Smarter

SMAll RuminanTs breeding for Efficiency and Resilience

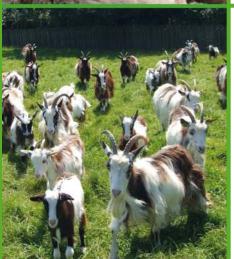## Small ruminant breeding for efficiency and resilience

Smarter is a new international collaborative research project, launched on 1/11/2018.

Smarter's objective is to study how genetic selection can help to increase resilience and efficiency (R&E) in small ruminants (sheep and goats) in their rearing environments, across a range of diverse environments and production systems, and make their raising more sustainable.

Smarter's approach concerns as well the animal, population/breed, and system/ farm levels.

Constant interaction with stakeholders helps **Smarter** staying in line with the needs of the breeders.

Definitions

Resilience: *the ability of an animal/system to maintain or revert quickly to high production and health status when exposed to a diversity of nutritional/health threats. Sheep and goats, mostly reared in less-favored environments, have a strong capacity of resilience and can adapt to harsh conditions.*

Efficiency: a) of feed resource used by the animal: ability to ma*intain or gain weight on less feed than another animal in the same environment,* b) *at agroecological level: includes the reduction of GHG emissions. Small ruminants forage does not compete with other land use, the improvement of their feed efficiency is a challenge.*

Main goals

- To identify new traits to select for R&E, and low-cost predictors of these traits

- To develop new methods to select R&E suitable for on-farm implementation

- To share genetic and genomic information among countries for more efficient breeding programs, and impulse international cooperation in evaluation of small ruminants

- To define R&E selection objectives taking account of the diversity of breeds, systems and environments

- To advise on the benefits of breeding for improved R&E at the farm level

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Resilience and efficiency traits studied in Smarter

Resilience: health and welfare, disease resistance, longevity, fertility, lamb vigor, survival, robustness

Efficiency: food efficiency, resource allocation, microbiota, gas emissions

Tradeoff between R&E traits

Expected outcomes

- Reducing the environmental impact of the farming systems

- Improving their socioeconomic sustainability and the eco-system services they provide

- Increasing resilience of livestock production while securing productivity

- Providing predictors of R&E suitable for on farm implementation

- Using resilience as lever to improve animal health and reduce drug-use

- 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

- Promoting diversity-rich livestock breeding and underutilized breeds

- Adapting breeding schemes to the different farming types

- Estimating the costs and benefits of the new selection strategies at farm level

- Training academics, breeders and farmers with the new tools generated by Smarter

- Exploring how better adaptation to local conditions improves animal wellbeing

Consortium and contacts

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Key facts and impact

A multi-actor initiative with **27 partners** *in* **13 countries**, *50% academic and 50% non-academic stakeholders*

46 breeds, **40 breeding bodies**, **5.000 farmers** *raising* **1,5 million small ruminants** *(20% of EU's livestock,* **impact on 70%** *of it)*

Stakeholder partners adopting the **tools and solutions** *developed, and disseminating them within their sectors*

A massive use of shared data, 500,000 phenotyped and 70,000 genotyped animals *(on common data standards)*

Non-European partners/stakeholders: *China, Canada, USA, Uruguay, Australia and New Zealand*

Smarter *received €7 mln funding for 4 years (2018-2022)*

Smarter partners