Associations between cow factors, intra-mammary infections and inflammatory indicators

Ann Nyman, MSc, PhD, National Veterinary Institute

Where do we start?

- What do we want to achieve?
  - Prevent spread of infectious subclinical mastitis
- How?
  - We have to find the cows that have infectious subclinical mastitis
- How do we find them?
  - By bacteriological culturing/ PCR assay
    - EXPENSIVE!
  - By measuring inflammatory indicators to help us select cows for sampling

Inflammatory indicators

- Somatic cell count (SCC)
  - At IMI the proportion of neutrophils can increase ≥ 90%
- Enzymes
  - Lactate dehydrogenase (LDH)
  - N-acetyl-β-D-glucosaminidase (NAGase)
  - Alkaline phosphatase (AP)

Inflammatory indicators

- Can increase/decrease due to other factors than infection, e.g. parity, stage of lactation, stress etc.
- How does this affect the ability to find cows with an infection?

Inflammatory indicators

- In Sweden we have used a adjusted SCC
  - Parity
  - Stage of lactation
  - Milk yield
  - Breed
- The adjusted SCC has been used to predict the probability that a cow has infectious subclinical mastitis in one or more udder quarters – “the udder health classes”

The project

Aim

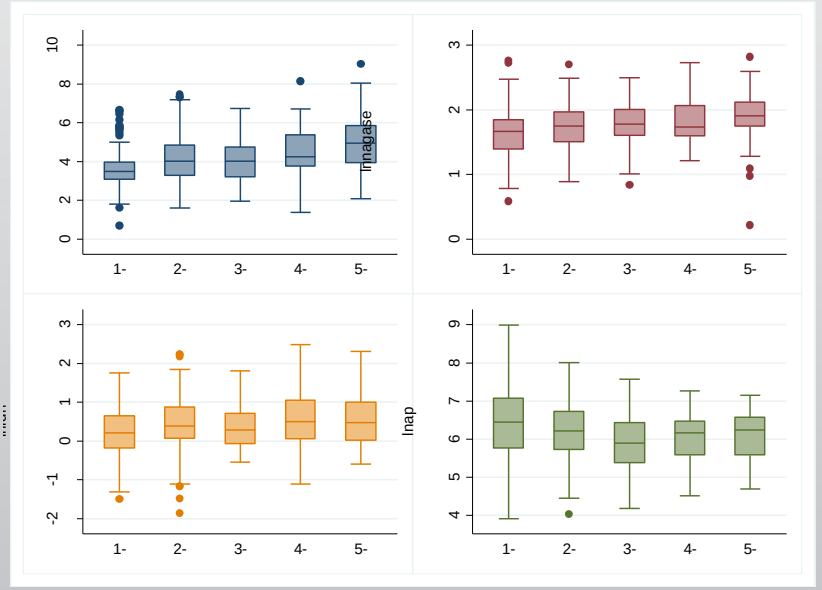
- To investigate associations between the inflammatory indicators and
  - cow factors
  - Intra-mammary infections (IMI)
- To investigate the ability of the inflammatory indicators to predict IMI

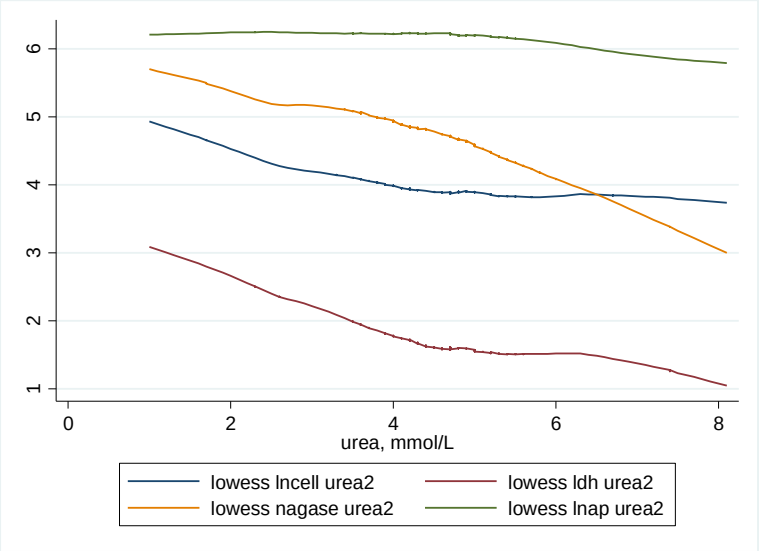
M&M

- Approximately 1000 cows from 25 herds
- 3 consecutive samplings
- Bacteriological culturing of all quarters on all occasions
- One whole udder milk sample – SCC, LDH, NAGase, AP

How does cow factors affect SCC, LDH, NAGase and AP in healthy cows?

