SMARTER: a European project on selection on efficiency and resilience in small ruminants with strong ICAR commitment and implication

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H2020-SFS-2016-2017
Research and Innovation Action
SMAll RuminanTs breeding for Efficiency and Resilience

Project period: Nov 2018 - Oct 2022
Coordination: INRA Toulouse (Carole Moreno-Romieux)

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

Coordinator, partners, stakeholders (to implement)

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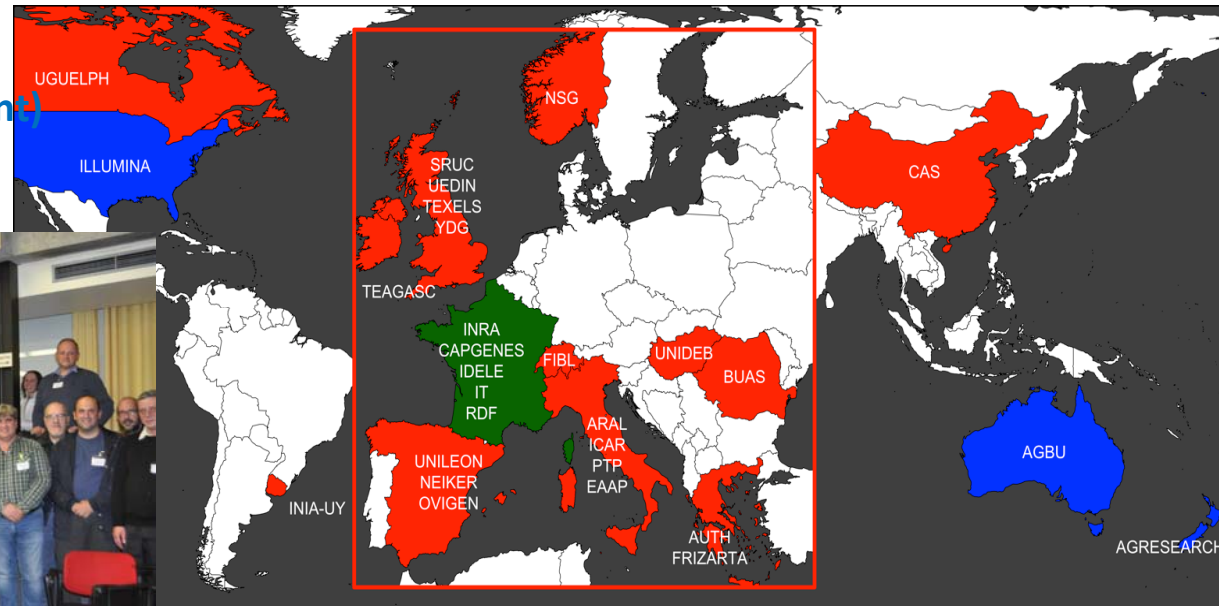
SMARTER is structured around 2 definitions of RESILIENCE and EFFICIENCY

RESILIENCE

The ability of an animal/system to maintain or revert quickly to high production and health status when exposed to a diversity of challenges, with a focus on nutritional and/or health challenges.

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. Focus on agro-ecological issue: competition with human nutrition (grains), water consumption, greenhouse gas emission.

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Smarter

What are resilience and efficiency traits studied in SMARTER?

Resilience

- **Disease resistance**: parasite, footrot, mastitis
- **Longevity / Survival**: lamb & embryo mortality, functional longevity
- **Maternal / lamb behavior**

Efficiency

- **Feed efficiency & resource allocation**: concentrate/hay/grazing, new predictors
- **Microbiota**: to predict GHG emission
- **Gas emission**: new tools

- **Trade-Off between** resilience-related traits and efficiency-related traits / production when disease and/or nutritional challenge

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Some figures to appreciate the impact of SMARTER

❖ 5,000 farmers, 1,500,000 ewes/goats will be directly targeted by SMARTER

❖ HD data set (existing or newly generating) : 500,000 phenotyped + 70,000 genotyped animals

❖ 46 breeds in SMARTER =20% of the sheep and goat populations in EU but via our non academic partners 70% of the EU populations will be impacted

