



# 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 maintain 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

### 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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[www.smarterproject.eu](http://www.smarterproject.eu)

## 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



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