

SMARTER

SMAll RuminanTs breeding for Efficiency and Resilience

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Report on dissemination, communication and exploitation activities

DELIVERABLE D8.8

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1 Introduction

WP8 Dissemination, training and stakeholder's engagement optimised and strengthened the SMARTER R&D innovation impact on scientific and stakeholders' communities.

WP8 objectives were:

- Foster interactions between partners and other scientific community members and stakeholders during multi-actor round tables
- Disseminate the project results to the scientific community and to the stakeholders using available communication tools (twitter, Facebook, network, movies, courses)
- Make available tools to facilitate wide dissemination of SMARTER outputs
- Train and build capacity of academics and non-academics

In order to carry out its activities, WP 8 was structured into the following four tasks:

- Task 8.1 Stakeholder's engagement (M1-M56)
- Task 8.2 Dissemination and training for scientific community (M1-M56)
- Task 8.3 Dissemination and training for stakeholders (M1-M56)
- Task 8.4: Dissemination tools (M1-M56)

This deliverables describes the activities carried out since the beginning of the project broken down per task.

2 Task 8.1 Stakeholders' engagement

Task leader: ICAR - Involved Partners: EAAP

2.1 Specifics objectives

The involvement of the stakeholders was promoted at the very beginning of the conception of the project. As an illustration, a 2-day meeting was organised in Urugne (France) in 2016, during which technicians and farmers from breeding organisations and breeding industry from French sheep and goat breeds were invited to express and share their view on the objectives and priorities of SMARTER. This process continued throughout the project and thus underlines the importance of the stakeholders as end-users of SMARTER outcomes.

- Foster interactions between partners and stakeholders
- Disseminate the project results to the stakeholders
- Encourage feedback from stakeholders
- Promote the exploitation of project results

2.2 List of Stakeholders

As SMARTER is a multi-actor approach project gathering around 50% of academic partners and 50% of non-academic, the establishment of a stakeholders' platform was a key feature to better disseminate and exploit the results of SMARTER. The stakeholders' platform was considered during the project as a participatory framework whose members would advise how to manage the project to maximise outcomes impacts for the small ruminant sector and how to exploit the most promising results for transfer. They would make sure that the project meets the end users' needs.

The process to establish the platform was described in the D8.2 and resulted in the choice of the relevant stakeholders as described in the following tables.

There are 19 national stakeholders. 17 were chosen following the initial process and 2 new stakeholders joined the platform during the project: Agris Sardegna and the Agricultural Research Institute of Cyprus.

| Organization | Country |
|---|---------|
| FNO (Fédération Nationale Ovine) | France |
| CNBL | France |
| ANICAP (Association Nationale Interprofessionnelle Caprine) | France |
| Milkplan SA | Greece |
| Inst of Applied Biosciences - CERTH | Greece |
| Hungarian S and G Breeders Assoc. | Hungary |

| | |
|--|-------------|
| Sheep Product Council | Hungary |
| SHEEP IRELAND | Ireland |
| ASSONAPA | Italy |
| Emilio Mauri s.p.a. | Italy |
| AIA | Italy |
| INATEGA SA | Spain |
| CONFELAC | Spain |
| ASSAFE Asociación Nacional de Criadores de Ganado Ovino de la Raza Assaf | Spain |
| Schweizerische Ziegenzuchtverband | Switzerland |
| AHDB | UK |
| National Sheep Association | UK |
| Agris Sardegna | Italy |
| Agricultural Research Institute of Cyprus | Cyprus |

There are 8 trans-national stakeholders.

| Organization |
|--|
| International Goat Association (IGA) |
| FAO |
| The Farm Animal Breeding and Reproduction Technology Platform (FABRE TP) |
| Global Agenda of Action in Support of Sustainable Livestock Development |
| The International Livestock Research Institute (ILRI) |
| The Standing Committee on Agricultural Research (SCAR) |
| Interbull Center |
| FACE Network |

There are finally 3 stakeholders support of the project.

| Organization |
|--------------------------|
| Illumina |
| AgResearch (New Zealand) |
| AGBU (Australia) |

On the whole, the stakeholders' platform gathered 30 stakeholders.

