

SMARTER

SMALL Ruminants breeding for Efficiency and Resilience

Newsletter – Issue 1



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SMARTER project

Small ruminants in Europe are mostly reared in difficult environments such as mountains/hills, arid, humid or low forage resources areas, where rearing cattle is difficult to impossible. In many of these environments, domesticated small ruminants are the only source of livelihood. Additionally, small ruminants use rangelands and contribute to maintaining an open environment, improving biodiversity and preventing fire damage in dry areas. To maintain these benefits in environments vulnerable to environmental and economic challenges, small ruminants need to be resilient and efficient.

SMARTER, a H2020 multi-actor project, is developing and deploying innovative strategies to improve Resilience and Efficiency (R&E) related traits in sheep and goats. It is structured around 10 work packages: 7 research work packages (WP1-WP7), a dissemination work package (WP8), a coordination & management work package (WP9) and an Ethics requirement work package (WP10)

In WP1&2, stakeholders will help to select key R&E traits including feed efficiency, health (resistance to disease, survival) and welfare. Experimental populations will be used to identify and dissect new predictors of these R&E traits and the trade-off between animal ability to overcome external challenges. SMARTER will estimate the underlying genetic and genomic variability governing these R&E related traits. This variability will be related to performance in different environments including genotype-by-environment interactions (conventional, agro-ecological and organic systems) in commercial populations.

WP3 will identify trade-offs and synergies between R&E and other production related traits under genetic control. We will identify underlying biological mechanisms for R&E and develop prediction models to manage such trade-offs and optimise R&E in challenging conditions (nutritional and health challenges).

WP4 will quantify the genetic diversity (in hardy and underutilised breeds) and identify signatures of selection related to specific breed adaptation to geo-climatic environments. New and available data on R&E phenotypic and genotypic information on different breeds from partners, from previous projects and from other WPs will be used to develop strategies to combine such heterogeneous data.

WP5 will characterise novel phenotypes defined in WP1, 2 & 3 using new and historical records from classical longitudinal traits (e.g. milk, growth) and to develop genomic methods for specific features of R&E related traits. WP6 will contribute to faster genetic gain for R&E through improved international cooperation by i) formalising the harmonised recording of phenotypes and genotypes and an international pedigree file, ii) generating international genetic and genomic evaluations, iii) establishing the necessary structures and procedures to facilitate cooperation in international evaluations, iv) analysing the cost-benefit of international genetic/genomic evaluations.



WP7 will develop balanced breeding goals to help the transition of European sheep and goat breeders and farmers towards resilient breeding by i) estimating the economic, environmental and social/labour value of resilience and production traits on farms, ii) interviewing farmers and breeders, iii) estimating the non-economic value of R&E related traits using choice modelling.

SMARTER will quantify the genetic variation of new R&E related traits in small ruminants in 13 countries: 10 EU countries (UK, France, Italy, Spain, Greece, Ireland, Norway, Switzerland, Rumania, Hungary) and 3 third countries (Canada, Uruguay and China). SMARTER involves 27 partners; half are academic organisations while non-academic partners represent technical institutes and breeding organisations at EU and international levels. The non-academic European partners represent 46 breeds (15 million adult females) and 40 breeding organisations, with 5,000 farmers breeding 1,500,000 adult females. The breeds studied in SMARTER represent 20% (sheep) and 15% (goat) of the European population. Beyond these breeds, SMARTER expects to directly impact other breeds in the partners' countries, to cover 70% of sheep and 66% of goat populations in Europe.

SMARTER will issue ready-to-use effective and efficient tools to make small ruminant production resilient through improved profitability and efficiency.

SMARTER Kick-off Meeting, 7th – 8th November 2018

The “Smarter” Kick-off Meeting (KoM) took place on 7th-8th November 2018 and was hosted by INRA research centre of Toulouse Midi-Pyrénées, France. It was followed by a one-day “Breeder’s meeting” on 8th-9th November in the Pyrenees’ area. The SMARTER KoM brought together nearly 70 persons representing the 27 partner organizations, and officially launched the project in the presence of representatives of the European Commission, and of the scientific direction of INRA. The meeting organized first a plenary session in order to give opportunity to everybody to take note of all aspects of the project. Then workshops were organized to give the participants time for involvement in the strategies of each work package.

