

# **The potential for routine measurement of rumen pH in commercial dairy cows and measuring redox in the reticulum**

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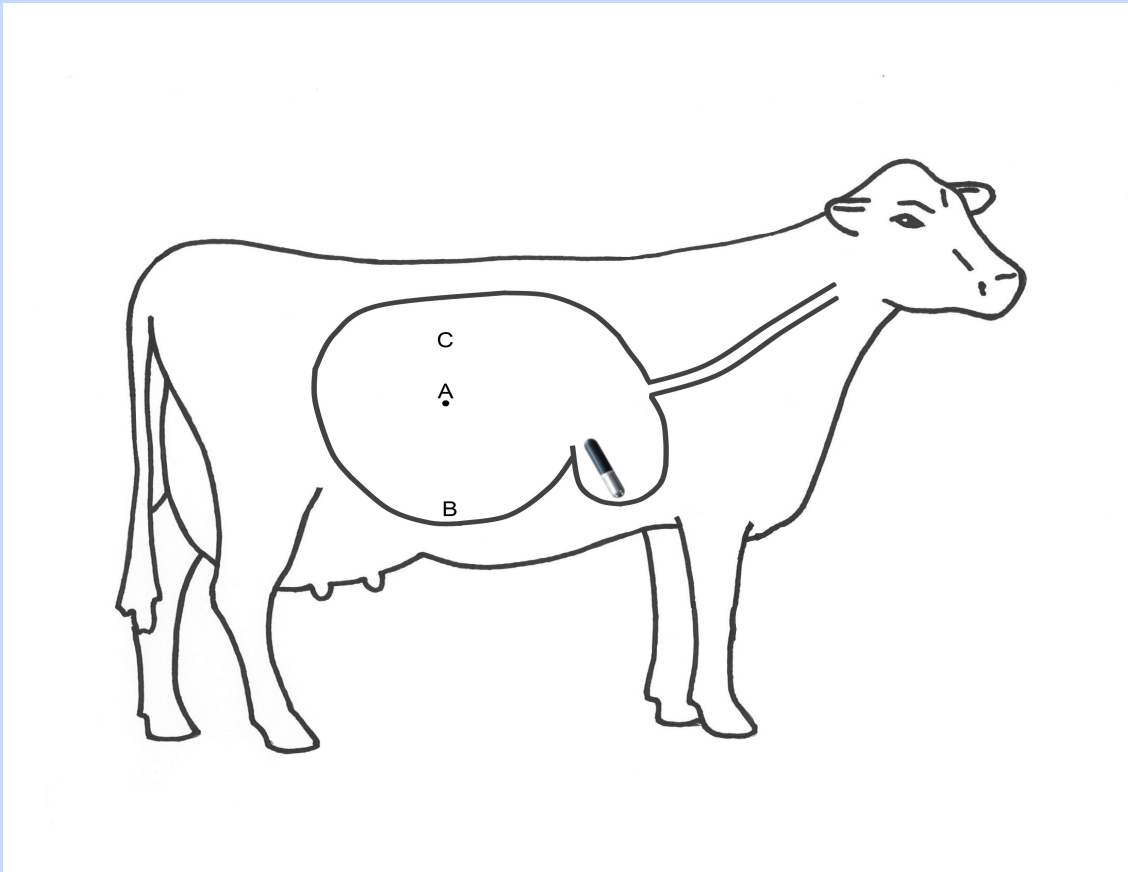
*eCow*

## **Monitoring Cows with a bolus - overview**

- **The effect of location on bolus data**
- **bolus issues for longevity**
- **long term data is reality**
- **hypothesis tested – does the reticulum redox and pH change dynamically**



## A guide to bolus locations



- **A - mid ventral**
- **B – base ventral**
- **C – floating**
- **D - reticulum**

