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Dairy farm evaluation of rumen pH bolus data: identifying the benefits

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The problem: why measure rumen pH

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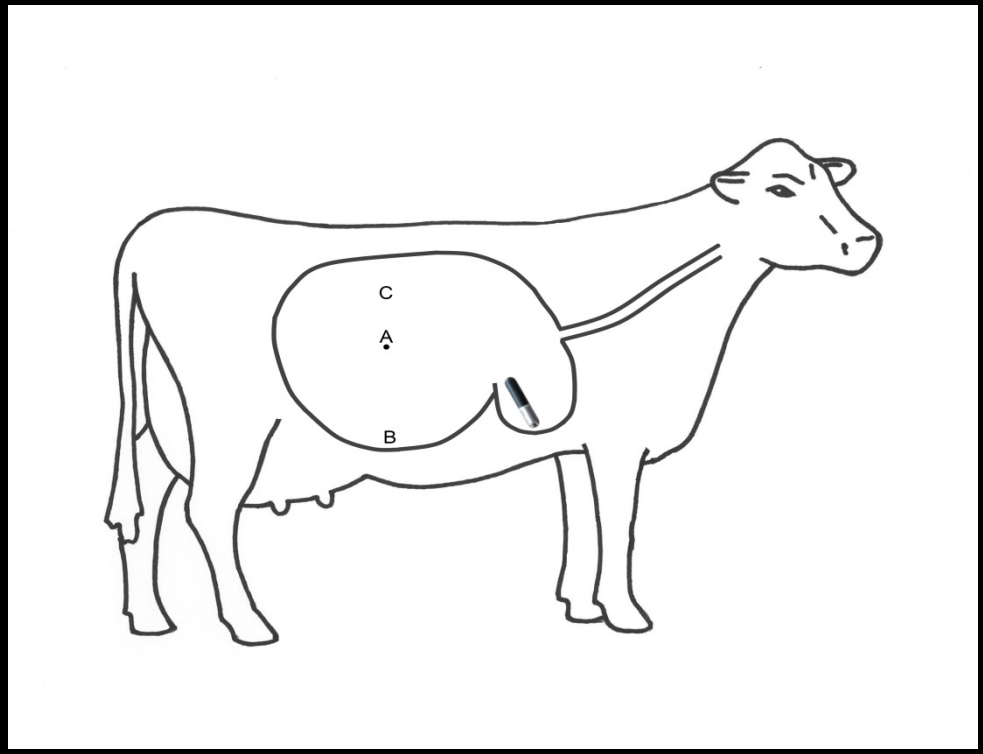
- Cow biome is a complex interaction of 20k organisms
- Forage quality is highly variable
- Nutritional theory is hard to apply on farms
- Milk output is conserved in the short term



SARA: the problem

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Rumen pH is determined by
FERMENTABILITY
X
INTAKE
As genetics has created cows with large appetites and intakes we have a problem of low pHs causing illness and reduced milk quality.

SARA defined as “extended” periods of “low” pH
What is “extended” and “low”.
If you cannot measure it you cannot control it.

Rumen pH Bolus

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- Inserted by mouth
- Retained in Reticulo-rumen
- Raw data (pH & T) downloaded to handset
- Handset Uploads to internet
- Bolus lasts 150 days before sensor fails
- Used >3 per group

This study

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- Thirty Farms
- Range of farm types
- >120 cows with boluses
- Started May 2013
- Continues …
  - Farmers addicted to data!