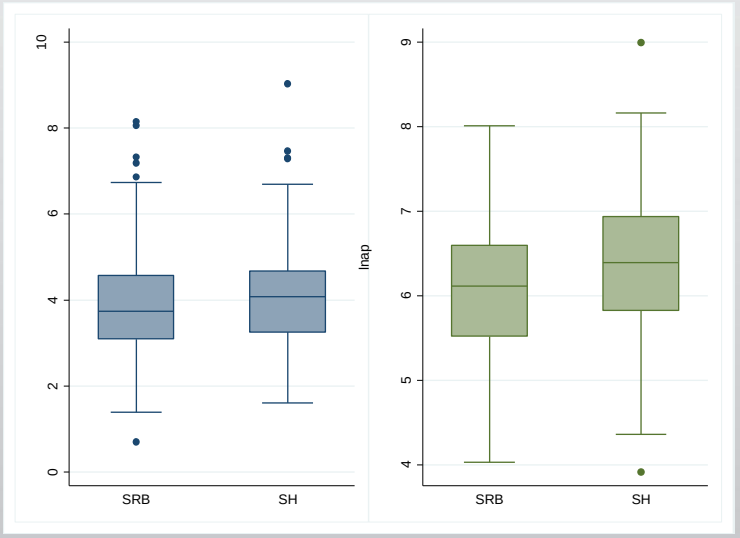
- Parity and urea in milk was associated with all inflammatory indicators

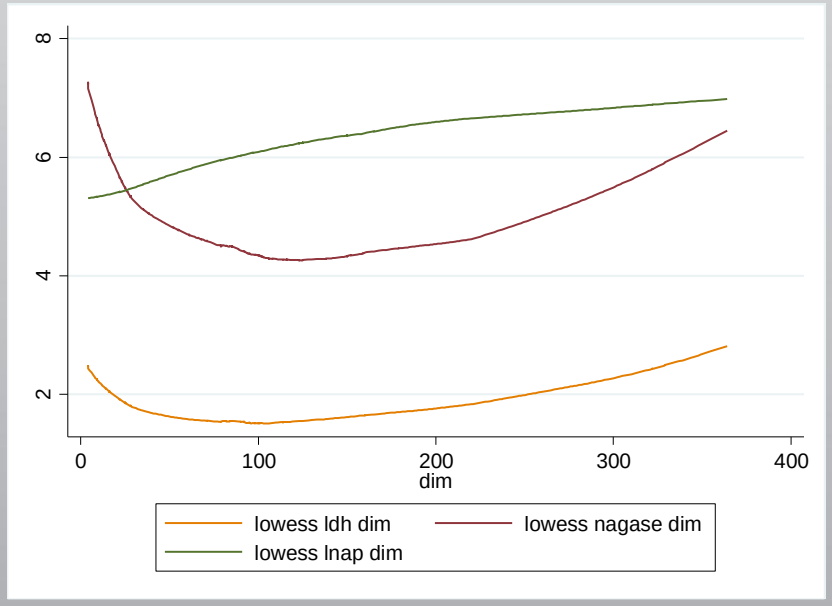




How does cow factors affect SCC, LDH, NAGase and AP in healthy cows?

