

Review of the Calving Evaluation for Swiss Beef Cattle

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Reasons of the review

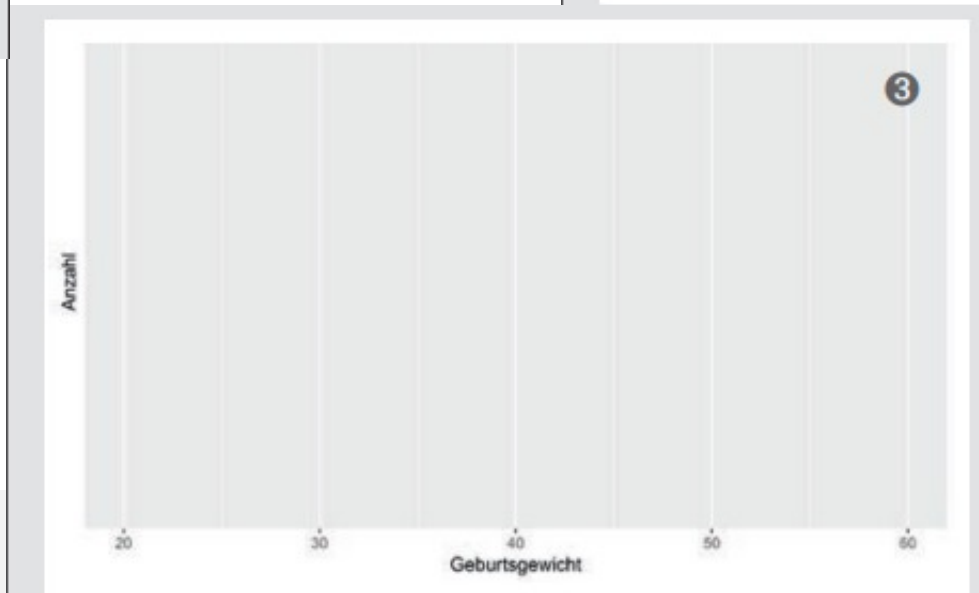
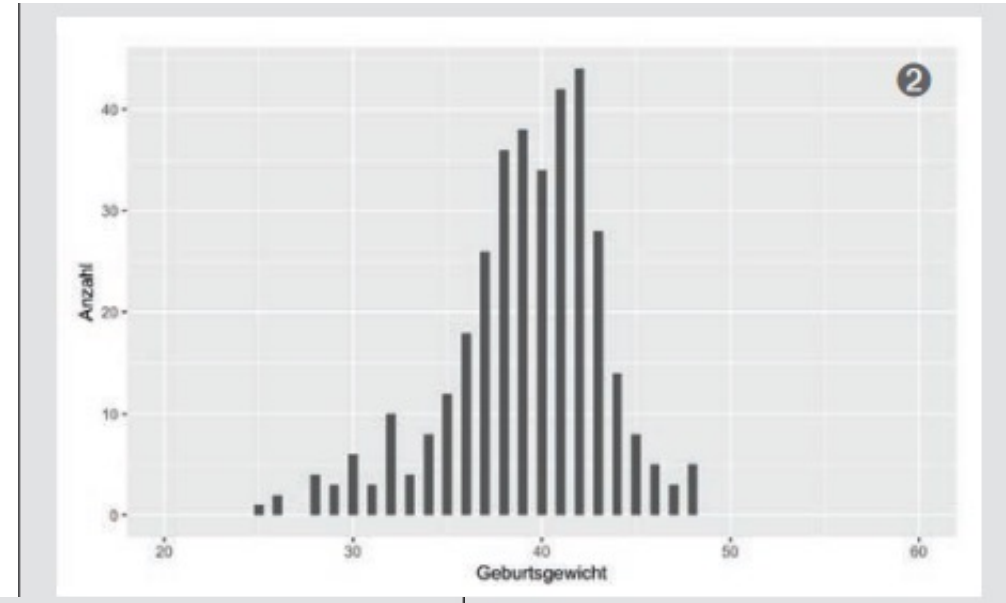
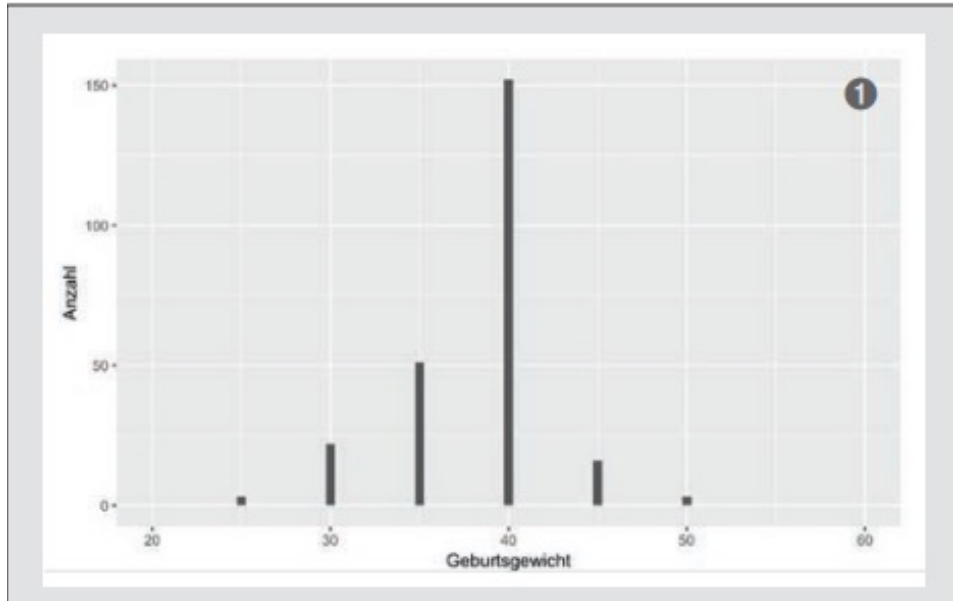
- Last update of the genetic parameter in 2010
- Interbeef is working with animal model
- Quality assurance and automation of the process
- Switch to Linux and MiX99-Software for evaluation
- Develop genomic selection for limousin