The following stakeholders were included in the governance of SMARTER: FNO; Sheep Ireland; Assonapa; Confelac; Schweizerische Ziegenzuchtverband; AHDB; International Goat Association (IGA); FAO; The Farm Animal Breeding and Reproduction Technology Platform (FABRE TP); Global Agenda of Action in Support of Sustainable Livestock Development; Illumina; AgResearch

During the project, we held 2 dedicated meetings to the stakeholders' platform, one in Edinburgh (27 November 2019) and one in León (19 May 2022). The main outputs of these 2 meetings are presented below.

2.3 Dedicated Meetings

Edinburgh meeting (17 participants)

The agenda was:

- Presentation of the stakeholders' platform and plan of dissemination and exploitation
- Each WP: synthetic presentation of the results achieved during the first year of SMARTER & expected by the end of the project
- Short presentation of each stakeholder: introduction, reaction to SMARTER presentation, expectations from SMARTER, how they figure out to interact with SMARTER
- Discussion/interaction with room
- Conclusion / next meeting

In synthesis, the below key elements have been clearly mentioned by many of the stakeholders, making such topics and issues an agreed demand of the stakeholders:

- A higher productivity of the sheep and goat sector, primarily from an efficiency point of view but also environmentally and economically sustainable
 - Improve the genetic elements for the milk and meat production, their quality and composition, both in sheep and goats
- The establishment of long-terms relations between breeders and research making possible the communication of different experiences
- The development of an international network for sharing ovine and caprine genetic information and experiences with different and local breeds. Tightly closed to this expectation is the achievement of an international genetic evaluation system that would benefit the whole sector and improve the efficacy of the genetic improvement programmes (International comparable breeding values)
 - Incorporation of new genetic traits in breeding programmes such as health traits, reproductive traits and feed efficiency, to be achieved by the improvement of new traits for longevity, rusticity and resilience
 - The use of genomics, accomplished to genetic improvement programmes was broadly suggested by many stakeholders as a major outcome of the Smarter

León meeting (17 participants)

The agenda was:

- Introduction
- Feedback from the main achievements of SMARTER

- Did SMARTER meet the expectations of the stakeholders expressed during the first meeting in Edinburgh?
- How to increase dissemination?
- Which could be the topics of a further project?

Stakeholders's Feedback from the main achievements of SMARTER

The opinions expressed during the discussion are synthesised below:

- The main problem of the international genetic evaluation (IGE) is that the aims of the local breeds are different from the international breeds. So the standardization is a key element for a successful IGE. The same difficulties apply to genomic selection for the across breed evaluation. The IGE is a big challenge for the community. Harmonising the IGE to reduce the variability is essential. In summary, although the SMARTER did a good work, there are difficulties for putting in practice the achievements of the project.
- It is important to focus the attention on a small number of traits that are interesting to most of the people and incorporating these traits in the breeding program. Moreover, putting together the different evaluations is an opportunity to learn from each other.
- The small number of identified traits is a limiting factor however the IGE is a way to share data and knowledge. Resilience traits and animal welfare are also elements to be considered in the evaluations. One question is for the participants: how can we preserve the small ruminant local breeds and their production systems? It is important to keep the diversity of different breeds and try to extend the results on the conventional breeds also to local breeds. In particular in a perspective of resistance to mastitis and milk quality (local breeds often have a higher quality of milk). The issue was coped through a specific work-package to defend the underutilized breeds. Moreover, some breeds in their production systems have an interest in terms of adaptation. This is a common concern of many stakeholders where the commercial breeds may put at risk some local breeds. Moreover, the diversity is a source of resilience in stock breeding. The diversity is also a part of the SMARTER and indicators of diversity have been identified by the Project. The Project is aware of the importance of local breeds and it is committed in their protection.

Did SMARTER meet the expectations of the stakeholders expressed during the first meeting in Edinburgh?

This sequence started with a presentation of the expectations raised by SMARTER and expressed in Edinburgh by the stakeholders:

- Traits to be selected for: production traits should be kept in the objective along with novel resilience and efficiency traits.
- Benefice from genomics is highly expected.
- Benefice from networking is an expected output from SMARTER.

