Temporal relationship between milk MIR predicted metabolic disorders and lameness events

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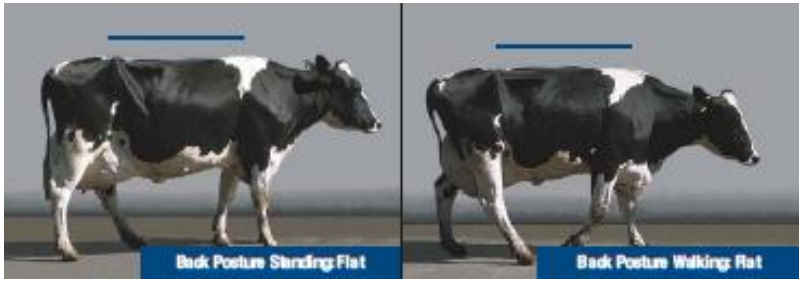
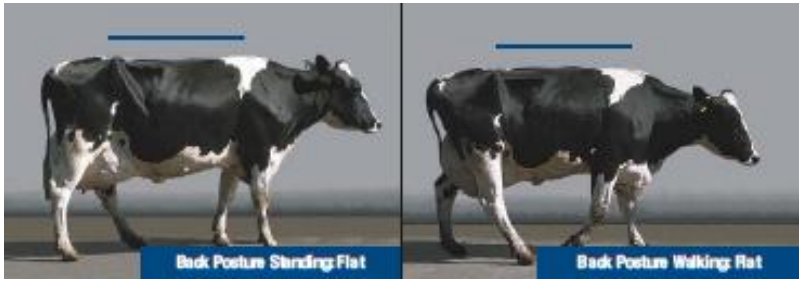
Context



Visual locomotion scoring

Context

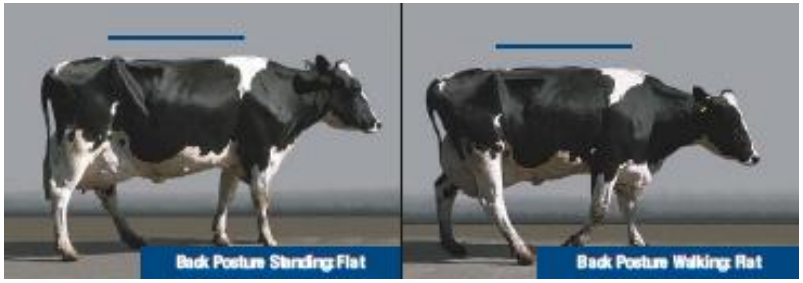


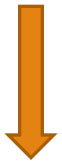
Visual locomotion scoring

TOO LATE !

