Connectivity needs of French dairy farms
Important development of precision livestock farming

New connectivity needs for the dairy farmers

New possibilities and challenges for their partners

Goal of the study: assess the connectivity landscape of the French Dairy Farms?
January → March 2015

4000 dairy farmers contacted by e-mail – 772 answers

Western and center of France

Survey with 53 questions:
- Farm and farmer characteristics
- Connected devices (farm + telecom)
- Use practices of those equipments
- Satisfaction regarding connectivity
- Expectations on farm and equipment
Sensors and Robots: Important penetration in Dairy farms

- Automatic feeder: 28%
- Heat monitoring: 19%
- Calving monitoring: 18%
- Camera: 16%
- Milk meters: 13%
- Milking Robot: 13%
- RFID tags: 6%
- Rumination monitoring: 5%
- Milk composition monitoring: 3%
- Electronic scale: 3%

67% have at least 1 connected device (87% in herds > 100 cows)

38% of the non-equipped expect to invest in a short term
Sensors and Robots: Short term investment perspectives

- Camera: 32%
- Heat monitoring: 24%
- Milking Robot: 21%
- Automatic feeder: 20%
- Calving monitoring: 14%
- Milk meters: 10%
- RFID tags: 6%
- Rumination monitoring: 5%
- Herd Navigator: 4%
- Feeding robot: 4%
- Milk composition monitoring: 3%
- Electronic scale: 3%
Growth tendency: example of AMS

Doubled since 2010

Number of farms equipped registered in milk recording

Estimation total number of farms equipped

Source: [Link]
Computers and mobile devices

Sources: étude agrinautes – agrisurgeurs 2015 (TICAgri/BVA) + étude Idele, Orange, Evolution 2015
Who are the connected farmers?

Methodology: FMA and hierarchical clustering

5 different classes

« Not concerned »
- « old » farmers (50 et +), no studies
- Small herds
- Low equipment rate with connected devices

« Technophile demanding »
- Young farmers, studies >2 years
- Big Herds / No grazing
- Very equipped and expect to invest
- Very demanding regarding connectivity

« Fixed internet mostly »
- Small grazing herds
- Low equipment rate with connected devices / Fixed internet
- No interest for mobile internet

« Grazing and connected »
- Studies > 2 years, Small grazing herds
- Very connected with mobile devices (SP)
- Interested for new technologies in the future

« Already equipped, cruising »
- Very equipped with connected devices
- Satisfied of their connectivity
• 35% of the dairy farmers are unsatisfied with the fixed internet network
• 46% are unsatisfied with the mobile internet network.
Why are they unsatisfied?

Mobile internet network on farm (office, barns)

- 49% 4G
- 18% 3G
- 27% 2G
- 6% Aucun réseau

Mobile internet network in the fields

- 49% 4G
- 13% 3G
- 28% 2G
- 11% Aucun réseau

Fixed internet network on farm (office, barns)

- 56% Plus de 10 mb/s
- 21.5% 2 à 10 mb/s
- 8.5% Moins de 512 kbps
- 14% 512 à 2 mb/s
- 13% 2G
- 28% 3G
- 11% 4G
- 6% Aucun réseau

Source: étude Agrinautes 2016
Connectivity issues

- Gap in the data
- Decision making / Remote supervision impossible
- Delayed information
Consequences for farmers and their partners

**Data Exhaustivity**
- Important consequences on decision making
- Unusable for advisory services and genetic evaluation?

**Delayed information**
- Still useful for decision making?
- Problem for services (milk recording, advisory services, AI,...)

**Remote control / supervision / maintenance**
- Mobile network: remote control difficult when outside of the Wifi network
- Fixed network: remote maintenance (milking robots) possible?
Solutions to improve farm connectivity

- Cellular / Satellite / Long Range
  - 3G
  - 4G
  - LoRa
  - SIGFOX

- Small Cell / Wifi bridge
- Femtocell / Wifi
- House
- Silos
- Barns
- Stable

- WAN Access

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Solutions to overcome the lack of connectivity

- Off line software and devices
- Take advantage of « traceable » technologies
- Use the new IoT networks: long range/low flow (Sigfox, LoRa)
- Fixed monitoring vs. mobile monitoring
Strong interest of dairy farmers for digital applications

- **80% of surveyed farmers** are equipped with connected tools (67%) or will be short-term (13%)
- This represents **around 48 000 dairy farms** in France
- **Strong diversity** of the connected farmers → not only the big and intensive farms

This involves new connectivity needs ...

- Farmers: farm management
- For their partners: data exchange and their potential use
- **Who should handle (and finance) the connectivity improvements: state, farmer, private telecom companies, farm partners (MRO, AI, feeding companies)?**
Questions ?

I'm connected, I received
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