



OptiMIR: new tools for a more sustainable dairy sector

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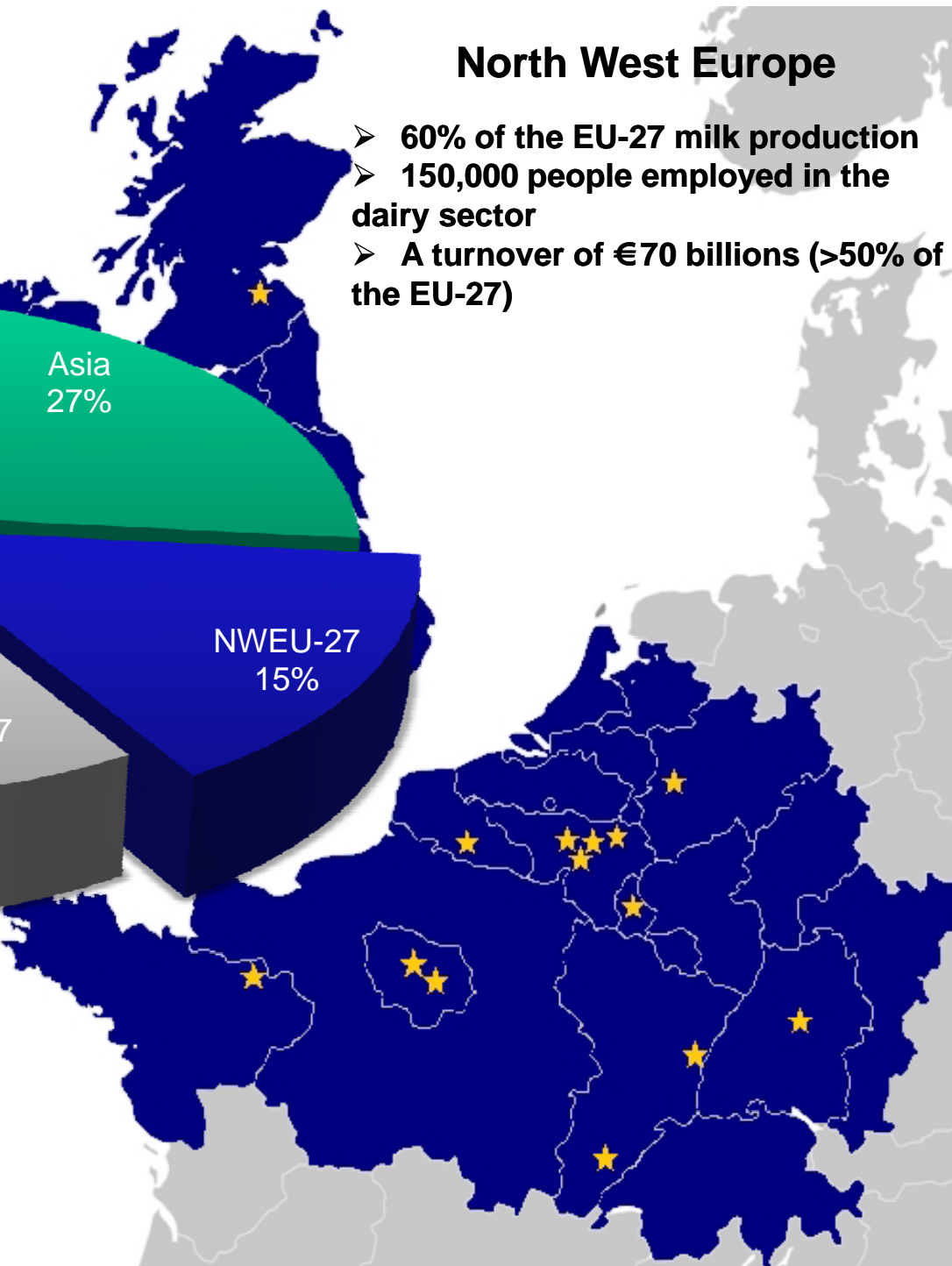
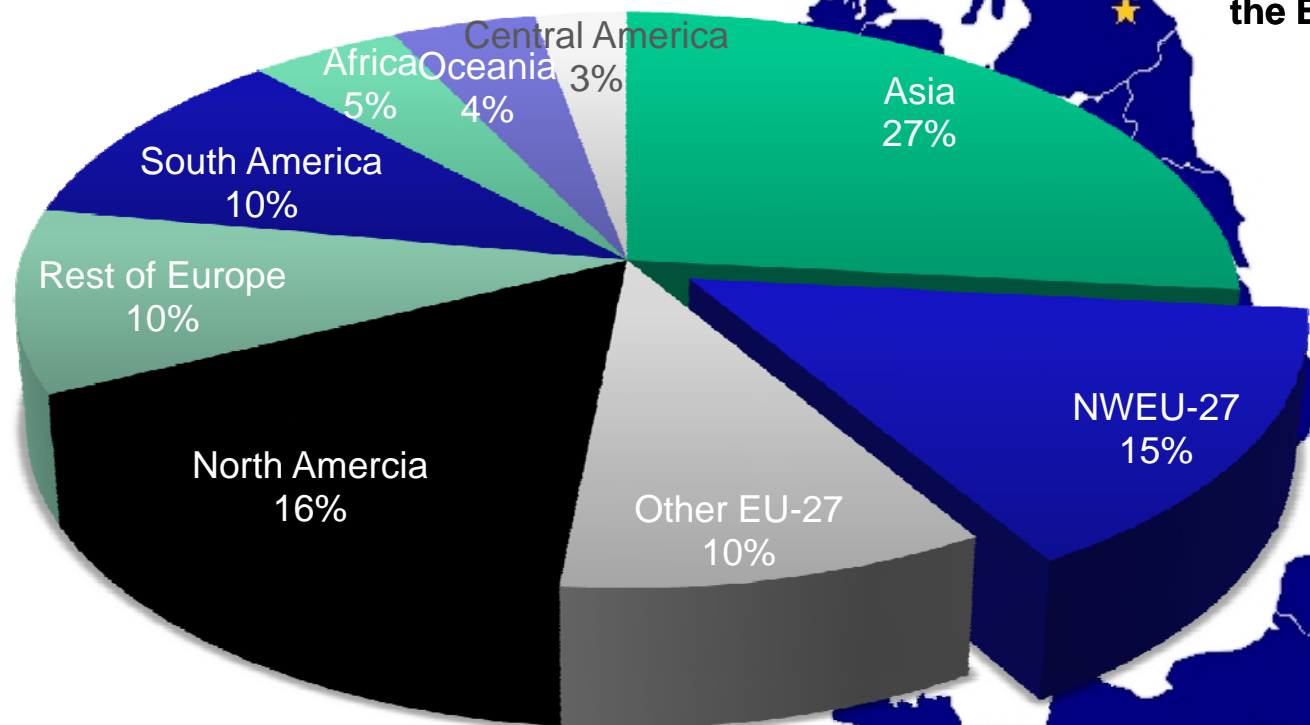


