Session 21

Estimation of genetic parameters for heifer mortality in Austrian Fleckvieh

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Background (1)

- Mortality rates of cows and stillbirth reported to have increased
- Little research dealing with calf and heifer losses
- Economic aspects:
  - higher replacement costs
  - higher veterinarian costs
  - reduced genetic gain
- Welfare aspects

Background (2)

- Modern economically derived breeding objectives must include functional traits
- Most countries include such traits (e.g. stillbirth, longevity)
- No breeding values for losses of replacement animals so far!

Aims

- Frequencies of mortality in Austrian Fleckvieh (dual purpose Simmental)
- Exploring genetic background of postnatal mortality
- Inseminated animals being slaughtered
- Estimation of breeding values and correlations to other traits

Data and Methods

Animals and definition of periods

- 86,249 female Austrian Fleckvieh calves born 2001-2004
- For breeding value estimation: N = 758,687
- complete life history
- single born
- <= 12.5% foreign gene proportion

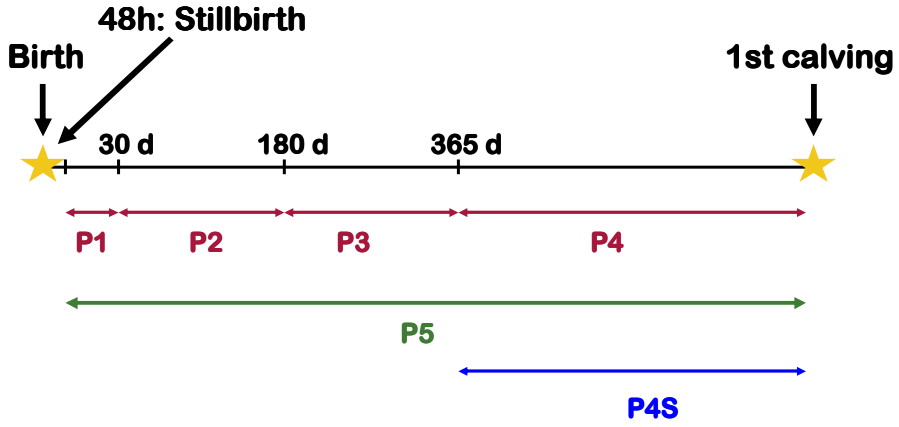
Data and Methods

Animals and definition of periods

- Earlier research suggested survival at different stages of life controlled by different genes
- Definition of periods

Data and Methods

Definition of periods



Data and Methods

Animals and definition of periods

- Binary data structure (1/0)
- Animals slaughtered or exported set to missing for this and subsequent periods (P1 - P5)

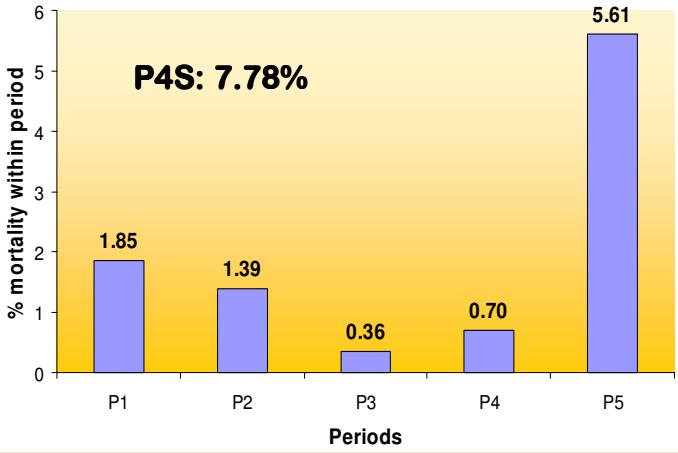
Data and Methods

Methods

- Generalized linear mixed model theory (ASReml)
- Univariate threshold sire model:
  (binomial distribution, logit link function)
- Random effects
  - sire (genetic) and herd*year
- Fixed effects
  - year*month, no. dam's parity, calving ease

Results

Postnatal mortality in % in different periods



Results

Heritabilities (%), standard errors and genetic variance

	h^2	se	σ^2_a
P1	6.6	2.3	0.255
P2	5.8	2.6	0.224
P3	0.0	-	-
P4	5.1	4.6	0.220
P5	6.7	1.8	0.252
P4S	6.3	1.5	0.230

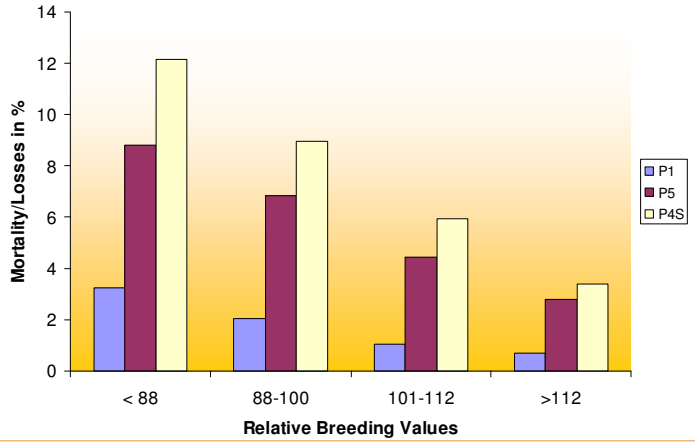
Results

Breeding values

- 371 (P5) to 1113 (P1) sires with a minimum of 100 offspring
- Standardization of breeding values: mean = 100, s = 12 for a genetic standard deviation
- Higher breeding values favourable

Results

Breeding value estimation sires >100 offspring



Results

Breeding value correlations

	TMI	FIT	LONG	STILL
P1	0.15	0.09	0.02	0.09
P5	0.29	0.15	0.11	0.14

Results

Breeding value correlations

	TMI	FIT	LONG	FERT
P4S	0.26	0.21	0.27	0.22

Conclusions

- 5.61% total calf and heifer mortality is higher than stillbirth rate
- Genetic and phenotypic variation reasonably high for P1, P2, P4S, P5
- Animals being inseminated but slaughtered could also be utilized
- Even if losses lower than in other breeds, further monitoring and genetic evaluation recommended