Reproduction traits evaluation in cattle in the Czech Republic

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Recording is performed for fertility, pregnancy and calving problems.

1. Fertility

Recording of fertility traits is carried out by breeding organisations and all data come to the central record, together with other data related to milk performance, pedigree etc. Data base includes all inseminations in the country (two millions in a year) from the year 1988 and all sires are evaluated.

Results of insemination (detected pregnancy) are evaluated for 1/0 trait by GS - model of BLUP procedure with maternal effect. Evaluation runs 4 times a year.

Model equation (Polasek and Cermak, 1992) is

$$y = HYS + RI + IN + L + AG + MP + GM + GF + F + GS + S + T + e$$

where:

   y   - result of insemination
   HYS - (usually 1 month, maximum 3 months)
   RI - rank of insemination (1 - 3)
   IN   - class of interval from calving to insemination within RI
   L - lactation number (1 - 3)
   AG - class of age of cows (heifers) within parity
   MP - class of milk production in the first 100 days of lactation within parity
   GM - genetic group of cows
   GF - genetic group of fathers of cows
   F - father within group (random effect - breeding value for daughter fertility)
   GS - genetic group of mated sires
   S - sire within group (random effect - breeding value for own fertility)
   T - technician within year (random effect)
   e - random residual effect

Evaluation is being done separately for cows, and for heifers (IN, L and MP are omitted from the model equation). Total breeding value of bulls fertility is expressed as a relative breeding value (RBV) which is the weight average of breeding values on heifers and on cows (weight is the number of inseminations) with standardisation of standard deviation to 10.

Results are published together with the breeding values for the others traits.

Genetic correlations, on the basis of breeding values of own fertility, and daughter fertility, with the other traits are in Table 1.

2. Traits related to pregnancy and calving of dairy bulls

Recording is done by the veterinary service. Data are centralised in the State Veterinary Institute. All pregnancies after insemination with young bulls in the progeny test are registered.
Recorded traits are:
     abortions
     length of pregnancy
     size of the fetus
     calving difficulty
     stillbirth
     viability of calves
     losses during first 10 days
     genetic disorders and BLAD

Table 1. Genetic correlations between traits for Simmental (below diagonal) and Black and White (above diagonal) cattle (Šafus et al. 1997)

	R1	R2	R3	R4	M1	M2	M3	M4	M5	B1	B2	B3	B4	B5
R1		.32	.03	-.04	-.06	-.02	.05	.0	.07	-.20	.03	-.29	-.22	.12
R2	.25		.0	-.06	.08	.12	.07	.04	.09	.32	.29	.30	.32	-.14
R3	.08	.03		.10	.02	.03	.04	-.02	-.03	-.09	-.05	-.10	-.19	-.14
R4	.02	.02	.10		.05	.07	.07	.02	.09	-.09	-.05	-.06	-.06	-.22
M1	.03	.01	.05	-.03		.83	-.38	.90	-.54	-.09	-.14	.0	-.08	-.40
M2	.06	.0	.04	.0	.89		.09	.81	-.21	-.09	-.18	-.05	-.11	-.56
M3	-.03	-.03	.0	.08	-.31	.07		-.25	.61	-.15	.14	-.13	-.15	.16
M4	.02	.0	.07	-.03	.90	.87	-.14		-.28	.0	.0	-.06	-.07	-.24
M5	-.08	.0	-.06	.03	-.48	-.26	.51	-.19		-.07	.13	-.09	-.03	.33
B1	.08	.0	-.08	-.10	-.08	-.03	.03	-.10	-.02		.40	.86	.98	-
B2	-.03	-.02	-.09	-.11	-.13	-.11	-.02	-.08	.05	.69		.46	.37	.37
B3	.04	-.07	-.14	-.18	.0	.0	-.08	-.06	-.03	.88	.79		.90	-
B4	.08	-.03	-.11	-.12	-.09	-.04	.03	-.10	.0	.99	.70	.91		.03
B5	-.05	-.05	-.04	.0	-.08	-.10	.04	.02	.08	.03	.38	.0	.02	

Fertility of bulls on heifers R1, Fertility of bulls on cows R2, Fertility of daughters - heifers R3, Fertility of daughters - cows R4, Milk kg M1, Fat kg M2, Fat % M3, Protein kg M4, Protein % M5, Body weight of bulls in 500 days kg B1, Corrected netto gain B2, Daily gain from 150 to 500 days B3, Daily gain from the birth to 500 days g B4, Dressing percentage B5.

Data are evaluated by simple statistics of frequency of abnormal occurrence in comparison with average of all tested bulls. According to the results the bulls are classified into the health groups A, B or C. A - no limitation in breeding; C - breeding use not allowed. Average results for all tested bulls in the year 1996 are shown in Table 2.

Table 2. Incidence in % of traits related to pregnancy and calving for dairy bulls tested 1996.

Trait	Czech Spotted Cattle (Simmental)	Black and White Cattle (Holstein)
Complicated calvings	4.03	4.18
Absolute big fetus	0.52	0.40
Stillbirth due to complicated calving	1.32	1.68
Stillbirth total	3.79	3.70
Losses of calves during first 10 days	7.42	7.24

3. Traits related to pregnancy and calving of beef bulls

Young bulls of beef breeds are progeny tested in crossbreeding in dairy herds. 400 AI are used on at least 20 farms.

According to information from farmer or veterinary service the course of calving is evaluated. Stillbirth calves, weight at calving, number of calves and calving characteristics are recorded. The calving is classified according to the 5 points scale (1 - without any help, ... 5 - embryotomy). In case of complicated calving, predicted reasons (oversize of calf, abnormal position of calf, narrow pelvic of cow, uterus torsion etc.) are recorded as well.

As a amount of the data from beef breeds is rather small, only approximative procedure is used for evaluation.

References

Polášek M., Cermák V. et al. 1992. Estimation of breeding value of bulls for own fertility and fertility of daughters/. Research report, VÚCHS Rapotín.

Šafus P., Pribyl J., Cermák V. 1997. Genetic correlations between traits for Czech Spotted and Holstein bulls./ _ivo_iš. Výr. (accepted).