

# Management of Reticuloruminal pH in Modern Dairy Herds

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# Farm Management:

## Control, Optimization and Monitoring

Operations and decisions involved in farm management rely on available information about the farm and the dairy cows.

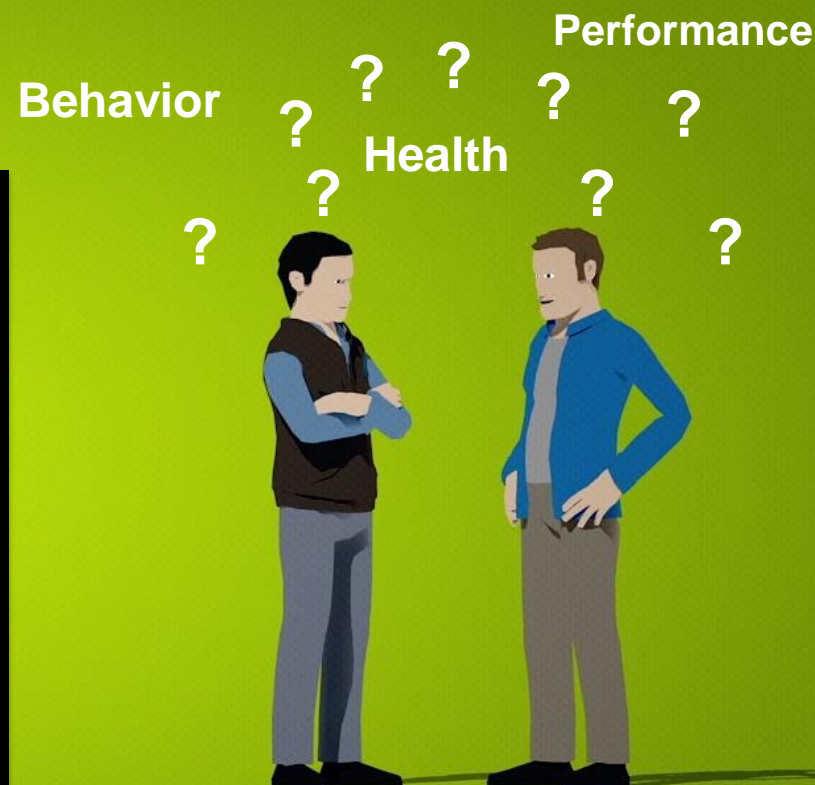
Increase profitability... with healthy animals!



# Development of Farm Management

- Managing bigger herds
  - cows and employees
- Efficiency enhancement needed
  - cost efficient
  - sustainable farming
- New technologies (on farm and analysis)
- New understanding of farming from customers
  - Healthy animals
  - Animal welfare

# Increasing the on farm data pool



**Challenge: Read and interpret the new data (interconnections and the parameters itself)**



What happens in the  
rumen?



? ? ?  
pH Level SARA ?  
? pH fluctuation ?

