

News - NAV routine evaluation

3 November 2015

The latest NAV routine evaluation for yield, fertility, type, udder health, other diseases, calving traits, milk ability, temperament, growth, longevity, young stock survival, 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	24.09.2015	17.09.2015	25.09.2015
Type, milkability and temperament	25.09.2015	17.09.2015	25.09.2015
Fertility	24.09.2015	17.09.2015	26.09.2015
Udder health and other disease	25.09.2015	17.09.2015	26.09.2015
Calving	30.09.2015	17.09.2015	26.09.2015
Longevity	30.09.2015	17.09.2015	20.09.2015
Growth	25.09.2015	17.09.2015	21.09.2015
Claw health	25.09.2015	17.09.2015	27.09.2015
Young stock survival	23.09.2015	17.09.2015	27.09.2015

Data used in genomic prediction

Genotypes were extracted from the joint Nordic SNP data base 21 October 2015. The annual exchanges of genotypes within Eurogenomics for Holstein have taken place and about 1,300 genotypes from the last birth year of bulls with milking daughters are included in the reference population, furthermore about 2,600 Polish reference bulls are included in the evaluation.. INTERBULL information from August 2015 and national information from present run were included in genomic prediction.

News in relation to NAV genetic evaluation

Genomic prediction

- GEBV reliabilities

Traditional evaluation

- Jersey Overall Udder – new weight on linear traits in overall udder conformation
- Claw health – new genetic parameters and cow EBVs including own records

Genomic prediction

GEBV reliabilities

GEBV reliabilities are published along with the GEBV. In table 2 the estimated reliabilities (%) for candidate bulls are presented per bred for the main traits. The differences in the level of the

reliabilities can to large extend be explained by the differences in size of the reference populations for the three breeds.

Table 2. Average GEBV reliabilities (%) for bull calves born in 2014

Traits	Holstein	RDC	Jersey
Yield	74	67	67
Growth	60	49	28
Fertility	65	47	42
Birth	70	57	44
Calving	64	43	65
Udder health	68	57	56
Other disease	45	38	26
Claw health	43	33	-
Longevity	61	38	37
Frame	73	58	63
Feet & Legs	68	54	53
Udder	73	55	60
Milking speed	69	66	60
Temperament	62	53	27

Traditional evaluation

Jersey Overall Udder

The weighing of the linear udder conformation traits in the overall udder index for Jersey has been changed. The new and the old weights are shown in table 3. The changes in weights for udder create significant reranking of cows and bulls. The correlation between the old and the new udder index for Jersey bulls is 0.84.

Table 3. Old and new weightings of linear udder traits in mammary. Jersey

Traits	Previous	New
Fore udder attachment	25	20
Rear udder height	5	
Rear udder width		
Udder cleft		10
Udder depth	35	25
Teat length	3	
Teat thickness	12	
Teat placement, front	15	
Teat placement, back		-10
Udder balance		-10
Codes for udder	5	

Claw health

The NAV claw health evaluation has been improved. The most important changes in the claw health genetic evaluation are:

- New genetic parameters
- Cow EBVs include own records

New genetic parameters for all 7 claw health traits in three lactations are estimated based on claw trimmer registrations done since 2010 where the joint Nordic registration scheme was introduced. For RDC and Holstein the new genetic parameters deviate moderately from the old estimates for RDC and Holstein whereas we do see significant changes between the new Jersey parameters and the parameters used so far within Jersey (=Holstein parameters). The estimated heritabilities for claw health traits in Jersey are somewhat lower than for RDC and Holstein. In table 4 an overview of the genetic parameters are presented.

Table 4 Overview genetic parameters for claw health traits

	Holstein	RDC	Jersey
Dermatitis (DDE)	0.04-0.05	0.03	0.04-0.07
Heel Horn Erosion (HHE)	0.03-0.04	0.04-0.07	< 0.02
Sole Haemorrhage (SHE)	0.02-0.03	0.03-0.04	< 0.01
Sole Ulcer (SUL)	0.04-0.05	0.02-0.03	0.01-0.03
Cork screw claws (CSC)	< 0.01	0.02-0.04	< 0.01
Skin Proliferation (SKP)	0.04-0.08	0.02-0.06	< 0.02
White line separation+ double sole (WLS)	0.01-0.02	< 0.02	< 0.01

The genetic correlations between lactations are for all claw traits between over 0.80 indicating that it to a large extent is the same traits which are expressed in all three lactations.

Genetically claw traits can be separated in two groups of traits: group 1(Dermatitis, Skin Proliferation, Heel Horn Erosion) group 2 (Sole Haemorrhage, Sole Ulcer, Cork screw claws, White line separation+ double sole). The genetic correlation between traits within each group is 0.5-0.9 whereas the genetic between traits in group 1 and traits in group 2 is close to 0.00.

The update of genetic parameters creates some changes in the ranking of animals. For Holstein and RDC bulls the correlations between the new and the old claw health index for progeny tested bulls are high 0.97-0.98. The corresponding correlation for Jersey is about 0.92 indicating significant reranking between bulls. For Holstein only 5% of the bulls change more that 4 index point comparing new and previous claw health index. For RDC about 8% of the bulls change more than 4 index points, and for Jersey the corresponding figure is 30%. The reranking is largest for Jersey due to the new genetic parameters.

The correlation between new and previous claw health index EBVs for cows is around 0.85. The new cow EBVs for claw health include now the cows own claw health registration, while the previous was based on pedigree information only.

Genetic base

EBVs for bulls and females are expressed on the same cow base. This genetic evaluation included cows born from 03.11.2010 to 03.11.2012 in the genetic base (average 100).

GMACE

Interbull GEBVs are available for genotyped Holstein bulls from the countries participating in the GMACE routine evaluation.

The figures can be found on the NAV search page for Interbull EBVs

<https://fabaweb.mloy.fi/SKJOWeb/WWWjasu/NAV/BullSearch.asp?strLang=DNK&strBreed=&strBirthCountry=&strBirthCountryID=&strName>

Publication of NTM for Nordic and foreign bulls

A NTM is published if the bull has official EBVs (NAV (G)EBV or international (G) 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 EBVs for the single bull exist. For traits without a NAV (G)EBV or an IB (G)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 $\frac{1}{2}(\text{EBVsire}-100) + \frac{1}{4}(\text{EBVmgs}-100) + 100$. If EBVsire or EBVmgs is not official NAV EBVs then 100 is used.

NAV search page

NAV publish (G)EBVs for herd book registered AI bulls from all three countries at a joint Nordic search page <https://nordic.mloy.fi/navbull>

NAV – frequency and timing of routine runs

NAV has 4 evaluations per year including all phenotypic data. In table 5 the future NAV and INTERBULL release dates are shown. NAV does eight extra genomic predictions to get GEBVs based on the newest information for females. The extra runs in 2015 takes place 5.1, 1.3, 5.4, 7.6, 5.7, 6.9, 4.10, and 6.12. After the extra runs GEBVs for females are published on national data bases

Table 5. NAV and INTERBULL release dates in 2015. EBVs released at NAV dates in bold will be delivered to international genetic evaluation.

Month	NAV	INTERBULL
December 2015		1
January 2016		
February 2016	2	
March 2016		
April 2016		5
May 2016	3	
June 2016		
July 2016		
August 2016	9	9
September 2016		
October 2016		
November 2016	1	
December 2016		6

You can get more information about the joint Nordic evaluation:

General about Nordic Cattle Genetic Evaluation: www.nordicebv.info

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