= Only a diagnosis

Context





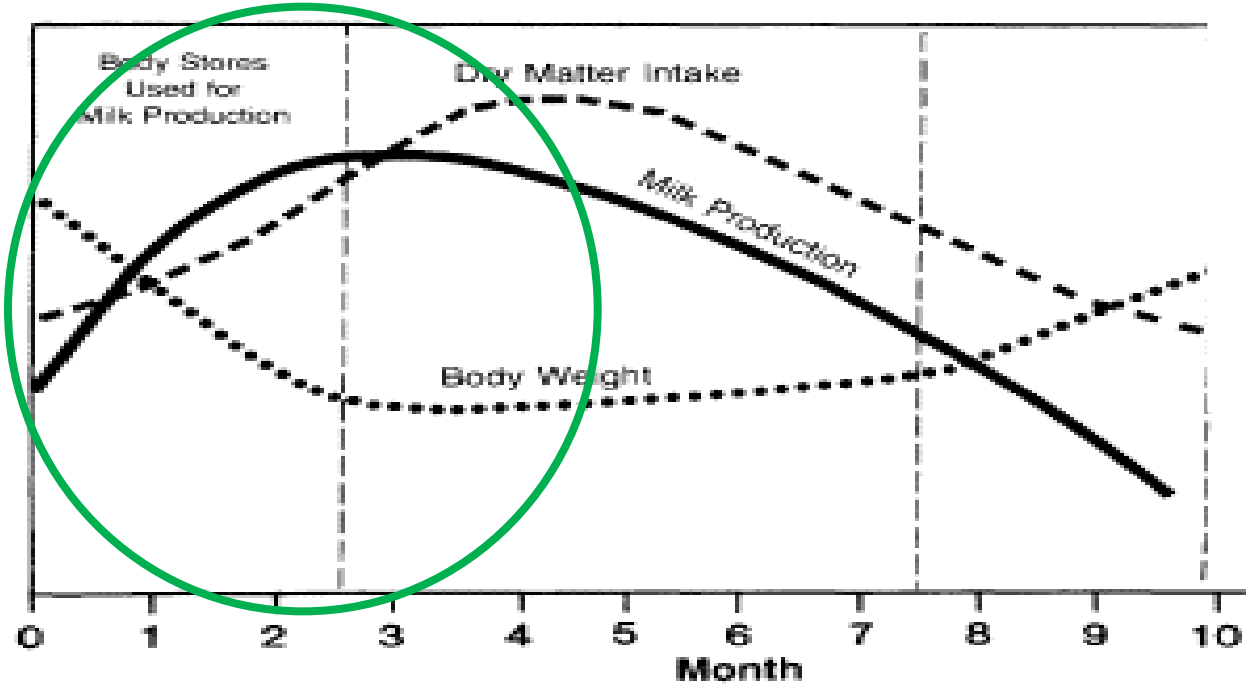
Visual locomotion scoring

Early detection?

= Only a diagnosis

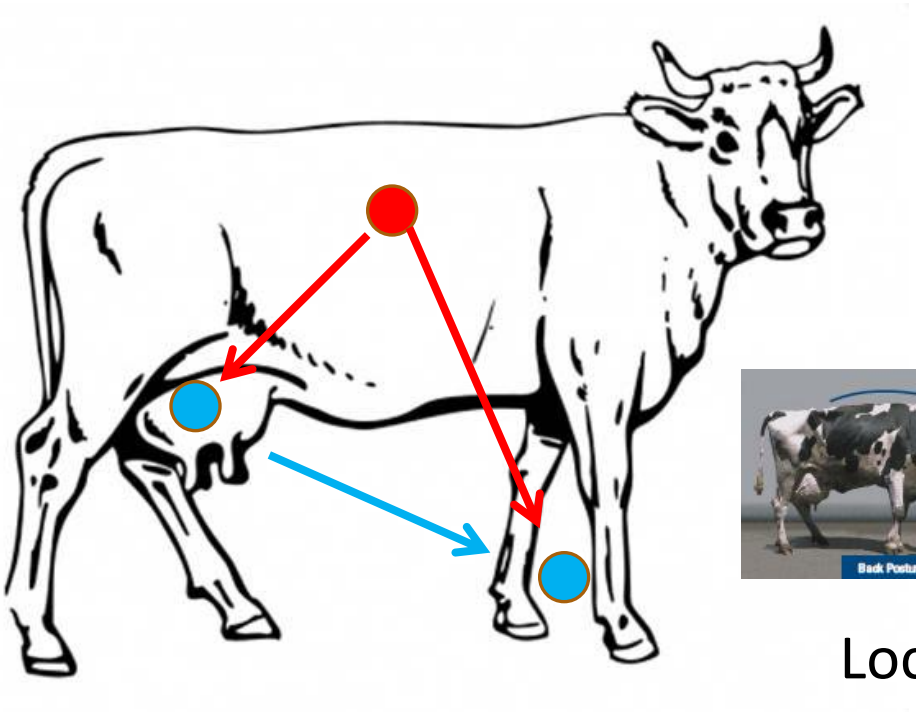
Hypothesis

Start of lactation



Hypothesis

- BHB
- Acetone
- Citrates
- C18:1cis9



Locomotion score

MIR predicted biomarkers

Milk samples

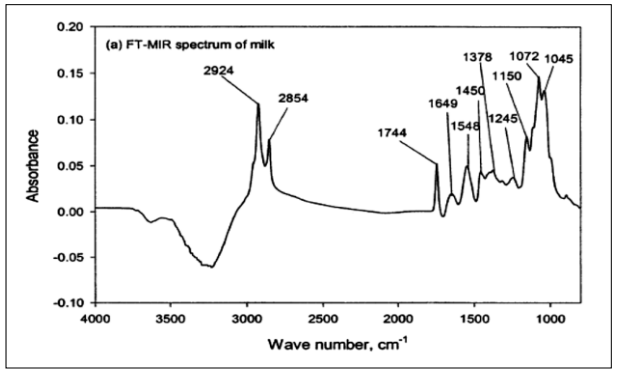
MIR analysis

MIR predicted biomarkers

Milk samples

MIR analysis

MIR spectra

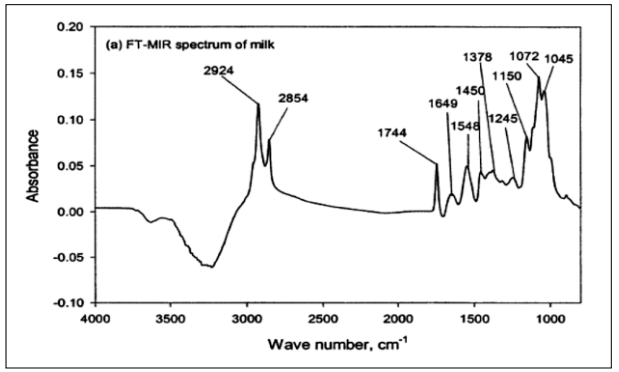


MIR predicted biomarkers

Milk samples

MIR analysis

MIR spectra



Reference values

Calibration

Prediction

Novel components

- BHB
- Acetone
- Citrates

Data

- 3 Breeds
  - 3753 Simmental, 1473 Brown Swiss, 1066 Holstein
- 161 farms
- 45044 samples
  - 9268 MIR
  - 38306 loc scores

