Combining automatic milking and grazing using detailed cow information

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EAAP 2016, Belfast, UK

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Autograssmilk

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Background

Autograssmilk - EU project

- Stop decline of grazing on AM farms !!!
- Evaluate technologies to support the integration of grazing and AM systems

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Introduction

- Combining grazing and robot milking:
  - Increase of variability in cow activity level and pattern throughout the day
  - Less information about feed (grass) intake
- How to deal with?

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Data collection

- On 4 research and 2 private farms (NL, B, DK and F)

- Collected by robots: DeLaval and Lely

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Data collection

- Collected by cow attached sensors - activity
  - IceTag at left hind leg (IceRobotics Ltd., UK)

  - Smarttag Neck (Nedap, NL)

  - Lely neck tag (Lely Industries, NL)

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Data collection

- Collected by cow attached sensors: eating time

  - Smarttag Neck (Nedap, NL)

  - Lifecorder+ (research tool, F)

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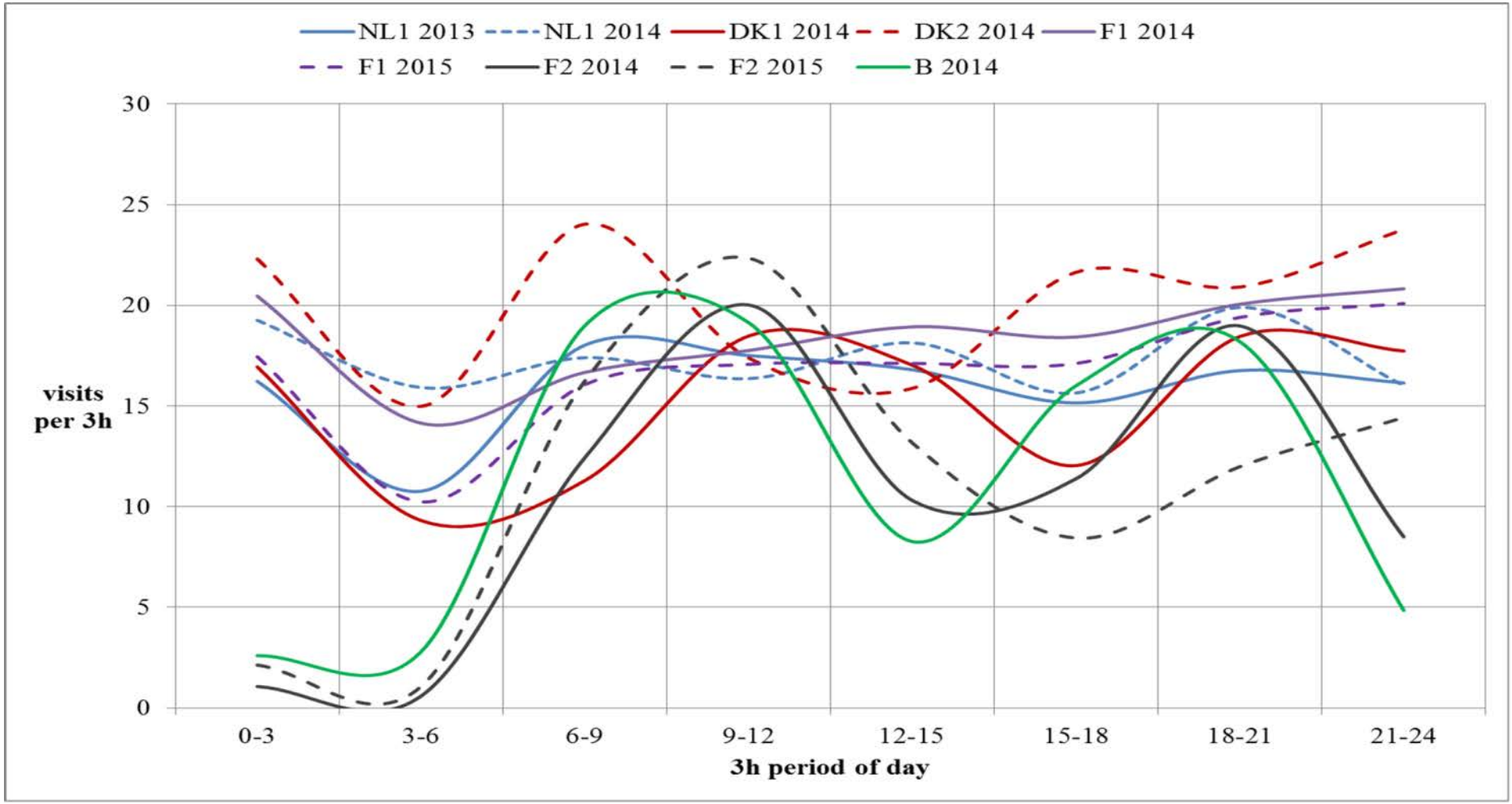
Results robots