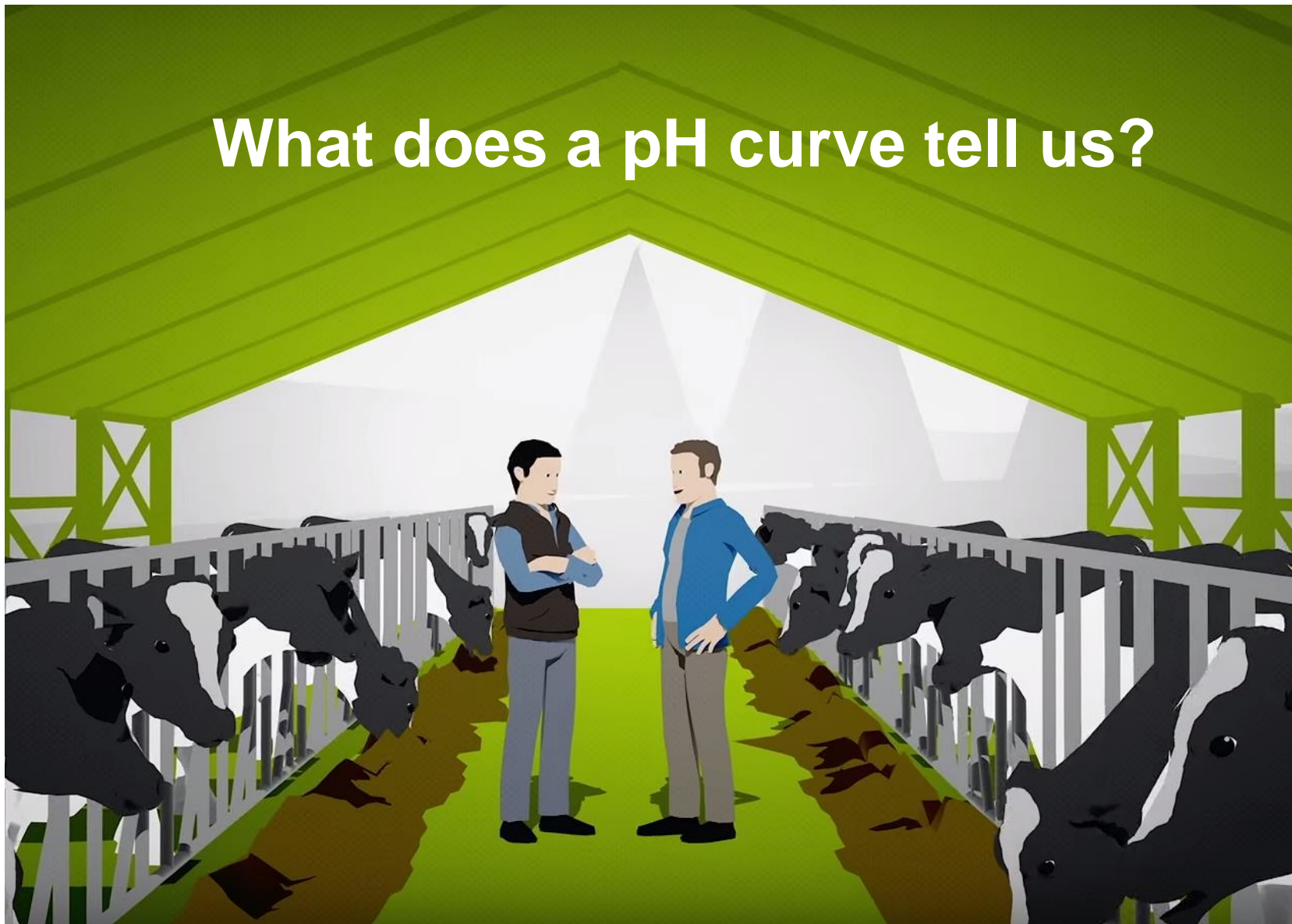


# Continuous reticuloruminal pH measurement

- Long-term measurement of reticuloruminal pH and temperature
- 144 measurements per day
- 150 days pH data, 4 years temperature
- Wireless data transmission and analysis



# What does a pH curve tell us?



## Reflects the Feeding Management: Feeding Times, Feed Push and the Diet



**Herd Health: High pH- Fluctuations, Off-Feed Syndrome, Acidotic Conditions**

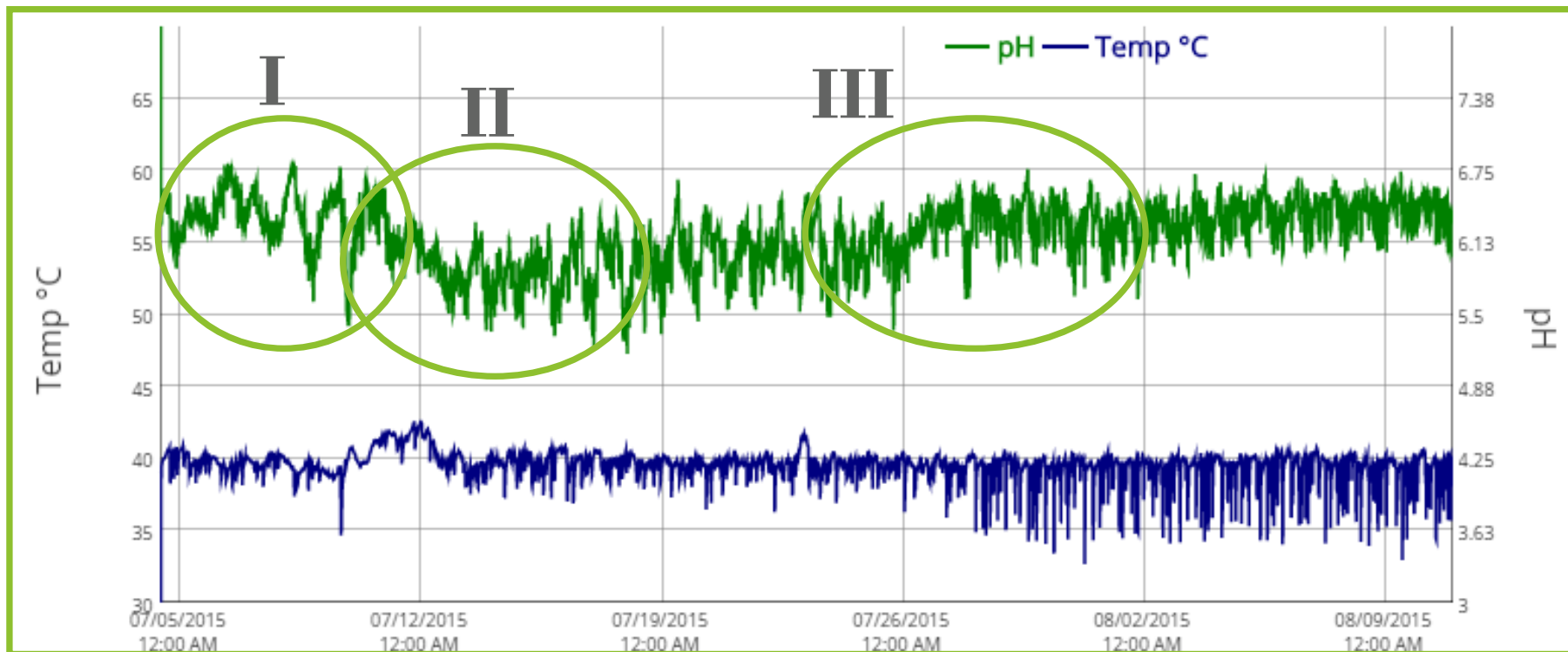


# pH in transition and high yielding dairy cows

- Several humoral, metabolic and physiological changes (*Bell, 1995; Overton and Waldron, 2004*)
- **5 key areas** to prevent and monitor production diseases of transition cows (*Mulligan et al. 2006*) :
  - 1) body condition score management,
  - 2) hypocalcaemia,
  - 3) negative energy balance,
  - 4) trace element status,
  - **5) rumen health**
- Relevance of rumen status due to high correlation between composition of rumen microbiota and milk yield and composition (*Jami et al. 2014*)
- Rumen microbiota is highly responsive to changes in the diet and feeding management (*Pitta et al. 2014, Gasteiner et al. 2009*)

