

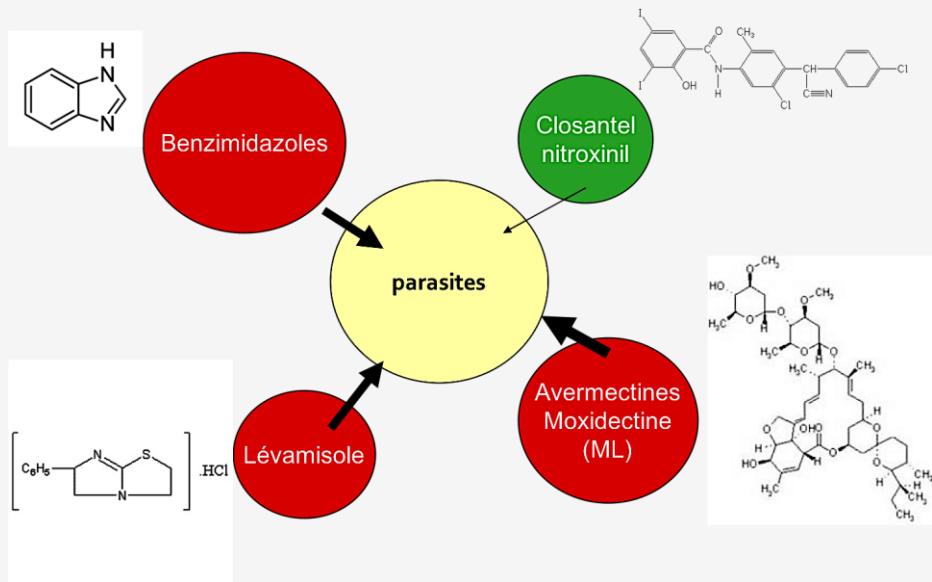
COMBAR

combatting anthelmintic
resistance in ruminants



(Only) together we can combat anthelmintic resistance

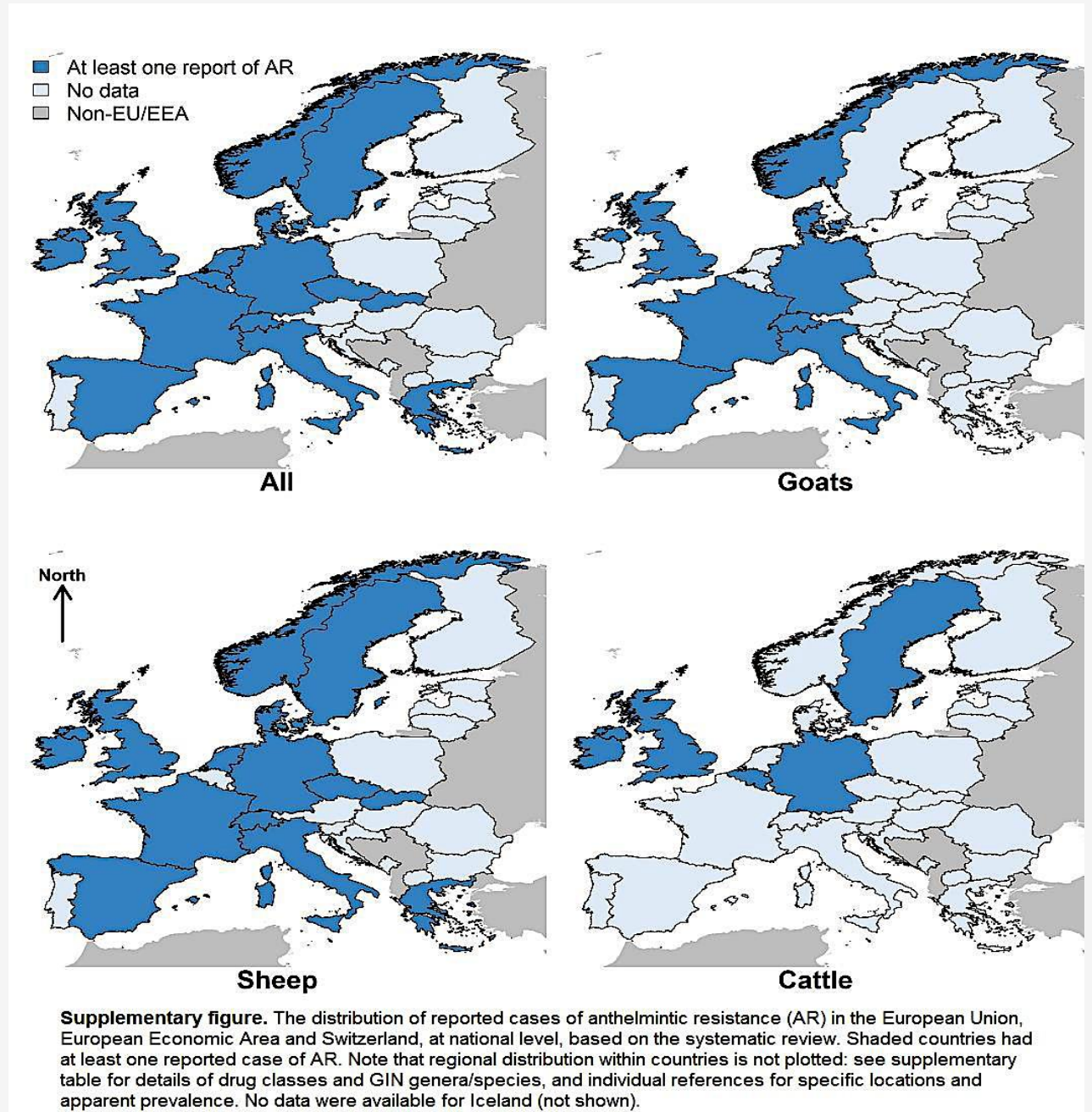