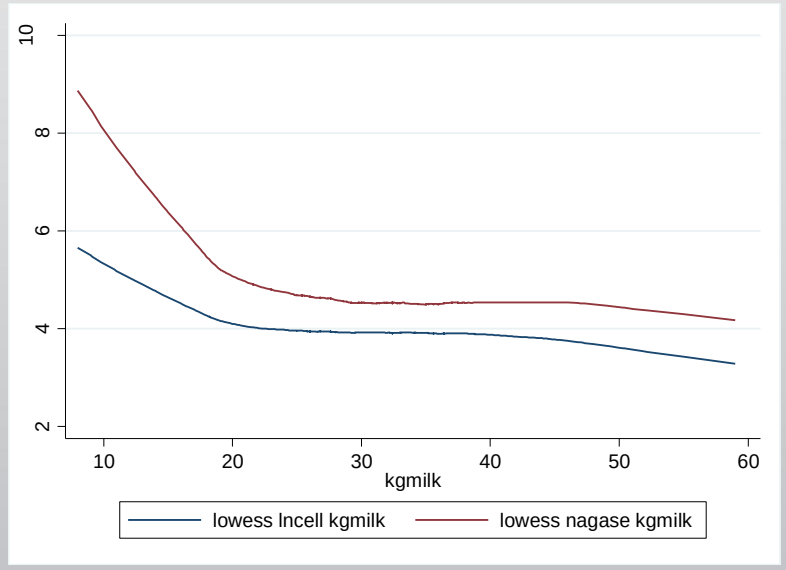
- Breed was associated with SCC and AP
- Days in milk (DIM) was associated with LDH, NAGase and AP



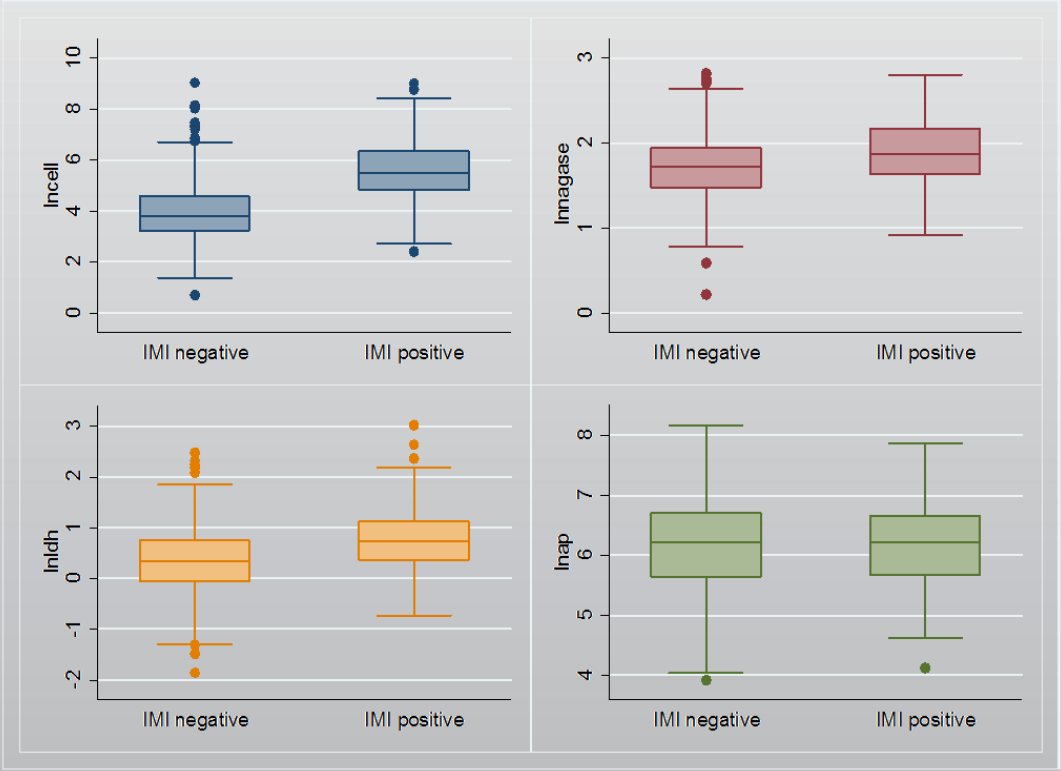


How does cow factors affect SCC, LDH, NAGase and AP in healthy cows?