## **Bolus data differences**

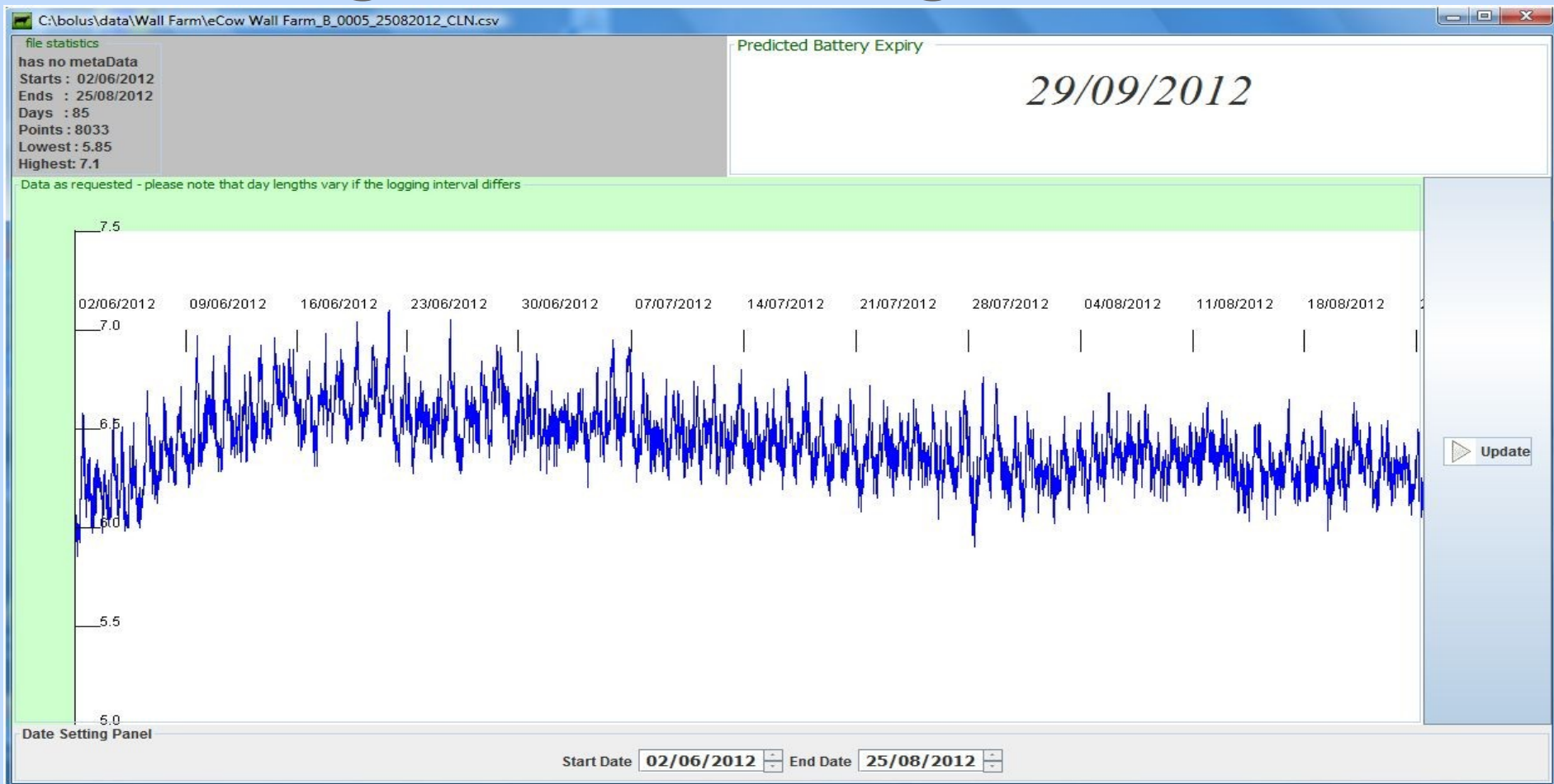
- **A steady state offset of -0.25 pH**
- **Dynamic changes need further research**

