



Interreg



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the European Union

North-West Europe

HoliCow

HoliCow – a new transnational approach to get the best out of DHI data collection and FT-MIR spectral data

Julie Leblois, awé groupe, project coordinator
ICAR conference, 23/05/2024, Bled

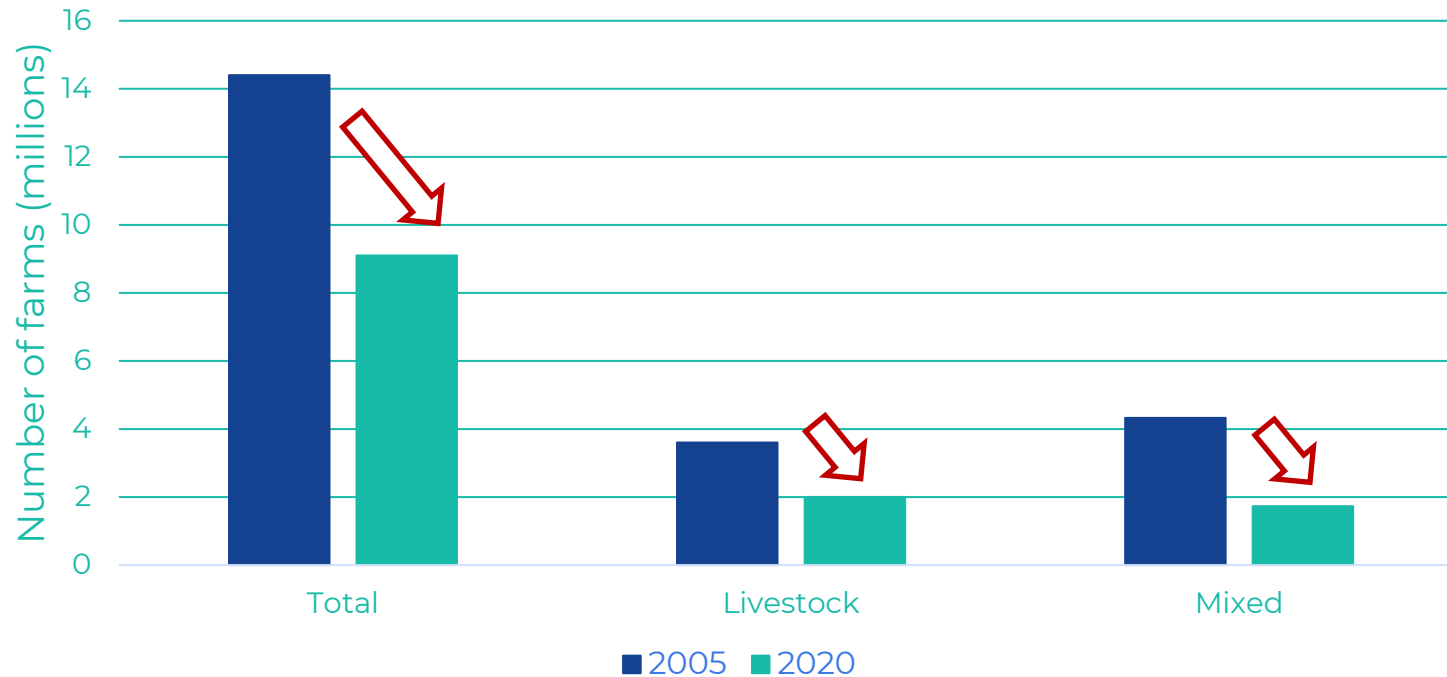


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HoliCow



Evolution of the number of farms (Eurostat)



- Unfair income
- Agri-bashing
- Farms are more and more connected
 - Huge amount of data
 - Management becomes very complex, especially for small ones with low manpower



Renewal of
generations is
very complicated



HoliCow - Enable small/med dairy farmers to benefit from big data for holistic decision-making

- 23/03/2023 → 30/06/2026
- 4,758,339.06€, 60% ERDF funding (2,855,003.42€)
- 12 partners, 7 countries



7 milk recording organizations

1 IT center

3 research centers / universities

1 association defending breeding companies



HoliCow - Enable small/med dairy farmers to benefit from big data for holistic decision-making

