

Genetic evaluation SOMATIC CELL COUNT and MILKING SPEED

General

Breeds: Fleckvieh, Brown Swiss, Pinzgauer, Grauvieh, Gelbvieh, Vorderwälder
 since 1998 genetic evaluation somatic cell count, since 2000 evaluation milking speed
 since 2002 together with Germany, since 2011 genomic evaluation, since 2021 single-step evaluation
 Implementation: LfL Grub

Data

Test day records for somatic cell count up to 3rd lactation between 8th and 312th day since 1990
 Average milk yield per minute of milking in 1st lactation between 8th and 275th day since 1990
 Countries: Austria, Germany, Czech Republic (Fleckvieh), Slovakia (Fleckvieh).

Traits:

- Somatic Cell Score (SCS): logarithmically transformed somatic cell count for 3 lactations.
- Average milk yield per minute (DMG): Milking rate by stopwatch method or Lactocorder or AMS (transformation: root of DMG)
- Milk flow: collected by interview (Brown Swiss Vorarlberg only)

Model

multivariate fixed regression test day model (BLUP animal model, single-step)
 Software MiX99

Effects:

- Herd test day
- Herd-year
- Classifier (milk flow)
- Milking time
- Region-Calving year-Calving season-Calving age
- Distance to calving
- Calving age
- Permanent environmental effect of the cow
- Genetic effect of the cow

Genetic parameters

Genetic parameters (heritabilities on diagonal, genet. corr. above diagonal):

	SCS 1 st lact.	SCS 2 nd lact.	SCS 3 rd lact.	DMG AT/BW	DMG BY	Milk flow
SCS 1 st lact.	10%	0.88	0.83	0.30	0.30	0.30
SCS 2 nd lact.		12%	0.95	0.20	0.20	0.20
SCS 3 rd lact.			13%	0.20	0.20	0.20
DMG AT/BW				35%	0.88	0.80
DMG BY					28%	0.80
Milk flow						20%

Publication

Breeding value somatic cell count (ZZ): average of the 3 lactations, the higher the lower the cell count.

Breeding value milking speed (MBK): breeding value for average milk yield per minute (DMG AT/BW)

Udder health index EGW: Index of breeding value somatic cell count (70% weight) and breeding value mastitis (30% weight) with the auxiliary traits fore udder attachment, udder depth and front teat placement.

as relative breeding values with mean value 100 and deviation 12

Relationship between breeding value and phenotype

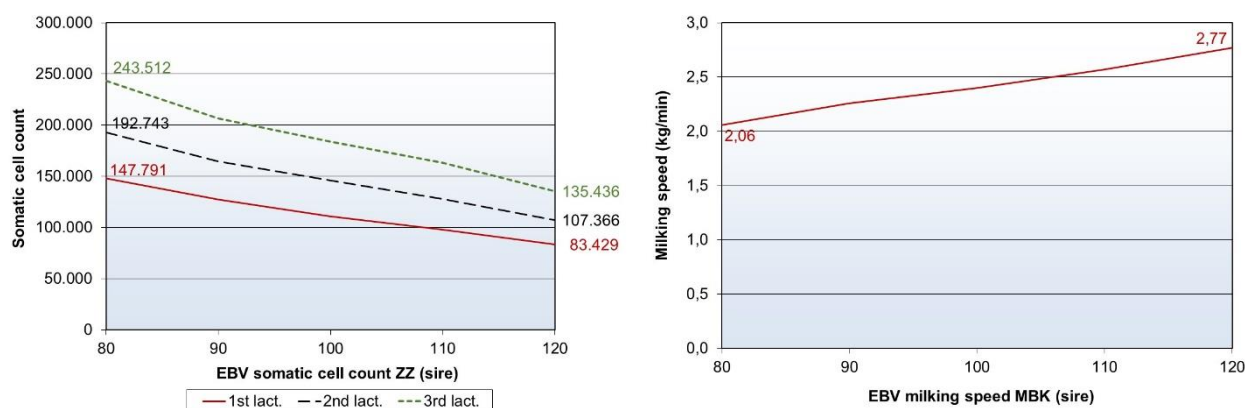


Fig.: Average somatic cell count and average milking speed depending on sire's cell count breeding value (ZZ) or milking speed breeding value (MBK) (Fleckvieh, Austria)

Genetic trends

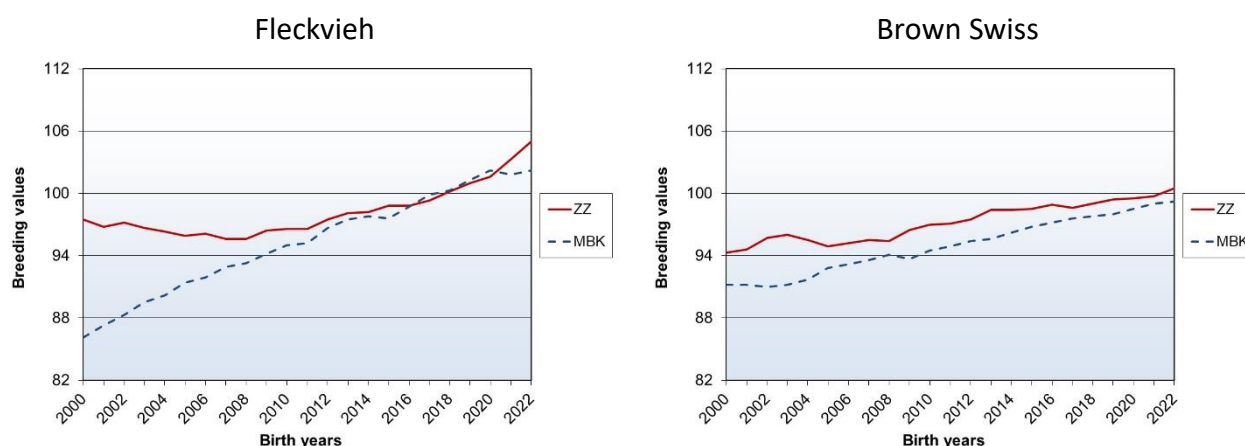


Fig.: Genetic trends for the breeding values somatic cell count (ZZ) and milking speed (MBK) for the cows (Austria)