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Genetics of displaced abomasum in German Holstein cows (session G5.6)

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Objectives

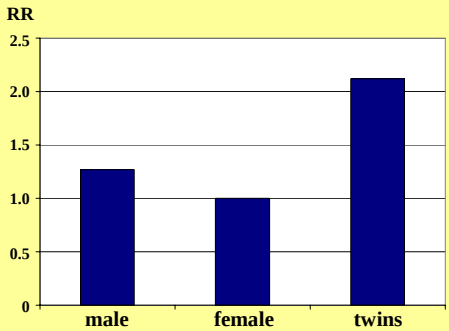
- Analysis of risk factors for abomasal displacement (DA) in German Holstein cows
- Estimation of genetic parameters for DA and milk production traits
- Recommendation of a breeding programme

Materials and methods

- 3706 cows with 4090 lactations from 50 dairy farms in Lower Saxony
- Lactational incidence of DA: 3.6%
  Left DA (LDA) vs. Right DA (RDA): 74 vs. 26%
- Residual Maximum Likelihood estimates for genetic parameters by using a linear animal model and transformation of the estimates to the liability scale

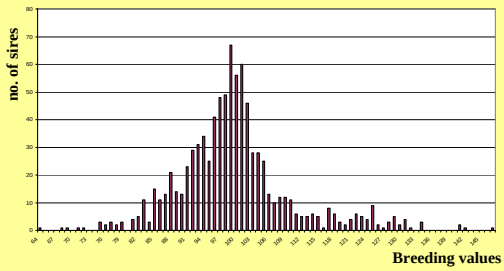
Results

- Significant risk factors for LDA
  - housing system: lower incidence in loose housing systems than in tied stall barns
  - calving month: highest incidences from February to June
  - sex and number of calves born: twins increase risk for LDA



Relative risk (RR) for the incidence of LDA through single and twin births

- Heritabilities
  DA: $h^2 = 0.20$
  LDA: $h^2 = 0.12$
  RDA: $h^2 = 0.26$



Distribution of breeding values (scale: 100±12) for the incidence of DA for sires with at least 3 daughters (n = 310)

- Genetic correlations with milk production traits of the lactation prior to the diagnosis of DA

305 - day milk production trait	DA	LDA	RDA
Milk yield	0.08	0.68	- 0.42
Fat yield	- 0.16	0.60	- 0.52
Protein yield	0.04	0.65	- 0.44
Fat percentage	- 0.20	- 0.77	0.18
Protein percentage	- 0.08	- 0.64	0.24

- Indirect selection response based on sires' breeding values (BV) for the ratio between fat content and protein content

BV for fat-%/protein-%	Incidence of LDA in daughters
< 100	0 %
100 – 102	4.4 %
> 102	4.1 %

Conclusions

- LDA and RDA are genetically determined traits in German Holstein cows
- Occurrence of LDA is significantly associated with increased milk yield traits and decreased milk fat and protein content
- An indirect selection procedure based on milk production traits appears feasible. Adopting such a selection scheme lets expect a higher selection response than direct selection against LDA