Case 1: Correcting low pH

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- 350 cow housed herd on TMR
- 12,000 litre average yields
- Was this SARA?
  - No Cud-balls
  - Some Loose dung with observed grains

Case 1: Strong daily cycle

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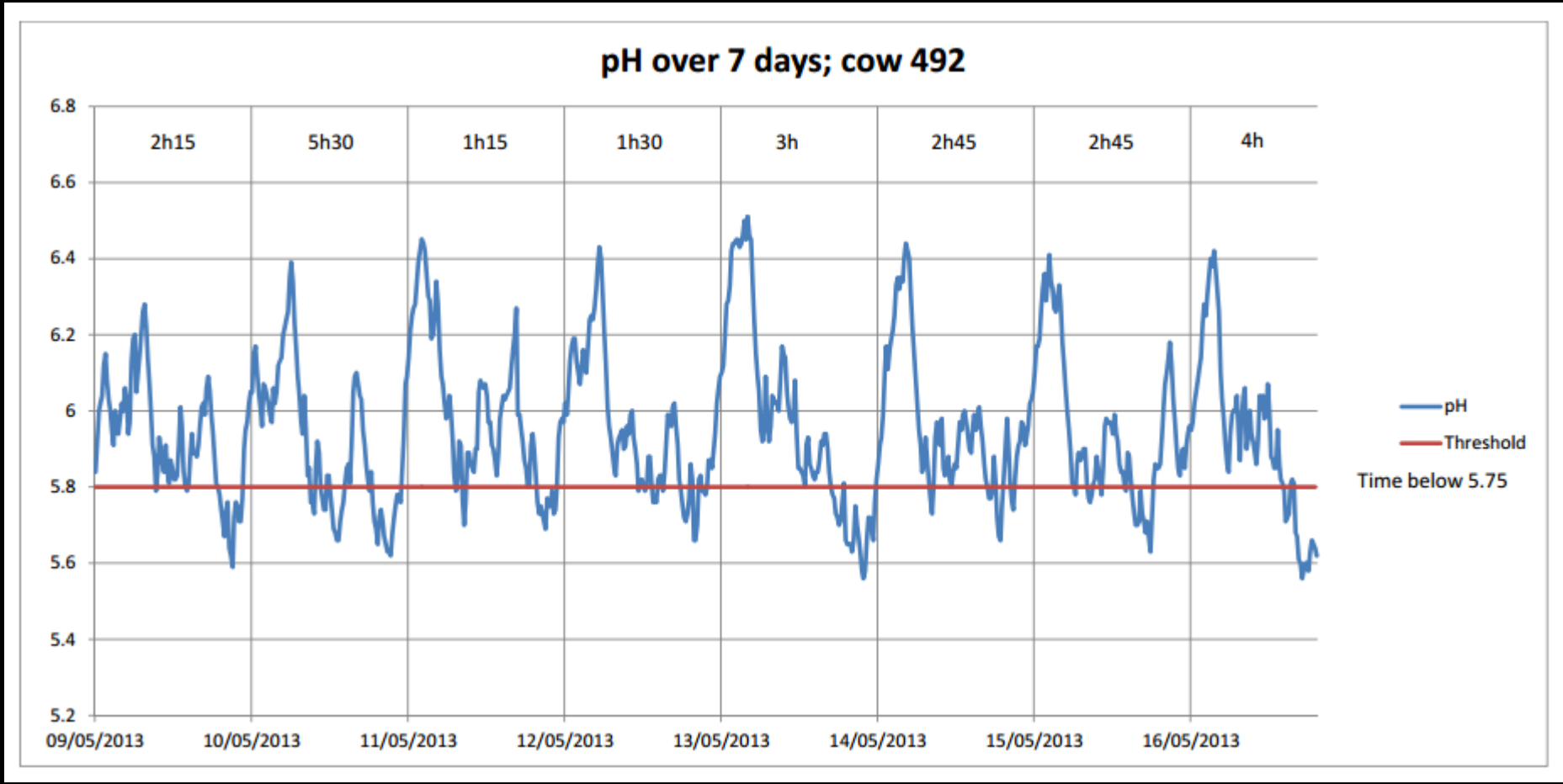