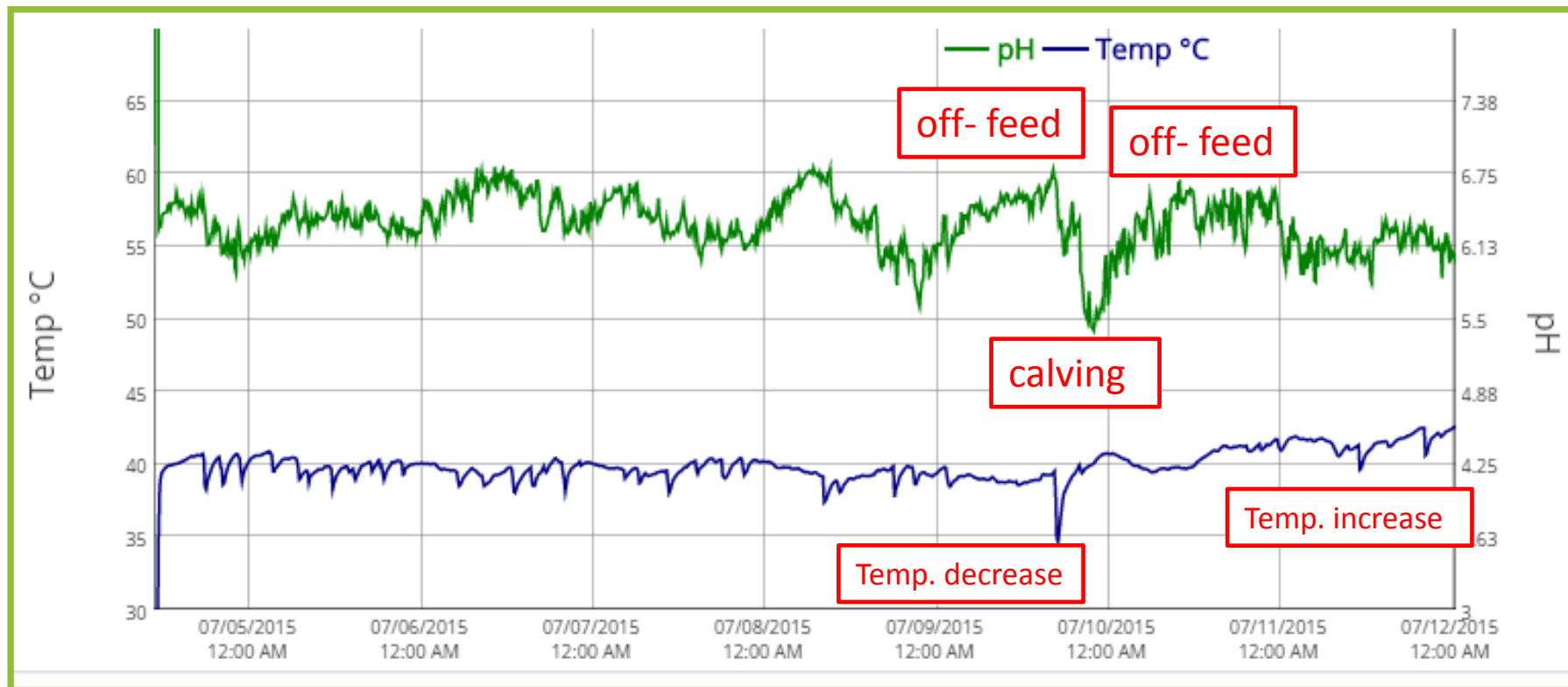
# PH INFLUENCED BY ANIMAL HEALTH

# Control, optimize and monitor the pH: 1<sup>st</sup> lactating transition cow



# 1<sup>st</sup> lactating transition cow - Part I

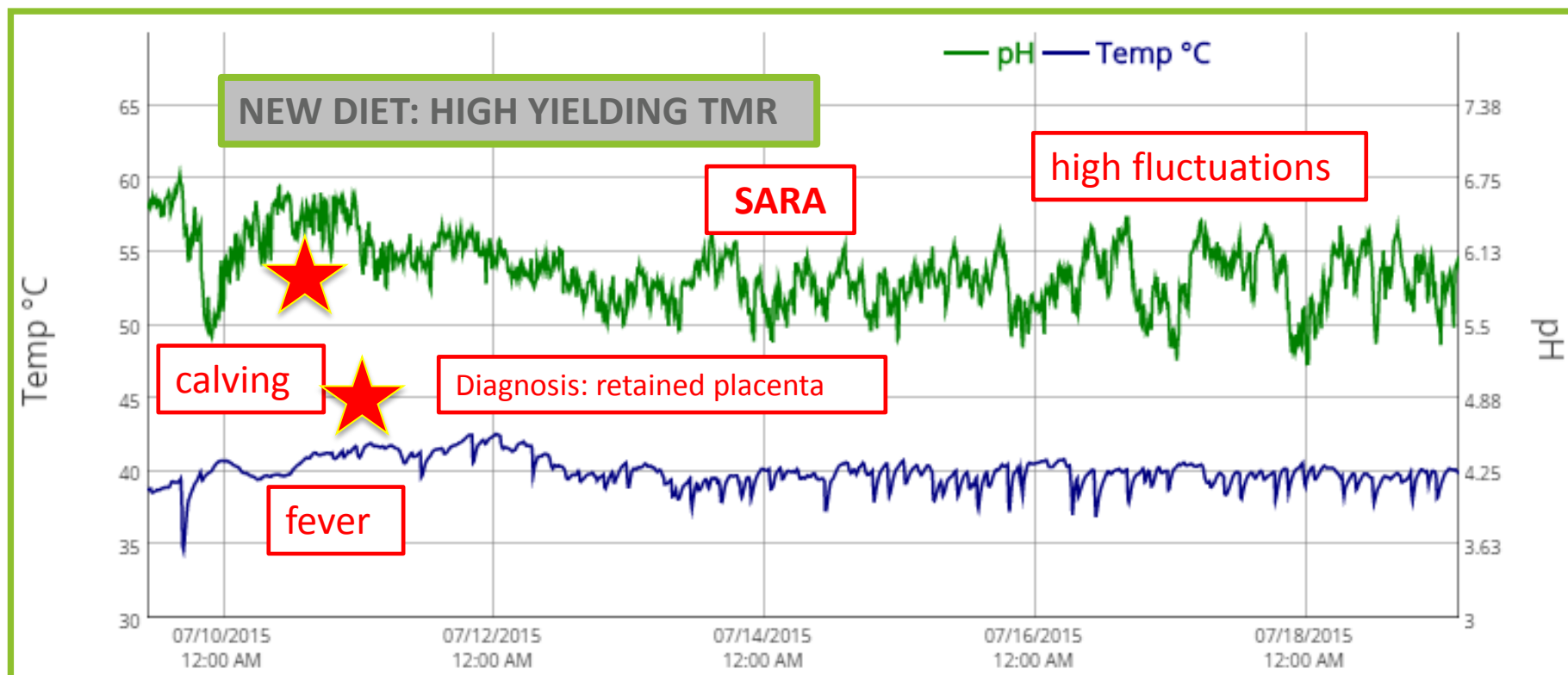
## Reticuloruminal pH in close-up and during calving





# 1<sup>st</sup> lactating