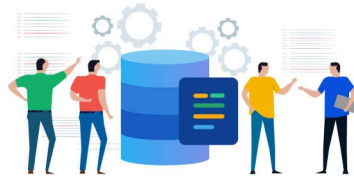


Several topics – 3 work packages

WP1

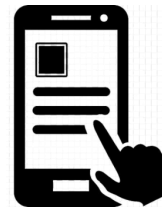
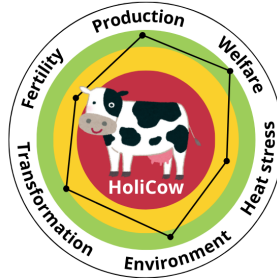


Data for farm tools



Tools for farmers

WP2



People for farmers

WP3



WPI

Data for farm tools



Transnational database



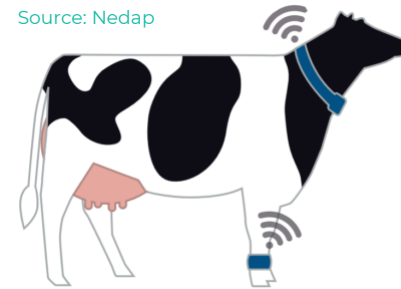
Community solution database



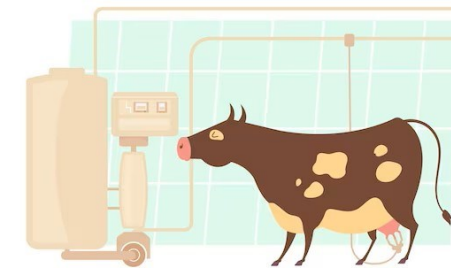
WPT1 Data for farm tools



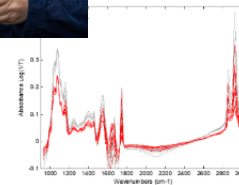
Source: Nedap



Animal sensors



Milking robots



Milk recording data



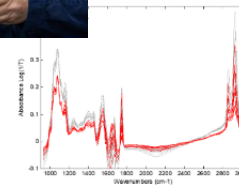


WPT1

Data for farm tools



Past projects → developement of predictive models for biomarkers

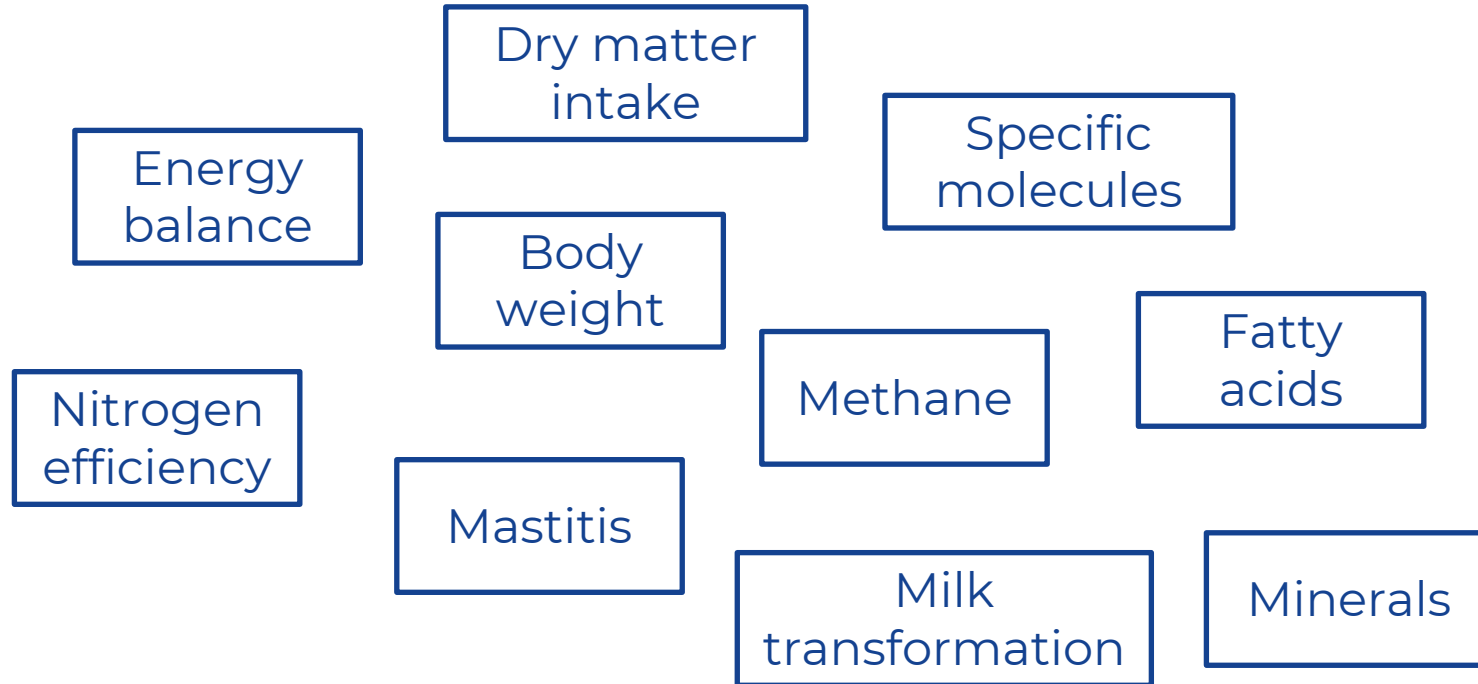


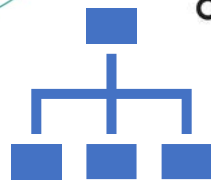
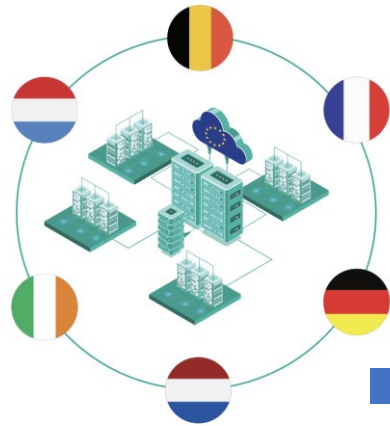
Milk recording data



