The impact of automation: two examples
grazing time, mobile milking

Valérie BROCARD,
Institut de l’Elevage, France
valerie.brocard@idele.fr
Use of the Lifecorder + activitymeter to estimate grazing time of dairy cows

Contact: clement.allain@idele.fr
Why record grazing time (GT) ?

- Get some information of grass intake (GDMI)
  - \[ \text{GDMI} = f(\text{GT} + \ldots) \]
  - 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 activity meter
- 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

![Conversion program graphic]
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

Cow n°3439 - Derval Farm

- Green: Grazing
- Yellow: Eating (barn)
- Blue: Ruminating
- Orange: Walking
- Gray: No activity
- Blue line: Lifecorder

Pasture

Barn

Pasture
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 temps d’accès à la pâture (min)

Date

01/05/2014
03/05/2014
05/05/2014
07/05/2014
09/05/2014
11/05/2014
13/05/2014
15/05/2014
17/05/2014
19/05/2014
21/05/2014
23/05/2014
25/05/2014
27/05/2014
29/05/2014
31/05/2014
02/06/2014
04/06/2014
06/06/2014
08/06/2014
10/06/2014
12/06/2014
14/06/2014
16/06/2014
18/06/2014
20/06/2014
22/06/2014
24/06/2014
26/06/2014
28/06/2014
30/06/2014
The impact of automation: two examples
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Trevarez mobile AMS experiment

T MEIGNAN and V BROCARD (Idele), J FRANCOIS and S GUIOCHEAU (CA Bretagne)
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 grazable area
  - Start: Sept 2012.
  - Very satisfactory.
The winter site (2)
The summer site
Mobile AMS first transfer 13\textsuperscript{th} of May’14

- AMS stopped on winter site at 06:40
- 1\textsuperscript{st} 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

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AUTOGRASSMILK is co-funded by the European Commission
The cost of mobility

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

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

Access and servicing
Decrease in feeding cost
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⁻¹, 1.8 m d⁻¹ (13 05 to 31 07)
## Transfer Assessment:

### Drafting gate transfer

<table>
<thead>
<tr>
<th>Steps</th>
<th>Duration (hours)</th>
<th>Workforce (WU)</th>
<th>Total h *WU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleaning</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Disconnections</td>
<td>0.33</td>
<td>1</td>
<td>0.33</td>
</tr>
<tr>
<td>Take out of the cowshed</td>
<td>0.66</td>
<td>4</td>
<td>2.64</td>
</tr>
<tr>
<td>Transfer and setting up on the summer site</td>
<td>0.5</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Reconnections</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### AMS transfer and cows transport

<table>
<thead>
<tr>
<th>Steps</th>
<th>Duration (hours)</th>
<th>Workforce (WU)</th>
<th>WU h*WU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disconnections</td>
<td>1.33</td>
<td>4</td>
<td>5.32</td>
</tr>
<tr>
<td>Animal transport</td>
<td>1.5</td>
<td>3</td>
<td>4.5</td>
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<tr>
<td>Trailers transport</td>
<td>0.25</td>
<td>3</td>
<td>0.75</td>
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<tr>
<td>Reconnections</td>
<td>2</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Finishings</td>
<td>1.5</td>
<td>3</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>23</strong></td>
<td></td>
<td><strong>23</strong></td>
</tr>
</tbody>
</table>

* This table does not include observers

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### Additional Information

<table>
<thead>
<tr>
<th>WU (h WU)</th>
<th>Including DeLaval taskforce</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>Période</td>
<td>P1</td>
</tr>
<tr>
<td>---------</td>
<td>----</td>
</tr>
<tr>
<td>Dates</td>
<td>16-05 au 28-08</td>
</tr>
<tr>
<td>Durée (jours)</td>
<td>105</td>
</tr>
<tr>
<td>Site</td>
<td>Hivernal</td>
</tr>
<tr>
<td>Nombre de vaches traitées</td>
<td>48,9</td>
</tr>
<tr>
<td>Stade de lactation moyen du troupeau (en jours)</td>
<td>220</td>
</tr>
<tr>
<td>Production laitière par stalle (en kg/jour)</td>
<td>928</td>
</tr>
<tr>
<td>Production laitière (en kg/VL/j)</td>
<td>18,8</td>
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<tr>
<td>Nombre de traites par jour</td>
<td>99</td>
</tr>
<tr>
<td>Fréquence de traite (en traites/VL)</td>
<td>2,38</td>
</tr>
</tbody>
</table>

*AUTOGRASSMILK is co-funded by the European Commission*
Thank you for your attention

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