(Rinderzucht Austria, https://www.zar.at/Aktuelles/Archiv/2017/Zukunftswerkstatt-Rinderzucht.html)

Data

- 3 Breeds
- 161 farms
- 45044 samples

- Biomarkers
  - Acetone
  - Citrates
  - BHB
  - Fat
  - C18:1cis9

(Rinderzucht Austria, https://www.zar.at/Aktuelles/Archiv/2017/Zukunftswerkstatt-Rinderzucht.html)

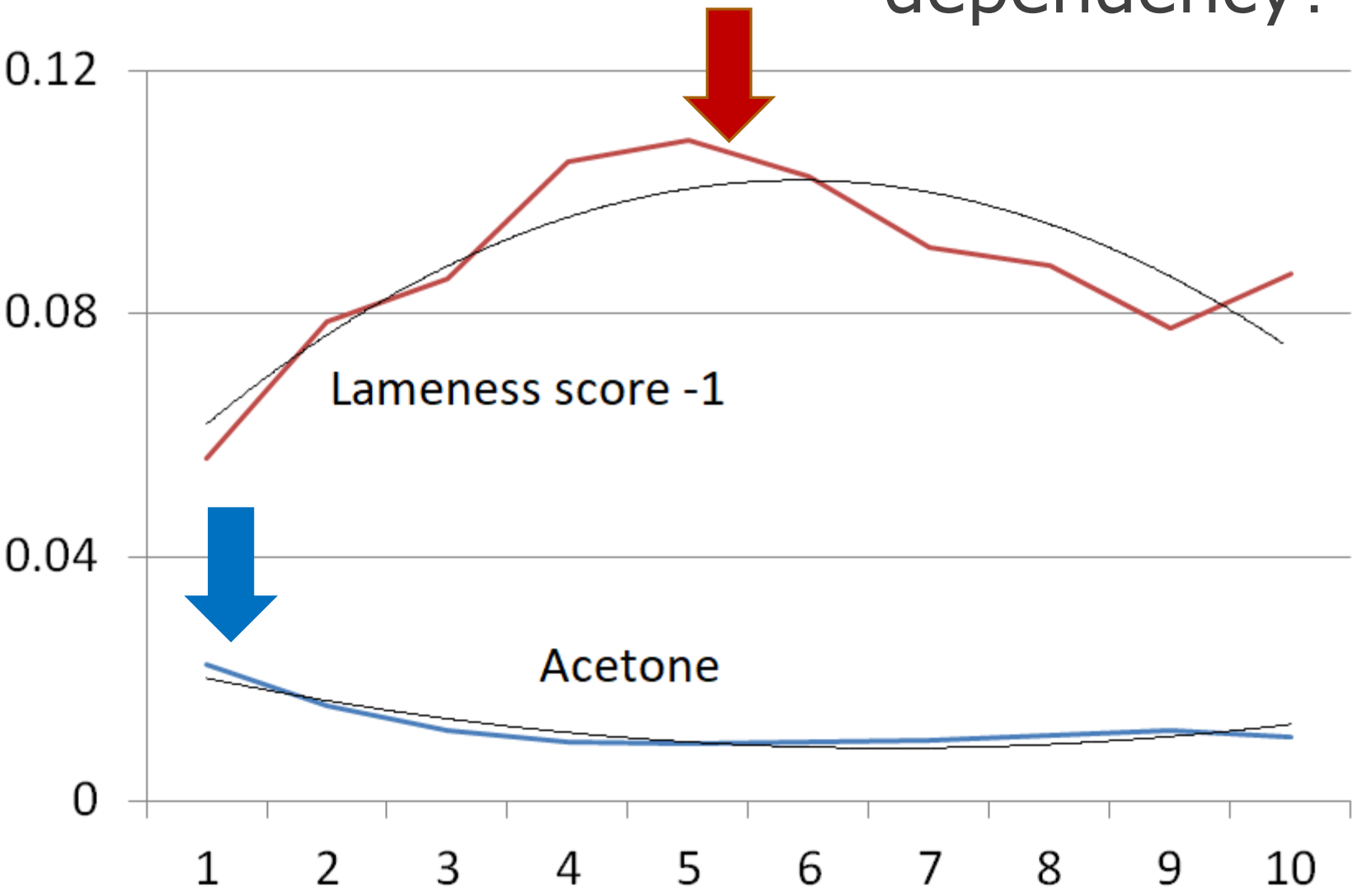
Objective

Looking at the relationship between locomotion score and potentially associated biomarkers