highly dependent on AH drugs



AR in Europe (nematodes)



Just another AR project?

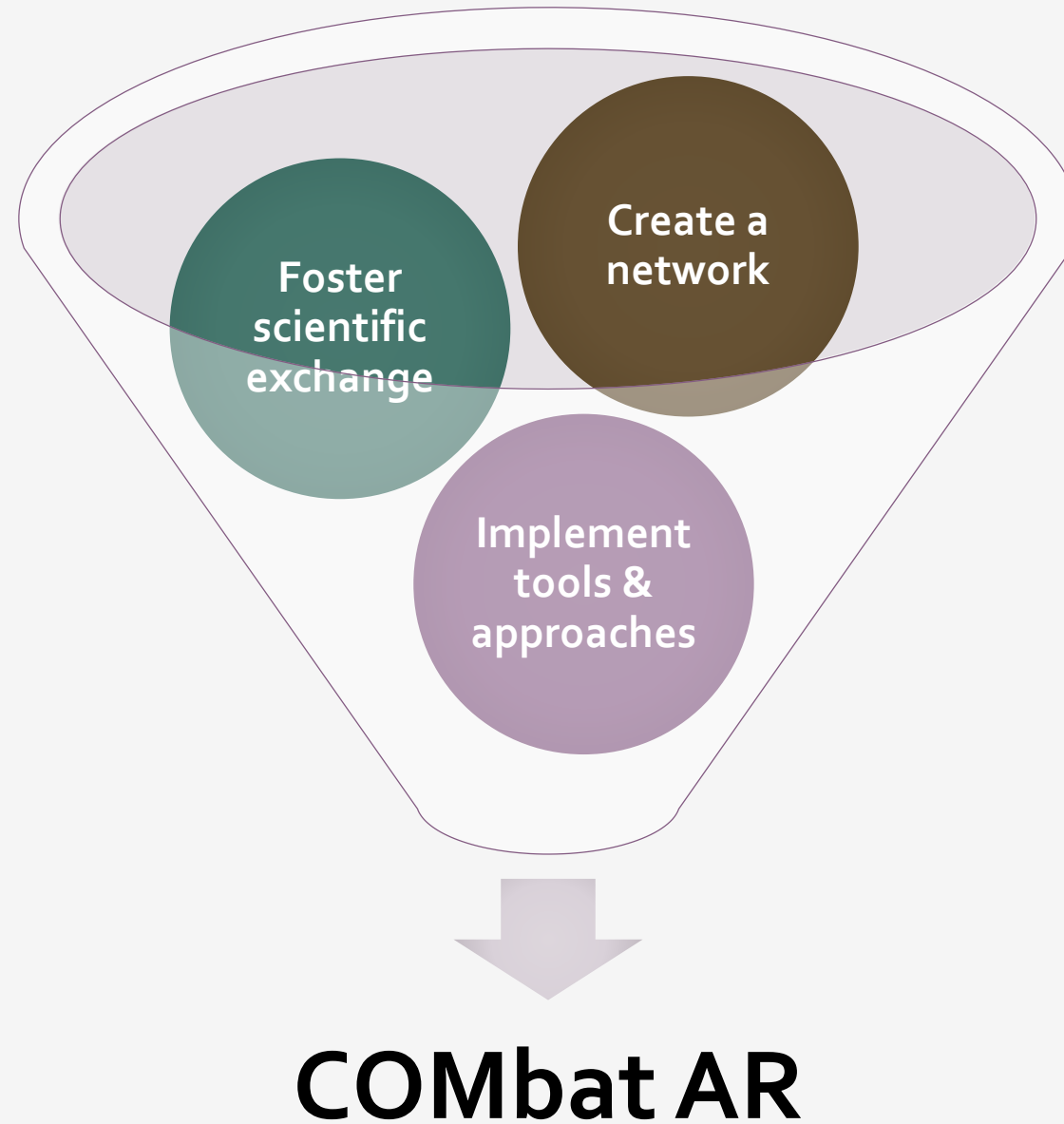
Too many projects already
Too much funding (EU-industry-other)

