Next generation European system for cattle improvement and management

Gene 2 Farm

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Theme 2: Food, Agriculture, Fisheries and Biotechnology

Work Programme Topic: **KBBE.2011.1.3-06:**

Development of next generation European system for cattle evaluation (especially DOUBLE PURPOSE cattle -> Non Holstein breeds)

Funding Scheme: **Research for the benefit of SMEs**

Call: FP7-KBBE-2011-5

- Addressing the needs of the cattle industry, in particular of the SMEs and end users, for an accessible, adaptable and reliable system to apply the new genomic knowledge to underpin SUSTAINABILITY AND PROFITABILITY OF EUROPEAN CATTLE FARMING.

- Carrying out a comprehensive programme of work from STATISTICAL THEORY DEVELOPMENT, through genome sequencing, to address new phenotyping approaches and the construction of tools, that will be validated in conjunction with SMEs and industry partners.

- OPTIMIZATION AND CUSTOMIZATION GENOMIC SELECTION, BREEDING AND POPULATION MANAGEMENT AND BETWEEN BREED PREDICTIONS.

- GENOME SEQUENCING
  - key animals and exchange data with other international projects to create the most comprehensive bovine genome sequence database.

- EXTENDED PHENOTIPIC DATA COLLECTION
  - Exploring opportunities for extended phenotypic collection, including the **use of automated on farm systems** and will develop standardisation protocols that, in consultation with ICAR, could be used by the industry for data collection and management.

- EDUCATION & TRAINING
  - Finally a dissemination programme will ensure that training needs of the industry are served from an entry level training programme for farmers to **advanced summer schools** for the SMEs and expert user community.

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SEVENTH FRAMEWORK PROGRAMME

- to derive complete genome information to understand genome structure and to design high and low density genotyping panels.

- to develop the tools to impute higher density genome information from lower density genotype data and to make exchange information easier.

- to address the needs for measuring a wider range of biological variables underlying important commercial traits, in order to provide data on additional important traits for use in selection.

- to develop appropriate statistical models and applications for using the genomic and phenotypic information in order to optimise and customise genetic selection strategies.

- to disseminate the information to the SMEs, the wider cattle breeding industry and to end users.

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SEVENTH FRAMEWORK
PROGRAMME

Research for the benefit of SMEs

9 SME

2.	ZuchtData	ZD	Austria
3.	GENO Breeding and A.I. Association	Geno	Norway
4.	Swissherdbook cooperative Zollikofen	SHB	Swizerland
5.	Associazione Nazionale Allevatori Bovini della Razza Bruna	ANARB	Italy
6.	Swiss Brown Cattle Breeders Federation	SBZV	Swizerland
7.	Czech Simmental Breeders Association	CESTR	Czech Republic
8.	Associazione Nazionale Allevatori Bovini di Razza Pezzata Rossa Italiana	ANAPRI	Italy
9.	English Guernsey Cattle Society	EGCS	UK
10.	Federación de asociaciones de Ganado Selecton	FEAGAS	Spain

3 Other

11.	European Brown Swiss Cattle Federation	EBSF	Italy
12	**European Simmental Cattle Federation**	**EVF**	**Germany**

13.	Biosciences Network Limited	BKTN	UK

6 RTD

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1.	**Parco Tecnologico Padano**	**FPTP**	**Italy**
14.	Norwegian University of Life Sciences	UMB	Norway
15.	Roslin Institute, University of Edinburgh	UEDIN	UK
16.	Wroclaw University of Environmental and Life Sciences	UPWROC	Poland
17.	Universidad of Zaragoza	UNIZAR	Spain
18.	Aristotelio Panepistimio Thessalonikis	AUTH	Greece