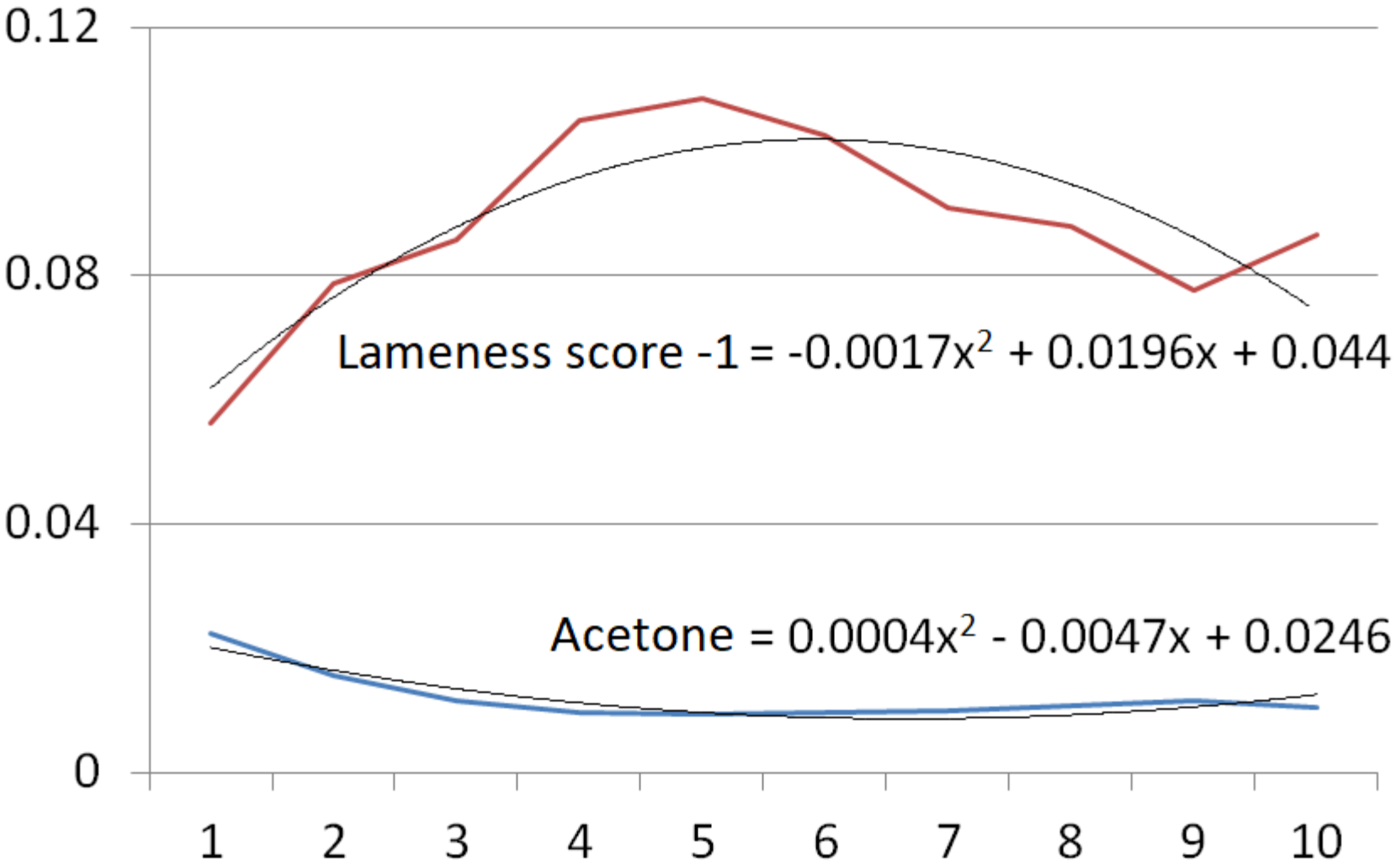
by modelling temporal dependency.

Modelling temporal dependency?

Temporal relationship?



Modelling temporal dependency?