Where did we go wrong ?

Why we did not manage to apply new tools ?

Which direction should we take ? Too many different approaches

Challenge



COMbat AR

COST Action

The European Cooperation in Science and Technology (COST) is a funding organisation for the creation of research networks, called **COST Actions**. These networks offer an open space for collaboration among scientists across Europe (and beyond) and thereby give impetus to research advancements and innovation.



Create a network



32

Participating countries to date

Parties

Action Details

📅 MoU - 04/17

📅 CSO Approval date - 23/06/2017

📅 Start of Action - 19/09/2017

📅 End of Action - 18/09/2021

Participations

Country	Date
🇦🇹 Austria	24/02/2017
🇧🇪 Belgium	13/09/2017
🇧🇦 Bosnia and Herzegovina	15/02/2018
🇦🇩 Croatia	15/10/2017
🇨🇪 Czech Republic	21/08/2017
🇩🇰 Denmark	03/09/2017
🇫🇮 Finland	20/05/2018
🇫🇷 France	30/09/2017
🇩🇪 Germany	17/07/2017
🇬🇷 Greece	13/07/2017
🇭🇺 Hungary	15/03/2019
🇮🇪 Ireland	15/09/2017
🇮🇱 Israel	16/07/2017
🇮🇹 Italy	12/09/2017
🇱🇮 Lithuania	23/05/2018
🇲🇪 Montenegro	27/12/2017
🇳🇱 Netherlands	13/11/2017
🇲🇰 North Macedonia	06/09/2017
🇳🇴 Norway	17/08/2017

🇳🇴 Norway	17/08/2017
🇵🇱 Poland	25/07/2017
🇵🇹 Portugal	18/09/2017
🇷🇴 Romania	08/09/2017
🇷🇸 Serbia	15/12/2017
🇸🇰 Slovakia	17/07/2017
🇸🇮 Slovenia	08/09/2017
🇪🇸 Spain	22/08/2017
🇸🇪 Sweden	25/07/2017
🇨🇭 Switzerland	11/07/2017
🇹🇷 Turkey	15/03/2019
🇬🇧 United Kingdom	01/03/2017
🇦🇱 Albania	

Total: 31

COST Near Neighbour Countries

Institution Name	Country
Ecole Nationale de Médecine Vétérinaire de El-Di Tchebet	Tunisia

