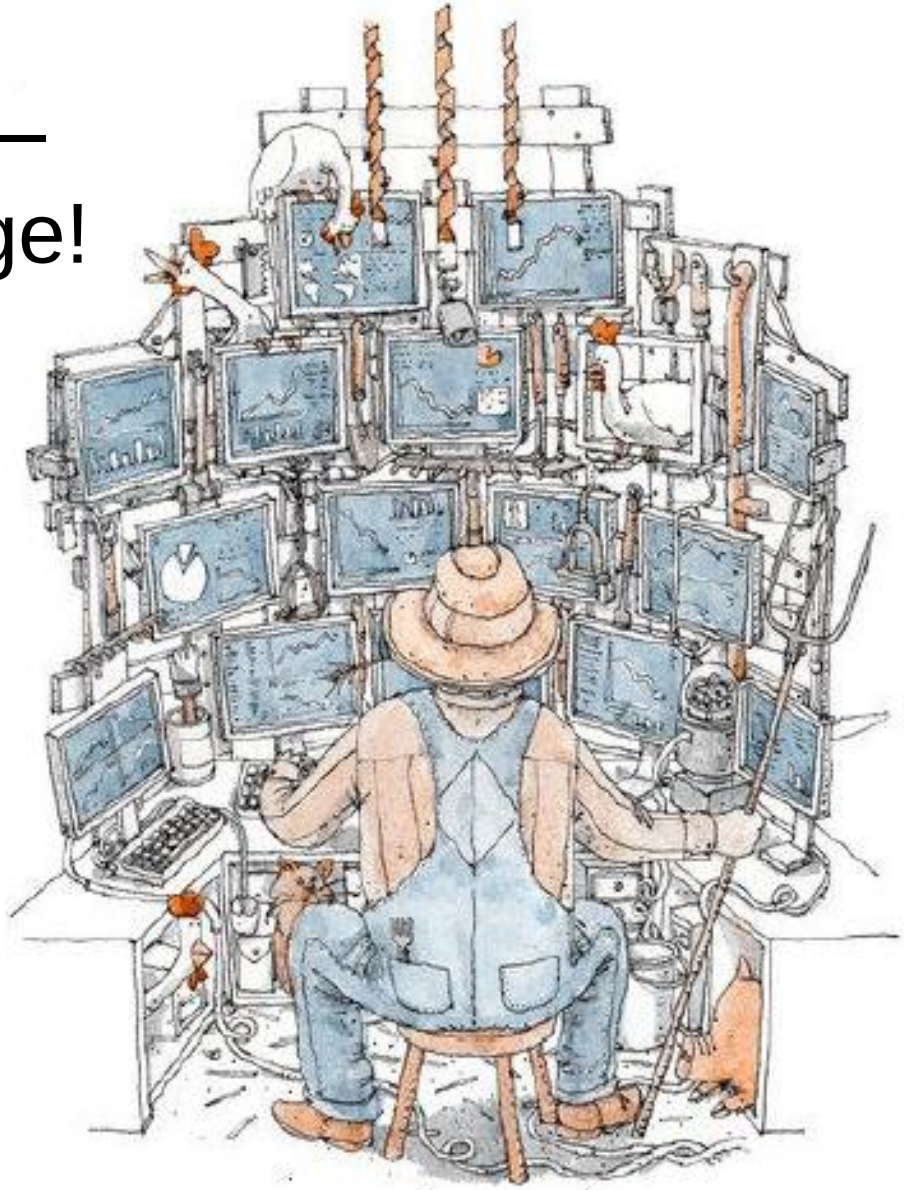
Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