Phenotypes

- Calving ease:

no help	1	300
slight	2	200
difficult	3	100
cesarean	4	100
- Birth weight: $10 \leq x \leq 80$ kg
- Gestation length: $260 \leq x \leq 310$ days

Potential to improve the data quality



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Data editing procedures

- Breed of animal and dam has to be:
KR,SI,SF,HO,BV,BS,OB,ROB,JE,MO,AN,AU,CH,LM,HH,AL,BD,SL,PI,HR
- Breed of sire has to be:
SI,OB,ROB,AN,AU,CH,LM,HH,AL,BD,SL,PI
- record removed, if
 - missing: birth date, lactation number, calving age, sire breed, herd, sire, dam, breeding organization of farm of birth, TVDid
 - twin, abort, ET, stillbirth
 - calving ease or birth weight may be missing
- min 100 observations per breedcombination
- min 5 observations per herd*year
- min 2 sires in herd*year
- variance in herd for calving ease and birth weight
- min 5 observations per sire

Evaluation models for calving traits

	Previous	New Beef	New Dairy
Phänotyp	Calving ease beef, dairy, Birth weight beef, dairy, <i>Stillbirth</i> <i>Gestation length</i>	Calving ease Birth weight	Calving ease Birth weight Gestation length
Covariate	-	Age at calving	
Fixed effects	sex year*month Lactation number with dam breed *age quartile breedcombination	sex year*month Lactation number with dam breed*age quartile breedcombination	
Random effects	sire herd*year Permanent environment	animal dam herd*year Permanent environment	animal herd*year Permanent environment
Model	Multi-breed evaluation	Multi-breed evaluation	

Genetic parameters

Beef

$h^2/\text{gen.corr}$	CEd	BWd	CEm	BWm
CEd	0.17	-0.63	-0.53	0.39
BWd		0.47	0.24	-0.72
CEm			0.09	-0.24
BWm				0.08

CE : calving ease, BW : birth weight, GL = gestation length
d : direkt, m : maternal

Dairy

$h^2/\text{gen.corr}$	CEd	BWd	GLd
CEd	0.11	-0.68	-0.31
BWd		0.20	0.38
GLd			0.53

Basis of Genetic evaluation

Beef

	LM	AN	AU	OB	CH	SI
Development	110'438	54'357	6'312	8'429	10'029	37'891
Routine	1'518	716	213	4'755	263	519

