

Status as of: 2016-06-08
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**Form BEEF**

**DESCRIPTION OF BEEF NATIONAL GENETIC EVALUATION SYSTEM**

**Country (or countries) DFS (Denmark, Finland and Sweden)**

Comment: From 201508 DFS participate in Interbeef as one country and send data together from a joined unofficial model with common trait definition, editing and parameters. This DFS trait definition and model is described below. However, it is not identical to the national models that are still official in Denmark, Finland and Sweden, respectively. Also the data collection and official publication is so far done nationally. Some descriptions related to national models are kept in cursive.

**Trait name: Birth weight, calving ease, still birth**

DATA COLLECTION	
Breed(s)	Charolais , Limousin, Simmental (BSM)
Trait definition	<p><b>DFS:</b>            *Birth weight (in Sweden it can be measured at d 1-4, corrected for in model)            *Calving ease (score 1-4, in dnk there is also score 5 put added to 4, in swe we correct for heterogenous variance due to adding together 2 different coding systems)            *Still birth (score 0-1, only official EBVs in dnk at the moment)</p> <p><b>All the traits are corrected for heterogeneous variance in different countries and therefore we do not have integers but use 1 decimals for BWT and 2 decimals for CAE and STB.</b></p> <p>(see exact trait definition under data adjustment)</p>
Method and frequency of measurement	
Who does the performance recording?	Responsible for the recording is Seges, Faba and Växa Sverige in D, F and S, respectively.
Method of collecting data	
Which animals get recorded?	<b>DFS:</b> Only purebred animals in model.
Is birthday recorded?	Yes
Is day of recording available?	Yes
Are the data adjusted and/or selected? If yes please describe the methodology applied	<p><b>DFS:</b>            We adjust all 3 traits for heterogeneous variance between countries.</p>

Time period for inclusion of records	<b>DFS:</b> records since 1980 included from all countries (however, data used in national evaluations is a bit different, for Sweden for example data from 1986 is used).
Criteria (data edits) for inclusion of records	<b>DFS:</b> only purebred animals with known sire and dam
Is embryo transfer applied? How are ET animals been identified? <sup>1</sup>	<b>DFS:</b> in joint model records from ET animals are excluded so these animals get only pedigree indices.
Is recipient mother ID recorded?	<i>D, F and S: ET applied and recipient mothers recorded.</i>
How do you treat incomplete data?	Deleted
<b>MODEL</b>	
Model used for genetic evaluation <sup>2a</sup>	<b>DFS:</b> ST-BLUP-AM DAM MPE (direct and maternal effect) <b>We run the 3 traits together in our unofficial nav model but w/o correlations between traits (only between dir and mat w/n traits). A better model would be to have also correlations between traits.</b> <i>In national models for WW, MT-BLUP-AM are used.</i> <i>D: birth weight, calving ease, still birth (direct and maternal effects)</i> <i>F: birth weight, calving ease (direct and maternal effects)</i> <i>S: birth weight, calving ease (direct and maternal effects) , both traits divided on first and later parity cows</i>
Environmental effects <sup>2b</sup>	<b>DFS:</b> HYS <sup>1</sup> (F) + ASE <sup>2</sup> (F) + TWIN <sup>2</sup> (F) + AACA <sup>2</sup> (F) + SEAS <sup>2</sup> (F) + <b>for BWT only:</b> BWAGE (F) <sup>1</sup> Defined as in the national evaluations (D:birth herd*birth year from nov-oct, F: birth herd*birth year, S: birth herd*birth year from oct-sept) and turned into unique DFS serial number <sup>2</sup> Classes of fixed effects are country coded  <i>D, F and S: Same environmental effects as in DFS model, but somewhat different class definitions. In Sweden we exclude records from twins for all traits but they are included in the nav model. Also in Swedish national model no season effect for calving ease.</i>
Use of genetic groups and relationships	<b>DFS:</b> No grouping, relationship matrix  <i>D, F and S: Relationship matrix. In D four genetic groups (Danish<sub>old</sub>, Danish<sub>new</sub>, French, and Other countries) are used and in F genetic groups by year of birth and by origin – imported or domestic – are used. In S no genetic groups. <b>Must check!</b></i>
Genetic parameters in the model <sup>3</sup>	
Adjustment for heterogeneous variance in evaluation model	<b>DFS:</b> Yes, we adjust for heterogeneous variance across country in our joint DFS model.  <i>D,F and S: No</i>
System validation	Trends and comparing successive evaluations
Definition of genetic reference	<b>DFS:</b> The EBVs from joint DFS model are so far unofficial and will