pH low and wide range, not much night time eating

Case 1: after a feed change

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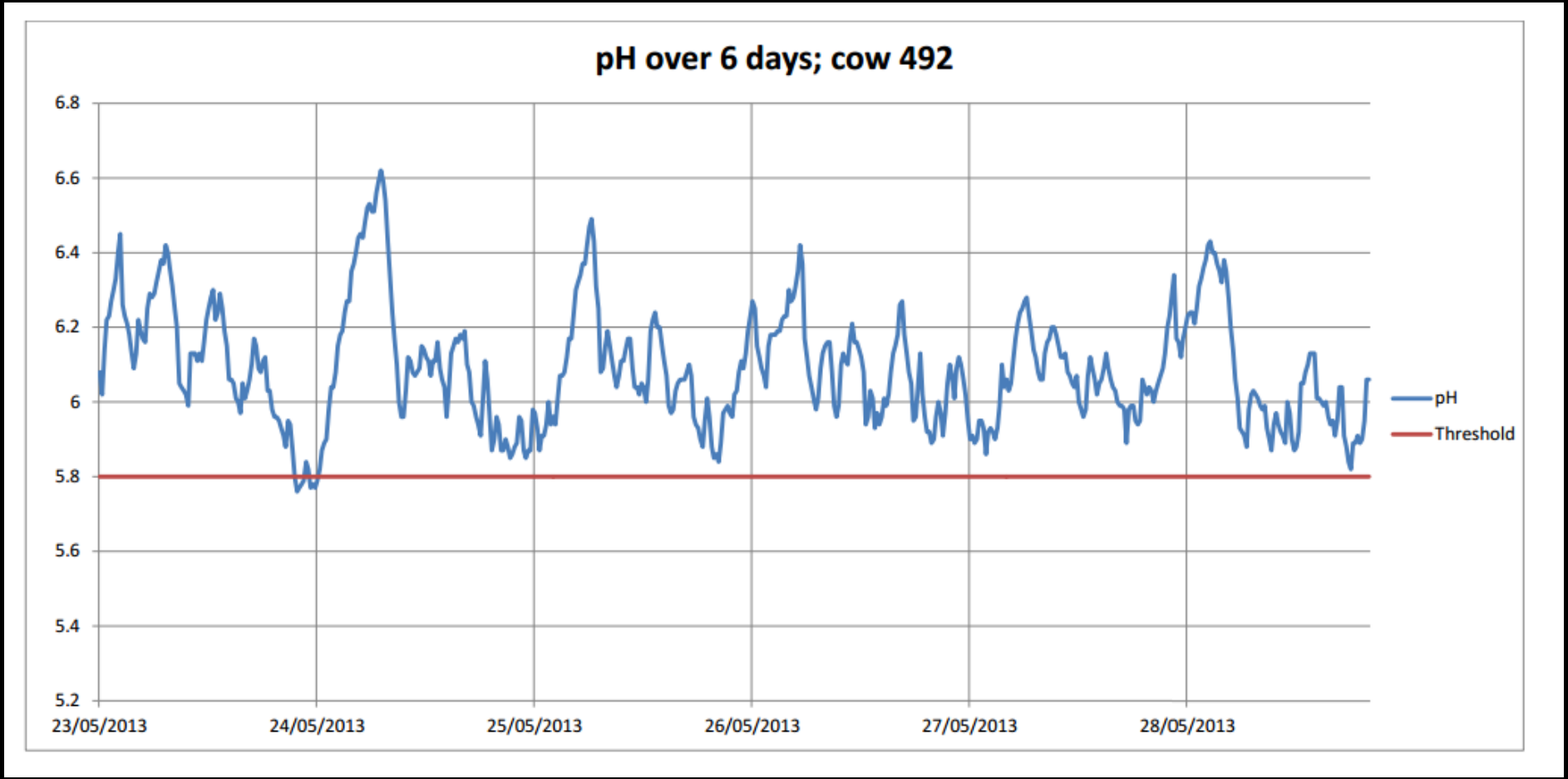

After reducing digestible energy, pH is higher with narrower range, cows eat more at night, no change in milk yield, farm saved £6000 within 3 weeks