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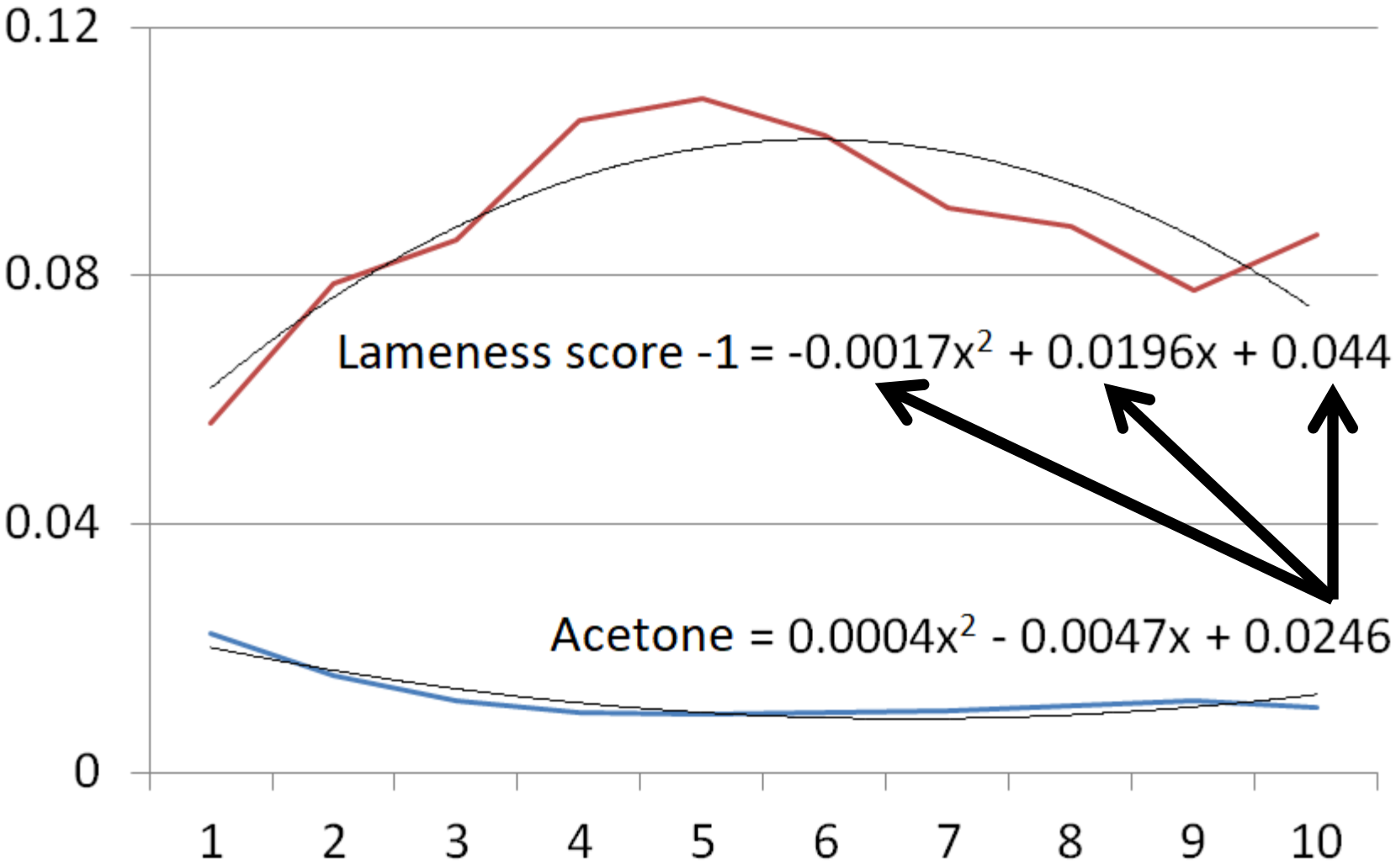

