



SC2 Coordinators Day
Multiactors project
Plant protection and breeding



SMARTER: SMAll RuminanT breeding for Efficiency and Resilience

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Semaine Européenne des Races locales des Massifs

Oloron-Sainte-Marie

« PASTORALISME & RACES LOCALES »

16-17-18 septembre 2018



Processus de création de SMARTER

(SMAll RumimanT breeding for Efficiency & Resilience)

Call SFS15: projet multi-acteur



chercheurs INRA, IDELE
Éleveurs et sélectionneurs

Chercheurs INRA et étrangers,
IDELE +INRA transfert



En 2016

Séminaire 2 jours

2 réunions physiques

En février 2017

SMARTER preproposition

*En septembre
2017*

SMARTER proposition finale

*En décembre
2017*

Evaluation : **15/15** les projets sont jugés sur:

- l'excellence scientifique
- l'impact
- la qualité de la mise en œuvre

Durée du projet :
du 1/11/2018
au 31/10/2022

The SMARTER is structured around 2 definitions of RESILIENCE and EFFICIENCY

RESILIENCE

La capacité d'un animal/système à maintenir ou récupérer rapidement une production et une bonne santé après une exposition à divers épreuves nutritionnelles et infectieuses.

The ability of an animal/system to either 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

vu comme l'efficacité d'utilisation des ressources alimentaires: efficacité alimentaire, dynamique de mobilisation des réserves, émission de gaz. Vision agro écologique = compétition pour l'alimentation humaine (céréales), utilisation de l'eau, émission de gaz nitrogène CO₂.

Considered as the efficiency of feed resource use by animals: feed efficiency, the dynamics of body tissue mobilisation and greenhouse gas. Agroecological issue: competition with human nutrition (grains) , water consumption, gas emission its impact on the environment.

What are resilience and efficiency traits studied in SMARTER?



Resilience

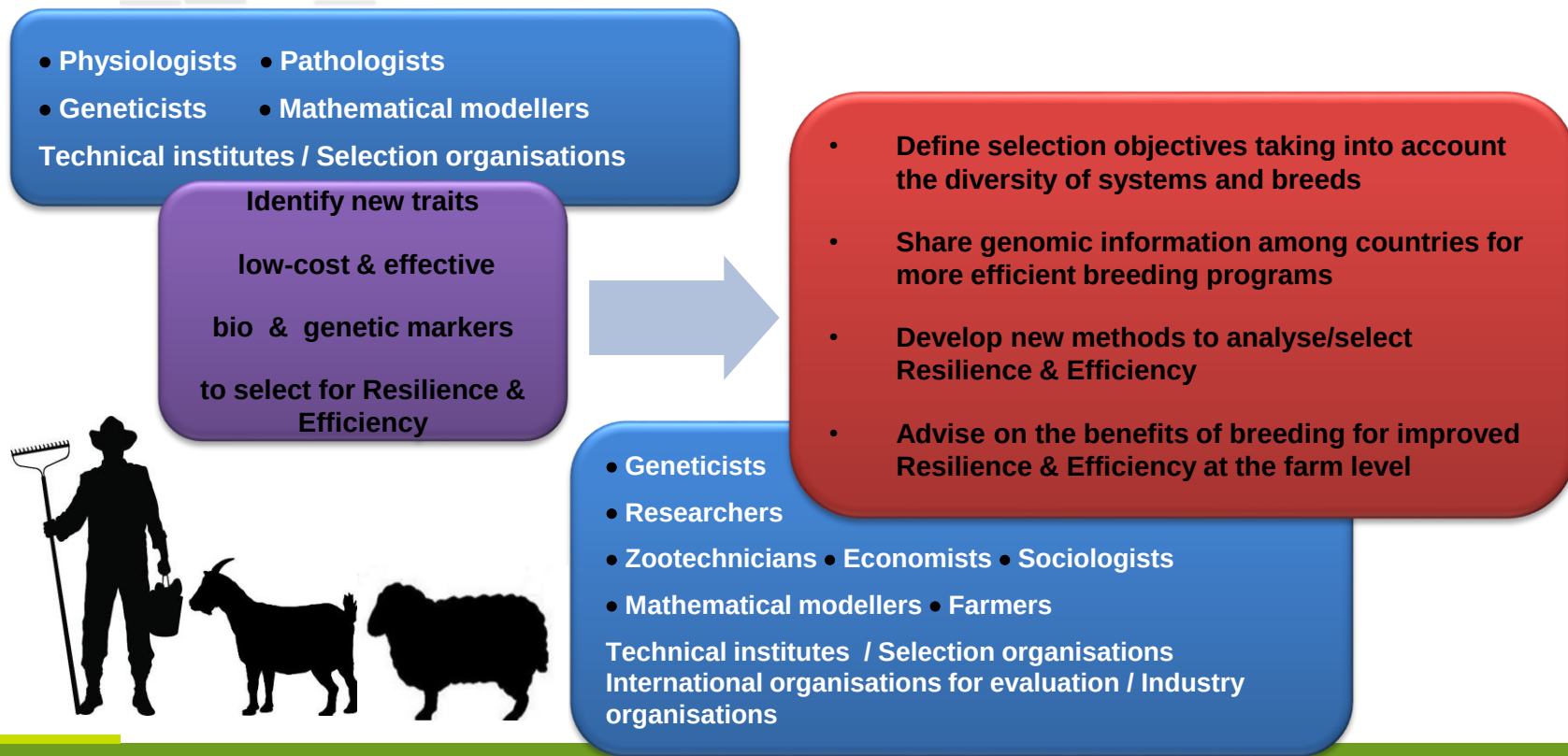
- Disease resistance (parasite, footrot, mastitis)
- Longevity/survival: lamb & embryo mortality, functional longevity
- Trade-off between parasite resistance, longevity, production, food efficiency and resource allocation when disease and/or nutritional challenge