transition cow - Part II

## Reticuloruminal pH of a diseased fresh cow



# 1<sup>st</sup> lactating transition cow - Part III

## Recovery Period



group change: back to close-up with TMR with less carbohydrates

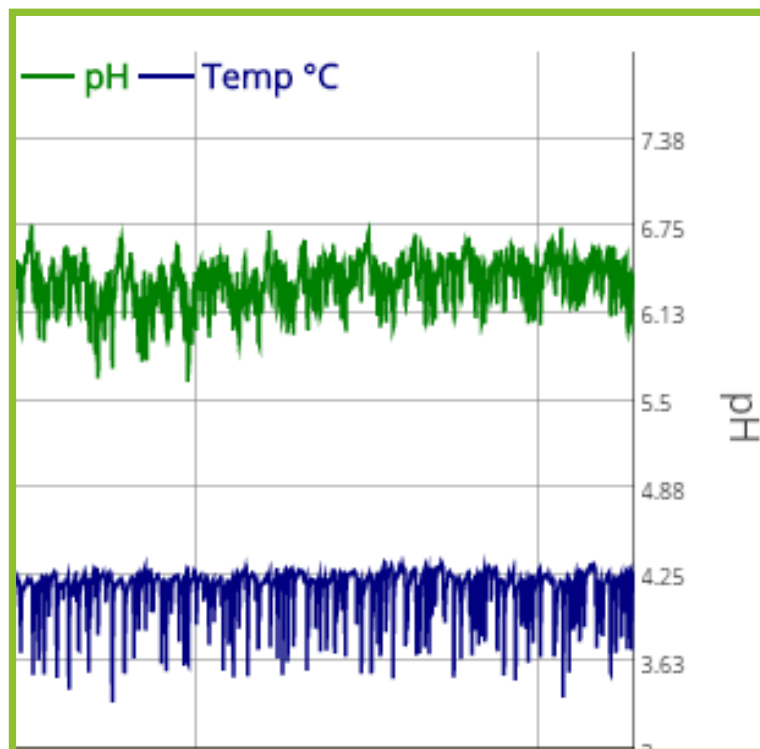
Recovery: more milk unless lower NEL, increase of water intake

