

Relationships between body surface
thermographs with rumen pH, rumen and
vaginal temperature in lactating dairy cows
fed a control or an acidogenic diet and
challenged with *E. coli* lipopolysaccharide

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Session 11

Montanholi YR (ymontanh@uoguelph.ca), ALZahal O,
Miller SP, Swanson KC, Schenkel FS, McBride BW

Outline



 Background & Introduction

 Material and Methods

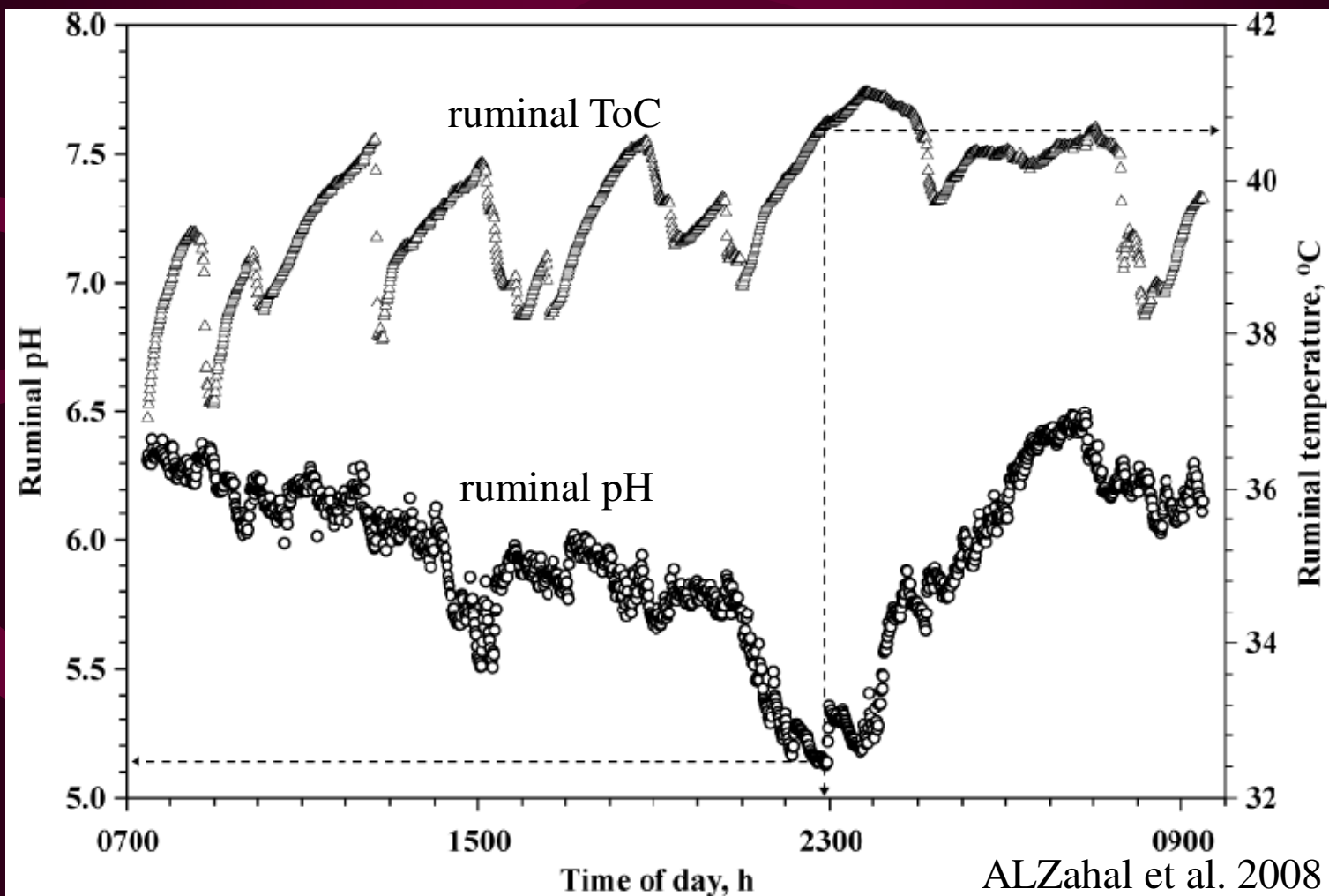
 Preliminary Results

 Acknowledgments

Background & Introduction

■ Rumen temperature and pH assessment

● ALZahal & McBride: Development of devices.