Phenotypic to Genomic Selection
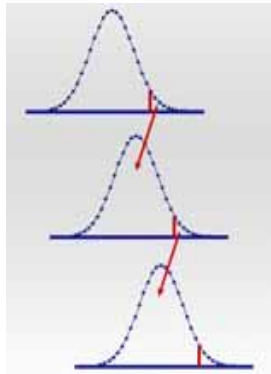
- Phenotypic selection (until '80s)
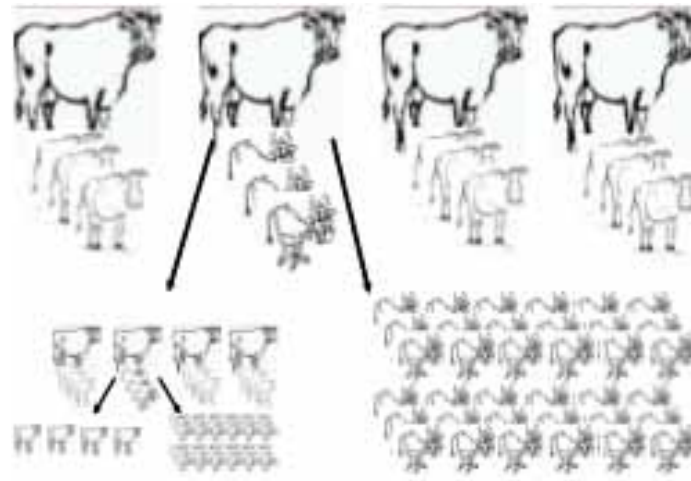
- Progeny testing ('80s → 2010)
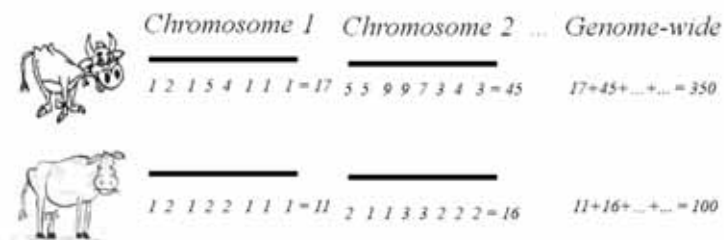
- gEBVs (since 2010 -> new era)

Project Targets

- Use of genomic information (non only EBV):
  - Mate selection
  - Inbreeding control
  - Applications in small populations

