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Bavarian State Research Center
for Agriculture

Genetic evaluation of peripartal problems in Bavarian Fleckvieh and Brown Swiss

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New data sources for health traits

- Aim of project „Pro Gesund“:
  - Increase of the health status in Bavarian dairy cattle herds
  - Collect data on health traits for the joint routine genetic evaluation (with Austria and Baden-Württemberg)

- Two new data sources since 2012:
  1) Observations of farmers concerning birth problems
  2) Veterinary diagnoses

1) Observations from farmers

- From the German Identification and Information System for Animals (HI-Tier) where every calving is registered

- Now including voluntary reports of
  - *Retained placenta (RP)*
  - *Downer cow syndrome (DCS)*
  - *Umbilical hernia (UH)*
  - *Calving ease (CE)*

- Question: *Are these observations suitable for the routine genetic evaluation, which until now is based on veterinary diagnoses?*

2) Veterinary Diagnoses

- Only from herds participating in the project Pro Gesund
  - ➔ Voluntary registration since 2012
  - ➔ Increasing number of registrations since last year

PRO GESUND
Rindermonitoring in Bayern.
Effizient vorsorgen. Gut betreuen.

Number of records by data source

	1) Observations	
	Fleckvieh	**Brown Swiss**
records	1.447.690	216.369
after filtering	734.097	83.412

- Filter steps included for example
  - Minimum of 15 observations per herd
  - Proportion of problems within a certain range

Number of records by data source

	1) Observations		2) Diagnoses
	Fleckvieh	**Brown Swiss**	**all breeds**
records	1.447.690	216.369	31.035
after filtering	734.097	83.412	12.812

- Filter steps included for example
  - Minimum of 15 observations per herd
  - Proportion of problems within a certain range
  - Only diagnoses with matching birth record within the observations

Incidence (%)

Trait	1) Observations	
	Fleckvieh	Brown Swiss
Retained placenta (1st lactation)	5.0 (2.7)	6.4 (5.4)
Downer cow syndrome	3.0	2.2
Calving ease* (1st lactation)	4.7	3.4
Calving ease* (later lactations)	2.9	2.7
Umbilical hernia	0.3	0.3

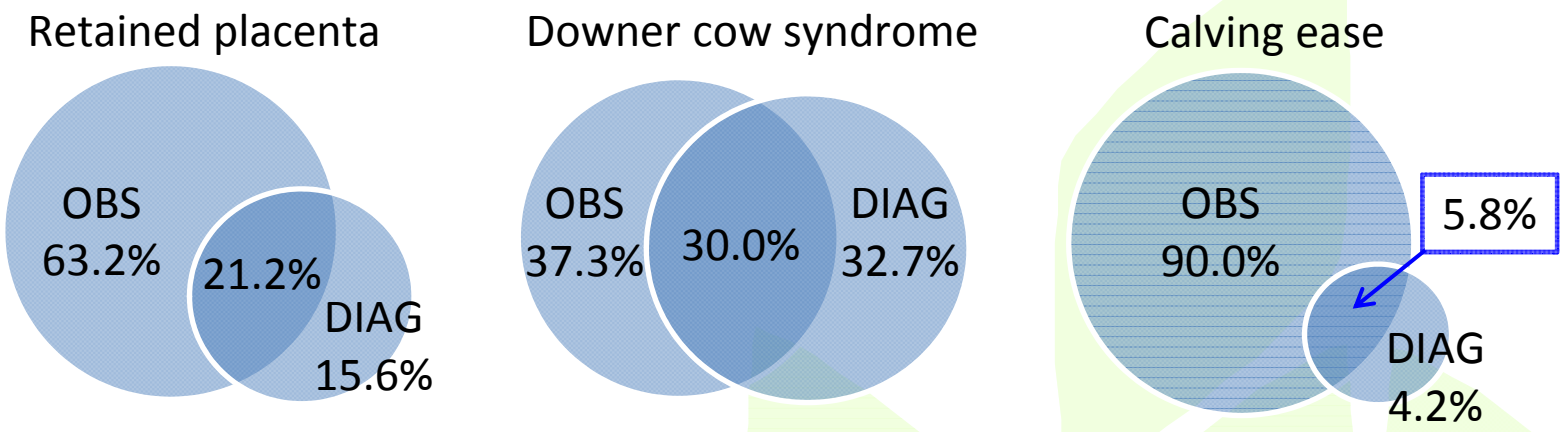
*3 and 4 on a scale of 1 to 4

Incidence (%)