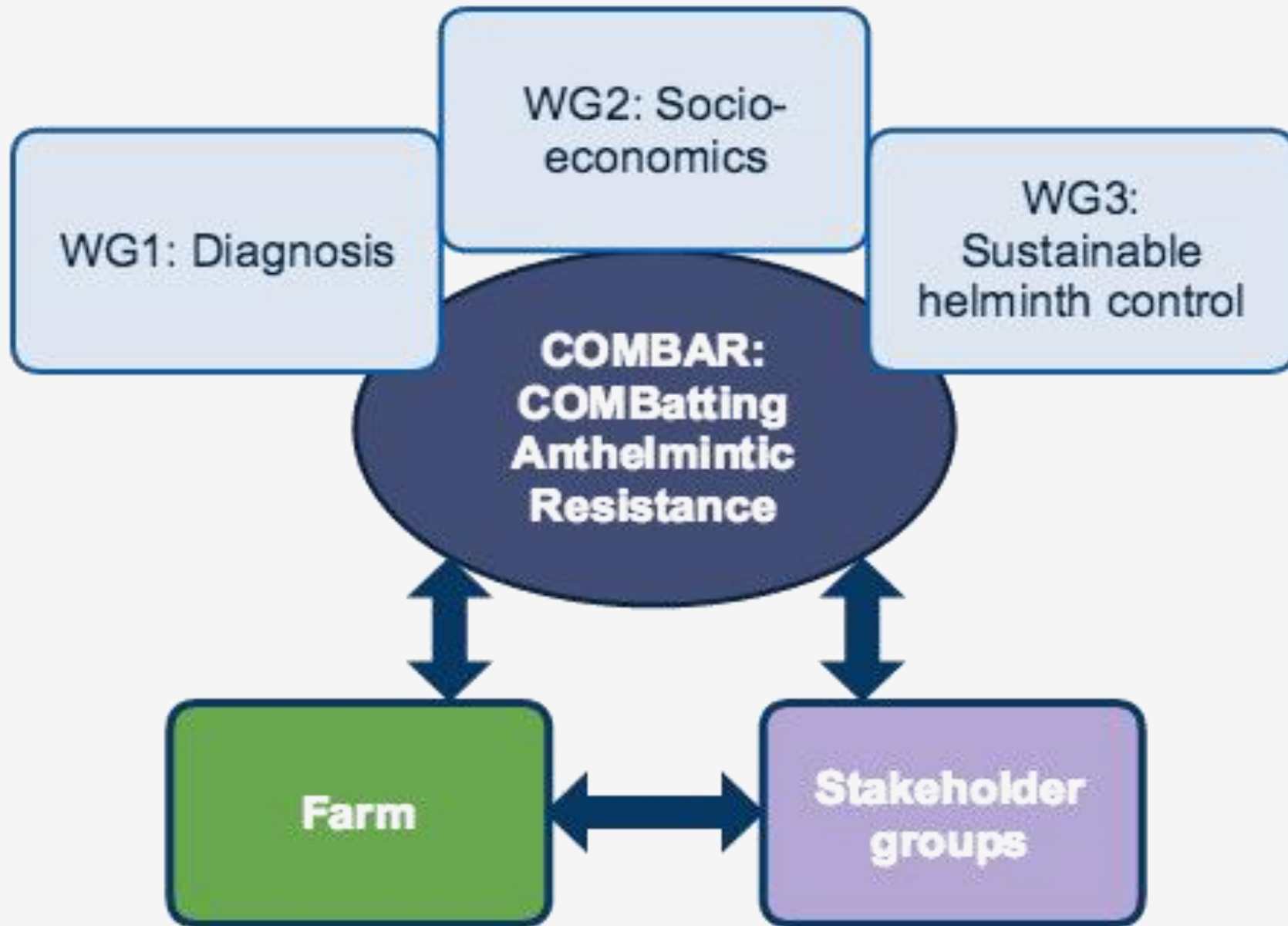


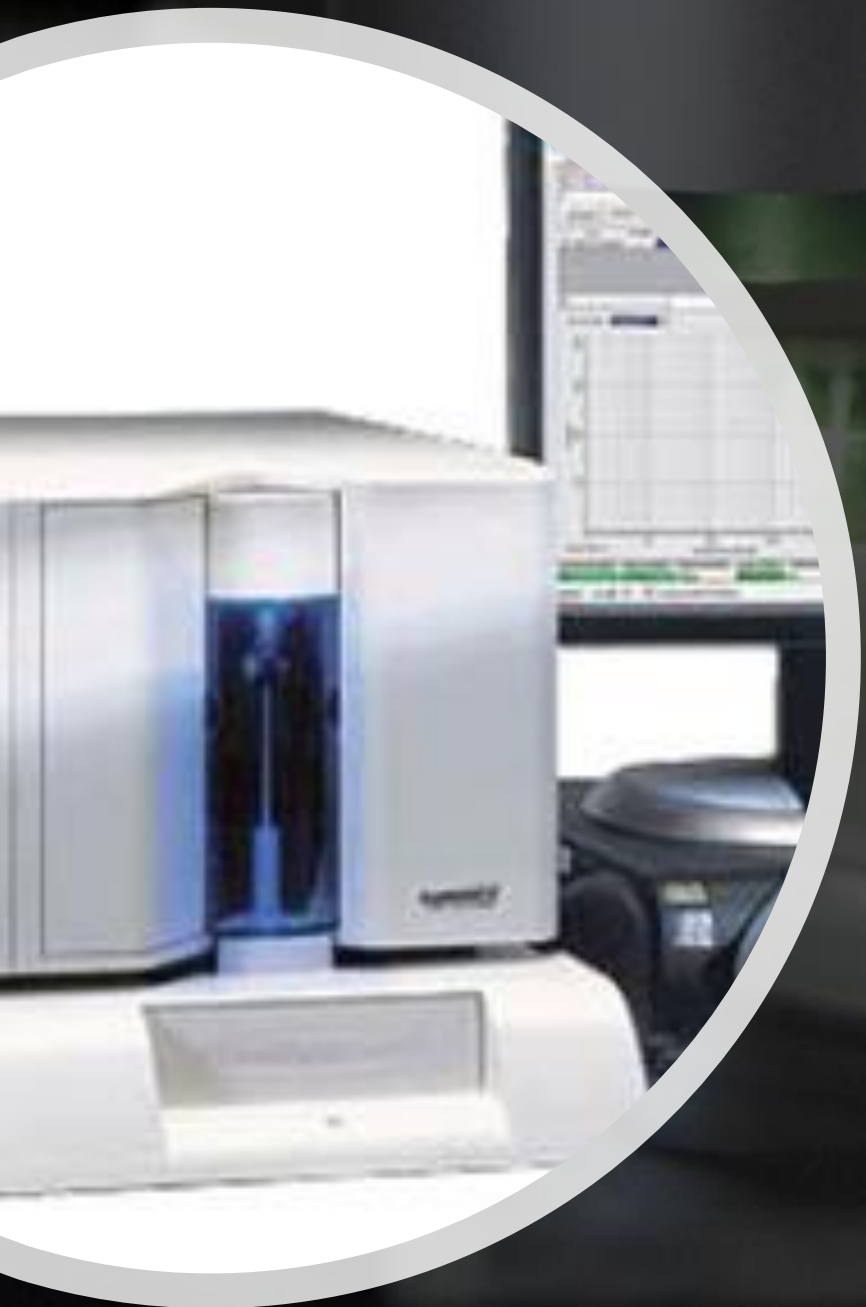
Research coordination objectives

- **To bridge the gap** between the different disciplines that have developed individual approaches to tackle AR in ruminants: **diagnostic development, vaccine research, targeted selective treatment approaches, decision support.**
- **To bring on board techniques and knowledge** from previously untapped areas of science, more specifically, (i) the **economic sciences** to understand the financial benefits and trade-offs involved in implementing new methods and (ii) the **social sciences** to understand human behaviour with regards to helminth control practices

Capacity building objectives

- To organize **training** in new techniques enhancing sustainable helminth control practices,
 - Novel laboratory and point-of-care diagnostics for helminth infections and AR;
 - Non-chemoprophylactic control approaches;
 - Modelling helminth epidemiology and control measures;
 - Economics of animal health and production;
 - Socio-psychological science methodologies in animal health research.
- To establish links with the **private and regulatory sector** and organize **dissemination activities** to achieve translation of the novel technologies and insights to the market.





WG 1 - Improving Diagnosis

To prioritise, evaluate and implement cost-effective methods for the diagnosis of helminth infections and AR

- **Task 1.1 Harmonize and validate diagnostic tests** for helminth infections and AR based on composite samples across laboratories, including standardisation of sample collection and processing .
- **Task 1.2** Prioritize, assess TRL, and **transfer the technology** of recently developed prototype diagnostic tests/platforms [e.g. multiple tandem-PCR (MT-PCR), Loop-mediated Isothermal Amplification (LAMP), bead-based multiplex systems (e.g. Luminex[®]) and pen-side FEC methods].
- **Task 1.3** Conduct **market analysis** and develop business plans for commercial test introduction, leveraging technical know-how of participants to support SME and industrial partners.
- **Task 1.4** Assess the **extent of AR** in ruminants using field surveys in selected/relevant COMBAR countries, to define the needs for and economic contribution of new technologies.