Case 2: Effect of grazing

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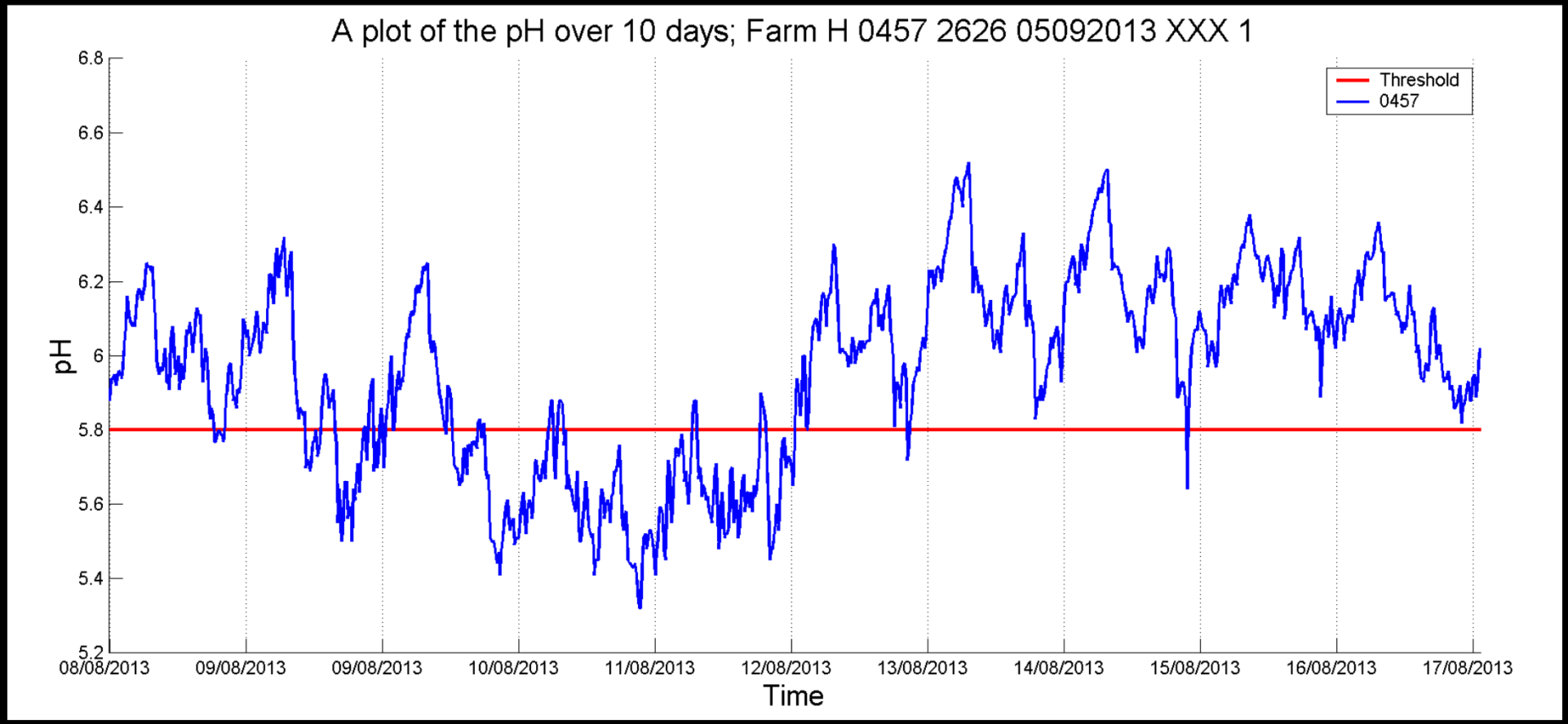
- Grass is the perfect food for cows ?



