

Genetic analysis of fertility in Swedish beef breeds



Anna Näsholm, Department of Animal Breeding and Genetics, Swedish University of Agricultural Sciences

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Aim

For inclusion of female fertility in the genetic evaluation of Swedish beef breeds the aim of this study was to explore phenotypic and genetic variation for age at 1st calving and calving interval.



Photo Jenny Svénnäs-Gillner, SLU

Conclusions

For an efficient and environmentally friendly production with beef cattle in Sweden it is important to breed for low age at 1st calving and short calving intervals.

Genetic effects are of importance for age at 1st calving and interval between 1st and 2nd calving and these traits are suitable for inclusion in genetic evaluation of beef breeds in Sweden.

Maternal genetic effects should be considered for age at 1st calving.

Materials and Methods

Data included in total almost 77 000 records on age at 1st calving and calving intervals for purebred cows born during the period from 1964 to 2006.

Direct and maternal heritabilities and genetic correlations were estimated with uni- and trivariate linear animal models using the DMU package.

Results

There was variation between and within breeds in age at 1st calving and calving interval.

Heritabilities were low to medium high for age at 1st calving, low for interval between 1st and 2nd calving, and close to zero for later calving intervals.

Low maternal heritabilities and negative genetic correlations between direct and maternal effects were found for age at 1st calving.

Genetic correlations for interval between 1st and 2nd and 2nd and 3rd calving were moderately high to high.

	Age 1		Int12		Int23		Int34	
	No. of obs.	Mean (SD)	No. of obs.	Mean (SD)	No. of obs.	Mean (SD)	No. of obs.	Mean (SD)
Angus	3 371	25,5 (3.7)	2 876	377 (70)	2 110	371 (61)	1 569	367 (51)
Blonde	1 064	29,4 (4.8)	1 157	418 (90)	764	395 (77)	513	389 (74)
Charolais	33 622	26,6 (4.3)	28 196	383 (65)	21 706	372 (58)	16 798	370 (54)
Hereford	17 130	25,9 (3.8)	14 723	376 (64)	11 244	371 (61)	8 707	369 (53)
Highland	4 872	32,6 (5.4)	3 935	399 (94)	2 964	382 (82)	2 282	378 (76)
Limousin	5 740	27,1 (4.5)	4 620	394 (78)	3 340	379 (65)	2 571	372 (57)
Simmental	11 190	25,7 (4.0)	9 287	387 (70)	6 907	377 (62)	5 174	375 (59)

	Heritabilities									
	Model with only direct genetic effects				Model with maternal effects for Age1			Genetic correlations		
	Age1	Int12	Int23	Int34	Dir	Mat	Dir Mat	Age1 Int12	Age 1 Int23	Int12 Int23
Charolais	0.17	0.07	0.02	0.00	0.26	0.06	-0.60	0.18, 0.14	0.23, 0.14	0.92
Hereford	0.17	0.05	0.03	0.02	0.38	0.12	-0.74	-0.10, 0.45	0.26, -0.05	0.60

Age1 = age at 1st calving Int12 = interval 1st and 2nd calving Int23 = interval 2nd and 3rd calving Int34 = interval 3rd and 4th calving