- Technical performance of the farms during grazing season

Farm id and year	Cows	Robots	Cows per robot	MF per cow per day	Cows with MI > 14 h (%)	MY level (kg/d)	Pasture access per day (h)
NL1 2013	52	1	52	2.45	21.9	25.4	11
NL1 2014	60	1	60	2.31	28.5	25.7	10
DK1 2014	94	2	47	2.58	22.7	26.6	18
DK2 2014	171	3	57	2.81	16.7	29.4	7
F1 2014	73	1	73	2.03	36.8	28.6	21
F1 2015	65	1	65	2.09	35.6	28.9	21
F2 2014	47	1	47	1.78	74.3	18.8	24
F2 2015	46	1	46	1.66	65.1	17.1	24
B1 2014	44	1	44	2.06	63.4	19.2	24

Results: milking robot visits

Distribution throughout the day



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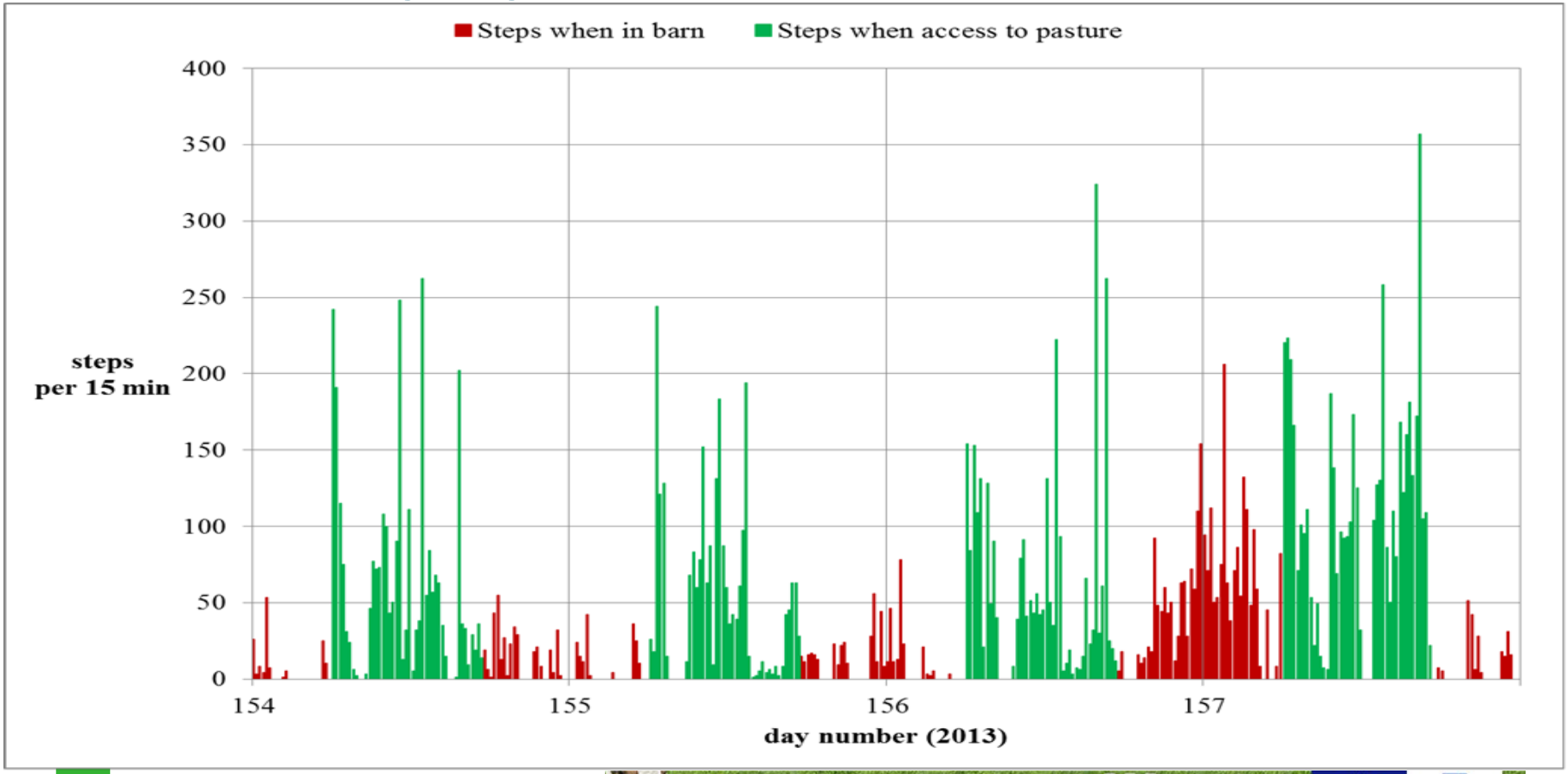
Results activity

