

## Overview of ongoing projects at Qualitas AG

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# Single Step Genomic Evaluation

(Adrien Butty, Mirjam Spengeler, Peter von Rohr)

- Replace the current multi-step genomic evaluation for all breed-trait combinations
- ssGTBLUP-method using MiX99-Software (Luke)
- Reliability estimation
- Include international data (MACE)
- Multi- vs single-breed analysis
- Bi-weekly routine evaluations
- Implement RRTDM for production traits in MiX99 (Madeleine Berweger, Patrick Stratz, Urs Schuler)

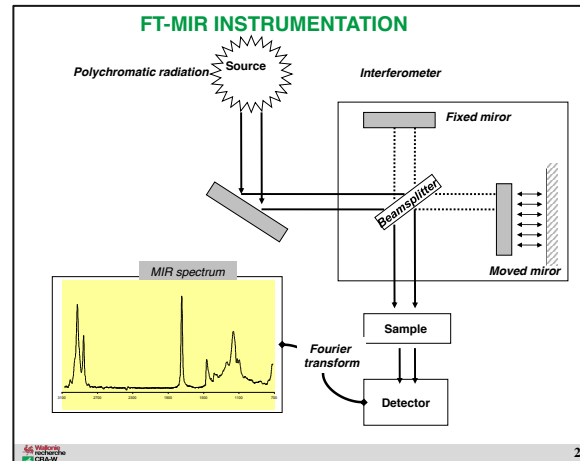
# Efficiency – Residual Feed Intake

(Patrick Stratz)

- Development of genomic evaluation for feed efficiency
  - Single Step Evaluation
- Feed intake data of 6638 Holstein cows from international collaboration (RDGP project)
  - Including data from Agroscope Posieux
  - Energy Corrected Milk (ECM), Metabolic Body Weight (MBW) and Residual Feed Intake (RFI)
- Multiple trait animal model for 2 lactation stages
  - Following Canadian implementation

# HappyMoo (Urs Schuler)

- HappyMoo-Tool (web-based)



Critère à saisir	Exemple	Situation 1	Unité
<b>Troubles de santé cliniques des vaches</b>			
Avortement précoce	0		Nombre sur l'année
Avortement tardif	1		Nombre sur l'année
Vélage difficile	3		Nombre sur l'année
Rétention placentaire	4		Nombre sur l'année
Fièvre de lait	3		Nombre sur l'année
Autres vaches couchées après vêlage	0		Nombre sur l'année
Métrite aiguë	1		Nombre sur l'année
Métrite chronique	3		Nombre sur l'année

- Use of FT-MIR-spectra of DHI milk samples. Models for mastitis, lameness / claw health, negative energy balance and stress (acute and chronic) will be developed.
- Quantify the economic consequences of the health status in a herd. (Based on “Bilan de santé du troupeau laitier”.)
- Embedding in the web-applications of the breeding associations possible.

# HappyMoo

**Interreg**   
EUROPEAN UNION  
**North-West Europe**  
**HappyMoo**  
European Regional Development Fund



2022  
APRIL  
27 > 29  
in Namur, BE

 **DAIR'INNOV22**  
interreg  
North-West Europe  
Dairy CONGRESS  
innovations to benefit cow welfare  
and dairy farming sustainability

 **GET YOUR TICKETS >>>**

# Mastitis prediction based on FT-MIR-spectral data

(Urs Schuler)

- Derive mastitis observations (healthy or ill) based on direct health data
  - Similar process as for the GE resistance to mastitis
  - Only observations made on herds with complete health data recording
- Assign mastitis observations to DHI milk samples
- Develop models (using FT-MIR-spectra of the milk samples) to predict the mastitis status for all DHI milk samples
- Use the predicted mastitis status in genetic evaluations

# Resilience

(Beat Bapst)

- Reaction Norm Models for Heat Stress
  - Data from Milk Recording (Test Day Records)
  - Weather data from MeteoSchweiz
  - Temperature Humidity Index (THI)
- Investigation of resilience traits based on AMS data
  - Deviation from a normal lactation curve and how quickly cows can return to the normal state

# SMARTER: SMALL RuminanTs breeding for Efficiency and Resilience (Beat Bapst)

- **Goal:** Phenotypic and genotypic characterization of resilience- and efficiency-related traits in small ruminants.
- Establishment of **new breeding and management strategies**
- Horizon 2020 Project: 2018 until 2023
- International consortium of **26 partners** with a total budget of 7.6 million €
- Qualitas AG is subcontractor of FiBL for **genetic analysis**
- **SZZV** involved as data **provider** and **stakeholder**
- <https://www.smarterproject.eu/>

**FiBL**





# SMARTER: SMALL RuminanTs breeding for Efficiency and Resilience

## Swiss partners (FiBL, Qualitas) works:

### Dairy sheep

- **Phenotyping** of at least 1200 Lacaune sheep with respect to gastrointestinal parasite infestation
- Estimation of **variance/covariance components** and genetic parameters
- BLUP **breeding value estimation**
- Collaboration: SMG/BGK

### Goats

- Genetic background of **parasite resistance**
  - Based on **existing studies** (Heckendorn et al., 2017)
  - **SNP genotyping** of approximately 1,250 goats with phenotypes; ssGBLUP, GWAS
- Feasibility study regarding the **international comparability of ebvs**, analogous to Interbull
- Collaboration: SZZV
- data provider: Uni Bern, HAFL



Bild: FiBL



Bild: SZZV



# Beef Production Model

(Jessica Gearing)

- Economic Weights for Beef Production Traits
- ECOWEIGHT (Wolfova *et al.* 2005)
- Collection of input data
  - Production costs, prices, culling and conception rates, ...
- Various Production Systems
  - SwissPrimBeef, NaturaBeef
- Expand to Beef-on-Dairy

# Mating Decisions based on SD of Gamete DGVs

(Franz Seefried)

- Increase probability of superior offspring
- DGVs for chromosome segments (haplotypes)
- Recombination hotspots
- Sampling of possible combinations
- Implementation in Optimum Genetic Contribution concept

**Prediction of expected genetic variation within groups of offspring for innovative mating schemes**

[Dierck Segelke](#) , [Friedrich Reinhardt](#), [Zengting Liu](#) & [Georg Thaller](#)

[Genetics Selection Evolution](#) 46, Article number: 42 (2014) | [Cite this article](#)

# Other Projects

- Ecobreed – Agroscope Tänikon (Simon Schlebusch)
- Longevity Project FiBL
- Resilient Dairy Genome Project (Canada)
- GWAS 1k Bull Run 7 (Mirjam)
- Composite Conformation Scores
- Influence of THI on Male Fertility (Swissgenetics, Beat)