INTERBULL breeding values calculated April 2025

This newsletter is primarily written for VikingGenetics staff and breeding advisors in Denmark, Sweden, and Finland, but can also be of interest for dairy farmers.

Table of content

International breeding values for the traits and breeds shown in table 1 have been published 3th April 2025

Current evaluation	
Daughter proven bulls: Yield Conformation Somatic cell count and udder health Longevity Calving – maternal and direct Female fertility Milking speed and temperament NTM for Nordic and foreign bulls	Young genomic tested bulls - HOL: Yield Conformation Somatic cell count and udder health Longevity Calving – maternal and direct Female fertility Milking speed and temperament

Table 1. Traits and breeds for which international breeding values are published.

Trait:	**International breeding values for the breeds:**
Yield	Red breeds, Holstein and Jersey
Conformation	Red breeds, Holstein and Jersey
Udder health	Red breeds, Holstein and Jersey
Longevity	Red breeds, Holstein and Jersey
Calving – maternal and direct	Red breeds and Holstein
Female fertility	Red breeds, Holstein and Jersey
Milking speed	Red breeds, Holstein and Jersey
Temperament	Red breeds and Holstein

You can find Interbull breeding values for all bulls with international breeding values on NAV Interbull search

On the page you can search within breed or country of birth. You can also search with the herd-book number or the name of the bull. Click on the herdbook number of the bull and view a graph-ical representation of the bulls' breeding values.

You can sort the bulls by different breeding values by clicking on the top line of the table.

Bulls born in Denmark, Finland and Sweden are in the following grouped under DNK/FIN/SWE

Daughter proven bulls

In the tables below, only sires that have breeding values based on daughter information is shown. Country refer to birth country of the bulls.

Yield

In tables 2-4 is a comparison of the genetic level of yield for bulls from different countries. The analysis includes bulls born in 2018 or later, that have more than 60 daughters in the genetic evaluation.

Table 2. Genetic level for yield traits, Red breeds. Bulls born in 2018 or later.

Country	No. of bulls	Milkindex	Fatindex	Proteinindex	Y-index	Y-index STD
Canada	13	93,2	88,3	86,2	85,6	10,7
Germany	9	101,9	97,6	102,0	99,6	7,3
DNK/FIN/SWE	115	99,2	104,5	103,5	105,1	8,6
UK	6	76,7	71,3	64,8	65,7	4,7
Norway	101	99,4	94,1	95,8	94,0	10,0
New Zealand	9	92,0	83,2	83,2	81,1	10,9

Table 3. Genetic level for yield traits, Holstein. Bulls born in 2018 or later.

Country	No. of bulls	Milkindex	Fatindex	Proteinindex	Y-index	Y-index STD
Australia	43	98,2	102,7	100,1	102,0	7,8
Belgium	10	103,2	105,2	105,7	106,0	4,7
Canada	265	107,0	110,5	106,9	108,9	12,7
Switzerland	62	97,5	97,1	95,7	96,0	10,3
Czech Republic	38	112,3	111,3	111,5	111,2	8,3
Germany	579	112,9	107,0	111,2	108,5	9,3
DNK/FIN/SWE	181	99,2	103,5	103,2	104,4	8,7
Spain	43	114,0	101,5	106,9	102,2	7,8
France	228	106,8	102,4	106,3	104,0	8,1
UK	38	97,6	109,3	101,0	106,5	10,0
Hungary	7	109,0	113,4	111,4	113,0	7,1
Israel	88	100,8	99,1	99,0	98,6	7,1
Italy	120	107,4	105,2	108,0	106,6	8,1
Japan	16	108,0	110,1	105,0	107,1	9,7
Netherlands	361	104,8	107,6	106,9	107,8	8,9
New Zealand	547	74,1	92,8	84,1	91,4	6,6
Poland	60	108,0	103,6	106,6	104,6	7,0
Slovenia	21	99,8	87,6	91,0	86,9	7,1
USA	1667	108,4	115,1	108,5	112,2	10,1

Table 4. Genetic level for yield traits, Jersey. Bulls born in 2018 or later.

Country	No. of bulls	Milkindex	Fatindex	Proteinindex	Y-index	Y-index STD
Australia	13	104,7	89,6	96,2	89,4	5,6
Canada	18	104,7	92,4	96,5	91,5	16,0
DNK/FIN/SWE	59	103,0	106,2	106,6	107,5	8,1
New Zealand	322	98,0	94,9	98,2	96,2	8,0
USA	284	115,7	104,2	110,4	104,8	9,9

International comparison for yield among most important populations shows that:

- Red breeds: DNK/FIN/SWE have higher genetic level than Norway and considerably higher level that Canada
- Holstein: USA has the highest genetic level while DNK/FIN/SWE has around average genetic level
- Jersey: Denmark has higher genetic level than USA. New Zealand has considerably lower genetic level

Conformation

The international genetic evaluation is done for 16 linear traits for Holstein, Red breeds and Jersey. In addition, frame, body condition score and locomotion are included in this trait group.

Breeding values for frame

EBV for frame is calculated from the 6 linear traits that are part of the international genetic evaluation. The composite NAV breeding value for frame also includes topline. There is no international genetic evaluation of topline.