WP1

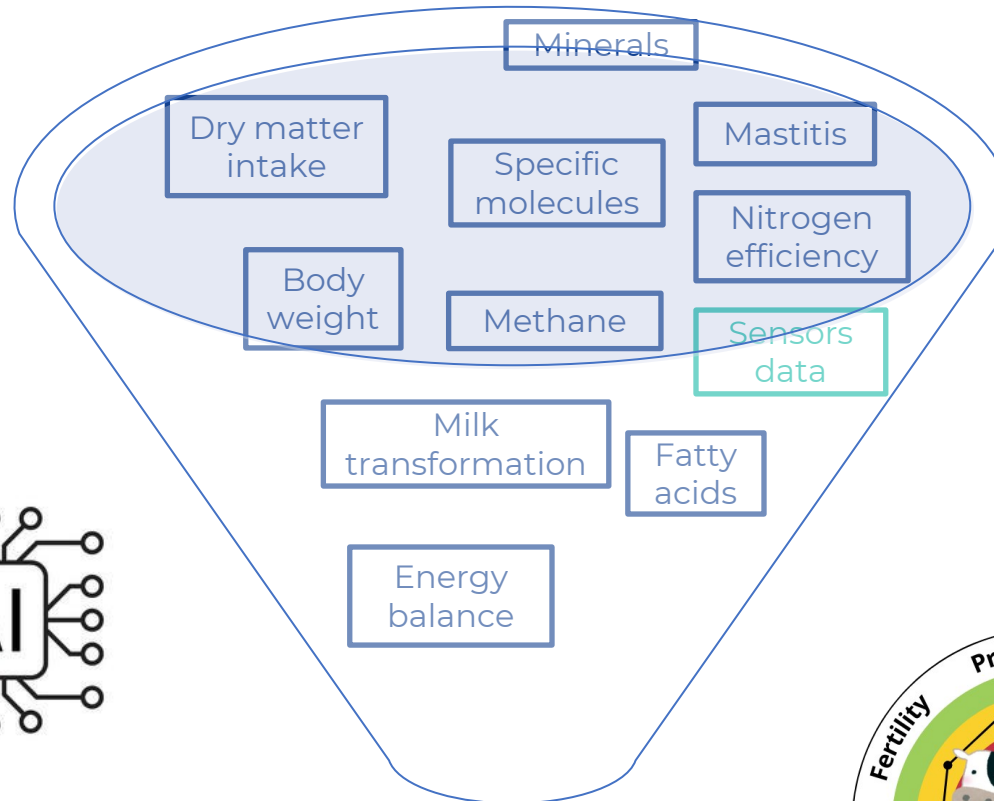
Data for farm tools



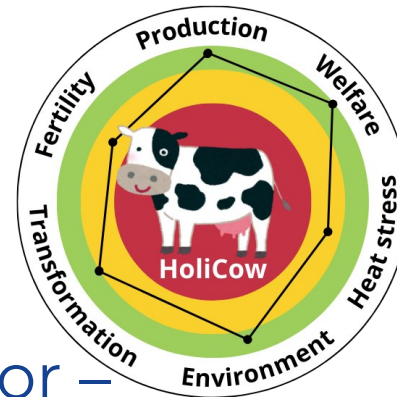


Clustering

Pilot farms involvement

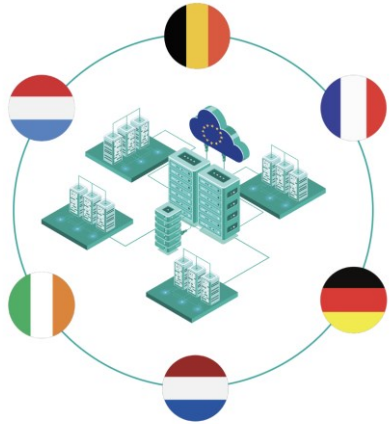


Summarized indicator – easy tool for farmers



WP1

Data for farm tools



63 millions of spectral data!

Transnational database

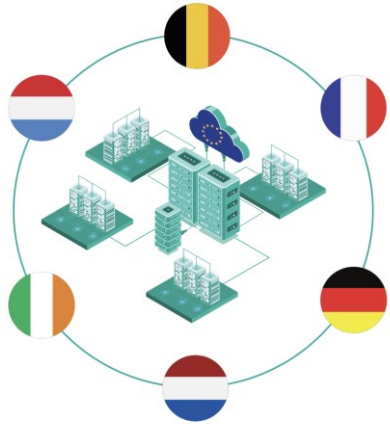