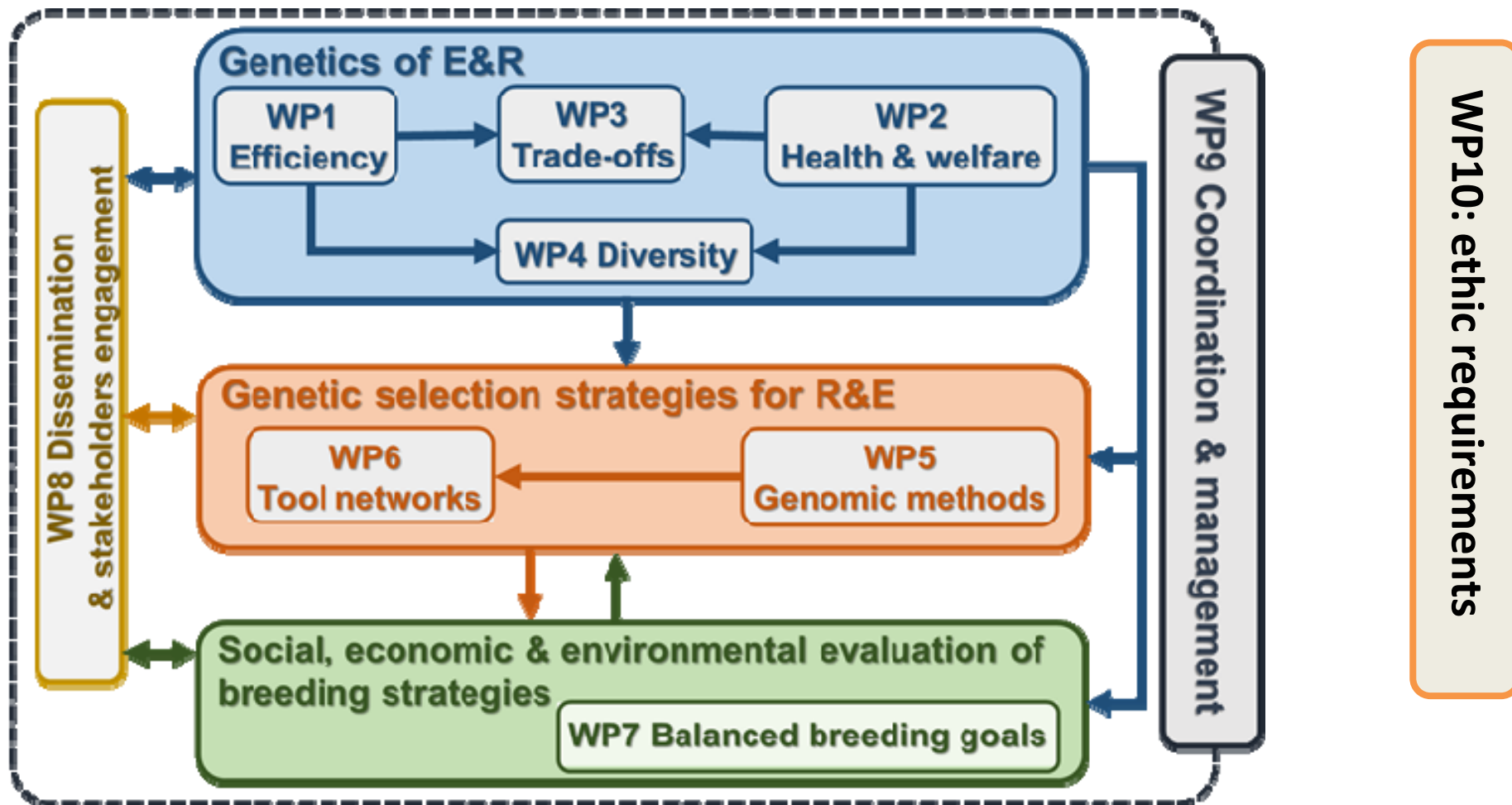**19 meat sheep breeds**   **13 dairy sheep breeds**   **14 dairy goat breeds**

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Organization of SMARTER project

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ICAR committed in WP6 "Practical Selection Tools to Benefit from International Cooperation"

Task 1: HARMONIZATION: phenotypes, genotypes, pedigree

Task 2: INTERNATIONAL EVALUATION: genetic, genomic

Task 3: PRACTICALITIES of international evaluations

ICAR-connected

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Guidelines

o Recommendations to measure efficiency and resilience traits in a similar way in each country => facilitate possible future common evaluation

o Suggest/define recording of new environmental effects

o Add a new brick to the sections of the *guidelines of the SGC WG*

Section 16: Dairy Sheep and Goats

Section 14: Alpaca & Goat ID & Fiber

Section XX: Meat and Reproduction in Small Ruminants

Section YY: Resilience & Efficiency in Small Ruminants

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ICAR committed in WP6 "Practical Selection Tools to Benefit from International Cooperation"

Across-Countries genetic & genomic evaluation

Is it worth carrying out multi-country evaluation in small ruminants?
Background = few exchanges, low connectedness, small reference population in most countries, genotyping costs

o 3 pilots studies to assess feasibility

Dairy sheep	Manech & Latxa	FR,SP	INRA
Dairy goats	Alpine & Saanen	FR, CN, IT, UK, CH	INRA
Meat sheep	Charollais, Vendéens, Texel, Suffolk	IR, UK, FR, UY, HU	TEAGASC

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ICAR committed in WP6 "Practical Selection Tools to Benefit from International Cooperation"

Across-Countries genetic & genomic evaluation

Towards a routine multi-country evaluation in small ruminants?

o Practicalities of international evaluation
  → Propose specification for routine evaluation in an organized international framework (cf. Interbull? Interbeef? alternative model?)
  - Agreement, data sharing acceptability
  - Technical issues
  - Business model, profitability
  - Needs (or no) from the countries
  → Business Plan & business model

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Reference center

Define, propose, conceive what could be a zootechnical reference center in small ruminants (cf. EU Regulation on Animal Breeding 2016/1012 (article 29))

o In cattle, Interbull is now the European Union Reference Centre for performance testing/genetic evaluation in bovine.

o **What about in sheep and goats ?**

  • SMARTER could help to define the outline of Reference Centre for performance testing/genetic evaluation in sheep & goats

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ICAR committed in WP8 "Dissemination, training and stakeholder's engagement"

Stakeholder's engagement through stakeholder platform and ICAR/EAAP network

- o Provides participatory framework through a stakeholder's platform
- o Dialogue between SMARTER partners & stakeholders

ICAR: dissemination and training for stakeholders

- o Organisation of (national) stakeholders round table sessions in 10 countries
- o Presentation to stakeholders at ICAR 2020 and ICAR 2022.

ICAR-connected tasks led / ICAR

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SMARTER PARTNERS

Thank you for your attention

www.smarterproject.eu