Trait	1) Observations		2) Diagnoses
	Fleckvieh	Brown Swiss	all breeds
Retained placenta (1st lactation)	5.0 (2.7)	6.4 (5.4)	2.6
Downer cow syndrome	3.0	2.2	3.1
Calving ease* (1st lactation)	4.7	3.4	0.6
Calving ease* (later lactations)	2.9	2.7	0.3
Umbilical hernia	0.3	0.3	0.02

*3 and 4 on a scale of 1 to 4

Reported problems by data source



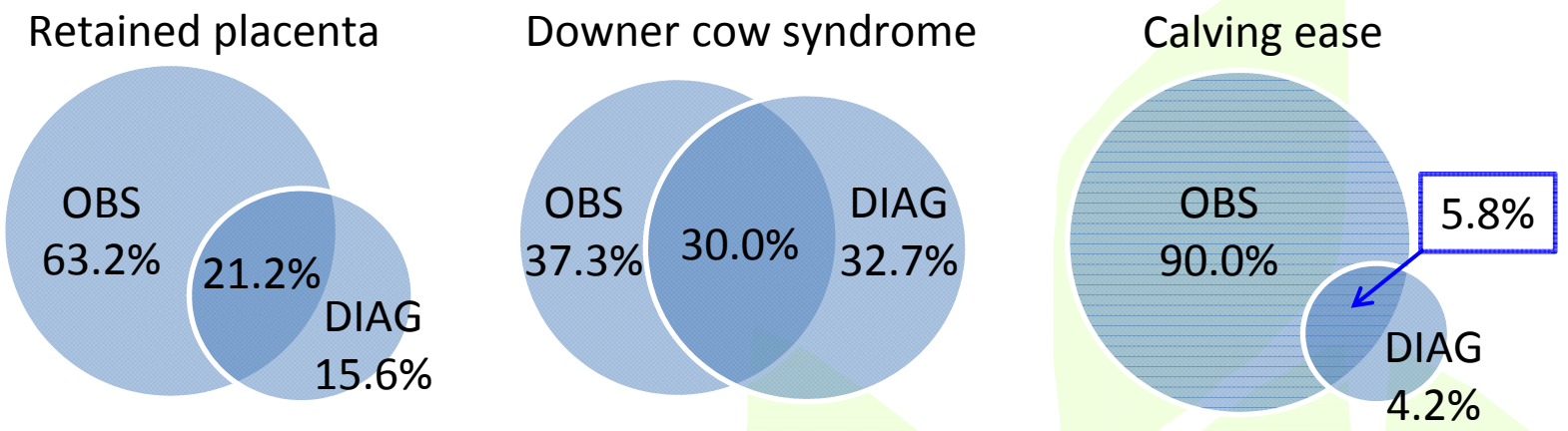
OBS = reported only by farmer

DIAG = reported only by veterinarian

Intersection = reported by both

On average 54% of DIAG also in OBS

Reported problems by data source



Phenotypic correlations between traits from different data sources:

	RP	DCS	CE
r_{OBS_DIAG}	0.36	0.44	0.18

Heritability (linear animal model)