The key points of the discussions are summarised:

- Productivity is an essential aspect that has to be considered and the IGE on the common traits is a valid instrument to increase the productivity. The productive traits and the resilience ones are the key-elements for assuring the productivity of the small ruminants. For that, it is also relevant to consider the climate adaptation and the animal welfare, because productivity is basically related to the resistance to heat stress. However, there are many gains from the IGE and we are ready to share the data. SMARTER has developed the proper scientific tools but

other related to the productivity have to be identified. We must work on the standardization of the IGE among breeds. Breeding for more productive and more efficient animals could permit to reduce the number of animals and thus act towards agroecology.

- Genomic is certainly a key issue in the small ruminant breeding. This sector can benefit from the discovery in this field achieved in the cows without forgetting the relevance of the local breeds.
- The National Round Table are a perfect chance to develop the proper network between stakeholders, research organizations, breeder organizations, researchers and academic world. So the breeders have to consider the future challenges properly presented.
- The overall diversity could benefit from genomic tools, as shown in SMARTER. The contribution of different breeds is important to maintain the global diversity of the European environment. There are local breeds that are not selected but preserve the global diversity at a global level. Some Guidelines on how to manage the local breeds and preserve the diversity would be beneficial to the sector. So the use of genomic information is essential to maintain the necessary variability.
- The work initiated between France and Spain (Manech x Latxa breeds) to try to build a common breeding program. SMARTER, alongside with the ARDI project, helped to provide the tools, especially the foundations of an across country evaluation.

How to increase dissemination?

This sequence start with the presentation by Riccardo Carelli of some statistics on the access to the SMARTER website and to the social media, as well as some initiative taken by the project to disseminate. In particular he highlighted the Newsletter, the website, the videos taken during the national round tables and in various events, the social media and the personal communications. The number of visit to the website is constantly increasing since 2019 as well the subscribers to twitter and Facebook. The National Round Tables are under organization in 10 different countries and they will reach the local stakeholders for a greater dissemination.

The discussion raised the main following points:

- It is a key objective to disseminate towards breeders and farmers. For example through the practice abstract, and also brief information addressed to the end-users.
- The experience of the Round Table in Uruguay has been positive since many actors are around the same table, breeders included that are exporting to Europe. So the breeders consider other aspects such as the welfare that is demanded in other markets. The vice-Ministry of Environment participated in the round table and now the welfare is a stronger aspect to be considered in Uruguay, not only the welfare of the animal but also the welfare of the farmers (social welfare). The agroecological focus is underlined in Uruguay.
- SMARTER has been a chance to initiate a networking activity for the interspecies and across-country evaluation programmes (France and Spain for dairy sheep; UK and France for the Charolaise). Also an international initiative facilitated by Interbull is one of the result of the project.

Which could be the topics of a further project?

The main ideas are the following:

- It is important to develop what has been started, especially on international evaluation and an international database of genotype.

- It is important to ensure a future since one of the main issues for small ruminant farming is the lack shepherd, who are an endangered species. Efficiency in the management is something that we must look after for assuring the sustainability of the sector.
- The breeds must be more resilient to the changing time and all the tools that have been developed by the Project have to be properly adopted, considering the subsidies that the EU and the Governments provide to the farmers.

Regarding the discussion, we would draw the following general main conclusions:

- Genetic diversity is a key element for many stakeholders, including maintaining local breeds. This must probably be highlighted in SMARTER's results.
- Efficiency and resilience are relevant objectives to provide a bridge between productivity and environmental concerns. The agroecological focus and the animal and social welfare are in line with the production target.
- Guidelines, harmonisation, cooperation are key words to cope with these objectives. The genomic tools might also be powerful to reach them.
- There are two important directions for the near future: succeed in disseminating all the work done toward end-users; put in practice what has been started in SMARTER.

2.4 Questionnaire on international evaluation

Finally the stakeholders' platform was invited to answer a questionnaire on international evaluation to help WP6 tackle the topic on the needs and willingness of across country evaluation. The rate of answer was high (15 stakeholders out of 30) and all the stakeholders considered international cooperation as very important for the small ruminant sector. This action showed how the stakeholders' platform could be committed in technical work packages.

