

The table contains current phenotypic breed averages and values per one breeding value unit (+1 EBV-unit) for single traits included in sub-indices in NTM. Phenotypic values are when applicable weighted across lactations 1-3 with weight factors 0.30, 0.25 and 0.45. Values are available for NAV countries together and for separate countries, but for many traits the values are very similar.

Below are the formulas for calculating a bull's effect and expected daughter performance when the EBV for the single trait (for example sole ulcer) is available. In the case of genomic bulls, the single trait EBV is not always available and then the formulas for calculating the effect is somewhat different (here the EBV for the sub-index is used, for example claw health, and its deviation/2 has to be multiplied with a regression between sub-index and single trait EBV).

How to calculate a bull's effect:

EBV deviation from mean / 2 * value for 1 EBV unit (from the table – in the example we use a value of -0,003)

• Example: Bull with EBV for sole ulcer 110: $(110 - 100) / 2 * -0,003 = -0,015$

How to calculate expected performance of bulls average daughter:

Bulls effect + breed average (from the table – in the example we use a value of 0,06)

• Example: Bull with EBV for sole ulcer 110: $-0,015 + 0,06 = 0,045$

How to calculate expected performance from certain mating:

(Bull's deviation from mean / 2 * value for 1 EBV unit) + (dam's deviation from mean / 2 * value for 1 EBV unit) + breed average

• Example: Bull with EBV for sole ulcer 110 and dam with EBV for sole ulcer 105: $-0,015 + (105-100) / 2 * -0,003 + 0,06 = 0,0375$

Trait	NAV Countries		Denmark		Finland		Sweden	
	Average	Value / +1 EBV unit	Average	Value / +1 EBV unit	Average	Value / +1 EBV unit	Average	Value / +1 EBV unit
Yield								
Milk (305-d, kg)	11437	65.6	11621	66.0	10844	62.7	11574	66.8
Fat (305-d, kg)	466	2.5	464	2.4	460	2.7	476	2.6
Protein (305-d, kg)	399	2.0	401	2.0	372	2.1	408	2.1
Breeding values not in NTM								
Fat-% (average in 305-d)	4.1	0.03	4.0	0.03	4.3	0.04	4.1	0.03
Protein-% (average in 305-d)	3.5	0.01	3.5	0.01	3.5	0.02	3.5	0.01
Growth								
Daily carcass gain								
Short fattening period (g/day)	591	2.3	595	2.3	565	2.7	563	2.3
Long fattening period (g/day)	539	2.1			557	2.1	508	2.1
Carcass conformation score (1-15)	4.0	0.04	3.6	0.04	4.5	0.04	4.4	0.04
Fertility								
Interval from calving to first insemination (cows) (days)	81	-0.6	80	-0.6	83	-0.6	81	-0.6
Interval from first to last insemination (heifers) (days)	22	-0.4	21	-0.4	23	-0.4	23	-0.4
Interval from first to last insemination (cows) (days)	44	-0.8	43	-0.8	45	-0.8	46	-0.8
Number of inseminations (heifers)	1.6	-0.01	1.6	-0.01	1.6	-0.01	1.5	-0.01
Number of inseminations (cows)	2.0	-0.01	2.0	-0.01	2.0	-0.01	1.8	-0.01
Birth								
Survival (sire) (%)								
1st lactation	96.0	0.06	96.0	0.06	94.3	0.08	97.4	0.04
2nd and later lactations	97.9	0.01	98.0	0.01	97.2	0.02	98.5	0.01
Calving ease (sire) (%)								
1st lactation	90.0	0.27	89.8	0.27	83.9	0.38	94.3	0.17
2nd and later lactations	93.9	0.12	93.2	0.13	92.7	0.14	96.5	0.08
Calving								
Survival (maternal) (%)								
1st lactation	96.0	0.08	96.0	0.08	94.3	0.10	97.4	0.05
2nd and later lactations	97.9	0.01	98.0	0.01	97.2	0.02	98.5	0.01
Calving ease (maternal) (%)								
1st lactation	90.0	0.23	89.7	0.23	84.2	0.32	94.4	0.14
2nd and later lactations	93.9	0.08	93.1	0.09	92.8	0.09	96.5	0.05
Udder health (%)	7.8	-0.54	9.0	-0.55	6.7	-0.52	6.6	-0.50
General health								

