

Genetic evaluation MILK and PERSISTENCY

General

Breeds: Fleckvieh, Brown Swiss, Pinzgauer, Grauvieh, Gelbvieh, Vorderwälder

Holstein: see www.vit.de

since 1963 genetic evaluation milk, since 1992 evaluation persistency

since 2002 jointly with Germany, since 2011 genomic evaluation, since 2021 single-step evaluation

Implementation: LfL Grub

Data

Test day results from all lactations between 8th and 350th lactation day since 1990

Countries: Austria, Germany, Czech Republic (Fleckvieh), Slovakia (Fleckvieh), Hungary (Fleckvieh).

Traits: milk yield, fat yield, protein yield

Model

multivariate random regression test day model (BLUP animal model, single-step)

Software MiX99

Effects:

- Herd test day (milking results per herd and test day)
- Lactation
- Lactation stage
- Calving age
- Day of gestation
- Calving year, season, region
- Genetic effect of the cow

additional correction for heterogeneous variances between herds

Genetic parameters

different for breeds, milk-, fat-, protein-kg, lactations and lactation days

Milk yield (on lactation basis, heritabilities on diagonal, genet. corr. above diagonal):

	Lact.	1	2	3+
Fleckvieh,	1	36%	0.93	0.91
Pinzgauer, Grauvieh,	2		32%	0.98
Gelbvieh, Vorderw.	3+			33%
	1	39%	0.93	0.93
Brown Swiss	2		34%	0.99
	3+			33%

Publication

Lactation breeding values from breeding values of days 8 to 312 (=305 days)

Breeding values for milk, fat and protein yield as average of lactations 1, 2 and 3+.

Breeding values for fat and protein percentages calculated from yield breeding values

Milk index MW:

Relative breeding value with mean value 100 and deviation 12
from breeding values for fat-kg and protein-kg:

Fleckvieh: 1 : 1.4

Brown Swiss: 1 : 1.7 (additionally protein-%)

Pinzgauer, Grauvieh, Gelbvieh: 1 : 1.5

Vorderwälder: 1 : 1.6

Breeding value persistency (PER):

Calculated from milk breeding values (energy corrected milk yield ECM).

Criterion: breeding value progression from 60th to 300th lactation day

higher persistency EBV → flatter lactation curve

Breeding value yield improvement (LS):

Increase of milk yield from the first to the second or higher lactations (no official breeding value).

Relationship between breeding value and phenotype

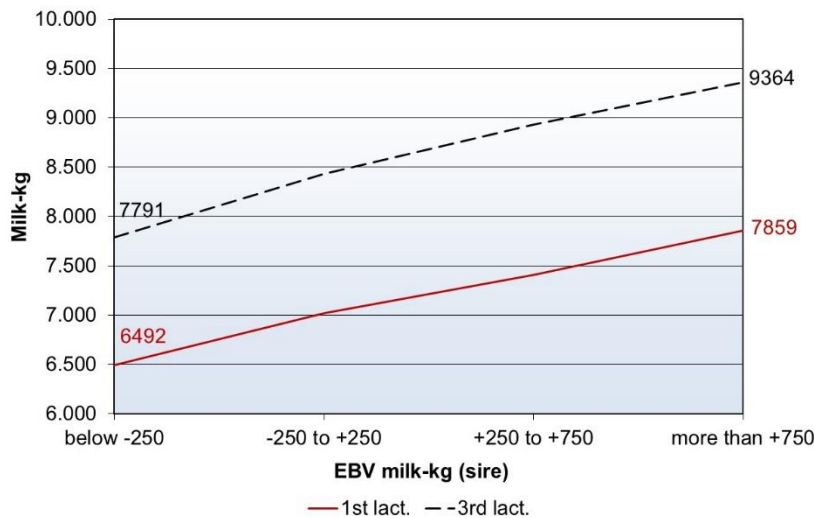


Fig.: Milk yield of daughters depending on sire breeding values for milk yield (Fleckvieh, Austria)

Genetic trends

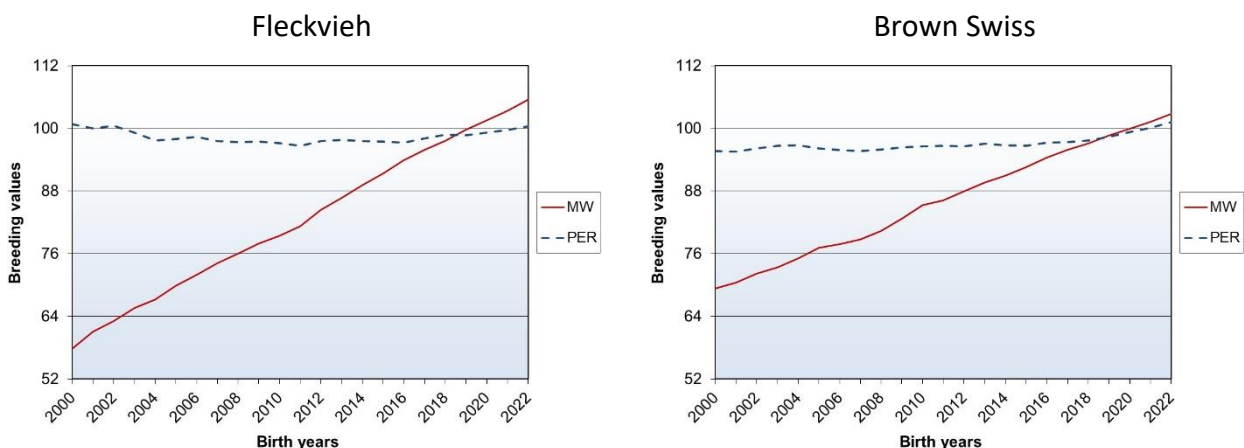


Fig.: Genetic trends for the milk index (MW) and breeding values for persistency (PER) for the cows (Austria)