

## Genetic evaluation

### BEEF BREEDS AND GENE CONSERVATION BREEDS

#### GENERAL

since 2017, 1x per year (end of January)

##### Breeds:

Beef breeds: Angus, Blonde d'Aquitaine, Charolais, Fleckvieh, Limousin

Gene conservation breeds: Grauvieh, Kärntner Blondvieh, Murbodner, Original-Braunvieh, Pinzgauer, Pustertaler Sprintzen, Tuxer, Waldviertler Blondvieh

##### Data:

only from Austria

##### Methodology:

BLUP animal model, for each breed separately

##### Publication:

as relative breeding values with a mean of 100 and a deviation of 12 points.

Higher breeding values are desirable from a breeding point of view (e.g. higher weight gain, fewer difficult births, lower calving interval).

Genetic reference base: birth years of the bulls 5 to 10 years ago

Minimum reliability: 30%.

**Please note that the breeding values are only comparable within the respective breed, but not between breeds or countries!**

Implementation: ZuchtData Vienna

#### MEAT

##### Data and traits

Weighing data as of 2002 and slaughter data of calves, rearing cattle, bulls and steers as of 2008 of animals with less than 25% foreign genes (incl. twins)

male, female, steers

##### Weighing data:

- 200-day weight: weighing between 90<sup>th</sup> and 280<sup>th</sup> day.
- 365-day weight: weighings between 281<sup>st</sup> and 500<sup>th</sup> day.

Effects:

- Sex and birth type (for birth weight)
- Age (linear and quadratic) within sex and birth type (for 200- and 365-day weight)
- Maternal lactation-calving age
- Year-month
- Herd or herd-year (incl. alpine pasture)
- Permanent environmental effect of the dam
- Genetic effect of the dam (maternal)
- Genetic effect of the animal

### Slaughter data:

- Net daily gain
- Carcass percentage
- Trade class (EUROP)

### Effects:

- Age (linear and quadratic) within category, sex and birth type.
- Maternal lactation-calving age
- Year-month-season
- Slaughterhouse-year
- Farm or farm-year (incl. alpine pasture)
- Genetic effect of the animal

## Genetic parameters

### Heritabilities (%):

Weight traits (direct): 20-39%

Weight traits (maternal): 3-8%

slightly negative genetic correlation between direct and maternal traits

## Publication

Breeding values for **direct 200-day (F200)** and **365-day (F365) weight**, **net daily gain (FNTZ)**, **carcass percentage (FAUS)**, **EUROP trade class (FHKL)** and **maternal 200-day weight (F200M)**. The **beef cattle meat index (FFW)** is calculated from the direct breeding values.

### Weighting (%) in beef cattle meat index (FFW):

Trait	Beef and dual purpose (except Fleckvieh, Angus)	Fleckvieh	Angus	Gene conservation breeds
<b>200-day-weight</b>	29	29	33.3	25
<b>365-day-weight</b>	29	29	33.3	25
<b>Net daily gain</b>	21	14	16.7	25
<b>Carcass perc.</b>		14		
<b>Trade class</b>	21	14	16.7	25

12 EBV-points are:

Trait	Beef breeds	Gene conservation breeds
<b>200-day-weight</b>	20 kg	15 kg
<b>365-day-weight</b>	33 kg	17 kg
<b>Net daily gain</b>	45 g	47 g
<b>Carcass perc.</b>	1.8%	
<b>Trade class</b>	0.35 classes	0.33 classes

## CALVING TRAITS

### Data and traits

Calvings (only singles) since 2000 of animals with less than 25% foreign genes  
Length of gestation and birth weight as auxiliary traits.

#### Calving ease:

Calving ease collected at performance recording.