Technologies in dairy production

NÖK, Måndag 23 juli 2018

Margareta Emanuelson

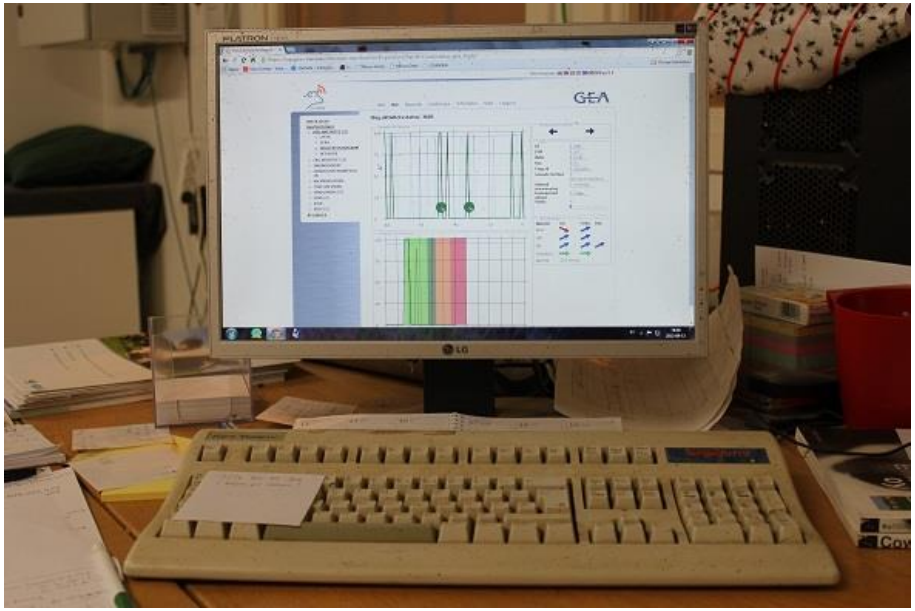
Digitalisation – a big challenge!



Type of Sensor	Measuring	Alerts
Movement Sensors	• Activity • Rumination • Eating time • Resting time • Lying time • Walking time	• Heat • Health • Calving • Lameness
Milk Analysis	• Progesterone • Ketones • Lactate Dehydrogenase • Fat and Protein • Colour • Somatic cell count • Conductivity	• Heat • Ketosis • Mastitis
pH	• Rumen pH	• Rumen health • Acidosis
Positioning	• Cow behaviour	• Heat • Location • Health
Cameras	• Heat • Body form • Movement	• Mastitis • Ketosis • Lameness • Body condition
Thermometer	• Temperature	• Health • Calving • Water intake

What do the farmers need?

Tina Dahl, Swedish dairy farmer



Technologies from Tina Dahl´s farm

Future needs – Tina Dahl

- Faster and more frequent updates
- Better integration between management-programmes
- Integration with feeding system

- Better analyses during pasture season

What do European farmers need?

A thematic network within Horizon 2020

4D4F – main objectives

- Developing a network for dairy farmers, dairy sensor technology suppliers, data companies, agricultural advisors and researchers.

- To explore ways to use data generated by dairy sensors.
- To support improved decision making by dairy farmers.

Questionnaire – future needs

- Farmers, advisors/veterinarians and scientists in 9 EU-countries
- 158 replies during spring 2018.

Questionnaire –results

- **Which areas need more sensor developments?**

  - Lameness
  - Udder health/mastitis

  - Calves and young stock (farmers)
  - Metabolic diseases (advisors)

Questionnaire –results

More research is needed

- on how to integrate multiple sensors and the data that they produce to improve timely decision making from the alerts