- Novel phenotypes
  - Better prediction of the biology
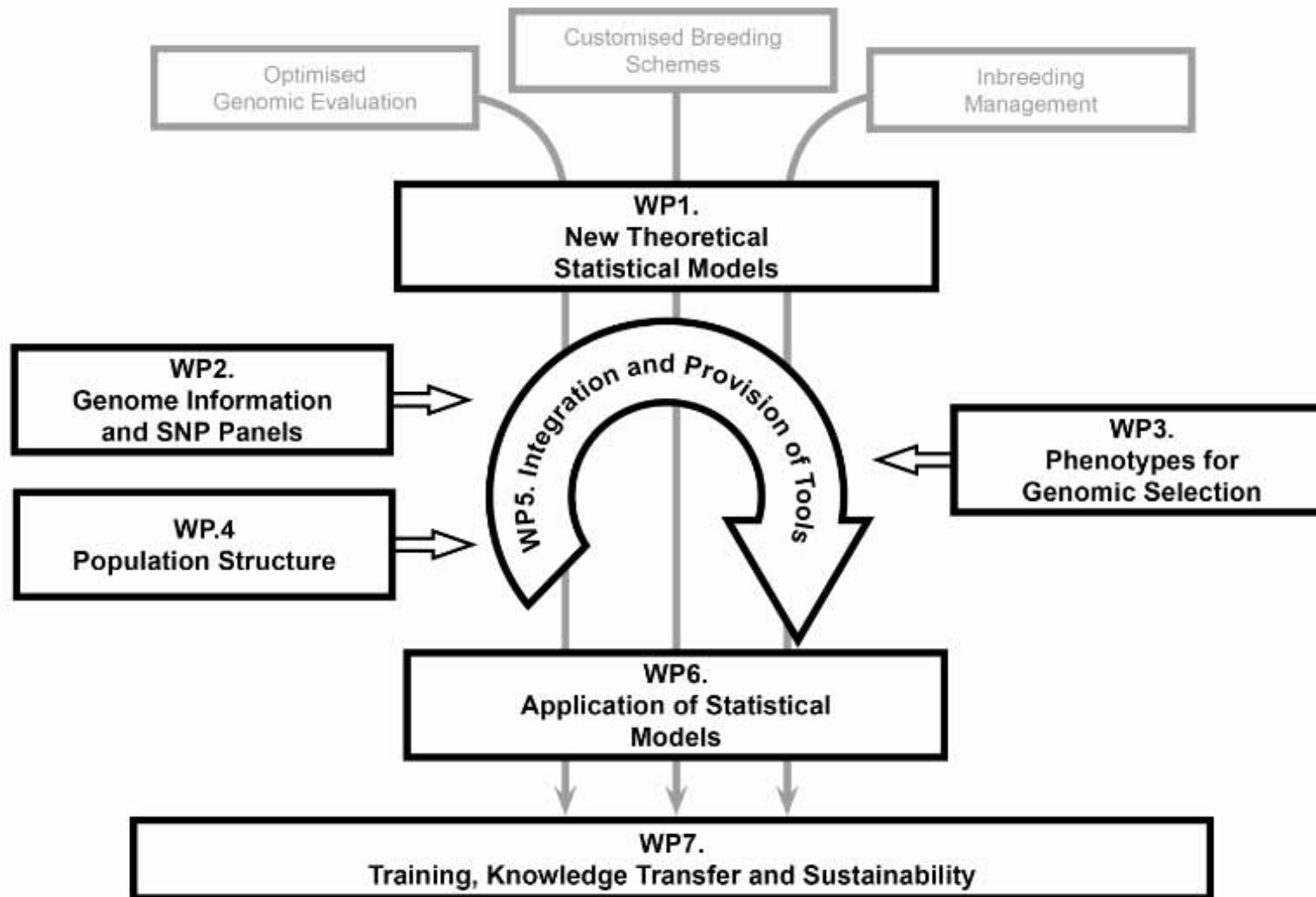 - Additional commercially important traits

- Genomic information
  - Optimised SNP panels
  - Genotyping by sequencing
  - Epigenetics

Project Overview

- Advisory board
    - Curt van Tassell   USDA
    - Filippo Miglior   Canadian Dairy Network
    - Ben Hayes   Department of Primary
    Industries
    - Daniel Gianola   Uni Wisconsin

- Organisations eg:
    - Fabre /Effab
    - EAAP
    - ICAR / INTERBULL

- Projects eg:
    - 1000 bull genomes
    - Other national and International projects

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SEVENTH FRAMEWORK
PROGRAMME

- **Task 3.1**. **Assessment of current practices and classification of needs**
  - Task Leader: Hermann Schwarzenbacher (ZD)   Month 0-12
- **Task 3.2**. **On-farm recording.**
  - Task Leader: Trygve Roger Solberg (GENO)   Month 3-13
- **Task 3.3**. **Novel Phenotype collection approaches.**
  - Task Leader: Alessandra Stella (FPTP)   Month 8-33
- **Task 3.4. Beef cattle data recording at the abattoir.**
  - Task Leader: Daniele Vicario (ANAPRI)   Month 11-33
- **Task 3.5**. **Standardisation procedures of traits measured across different breeds**
  - Task Leader: Enrico Santus (ANARB)   Month 18-33
- **Task 3.6. Recommendations for large-scale application.**
  - Task Leader: Georgios Banos (AUTH)   Month 32-48

KO Meeting : Lodi (ITALY) February 2012

Cork, IRELAND - May 2012
   Jointly to annual ICAR/INTERBULL meeting

Ski, NORWAY - GENO headquarter - October 2012

Gene**2**Farm

http://155.253.6.233/gene2farm/   (Web site under construction)

Projected start date   1st January 2012
End   31st December 2016

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