- Distribution of hourly activity throughout the day
  - **IceTag leg sensor** - individual cow



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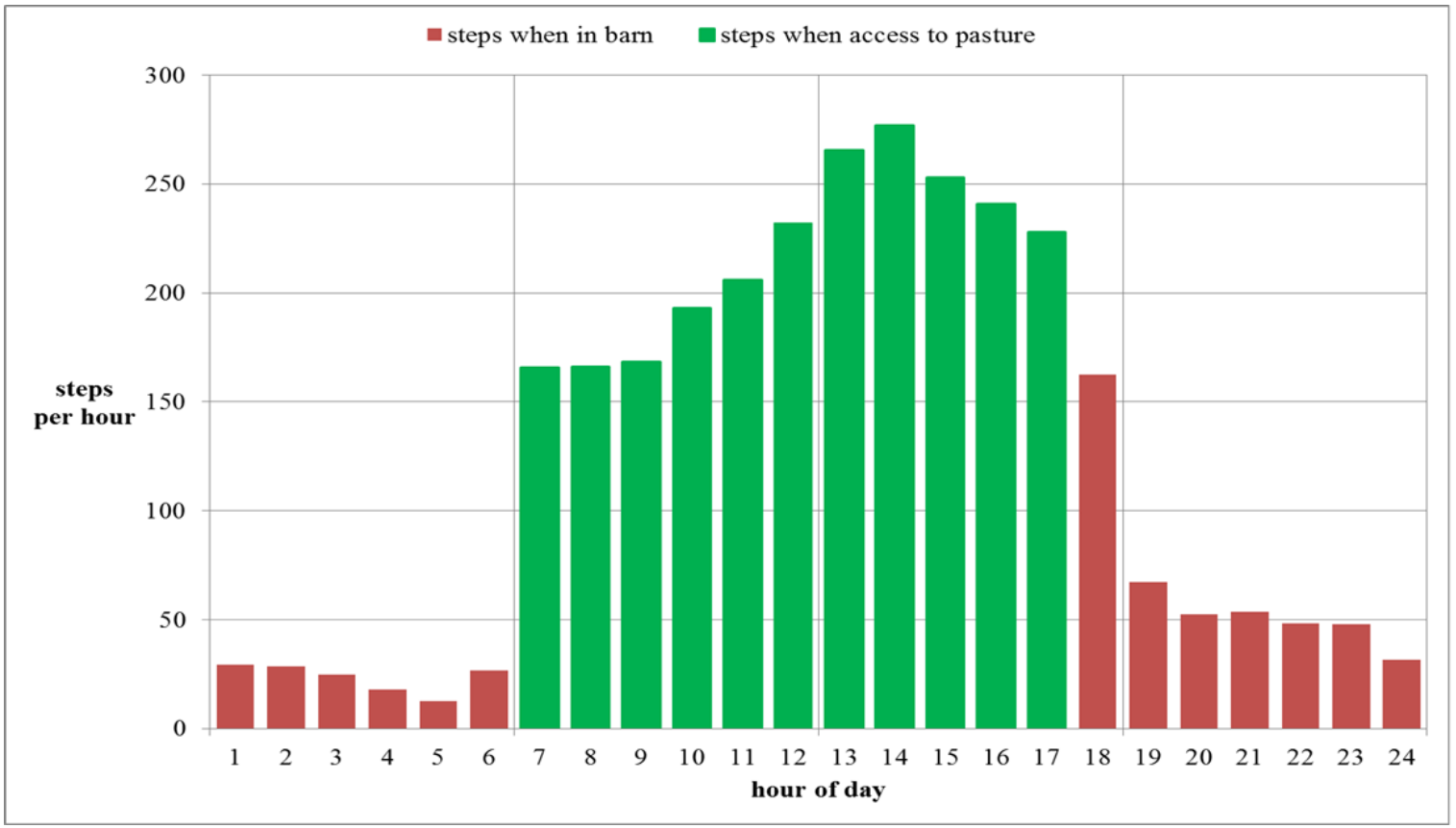
Results activity