<p>base Next base change</p>	<p>not be published but will only be used for validation of IB EBVs on DFS scale. The genetic base (for the mean) will be defined as DFS animals born 3-8 yr before evaluation and with cae record?? and RBV will be computed (fixed value for std of EBVs not decided).</p> <p><i>In D, F and S there are rolling bases with animals born 3-7, 2-7 and 4-9 years, respectively, before current evaluation. In D the genetic base is animals with high reliability on EBV.</i></p>
<p>Assessment of index quality (computation of reliability, connection)</p>	<p><b>DFS:</b> No reliabilities calculated from joint DFS model.</p> <p><i>In D and S reliability is calculated by an approximate selection index methodology (counting number of records on individual, progeny, sire, dam and their progeny). In F reliabilities are computed by MiX99 and ApaX99.</i></p>
<p><b>PUBLICATION</b></p>	
<p>Expression of genetic evaluations</p>	<p><b>DFS:</b> see under Definition of genetic reference base</p> <p><b>Must update the below for calving traits:</b></p> <p><i>In D: direct and maternal genetic effects are not published, but EBV for direct genetic effect is a part of the sub index for growth potential at weaning (called VÆKST) and EBV for maternal genetic effect is a part of the sub index for milking ability (called MÆLK). These EBVs are standardized in comparison with the reference base (mean 100 and SD 10). The sub-indices are used to construct a total merit index (S-indeks).</i></p> <p><i>In F: direct and maternal genetic effects are published as both EBV and RBV (mean 100 and SD 10). Weaning weight index is included in the total merit index for bulls and cows according to below:</i>  <i>Bulls: -0,5*birth weight index (direct) + 0,3*weaning weight index (direct) + 1,0* yearling weight index (direct)</i>  <i>Cows: -0,3*birth weight index (direct) + 0,3* weaning weight index (maternal)+ 1,0* yearling weight index (direct)</i></p> <p><i>In S: direct and maternal genetic effects are published as RBV (mean 100 and SD 10). The maternal RBV is included in a “Maternal” sub-index and also in total merit index for bulls and cows.</i></p>
<p>Criteria per official publication of evaluations</p>	<p><b>DFS:</b> see under Definition of genetic reference base</p> <p><b>Must update the below for calving traits:</b></p> <p><i>In D: MÆLK: reliability on MÆLK or S-indeks above 10%</i>  <i>VÆKST: reliability on VÆKST or S-indeks above 10%</i>  <i>In F: EBV is published when domestic animal has own weight record. If own weight record is missing, the requirements are: Domestic cows, 2 progeny results and Domestic bulls, 5 progeny results. The requirements for imported and ET animals are: Imported and ET cows, 2 progeny results and Imported and ET bulls,</i></p>

	<p>10 progeny results.  <i>S: Own or offspring with phenotypic records.</i></p>
Number of evaluations / publications per year	<p><b>DFS:</b> the joint unofficial DFS model will be run in connection to data delivery for the Interbeef evaluations.</p> <p><i>In D, F and S the national the number of official evaluations per year are 4, 5 and 3, respectively.</i></p>
Anticipated changes in the near future	No
Key reference on methodology applied	<p><i>D: <a href="http://www.lr.dk/kvaeg/diverse/principles.pdf">www.lr.dk/kvaeg/diverse/principles.pdf</a></i>  <i>F: -</i>  <i>S : <a href="http://www.vxa.se/Radgivning-service/Avel/Avel-pa-djupet1/Avelsvardering-for-kottraser/">http://www.vxa.se/Radgivning-service/Avel/Avel-pa-djupet1/Avelsvardering-for-kottraser/</a></i>  +  <i>Eriksson et al., 2007, Genetic Evaluation of Beef Cattle in Sweden, Eriksson et al. Interbull Technical Workshop Paris, France March 9-10, 2007</i>  <i>Hans Stålhammar, 1997, Genetic Studies of Beef Characteristics in Swedish Cattle Breeds 1997, Acta Univ. Agr. Sueciae, Agraria 55</i></p>
Key organization: Contact person, address, phone, fax, e-mail, website	<p><b>DFS contact person</b> (also Swedish contact person):  Växa Sverige: Emma Carlén, Box 7023, S-750 07 Uppsala, Sweden,  Phone: +46-10-4710614, emma.carlen@vxa.se, www.vxa.se</p> <p>Danish contact person:  Seges: Anders Fogh, Agro Food Park 15, DK 8200 Aarhus N Denmark,  Phone : +45 8740 5337, adf@seges.dk, www.seges.dk</p> <p>Finnish contact person:  Faba: Kaisa Sirkko, Box 40, FI-01301 Vantaa, Finland,  Phone : +358 20747 2052, kaisa.sirkko@faba.fi, www.faba.fi</p>

- 1) Use Appendix II BEEF for sample ID of ET animals
- 2a) Use abbreviation listed in the attached list of abbreviation to define the type of model.
- 2b) Use abbreviation for most common effects as listed in the attached list of abbreviation indicating, also, if the effect is treated as random (R) or fixed (F).
- 3) Use Appendix I BEEF for heritability/genetic variance estimates.

**Form BEEF**

**Appendix I BEEF**

### Parameters used in genetic evaluation

**Country: DFS**

(below are parameters used in DFS unofficial model, which are currently a combination of parameters for the breeds in the national evaluations).

**Main trait group: Calving traits****Breed: BSM, CHA and LIM**

Trait <sup>(1)</sup>	Definition	$h_d^2$	$h_m^2$	$r_{g(d,m)}$	$c^2$	$\sigma_p^2$
BWT	Birth weight	0,38	0,09	-0,15	0,07	850
CAE	Calving ease	0,16	0,08	-0,20	0,07	0,182
STB	Still birth	0,05	0,025	-0,20	0,07	0,0384

$h_d^2$ : direct heritability;  $h_m^2$ : maternal heritability;  $r_{g(d,m)}$ : genetic correlation between direct and maternal effects;  $c^2$ : repeatability of (maternal) permanent environmental effects;  $\sigma_p^2$ : phenotypic variance.

1) If you have more than one trait (e.g. a.w.w. at 120d and 210d) provide the correlations between traits. **Currently we haven't added correlations between the traits but that is the case in the national official models. Will ITBC run MT-MC for calving traits then we will add correlations as well.**