# Different curves- same ration and feeding management

Diseased Cow



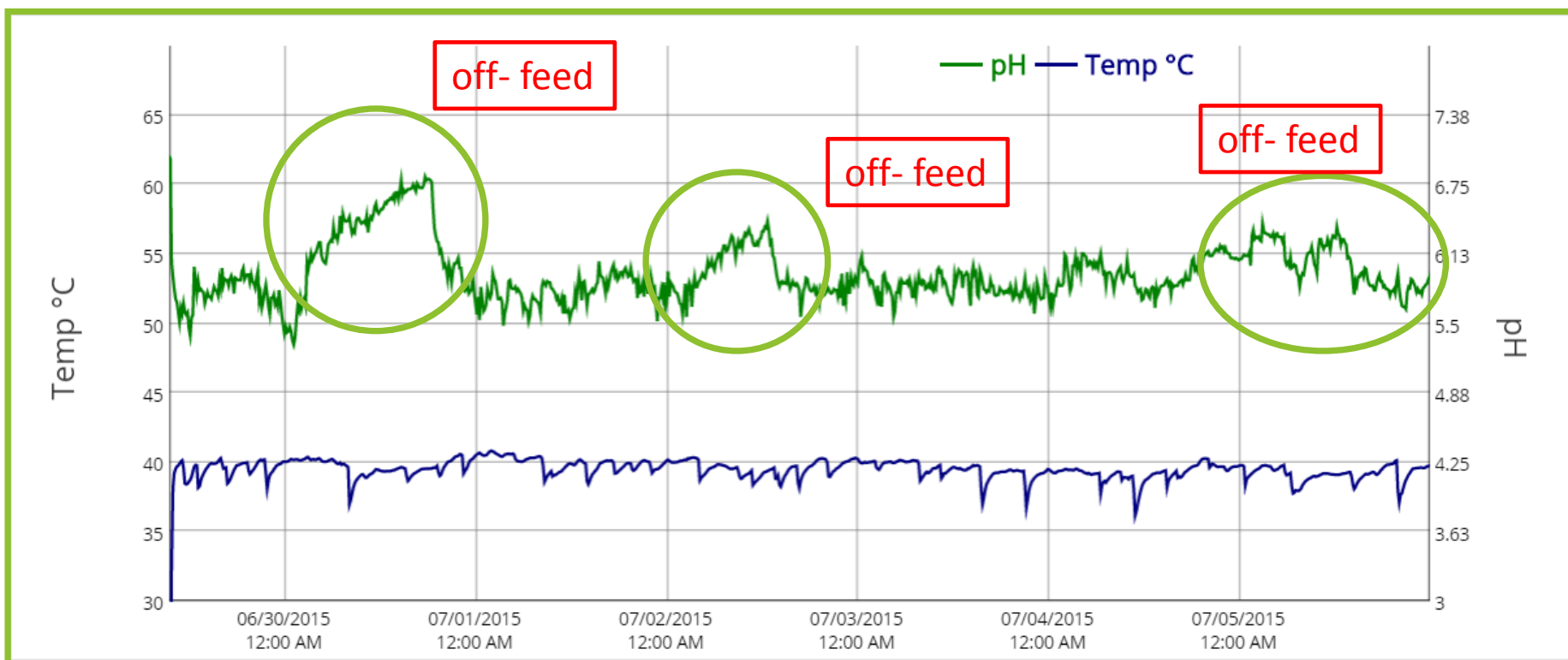
Recovered Cow



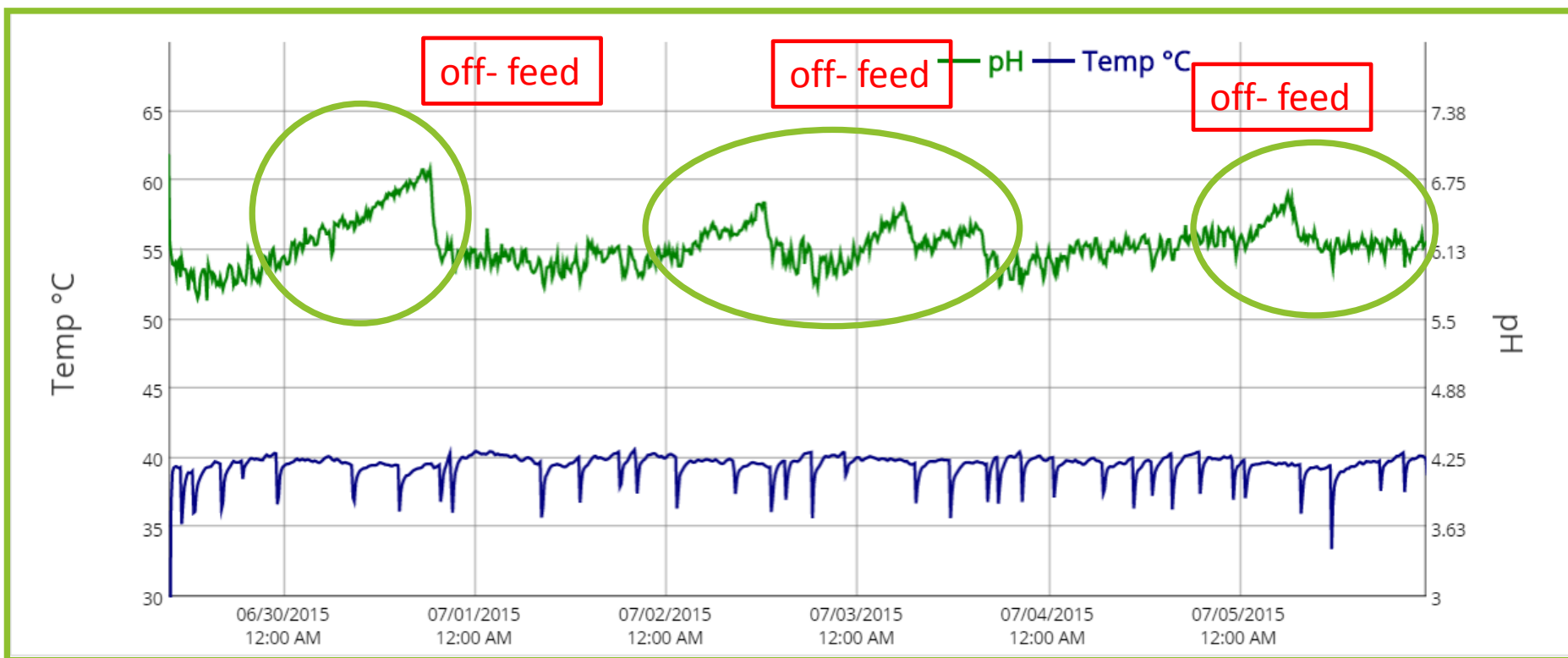
