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 90th and 280th day.
- 365-day weight: weighings between 281st and 500th 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
200-day-weight	29	29	33.3	25
365-day-weight	29	29	33.3	25
Net daily gain	21	14	16.7	25
Carcass perc.		14		
Trade class	21	14	16.7	25

12 EBV-points are:

Trait	Beef breeds	Gene conservation breeds
200-day-weight	20 kg	15 kg
365-day-weight	33 kg	17 kg
Net daily gain	45 g	47 g
Carcass perc.	1.8%	
Trade class	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)
1st 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.).

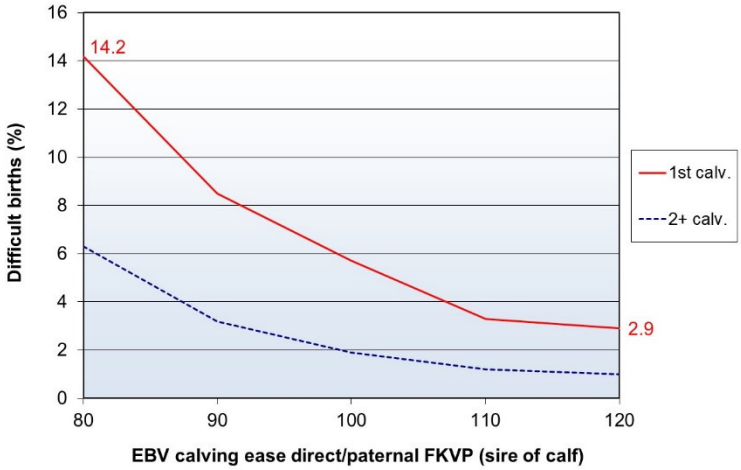

Fig.: Average difficult birth rate depending on the EBV for direct calving ease (FKVP) of the sire of calf (Fleckvieh)

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)

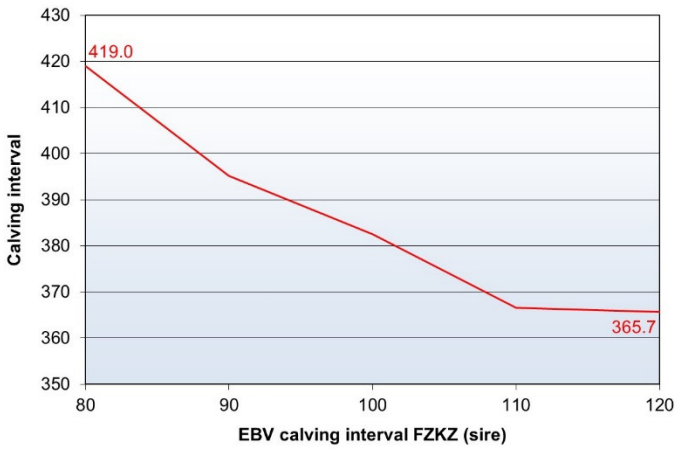

Fig.: Average calving interval depending on the breeding value for calving interval (FZKZ) of the sire (Angus)

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

Economic weights in the FGZW for Fleckvieh (FV)

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

Economic weights in the FGZW for Angus (AA)

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

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

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

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 (%)	
Meat	**Net daily gain**	25	**70**
	Dressing percentage	20	
	Trade class	25	
Fitness	**Calving ease direct/paternal**	15	**30**
	Calf vitality index	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