We calculate international breeding value for frame based on a regression of NAV breeding values for the 6 linear international traits on NAV EBV for frame for Danish, Swedish and Finnish bulls born in 2015-2018. The estimated regression coefficients are used to calculate international breeding value for frame for foreign bulls. This method is used to ensure the same relative weight between traits in NAV and international composite traits.

Breeding values for feet and legs

EBV for feet and legs is calculated from the 3 linear traits that are part of the international genetic evaluation. The composite NAV breeding values for feet and legs also include hock quality and bone quality. There is no international genetic evaluation for these two traits.

We calculate international breeding value for feet and legs based on a regression of NAV breeding values for the 3 linear international traits on NAV EBV for feet and legs for Danish, Swedish and Finnish bulls born in 2015-2018. The estimated regression coefficients are used to calculate international breeding value for feet and legs for foreign bulls.

Breeding values for udder

The international genetic evaluation for udder includes 7 traits. The Nordic genetic evaluation for udder also includes teat thickness and udder balance. There is no international evaluation for these two traits.

We calculate international breeding value for udder based on a regression of NAV breeding values for the 7 linear international traits on NAV EBV for udder for Danish, Swedish and Finnish bulls born in 2015-2018. For Holstein the non Interbull traits Rear udder Width, Udder balance and Teat thickness are estimated from the 7 seven linear Interbull udder traits. For RDC and Jersey the estimated regression coefficients are used to calculate international breeding value for udder for foreign bulls.

Genetic level of composite conformation traits

In tables 5-7 is a comparison of genetic level of composite conformation traits for bulls from different countries. The calculation includes bulls that have at least 25 daughters in genetic evaluation.

Table 5. Genetic level for conformation traits, Red breeds. Bulls born in 2018 or later.

Country	No. of bulls	Frame		Feet&legs		Udder	
		Average	STD	Average	STD	Average	STD
Canada	18	102,3	4,5	104,9	5,4	99,1	8,2
Germany	13	109,2	5,5	104,0	4,1	102,8	10,6
DNK/FIN/SWE	107	98,2	8,6	102,6	5,8	100,8	7,3
UK	6	98,8	3,9			102,8	6,8
Norway	79	97,3	7,9	100,6	5,4	85,4	9,4
USA	5	111,2	6,5	104,4	4,2	111,8	3,9

Table 6. Genetic level of conformation traits, Holstein. Bulls born in 2018 or later.

Country	No	Frame		Feet&legs		Udder	
		Average	STD	Average	STD	Average	STD
Australia	19	115,3	12,1	99,6	5,6	102,5	12,6
Belgium	9	108,6	16,1	104,8	5,7	103,6	6,7
Canada	238	113,3	10,8	96,8	5,5	107,6	9,3
Switzerland	72	108,9	9,4	98,5	5,6	109,2	9,5
Czech Republic	40	109,1	8,8	100,2	4,1	98,2	9,1
Germany	540	106,0	8,9	101,3	5,3	105,2	8,3
DNK/FIN/SWE	161	98,8	9,9	101,1	5,9	103,5	8,1
Spain	54	111,5	8,0	99,9	6,2	103,3	9,0
France	193	117,2	9,6	102,7	5,7	111,0	9,4
UK	24	102,9	13,1	98,8	5,2	104,0	7,0
Hungary	7	111,3	10,5	97,9	5,5	103,7	6,3
Italy	117	112,4	10,0	98,8	5,0	102,7	8,6
Japan	221	110,3	9,6	97,4	4,9	99,9	8,3
Netherlands	298	107,7	9,9	105,8	7,4	101,1	9,8
New Zealand	554	85,2	9,3			89,6	7,6
Poland	52	111,8	11,9	103,3	5,4	100,4	9,6
Slovenia	18	106,9	9,0	98,2	4,5	90,7	8,1
USA	965	105,8	10,4	97,7	5,2	102,1	8,7

Table 7. Genetic level of conformation traits, Jersey. Bulls born in 2018 or later.

Country	No	Frame		Feet&legs		Udder	
		Average	STD	Average	STD	Average	STD
Australia	6	106,8	7,1	106,2	3,4	97,5	6,4
Canada	22	101,0	10,8	105,3	6,1	100,3	9,0
DNK/FIN/SWE	57	96,6	7,3	97,5	7,8	100,1	10,1
USA	183	102,3	7,5	100,8	5,6	102,1	8,5

International comparison for conformation traits among most important populations show that:

- Red breeds: Of the main populations Germany has the highest genetic level for both Frame, feet&legs and udder. Canada has similar genetic level as DNK/FIN/SWE. Compared to Norway, DNK/FIN/SWE have similar genetic level for frame and feet&legs and higher level for udder.

- Holstein: DNK/FIN/SWE has lower genetic level for frame than the main Holstein populations. Canada, Spain, France and Italy have the highest genetic level for frame. Populations with grass based dairy farming like New Zealand has lower genetic level for frame. For feet&legs Netherlands has the highest level and there are small differences between populations. DNK/FIN/SWE has around average genetic level for udder, while France, and Canada have the highest genetic level for udder.