To deliver



List of harmonized, validated and newly introduced diagnostic tests across European laboratories, and TRL of new but not yet commercially available tests.



European market analysis for at least 1 novel diagnostic test.



Updated maps of occurrence and extent of AR in ruminants in Europe.



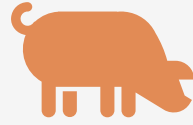
WG2: Understanding socio-economic aspects

To develop, disseminate and apply methods to study the economics and human behaviour in the field of helminth control in ruminants

- **Task 2.1 Train** the participants in the principles and methods of the economics of animal health. The training will focus on animal health decisions at farm level subject to resource scarcity and budget constraints and include practical real-life examples.
- **Task 2.2 Study** the economic effects of novel parasite control approaches as identified in WG3, and integrate them into market assessment and business planning in WG1 and WG3.
- **Task 2.3** Train participants in the theory and methods of **socio-psychological research** relevant to animal health. The theory will include grounded theories from behavioural and health psychology. Methods will include the conduct of in-depth interviews and focus group meetings.

- **Task 2.4** Conduct **standardised in-depth interviews and focus group meetings** in different European countries to identify the most important barriers and motivations for the adoption of sustainable GIN control strategies, and feed these into exploitation assessments in WG1 and WG3.
- **Task 2.5** Develop and validate conceptual model(s) that predict farmer behaviour with regard to helminth control in ruminants in different settings (countries, production systems).
- **Task 2.6** Develop a **communication strategy** to promote sustainable helminth control methods based on the insights from the validated behavioural models.

To deliver



Workshop on the economics of animal health and GIN control.



Workshop on socio-psychological research methods relevant to animal health.



White paper on the current barriers and motivations for the adoption of sustainable GIN control strategies and methods to overcome them.



WG3: Innovative, sustainable control methods

To develop practical and sustainable helminth control strategies that integrate current insights from diagnostics, TT/TST approaches, epidemiology, vaccinology, farm economics and human behaviour.

- **Task 3.1** Compile a **database of evidence-driven alternative control approaches** that have been trialled in Europe and globally, noting information inputs, processing, application and outcome, and any observed hurdles between proof of concept and practical application in a commercial setting.

- **Task 3.2** Broaden the concepts of **alternative control approaches to different ruminant sectors in Europe**, taking account of variation in production and social context. Use underpinning knowledge and practical experience within the consortium to support members in efforts to refine, validate and evaluate such approaches in new environments.

- **Task 3.3** Evaluate impacts of future changes in parasite challenge, farm management and novel control tools on current TT/TST and DSS based strategies. This will include **predictive modelling**.
- **Task 3.4** Conduct gap analysis of information needed for further development of **decision support tools**, in terms of technical hurdles as well as farmer attitudes and economic-social constraints.
- **Task 3.5** Engage with animal health advisors and professional organisations to discuss how sustainable parasite control approaches and DSS can be integrated in existing professional advice, and where applied, measure the impact of past and inter-current dissemination initiatives on parasite control practices

To deliver



Database of evidence-driven alternative control approaches.



Scientific papers on the conceptual, *in silico* and/or *in vivo* evaluation of integrated control strategies.



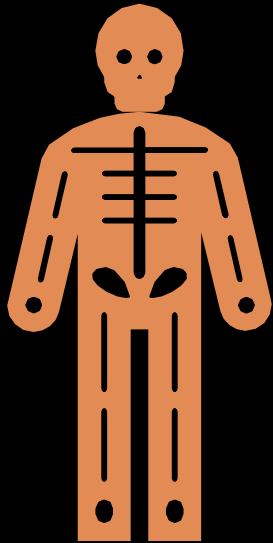
Road map for further research and development of DSS.



Report of “best practice” guidelines for sustainable GIN control for knowledge institutions, animal health workers and professional organisations.