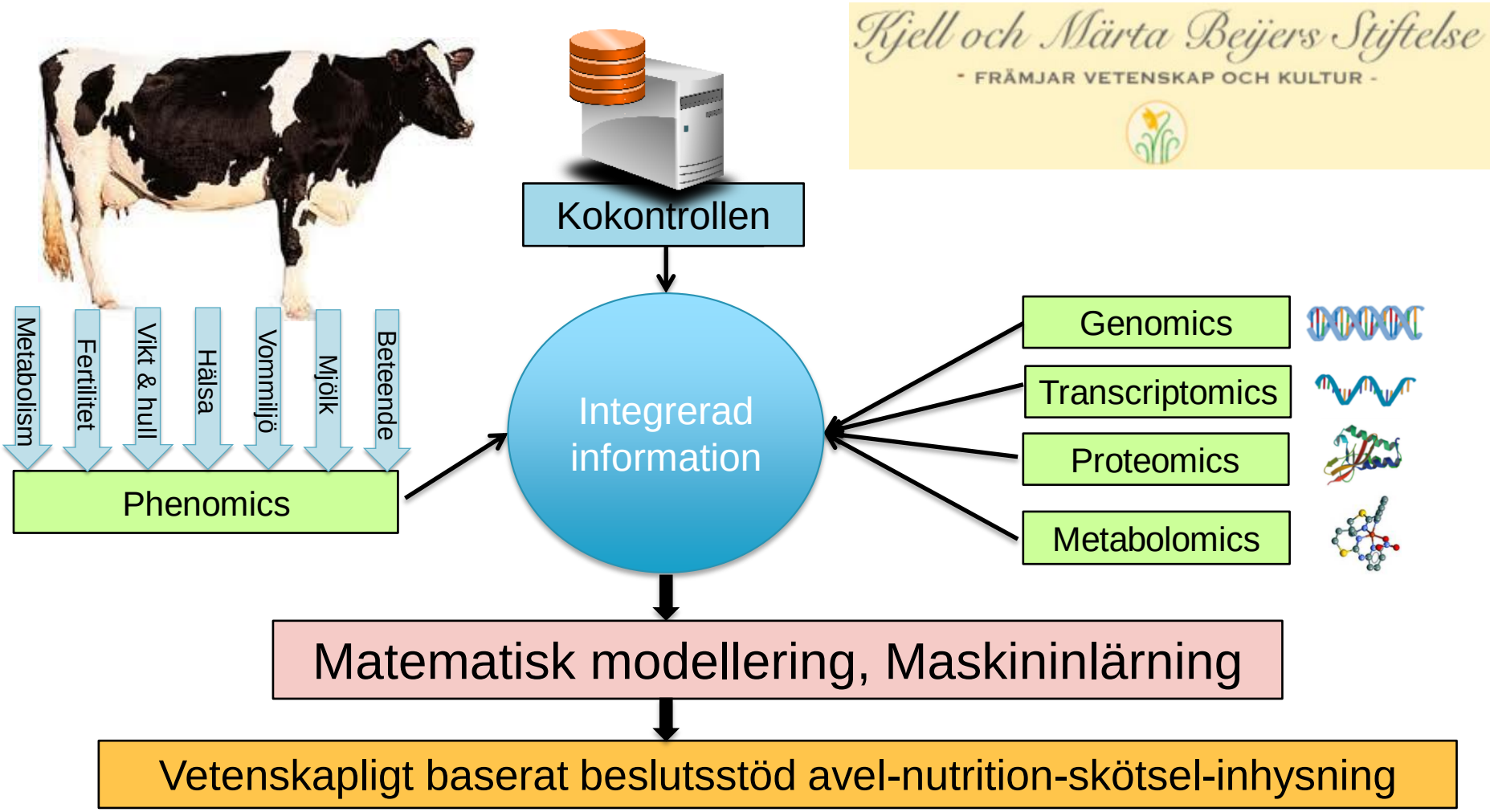
- on sensors which can capture specific dairy cow health issues for example, mastitis caused by *Escherichia coli*

- on detailed cost benefit analysis which will help farmers make informed decisions.