Background & Introduction

Montanholi et al. 07, 08, 2009



Schaefer et al. 2005



Efficiency

Richardson et al. 2001



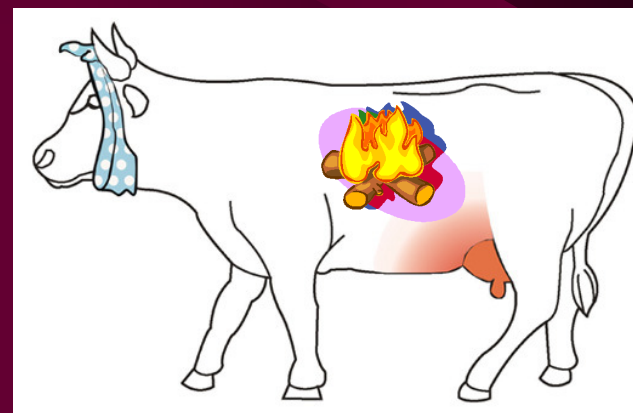
Nkrumah et al. 2006



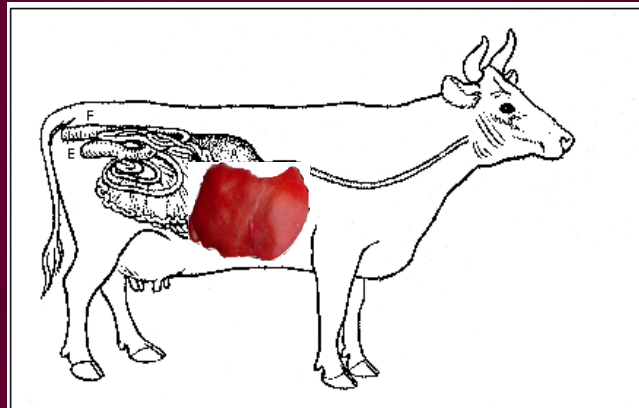
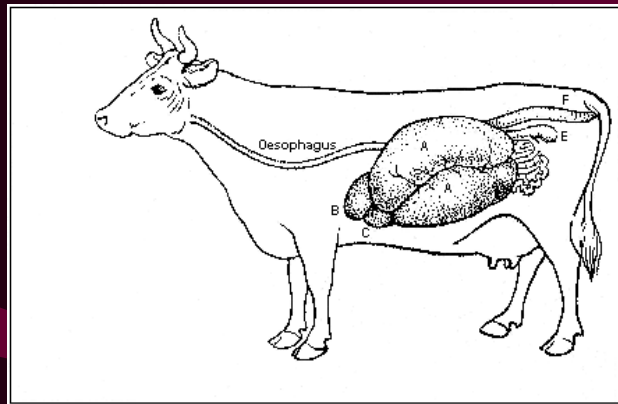
Castro et al. 2007



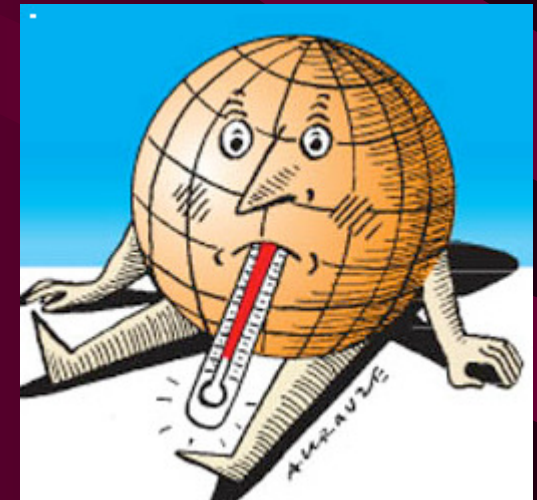
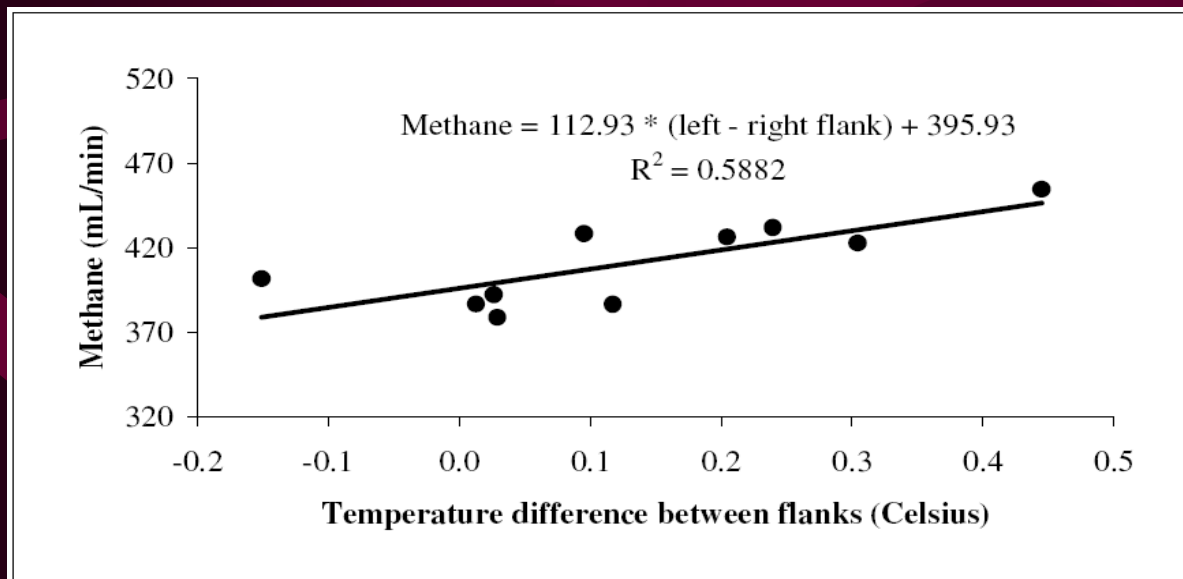
Montanholi et al. 2008