## **Designing a bolus for long term monitoring**

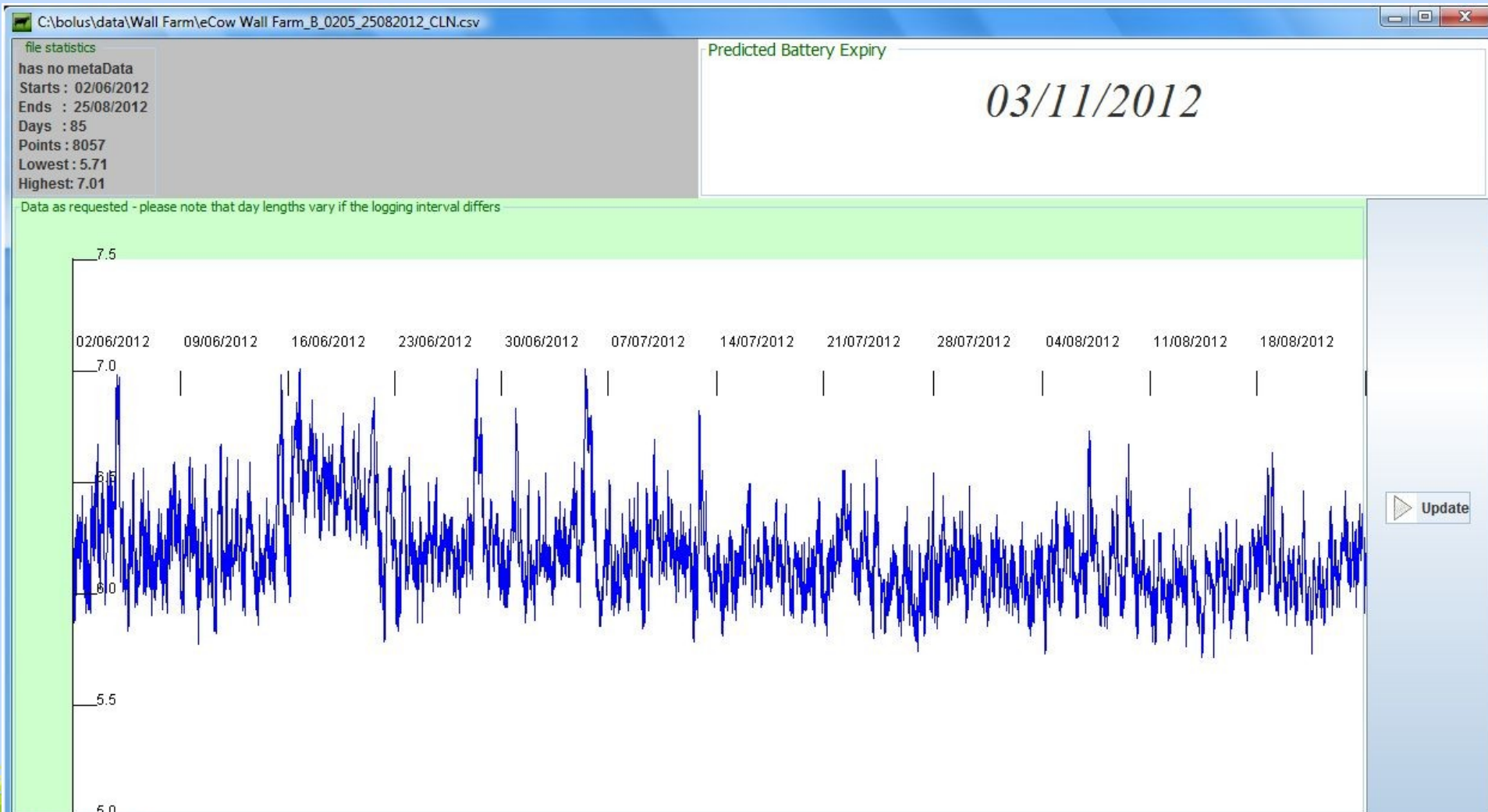
- **pH sensors are liable to drift due to poisoning of the reference electrode**
- **battery life is determined by radio on time**
- **Maximum life of an accurate bolus is now about 180 days**
- **868-916 MHz is the favoured frequency for legal reasons**



# Long Term Monitoring with eBolus



# Long term monitoring



## **Benefits of Monitoring with a bolus**

- **identify threshold of acidosis**
- **feed to acidosis threshold**
- **increases milk yield (7-10%)**
- **increases milk quality**
- **decreases methane emission per litre**
- **monitor the group (1:50) not the cow**







**Hypothesis:**

**Does a drinking event change redox and pH in the reticulum ?**

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## pH, redox and temperature

