Introduction to SMARTER and the Summer School

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The SMARTER Consortium

7M€

Coordinator
Partners
Leaving Partners

27 partners, 13 countries (10 EU + Uruguay + Canada + China)
50% of non–academic partners

Stakeholders platform : 30 (19 national, 8 trans-national and 3 support stakeholders)

SMARTER is structured around 2 definitions of RESILIENCE and EFFICIENCY (R&E)

RESILIENCE

The ability of an animal/system to maintain or revert quickly to high production and health when exposed to a diversity of challenges (nutritional and/or infectious).

EFFICIENCY

Considered as the efficiency of feed resource use by animals: feed efficiency, the dynamics of body tissue mobilization and its impact on the environment.

IMPACT: 48 EU breeds are in the SMARTER project

❖ **48 breeds corresponding to 20% of small ruminant EU populations → impact on 70% of the EU populations**

❖ **5 000 farmers, 1 500 000 ewes/goat directly impacted by SMARTER**

20 meat sheep breeds

48 breeds (conventional, hardy, local...):
- 14 dairy goat breeds (Alpine, Saanen, Yorkshire composite,Bionda, Verzasca, Carpatina, Fossé, Frisa, Orobica, Provencale, Damascus, greek Eghoria, Skopelos, Guisandaesa),
- 14 dairy sheep breeds (Assaf, Basco-Béarnaise, Boutsiko, Chios, Churra, Frizarta, Lacaune, Latxa, Manech tête noire, Manech tête rousse, Corse, Sarda, Tsigai, Turcana)
- 20 meat sheep breeds (Charollais, Merino, Norwegian White sheep, Suffolk, Texel, BMC, Causse du lot, Rouge de l'Ouest, Ojalada, Romane, Lacaune, Scottish Blackface, Lleyn, Dorset, Solognote, Bizet, Charmoise, Vendeen, Castellana blanca & negra).

Non EU breeds: Some wool Uruguayan sheep breeds (Uruguayan Creole sheep, Merino and Corriedale) and around 80 Chinese and Tibetan native breeds.
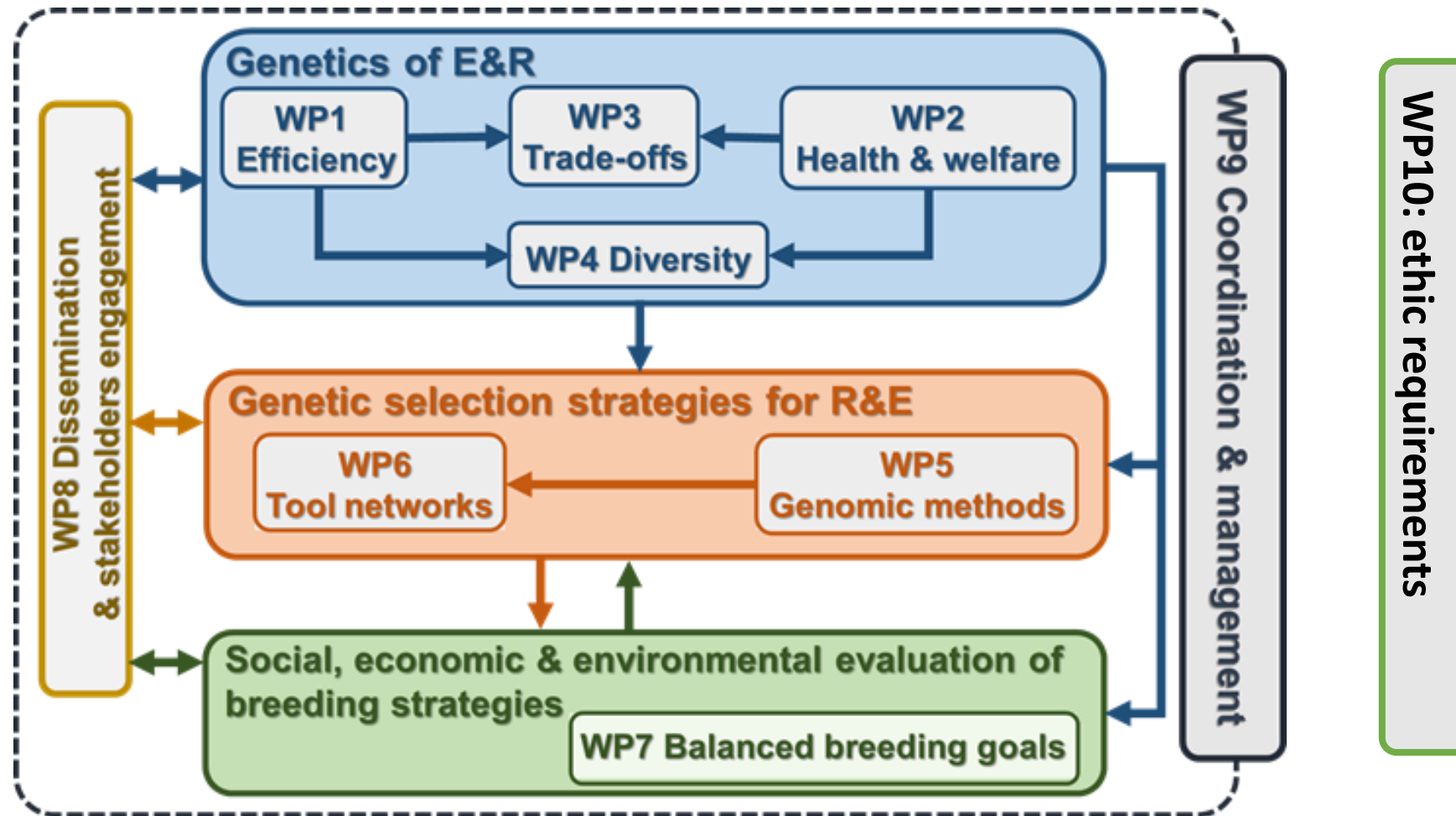
14 dairy sheep breeds