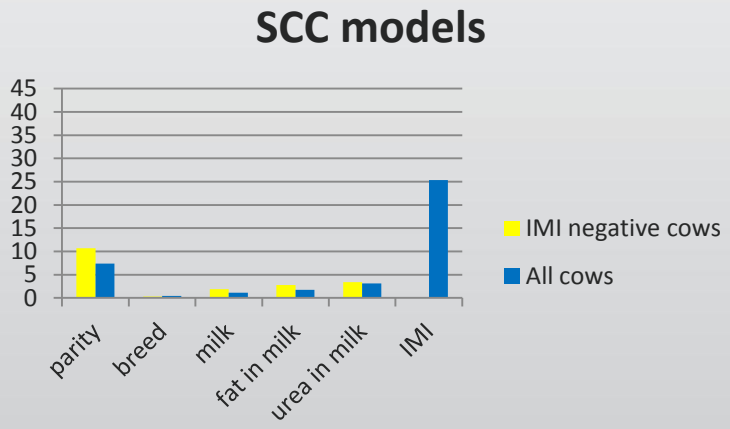
- Season was associated with LDH and NAGase
  - Lowest in October-November compared to January-April
- Milk yield was associated with SCC and NAGase
- Percentage of fat in milk was associated with SCC and AP
  - Increasing SCC and AP with increasing percentage of fat
- Percentage of protein was associated with LDH
  - Increasing LDH with increasing percentage of protein

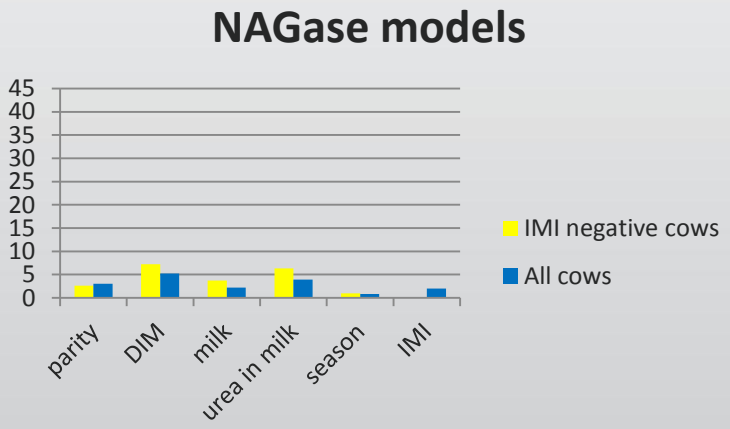


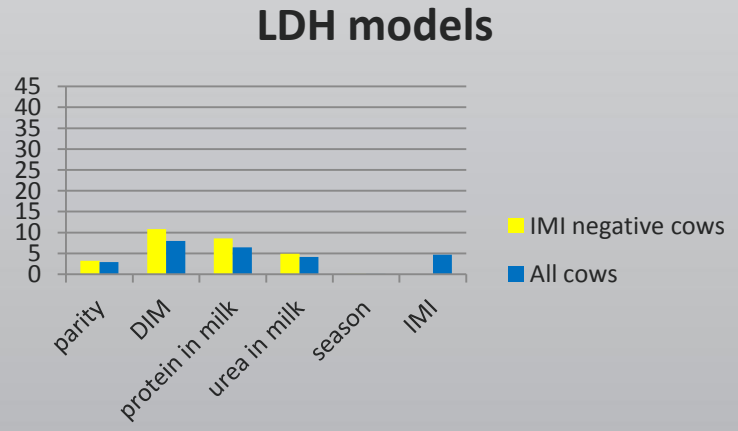
Associations between IMI and SCC, LDH, NAGase and AP

