

Short description of genetic and genomic evaluations in the Czech Republic

EBVs for four groups of traits:

1. Field test
 - Calving ease (scored 1 - 4)
 - Birth weight
 - Adjusted weight at 120 days
 - Adjusted weaning weight
 - Adjusted yearling weight
2. Conformation
 - HS – height at sacrum
 - BL – body length
 - LW - live weight
 - CW - width of the chest base between the front legs front view
 - CD - chest depth behind the blade
 - P - pelvis length and width
 - SM - shoulder muscling
 - BM - back muscling
 - PM - pelvis muscling
 - PT - overall thoroughbredness, harmony of body conformation and sex expression
3. Carcass traits
 - Carcass weight
 - Carcass conformation
 - Carcass fatness
4. Growth of bulls in performance-test station

Software used: BLUPF90 family

1. Field test

MODEL: Multi-trait animal model with direct and maternal genetic effect and permanent maternal environment

ENVIRONMENTAL EFFECTS:

- sex (fixed)
- age of dam (fixed)
- heterosis of calf (fixed linear regression)
- heterosis of dam (fixed linear regression)
- birth year (fixed)
- CG (random)

NUMBER OF GENETIC EVALUATION PER YEAR: 4

Breeding values are predicted for all herds included in performance testing. We run multi-breed evaluation for purebred and crossbred animals jointly.

Number of animals with performances (in thousands):

Breed	Purebred	Crossbred
Beef Simmental	18	15
Belgian blue	0.2	1
Highland	1	0.3
Galloway	2	1
Gascogne	2.5	0.5
Hereford	16	8
Aberdeen Angus	29	6
Charolais	42	16
Limousine	12	5
Blonde d'Aquitaine	5	2
Piemontese	3	2
Salers	1	0
Other	1	

2. Conformation

Evaluation is based on the scoring of an evaluated trait by 1 (minimum) to 10 (maximum) points within the biological extremes of evaluated breed. A majority of traits is evaluated subjectively. Height at sacrum and live weight are determined by measuring and weighing and conversion tables are used to obtain their point scoring while age, sex and breed are respected.

MODEL: Multi-trait animal model

ENVIRONMENTAL EFFECTS:

- Sex (fixed)
- Age of dam (fixed)
- Age at evaluation (fixed regression) - for HS, BL, LW, CW, CD, P
- Average daily gain from birth to date of evaluation (fixed regression) – for SM, BM, PM, PT
- CG (fixed)

NUMBER OF EVALUATION PER YEAR: 1

We run multi-breed evaluation for purebred and crossbred animals jointly.

Number of animals (in thousands)

Breed	Purebred	Crossbred
Beef Simmental	13	1
Belgian blue	0.2	0
Highland	0.5	0
Galloway	0.7	0
Gascogne	1.5	0
Hereford	3.5	0.1
Aberdeen Angus	15	0.5
Charolais	29	0.8
Limousine	9	0.2
Blonde d'Aquitaine	4	0.2
Piemontese	2	0.1
Salers	0.5	0
Other	0.1	

3. Carcass traits

Carcass weight in kg. Carcass conformation is evaluated by a six-class scale (S, E, U, R, O, P) from the best carcass conformation S to the worst P. Carcass fatness is evaluated by a five-class scale from 1 (lowest carcass fatness) to 5 (highest carcass fatness).

MODEL: Multi-trait animal model

ENVIRONMENTAL EFFECTS:

- Herd x year x season x abattoir (random)
- Sex (fixed)
- Breed (fixed)
- Age at slaughter (fixed regression)
- Heterosis (fixed regression)
- Classifier (fixed)

NUMBER OF EVALUATION PER YEAR: 1

We run multi-breed evaluation for all purebred and crossbred animals older than 250 days and younger than 900 days slaughtered in abattoirs in the Czech Republic since 2006.

Number of animals (in thousands)

Breed	Purebred + crossbred
Beef Simmental	6.5
Belgian blue	4.4
Highland	1
Galloway	3
Gasconne	2.5
Hereford	12
Aberdeen Angus	39
Charolais	64
Limousine	23
Blonde d'Aquitaine	7
Piemontese	11
Salers	1.7
Dairy + Dual cattle	667

4. Growth of bulls in performance-test station

Average daily gains of bulls (ADGB) at a performance test station.

MODEL: Multi-trait animal model (with birth weight, weight 120 days and weight 210 days as correlated traits)

ENVIRONMENTAL EFFECTS for AFGB:

- CG (fixed)
- Age of dam (fixed)
- Linear and quadratic regression on age at the beginning of test (fixed regression)
- Model and environmental effects for correlated traits (BWT, W120, W210) are the same as in genetic evaluation for field test.

NUMBER OF EVALUATION PER YEAR: 1

Number of animals

Breed	Purebred
Beef Simmental	3200
Belgian blue	72
Highland	1
Galloway	150
Gascogne	300
Hereford	800
Aberdeen Angus	3300
Charolais	5800
Limousine	2300
Blonde d'Aquitaine	800
Piemontese	650
Salers	230
Other	120

5. Other traits

We are running research project on fertility traits in beef cattle.

6. Genomic in Beef cattle

We didn't introduce genomic in beef cattle in the Czech Republic.