Background & Introduction



CH_4



Background & Introduction

Objective:

-  Verify the associations between the actual rumen pH and temperature measurements with infrared thermography data.

Material & methods

■ Cows and experimental conditions

- Eight lactating Holstein cows with rumen fistula.
- Tie-stall facility (Ponsonby research center – Univ of Guelph).
- December 2009 – February 2010.
- Feed offered for ad libitum intake.
- Milked twice a day (5:00 am and 4:30 pm).
- LPS – intramammary injection (8:30 am).

Material & methods

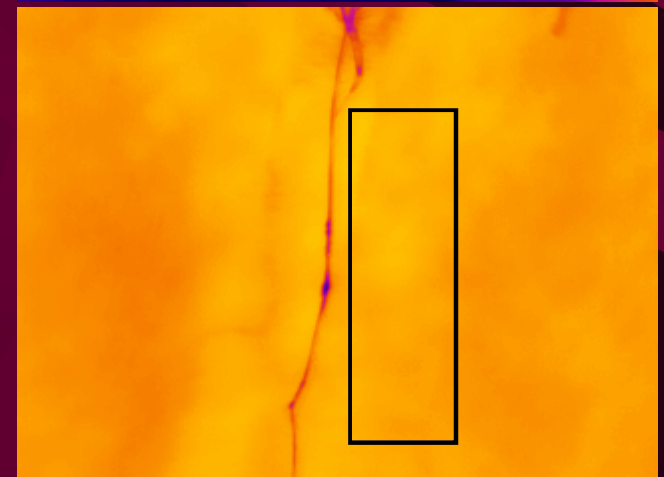
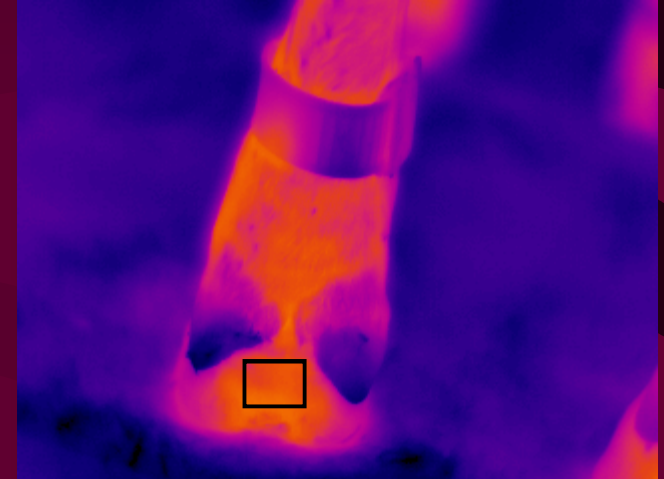
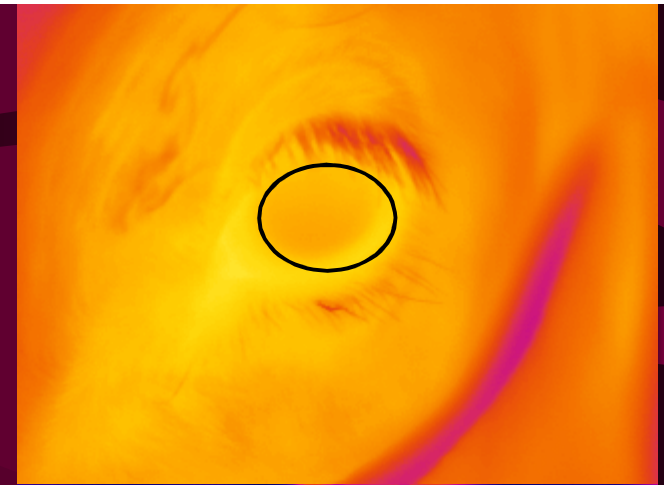
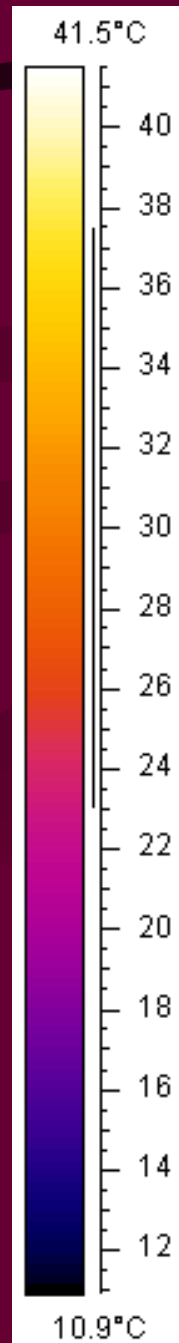