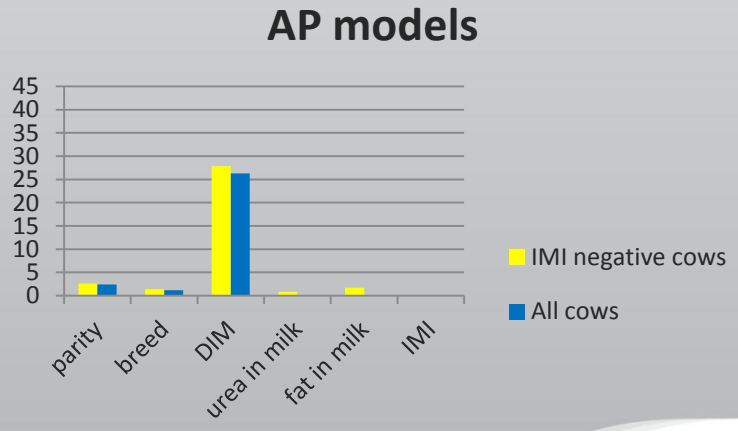


Amount explained





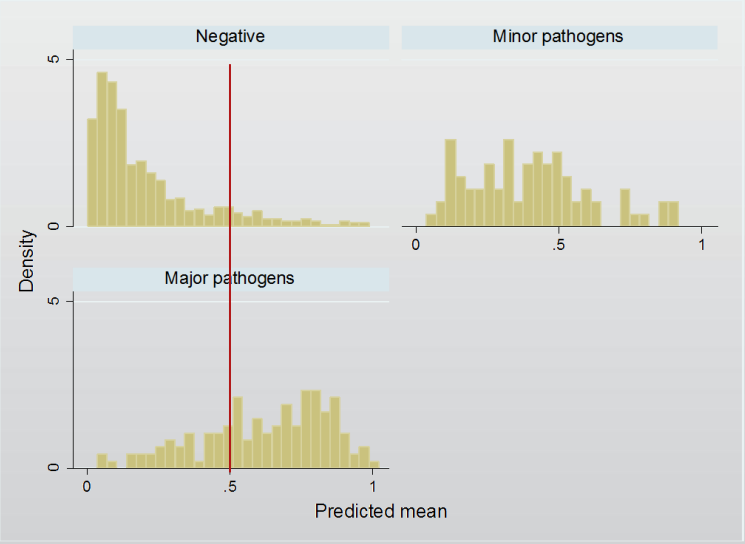




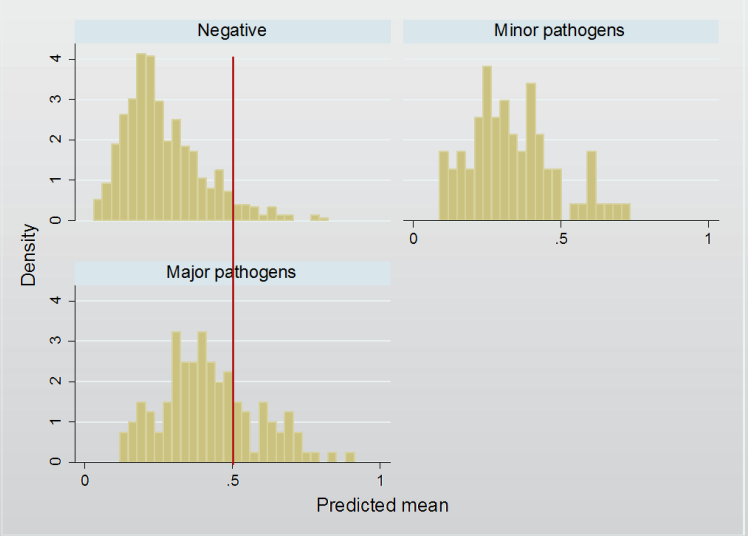
Predictability

	Sensitivity	Specificity
lncell	56%	90%
lnldh	22%	94%
lnnagase	9%	96%
lnap	0%	100%

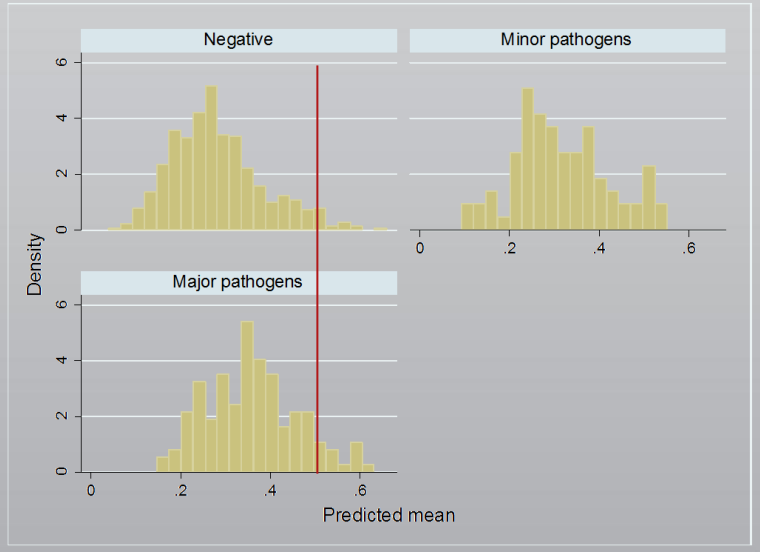
lnSCC



lnLDH



lnNAGase



Conclusions

- All investigated inflammatory indicators ere significantly associated with cow factors
- It does not seem necessary to adjust the SCC for cow factors
- SCC seems the best indicator to use to find cows with subclinical mastitis

Acknowledgments

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