Who we are

COMBAR Management Structure



Chair: Johannes Charlier (BE)

Vice-chair + grant holder: Smaragda Sotiraki (GR)

WG-leaders:

- **WG₁** – Diagnostics: Laura Rinaldi (IT) + Georg von Samson-Himmelstjerna (DE)
- **WG₂** – Socio-economics: Edwin Claerebout (BE) + Fiona Kenyon (UK)
- **WG₃** – Integrated control: Eric Morgan (UK) + Hervé Hoste (FR)

STSM panel

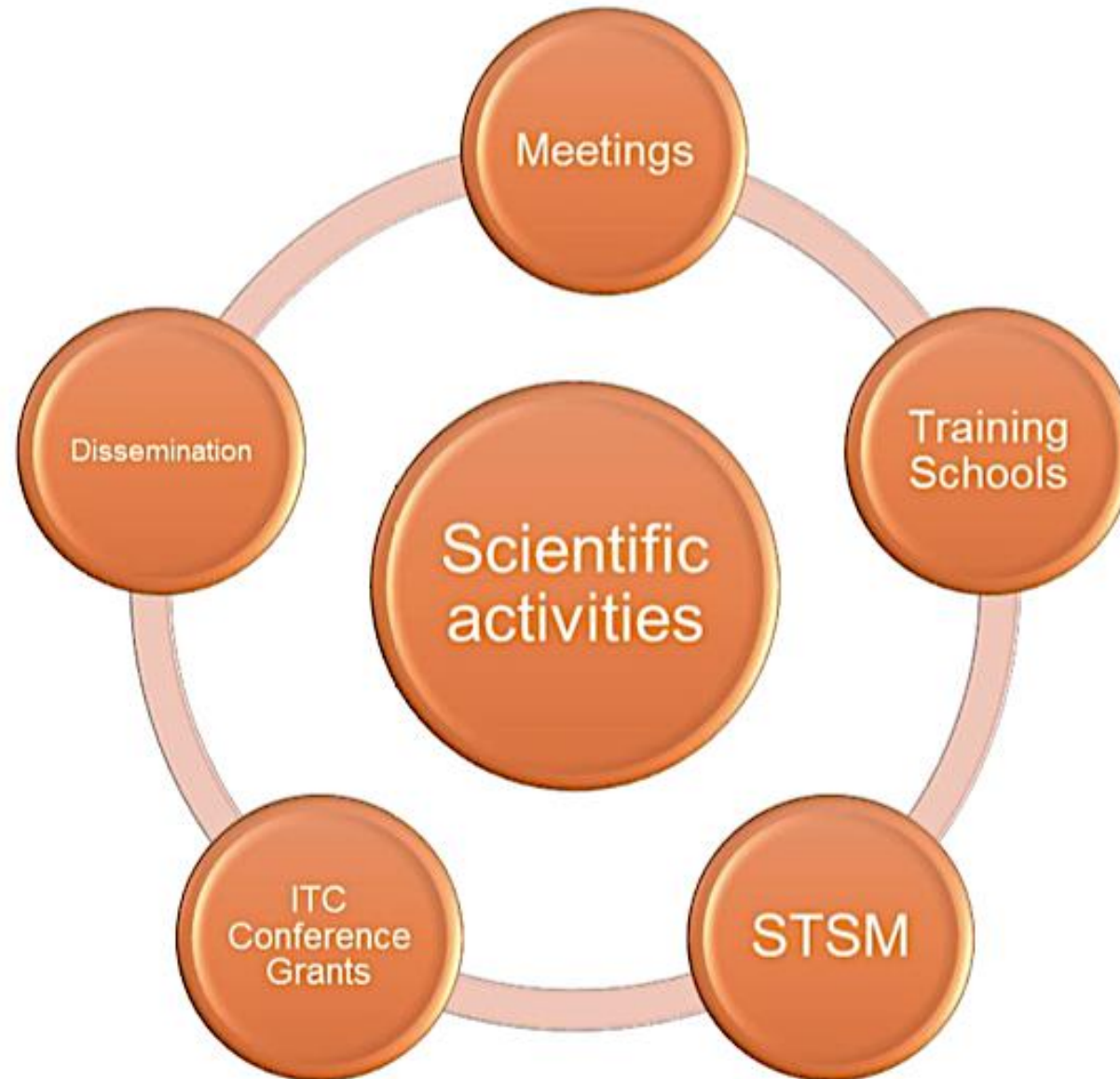
- **Coordinator:** Maria Martinez-Valladarez (ES)
- **Members:** Hubertus Hertzberg (CH), Theo De Waal (IE), Marian Varady (SK), Heidi Enemark (NO)