3 Task 8.2 Dissemination and training for scientific community

Task leader: EAAP

Involved Partners: ICAR, S-ICAR, AUTH, FIBL, INRAE, SRUC, TEAGASC, UEDIN, UNIDEB, UNILEON, CNR

SMARTER results were communicated (oral communications and posters) at numerous European and international conferences such as EAAP annual meetings (virtual meeting December 2020, Davos Switzerland in 2021 and Porto in 2022) and the 2022 World Congress on Genetics Applied to Livestock Production (WCGALP). The organization of the final SMARTER project conference was also one of the task objective.

Scientific results were published in high-ranked peer-reviewed scientific journals, non peer-reviewed papers.

SMARTER partners were also involved in training activities, the main one being the SMARTER training school organized towards the end of the project.

3.1 Presentations at conferences/workshops

SMARTER representatives attended numerous conferences and workshops; during these events, the latest project developments, progresses and results were presented to the audience; in particular,

partners made 139 presentations on project activities and results within 62 scientific conferences/workshops; all presentations are available at <https://www.smarterproject.eu/conferences/>.

It is worthwhile to mention:

- the organization of the session “SMARTER EU project: Breeding Small ruminants for efficiency and resilience”, within the EAAP virtual Annual meeting hold on 4th December with a total of 12 presentations and 8 posters (<https://www.smarterproject.eu/smarter-session-eaap-2020/>)
- the strong participation to WCGALP 2022 held in Rotterdam (3-8 July 2022), where project partners made 19 presentations/posters

3.2 Papers and presentations

Project partners carried out intensive activities in terms of publications (both peer and non peer reviewed), as follows – *Numbers may vary because of the date of publication > please go on the website to have the updated list.*

- 56 open access peer reviewed publications; all open access publications are available at <https://www.smarterproject.eu/list-of-publications/>
- 32 non peer reviewed publications; all non peer reviewed papers are available at <https://www.smarterproject.eu/no-peer-reviewed-publications/>.

3.3 Training Activities

Internal Training

A 2-days SMARTER training school was organized to present and learn standard population genomics analyses pipelines, Leon, 17-18 May 2022; 13 SMARTER participants attended the training school.

SMARTER Training School

The SMARTER’s Training School “**Using Genetics and Modelling to Improve Resilience and Efficiency in Small Ruminants**” (for further details please refer to Deliverable D8.7) has been organized by EAAP, in collaboration with INRAE, from 27th to 30th March 2023, in Toulouse. A total of 19 students from 7 countries (Italy, France, Spain, Greece, Nigeria, Cyprus and Ireland) have attended the event.

The training school was structured into four different modules:

- Module 1: Traits and methods to compute phenotypes
- Module 2: Mechanistic and statistical modelling of resilience and feed efficiency
- Module 3: Detecting Stress and evaluating ability to cope with stress
- Module 4: How can resilience and efficiency traits impact system performances and modify farmers’ breeding choices

The videos, presentations and photos of the training school are available on the SMARTER website (<https://www.smarterproject.eu/smarter-training-school/>).

3.4 SMARTER Final Conference

The SMARTER’s final scientific conference (jointly organized by ICAR, EAAP, INRAE and IT) took place on 22nd - 23rd May 2023, in Toledo at the Palacio de Congresos “El Greco”. The conference was organized in convergence with ICAR’s conference on “Breeding for resilience: transitioning diverse livestock farming systems into the future”. The SMARTER conference was attended by 59 project partners and 12 stakeholders; 28 presentations (available at <https://www.smarterproject.eu>, with the

exception of WP4 for confidentiality reasons) were made, illustrating the main achievement of the project (for further details, please refer to Deliverable D8.6).

4 Task 8.3 Dissemination and training for stakeholders

Task leader: ICAR

Involved Partners: S-ICAR, EAAP, ARAL, RDF, FRIZARTA, NSG, UNILEON, TEAGASC, UNIDEB, FIBL, SRUC, INIA

4.1 Specifics objectives

The stakeholders' platform cannot be extended to all potentially interested organisations. One of the reasons is the English language which is not spoken and understood by all technicians and farmers. In the purpose of disseminating outcomes and collecting feedback and views towards and from the largest audience, the roundtables, held in local language, played, among the training activities, a major role in the dissemination towards the stakeholders. They were therefore the most important opportunity to train the participating stakeholders.