The low period is when cows grazed a new high sugar grass pasture

Case 3:TMR and farm routine

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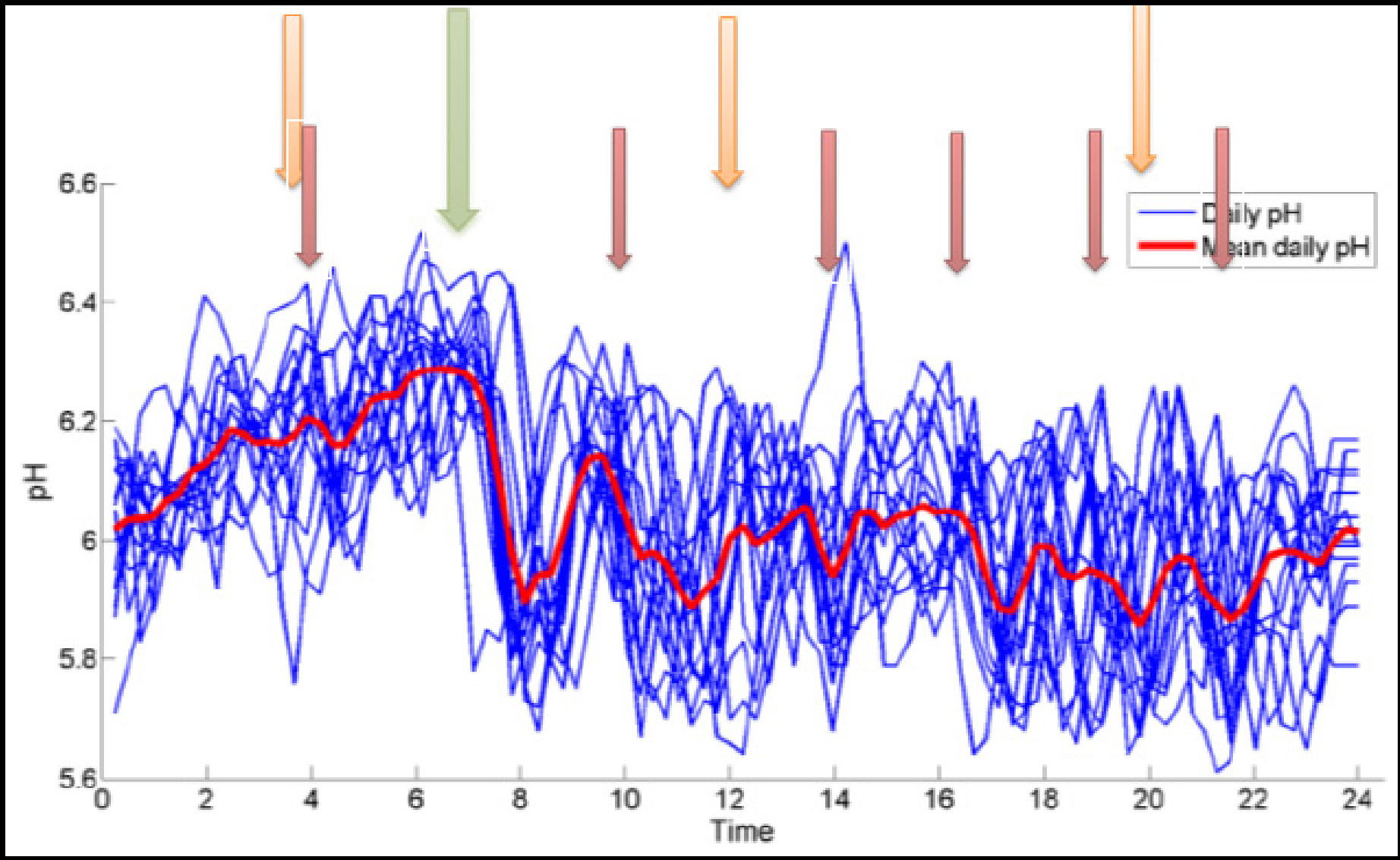