- 5 countries
- 63 millions of spectral data
- 5.6 millions of dairy cows
- 33,300 dairy farms



Harmonization of data formats

(Grelet et al. 2015)





63 millions of
spectral data!

WP1

Data for farm tools

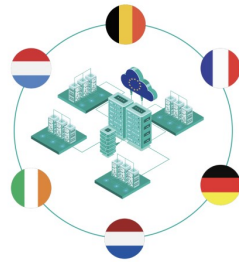
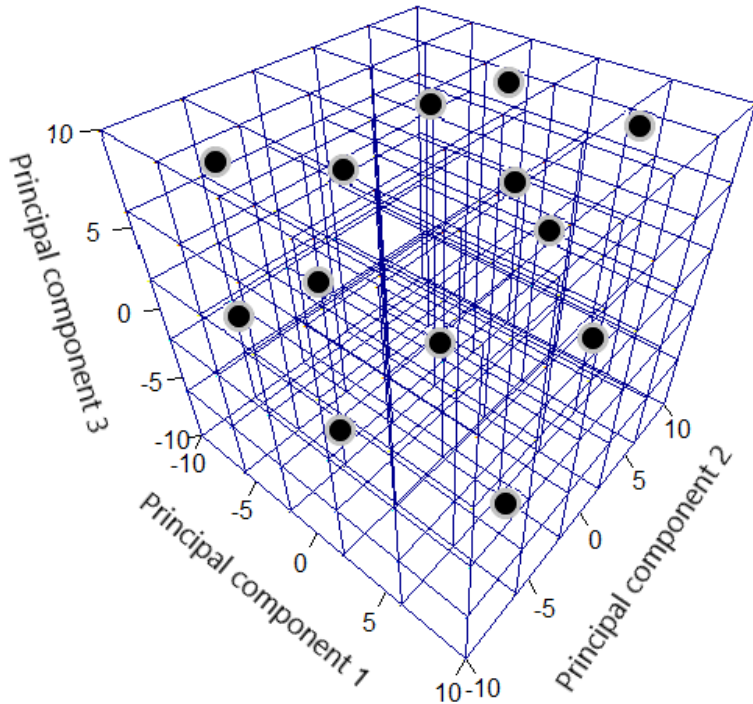


WP1

Data for farm tools



1. Data reduction ✓



63 millions of spectral data!