Walloon Agricultural Research Centre
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Farming Systems, Territory and Information Technologies Unit
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North West Europe

- 60% of the EU-27 milk production
- 150,000 people employed in the dairy sector
- A turnover of €70 billions (>50% of the EU-27)





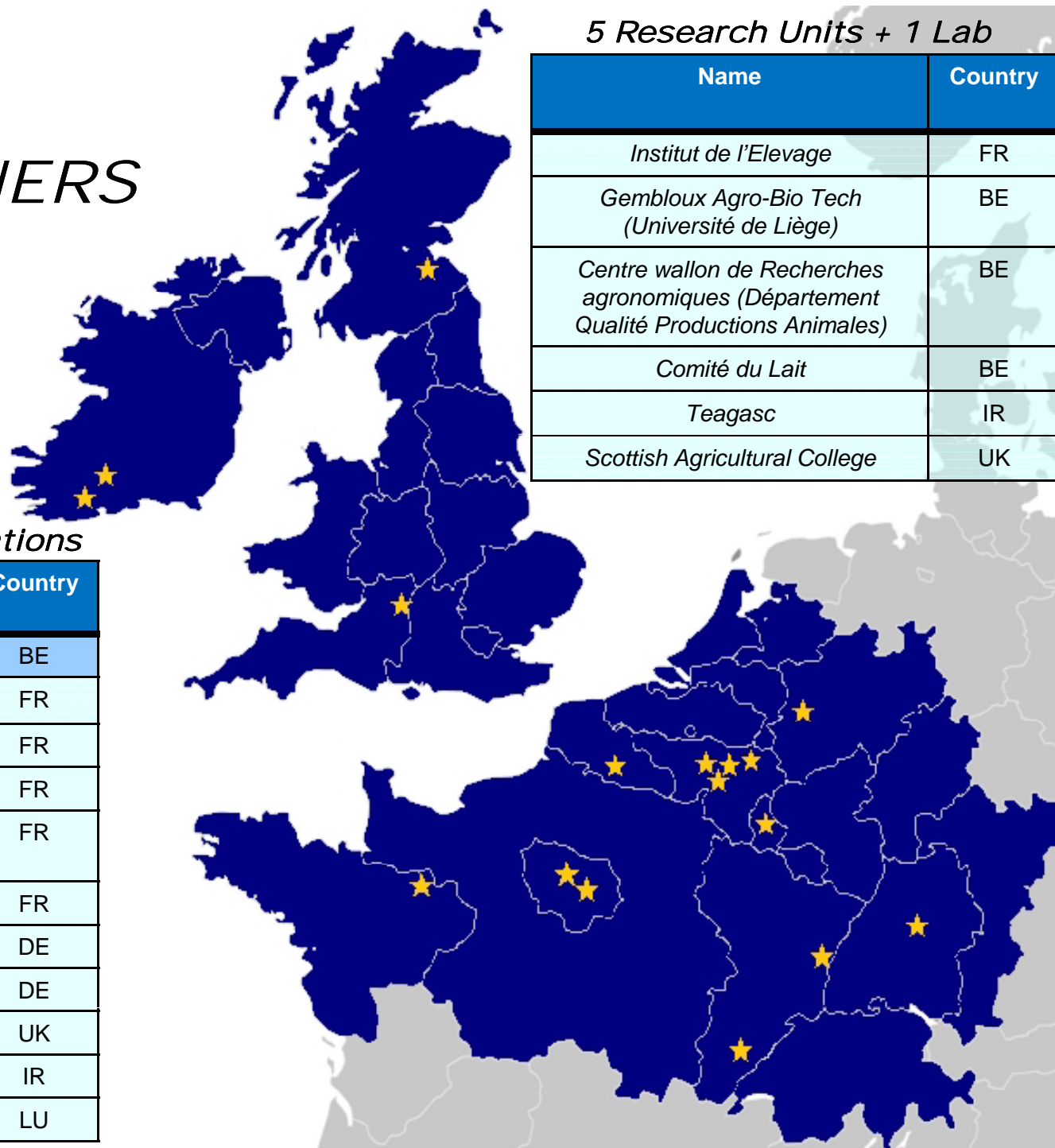
PARTNERS

5 Research Units + 1 Lab

Name	Country
<i>Institut de l'Elevage</i>	FR
<i>Gembloux Agro-Bio Tech (Université de Liège)</i>	BE
<i>Centre wallon de Recherches agronomiques (Département Qualité Productions Animales)</i>	BE
<i>Comité du Lait</i>	BE
<i>Teagasc</i>	IR
<i>Scottish Agricultural College</i>	UK

11 Milk Recording Organizations

Name	Country
<i>Association Wallonne de l'Elevage</i>	BE
<i>Chambre régionale Agriculture Alsace</i>	FR
<i>ADECL62 (Pas-de-Calais)</i>	FR
<i>CLASEL (Sarthe & Mayenne)</i>	FR
<i>SCL du Doubs et du territoire de Belfort</i>	FR
<i>France Conseil Elevage</i>	FR
<i>LKV Baden-Württemberg</i>	DE
<i>LKV Nordrhein-Westfalen</i>	DE
<i>National Milk Recording</i>	UK
<i>Irish Cattle Breeding Federation</i>	IR
<i>CONVIS</i>	LU





AIMS

To improve the profitability and sustainability of the dairy sector by providing milk producers with innovative standardized management tools based on association between MIR milk records and cows' status :

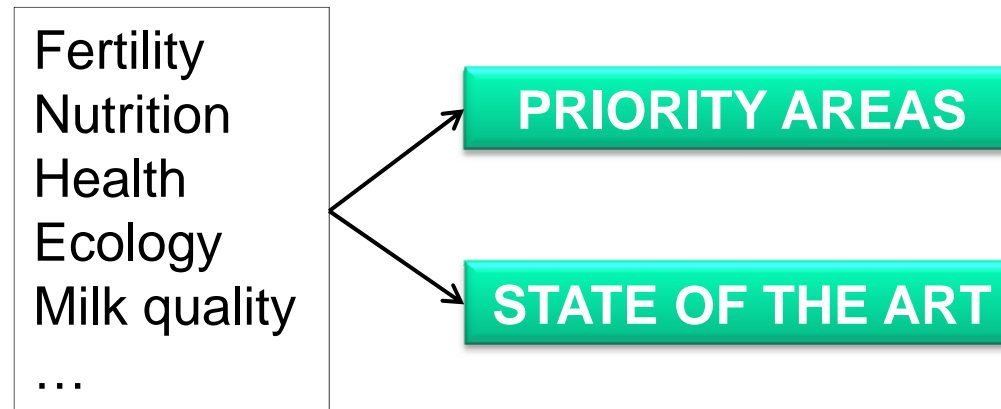
- ✗ To reduce the costs of production through improved daily herd management for example :
 - ➔ costs of feeding with energetic balance indicator
 - ➔ veterinary costs with early diagnosis of mastitis
 - ➔ costs of semen straws with insemination predictor
- ✗ To bring opportunities to access competitive markets by measuring quality traits linked to higher added value (e.g. low-cost measure of food label claims).
- ✗ To decrease the impact on the environment (quantification of methane and nitrogen production).



