Use of sensor systems at Dutch dairy farms

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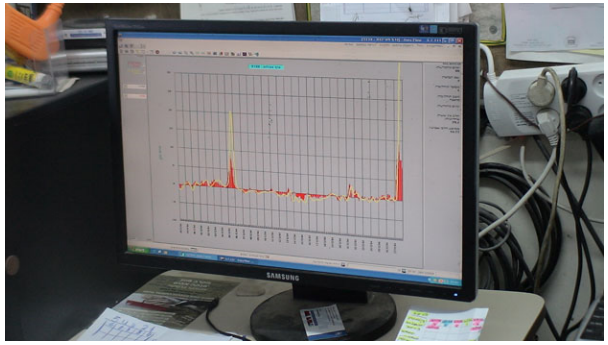
Research on sensor systems for dairy cow management

- Conducted research:
  - Development of new sensor systems
  - Detection models for sensor systems
    - E.g., oestrus and mastitis detection



- Not conducted yet:
  - Overview of sensor systems available at dairy farms
  - Reasons of farmers for investing/ not investing in sensor systems
  - Extent of use of sensor systems

Objectives

- Overview of sensor systems available at Dutch dairy farms
- Investigate reasons for investing in activity meters/ pedometers
- Investigate extent of use of activity meters/ pedometers
- Investigate reasons for not investing in sensor systems

Available data

- Online survey sent to 1,672 Dutch dairy farms

- Questions on:
  - Availability of sensor systems
  - Reasons for investing/not investing
  - Extent of use sensor systems
  - Year of investment
  - Automatic milking system (AMS) available

- 512 dairy farms responded (response rate of 31%)
  - 202 farms with sensor systems (121 AMS, 81 CMS)
  - 310 farms without any sensor systems

Type of sensor system at the farm	No. of AMS farms (n=121)
Electrical conductivity sensor	112 (93%)
Colour sensor	72 (60%)
Milk temperature sensor	56 (46%)
Activity meters/pedometers for dairy cows	50 (41%)
Weighing platform	33 (27%)
Fat/protein sensor	24 (20%)
Somatic cell count sensor	21 (17%)
Activity meters/pedometers for young stock	14 (12%)
Rumination activity sensor	11 (9%)
Temperature sensor	7 (6%)
Lactate dehydrogenase (LDH) sensor	3 (2%)
Beta-hydroxybutyrate (BHB) sensor	3 (2%)
Progesterone sensor	2 (2%)
Urea sensor	2 (2%)
Rumen pH	0 (0%)

Type of sensor system at the farm	No. of AMS farms (n=121)	No. of CMS farms (n=81)
Electrical conductivity sensor	112 (93%)	28 (35%)
Colour sensor	72 (60%)	1 (1%)
Milk temperature sensor	56 (46%)	4 (5%)
Activity meters/pedometers for dairy cows	50 (41%)	57 (70%)
Weighing platform	33 (27%)	4 (5%)
Fat/protein sensor	24 (20%)	0 (0%)
Somatic cell count sensor	21 (17%)	1 (1%)
Activity meters/pedometers for young stock	14 (12%)	23 (28%)
Rumination activity sensor	11 (9%)	10 (12%)
Temperature sensor	7 (6%)	11 (14%)
Lactate dehydrogenase (LDH) sensor	3 (2%)	1 (1%)
Beta-hydroxybutyrate (BHB) sensor	3 (2%)	1 (1%)
Progesterone sensor	2 (2%)	1 (1%)
Urea sensor	2 (2%)	1 (1%)
Rumen pH	0 (0%)	0 (0%)

Reasons for investing in activity meters/pedometers for dairy cows (1)

- On farms with an AMS

Reason	%
Improving oestrus detection rates	72%
Improving profitability of the farm	48%
Insights in fertility level of the herd	42%
Bought for a reduced tariff with the AMS	30%
It was standard with the AMS	18%
Reducing labour	6%
Other reasons	0%

n=50 farms

Reasons for investing in activity meters/pedometers for dairy cows (2)

- On farms with a conventional milking system

Reason	%
Improving oestrus detection rates	81%
Improving profitability of the farm	47%
Insights in fertility level of the herd	46%
Reducing labour	39%
Other reasons	5%
It was not a conscious decision to invest	4%

n=57 farms

Extent of use of activity meters/pedometers for dairy cows (1)

- On farms with an AMS

Extent of use	%
Never	0%
Sometimes	6%
Regularly	6%
Frequently	14%
Daily	74%

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n=50 farms

Extent of use of activity meters/pedometers for dairy cows (2)

- On farms with a conventional milking system

Extent of use	%
Never	2%
Sometimes	4%
Regularly	4%
Frequently	18%
Daily	74%

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n=57 farms

Reasons for not investing in sensor systems

Reasons for not investing	No.	%
Prefer to invest money in other things for the farm	149	48
Uncertainty about the profitability of the investment	119	38
Poor integration with other farm systems and software	40	13
Waiting for improved versions of sensor systems	29	9
There are better alternatives to improve daily management	24	8
There is too much information provided without knowing what to do with it	24	8
Not familiar with sensor systems that are available	20	6
Not enough time to work with sensor systems	11	4
Poor technical support or training	6	2
Too difficult or complex to use	6	2
Sensor systems are not reliable	4	1
Sensor systems are not useful	3	1

n=310 farms

Summary (1)