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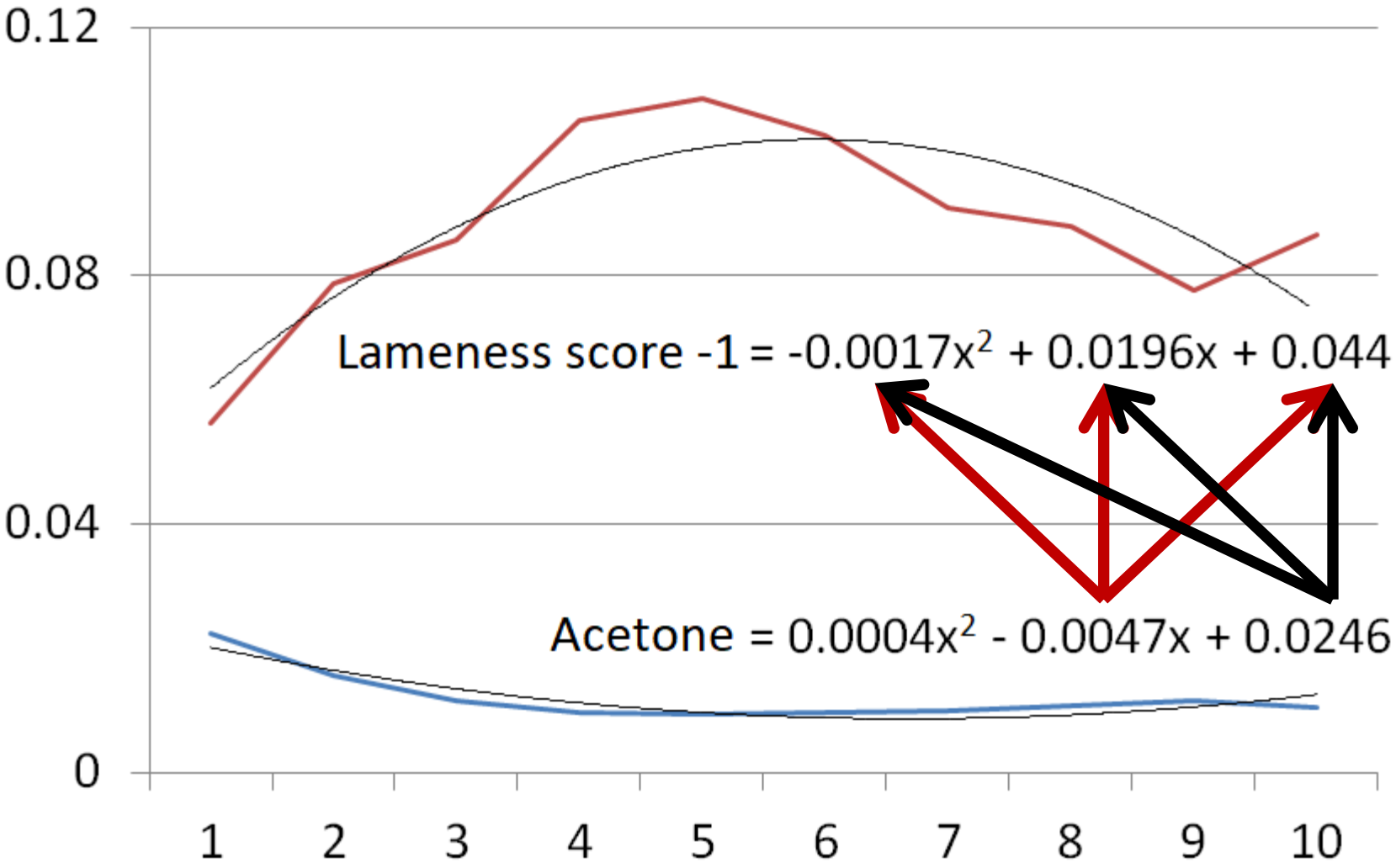

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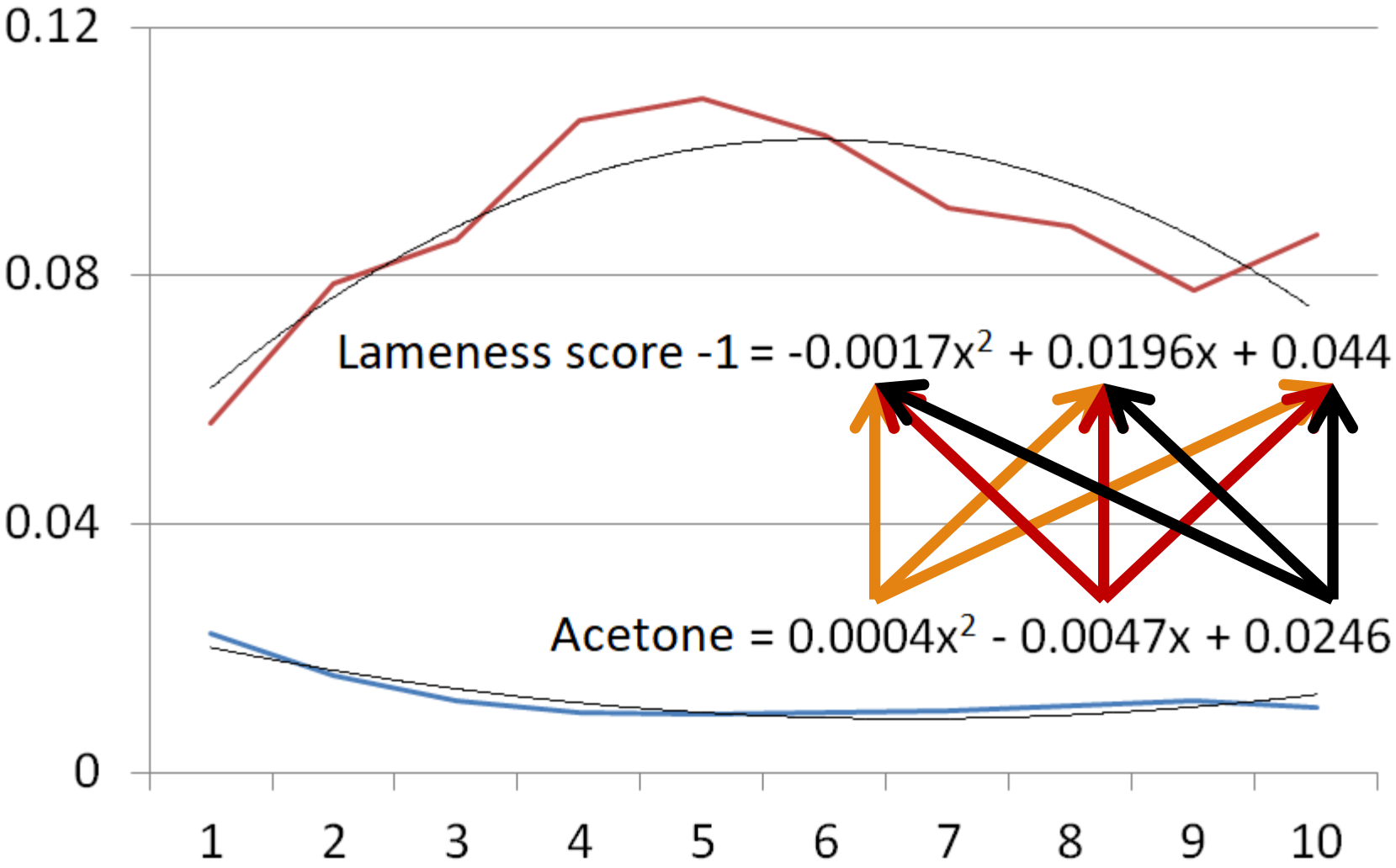