Method developed within ExtraMIR (Soyeurt) : World Representative Spectral Database





2. Inventory of the FT-MIR prediction equations ✓

- >500 prediction equations identified
- After cleaning: 200



3. API construction to calculate all predictions ✓



Final file: 200 predictions for each spectra selected
by the WRSD method





Ongoing work

- Modelling for clustering based on
 - Spectral data
 - Predictions

- Types of considered models – unsupervised learning methods (tools: Auto-ML, autoencoder, incremental clustering)



Summary data treatment

Data in the transnational DB



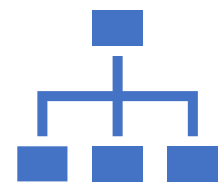
Data reduction (spectra)



Calculation of predictions



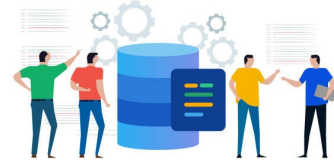
Unsupervised learning for clustering



6 clusters

Clustering





Community solution database

- Advice about solutions to the problems addressed
- Possibility to provide feedback on the tool



WP1

Data for farm tools



Farmers
- Pilot farms
- Larger scale

Advisors

my@arenet

Accès intranet AWE

- Général
- Animal
- Editions
- Troupeau viande
- Troupeau lait
- Mise à jour Ariane
- Wallonie Elevages
- Helpline



Alert



Heat stress problem identified
Solutions proposed:

- Allow animals inside
- Increase water points
- Use ventilation fans
- Trees on pasture
- Other solution: note it



WPT1

Data for farm tools



my@wepnet

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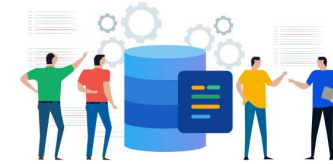
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WPT1

Data for farm tools



my@wénet

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Heat stress problem identified
Solutions proposed:

Allow animals inside

Was this solution effective?/Please rate this solution

☆☆☆☆☆



WP1

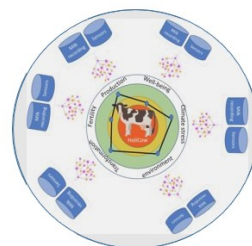
Data for farm tools



my@awenet

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Accès intranet AWE



Heat stress problem identified
Solutions proposed:

Allow animals inside

Was this solution effective?/Please rate this solution

★★★★☆

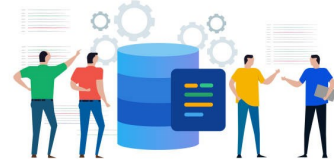
Feedback to be stored



Probably possibility to write detailed feedback too (farmers, advisors)

WPT1

Data for farm tools



my@arenet

Accès intranet AWE

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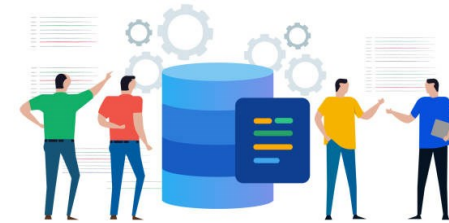
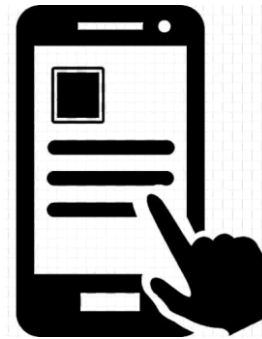
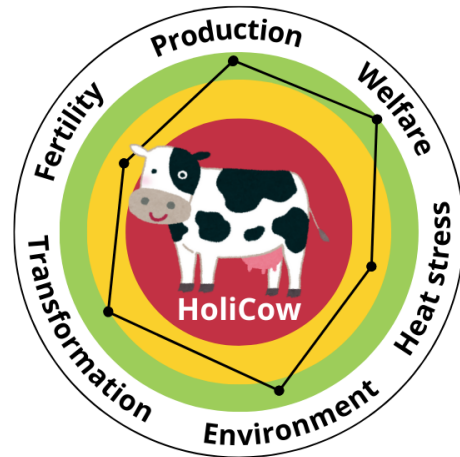
- Allow animals inside
- Increase water points
- Use ventilation fans
- Trees on pasture
- Other solution: write here