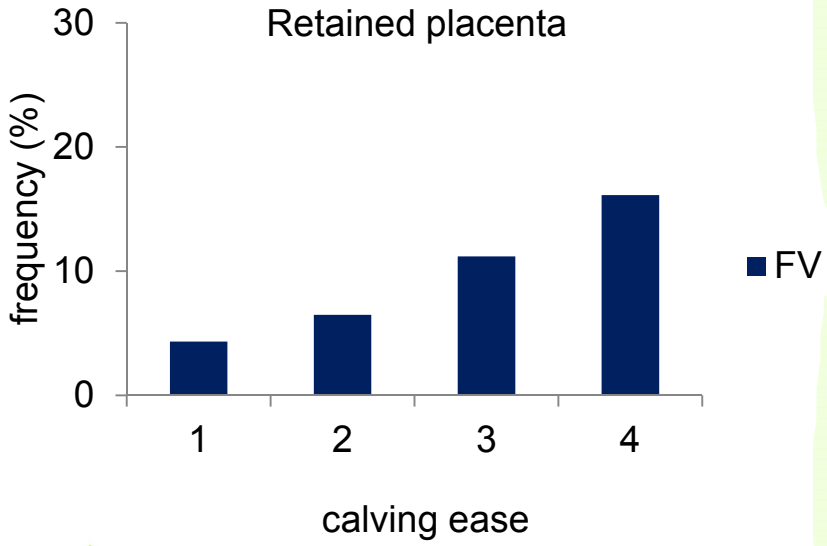
$$y = Parity * AgeCow + (SexCalf) + Animal + Herd * Year * Season + e$$

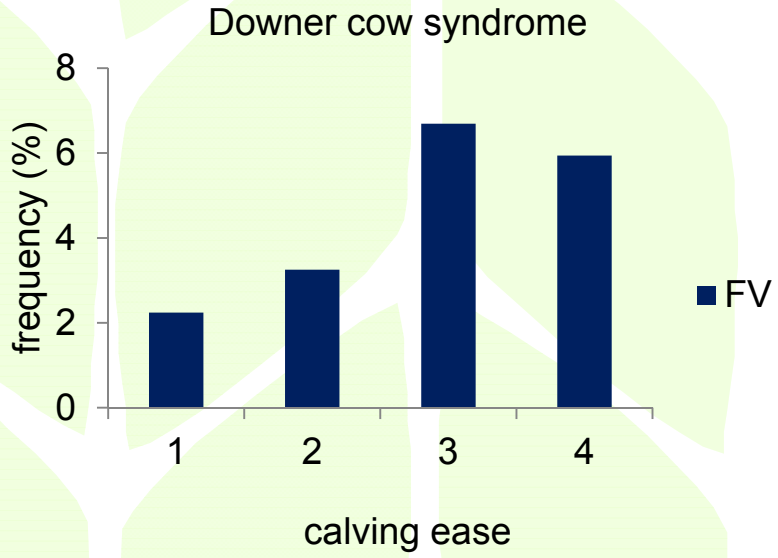
Pedigree: 5 generations

Trait	Fleckvieh	Brown Swiss
RP	**0.024**±0.002	**0.021**±0.004
DCS	**0.036**±0.002	**0.036**±0.006
CE (1st lactation)	**0.097**±0.006	**0.016**±0.006
CE (later lactations)	**0.031**±0.003	**0.026**±0.006

Genetic correlations FV (linear sire model)