5-level scale (easy, normal, difficult, caesarean section, embryotomy)

1<sup>st</sup> calving and higher calvings recorded as different traits

#### Stillbirth:

Stillborn or died within 48 h

Effects:

- Region-Year-Month
- Sex
- Lactation-calving age of the dam
- Herd or herd-year (incl. alpine pasture)
- Permanent environmental effect of the dam
- Genetic effect of the dam (maternal)
- Genetic effect of the animal

### Genetic Parameters

#### Heritabilities (%):

Calving traits (direct/paternal): 1-17%

Calving traits (maternal): 1-9%

negative genetic correlation between direct and maternal traits

### Publication

1st calving and higher calvings combined in a 75% to 25% ratio

#### Calving ease direct/paternal (FKVP):

indicates how easy or difficult the calves of a bull are born (e.g. size of the calf).

#### Calving ease maternal (FKVM):

indicates how easy or difficult the daughters of a bull calve (e.g. size of the cow, shape of the pelvis)

#### Stillbirth direct/paternal (FTGP):

indicates how often the calves of a bull are stillborn or die (vitality, lack of robustness, etc.)

#### Stillbirth maternal (FTGM):

indicates how often daughters of a bull produce calves that are weak for life (weakness in labour, pelvic shape, etc.).

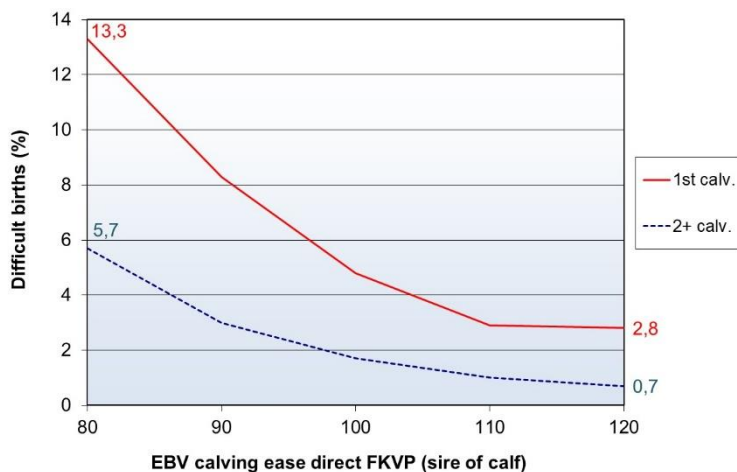


Fig.: Average difficult birth rate depending on the EBV for direct calving ease (FKVP) of the sire of calf (Fleckvieh)

## FERTILITY

### Data and traits

**Calving interval** since 2000 of animals with less than 25% foreign genes

Effects:

- Region-Year-Month
- Lactation-calving age
- Herd or herd-year (incl. alpine pasture)
- Permanent environmental effect of the cow
- Genetic effect of the cow

### Genetic parameters

**Heritabilities (%)**: 2.5%

### Publication

#### Breeding value for calving interval (FZKZ)

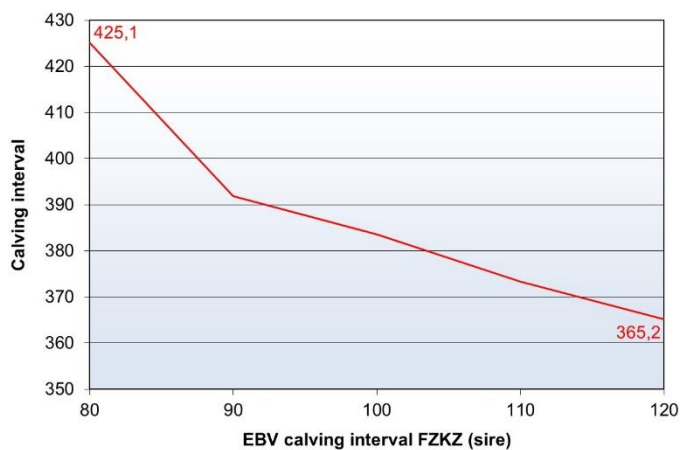


Fig.: Average calving interval depending on the breeding value for calving interval (FZKZ) of the sire (Angus)

## BEEF CATTLE TOTAL MERIT INDEX FGZW

Objective: Maximisation of the total economic benefit (economic total merit index) considering the expected selection responses

- with index method (Miesenberger, 1997, adapted) from the EBV for the individual traits
- consideration of the economic weights, the genetic relationships and the individual reliabilities.

