

DESCRIPTION OF NATIONAL GENETIC EVALUATION SYSTEMS

Country (or countries)	BELGIUM (Walloon Region)
Main trait group¹	Calving Traits
NOTE! Only one trait group per form!	
Breed(s)	Dual Purpose Belgian Blue
Trait definition(s) and unit(s) of measurement² Attach an appendix if needed	<ul style="list-style-type: none"> - Gestation length (no. days) - Birth weight (kg) - Calving ease scores ranging from 1 to 4 (1 – easy; 2 – easy with help; 3 – hard with help; and 4 – caesarean section) - Body conformation score of the calf from 1 (very low meat) to 9 (very high meat)
Method of measuring and collecting data	Gestation length obtained from IA and calving dates Birth weight and calving ease assessed by breeders on voluntary basis
Time period for data inclusion	All available data since 1988
Age groups (e.g. parities) included	All
Other criteria (data edits) for inclusion of records	Calving interval > 250 and < 315 days Valid birth date
Criteria for extension of records (if applicable)	N/A
Sire categories	All
Environmental effects³, pre-adjustments	No pre-adjustments
Method (model) of genetic evaluation³	Multitrait animal mixed inheritance model – covariance between direct and maternal effects Fixed effects were included for (1) allele substitution effect related to offspring and dam genotypes for muscular hypertrophy (mh) respectively and (2) dominance effects of mh/+ related to direct effect of the offspring and the dam genotypes for mh respectively
Environmental effects³ in the genetic evaluation model	Herd (F) Season of birth (F) Sex (F) Dam age x dam parity (F) Age of the animal and technician for body conformation score only (F) Herd – Year of birth (R) Maternal permanent environment (R)
Adjustment for heterogeneous variance in evaluation model	No Adjustment
Use of genetic groups and relationships	All known relationships of cows and sires are considered. No genetic groups
Blending of foreign/Interbull information in evaluation	No blending
Genetic parameters in the evaluation	See Appendix GE

System validation	Trend validations
Expression of genetic evaluations If standardised (e.g. RBV), give standardisation formula in the appendix	Transformed to RBV (average 100, SD 10)
Definition of genetic reference base	All cows born 7 years before the current year
Next base change	Base changes every year
Calculation of reliability	Reliabilities are calculated from PEV obtained by direct inversion of the coefficient matrix
Criteria for official publication of evaluations	REL > 49% At least 19 daughters in > 4 herds
Number of evaluations / publications per year	1
Use in total merit index⁴	No
Anticipated changes in the near future	
Key reference on methodology applied	Mota, R. R., et al. "Genetic evaluation for birth and conformation traits in dual-purpose Belgian Blue cattle using a mixed inheritance model." Journal of animal science 95.10 (2017): 4288-4299.
Key organisation: name, address, phone, fax, e-mail, web site	<p>Organisation responsible for genetic evaluations and computing center:</p> <p>Elevéo Asbl 4, rue des Champs Elysées B-5590 Ciney</p> <p>Organisation responsible for R&D: University of Liège (ULiège) Gembloux Agro-Bio Tech (GxABT) Agriculture, Bio-engineering and Chemistry Department Animal Science Unit Numerical Genetics, Genomics and Modeling Passage des Déportés, 2 B-5030 Gembloux Belgium</p> <p>Phone: + 32/81/622206 Fax: + 32/81/622115 E-mail : nicolas.gengler@ulg.ac.be WEB site for publication of sire breeding values: http://www.awenet.be</p>

1) Either: Production (e.g. milk, fat, protein), Conformation, Health (e.g. mastitis resistance, milk somatic cell, resistance to diseases other than mastitis), Longevity, Calving (e.g. stillbirth, calving ease), Female fertility (e.g. non-return rate, interval between reproductive events, number of AI's, heat strength), Workability (e.g. milking speed, temperament), Beef production, Efficiency (e.g. body weight, energy balance, body conditioning score), or Other traits.

- 2) Indicate frequencies per category if the trait is categorical and specify transformation of data if practiced.
- 3) Use abbreviations for most common effects (see document with list of abbreviations at http://www-interbull.slu.se/service_documentation/General/list_of_abbreviations.rtf) and indicate random (R) or fixed (F).
- 4) Please give economic weights and indicate how they are expressed (preferably in genetic standard deviation units).

Parameters used in genetic evaluation

Country (or countries): BELGIUM (Walloon Region)
Main trait group: Calving Traits
Breed (repeat as necessary): Dual purpose Belgian-Blue

Trait	Definition	ITB ^a	h ^{2b}	genetic variance ^b	official proof standardisation formula ^c
Direct gestation length			0.235	7.906	
Maternal gestation length			0.091	3.073	
Direct Birth Weight			0.247	8.238	
Maternal Birth Weight			0.077	2.577	
Direct Calving Ease			0.370	0.5176	
Maternal Calving Ease			0.135	0.1887	
Direct body conformation score			0.402	0.8522	
Maternal body conformation score			0.102	0.2161	

^a Indicate, with X, traits that are submitted to Interbull for international genetic evaluations.

^b If repeated records are treated as separate traits, provide heritability estimates and genetic variances separately for each trait, as well as for all traits pooled, i.e. for the trait submitted to Interbull.

^c Expressed as follows:

StandEval=((eval-a)/b)*c+d where a=mean of the base adjustment, b=standard deviation of the base, c=standard deviation of expression (include sign if scale is reversed), and d=base of expression.