- Jersey: Denmark has lower genetic level for frame than USA, and the same level for udders

Somatic cell count and udder health

Interbull does two international genetic evaluations – one for somatic cell count and one for udder health. In the first one only somatic cell count is included for all countries. NAV sends breeding values for somatic cell count to Interbull, so Nordic bulls get official breeding values for somatic cell count in countries where this trait is official. In the second evaluation breeding values based on mastitis diagnoses are included. NAV's official breeding value for udder health is used. For countries that do not record mastitis diagnoses, somatic cell count is included in this evaluation.

Index for udder health is published in the Nordic countries when reliability is 40% or higher. In tables 8-10 is a comparison of genetic level of udder health for bulls from different countries.

Table 8. Genetic level for udder health, Red breeds. Bulls born in 2018 or later.

Country	No. of bulls	Average	STD
Australia	18	96,3	7,8
Canada	14	94,8	10,7
DNK/FIN/SWE	202	101,0	8,7
UK	8	99,8	5,4
Norway	153	99,7	9,0
New Zealand	32	91,9	7,6
USA	6	96,7	5,8

Table 9. Genetic level for udder health, Holstein. Bulls born in 2018 or later.

Country	No. of bulls	Average	STD
Australia	74	97,6	7,1
Austria	5	96,6	5,0
Belgium	15	99,4	6,2
Canada	284	98,7	9,0
Switzerland	33	99,8	8,6
Czech Republic	59	97,7	9,1
Germany	601	100,2	8,0
DNK/FIN/SWE	254	102,2	7,1
Spain	82	102,2	8,4
Estonia	11	96,9	8,8
France	328	102,4	7,1
UK	39	99,1	6,3
Hungary	7	100,5	10,9
Israel	139	99,2	8,8
Italy	147	100,5	8,1
Japan	250	94,5	7,1
Korea	27	93,8	6,3
Luxembourg	6	99,7	6,5
Netherlands	353	100,0	7,4
New Zealand	776	92,4	7,2
Poland	111	99,0	9,3
Slovenia	40	93,6	9,3
USA	1510	99,1	8,4

Table 10. Genetic level for udder health, Jersey. Bulls born in 2018 or later.

Country	No. of bulls	Average	STD
Australia	28	90,1	5,6
Canada	10	86,6	11,6
DNK/FIN/SWE	88	100,7	7,4
New Zealand	444	93,6	6,7
USA	213	84,1	9,3

International comparison for udder health among most important populations show that:

- Red breeds: DNK/FIN/SWE has same genetic level as Norway
- Holstein: DNK/FIN/SWE has similar or higher genetic level than other major European populations, USA and Canada
- Jersey: Denmark is substantially better than the other populations.

Longevity

In tables 11-13 is a comparison of genetic level of longevity for bulls from different countries. Bulls are included if they have at least 40 daughters in the genetic evaluation.

Table 11. Genetic level for longevity, Red breeds. Bulls born in 2017 or later.

Country	No. of bulls	Average	STD
Australia	7	88,7	11,2
Canada	22	83,9	11,7
Germany	12	98,5	7,3
DNK/FIN/SWE	111	102,2	9,1
UK	12	83,7	6,0
Norge	123	91,7	6,4
USA	7	82,7	6,8

Table 12. Genetic level for longevity, Holstein. Bulls born in 2017 or later.

Country	No. of bulls	Average	STD
Australia	40	95,9	9,7
Austria	7	101,4	7,8
Belgium	17	101,9	8,1
Canada	382	99,9	9,0
Switzerland	96	96,9	8,3
Czech Republic	53	105,5	6,1
Germany	767	104,8	8,6
DNK/FIN/SWE	207	103,2	7,4
Spain	23	93,0	7,2
France	266	97,9	7,7
UK	39	96,4	14,0
Israel	132	93,9	5,5
Italy	131	99,4	8,3
Luxembourg	13	100,1	12,1
Netherlands	526	103,2	8,4
New Zealand	487	85,6	5,8
Poland	89	94,5	8,6
Slovenia	40	92,0	5,7
USA	2108	103,5	8,9

Table 13. Genetic level for longevity, Jersey. Bulls born in 2017 or later.

Country	No. of bulls	Average	STD
Australia	16	95,9	6,8
Canada	19	95,9	7,8
DNK/FIN/SWE	64	100,3	7,3
New Zealand	122	91,5	5,9
USA	330	101,0	7,4

International comparison for longevity among most important populations shows that:

- Red breeds: DNK/FIN/SWE has higher level than the other populations
- Holstein: DNK/FIN/SWE are among the countries with the highest genetic level
- Jersey: Denmark and USA has the highest genetic level

Calving – maternal and direct

For Red breeds Canada, Denmark, Finland, Norway, Sweden and The United States send data to this evaluation. It has not been possible to obtain enough high correlations between countries for still birth, so the international evaluation only includes calving ease (maternal and direct) for Red breeds.

In the Holstein group there are international breeding values for both still birth (maternal and direct) and calving ease (maternal and direct), but only for first lactation. In the Nordic countries also, information from later lactations and from birth weight is included in calving, maternal and calving, direct.

