

# The impact of automation: two examples

grazing time, mobile milking



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# Use of the Lifecorder + activitymeter to estimate grazing time of dairy COWS

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# Why record grazing time (GT) ?

- Get some information of **grass intake** (GDMI)
  - $GDMI = f(GT + \dots\dots\dots)$
  - Difficult to measure, only fundamental research plants
- Reassure farmers on "what the cows are doing outside " = grazing ?
- Improve grass management?
  - **How to record easily grazing time?**

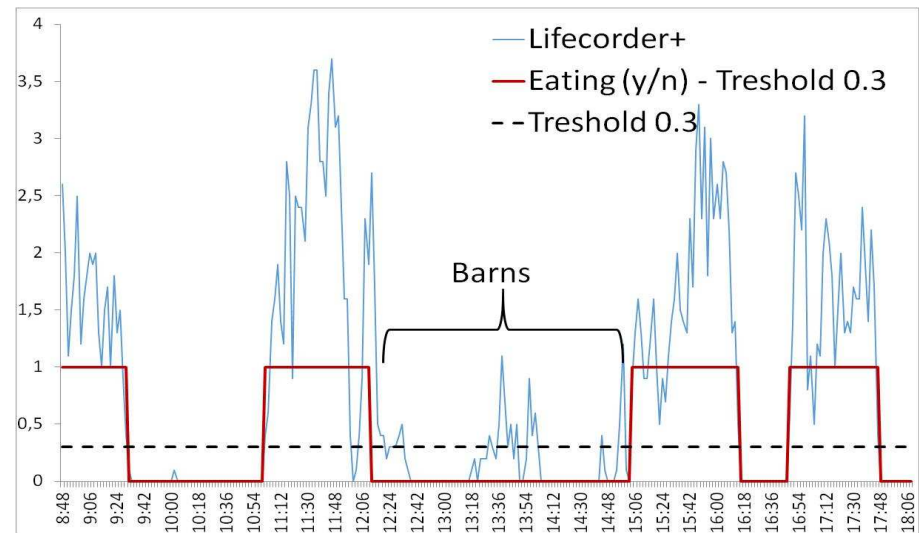


# Device description

- Lifecorder + sensor : uniaxial neck mounted activitymeter
- Excel program (*R. Delagarde – INRA*) to convert the sensor signal into a grazing (Yes/No) information
- 0.3 activity level used as the detection threshold