4.2 SMARTER's Round tables

The roundtables were organised in 10 countries, from April 2022 to February 2023. They allowed to disseminate and exploit the main practical results of SMARTER to the stakeholders of each country, breeders, breeding organisations, (inter)-professional organisations, researchers, agricultural education, newspapers. They were organised in the language of the country, so that it was possible to target a larger audience. The following table gives the dates and location of each roundtable.

| Country | Organising partner | Participating partners | Date | Location |
|-------------|--------------------|---------------------------------------|---------------------|-------------------------|
| France | RDF | INRAE, IDELE, CAPGENES | 5-6 April 2022 | Sèvremont |
| Uruguay | INIA UY | IDELE, UNILEON | 21-22 April 2022 | Tacuarembó |
| Hungary | UNIDEB | | 22 April 2022 | Debrecen |
| Spain | UNILEON | IDELE, OVIGEN, NEIKER, INIA-UY | 8 June 2022 | Valladolid (Foro Ovino) |
| Greece | FRIZARTA | AUTH | 25 June 2022 | Agrinio City |
| Ireland | TEAGASC | | 12 July 2022 | Thurles |
| Switzerland | FIBL | | 17 November 2022 | Entlebuch |
| The UK | SRUC | NSG, UEDIN, ABACUSBIO, TEAGASC, TEXEL | 7 December 2022 | Edinburgh |
| Italy | ARAL | IDELE, INRAE, CNR, CAPGENES | 9-10 February 2023 | Padenghe sul Garda |
| Norway | NSG | SRUC, INRAE | 17-18 February 2023 | Stjørdal |

The Deliverable D8.7 gives an exhaustive presentation of the roundtables, with, in annexes, the agenda of each one. All the presentations, as well as many pictures and videos are available on the SMARTER website on the round table page (<https://www.smarterproject.eu/national-round-tables/>).

If the roundtables were a major series of training events, training activities also included two ICAR meetings: one organised in 2021 in Leeuwarden (the Netherlands) - mainly in remote, due to Covid situation- and one in 2023 in Toledo (Spain) where the final meeting of SMARTER took place.

In 2021, a specific session was dedicated to SMARTER, with 4 presentations:

- Selection tools to benefit from international cooperation in small ruminants: a comprehensive work package of the SMARTER project (Astruc et al.)
- Which novel traits to improve feed efficiency? (Tortereau et al.)
- Feasibility of a genomic selection approach for gastro-intestinal nematodes resistance based on a female informative population in Sarda breed sheep (Carta et al.)
- A stakeholder platform to disseminate results from SMARTER project (Burke et al.)

Audio visual material related to the 10 Round Tables is available at

<https://www.smarterproject.eu/national-round-tables/>.

4.3 Toledo Meeting (12 participants)

In 2023, the two-day meeting was the opportunity to review all the work done in SMARTER with presentations of highlights, policies recommendations and share the outcomes. The sessions were open to everyone.

The presentation of the WP4 on underutilised breeds was done in a joint meeting with the European Regional Focal Point (ERFP) as the results and discussions fully interested the stakeholders attending the ERFP. The deliverable D8.6 describes this final meeting in Toledo in more detail.

The members of the stakeholders' platform were also invited to participate to the final meeting in Toledo. 12 of them attended the meeting.

SMARTER's organisation made sure to have some feedback time for each presentation.

The Conclusion session as a roundtable allowed the stakeholders to express themselves:

- The presentations and results/outcomes were found complete and useful.
- They appreciated the hard work done to get these results and gave a positive feedback on the overall project, in particular with the work done inter-countries, possible applications-policies, and future research. They particularly enjoyed the WP4, that opened scope on other breeds, and this could be a good approach for a next project. This last point is in line with the statement of some stakeholders in the dedicated meeting where they expressed the need to consider local and underutilized breeds.
- They asked for the content to be shared and related on their platform. This is a good point in line with a more widespread dissemination.
- They expressed wide interest for a continuation of the research and to obtain practical applications of the results.

4.4 Other meetings

Finally, each country had the opportunity to organise various national seminars and conferences (mostly in local language) that presented the practical outcomes of SMARTER. These events are listed in the dissemination and communication activities (under Task 8.4).