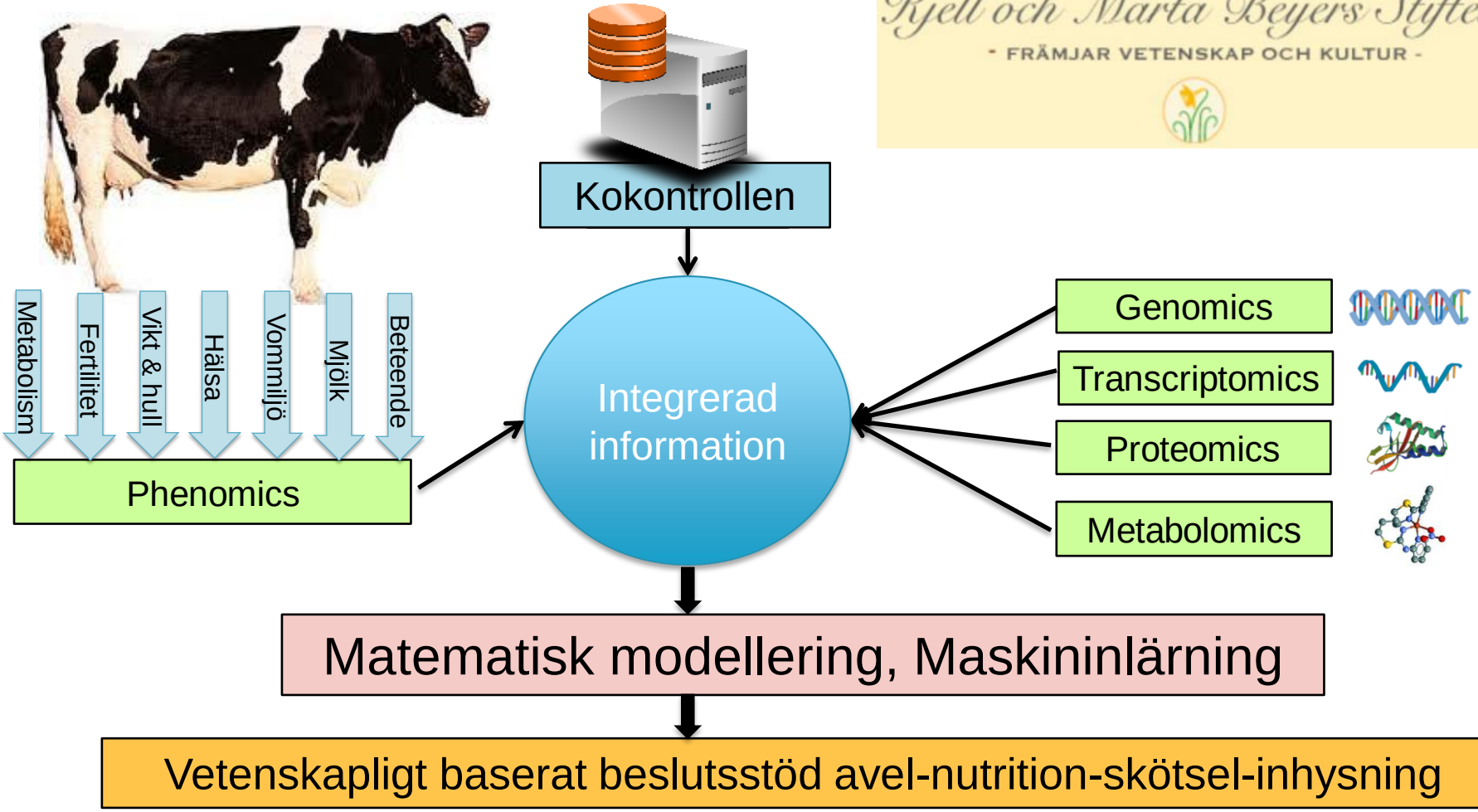
GIGACOW

An infrastructure for precision dairy cattle research - to be developed in Sweden

We need all this in one place



This place will be GIGACOW



Ambitions for GIGACOW

- A new opportunity for the Swedish dairy industry.
- A joined-up solution for collection, curation, enrichment and advanced analyses of Big Data.
- A network of modern dairy farms.
- Will replace the current practice of ad-hoc collection of farm data by individual research projects.
- A central resource for farmers, researchers, as well as industry and stakeholder organizations.