We have calculated international indices for calving, maternal and calving, direct by performing a regression between NAV breeding values for still birth and calving ease and NAV breeding value for calving for Nordic bulls born in 2008-2012. The calculated regression coefficients are used to calculate a calving index for foreign bulls - same method is used for calving, maternal and calving, direct.

In Tables 14 and 15 the average genetic level for Red breed and Holstein bulls is shown for different countries. Only bulls born in 2018 or later are included. Bulls need to have breeding values for yield to be included.

Table 14. Genetic level for calving, maternal and calving, direct, Red breeds. Bulls born in 2018 or later.

Country	Calving, direct			Calving, maternal		
	No. of bulls	Average	STD	No. of bulls	Average	STD
Canada	17	94,2	5,5	6	95,3	6,9
DNK/FIN/SWE	120	101,3	6,5	103	99,9	6,0
Norway	102	99,2	8,3	101	92,2	6,4

Table 15. Genetic level for calving, maternal and calving, direct, Holstein. Bulls born in 2018 or later.

Country	Calving, direct			Calving, maternal		
	No. of bulls	Average	STD	No. of bulls	Average	STD
Australia	52	97,6	4,5	1	94,0	
Belgium	11	99,8	5,0	9	101,8	4,5
Canada	290	98,7	5,7	215	101,5	4,7
Switzerland	82	97,6	4,8	56	100,8	8,2
Germany	631	99,4	6,0	563	100,9	5,9
DNK/FIN/SWE	183	100,3	5,3	179	101,9	5,4
Spain	31	99,2	3,9	6	102,0	3,5
France	270	97,0	6,0	242	106,0	7,5
UK	33	101,1	3,6	16	102,8	2,0
Israel	52	96,6	4,8	100	92,5	6,1
Italy	120	97,7	4,7	91	101,1	4,0
Netherlands	366	99,1	5,9	316	98,8	7,1
Poland	77	96,6	4,3	71	99,0	5,3
USA	1785	100,7	4,9	1210	103,3	4,6

International comparison for calving traits among most important populations shows that:

- Red breeds: DNK/FIN/SWE and Norway have similar genetic level for calving, direct. For calving, maternal DNK/FIN/SWE has a higher level than Norway
- Holstein: DNK/FIN/SWE are around the average for both calving, direct and calving, maternal.

Female fertility

NAV calculates breeding values for female fertility based on linear regression between NAV breeding values for female fertility and NAV breeding values for the sub-indices in female fertility. Basis for the regressions are Nordic bulls born in 2003-2007 – see more information below. The estimated regression coefficients are used to calculate international breeding value for female fertility for foreign bulls.

In practice 3 regressions are calculated with different explaining variables (Jersey only 2 and 3):

1: Female fertility = Ability to conceive (R^2, HOL = 0,05) (R^2, Red breeds = 0,35)
2: Female fertility = Days open (R^2, HOL = 0,87) (R^2, Red breeds = 0,85) (R^2, Jer = 0,87)
3: Female fertility = Ability to return to recycle after calving + ability to conceive + Days open (R^2, HOL = 0,96) (R^2, Red breeds = 0,94), (R^2, Jer = 0,94).

R^2 (degree of explanation) indicates the proportion of the variance of the index for female fertility, that the traits in the regression can explain. Since the regression is used on foreign bulls, and the genetic correlations between international and NAV traits are not 1, the observed degree of explanation will be lower.

For each foreign bull we use the regression with the greatest explanatory power given the international sub-indices that are available. The degree of explanation therefore depends largely of the traits being available from the different countries.

Table 16. Genetic level for female fertility, Red breeds. Bulls born in 2018 or later.

Country	No. of bulls	Average	STD
Canada	13	95,5	7,9
Germany	8	101,6	7,5
DNK/FIN/SWE	106	100,4	9,9
UK	6	92,3	8,1
Norway	79	112,1	7,3
New Zealand	6	100,0	2,3

Table 17. Genetic level for female fertility, Holstein. Bulls born in 2018 or later.

Country	No. of bulls	Average	STD
Australia	38	96,8	6,8
Belgium	10	92,7	9,3
Canada	243	94,6	8,9
Switzerland	57	95,3	5,3
Czech Republic	35	95,4	4,0
Germany	491	97,3	9,4
DNK/FIN/SWE	180	104,6	9,6
Spain	14	93,2	8,9
France	189	97,0	8,3
UK	28	100,5	6,3
Israel	87	96,3	2,7
Italy	97	95,2	8,6
Japan	16	90,3	6,4
Netherlands	339	94,4	8,9
New Zealand	353	99,0	5,5
Poland	23	88,2	8,3
USA	1552	94,8	7,2

Table 18. Genetic level for female fertility, Jersey. Bulls born in 2018 or later.

Country	No. of bulls	Average	STD
Australia	13	88,5	6,5
Canada	18	90,3	8,7
DNK/FIN/SWE	61	102,2	12,9
New Zealand	210	96,5	7,4
USA	264	89,7	7,8

International comparison for female fertility among most important populations shows that:

- Red breeds: DNK/FIN/SWE has a lower level than Norway
- Holstein: DNK/FIN/SWE has a higher genetic level than all other populations
- Jersey: Genetic level is higher in Denmark than the other populations

Milking speed and temperament

In Tables 19-21, the genetic level for bulls from different countries, born in 2018 or later are shown for Holstein, Red breeds and Jersey.