Conversion program

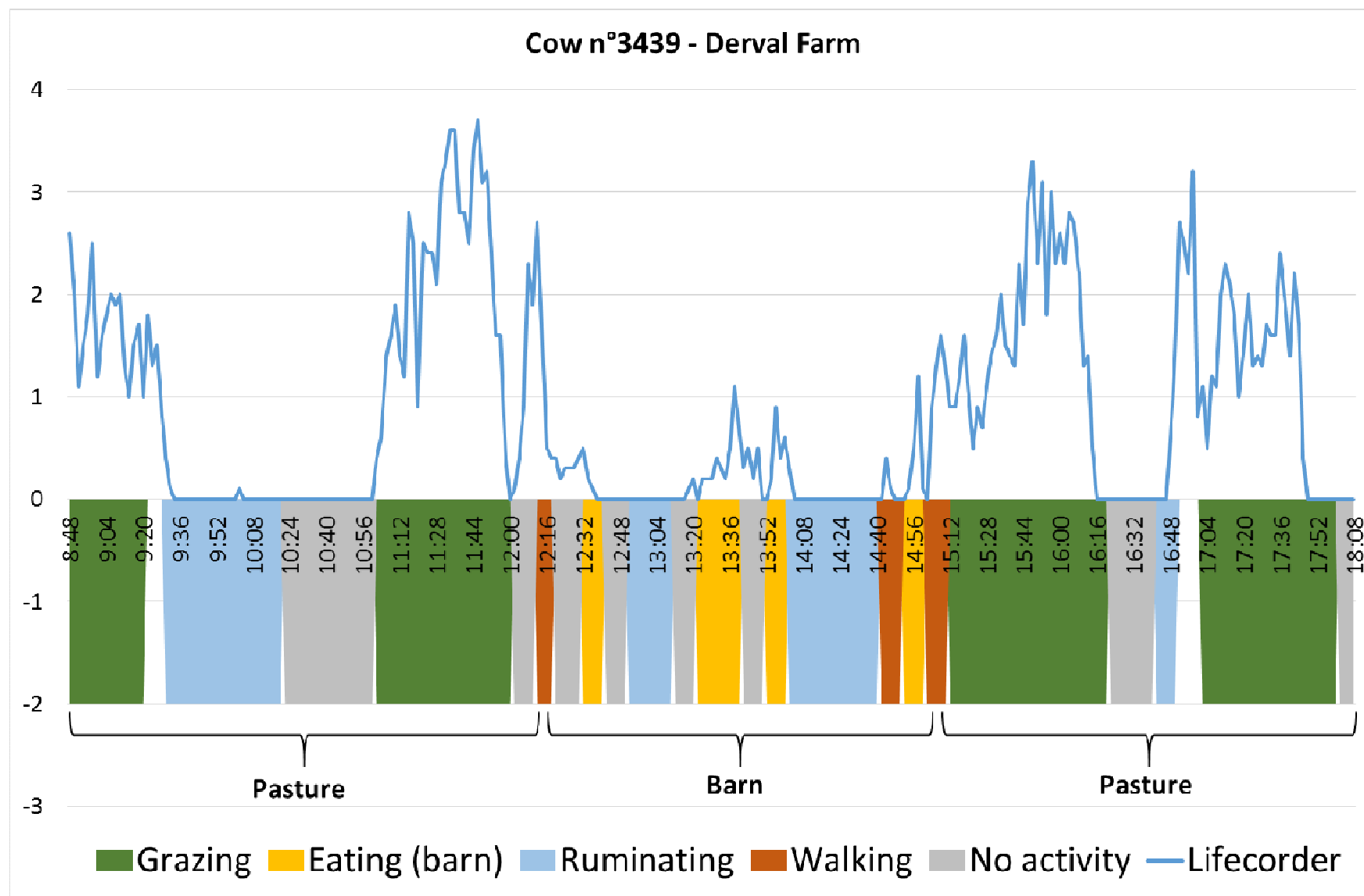


# Method

- Tested in 2 experimental AMS farms
  - 25 cows equipped in Derval farm
  - 14 cows equipped in Trévarez farm
- Observations as reference
  - Methodology : scanning every 10 min in the pastures
  - Recorded activities : grazing / ruminating and standing / lying / walking
  - 1 observation session in Derval (10h)
  - 12 observation sessions (1 to 3h) on 7 days in Trévarez