OBJECTIVE 1

To share experience, knowledge and existing expertise in milk sector

We need priority areas and the state of the art in each area



Work packages of the Project

WP 1 : Guidelines - Define priorities and state of the art in achieving profitability and the sustainability of the dairy sector

WP2 : Development - To develop operating prototype of tools relevant to priorities defined in WP1

WP 3 : Implementation, Validation & Roll-out : to provide stakeholders with a low-cost, users friendly and up-to-date access to validated web-tools through a private web-account

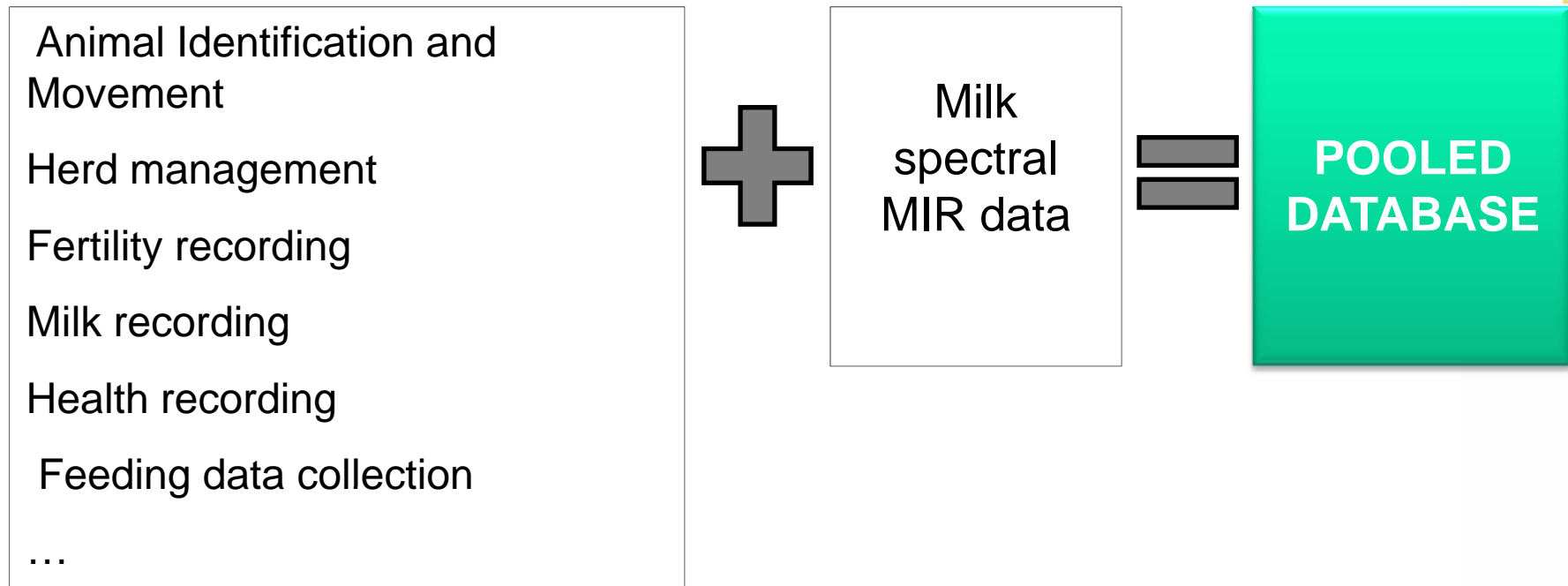
A 1 : Sector's Survey

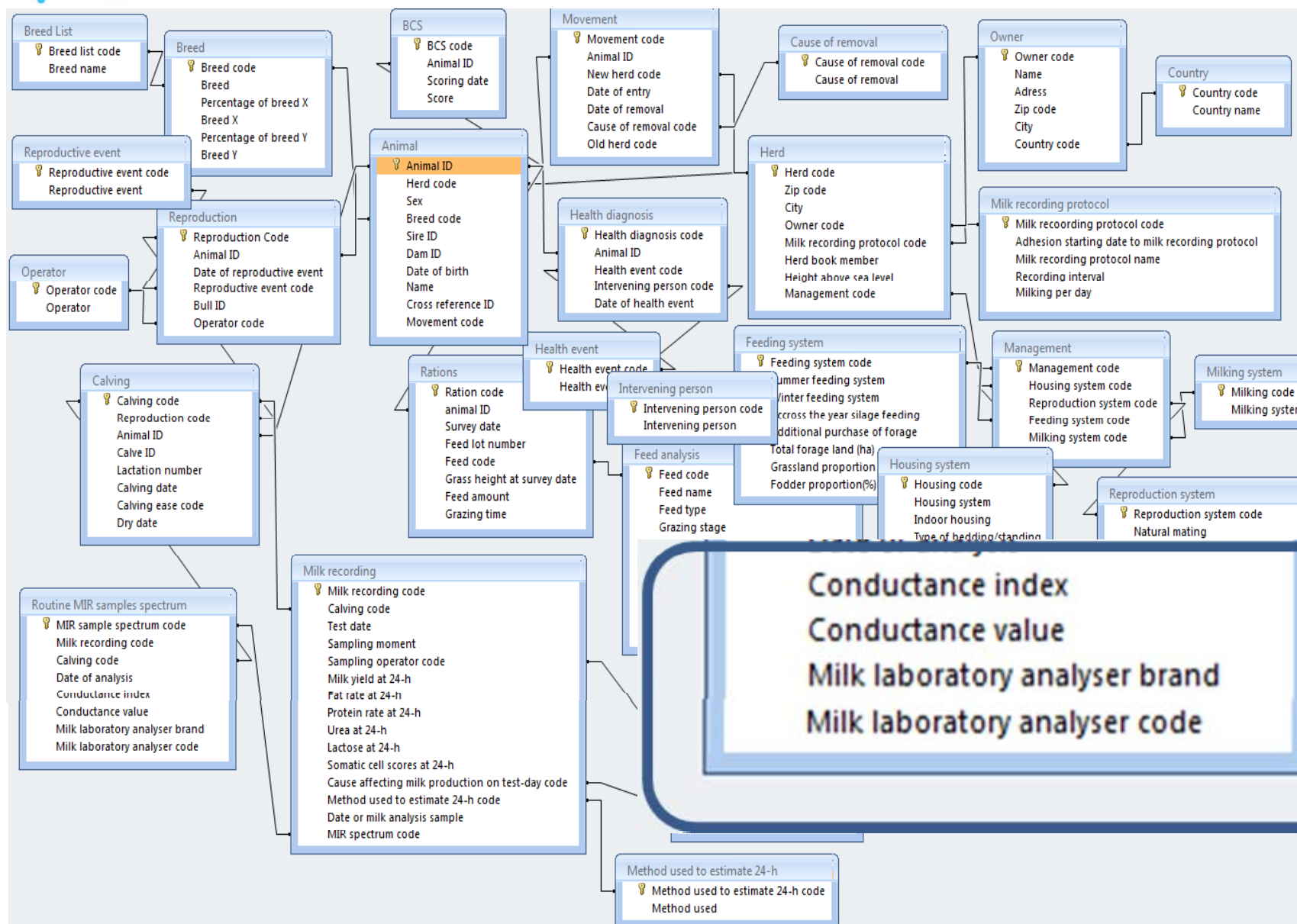
A 2 : Experts' Group

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OBJECTIVE 2

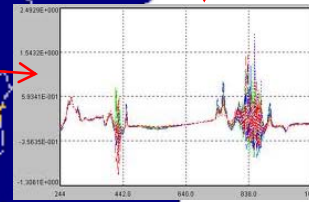
To pool the resources of milk recording organizations and research centres on the priority areas defined and on MIR milk spectra







STANDARDIZATION

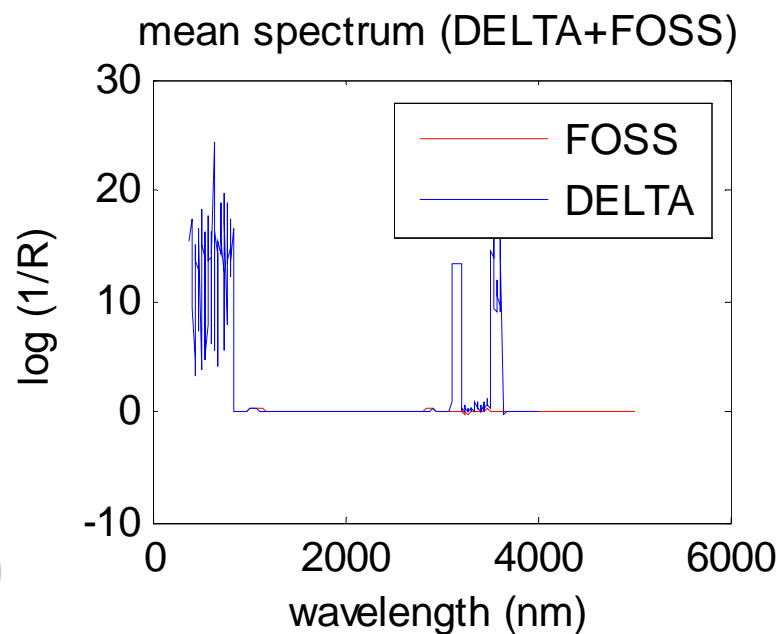
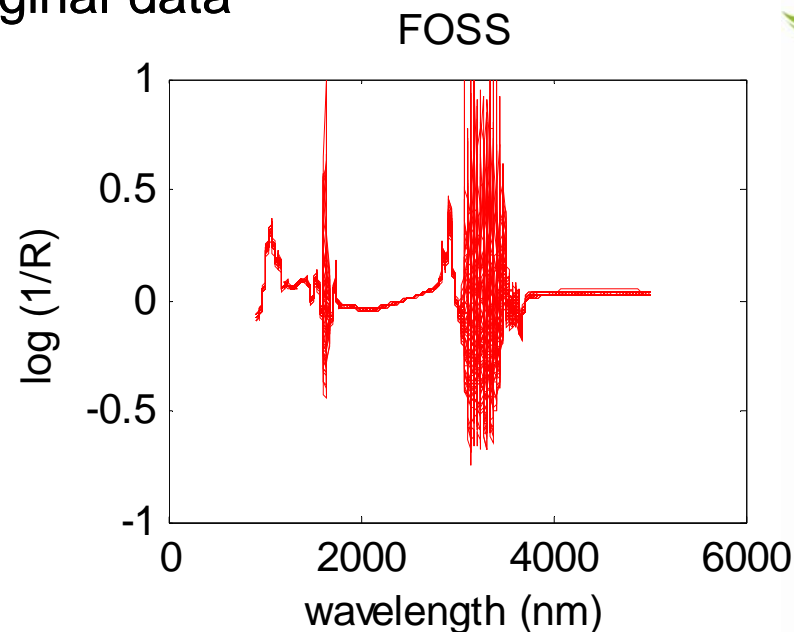
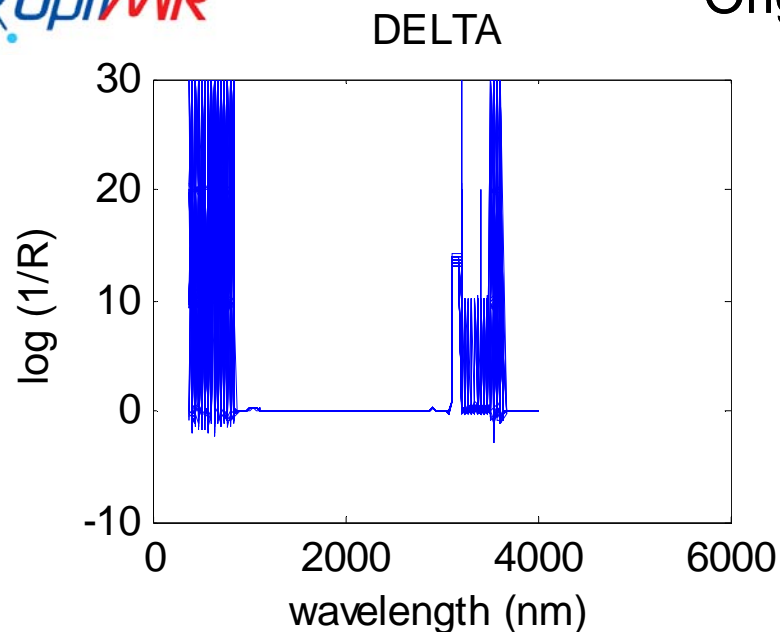


INTERREG IVB



Example of 70 samples measured with 2 different instruments (Delta & Foss)