- Distribution of hourly activity throughout the day
  - **IceTag leg s**ensor - herd average



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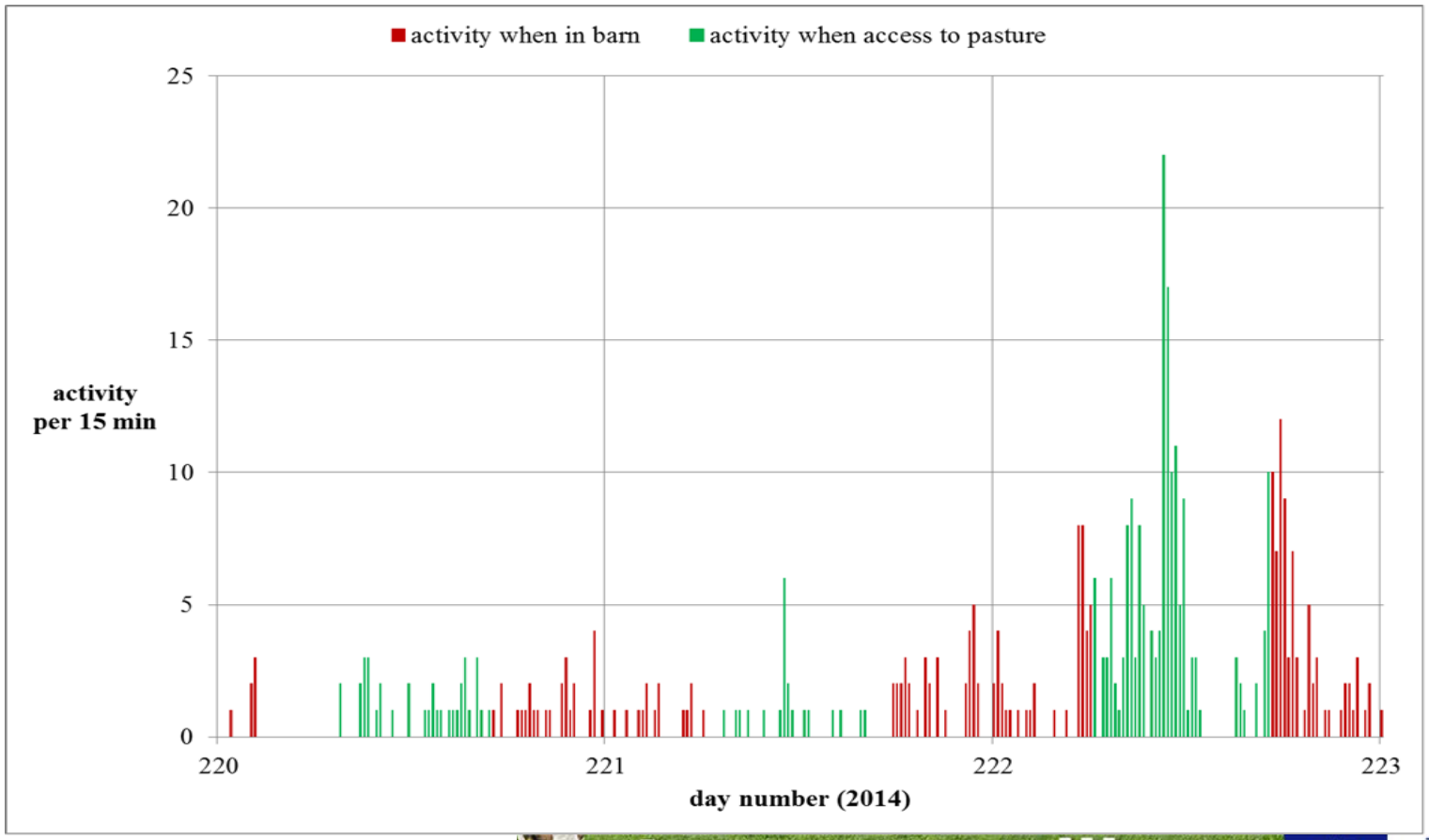
Results activity