Table 19. Genetic level for milking speed and temperament, Red breeds. Bulls born in 2018 or later.

Country	Milking speed			Temperament		
	No. of bulls	Average	STD	No. of bulls	Average	STD
Canada	16	91,5	11,7	16	94,3	9,9
Germany	7	104,5	5,0	10	103,3	3,6
DNK/FIN/SWE	107	99,6	6,8	90	102,2	11,8
Norway	91	94	4,2	85	97,5	5,6

Table 20. Genetic level for milking speed and temperament, Holstein. Bulls born in 2018 or later.

Country	Milking speed			Temperament		
	No. of bulls	Average	STD	No. of bulls	Average	STD
Australia	21	102,8	6,3	21	104,8	6,1
Belgium	8	87,3	6,5	8	104,6	9,6
Canada	182	99,4	12,0	174	103,7	12,7
Switzerland	74	97,6	10,3	73	104,2	10,7
Germany	425	95,4	9,1	332	101,2	15,0
DNK/FIN/SWE	143	100,5	8,5	124	101,0	16,2
France	189	93,6	7,7	188	103,8	8,2
UK	27	99,6	12,7	27	104,4	10,4
Italy	95	92,1	4,1	93	102,5	9,4
Netherlands	295	91,4	9,9	253	103,2	12,3
New Zealand	559	102,1	2,8	559	97,8	2,3
Slovenia	24	96,0	5,8			
USA	410	98,6	12,6	399	103,7	14,2

Table 21. Genetic level for milking speed, Jersey. Bulls born in 2018 or later.

Country	No. of bulls	Average	STD
Australien	10	102,5	10,2
Canada	18	97,3	9,0
DNK/FIN/SWE	51	100,1	10,2
New Zealand	304	99,1	6,7
USA	10	102,1	7,9

International comparison for milking speed and temperament among most important countries show that:

- Red breeds: DNK/FIN/SWE has a higher genetic level for milking speed and temperament than Norway and Canada
- Holstein: DNK/FIN/SWE has similar level as other populations for milking speed and temperament.
- Jersey: Denmark has similar genetic level as New Zealand and USA

NTM for Nordic and foreign bulls

NTM index is calculated for all bulls (Nordic and others) that have official breeding values (NAV breeding values or international EBVs) for yield, udder health and conformation.

Interbull NTM is calculated by weighing the Interbull / NAV breeding values for yield, female fertility, calving (maternal and direct), udder health, longevity, feet&legs, udder, milking speed and temperament. The same economic weight factors are used as for NAV breeding values.

Rules for calculation of NTM based partly or entirely on international breeding values are stated below in order of priority.

1. **Bull has NAV breeding value for a trait**

If the bull has NAV breeding value for a specific trait, this is used in the calculation of NTM - no matter if the bull also has international breeding value for that trait.

2. **Bull has no NAV breeding value, but has an international breeding value for a trait**

If the bull does not have NAV breeding value for the trait, the international breeding value is used, provided that Interbull calculates international breeding values for that trait and the bull comes from a country which provides data for that trait.

3. **Bull has no NAV or no international breeding value for a trait**

For traits where no Interbull EBV is available or the bull has no Interbull EBV, and at the same time it is not tested in the Nordic countries, a pedigree index is used. Pedigree index is calculated as ½ (EBV_{sire} -100) +1/4 ($EBV_{maternal\ grand\ sire}$-100) +100. The contributions from the sire and maternal grand sire can be based on either NAV breeding values or international breeding values. If EBV_{sire} or $EBV_{maternal\ grand\ sire}$ are unofficial the pedigree index is set to 100.

Publication rules for NTM

All foreign and Nordic bulls that have Interbull breeding values for yield, udder health and udder get a public Interbull NTM. This NTM is calculated with a lower reliability than an NTM for Nordic proven bulls, where information for all traits is always available.

Genetic level for Interbull NTM

In tables 22-24 genetic level for Interbull NTM for Jersey, Red breeds and Holstein are shown. Bulls included are born in 2018 or later.

Table 22. Genetic level for NTM, Red breeds. Bulls born in 2018 or later.

Country	No. of bulls	Average	STD
Canada	9	-22,1	8,9
Germany	5	3,0	4,0
DNK/FIN/SWE	114	8,9	9,5
Norway	79	-7,4	9,3

Table 23. Genetic level for NTM, Holstein. Bulls born in 2018 or later.

Country	No. of bulls	Average	STD
Australia	17	1,2	11,1
Belgium	9	4,1	6,0
Canada	185	5,5	15,0
Switzerland	39	-4,2	12,3
Czech Republic	37	7,5	7,3
Germany	425	9,4	8,6
DNK/FIN/SWE	174	10,4	9,0
Spain	43	2,2	7,2
France	196	5,3	7,6
UK	24	10,2	8,8
Hungary	7	13,9	9,1
Italy	88	5,7	7,5
Japan	16	0,3	9,0
Netherlands	272	6,9	10,4
Poland	57	1,0	8,4
Slovenia	21	-20,0	9,1
USA	794	10,4	9,7

Table 24. Genetic level for NTM, Jersey. Bulls born in 2018 or later.