# PH INFLUENCED BY FEEDING MANAGEMENT



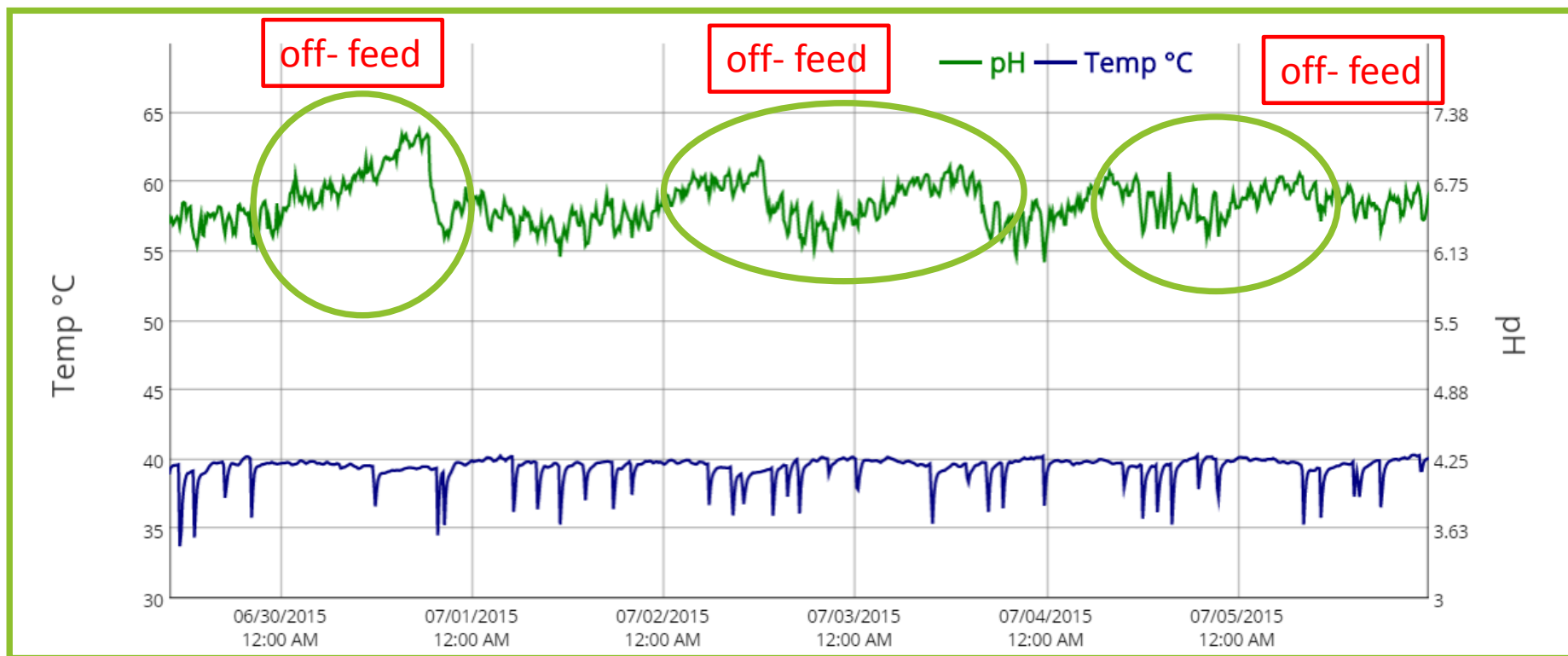
# Control, optimize and monitor the pH: Cow 1 – Irregularities in feeding times