- Distribution of hourly activity throughout the day
  - **Nedap Smarttag Neck** - individual cow



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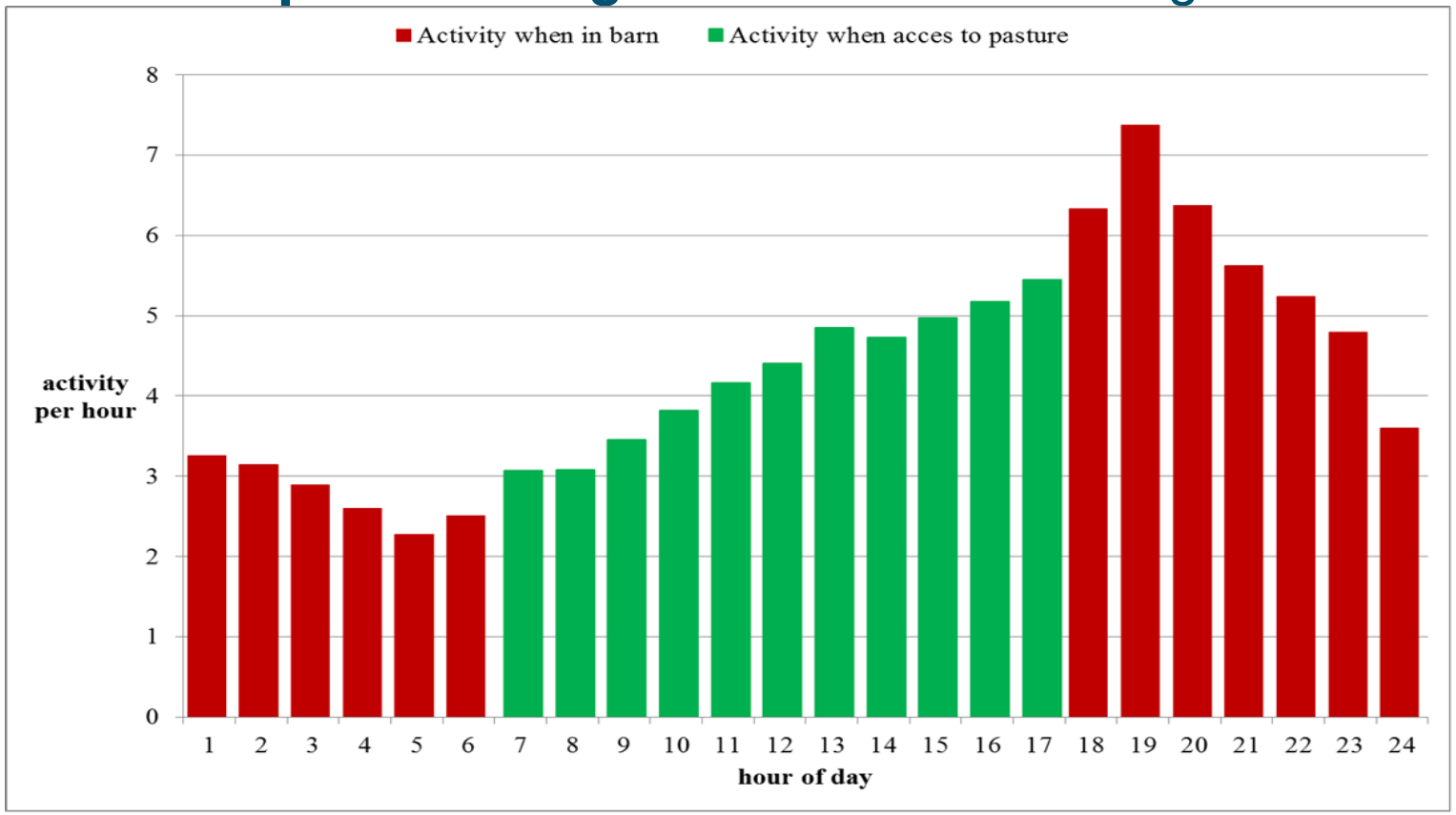
Results activity