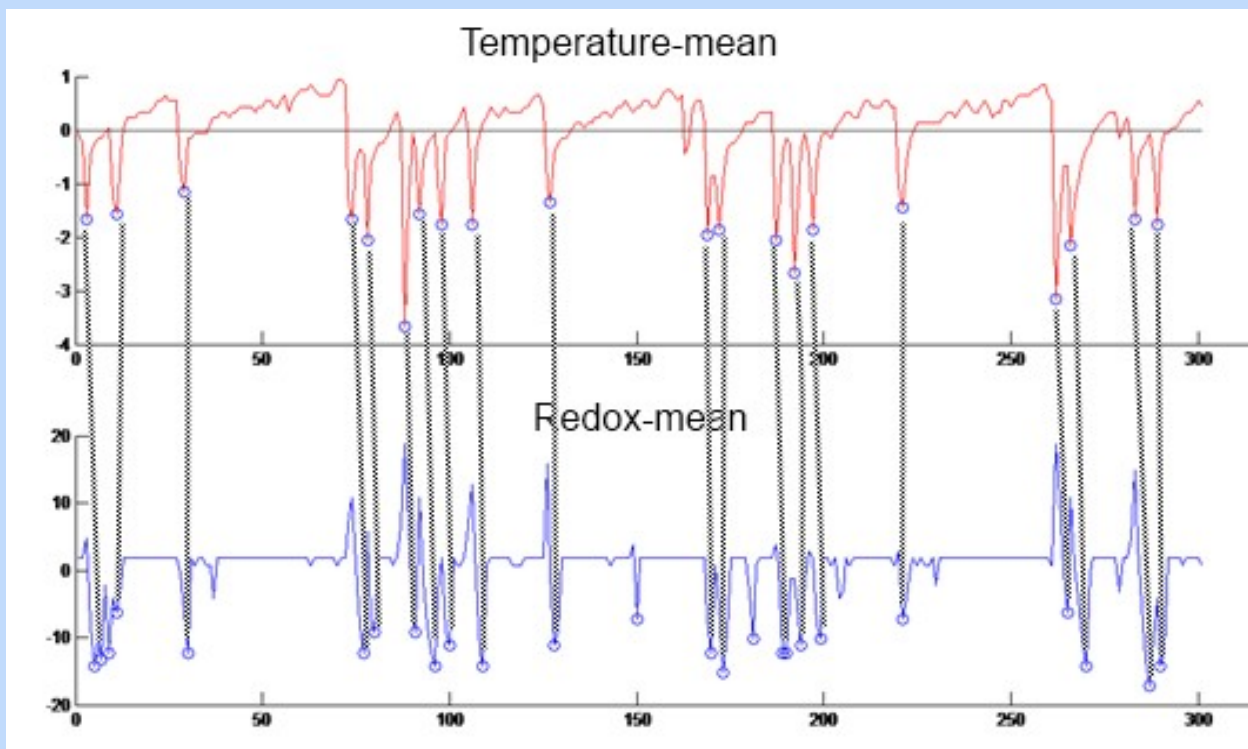
- **three fistulated cows**
- **boluses rotated to remove any bolus effect**
- **calibrations were checked before and after insertion and removal**