Case 4: Robotic Milking

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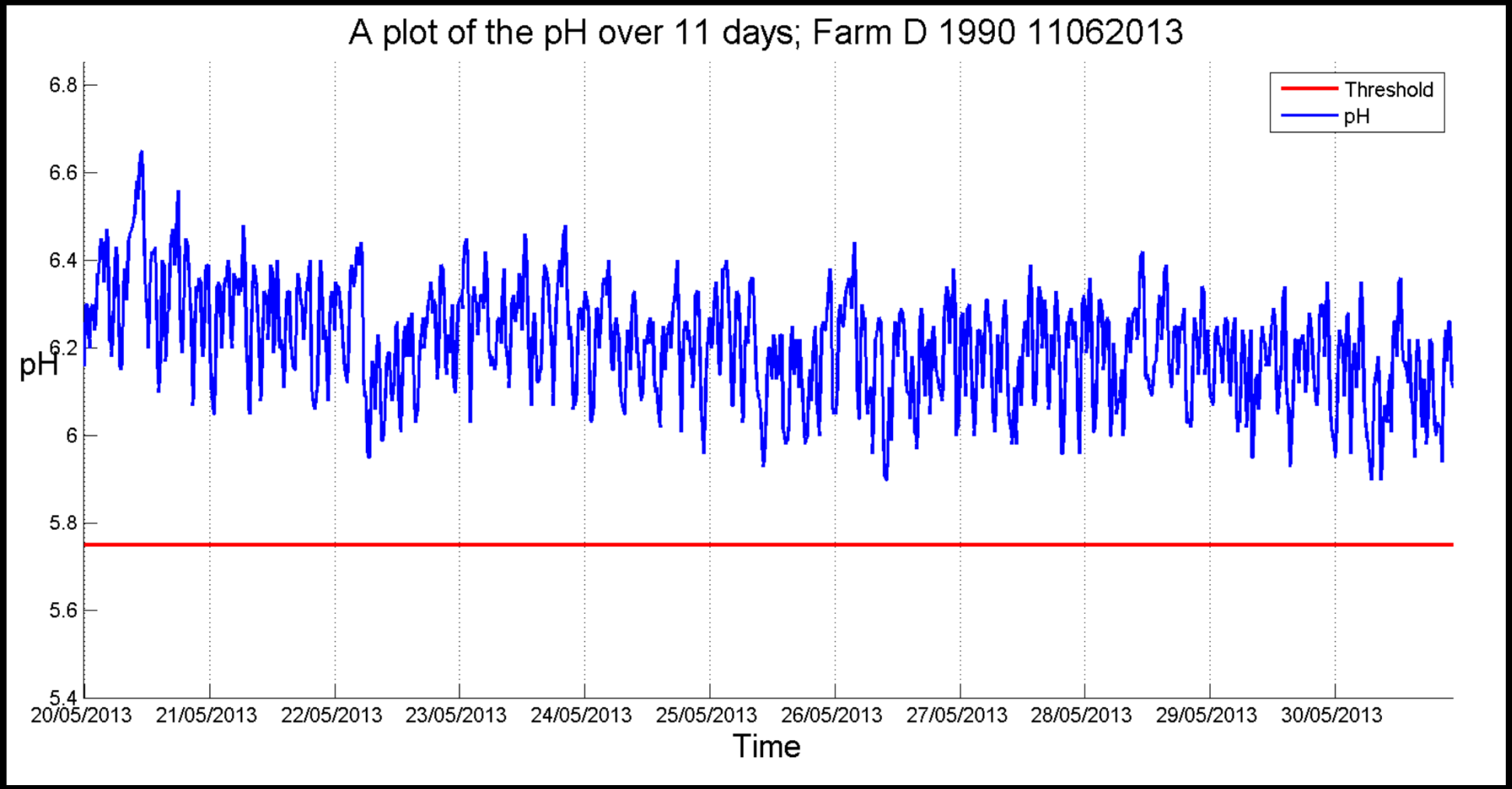

Case 5: Cake and Grass

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- Traditional predominant system in the South West UK
- Cows at grass from April to October
- Cows fed in parlour with concentrate