- Distribution of hourly activity throughout the day
  - **Nedap Smarttag Neck** - herd average



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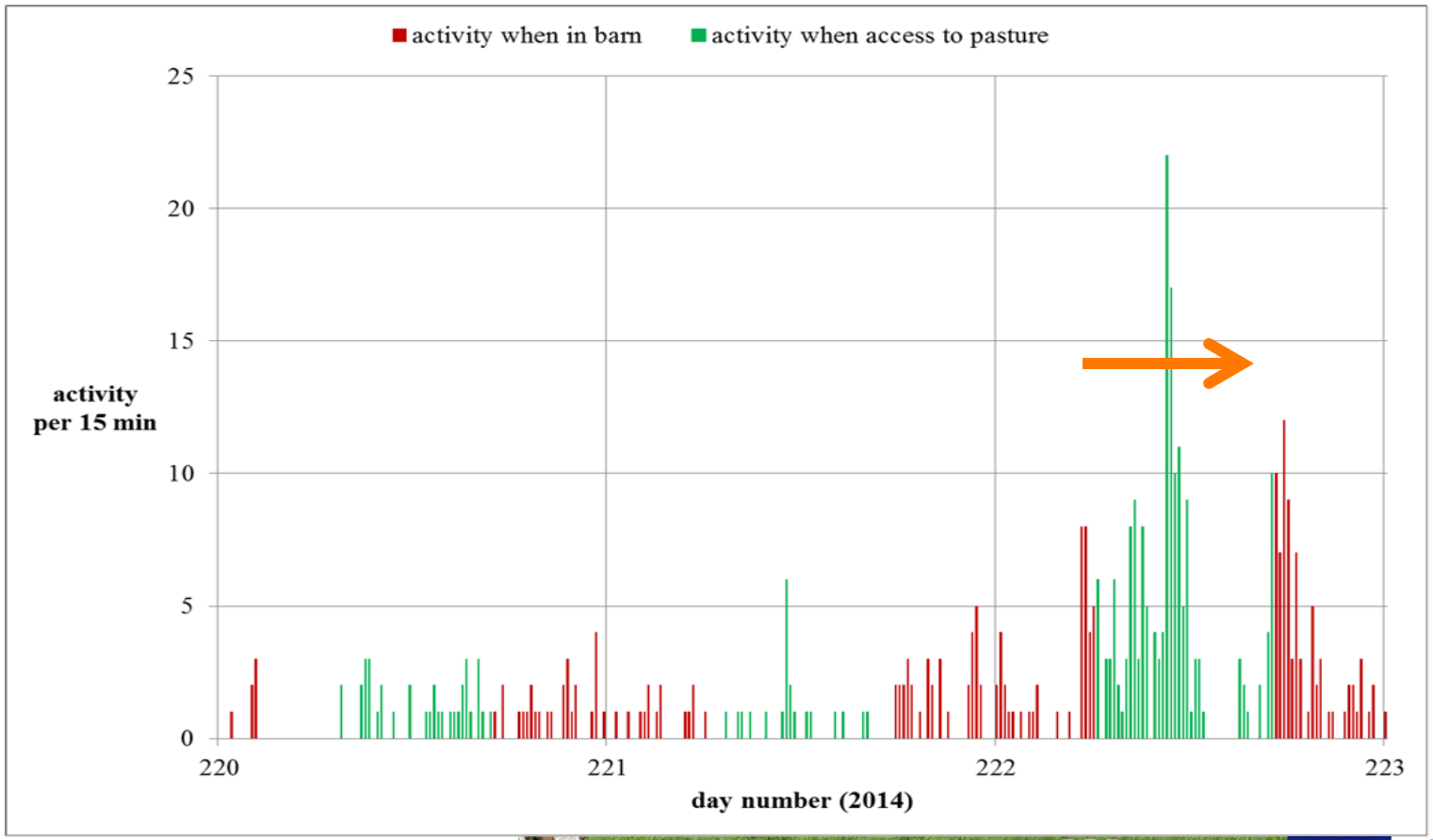
Results – activity for heat detection