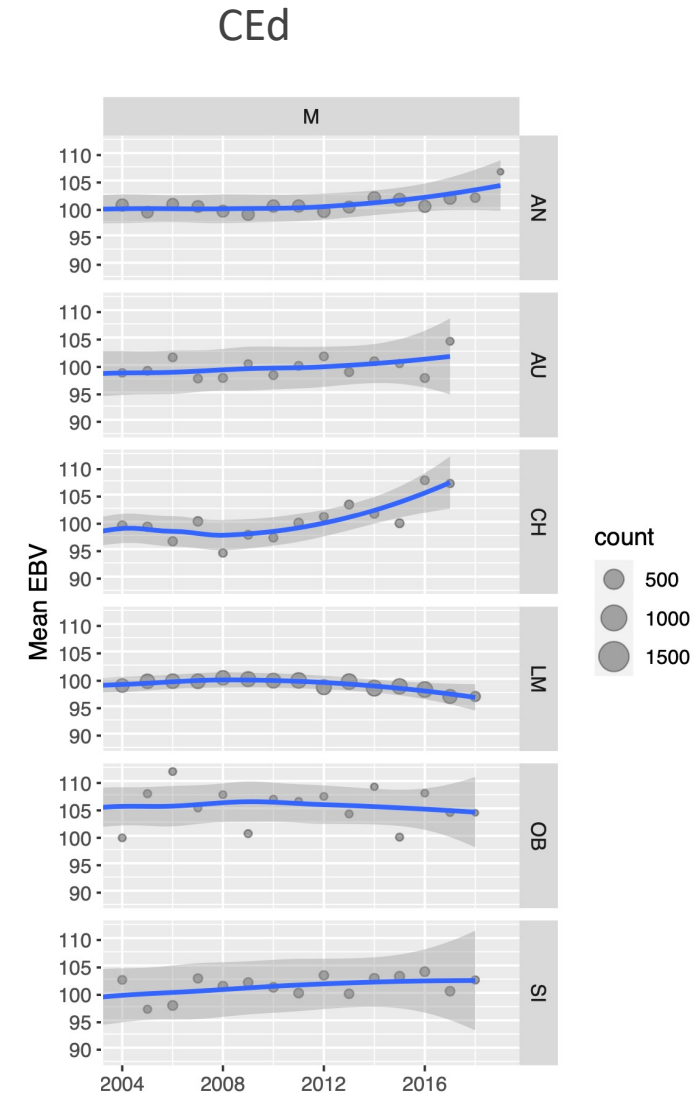
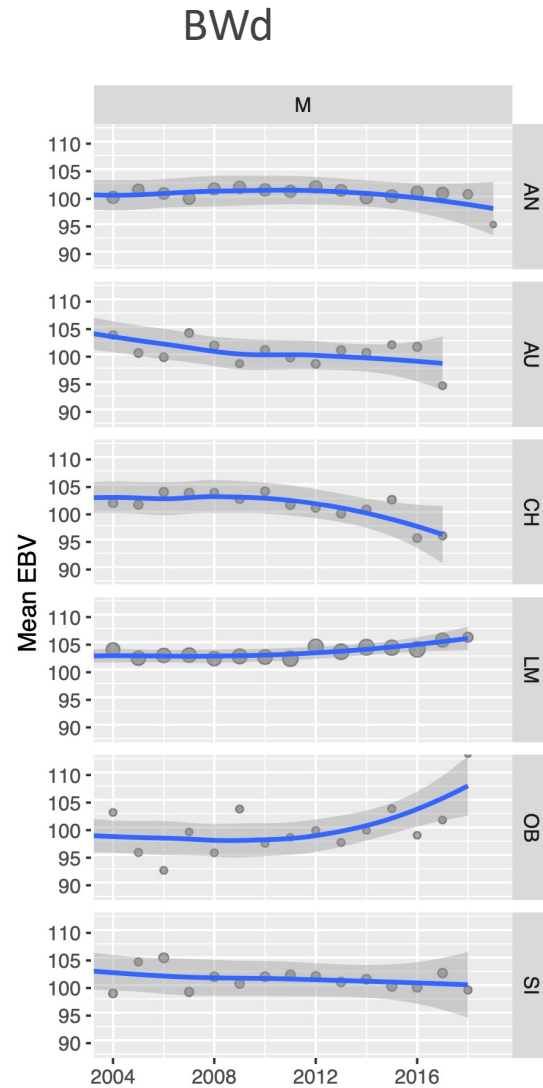
Dairy

	LM	AN	AU	OB	CH	SI
Development	4'316	800	96	61'452	97	143'470
Routine	549	1'596	213	4'755	317	1'065