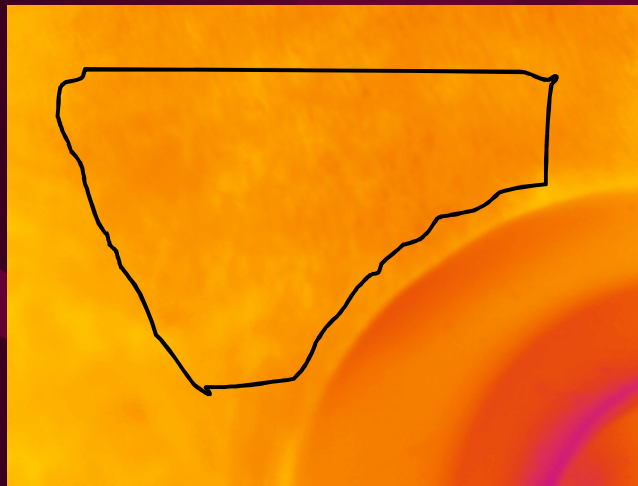
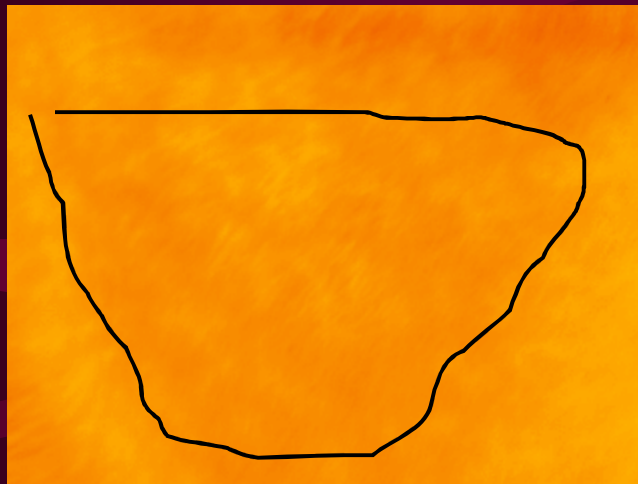
Experimental design and data collection

	Period 1		Period 2		Period 3		Period 4	
Animal ID	Diet	LPS	Diet	LPS	Diet	LPS	Diet	LPS
3587	CONTROL	NO_LPS	SARA	NO_LPS	CONTROL	LPS	SARA	LPS
3621	SARA	LPS	CONTROL	LPS	SARA	NO_LPS	CONTROL	NO_LPS
3622	CONTROL	NO_LPS	SARA	LPS	SARA	NO_LPS	CONTROL	LPS
3631	SARA	NO_LPS	SARA	LPS	CONTROL	NO_LPS	CONTROL	LPS
3636	SARA	NO_LPS	CONTROL	NO_LPS	CONTROL	LPS	SARA	LPS
3645	CONTROL	LPS	SARA	NO_LPS	SARA	LPS	CONTROL	NO_LPS
3654	SARA	LPS	CONTROL	LPS	CONTROL	NO_LPS	SARA	NO_LPS
3657	CONTROL	LPS	CONTROL	NO_LPS	SARA	LPS	SARA	NO_LPS

 Rumen T, Vaginal T and Rumen ph collected every 1 min.
Infrared images collected every 1h between 8:30 and 21:30