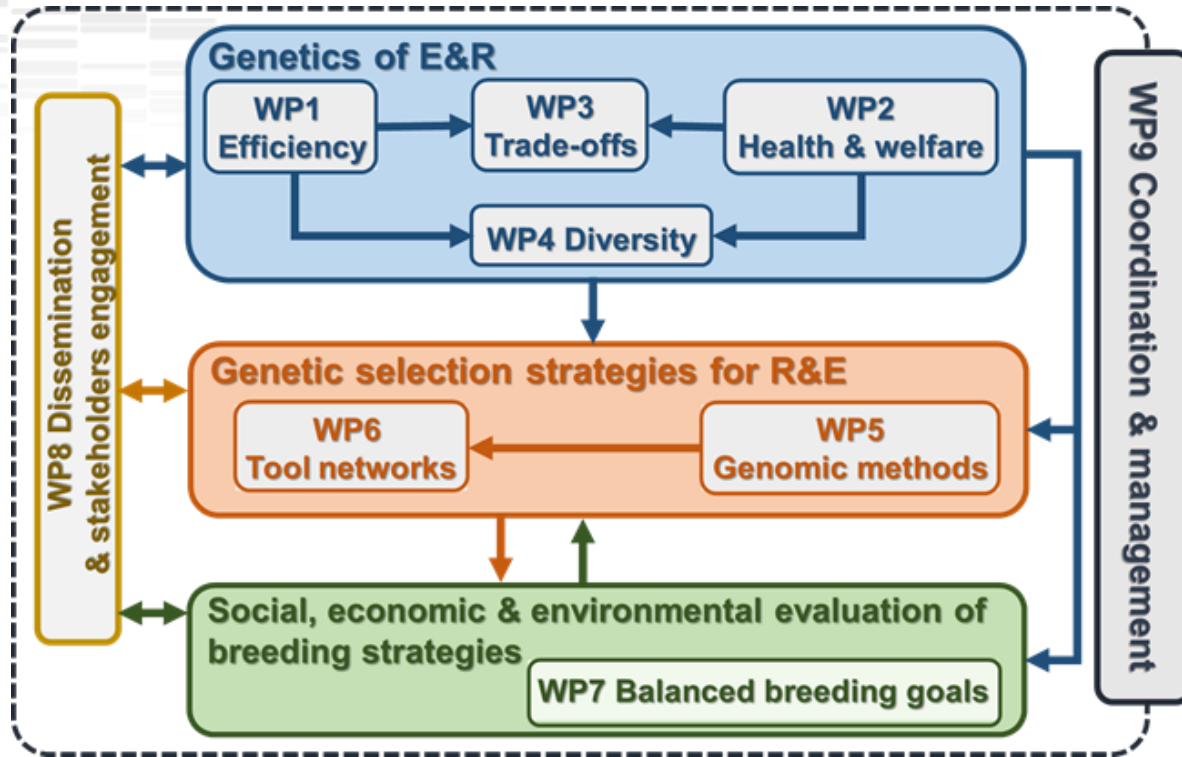
Efficiency

- Food efficiency : concentrate/hay/grass, new predictors
- Resource allocation
- Microbiota: to predict gas emission
- Gas emission : new tools