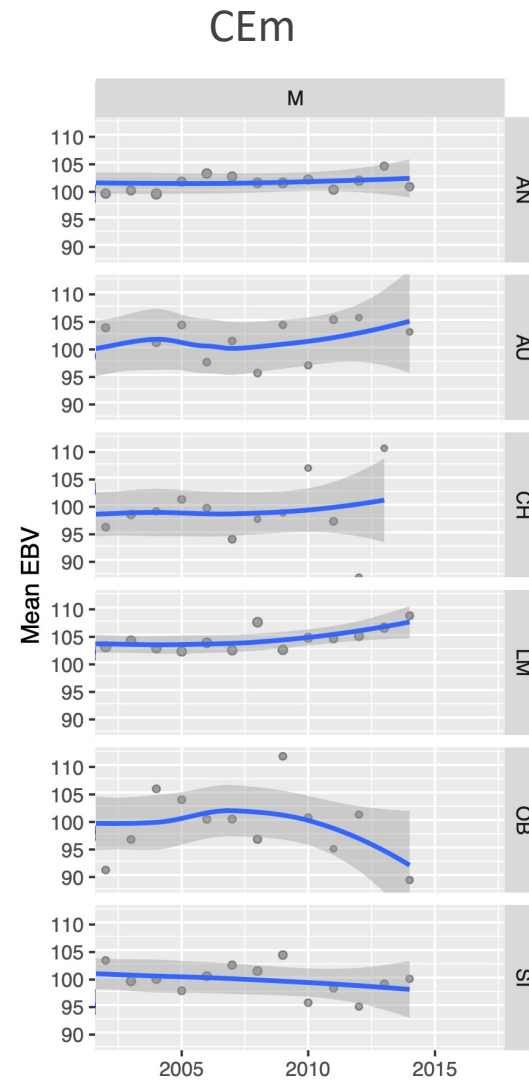
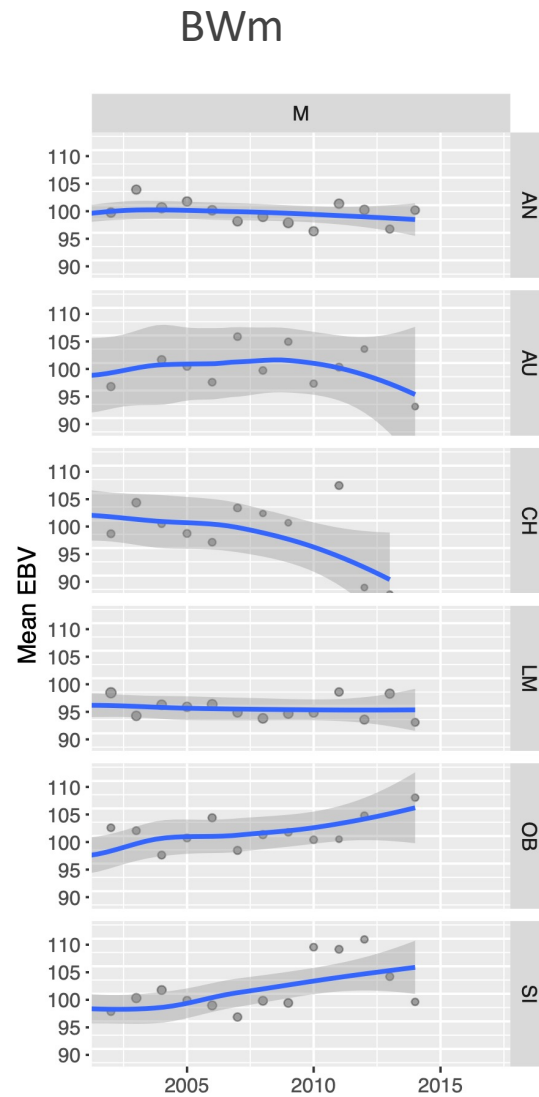
Basisdefinition: female and male animals with birth year between 2010-2018