- Distribution of hourly activity throughout the day
  - **Nedap Smarttag Neck** - individual cow



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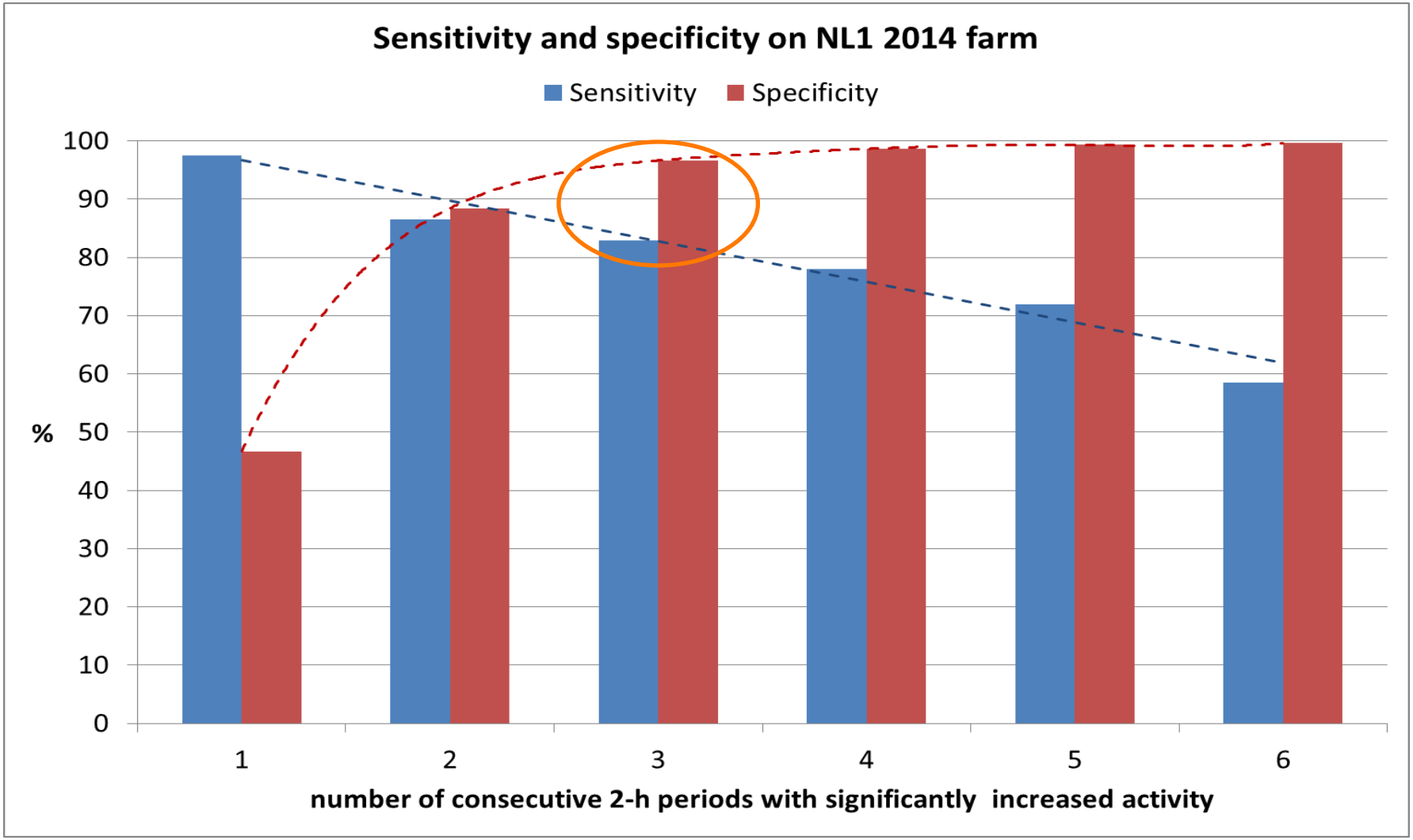
Results heat alerts