Case 5:Cake and Grass

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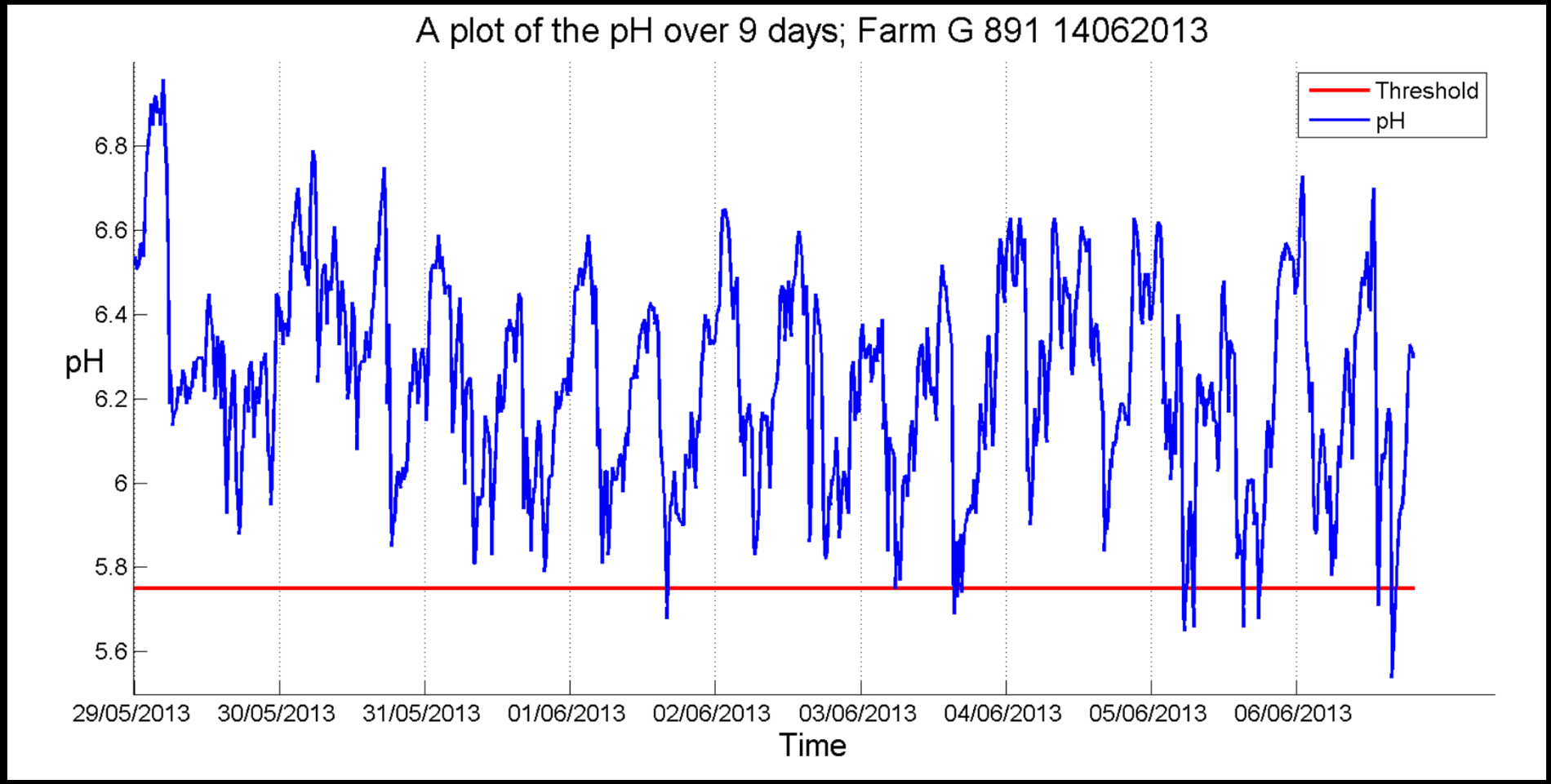

Strong twice daily fluctuations in pH

Case 6: Rumen Buffer

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- Rumen Buffer is routinely used to “raise” pH
- Experimental Farms are good for controlled studies
  - But
  - Farm practice is very different
  - Results are used to sell a product
  - No diagnosis possible before wireless rumen bolus