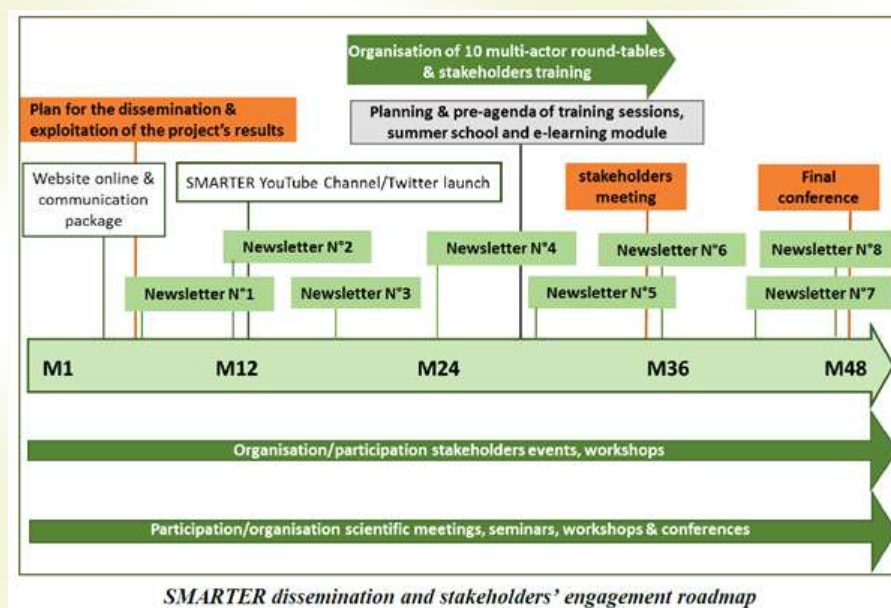
Three main results were achieved at the end of kick-off meeting: 1) A concrete planning of the tasks to be conducted during the first year of the project and how to implement them; 2) A better identification of the interactions between tasks and WPs and how to implement them to foster synergies within the project; 3) A strategy was built to associate closely stakeholders of the sheep and goat sector to the development of the project, to make it known and to integrate their needs and advices.

The Breeder’s meeting was organized to give the opportunity to the attendees of the KoM to learn about the breeding organizations in ten of the SMARTER countries (with presentations of small ruminants’ organizations in these ten countries), and also to see the “real life” of breeding practices in French mountains, with a field trip to a control station for Pyrenees dairy sheep breeds, and a dairy sheep farm.



SMARTER's list first dissemination and communication activities

After five months of activity, SMARTER has just finished the development of its *Dissemination and Exploitation Plan*, which is the framework of its dissemination activities. As represented in the diagram below, to date SMARTER's activities related to dissemination are at a preliminary stage, but they have begun yet to develop. Among the activities, two surveys have been prepared to contact the stakeholders as indicated by the partners, in order to set up a stakeholders' platform. And several tools have been also produced which will help the project's communication, and the dissemination and exploitation of its results.



1. Setting up a stakeholder's platform

SMARTER uses a multi-actor approach where stakeholder engagement is at the core of a project which has been co-constructed from the very beginning (March 2016) by academic, non-academic partners and stakeholders (researchers, farmers, breeders, technicians, trainers). The orientation of the program's strategy towards a maximal interaction with all stakeholders is to optimize dissemination of the outcomes of the project. The plan is to facilitate interactions between the scientific community and interested parties to make the SMARTER innovations and applied solutions available to end-users.

SMARTER dissemination activities rely also on the complementarity of the networks of EAAP and ICAR who represent horizontal (among peer scientists) and vertical (farm service providers and breeding organisations) networks. The grid of academic and non-academic partners in the project countries will be an asset to multiply the diffusion and exchange at international as well as regional level. In the SMARTER Project, it is expected that several sessions of presentation of the project and of its results will be organized during ICAR's and EAAP's annual conferences, where will be presented also the Guidelines on performance recording, and the Guidelines on recording efficiency and resilience traits in small ruminants, useful tools disseminated through the ICAR's and EAAP's communities, in Europe but also beyond, all around the world.