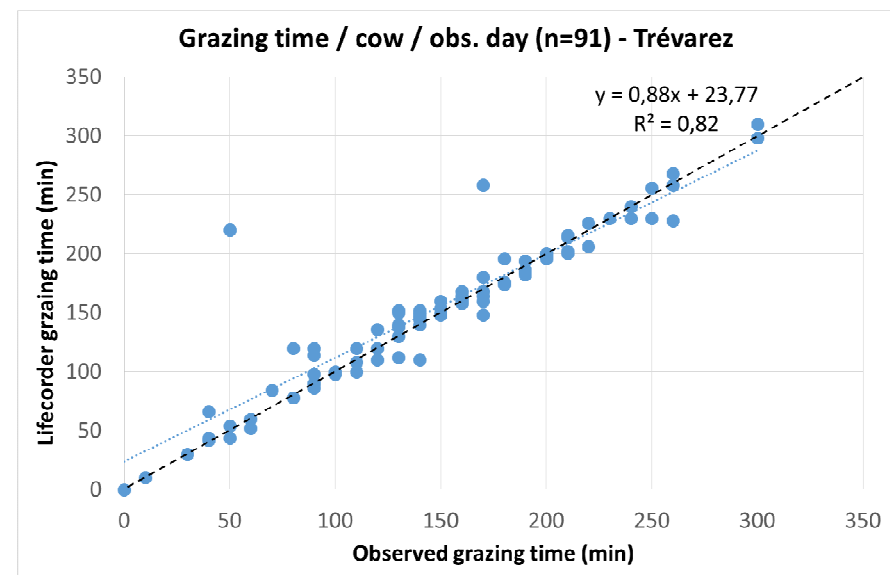
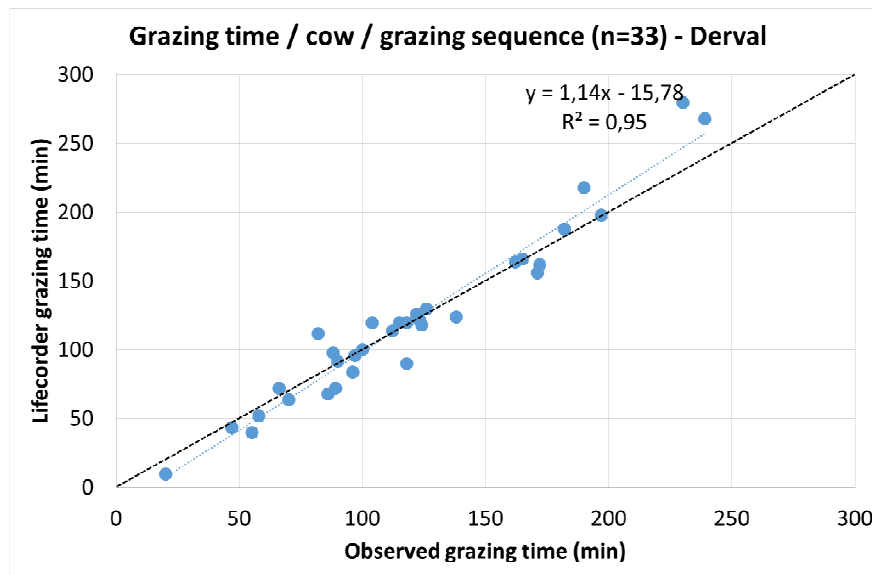


# Results



# Results

- Very good correlations in both cases
- Ave. Bias = 1.1 min (0.9 %) in Derval and 6 min (4%) in Trévarez
- Impact of walking in the pathways
- Possible tool to monitor eating behaviour and to manage grazing