Country	No. of bulls	Average	STD
Canada	12	-13,2	13,0
DNK/FIN/SWE	57	9,8	8,4
USA	115	-7,6	8,3

International comparison of NTM among most important populations shows that:

- Red breeds: DNK/FIN/SWE is significant better in NTM than Canada and Norway
- Holstein: DNK/FIN/SWE, UK and USA have the highest level and are closed followed by the major European populations.
- Jersey: Denmark's average NTM is more than 17 index points better than USA

Changes since last run

In the evaluation in April 2025 the following changes are done compared to December 2024 evaluation. Only changes in major countries:

Yield

- Canada, France, Germany, Netherland (ALL) have base change.
- USA (ALL) has base change and drops in information due to pedigree accuracy and herd-year minimum edits.
- ITA (HOL, JER) has base change.

Fertility

- Canada, France, Germany, Netherland (ALL) have base change.
- USA (ALL) has base change and drops in information due to pedigree accuracy and herd-year minimum edits.
- Italy (HOL) has base change.

Calving

- Canada, Germany (ALL) have base change.
- France (HOL) has several missing bulls in current submission. Those bulls don't appear anymore among the publication files provided by the partner in charge of proofs publication. Bulls affected concern « old » bulls, 98% of them being born before 1995. Moreover, pedigree updates have also been carried out.
- Italy (HOL) has base change.
- Netherland (HOL, RDC) has base change and for HOL finetuned of the EDC calculation causing drop in information.

Conformation

- Canada, France (ALL) have base change.
- Denmark, Finland, Sweden (ALL) has changed in trait definition for ANG from angularity to rib structure. Data scored before 1.1.2020 deleated. Due to the fact that ANG is included in-OCS for HOL and JER, OCS has also changed for these breeds.
- Netherland (ALL) has base change and drops in information for udder conformation traits due to data edits.
- Italy (HOL, JER) has base change.
- France (HOL) has everal missing bulls in current submission. Those bulls don't appear anymore among the publication files provided by the partner in charge of proofs publication. Bulls affected concern « old » bulls, 98% of them being born before 1995. Moreover, pedigree updates have also been carried out.
- USA (HOL) has base change and small drops in information due to parentage verification.
- USA (OTH) has base change and transitioned from a single-trait reliability calculation to a multi-trait reliability calculation.

Udder health

- Canada, France, Germany, Netherland (ALL) have base change.
- USA (ALL) has base change and drops in information due to pedigree accuracy and herd-year minimum edits.
- Denmark, Finland, Sweden (HOL,RDC) has some drops in information due to editing checks of fertility and calving infomation: check if the herd is participating in disease regristration and if the fertility registrations is in agreement with calving informations. If not, the record is deleted.
- France (HOL) has several missing bulls in current submission some traits. Those bulls don't appear among the publication files provided for this run. Bulls affected concern « old » bulls, 98% of them being born before 1995. Moreover, pedigree updates have also been carried out.
- Italy (HOL) has base change. MAS: Different statistical model applied with change in variance components: Information about differential somatic cell count (DSCC) has been added, Pluriparae information included (maximum parity order 3), stricter editing criteria causing drops in information: filtered for age at calving within parity, removed outliers for SCS and DSCC, for inclusion of the lactation, the first test day (TD) must be within 60 days in milk (DIM) while the maximum distance between 2 consecutives TDs must be <= 70 DIM. Moreover, at least 3 TDS are needed to consider a lactation.

Longevity

- Canada, France, Germany, Netherland (ALL) have base change.
- USA (ALL) has base change and drops in information due to pedigree accuracy and herd-year minimum edits.
- Italy (HOL, JER) has base change.

Milking speed and temperament

- Canada, France, Germany, Netherland (ALL) have base change.
- USA (ALL) has base change and drops in information due to pedigree accuracy and herd-year minimum edits.
- France (HOL) has several missing bulls in current submission some traits. Those bulls don't appear among the publication files provided for this run. Bulls affected concern « old » bulls, 98% of them being born before 1995. Moreover, pedigree updates have also been carried out.
- Italy (HOL) has base change.

International comparison of changes since last run shows that:

- All countries: Changes are smaller changes with a minimal effect on the reliability and indexes.

Genomic tested young Holstein bulls

In the tables below, only Holstein sires that have breeding values based on genomic information and no daughters is shown.

Averages are only shown for countries with more than 20 bulls.

Yield

In tables 25 is a comparison of the genetic level of yield for bulls from different countries.

Table 25. Genetic level for yield traits, Holstein. Bulls born in 2022 or later.