5 Task 8.4 Dissemination tools

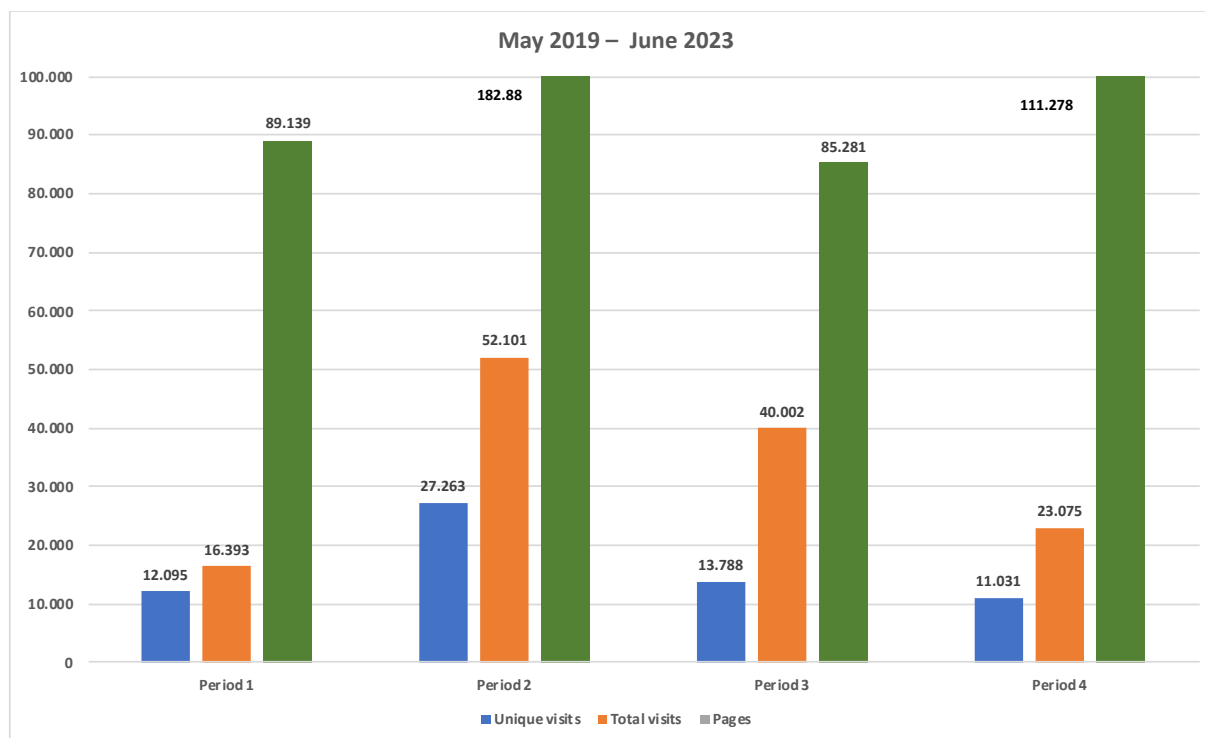
Task leader: EAAP

Involved Partners: ICAR

This task implemented efficient communication tools to disseminate SMARTER outputs through:

Communication's tools (digital tools)

- **The graphic project identity and communication package** (for further information please refer to Deliverable D8.1), containing the project logo, the project leaflet, the project poster and the template for Power Point presentations, was created in the first months of project duration.
- **SMARTER website:** the website (<https://www.smarterproject.eu>), on line since May 2019, was continuously updated throughout the project duration; from May 2019 the website received a total of 64.177 unique visits, 131.571 total visits and 468.586 pages visited. The figure below shows the statistics broken down per period.



- **SMARTER Social media** channels (Facebook - <https://www.facebook.com/smarterproject.eu/> and Twitter/X - https://twitter.com/i/flow/login?redirect_after_login=%2FSmarterprojectE) were opened in May 2019 and were continuously feeded during the project life. The figure below shows the overall statistics for the social media, broken down per period.