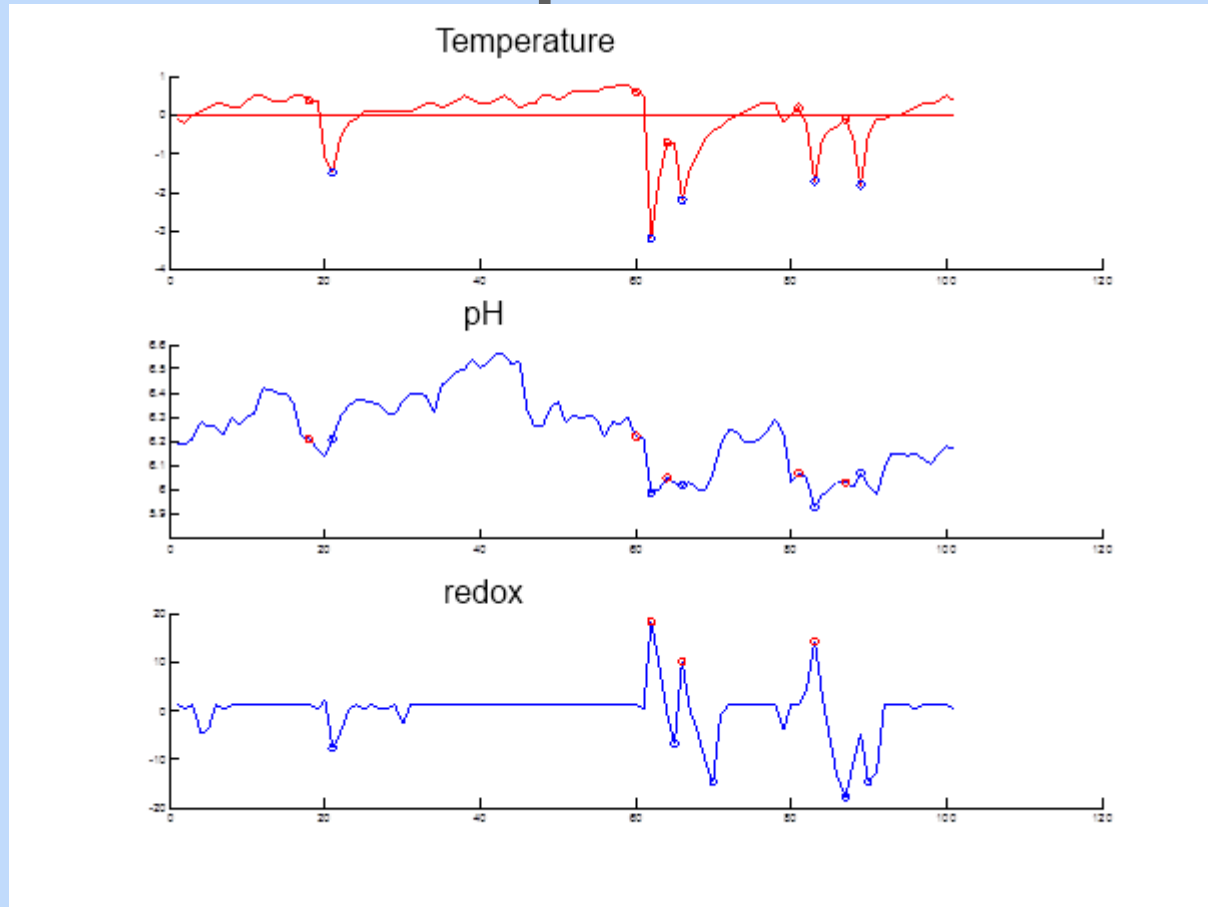
## Redox

- **No major effect of treatment**
  - **ie oxidation of the reticulum is not proven**
- **There are measurable effect due to drinking events**

# Drinking causes a change in redox



# Effect of drinking on pH is not as expected



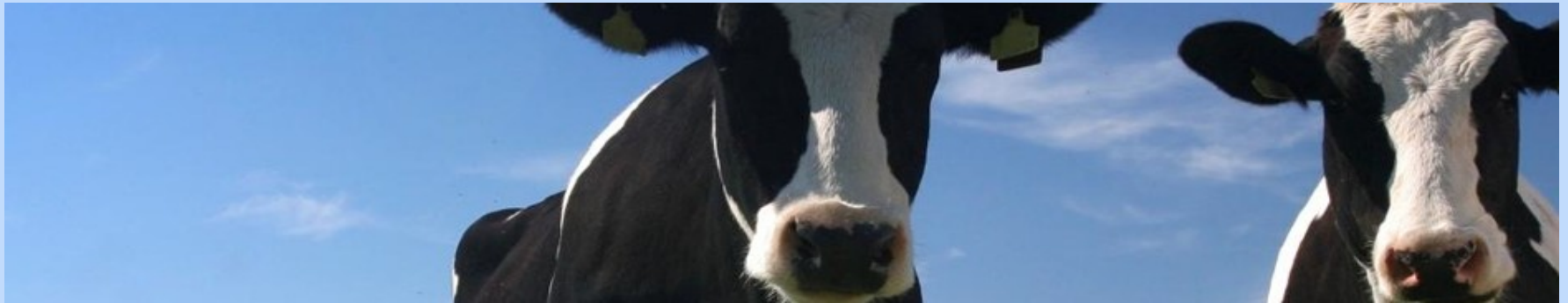
# Summary Table of Results

Drinking events	Redox maxima & event	Event and no redox change	Mean redox mV	maximum redox mV	minimum redox mV
794	543	251	-184	-160	-194

# Summary

- **Routine monitoring of pH on commercial farms exists**
- **eCow bolus operates for up to 6 months**
- **feed interventions can be based on rumen pH**
- **redox can be monitored**
- **more research is needed to understand the interaction between pH , redox and water intake**





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