14 dairy goat breeds

Organisation of SMARTER project

Expected Impact

At the farm level:
- Increasing resilience of livestock production while securing productivity
- Providing predictors of R&E suitable for on farm implementation
- Using resilience as a lever to improve animal health and reduce drug-use
- Reducing the environmental impact of the farming systems → Improving their socioeconomic sustainability and their eco-system services
- Exploring how better adaptation to local conditions improves animal wellbeing → Promoting diversity-rich livestock breeding and underutilized breeds
- Training academics, breeders and farmers with the new tools generated by SMARTER

At the breeding system level:
- Generating across-country genetic and genomic evaluations by pooling genomic data and creating new shared reference populations in sheep and goat → Creating an international initiative to facilitate international evaluations in small ruminants
- Adapting breeding schemes to the different farming types
- Estimating the costs and benefits of the new selection strategies at farm level

Limit GHG

SOCIETY

Improve welfare, adaptation
Promote Genetic diversity

Introduction to the Summer School

Part of WP8 dissemination strategy

At national level: 10 Round tables (2d) between researchers & stakeholders

At EU level: SMARTER meetings during the annual european conference EAAP.

At international level: Summer course for students, researchers & stakeholders.

Module 1 – Monday 27

Traits and methods to compute phenotypes

- Definition of resistance and resilience in small ruminant and for feed efficiency (theoretical and concepts)

- Traits and measures related to RR &FE traits (practical examples and genetic basis)

- Recording systems: examples in different countries and breeds.

- Statistical treatment of raw input data (R/R): transformation/normalization, repeated measures vs multi-trait, etc.

Module 2 – Tuesday 28

Mechanistic and statistical modelling of resilience and feed efficiency

- General introduction to statistical and mechanistic mathematical models

- Mechanistic models of trade-offs determining variation in resilience and feed efficiency

- Statistical models of resilience trajectories

- Modelling resilience of sheep to gastro-intestinal parasite infections

Module 3 – Wednesday 29

Detecting Stress and evaluating ability to cope with stress

- Present the norm reaction model to evaluate how animals deal with stresses when stresses are directly measured

- When stresses are not measured, how to infer and quantify their existence using deviation from trajectories, either of a group or of an individual

- How to include these inferred stresses into the norm reaction model for resistance to stress

Module 4 – Thursday 30

How can resilience and efficiency traits impact system performances and modify farmers' breeding choices?

- Redesign of farming systems to switch towards more sustainable and resilient sheep and goat production using modelling

- Understand farmers' choice to use new breeding traits for more sustainable livestock production using surveys

Feedback sessions

1. Challenge session (module 3)
2. Survey session (module 4)

SMARTER PARTNERS

Thank you for your attention and have a great week!!

www.smarterproject.eu