, 2.9, 2.10, and 2.12. After the extra runs GEBVs for females are published on national data bases

Table 8. NAV and INTERBULL release dates in 2013/14. EBVs released at NAV dates in bold will be delivered to international genetic evaluation.

	2013/14	
Month	NAV	INTERBULL
November 2013	**2**	
December 2013		3
January 2014		
February 2014	**3**	
March 2014		
April 2014		1
May 2014	2	
June 2014		
July 2014		
August 2014	**12**	12
September 2014		
October 2014		
November 2014	**3**	
December 2014		2

You can get more information about the joint Nordic evaluation:

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