Original data



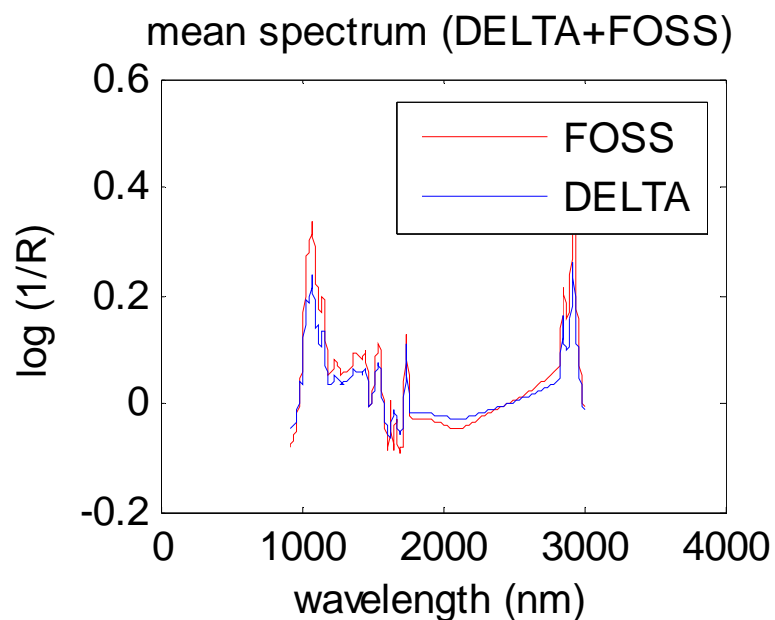
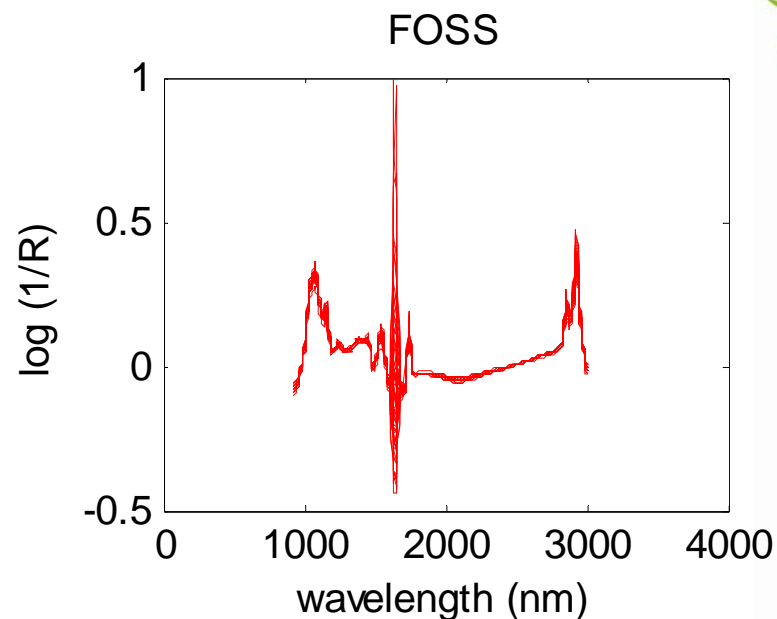
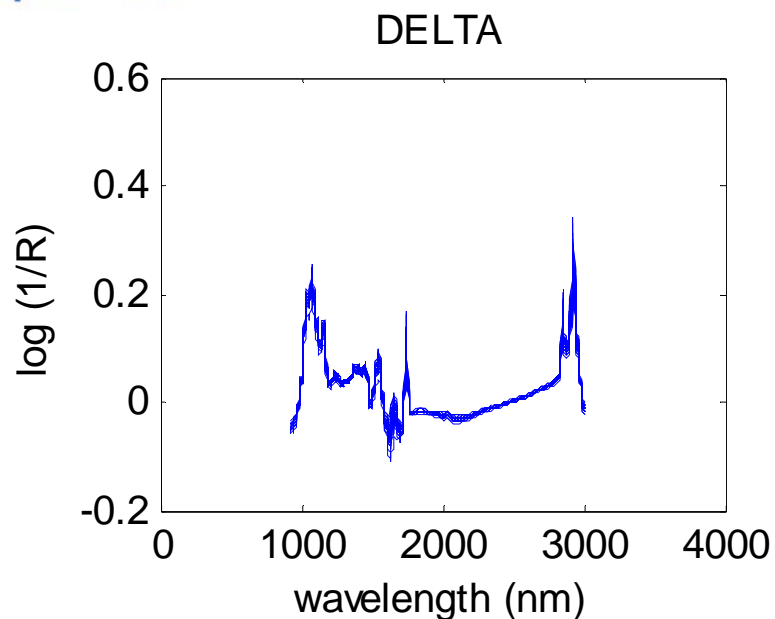
Foss: 1060 wavenumbers not fixed step
Delta: 935 wavenumbers not fixed step