Country	No. of bulls	Milkindex	Fatindex	Proteinindex	Y-index	Y-index STD
Australia	70	98,4	103,5	99,5	102,0	8,7
Belgium	18	113,4	118,8	116,6	118,7	6,3
Canada	583	110,1	119,0	111,5	116,0	11,1
Switzerland	22	106,9	110,8	107,0	109,1	6,5
Czech Republic	43	114,7	117,2	114,8	116,1	5,1
Germany	684	116,8	115,7	117,5	116,7	6,8
DNK/FIN/SWE	145	103,8	118,6	115,4	120,1	7,6
Spain	99	112,6	108,4	109,4	108,1	9,8
France	493	111,0	109,2	112,1	110,7	7,2
UK	68	108,4	124,3	114,1	121,2	13,3
Hungary	41	110,9	106,0	107,0	105,6	7,4
Italy	90	113,4	114,0	115,6	115,3	8,3
Netherlands	599	109,6	112,8	112,7	113,6	7,6
New Zealand	12	67,9	86,8	77,3	84,8	5,2
Poland	90	115,5	113,3	116,9	115,3	6,2
USA	2423	111,8	125,1	116,0	122,1	7,6

International comparison for yield shows that DNK/FIN/SWE, has same genetic level as other major countries

Conformation

The international genetic evaluation is done for 16 linear traits for Holstein. In addition, frame condition score and locomotion are included in this trait group.

Calculation of frame, feet&legs and udder follows same principles as for daughter proven bulls.

In tables 26 is a comparison of genetic level of composite conformation traits for bulls from different countries.

Table 26. Genetic level of conformation traits, Holstein. Bulls born in 2022 or later.

		Frame		Feet&legs		Udder	
Country	No	Average	STD	Average	STD	Average	STD
Australia	5	113,4	9,4	102,0	5,7	109,6	6,7
Belgium	9	110,9	5,3	105,3	6,7	105,2	6,5
Canada	343	115,9	10,8	100,8	4,4	106,6	8,1
Switzerland	17	117,9	7,3	100,9	3,2	118,6	7,5
Czech Republic	22	110,0	7,1	99,6	4,7	105,9	9,3
Germany	381	107,3	8,2	103,6	4,6	107,7	8,0
DNK/FIN/SWE	73	100,9	8,5	101,5	4,2	106,0	6,7
Spain	47	115,0	12,5	102,9	3,6	112,3	9,4
France	284	115,9	8,4	104,9	4,7	115,3	9,0
UK	50	105,5	7,5	98,2	3,2	98,7	9,4
Italy	24	111,4	10,0	100,4	3,7	102,0	7,0
Hungary	48	113,1	10,1	100,4	3,6	107,4	8,8
Netherlands	182	107,6	8,0	107,5	6,7	104,4	8,0
Poland	50	113,2	9,9	102,0	5,3	107,2	9,4
USA	1328	106,8	9,9	98,0	4,1	97,9	8,6

International comparison for conformation traits among most important populations shows that DNK/FIN/SWE has lower genetic level for frame than other populations. For feet&legs there are only small differences between populations. For Udder France and Spain have the highest level while DNK/FIN/SWE is around average.

Somatic cell count and udder health

In tables 27 is a comparison of genetic level of udder health for bulls from different countries.

Table 27. Genetic level for udder health, Holstein. Bulls born in 2022 or later.

Country	No. of bulls	Average	STD
Belgium	9	101,6	5,0
Canada	343	98,0	5,3
Switzerland	17	102,9	4,6
Czech Republic	12	100,6	5,8
Germany	381	103,0	6,2
DNK/FIN/SWE	72	104,1	5,3
Spain	47	103,7	9,6
France	283	107,1	6,1
UK	50	99,1	4,8
Hungary	24	97,6	6,5
Italy	48	101,3	6,1
Netherlands	181	102,7	5,7
Poland	50	103,8	6,1
USA	1327	99,1	4,8

International comparison for udder health among most important populations show that DNK/FIN/SWE is around average for the European populations while North American populations have a lower level.

Longevity

In tables 28 is a comparison of genetic level of longevity for bulls from different countries.

Table 28. Genetic level for longevity, Holstein. Bulls born in 2022 or later.

Country	No. of bulls	Average	STD
Australia	5	99,4	3,8
Belgium	9	109,5	5,2
Canada	343	105,1	6,4
Switzerland	17	107,5	3,9
Czech Republic	12	106,2	5,7
Germany	381	113,9	6,0
DNK/FIN/SWE	73	110,0	5,0
Spain	47	108,8	8,6
France	284	110,1	6,1
UK	50	104,7	4,8
Hungary	24	97,6	6,2
Italy	48	105,0	6,0
Netherlands	182	110,9	7,1
Poland	50	107,2	6,3
USA	1330	106,5	4,8

International comparison for longevity among most important populations shows smaller difference between the major populations.

Calving – maternal and direct

In Tables 29 the average genetic level for bulls is shown for different countries.

Table 29. Genetic level for calving, maternal and calving, direct, HOL. Bulls born in 2022 or later.

Country	Calving, direct			Calving, maternal		
	No. of bulls	Average	STD	No. of bulls	Average	STD
Belgium	9	99,2	3,1	9	104,1	3,9
Canada	343	98,5	4,0	343	101,7	5,0
Switzerland	17	99,1	3,4	17	103,3	3,6
Czech Republic	12	100,0	2,9	12	103,2	3,8
Germany	381	101,1	3,8	381	104,0	5,1
DNK/FIN/SWE	72	101,3	3,5	72	103,6	5,2
Spain	47	98,8	4,7	47	100,6	5,0
France	283	98,0	4,1	283	102,2	5,0
UK	50	99,1	3,9	50	102,3	3,6
Hungary	24	97,6	3,5	24	100,7	2,7
Italy	48	99,8	3,5	48	103,3	3,8
Netherlands	182	100,8	3,4	182	102,0	4,6
Poland	50	98,8	3,7	50	102,5	6,0
USA	1328	100,6	3,4	1327	103,6	3,9

International comparison for calving (direct and maternal) shows that DNK/FIN/SWE has similar level as the other major countries

Female fertility

In Tables 30 the average genetic level for bulls is shown for different countries.