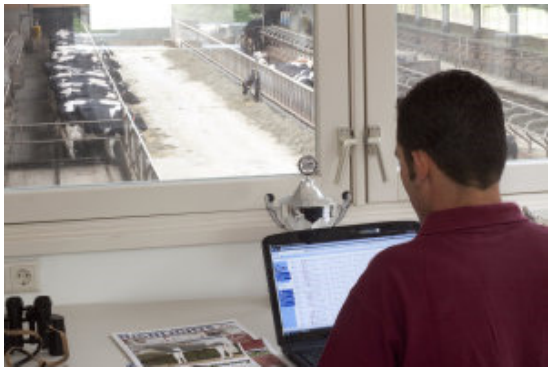
- Most available sensors on AMS farms
  - Mastitis detection sensors
  - Activity meters/pedometers
  - Weighing platform

- Most available sensors on CMS farms
  - Electrical conductivity meters
  - Activity meters/pedometers

- Activity meters/pedometers for dairy extensively used

Summary (2)

- **Improving oestrus detection rates** most important reason for investing in activity meters/pedometers for dairy cows

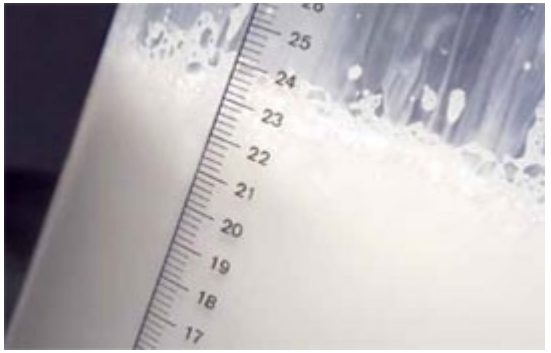


- **Reducing labour** important reason for investing in activity meters/pedometers for dairy cows on farms with a CMS

- Reasons for investing/not investing **economically** related

Future research with the data

- Investigating effect of sensor systems on technical parameters
  - Milk production
  - Calving interval
  - Somatic cell count
  - .....



- Investigating effect of sensor systems on economic performance of the farm
  - Comparing year before and after investment

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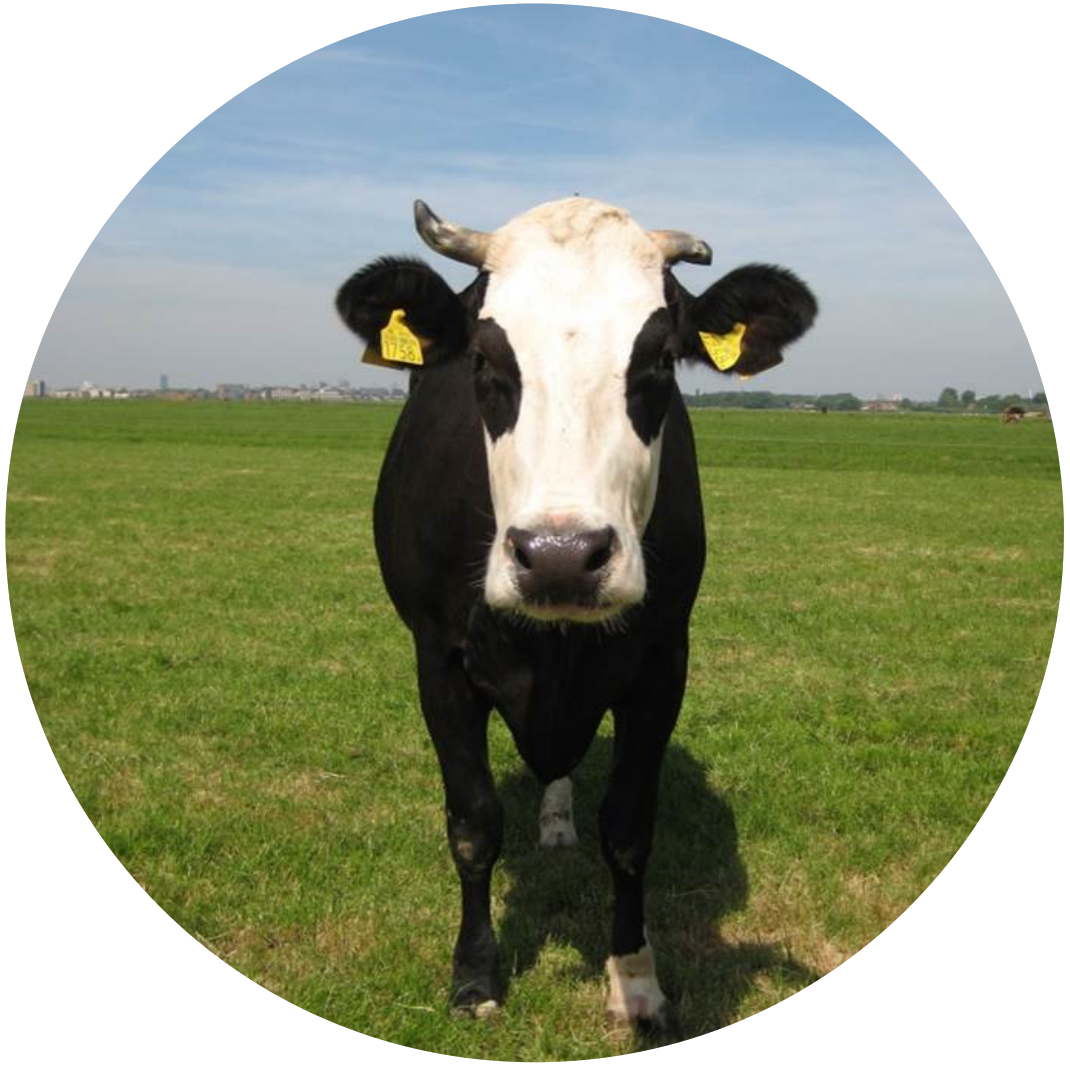
Thanks for your attention !!!



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