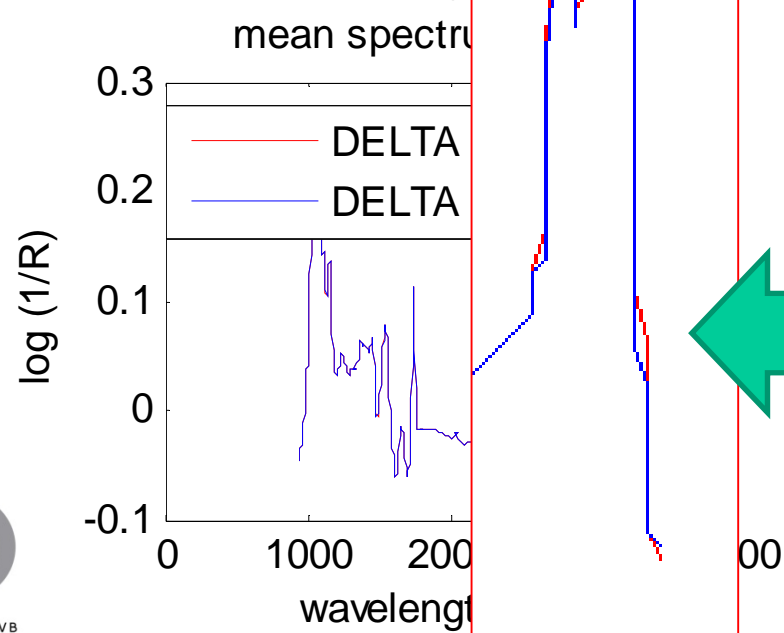
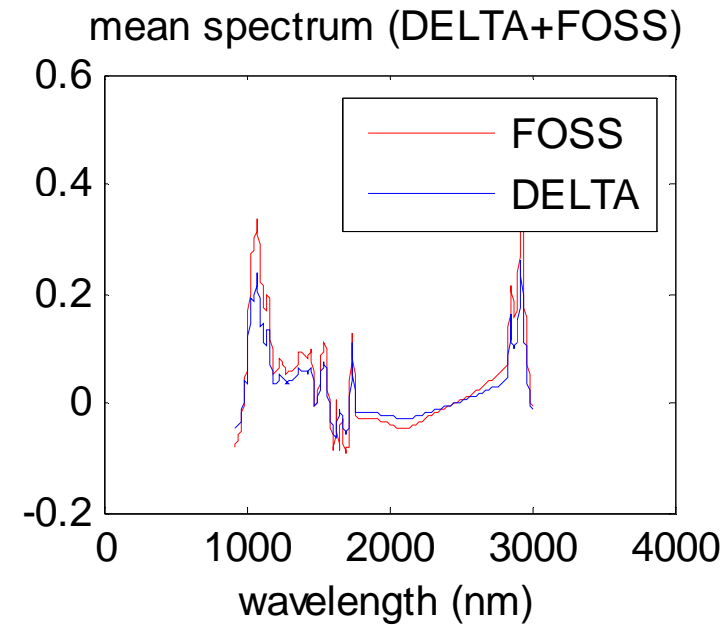
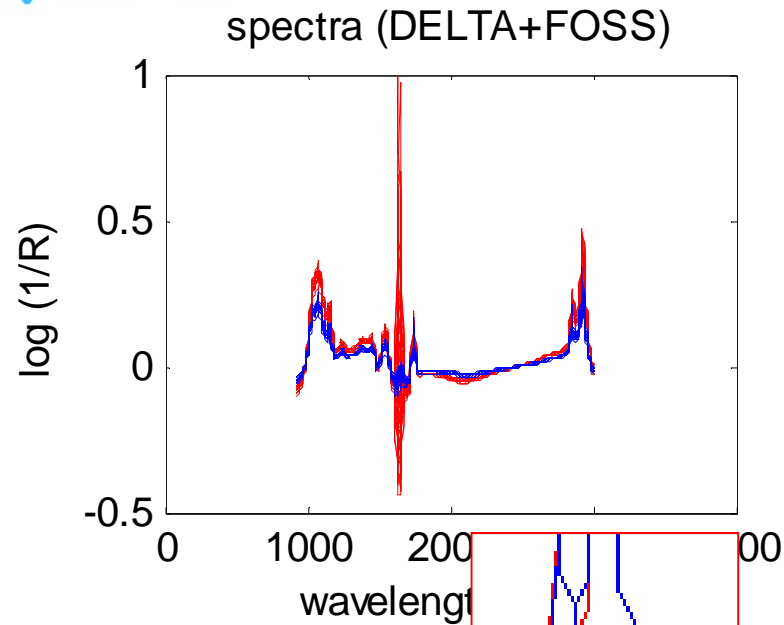
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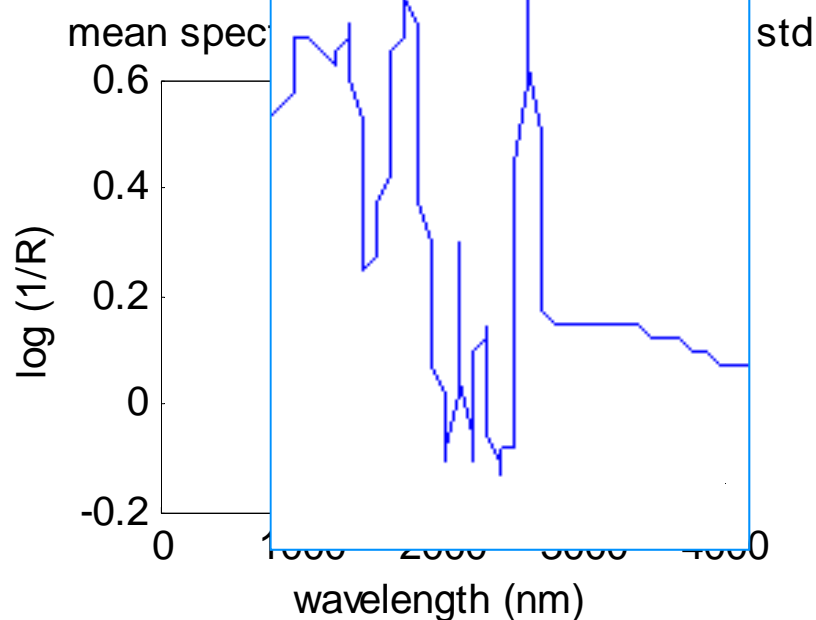
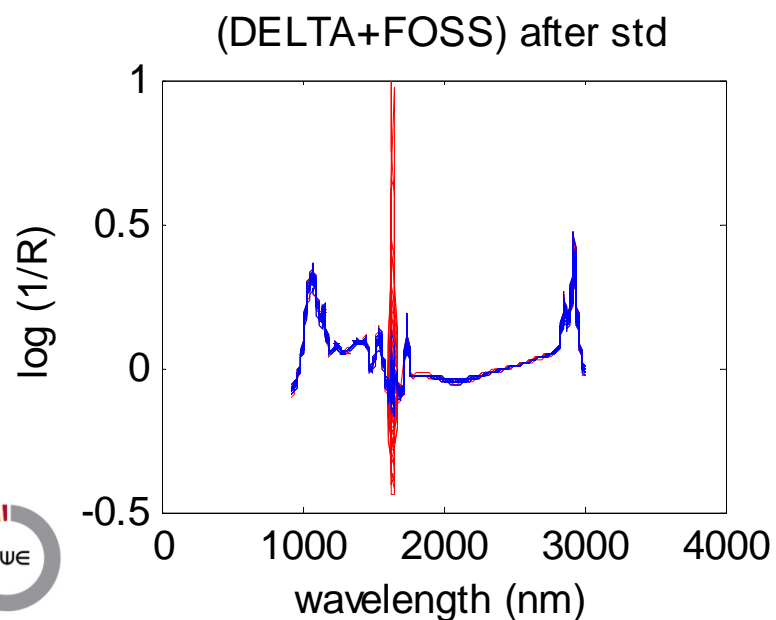
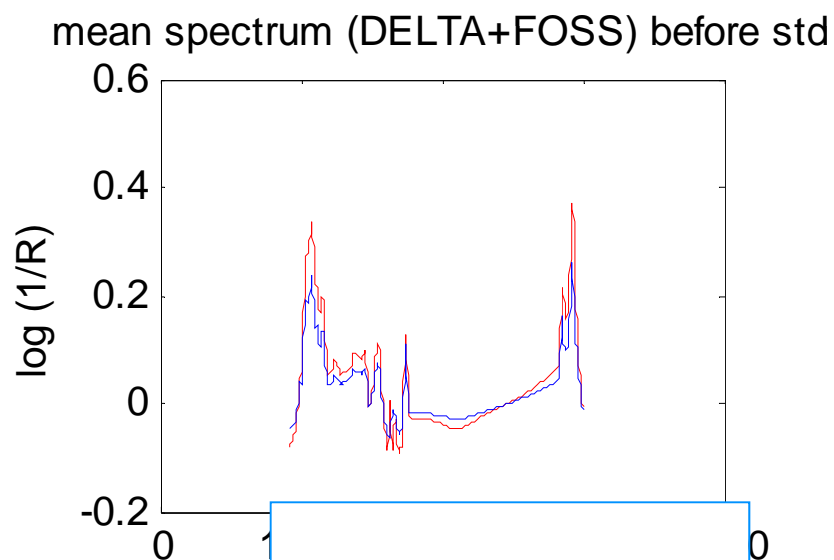
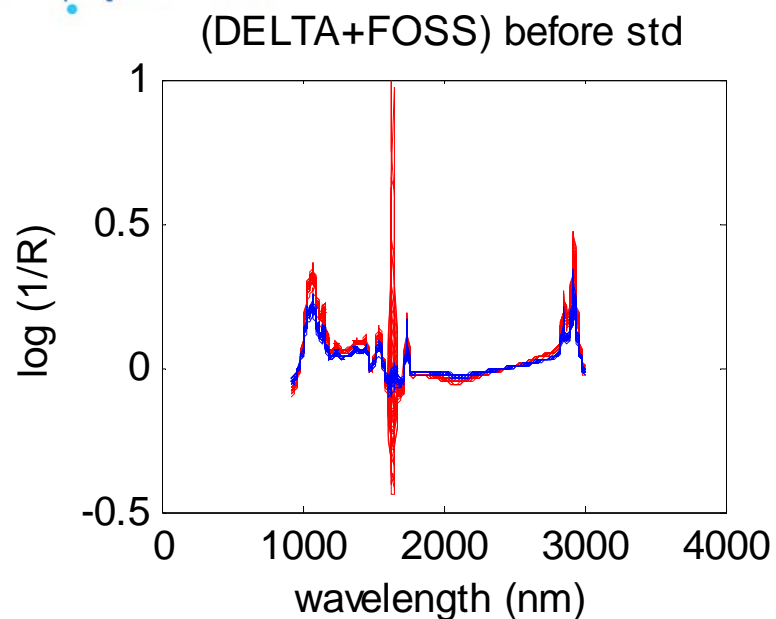
Original data removing part of the spectra