Science communication manager: Martin Kašný (CZ)

+ MC members, WG members, students, experts

*What is COST
offering*

COST Networking Tools



combating anthelmintic resistance in ruminants

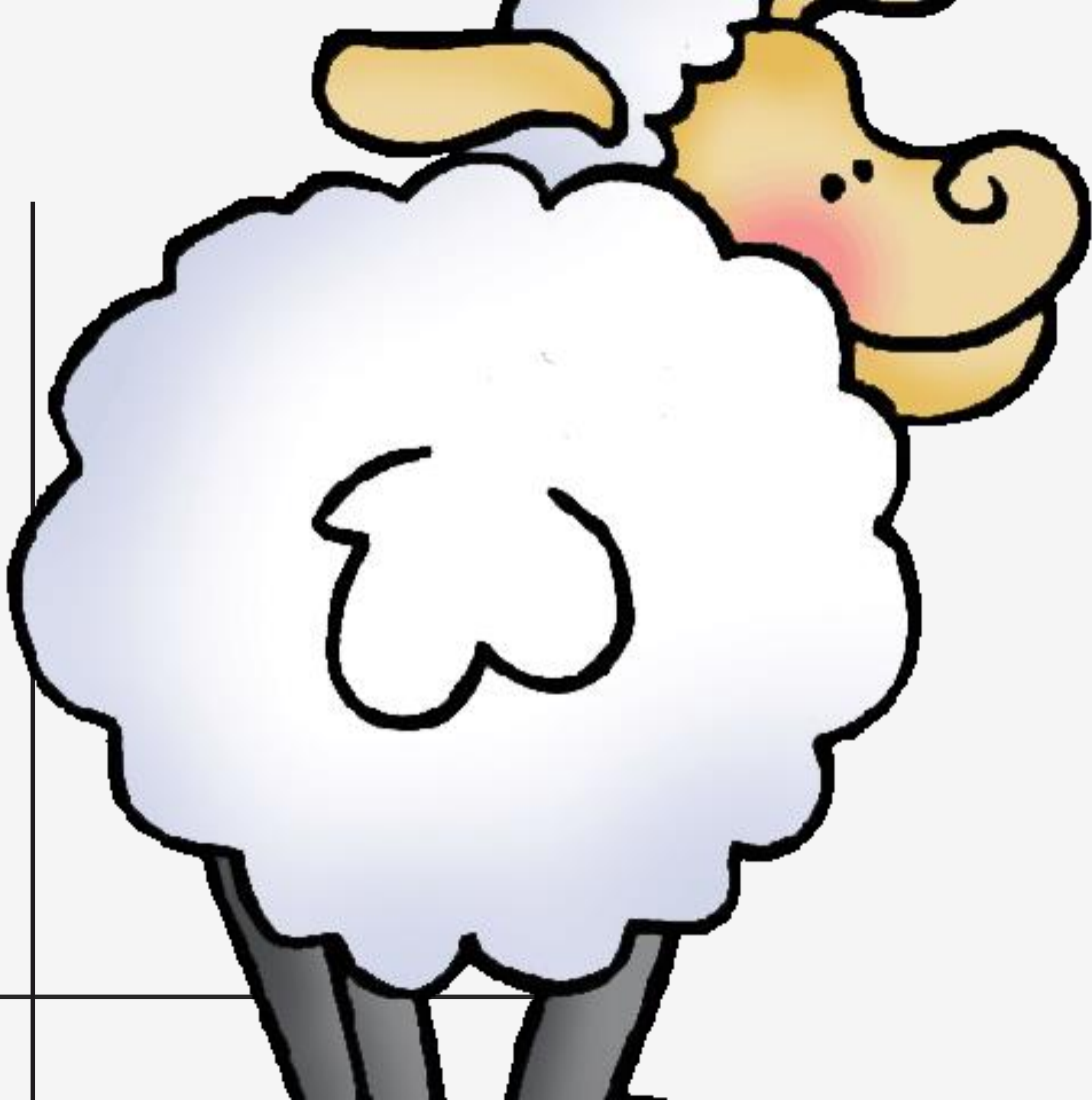
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in ruminants

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