| | Facebook | | | | Twitter | | |
|--------------|------------|------------|------------|---------------|------------|------------|----------------|
| | Followers | Posts | Likes | Reach | Followers | Tweets | Impressions |
| Period 1 | 97 | 16 | 85 | 2.345 | 109 | 17 | 17.555 |
| Period 2 | 58 | 48 | 66 | 5423 | 98 | 89 | 34.671 |
| Period 3 | 65 | 90 | 37 | 7.064 | 127 | 131 | 37.553 |
| Period 4 | 22 | 50 | 10 | 4.965 | 43 | 46 | 22.120 |
| Total | 242 | 204 | 198 | 17.797 | 377 | 283 | 111.899 |

SMARTER's publications – communication to the public

- **Periodic newsletter:** SMARTER published, on a biannual basis, a newsletter aiming at providing insights on project activities (<https://www.smarterproject.eu/dissemination/newsletter-archive/>); 8 issues were published with a total of 60 articles and 257 subscribers:
 - Issue n. 1 in May 2019, with a total of 6 articles;
 - Issue n. 2 in December 2019, with a total of 8 articles;
 - Issue n. 3 in July 2020, with a total of 8 articles;
 - Issue n. 4 in February 2021, with a total of 7 articles;
 - Issue n. 5 in September 2021 with a total of 10 articles;
 - Issue n. 6 in March 2022, with a total of 6 articles;
 - Issue n. 7 in November 2022, with a total of 7 articles;
 - Issue n. 8 in June 2023 with a total of 8 articles.
- **5 Press releases** were produced during the project lifetime (<https://www.smarterproject.eu/press-releases/>)
- **6 interviews** both in Radio and TV; (<https://www.smarterproject.eu/other-communication-activities/>)
- **5 Videos** (<https://www.smarterproject.eu/dissemination/video/>)
- Participation to **142 industry events** (<https://www.smarterproject.eu/other-communication-activities/>)
- **54 various activities** such as training courses, communication activities towards university, high school students and general public (<https://www.smarterproject.eu/other-communication-activities/>)

Practice Abstracts

SMARTER produced a total of 12 practice abstracts as follows:

- Practice Abstract n. 1: Phenotyping of feed intake in small ruminants – How to do in practice?
- Practice Abstract n. 2: Greenhouse gases measurement in sheep using Portable Accumulation Chambers (PACs)
- Practice Abstract n. 3: Predicting feed intake in small ruminants – How to do in practice?
- Practice Abstract n. 4: Setting up across country genetic evaluations in sheep and goats requires international cooperation and the establishment of harmonised tools
- Practice Abstract n. 5: Compute Realized reliabilities of predictions from consecutive genetic evaluations using method LR
- Practice Abstract n. 6: Inferring challenges from frequently collected data
- Practice Abstract n. 7: Across-country genetic selection for feed efficiency indicators in Lacaune sheep from Greece and France
- Practice Abstract n. 8: Breeding to improve lamb survival and maternal efficiency in meat sheep
- Practice Abstract n. 9: A low-density sheep genotype panel for SMARTER sheep breeds
- Practice Abstract n. 10: When, why & how to breed for disease resilience in livestock
- Practice Abstract n. 11: Producing guidelines to record efficiency and resilience in small ruminants
- Practice Abstract n. 12: Across-country genetic evaluations are feasible in small ruminants

Practice Abstracts from 1 to 6 are shown in Deliverable D8.3 First batch of practice abstract for end-users, while Practice Abstracts from 7 to 12 are shown in Deliverable D8.5 Second batch of practice abstract for end-users.

All Practice Abstracts are available at <https://www.smarterproject.eu/practice-abstracts-eip-agri/>.

6 Conclusion

SMARTER partners will continue to disseminate and communication project activities. In fact, at least 20 additional papers are either under publication or been submitted to conferences.

Moreover, project partners will participate to:

- XV Simposio Brasileiro de Melhoramento Animal (Jatai, Brasil - 24-25 July 2023);
- the 74th EAAP Annual meeting organized in Lyon from 28 August to 1 September 2023; partners will contribute to Session 96 entitled ERANET-funded 'Grass to Gas' and EU-funded 'SMARTER' projects (31 August 2023) with 6 presentations and 6 posters;
- XXIV Simposio CONBIAND (Veracruz, Mexico - 2-6 October 2023);
- TECH-OVIN (Bellac, France - 6-7 September 2023).

7 Deviations or delays

The delay was due to the fact that partners were given time after the end of the project to report all the activities carried out on all the entire project.