Table 30. Genetic level for female fertility, Holstein. Bulls born in 2022 or later.

Country	No. of bulls	Average	STD
Australia	5	98,2	6,1
Belgium	8	100,0	7,4
Canada	335	95,4	7,6
Switzerland	17	99,1	5,2
Czech Republic	12	95,7	7,0
Germany	379	102,8	7,7
DNK/FIN/SWE	73	108,1	8,0
Spain	45	99,4	8,9
France	283	103,1	7,7
UK	37	99,8	4,9
Italy	47	98,4	7,0
Netherlands	179	100,4	8,3
Poland	47	99,8	8,2
USA	1116	99,7	5,7

International comparison for female fertility among most important populations shows that DNK/FIN/SWE is clear in the lead.

Milking speed and temperament

In Tables 31, the genetic level for bulls from different countries.

Table 31. Genetic level for milking speed and temperament, Holstein. Bulls born in 2022 or later.

Country	Milking speed			Temperament		
	No. of bulls	Average	STD	No. of bulls	Average	STD
Australia	5	104,8	16,1	5	100,2	2,9
Belgium	9	98,1	8,6	7	104,3	5,7
Canada	339	98,9	5,8	312	104,4	7,2
Switzerland	17	98,7	2,0			
Czech Republic	12	104,6	8,6			
Germany	373	98,0	2,6	373	102,7	5,6
DNK/FIN/SWE	71	103,2	2,9	71	101,9	3,9
Spain	47	98,1	2,6	40	104,4	2,3
France	283	95,3	3,1	281	104,1	4,4
UK	41	101,1	5,0	35	101,6	0,6
Italy	48	93,4	8,8	47	102,5	7,7
Netherlands	181	96,2	4,3	179	101,0	10,9
Poland	48	94,6	9,5	47	102,6	11,4
USA	1305	101,9	4,5	1094	103,5	4,4

For milking speed DNK/FIN/SWE has a high genetic level. For temperament are only small differences between populations.

Changes since last run
In the evaluation in April 2025 the following changes are done compared to December 2024 evaluation:

Yield:
- Canada, Germany, Italy, Netherland have base change.
- France has base changes, and some bulls changed from official to unofficial due to correction in some genotypes because of incompatible parentage check. Some bulls missing pedigree due to the pedigree update.

Fertility:
- Canada has base change and decrease in reliability for CRC due to the decreased reference population for CAN as USA no longer participates in MACE for CRC since 2412r evaluation.
- France has base change and bulls changed from official to unofficial due to correction in some genotypes because of incompatible parentage check. Some bulls missing pedigree due to the pedigree update. Change in type of proof of hco.
- Germany has base change and submitted GEBVs using single-step methodology.
- Italy has base change and decrease in reliability due to the change of EDC for some bulls and if the bulls included or not in the reference population.
- Netherland has base change.

Calving:
- Canada, Italy, Netherland have base change.
- France has base change and bulls changed from official to unofficial due to their genotypes were no longer valid because of incompatible parentage. Bulls missing pedigree due to the pedigree update.
- Germany has base change and submitted GEBVs using single-step methodology.

Conformation:
- Canada, Italy, Netherland have base change.
- France has base change and bulls changed from official to unofficial due to their genotypes were no longer valid because of incompatible parentage. Bulls missing pedigree due to the pedigree update.
- Germany has base change and submitted GEBVs using single-step methodology.

Udder health:
- Canada, Italy, Netherland have base change.
- France has base change and bulls changed from official to unofficial due to their genotypes were no longer valid because of incompatible parentage. Bulls missing pedigree due to the pedigree update.
- Germany has base change and submitted GEBVs using single-step methodology.

Longevity:
- Canada, Italy, Netherland have base change.
- France has base change and bulls changed from official to unofficial due to their genotypes were no longer valid because of incompatible parentage. Bulls missing pedigree due to the pedigree update.
- Germany has base change and submitted GEBVs using single-step methodology.

Milking speed and temperament:
- Canada, Italy have base change.
- Denmark, Finland, Sweden has decrease in reliability.
- France has base change and bulls changed from official to unofficial due to their genotypes were no longer valid because of incompatible parentage. Bulls missing pedigree due to the pedigree update.
- Germany has base change and submitted GEBVs using single-step methodology.
- Netherland has base change and decrease in information due to the finetuning of reliability calculation

International comparison of changes since last run shows that:

- All countries: Changes are smaller changes with a minimal effect on the reliability and indexes.

Dates of publication of Interbull breeding values in 2025:

Month	Date
April	1
August	12
December	2

The indices can be found at the national databases in Denmark, Sweden, and Finland 2-3 days after they have been published by Interbull.

Regards
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