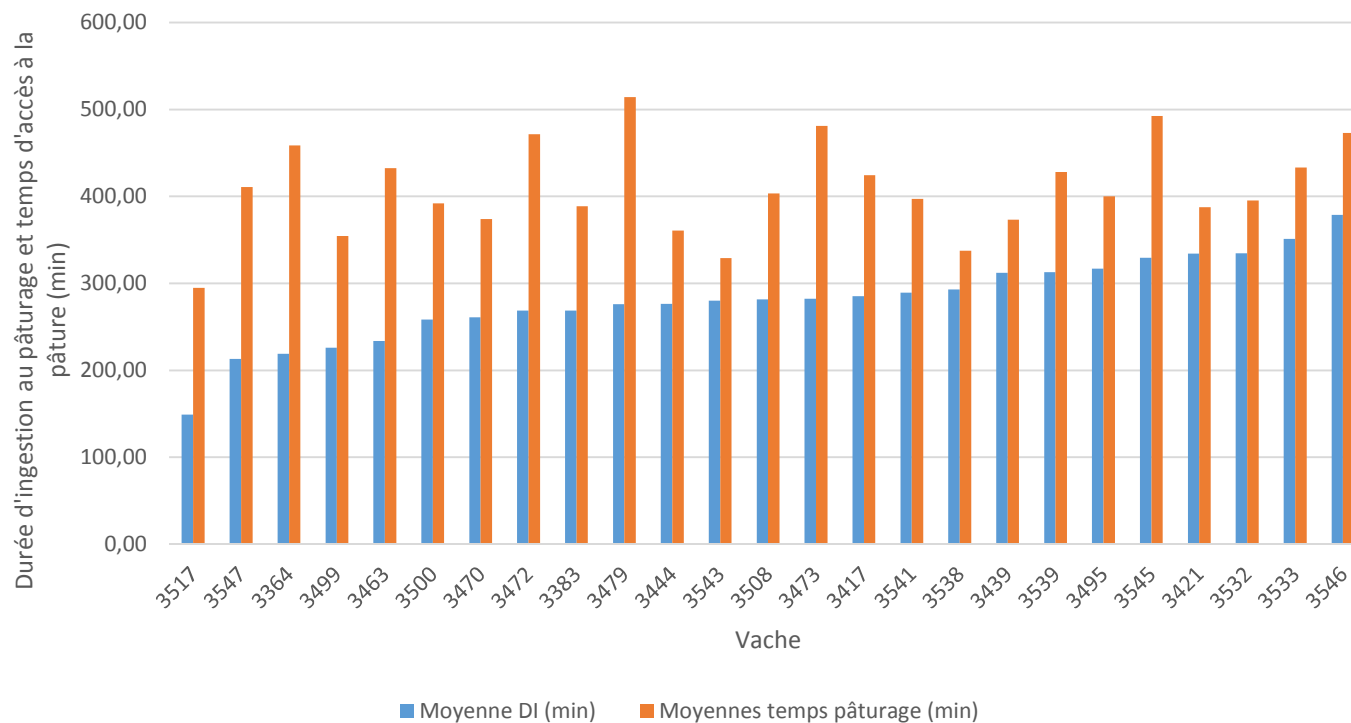


# First conclusions

- Lifecorder+ : an easy and cheap tool to record precisely grazing time
- Data collection and working out = easy
- Gives information on variations
  - among days: advice on grass management?  
Cow traffic organisation?
  - among cows: to investigate...
- Other sensor tested in parallel
- Link to grass intake ???

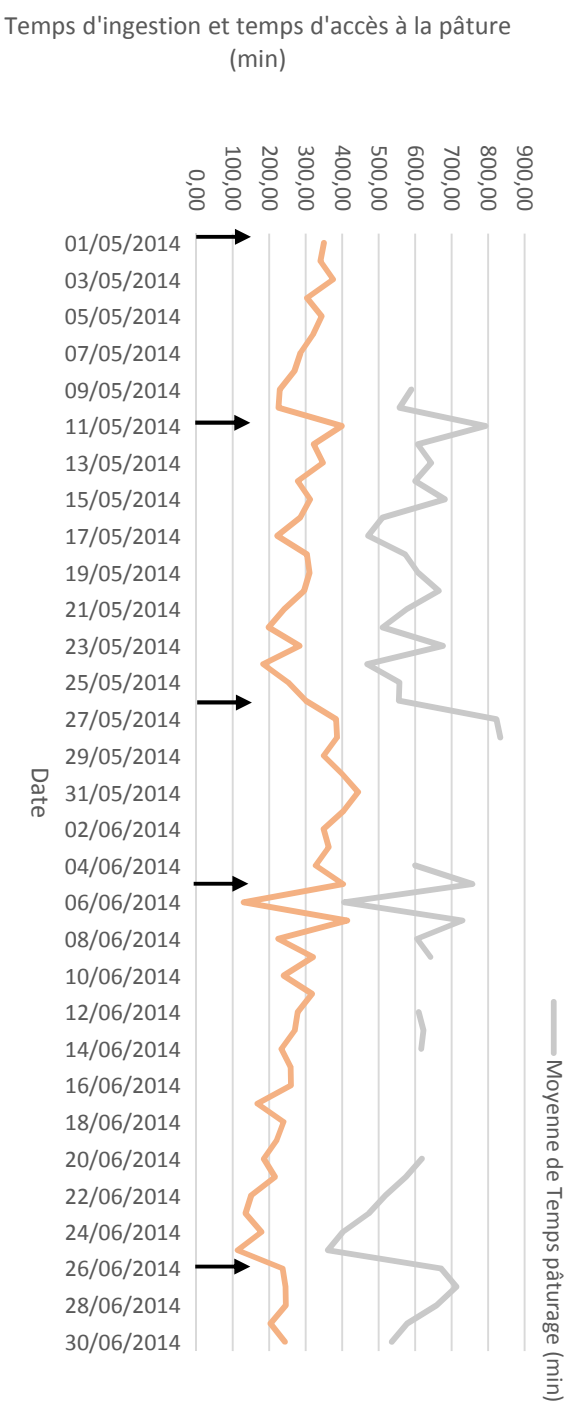








## Temps d'ingestion et d'accès à la pâture



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# Trevarez mobile AMS experiment