How?

- Create a network of dairy farms and dairy farmers. (3000 cows, 20-30 farms)
- Genotype all cows in the included herds.
- Develop a system for data exchange.
- Develop a database for efficient data storage and retrieval
- Develop procedures for data extraction
- Develop a data policy in line with the concept that the data that is collected belongs to the farmer.
- Use machine learning approaches to make novel inferences and predictions.

Challenges

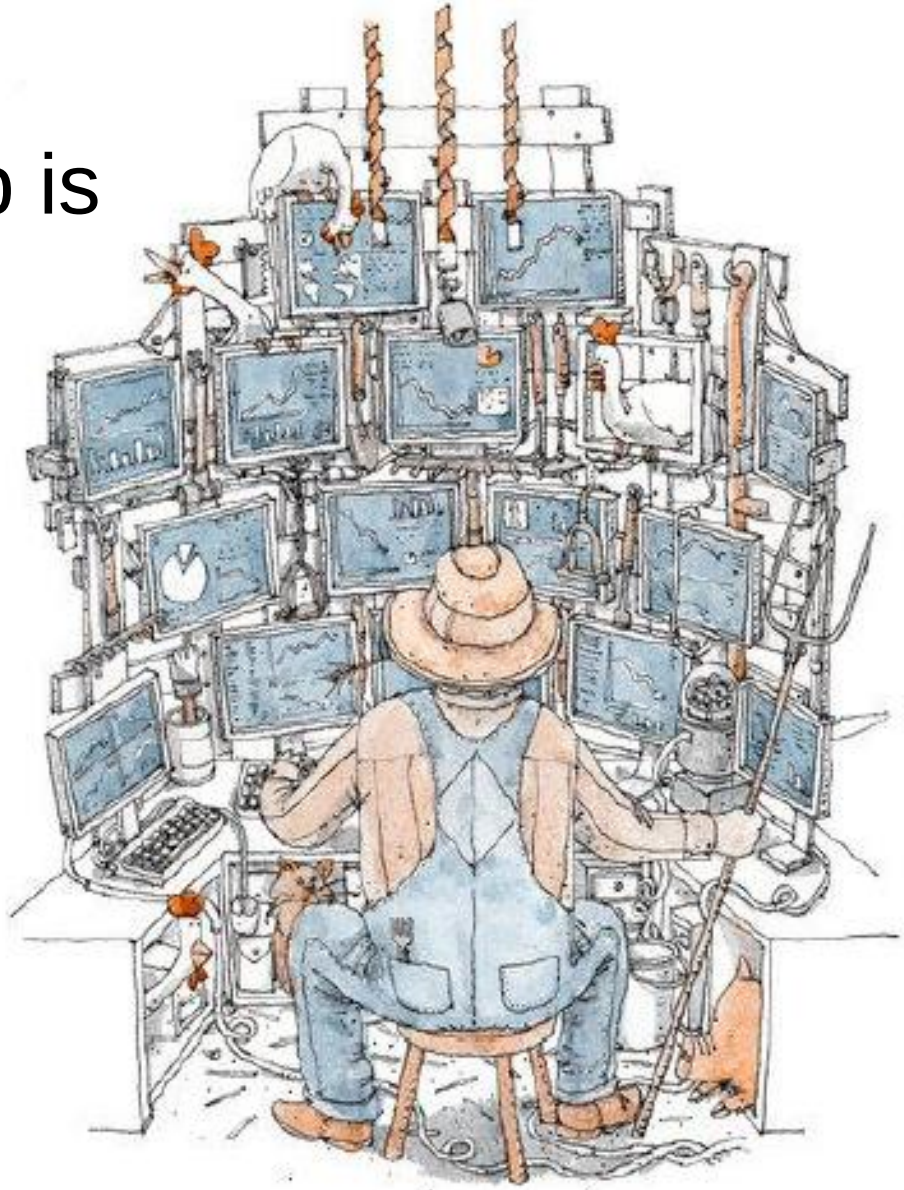
- Data access from current technologies (milking robots) often ‘hidden’ by companies
- Getting farmers on-board and building up network of users (that are willing to contribute)
- High-dimensional & longitudinal data
- Make this a permanent resources.

