

A Bayesian approach: 1 + 1 = 3?

Risk factor analysis for Digital Dermatitis and Interdigital Dermatitis

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Aim

Estimating risk factors related to Digital Dermatitis (DD) and Interdigital Dermatitis (ID) with data from two separate field studies

Type of data used

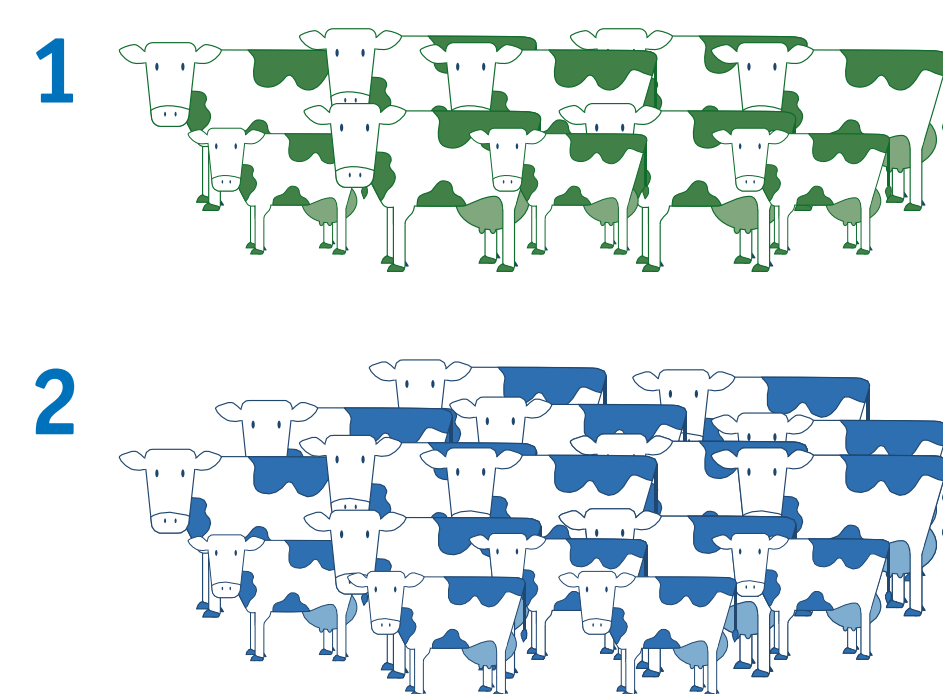
- Infectious claw disorders (ICD) scored by professional claw trimmers and registered in DigiKlauw®.
- **Similar** questionnaire for risk factors for DD and ID in both studies.

What method did we apply?

- Two different ICD's were assessed i.e. digital dermatitis (DD), interdigital dermatitis (ID)
- Presence/absence of each ICD per cow
- Analysis on farm-level (negative binomial)
- Frequentistic results of risk factor analysis on 40 dairy herds as prior information in bayesian risk factor analysis on 95 dairy herds.