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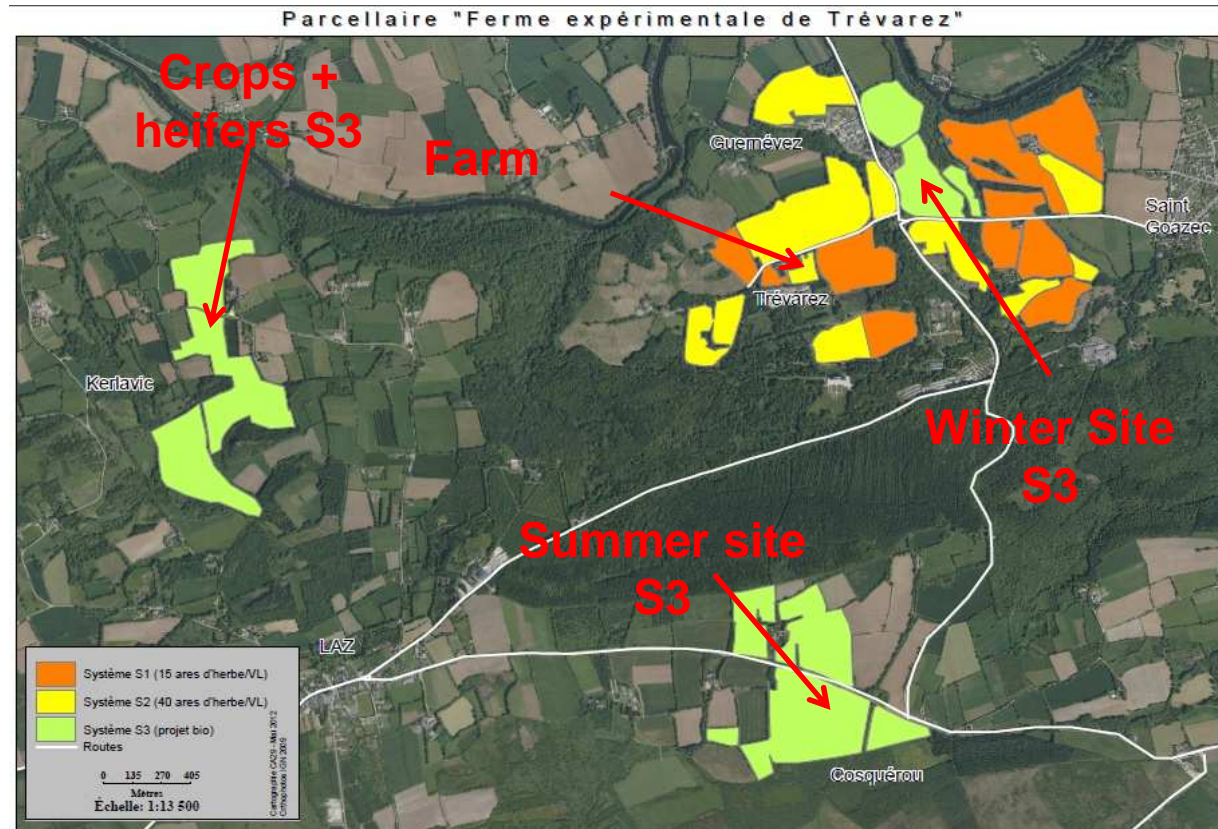
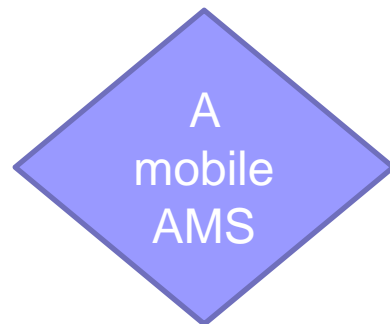


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# A mobile AMS for a fragmented land

- good grass growth
- AMS purchase
- 55 dairy cows
- organic production



- 2 sites to welcome cows and robot (May-Oct / Nov-April).
- Transfer of animals and equipments on the same day.