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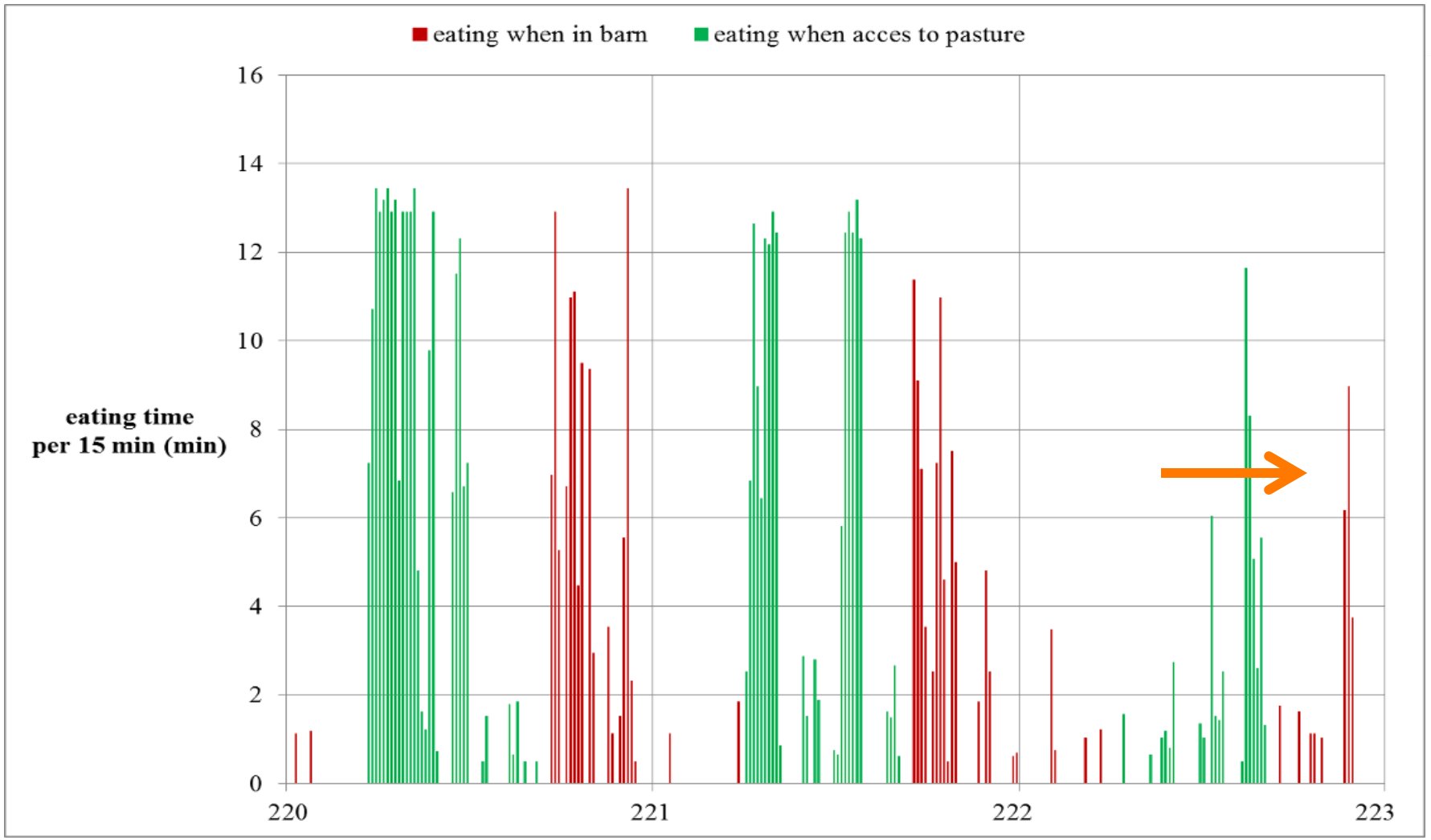
Results eating sensor Nedap

Eating pattern one cow throughout 3 days



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Results eating sensors Nedap

Herd eating time per day in barn and pasture

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Conclusions

- The project has shown that:
  - Increasing grazing resulted in a lower milking frequency and lower milk production per cow.
  - Lower milking frequencies in full time grazing are mainly due to low milking visits during the night.
  - In order to cope with the different characteristics of activity measurements, a different approach for oestrus detections models is needed.
  - Actual information from eating sensors is promising for daily cow and herd management purposes.

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Thank you for your attention !!

- Acknowledgement

This research was funded by the European Union's Seventh Framework Programme managed by REA-Research Executive Agency http://ec.europa.eu/research/rea ([FP7/2007-2013] under grant agreement no. SME-2012-2-314879.