Data after interpolation of DELTA spectra to the FOSS range



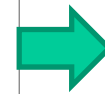
Data after PDS of DELTA spectra



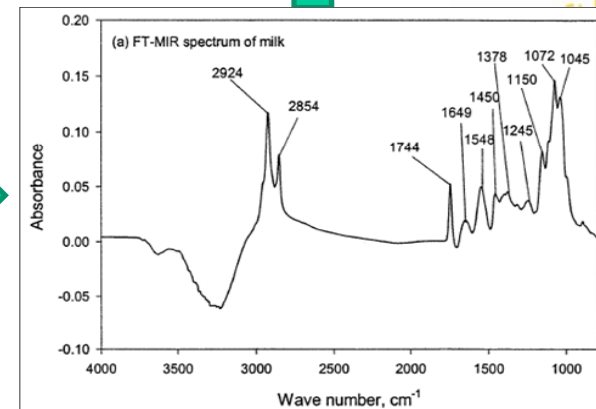
OBJECTIVE 3

To identify relevant associations between animal phenotypes and the shape of MIR milk spectra

Pregnant cows ...
Cows with a negative energy balance...
Cows with mastitis ...
Cows producing few methane ...
Cows giving milk with nice fatty acid profile ...
...



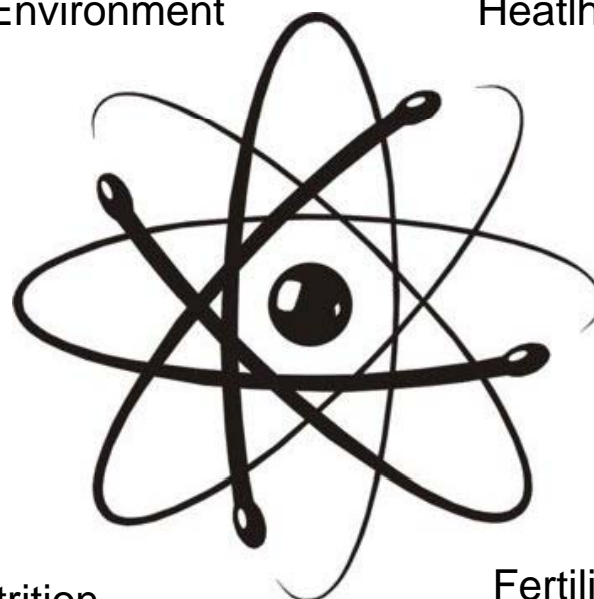
New performance indicators based on MIR





Environment

Health



Nutrition

Fertility

UNIVERSITÄT HOHENHEIM



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OBJECTIVE 4

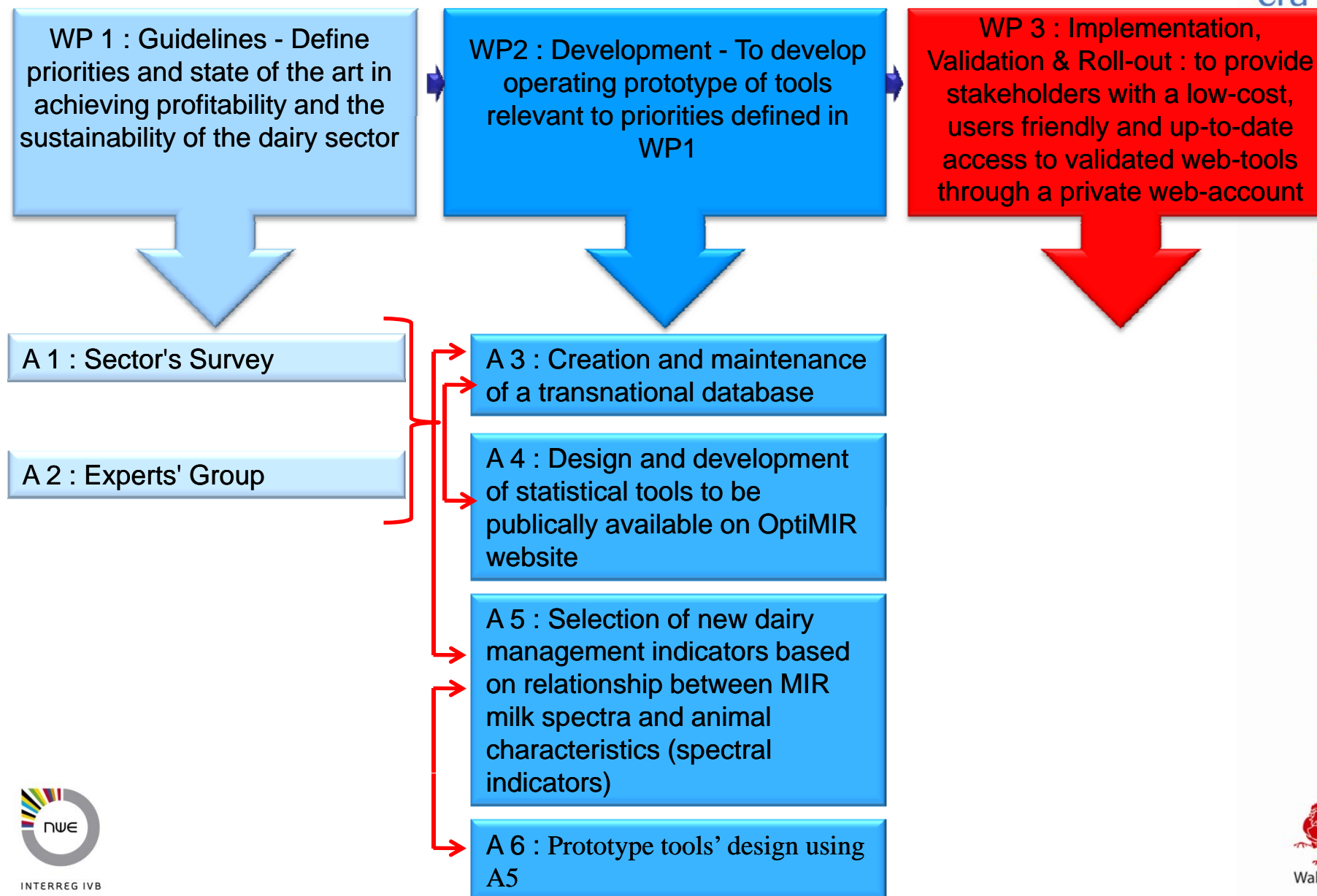
To develop an operating prototype of web-based tools