Results

Brown Swiss, oleic acid (C18:1cis9)

Correlations between

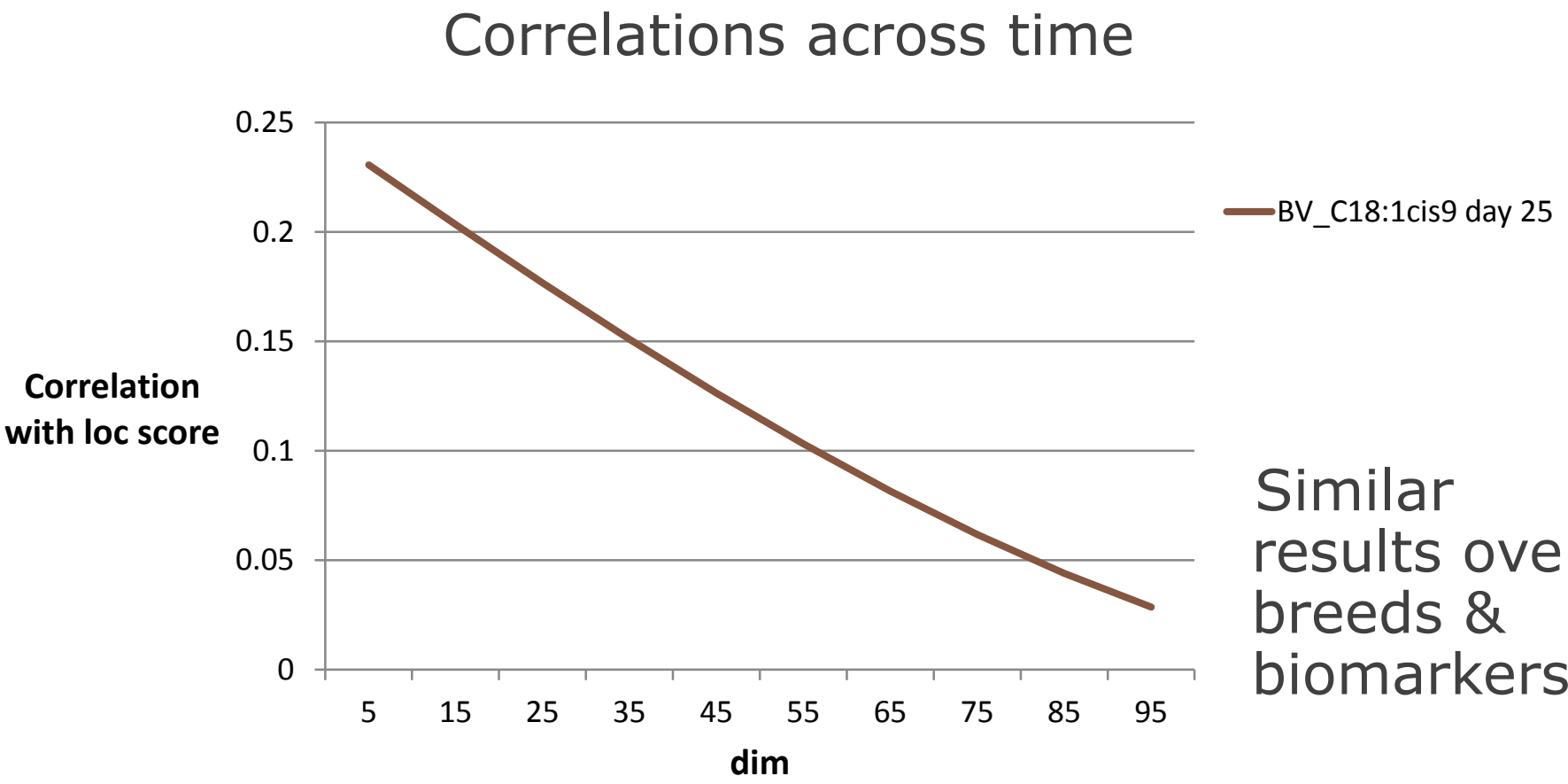
NON temporal regression coefficients

	L_ct	L_lin	L_q
B_ct	0.16	0.27	0.84
B_lin	-0.13	< 0.01	-0.93
B_q	0.01	-0.13	> 0.99

! Variances !

Results

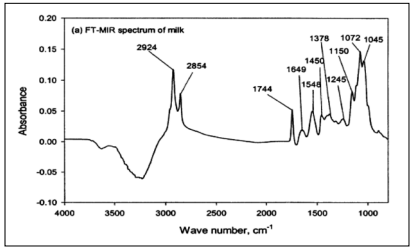
Brown Swiss, oleic acid (C18:1cis9)



Similar results over breeds & biomarkers

Discussion

NOT optimized:



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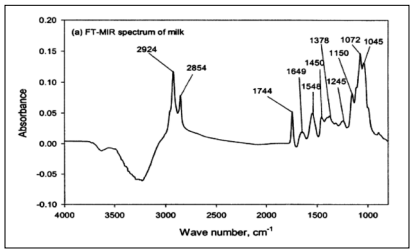

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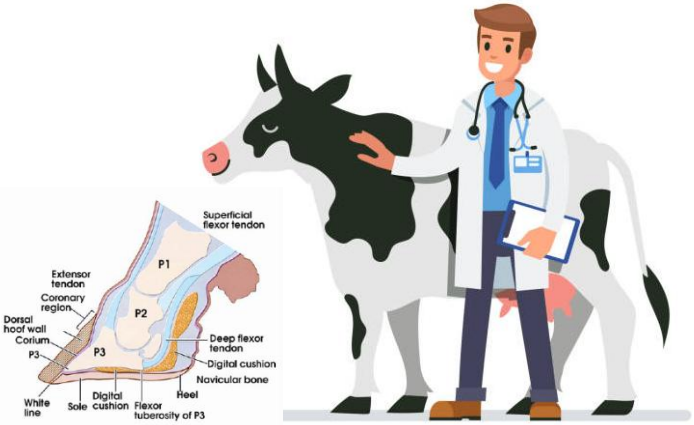


Hoof and leg diseases

=> NO distinction

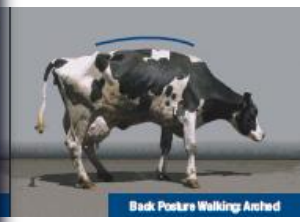