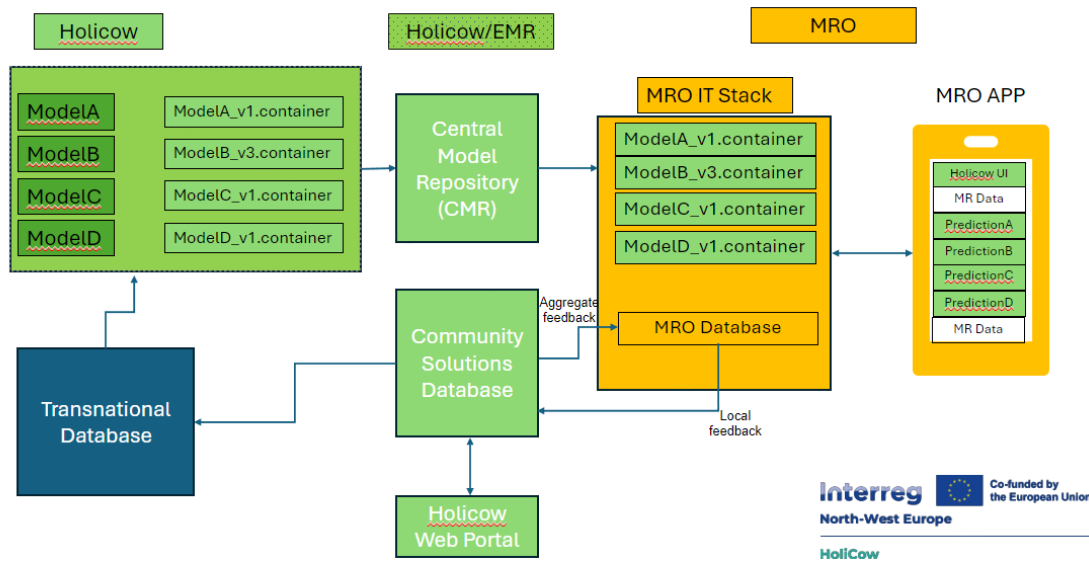
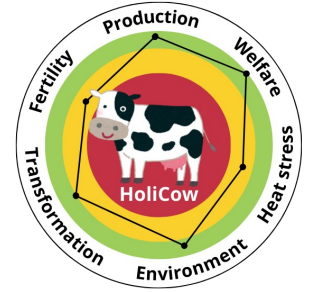
New solution to be stored and proposed

WP2

Tools for farmers



WP2 Tools for farmers

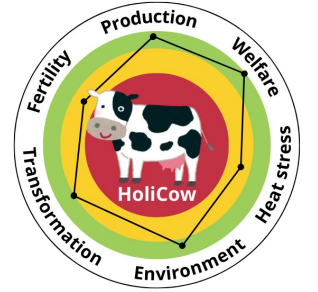


Development of the data flow structure and requirements at the different levels

- HoliCow
- MROs
- EMR



WP2 Tools for farmers



- IT implementation of the developed clustering methods (development of APIs and Dockers)

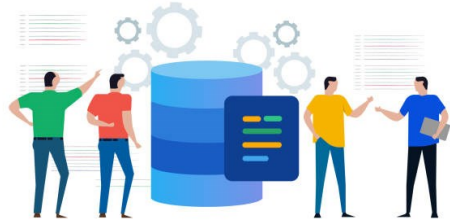
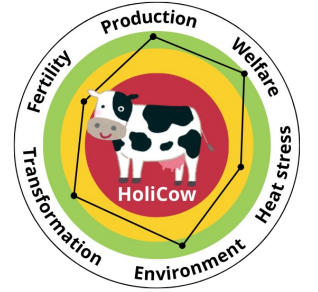


- Documentation for the implementation in the different MROs' platforms



- Training of IT staff from the MRO partners (webinars)





Technical production of the community database



Quality Assurance for spectral data & modelling





WP3

People for farmers



WP3 People for farmers



1. Training of farmers and advisors to the developed tools (report, community database)



Organisation of training sessions



Production of explanatory documents



Training on farms



Webinars, MOOCs

WP3

People for farmers



2. Sensibilisation of rural communities to the importance of farming livestock → support from community to farmers



Take-home messages

- Functional database containing 63 millions spectra (more to come)
- Data processing is challenging
 - Volume of data
 - Data sources
- Creation of a « solutions » oriented database
- Involvement of pilot farms throughout the entire project
- Communication to general public about farming is key





Thank you!

Julie Leblois,
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