# Control, optimize and monitor the pH: Cow 2 – Irregularities in feeding times

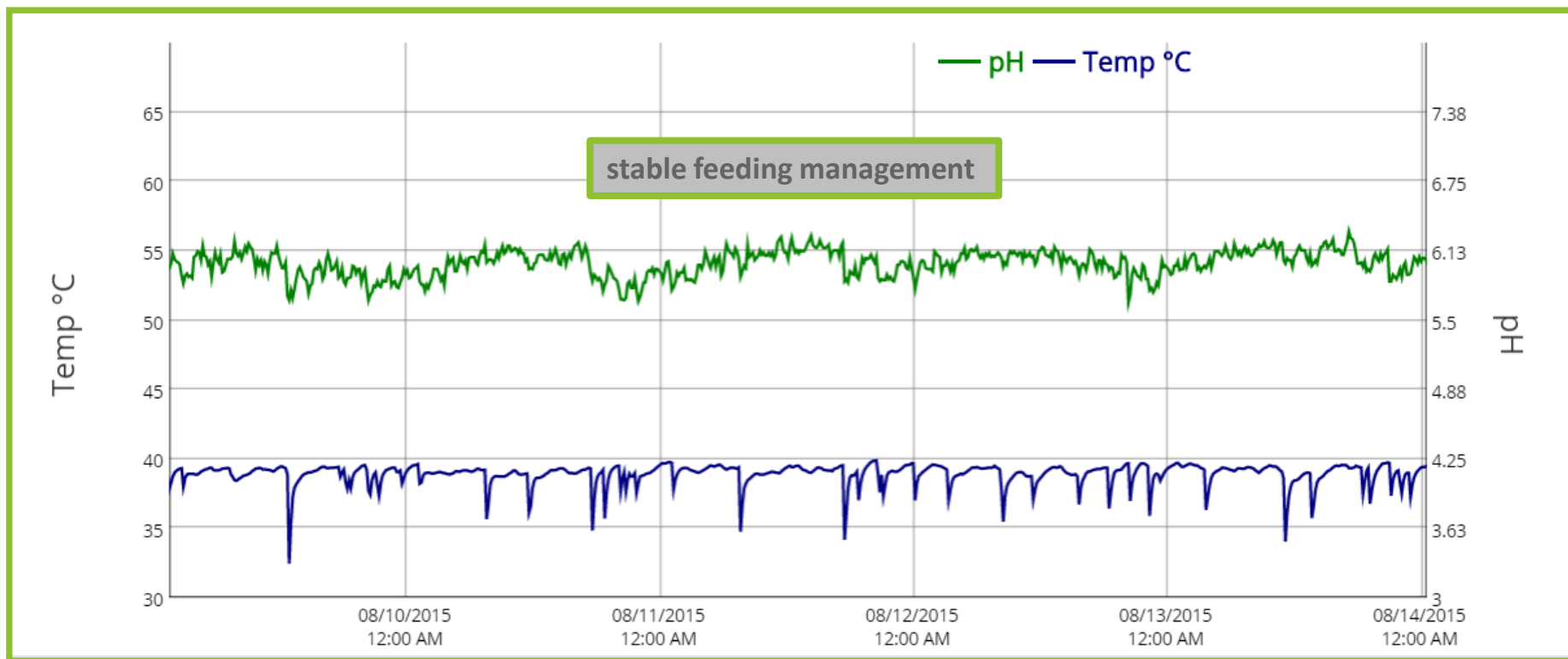


# Control, optimize and monitor the pH: Cow 3 – Irregularities in feeding times



# Control, optimize and monitor the pH:

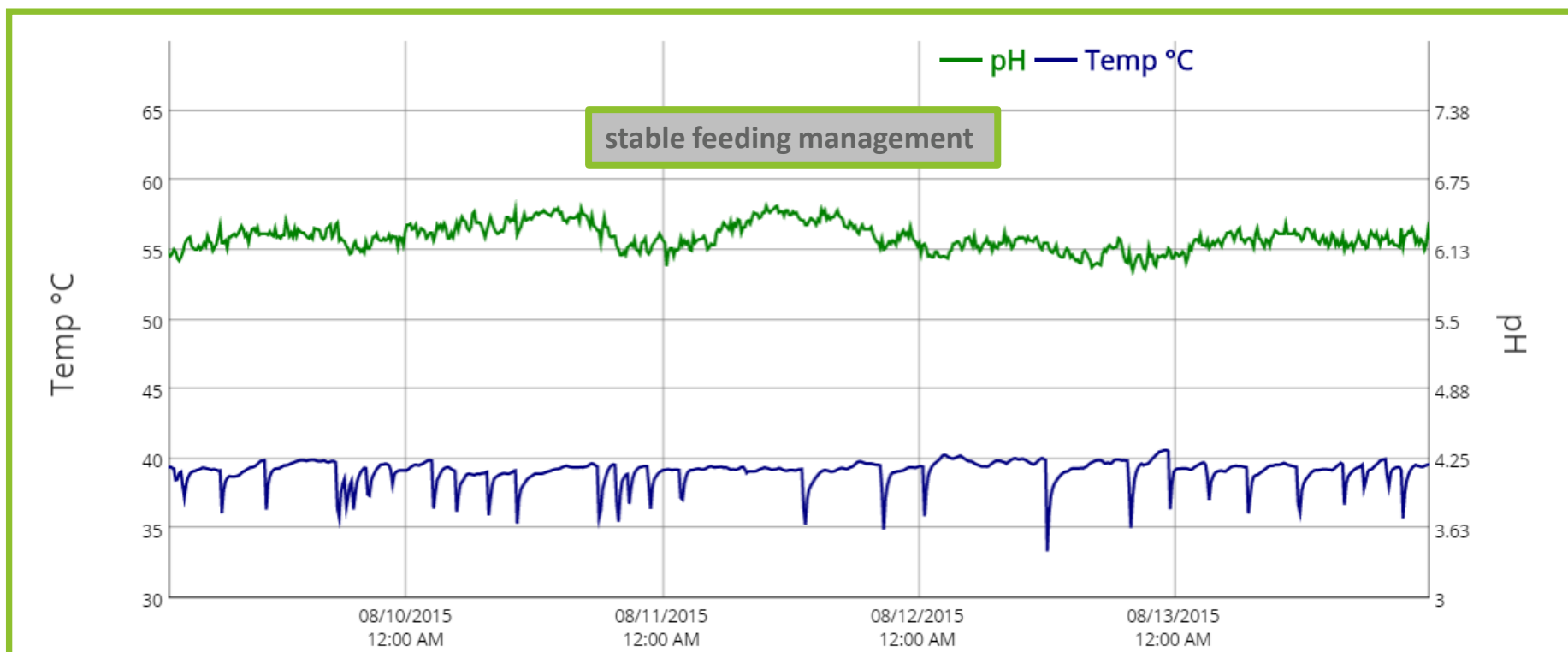
## Cow 1 – **No** irregularities in feeding times