Discussion

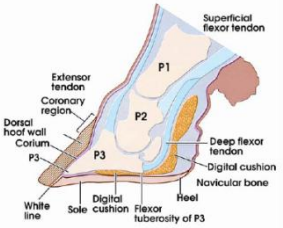
NOT optimized:

PUB

etone

rates





Hoof and leg diseases

=> NO distinction

Conclusions

Relation = right direction

BUT

Size of the correlations = small

Conclusions

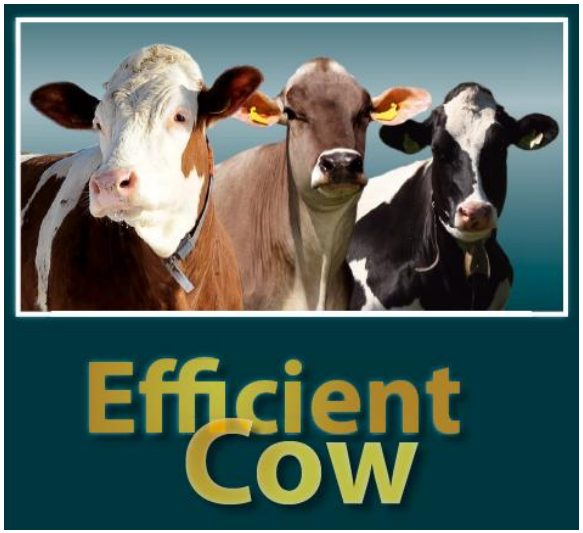
Relation = right direction

BUT

Size of the correlations = small

Worth investigating!

Acknowledgments



PLUS GE

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THANK YOU

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Methodology

Lamescore
OR
Biomarker

= Herd-Year-Season + month + Lactgroup + Animal-Lactation + e

Nested: Pol Leg 2

Reml, test-day model