Material & methods

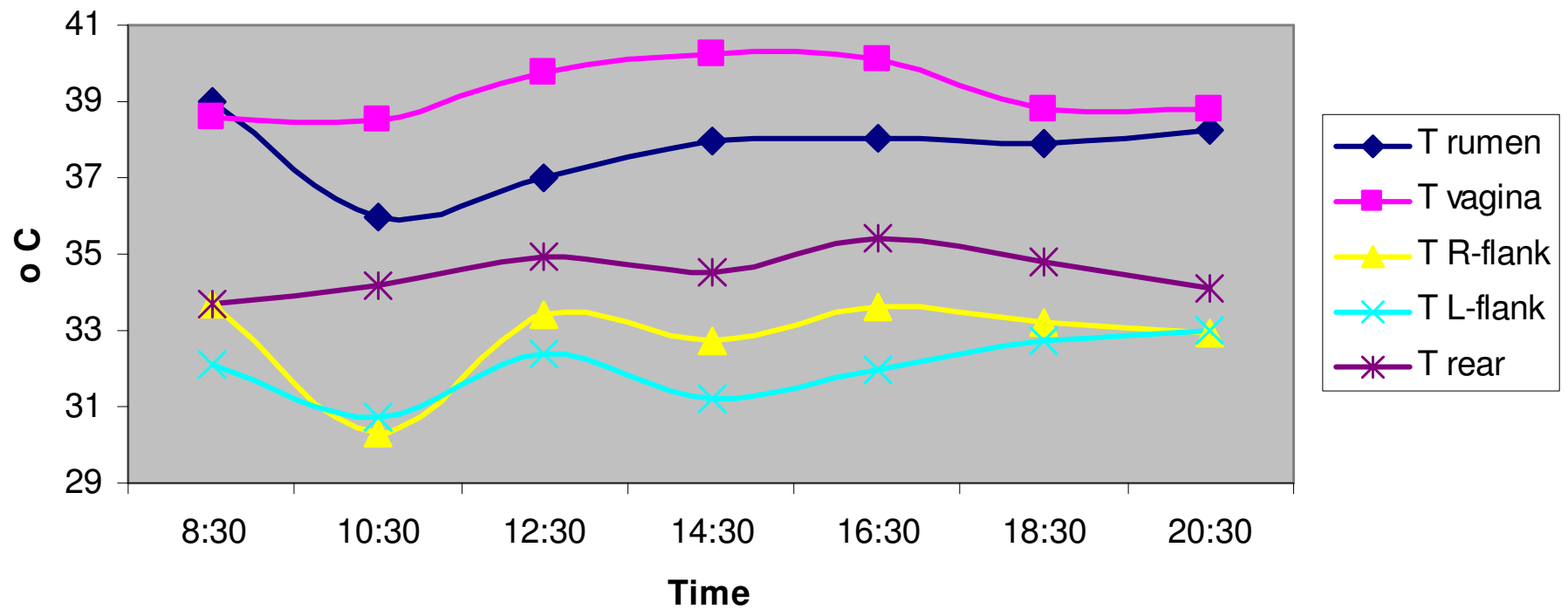
■ Infrared thermographs



Results

■ Rumen and Vaginal temperature and body surface thermographs

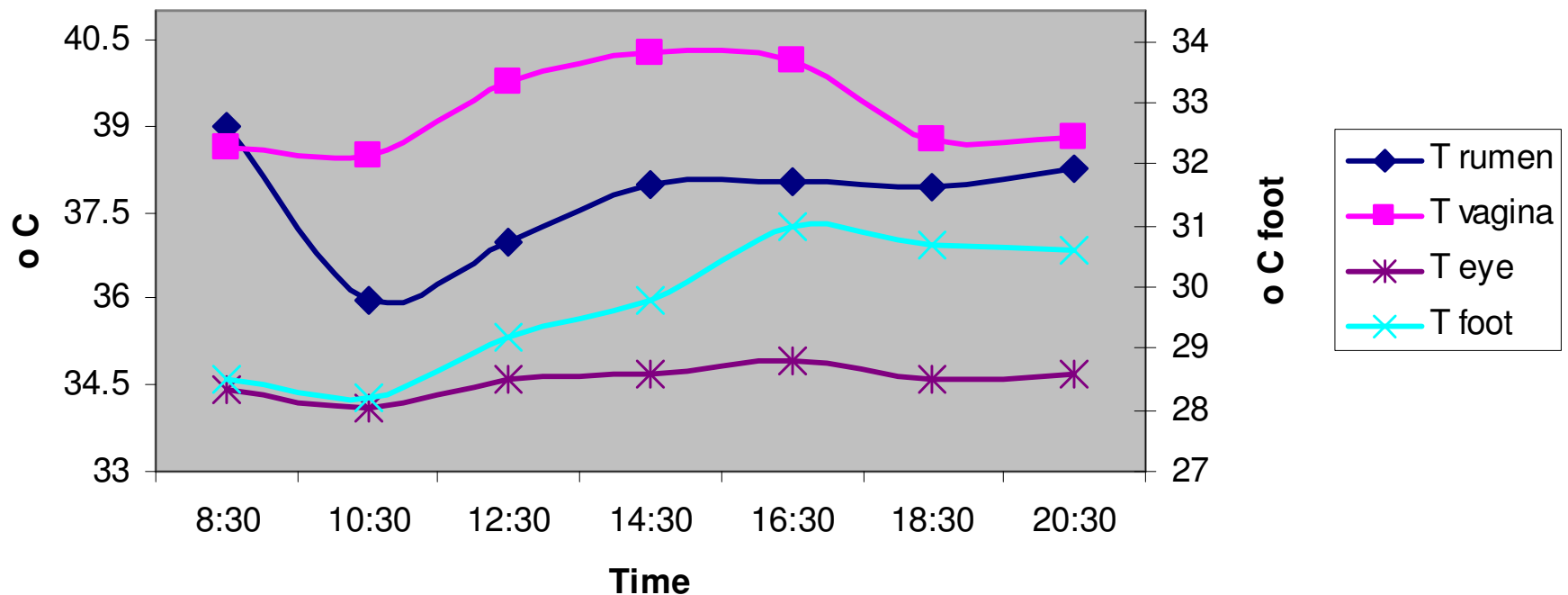