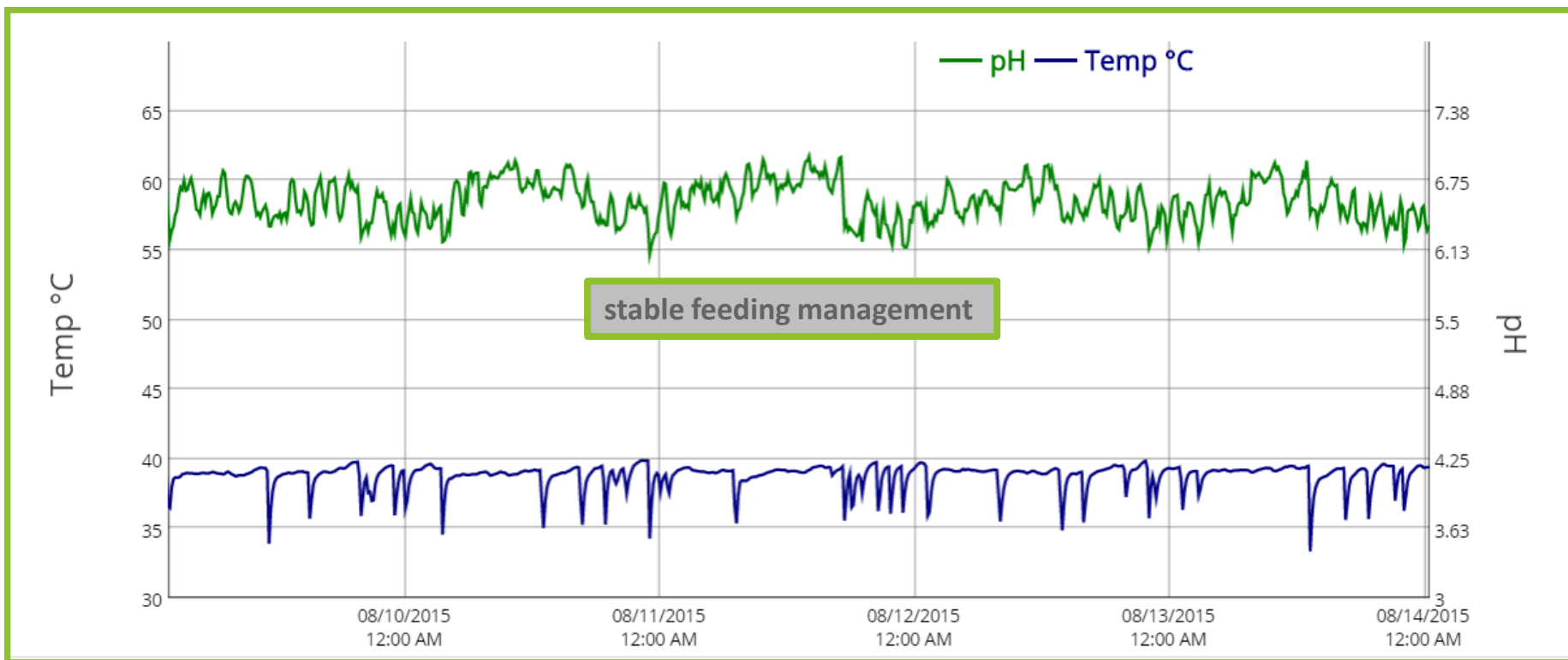
# Control, optimize and monitor the pH:

## Cow 2 – **No** irregularities in feeding times



# Control, optimize and monitor the pH:

## Cow 3 – **No** irregularities in feeding times



# Conclusions

- **Management of pH** means managing health and feeding
  - Feeding pattern, Diets
  - Prevention of SARA
- **Optimal feed management** is a key factor in the **economic efficiency and profitability** of the modern dairy farm. Optimized rumen function is a **key driver for animal health and performance**.
- **Two types** of pH measurement: Permanent and problem/event detection based
- Measurement of pH in numerous **commercial dairy herds** provides new data. We need to learn how to interpret the data in detail.

**We are just at the beginning to understand our dairy cows!**

*Thank you!*