Case 6: Rumen Buffer

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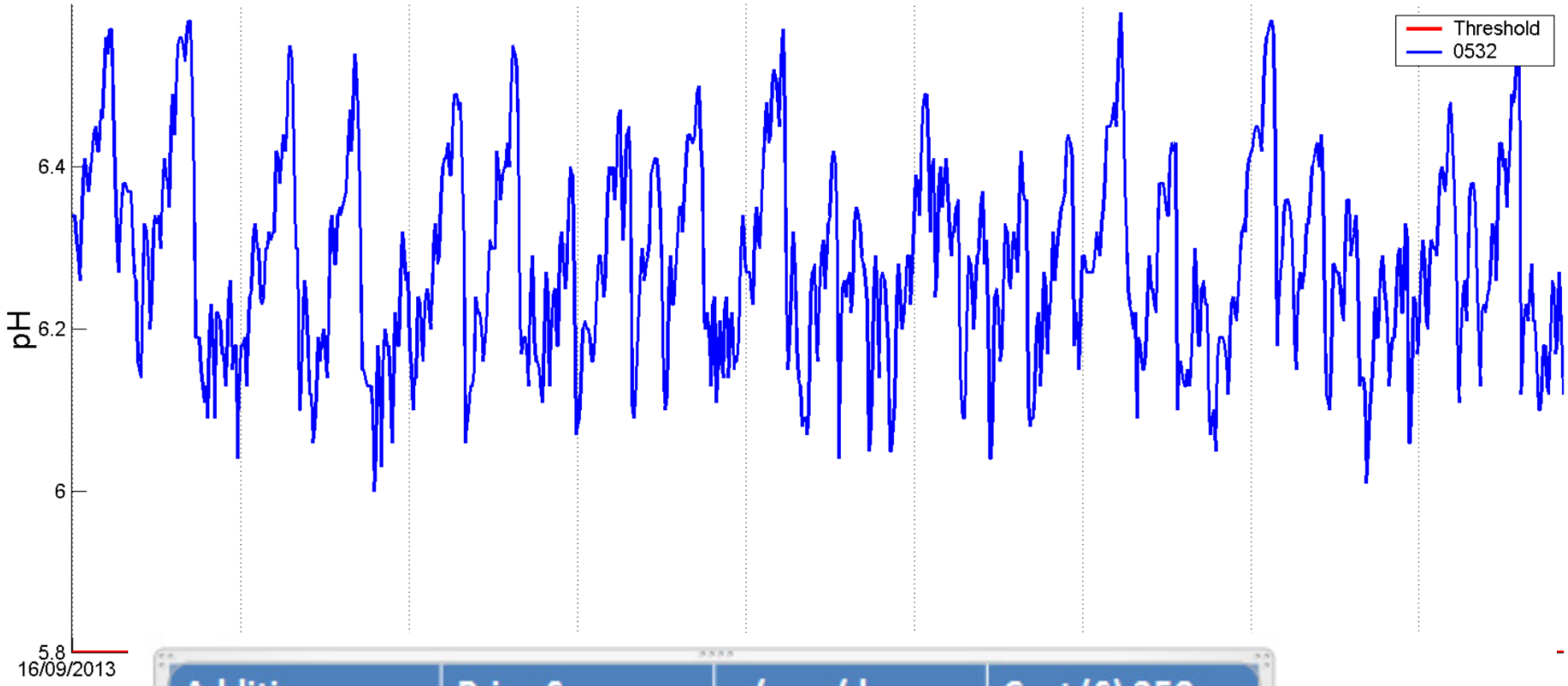

Additive	Price £	p/cow/day	Cost (£) 250 cows
Bicarb	350	9	22.5
Acidbuf	550	5.5	13.75
Total		16.5	36.25

£1103/month
£13,231/year

Conclusions

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- Rumen pH was monitored in the reticulum routinely
- Each farm system has a different pattern of pH
- pH should be measured before rumen buffer used
- Incidence of SARA were rare (self selected group)
- Grass can cause low pHs
- Rumen pH analysis should focus on
  - Mean values
  - Range of values (less is better?)
  - Slope of drop
  - Number of drops per day
  - Length of non-feeding periods

Thank You For Listening

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- Toby.mottram@rau.ac.uk

- Mole Valley Farmers
- Jeremy Hamilton, Three Counties Feeds
- Colleagues at RAU

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