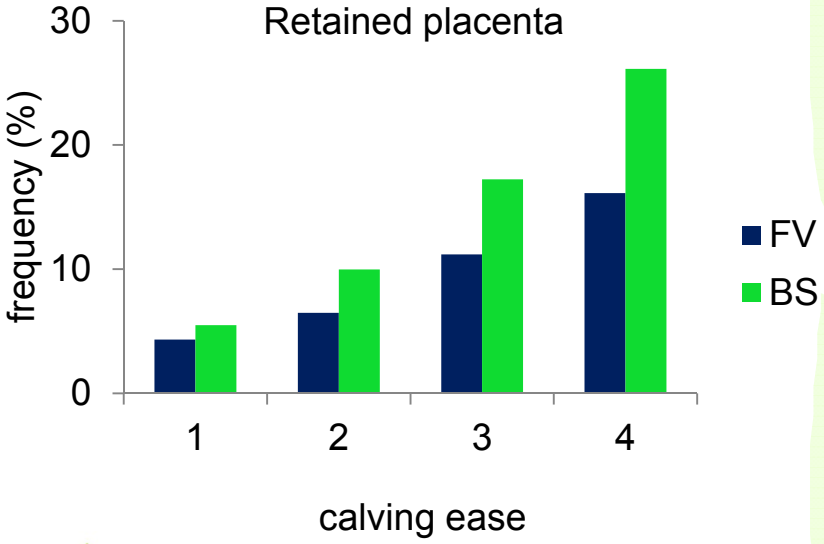
Fleckvieh	DCS	CE_1	CE_2+
RP	**0.25**±0.05	**0.38**±0.08	**0.38**±0.08
DCS		**0.53**±0.13	**0.13**±0.07
CE_1			**0.84**±0.03

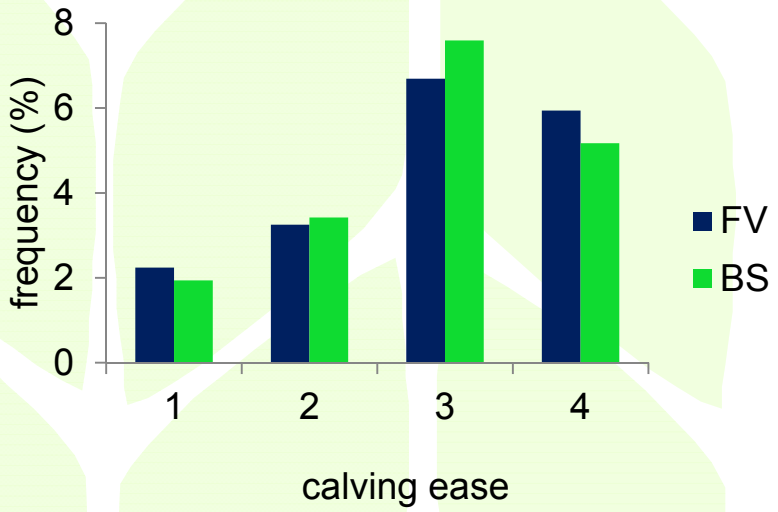




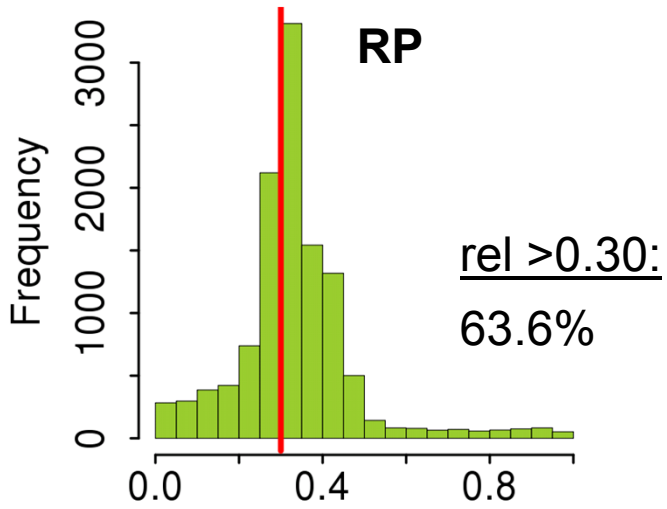
Genetic correlations BS (linear animal model)