● No-LPS control and SARA



Results

■ Rumen and Vaginal temperature and body surface thermographs

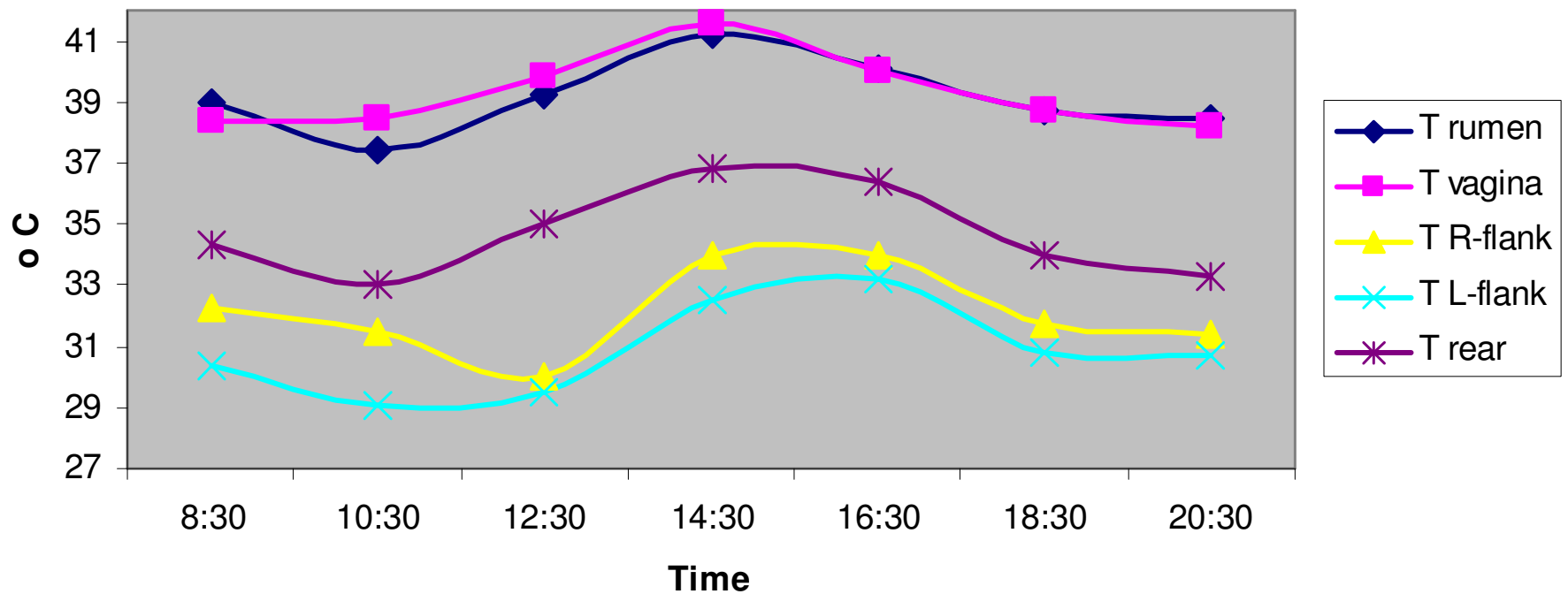
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Results

