New breeding values for beef breed sires used on dairy cows

On the 11ᵗʰ of December 2018 NAV releases breeding values for beef breed sires used for insemination of dairy cows. The use of beef semen in dairy herds has increased considerably during the past years, and these new breeding values will aid farmers in their choice of the right beef sire to use on dairy cows that are not needed to produce replacement heifers. The breeding values will make it possible to compare beef sires across breeds.

Breeding values for calving traits and carcass traits

Breeding values are calculated for two groups of traits: calving traits and carcass traits. Three biological traits are considered within the group of calving traits: calf survival, calving ease and calf size. The latter trait is only scored in Denmark. The calving traits are subdivided into two categories: first parity *versus* later parity, since there is a difference between the first and later calvings. The first calving tends to be more difficult compared to later calvings. Three main traits are considered among the carcass traits: daily carcass gain, carcass conformation score and carcass fat score. Since data covers both male and female beef × dairy crossbreds, each of these main traits is subdivided into two categories: bulls versus heifers.

Publication and presentation of breeding values

In total, seven breeding values can be published for each beef sire: four for calving traits and three for carcass traits. The four breeding values for calving traits (calf survival first and later parities, calving ease first and later parities) are publishable when the reliability of calf survival, later parities exceeds 50% or when there are more than 500 beef × dairy offspring. The three breeding values for carcass traits (daily carcass gain, carcass conformation score and carcass fat score, which are averages of the breeding values for the respective male and female traits). The limit for publication is reliability of 50% for the breeding value for carcass conformation score, or at least 500 beef × dairy offspring.

Breeding values are presented with a mean of 100 and a standard deviation of 10, as for the NAV breeding values for dairy breeds. Breeding values are calculated and presented so they are comparable across beef breeds. For some traits, like carcass conformation and fat score, differences between breeds are substantial (Table 1). For example, sires from the continental European breeds have on average higher breeding values for carcass conformation score and lower breeding values for carcass fat score, compared to British breeds. For the calving traits, the reverse is true and British breeds score on average better.

Table 1. Mean (of published) breeding values by sire beef breed.

	Calving traits [1]					Carcass traits [1]			
	N	CSu1	CSu2	CE1	CE2	N	DG	CCS	CFS
Angus	39	108	105	115	117	66	90	70	137
Simmental	48	100	101	99	98	143	106	77	103
Blonde	31	105	103	100	103	50	100	94	84
Danish Blue	69	91	97	95	97	92	107	120	83
Limousin	71	105	102	100	101	113	94	98	108
Charolais	49	95	97	102	96	81	113	89	105
INRA	1	104	107	131	114	4	84	118	108

| Hereford | 27 | 109 | 104 | 109 | 105 | 43 | 86 | 67 | 141 |

[1] CSu1 = calf survival, first parity; CSu2 = calf survival, later parities; CE1 = calving ease, first parity; CE2 = calving ease, later parities; DG = daily carcass gain; CCS = carcass conformation score; CFS = carcass fat score.

Data sources

The data for calving traits are recorded by dairy farmers, who report stillborn calves, how easy or difficult the calving was, and in Denmark also the size of the calf. Data on carcass traits are collected from slaughter houses, which assess the conformation of the carcasses according to the EUROP classification system.

Data are selected to be representative for mainstream production systems for beef × dairy crossbreds in the Nordic countries. Most importantly, data are only included for beef x dairy crossbreds born on milk producing herds. This is done to avoid incorporating data from dairy herds that are in a transition to beef production with suckler cows.

Facts and figures

Danish Blue is the largest breed for beef × dairy offspring in Denmark (Table 2). Angus and Blonde d'Aquitaine are the largest breeds in Finland, and in Sweden the use of beef breeds is somewhat more spread. Data were checked for patterns of beef sire use within and across countries, to ensure that breeding values can be compared across breeds.

Table 2. Country-wise distribution of beef breed of beef × dairy offspring with calving records and born in the period 2013-2017.

Sire breed	Denmark	Finland	Sweden
Angus	1.8	18.0	13.7
Blonde	3.2	42.0	1.8
Danish Blue	79.2	-	-
Beef Shorthorn	0.1	-	-
Simmental (beef)	2.3	6.7	28.1
Charolais	4.2	6.0	19.7
Hereford	0.3	2.1	20.5
Highland	0.0	0.0	0.1
INRA	1.6	-	-
Limousin	7.0	25.2	16.1
Piemontese	0.1	0.0	-
Wagya	0.1	-	-