Early reproductive disorders (%)	4.9	-0.14	6.9	-0.17	3.4	-0.12	1.5	-0.08
Late reproductive disorders (%)	6.4	-0.11	3.0	-0.08	15.7	-0.19	5.4	-0.12
Ketosis (%)	1.4	-0.03	2.2	-0.03	0.7	-0.02	0.4	-0.02
Other metabolic diseases (%)	5.5	-0.13	7.1	-0.15	3.0	-0.10	4.0	-0.12
Feet and leg problems (%)	5.2	-0.17	10.4	-0.22	0.7	-0.10	1.7	-0.12
Claw health								
Sole ulcer (p)	0.04	-0.005	0.06	-0.005	0.04	-0.004	0.03	-0.004
Sole hemorrhage (p)	0.21	-0.005	0.31	-0.006	0.10	-0.003	0.13	-0.004
Heel horn erosion (p)	0.14	-0.005	0.21	-0.006	0.12	-0.005	0.06	-0.003
Digital dermatitis + interdigital Dermatitis (p)	0.20	-0.006	0.24	-0.005	0.08	-0.005	0.18	-0.007
Verrucose dermatitis + Interdigital Hyperplasia (p)	0.04	-0.004	0.05	-0.004	0.02	-0.003	0.04	-0.003
Double sole + white line separation (p)	0.06	-0.002	0.08	-0.002	0.08	-0.002	0.02	-0.001
Cork screw claw (p)	0.06	-0.001	0.09	-0.001	0.02	0.000	0.02	0.000
Frame								
Stature (cm)	151.3	0.21	151.0	0.21	151.6	0.24	151.7	0.20
Body depth (1-9)	6.4	0.03	6.4	0.03	6.3	0.04	6.4	0.03
Chest width (1-9)	5.5	0.03	5.5	0.03	5.5	0.04	5.6	0.02
Rib structure (1-9)	5.5	0.03	5.4	0.03	5.5	0.04	5.9	0.03
Top line (1-9)	6.6	0.03	6.6	0.03	6.5	0.04	6.6	0.03
Rump width (1-9)	5.8	0.03	5.7	0.03	5.9	0.04	5.7	0.03
Rump angle (1-9)	4.8	0.05	4.8	0.04	4.6	0.06	4.8	0.04
Feet & legs								
Rear legs, side view (1-9)	5.1	0.03	5.1	0.03	5.1	0.03	5.2	0.02
Rear legs, rear view (1-9)	5.9	0.03	5.9	0.03	5.7	0.03	6.3	0.02
Hock quality (1-9)	5.8	0.04	5.8	0.04	5.9	0.04	5.6	0.03
Bone quality (1-9)	6.4	0.03	6.4	0.03	6.2	0.04	6.4	0.03
Foot angle (1-9)	5.0	0.02	5.0	0.02	4.9	0.02	5.1	0.02
Udder								
Fore udder attachment (1-9)	5.1	0.04	5.1	0.04	5.1	0.04	5.2	0.03
Rear udder height (1-9)	5.9	0.03	5.8	0.03	6.0	0.03	6.0	0.03
Rear udder width (1-9)	6.0	0.04	6.1	0.04	5.8	0.04	5.9	0.04
Udder cleft (1-9)	5.7	0.04	5.7	0.04	5.6	0.04	5.8	0.03
Udder depth (1-9)	5.4	0.06	5.1	0.05	5.7	0.06	5.7	0.05
Teat length (1-9)	5.5	0.07	5.5	0.07	5.5	0.07	5.6	0.06
Teat thickness (1-9)	5.4	0.04	5.5	0.05	5.2	0.04	5.4	0.03
Teat placement (front) (1-9)	5.6	0.06	5.6	0.06	5.5	0.06	5.7	0.05
Teat placement (back) (1-9)	6.6	0.06	6.3	0.06	6.8	0.06	6.7	0.05
Udder balance (1-9)	5.3	0.03	5.3	0.03	5.3	0.03	5.3	0.02
Milkability (g fat+protein/min)	195	2.9	n/a	n/a	n/a	n/a	n/a	n/a
Temperament (1-5 or 1-9)	n/a	n/a	5.4	0.05	3.2	0.02	5.5	0.03
Longevity (days in production)	877	11.1	819	11.1	1020	11.6	899	10.7
Youngstock survival								
Early period (heifers) (%)	97.1	0.10	96.7	0.10	97.6	0.09	97.8	0.09
Late period (heifers) (%)	96.1	0.12	95.9	0.12	97.2	0.10	95.7	0.13
Early period (bulls) (%)	95.4	0.10	94.9	0.10	94.8	0.10	97.5	0.07
Late period (bulls) (%)	96.1	0.21	95.3	0.23	96.9	0.18	97.9	0.16