### Economic weights

Economic weights in the FGZW for beef and dual purpose breeds (BA, CH, FV, LI, GR, PI)

	Trait	Economic weight (%)	
<b>Meat</b>	200-day-weight	10	<b>35</b>
	365-day-weight	10	
	Net daily gain	7.5	
	Trade class	7.5	
<b>Maternal</b>	200-day maternal	20	<b>20</b>
<b>Calving traits</b>	Calving ease direct	10	<b>40</b>
	Calving ease maternal	10	
	Stillbirth direct	10	
	Stillbirth maternal	10	
<b>Fertility</b>	Calving interval	5	<b>5</b>

Economic weights in the FGZW for Fleckvieh (FV)

	Trait	Economic weight (%)	
<b>Meat</b>	200-day-weight	10	<b>35</b>
	365-day-weight	10	
	Net daily gain	5	
	Carcass percentage	5	
	Trade class	5	
<b>Maternal</b>	200-day maternal	20	<b>20</b>
<b>Calving traits</b>	Calving ease direct	10	<b>40</b>
	Calving ease maternal	10	
	Stillbirth direct	10	
	Stillbirth maternal	10	
<b>Fertility</b>	Calving interval	5	<b>5</b>

Economic weights in the FGZW for Angus (AA)

	Trait	Economic weight (%)	
<b>Meat</b>	200-day-weight	10	<b>30</b>
	365-day-weight	10	
	Net daily gain	5	
	Trade class	5	
<b>Maternal</b>	200-day maternal	20	<b>20</b>
<b>Calving traits</b>	Calving ease direct	10	<b>40</b>
	Calving ease maternal	10	
	Stillbirth direct	10	
	Stillbirth maternal	10	
<b>Fertility</b>	Calving interval	10	<b>10</b>

**Economic weights in the FGZW for Gene conservation breeds (MB, PS, TX, WV)**

	Trait	Economic weight (%)	
<b>Meat</b>	<b>200-day-weight</b>	6.25	<b>25</b>
	<b>365-day-weight</b>	6.25	
	<b>Net daily gain</b>	6.25	
	<b>Trade class</b>	6.25	
<b>Maternal</b>	<b>200-day maternal</b>	20	<b>20</b>
<b>Calving traits</b>	<b>Calving ease direct</b>	10.0	<b>50</b>
	<b>Calving ease maternal</b>	12.5	
	<b>Stillbirth direct</b>	12.5	
	<b>Stillbirth maternal</b>	15.0	
<b>Fertility</b>	<b>Calving interval</b>	5	<b>5</b>

In the Fleckvieh breed, a **beef cattle fitness index (FFIT)** is also calculated from the individual fitness breeding values.

## CROSSBREEDING INDEX GKZ

### General

since 2000, 3 times a year

"Total merit index" for Fleckvieh/Simmental, Original Braunvieh and beef cattle in crossbreeding to Fleckvieh and Brown Swiss cows respectively

- with index method (Miesenberger, 1997, adapted) from the EBV for the individual traits
- consideration of the economic weights, the genetic relationships and the individual reliabilities

Implementation: ZuchtData Vienna

### Economic weights

Economic weights in FGZW:

	Trait	Economic weight (%)	
<b>Meat</b>	<b>Net daily gain</b>	25	<b>70</b>
	<b>Dressing percentage</b>	20	
	<b>Trade class</b>	25	
<b>Fitness</b>	<b>Calving ease direct/paternal</b>	15	<b>30</b>
	<b>Calf vitality index</b>	15	

### Publication

**Crossbreeding index GKZ** as relative breeding value with a mean value of 100 and a deviation of 12 points

expressed on a Fleckvieh or Brown Swiss cow basis