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


ICAR 2019: Prague, Czech Republic, 17-21 June 2019
**SMARTER** - a European project on selection on efficiency and resilience in small ruminants with strong ICAR commitment and implication

**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)

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under the Grant Agreement n°772787
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.
SMATER - a European project on selection on efficiency and resilience in small ruminants with strong ICAR commitment and implication

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
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
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 committed in WP6 “Practical Selection Tools to Benefit from International Cooperation”

Guidelines

- Recommendations to measure efficiency and resilience traits in a similar way in each country => facilitate possible future common evaluation
- Suggest/define recording of new environmental effects
- Add a new brick to the sections of the guidelines of the SGC WG

Section 16: Dairy Sheep and Goats
Section XX: Meat and Reproduction in Small Ruminants
Section 14: Alpaca & Goat ID & Fiber
Section YY: Resilience & Efficiency in Small Ruminants
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

- 3 pilots studies to assess feasibility

<table>
<thead>
<tr>
<th>Ruminants</th>
<th>Breeds/Districts</th>
<th>Countries</th>
<th>Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy sheep</td>
<td>Manech &amp; Latxa</td>
<td>FR, SP</td>
<td>INRA</td>
</tr>
<tr>
<td>Dairy goats</td>
<td>Alpine &amp; Saanen</td>
<td>FR, CN, IT, UK, CH</td>
<td>INRA</td>
</tr>
<tr>
<td>Meat sheep</td>
<td>Charollais, Vendéens, Texel, Suffolk</td>
<td>IR, UK, FR, UY, HU</td>
<td>TEAGASC</td>
</tr>
</tbody>
</table>
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Across-Countries genetic & genomic evaluation

Towards a routine multi-country evaluation in small ruminants?

- 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
ICAR committed in WP6 “Practical Selection Tools to Benefit from International Cooperation”

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))

- In cattle, Interbull is now the European Union Reference Centre for performance testing/genetic evaluation in bovine.
- **What about in sheep and goats?**
  - SMARTER could help to define the outline of Reference Centre for performance testing/genetic evaluation in sheep & goats
ICAR committed in WP8 “Dissemination, training and stakeholder’s engagement”

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

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

ICAR: dissemination and training for stakeholders

- Organisation of (national) stakeholders round table sessions in 10 countries
- Presentation to stakeholders at ICAR 2020 and ICAR 2022.
Thank you for your attention

www.smarterproject.eu