Global objective of SMARTER

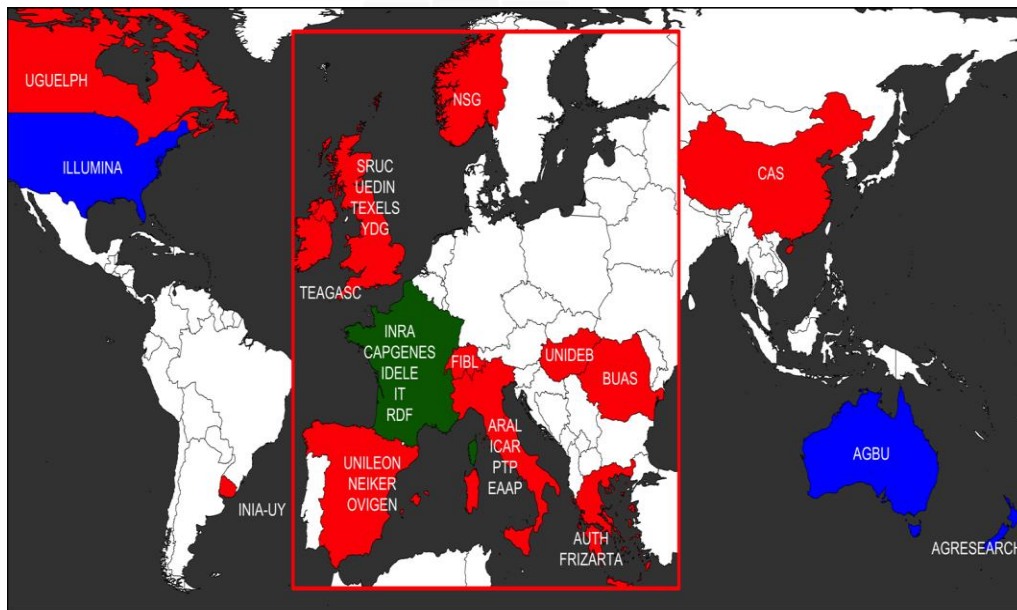


Organisation of SMARTER project



SMARTER Consortium overview

26 partners, 13 countries (10 EU+UR+Ca+China),
50% of non-academic partners



Coordonator, partners, stakeholders (to implement)

New resilience & efficiency traits-trade-off: (WP1,2,3)

(INRA, CAPGENES, RDF, IDELE, JNILEON, UEDIN, SRUC, Y-DG, AUTH, FRIZARTA, TEAGASC, FIBL, INIA-UY, ARAL, NSG)

Genetic diversity (WP4)

(INRA, all the other partners)

Development of new methods/models (WP3,5,7)

(SRUC, TEAGASC, UEDIN, AUTH, UGUELPH, INIA-uy, INRA, IDELE)

The first Multi-countries Genomic selection (WP6)

(UGUELPH, NEIKER, OVIGEN, ARAL, TEAGASC, INIA-uy, SRUC, TEXELS, Y-DG, INRA, CAPGENES, RDF, IDELE, NSG, FIBL, BUAS, UNIDEB, FRIZARTA, ICAR)

Breeding for improved Resilience & Efficiency at the farm level (WP7)

(AUTH, FRIZARTA, INRA, RDF, CAPGENES, IDELE, INIA-uy, ARAL, OVIGEN)

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

20 meat sheep breeds



14 dairy sheep breeds



14 dairy goat breeds



The 48 EU breeds in SMARTER



48 breeds (conventional, hardy, local...):

- 14 dairy goat breeds (Alpine, Saanen, Yorkshire composite, **Bionda**, **Verzasca**, **Carpatina**, **Fossé**, **Frisa**, **Orobica**, **Provencale**, Damascus, greek Eghoria, Skopelos, **Guisandaesa**),
- 14 dairy sheep breeds (Assaf, Basco-Béarnaise, Boutsiko, Chios, Churra, Frizarta, Lacaune, Latxa, **Manech tête noire**, Manech tête rousse, Corse, Sarda, **Tsigai**, **Turcana**)
- 20 meat sheep breeds (Charollais, Merino, Norwegian White sheep, Suffolk, Texel, BMC, Causse du lot, Rouge de l'Ouest, Ojalada, Romane, Lacaune, Scottish Blackface, Lley, Dorset, **Solognote**, **Bizet**, **Charmoise**, Vendéen, **Castellana blanca & negra**).



Non EU breeds: Some wool Uruguayan sheep breeds (**Uruguayan Creole sheep**, Merino and Corriedale) and around 80 Chinese and Tibetan native breeds.



Communication and dissemination strategies

Targets= researchers, students & stakeholders (breeders, farmers, industries) but not only

- 3 Main events to meet researchers/stakeholders/students



At national level: 10 Round tables (2d) between researchers & stakeholders



At EU level: SMARTER meetings during the annual european conference EAAP.



At world level: Summer course for students, researchers & stakeholders.

- 4 main communication tools:



To maximise the dissemination of our results, in the broad sense from researcher to consumer

TO CONCLUDE

➤ **A multi actor approach and data sharing**

Démarche multi-acteur et de partage des données

➤ **Understand the interactions and the trade-off between resilience/robustness and production**

Comprendre les interactions et les compromis entre résilience/robustesse et caractères de production

➤ **Propose innovative strategies to select small ruminants**

Proposer des stratégies de sélection innovantes pour sélectionner les petits ruminants sur:

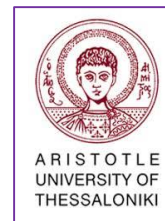
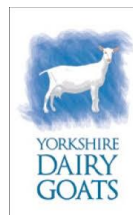
- *Leur résilience/robustesse,*
- *Leur autonomie,*
- *Leur adaptabilité aux conditions variables de leur milieu d'élevage (extensives, bio, agro-écologiques)*



➤ **Estimate the financial, environmental, social cost/benefits of these new selection strategies**

En évaluant les coûts/bénéfices financiers, environnementaux et sociaux de ces nouvelles stratégies

SMARTER PARTNERS



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