Interested parties so far:

- Växa Sverige
- Viking Genetics
- Beijer Laboratory Animal Sciences
- Aarhus University
- Lund University

Data ownership is the biggest challenge!

from my point of view



SLU

4D4F
Data Driven Dairy Decisions for Farmers

FEATURED VIDEO

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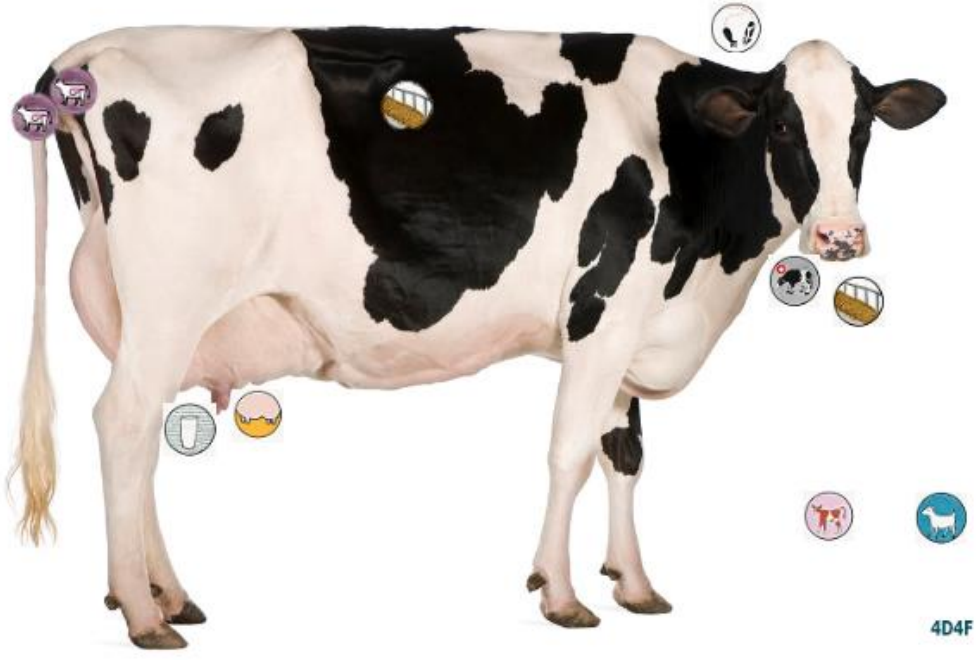
4D4F
Data Driven Dairy Decisions for Farmers

Technology warehouse

The "4D4F Technology Warehouse" gives an overview of the commercial technologies available to monitor and support cow health and performance. At this moment, we have compiled over 100 different sensor systems in our 4D4F Technology Warehouse. Click on the logo of your interest on the interactive cow image to access the Technology Warehouse.

Do you know a commercial sensor that is not yet on the list? Please let us know, and give us your feedback in the comment section below or mail us at info@4D4F.eu.