■ Rumen and Vaginal temperature and body surface thermographs

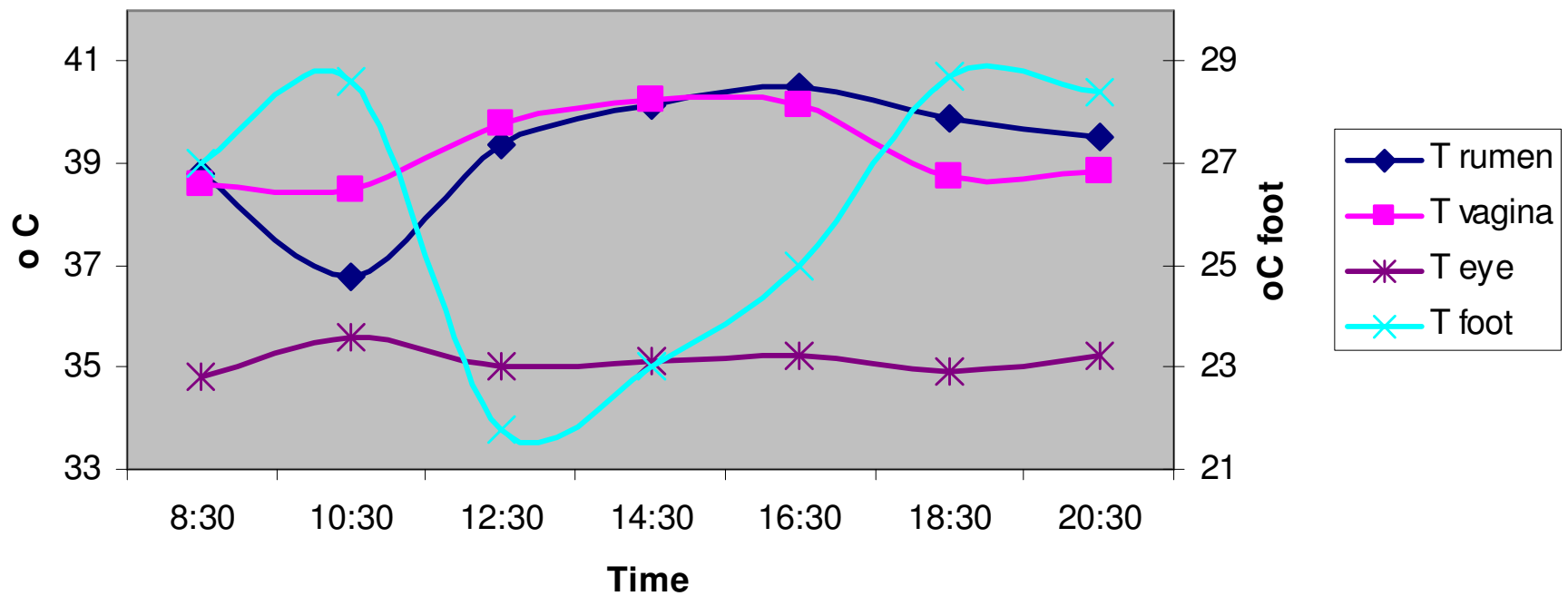
● LPS control and SARA



Results

■ Rumen and Vaginal temperature and body surface thermographs

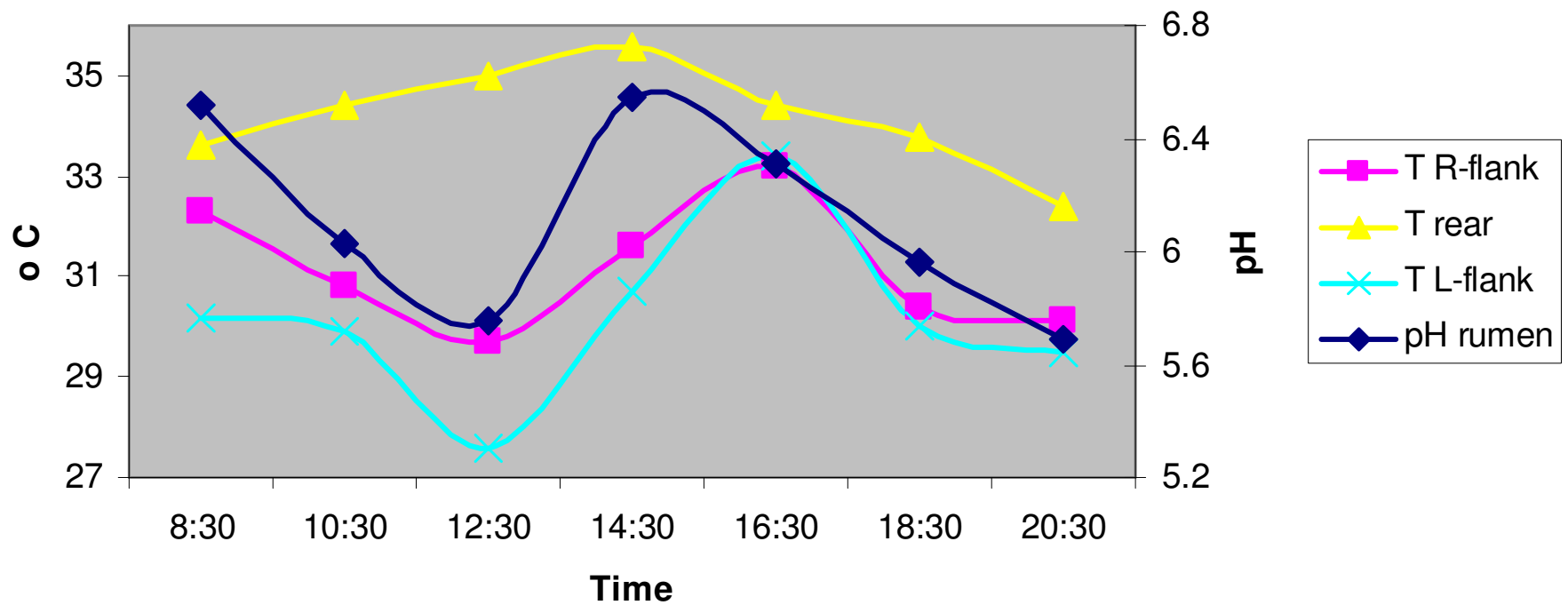
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Results