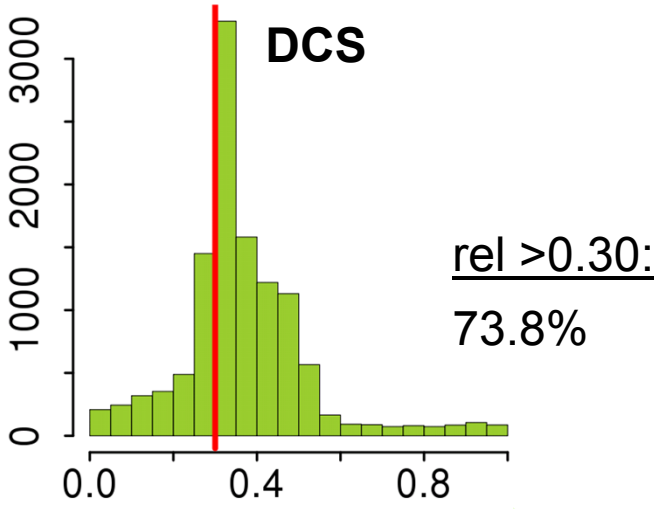
Brown Swiss	DCS	CE
RP	**0.13**±0.13	**0.29**±0.15
DCS		**0.10**±0.15

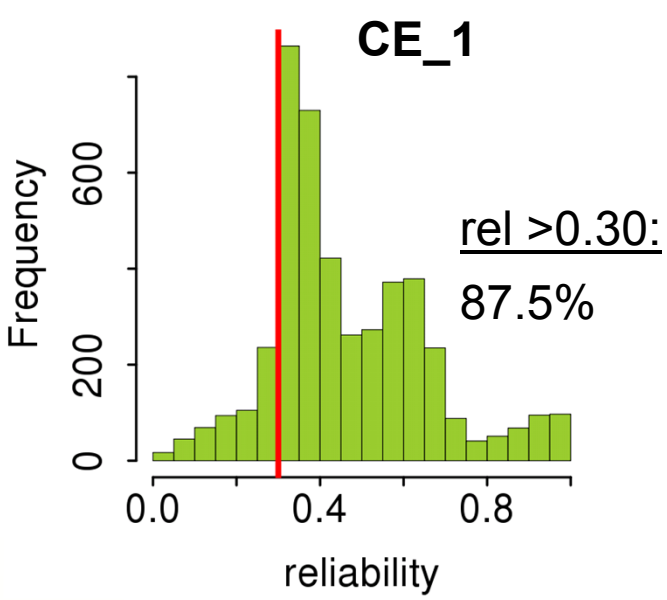


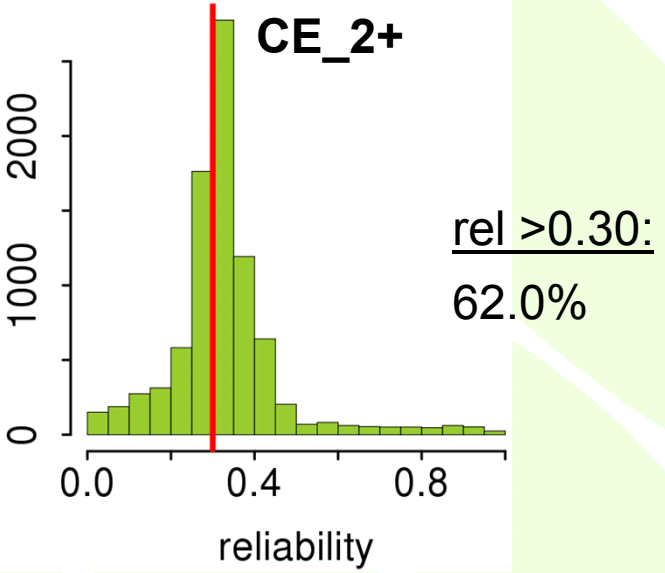


Reliabilities of EBVs









Conclusions

- Accordance between the two data sources needs to be improved
- Large quantity of data from the first data source enables estimation of breeding values despite small heritabilities
- Usage of farmers‘ observations for the joint genetic evaluation can be recommended


Thanks for your attention!
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für tierische Veredelung in Bayern e.V.
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Bayerisches Staatsministerium für
Ernährung, Landwirtschaft und Forsten

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