Pregnancy diagnosis...
Evaluation of energy balance...
Early detection of mastitis...
Estimation of methane production...
Measurement of fatty acids...
...

INFORMATION TOOLS

**ADVISORY & DECISION
MAKING TOOLS**

Work packages of the Project



OBJECTIVE 5

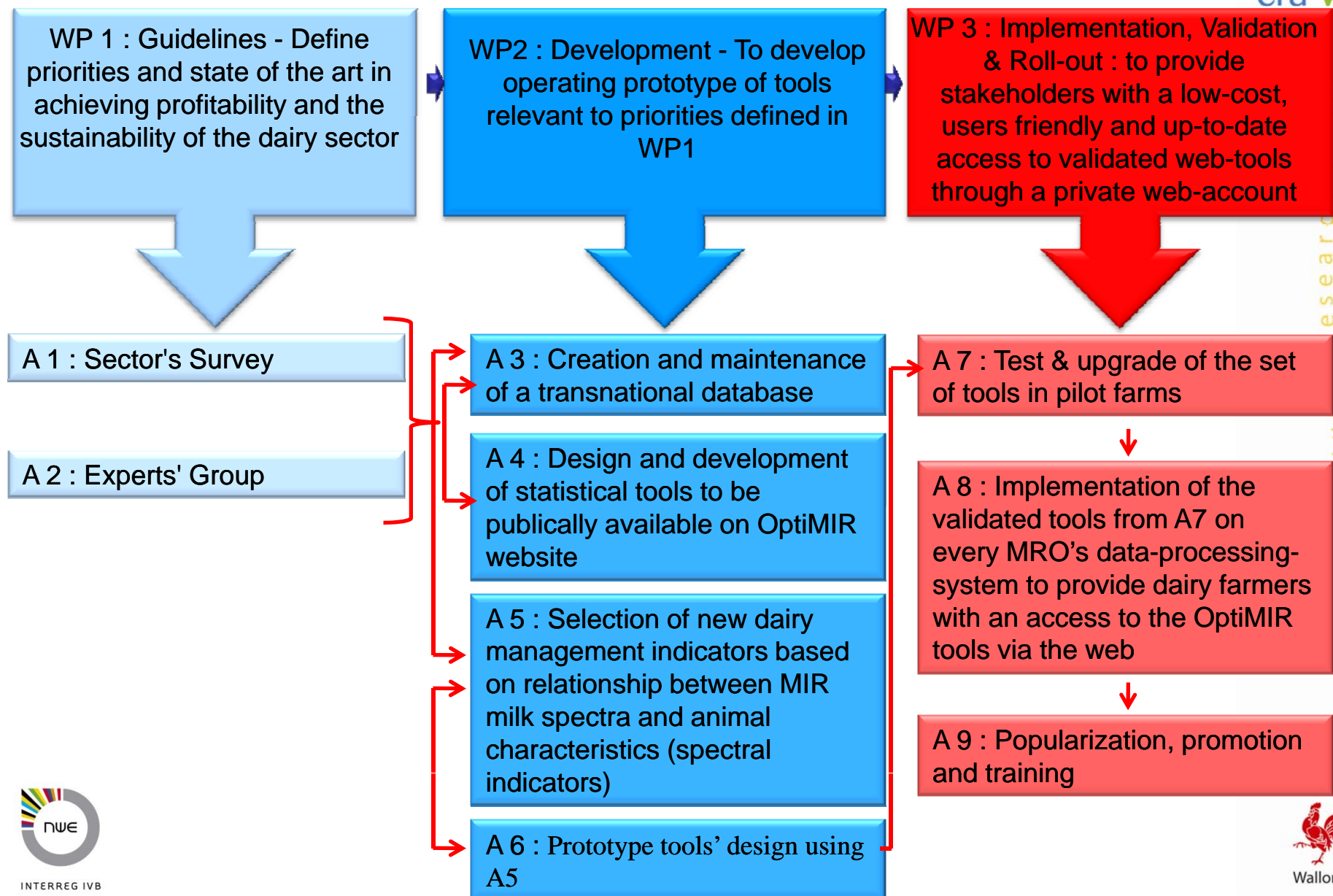
**To test, validate and implement the set of web-based tools
on all Milk Recording Organizations' data-system**

Pregnancy diagnosis...
Evaluation of energy balance...
Early detection of mastitis...
Estimation of methane production...
Measurement of fatty acids...
...

INFORMATION TOOLS

**ADVISORY & DECISION
MAKING TOOLS**

Work packages of the Project





Conclusions

OptiMIR is an innovative Approach

- ➡ Large co-operation between MRO's and research institutions specialized in animal sciences and infrared spectroscopy
- ➡ Exploration and use of the all infra-red spectrum resulting from routine milk analysis as indicator of the cows' status
- ➡ Harmonization of the data collected by the various MRO's allowing a better validity of the management tools developed for all the areas of North West of Europe and their various systems of production



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Thank you for your attention