In the last 3 months, SMARTER organised two surveys for collecting the proposals by the partners for national and international stakeholders. In detail, a survey was arranged oriented to national stakeholders permitting each partner and WP leaders to propose up to 3 stakeholders from their own country. Secondly, a survey oriented to European/international stakeholders permitting to each partner and WP leaders to rank a list of 18 stakeholders proposed a priori, but also to propose international stakeholders on their own.



Result of the process to choose the stakeholders and decision of ExCom meeting of Feb 2019: 24 national stakeholders were proposed by the members (3 from Greece, 3 from France, 3 from Hungary, 3 from Spain, 3 from Italy, 2 from Ireland, 1 from Norway, 1 from Canada, 2 from Switzerland, 2 from UK). The ExCom meeting of 1st Feb 2019 decided to invite all these stakeholders to participate to the platform.

The proposed international stakeholders ranked above the average are retained and will be invited to participate to the platform. When including AGBU, AgResearch and Illumina, the total reaches 39 potential stakeholders to be part of the platform. On 20th March 2019, an invitation letter was sent to all potential stakeholders in order to get their assent about their participation to the stakeholders' platform. At present, the replies from stakeholders are being compiled. Among the potential 39 stakeholders, a dozen (according to DoA) will constitute the stakeholders committee. This committee will participate to the annual meetings and be part of the governance. The committee will be formed according to the motivation and commitment of the stakeholders.

2. Dissemination tools set up by Smarter

The dissemination tools set up by SMARTER with the help of EAAP are a logo, a website, a flyer and a poster:

- **A logo:**



- **A project website:**

The website www.smarterproject.eu is online from May 2019 and it will be the main dissemination tool. It will inform about project achievements, publications references, news, individual partner descriptions, project contacts, events, provide related background information etc...

- **A communication package:**

A template for Power Point presentations to be used by partners during scientific congresses and workshops with stakeholders, have been set up.

- **A flyer and a poster**

A flyer and a poster have been set up to disseminate in all circumstances and contexts in which SMARTER partners shall communicate.

Social media tools including **Twitter and Facebook** will also be created, and videos inserted on **YouTube Channel**.

New Post-doc at TEAGASC for SMARTER project: Aine O'Brien



Originally from a sheep farming background, Aine completed her Bachelor of Agricultural Science at University College Dublin in 2015. Subsequently she undertook a PhD in sheep genetics and genomics at Teagasc Moorepark, Co.Cork under the supervision of Donagh Berry and Sean Fair (University of Limerick). Her PhD thesis is entitled "Genetics and genomics for performance in a multi-breed Irish sheep population". Away from work she enjoys maintaining a small sheep flock, going to the gym and hiking. Aine's proposed start date for the SMARTER post-doc is the 29th of April 2019.



New project manager at INRA TRANSERT for SMARTER project: Cloé Paul-Victor

Since 12th of March 2019, Cloé PAUL-VICTOR is the new project manager for the SMARTER project replacing Marine PAUPIERE. Please contact Cloé and add her in your emails when necessary. You will find below all her contact information.



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First automated feed intake and methane records start in Uruguay: new phenomic era begins

In April 2019, the fourth trial for measure individual feed intake in sheep has started. The new facilities bought by INIA (<http://intergado.com.br>) consist of five outdoor pens equipped each with five automated feeding systems and two automatic weighing platforms allowing individual records of feed intake and body weight

The first animals recorded were sixty-four Corriedale lambs (357±14 days old), from divergent lines for resistance to gastrointestinal parasites developed by the Uruguayan Wool Secretariat.

After 14 days of acclimatization to diet (ad libitum Lucerne silage: DM 36.5%, CP 21.7%, ME 2.51%) and feeding system, two tests were run over two periods of 44 (P1) and 42 days (P2), respectively. Firstly, the animals were maintained worm-free (P1) followed by an artificial infestation of *Haemonchus contortus* (P2). The infestation occurred in three consecutive days with 2,000 L3 larvae per day. The third test was with the breed Corriedale as well, come from the Glencoe Experimental Unit of INIA. The animals were the ewe-lambs progeny of resistant and neutral sires based on FEC EBV.

In April, the first record on Merino breed has started. They are 300 lambs come from the Ultrafine Nucleus from INIA Glencoe. At the same time, the portable accumulation chamber (PAC) was built and the first methane emission records were taken. These advances complement activities from SMARTER and RUMIAR (INIA-Uruguay) project.



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