

Genetic evaluation LONGEVITY

General

Breeds: Fleckvieh, Brown Swiss, Pinzgauer, Grauvieh, Gelbvieh, Vorderwälder
since 1995 genetic evaluation for functional longevity
since 2001 together with Germany, since 2011 genomic evaluation, since 2021 single-step evaluation
Implementation: ZuchtData Vienna

Data

Length of productive life of dairy cows that have calved since 1995
Countries: Austria, Germany, Czech Republic (Fleckvieh), Italy (Fleckvieh).
Traits: Productive life up to 7th calving divided into 9 stages, each survived yes/no.
Sections: 1st lactation (up to 50th, 51st-250th and 251st day until 2nd calving), 2nd lactation (up to 150th and 151st day until 3rd calving) and each 3rd to 6th lactation

Model

multivariate BLUP animal model (single step)
Software MiX99

Effects:

- Region-first calving year and Region-year-season.
- Alping pasturing-herd-year
- Age at first calving
- (Change in) herd size
- Relative milk yield (fat-kg+protein-kg) within herd → yield-independent longevity
- Heterosis and recombination loss (Fleckvieh, Pinzgauer)
- Genetic effect of the cow

Genetic parameters

Heritabilities:

Individual sections: 1.2 bis 4.8%

Heritabilities for longevity calculated from the section breeding values:

Breed	Heritabilities (%)
Fleckvieh	10.6
Brown Swiss	13.1
Pinzgauer	10.6
Grauvieh	11.8
Gelbvieh	9.3
Vorderwälder	11.5

Publication

Combination of the 9 section breeding values according to the economic weights to a longevity breeding value.

Combination with conformation traits as auxiliary traits, genetic correlations:

Breed	Fleckvieh	Brown Swiss	Pinzgauer	Grauvieh	Gelbvieh	Vorderw.
Frame	-0.09		-0.08	-0.09	-0.11	-0.12
Feet & legs*	+0.30	+0.25	+0.36	+0.39	+0.31	+0.32
Udder	+0.40	+0.28	+0.39	+0.45	+0.50	+0.40
Cross height		-0.11				
Pelvis		+0.20				
Muscling		+0.24				

* Grauvieh: Shape

Breeding value for **functional longevity (ND)** as relative breeding value with mean value 100 and deviation 12

Relationship between breeding value and phenotype

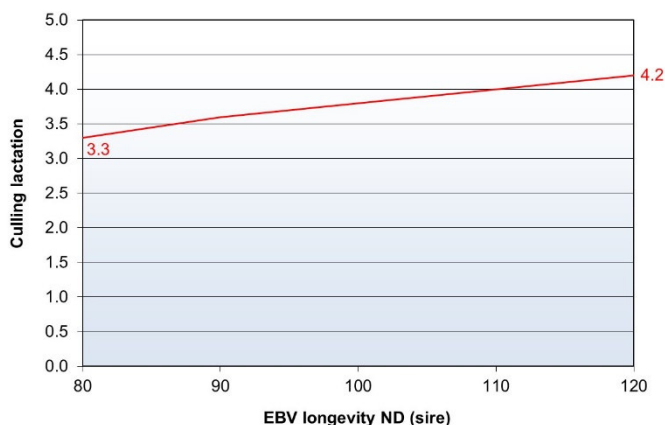


Fig.: Average culling lactation of the daughters depending on the breeding value for longevity of the sire (Fleckvieh, Austria)

Genetic trends

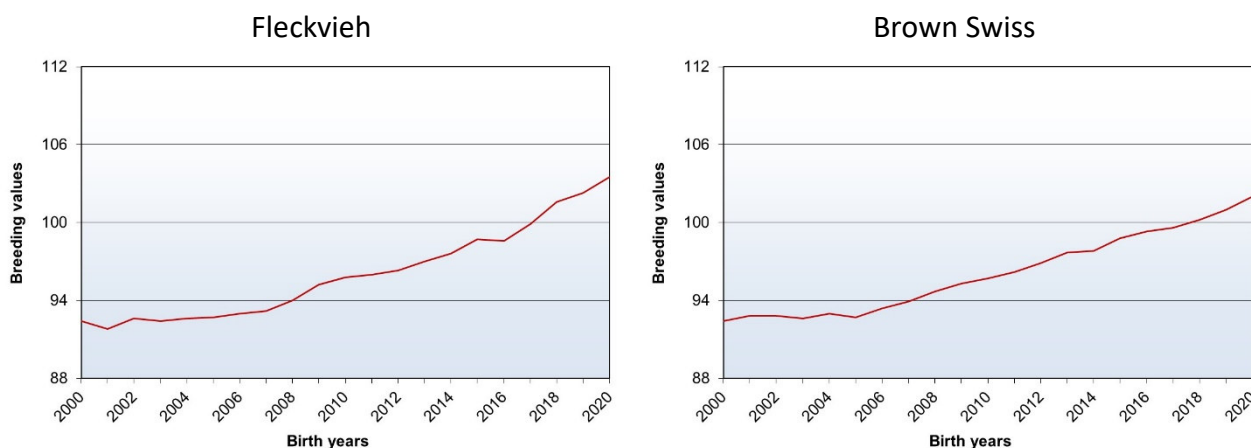


Fig.: Genetic trends for the breeding values for longevity (ND) for the cows (Austria)