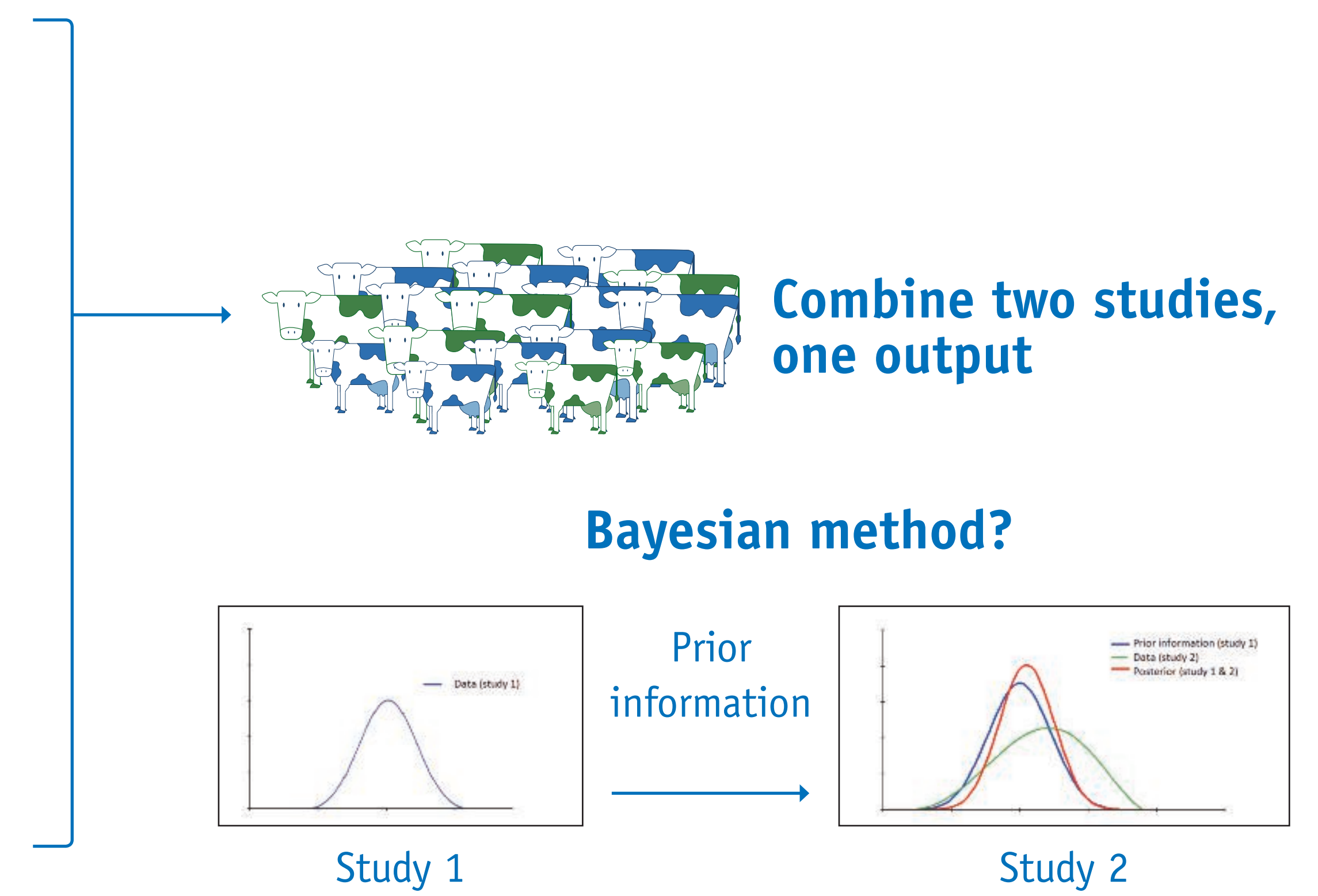
40 dairy herds

2014 - 2015
More than average DD incidence

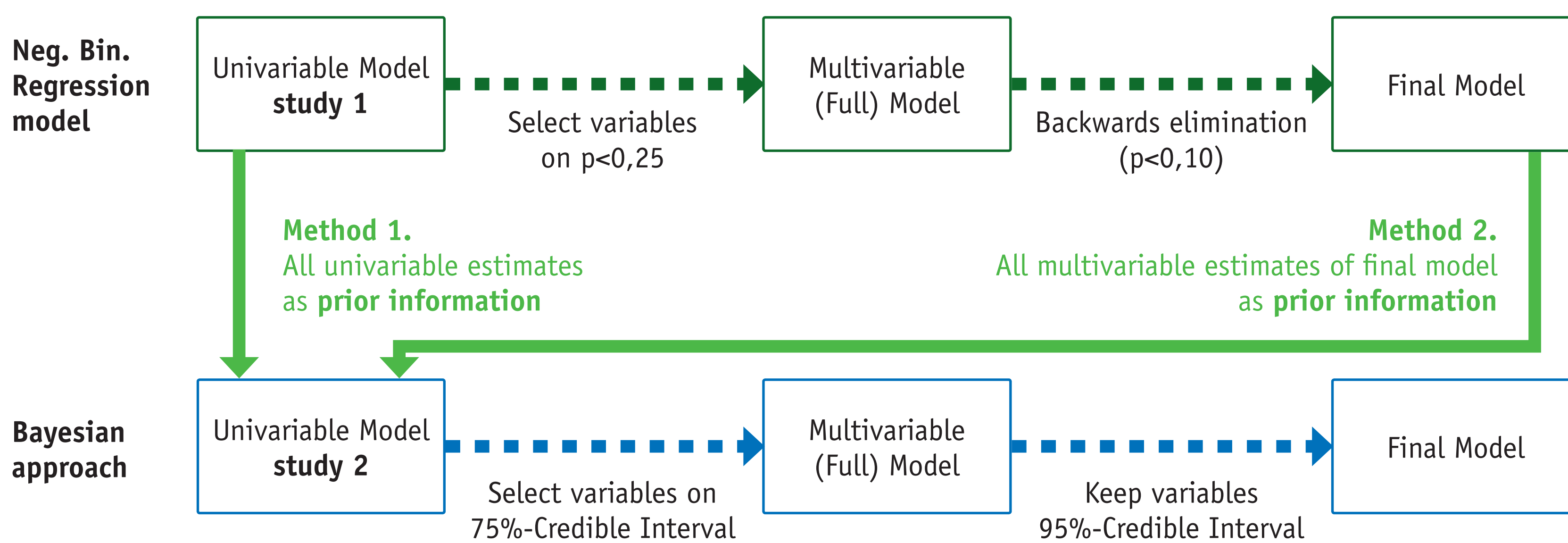


95 dairy herds

2017 - 2018
Low, average and high DD incidence



Process



Results

Digital Dermatitis

	N=40	N=95	Bayesian (method 2)
Rubber on the floor	↓ IRR=0,63		↓ IRR=0,63
Access to pasture	↓ IRR=0,62	↓ IRR=0,51	↓ IRR=0,66
>Twice a day manual manure scraping	↓ IRR=0,73		↓ IRR=0,68
Over-occupancy of the cubicles	↑ IRR=1,63		↑ IRR=1,51

Interdigital Dermatitis

	N=40	N=95	Bayesian (method 1)
Access to pasture	↓ IRR=0,61	↓ IRR=0,33	↓ IRR=0,57
Unknown presence of ICD's young stock		↑ IRR=3,01	↑ IRR=2,12
Known presence of ICD's young stock			↓ IRR=0,63
>Twice a day manual manure scraping		↓ IRR=0,35	

Discussion

- Selected herds, representativeness of results?
- Method 1 and 2 compared with model fit (Log-Marginal-Likelihood and DIC's)
- Method differed per ICD
- Optimal method?

Conclusion

With bayesian methods two similar studies were combined, resulting in seemingly higher statistical power. DD and ID were associated with farm-level factors related to cleanliness and type of floor, access to pasture and cubicles and general awareness of the farmer about ICD's.



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