# Trévarez: the mobile AMS, winter site

- Free range stall
- 1 trailer for AMS, 1 trailer for bulk
- 14 ha grazeable area
  - Start: Sept 2012.
  - Very satisfactory.



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## The winter site (2)



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# The summer site



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Camera

Concentrate silo

Robot trailer

Tank trailer

## The summer site



technical  
room

3 directions  
drafting gate

Stabilized  
track

Waiting area/ slotted  
floor / pit



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# Mobile AMS first transfer 13<sup>th</sup> of May'14

- AMS stopped on winter site at **06:40**
- 1<sup>st</sup> cow milked on summer site at **10:25**
  - 30 human hours required incl. 10 from retailer
  - Preparation before → no major logistic difficulty
  - 4-5 days for cows to traffic with no help at all





# The cost of mobility

- On winter site :
  - 40 000 €
- On summer site:
  - 55 000 €

Access and servicing

Decrease in feeding cost



- What's coming next ?
  - Evaluate the system in work (technically, economically, work load)
  - Test organisations to optimise cow traffic and grass valorisation.





**54 Holstein cows**  
**0.4 ha grazed grass per cow**  
**100% grazed grass based diet since 13 05**  
**day and night paddocks (27)**  
**0,5 kg conc per milking**

**19.5 kg milk d<sup>-1</sup>, 1.8 m d<sup>-1</sup> (13 05 to 31 07)**



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## Transfer Assessment:

### Drafting gate transfer

Steps	Duration (hours)	Workforce (WU)	Total h *WU
Cleaning	1	1	1
Disconnections	0.33	1	0.33
Take out of the cowshed	0.66	4	2.64
Transfer and setting up on the summer site	0.5	4	2
Reconnections	1	1	1
Total			7

### AMS transfer and cows transport

Steps	Duration (hours)	Workforce (WU)	WU h*WU
Disconnexions	1.33	4	5.32
Animal transport	1.5	3	4.5
Trailers transport	0.25	3	0.75
Reconnections	2	4	8
Finishings	1.5	3	4.5
Total			23

\* This table does not include observers



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Total\*

WU (h WU)

30

Including DeLaval taskforce

10



Période	P1	P2	P3	P4	P5	P6
Caractéristique	Pâturage J/N	Pâturage J + ensilage d'herbe	Pâturage J + ensilage de maïs	<b>100% bâtiment</b>	Pâturage J + ensilage de maïs	Pâturage J/N
Dates	16-05 au 28-08	29-08 au 24-11	25-11 au 21-12	<b>22-12 au 23-03</b>	24-03 au 12-05	13-05 au 31-07
Durée (jours)	105	88	27	<b>93</b>	49	80
Site	Hivernal	Hivernal	Hivernal	<b>Hivernal</b>	Hivernal	Estival
Nombre de vaches traites	48,9	37,5	50,0	<b>45,2</b>	51,6	51
Stade de lactation moyen du troupeau (en jours)	220	206	131	<b>112</b>	132	188
Production laitière par stalle (en kg/jour)	928	665	1121	<b>1003</b>	1197	994
Production laitière (en kg/VL/j)	18,8	17,7	22,4	<b>22,2</b>	23,1	19,47
Nombre de traites par jour	99	84	119	<b>107</b>	100	90

Fréquence de



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# Thank you for your attention

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Aidan & Ann Power  
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SME Farm IE

SME Farm DK  
Thure and Susanne Worm



KNOWLEDGE CENTRE  
FOR AGRICULTURE

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FP7-SME-2012-314879-AUTOGRASSMILK is co-funded by the European Commission

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