To download the "4D4F Technology Warehouse" document, click here



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4D4F - Data Driven I
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Body Condition Scoring (BCS) is a numeric scoring system for body fat energy reserves in a cow and is a good indicator for the nutritional status of a cow. Let's see the results of installing this technology in a farm:youtu.be/MYNUHE04V_Y #H2020 @EU_H2020

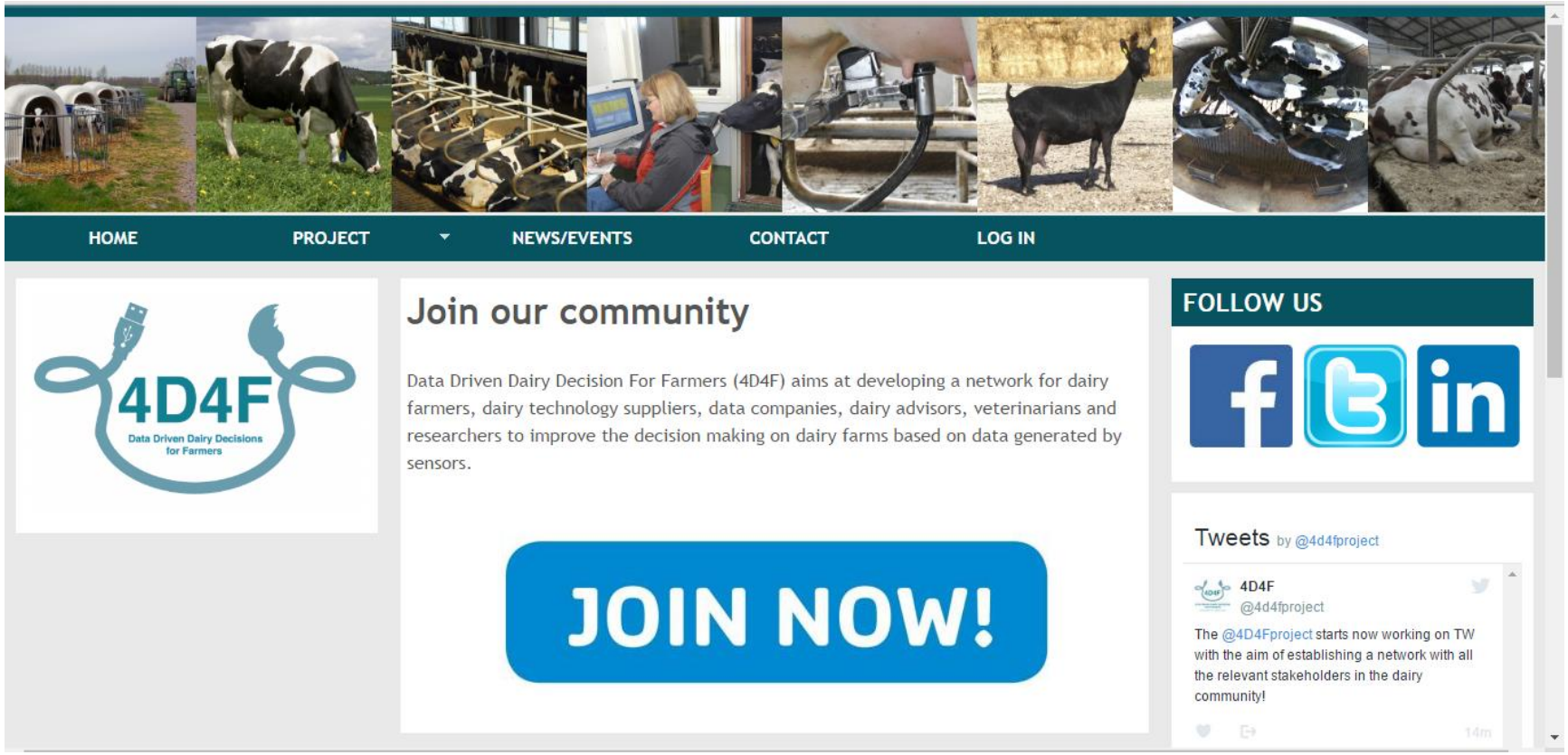
YouTube @YouTube

3h

4D4F - Data Driven Dairy Decisions For Farmers Retweeted

M3-BIORES

4D4F website



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www.4d4f.eu