Basisdefinition: male animals with birth year between 2010-2018

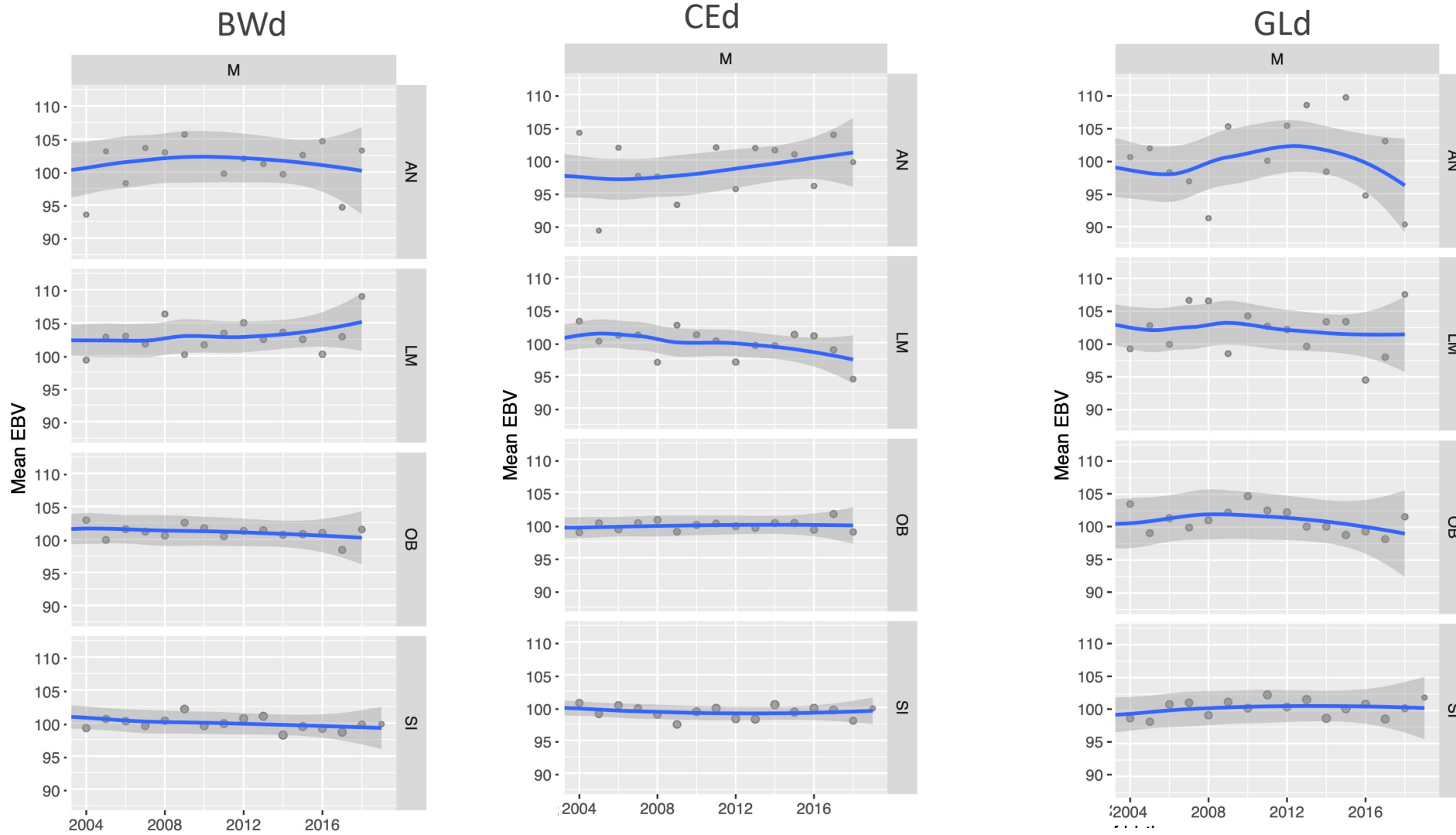
Beef: Genetic trend for direct traits



Beef: Genetic trend for maternal traits



Dairy: Genetic trend for direct traits



2-step genomic prediction limousin

Background

- Around 6'000 genotyped limousin
- Minimal requirement: 1'000 animals in training
- Requirement training:
 - genotype available
 - breed LM
 - reliability of the conventional EBV either 0.5 or 0.35
 - male and female animals

Validation reliabilities

Trait	number of reference animals (M/F)	Rel Threshold Training	Validation reliability	Conclusion
Beef				
BWd	5294 (4678/616)	0.5	0.349	✓
BWm	3454 (2956/498)	0.5	0.538	✓
CEd	3582 (3159/423)	0.5	0.546	✓
CEm	2088 (1665/433)	0.35	0.414	✓
Dairy				
BWd	770 (723/47)	0.35	0.353	✗
CEd	647 (620/27)	0.35	0.358	✗
GLd	796 (734/62)	0.35	0.202	✗

CE: calving ease, BW: birth weight, GL = gestation length
 d : direkt, m : maternal

Next Steps

- Implementation in the april run 2022 of genetic evaluation
-> Publication 5.4.22
- Participate to the testrun in april 2022 of Interbeef for AN, CH, LM, HH, SI

Take home messages

- Transition from sire to animal model
- Implementation of quality assurance and automation of the process
- Switch to Linux and MiX99-Software for evaluation
- Beef: similar model as Interbeef community
- Implementation of genomic selection for limousin in beef-part for calving traits