Rumen pH and body surface thermographs

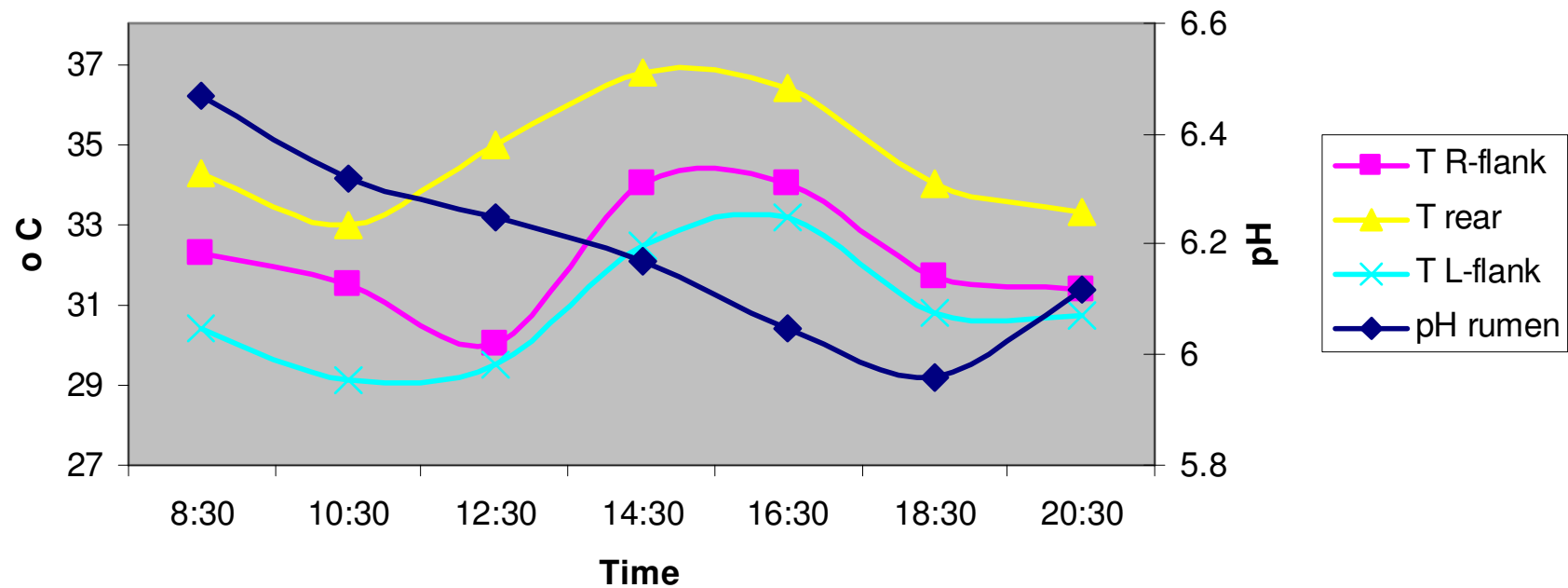
No-LPS control and SARA



Results

■ Rumen pH and body surface thermographs

● LPS control and SARA



Acknowledgements

Technical support: Tim Caldwell, Michael Steele and farm staff of Ponsonby research station.

