



# ROADMAP

## Rethinking of antimicrobial decision-systems in the management of animal production

Research and Innovation action: H2020 – 817626  
Call: H2020-SFS-2018-2  
Type of action: Research and Innovation Action (RIA)

### Report of the final scientific conference

Noraly van Hemert <sup>\*1</sup>, Tamara Rodríguez Silva<sup>2</sup>, Cagla Kaya<sup>1</sup>

<sup>1</sup> EFFAB, The Netherlands; <sup>2</sup> FEUGA, Spain

\* Deliverable leader – Contact: [noraly.vanhemert@effab.info](mailto:noraly.vanhemert@effab.info)

## DELIVERABLE D7.7

**Workpackage N°7**

**Due date:** M48

**Dissemination level:** Public



---

## About the ROADMAP research project

The overall aim of ROADMAP is to **foster transitions towards prudent use of antimicrobials (AMs) in animal production in different contexts to manage antimicrobial resistance (AMR). Prudent antimicrobial use (AMU) will be achieved by enhancing antimicrobial decision-systems along the food and drug supply chains.** ROADMAP will focus on supporting animal health and welfare through prevention and health promotion actions.

AMR is recognized as a significant threat to global public health and food security. Overuse and improper use of AMs in many parts of the world contribute to the emergence and spread of AMR. Although human and animal health require AMs, it has been estimated that two thirds of the future AMU growth worldwide will be in animal production. Improving the management of AMU in farm animals is therefore a critical component of dealing with AMR and optimizing production in the livestock sector. Nevertheless, the variety of contexts of AMU in the livestock sector is a major challenge to managing AMR. **There is no “one-size-fits-all” solution to improve AMU and strategies must be contextually developed** (for instance, strategies used in the Danish pig industry are difficult to adapt and adopt in the French free-range poultry farming). Successful solutions must be combined and tailored to the production systems and the social and economic context in which they operate.

ROADMAP will meet three general objectives, in line with the EU AMR Action plan: i) **Rethink AM decision-systems and animal health management**; ii) **Develop options for encouraging prudent AMU in animal production**; iii) **Engage all actors in the food and drug supply chains in fostering a more prudent use of AMs.**



## Project consortium

Part. N°	Participant organisation name (acronym)	Country
1	Institut National de la Recherche Agronomique (INRA) **	France
2	Association de coordination technique agricole (ACTA) ***	France
3	Centre de coopération internationale en recherche agronomique pour le développement (CIRAD) **	France
4	University of Liverpool (ULIV) *	United Kingdom
5	Cardiff University (CU) *	United Kingdom
6	James Hutton Institute (HUT) **	United Kingdom
7	Alma Mater Studiorum - Università di Bologna (UNIBO) *	Italy
8	Aarhus Universitet (AU) *	Denmark
9	Eigen Vermogen van het Instituut voor Landbouw en Visserijonderzoek (EV-ILVO) **	Belgium
10	Research Institute of Organic Agriculture (FiBL) **	Switzerland
11	Stichting Wageningen Research (WR) *	Netherlands
12	Swedish University of Agricultural Sciences (SLU) *	Sweden
13	Southern Agriculture and Horticulture Organization (ZLTO) ***	Netherlands
14	European Forum of Farm Animal Breeders (EFFAB) ****	Netherlands
15	Fundacion Empresa Universidad Gallega (FEUGA) ****	Spain
16	Dierengezondheidszorg Vlaanderen (DGZ) ***	Belgium
17	INRA Transfert (IT) ****	France

\* *Universities/veterinary schools*

\*\* *Research institutes specialized in both fundamental and applied agricultural and veterinary sciences*

\*\*\* *Public and private advisory services Organisations*

\*\*\*\* *Knowledge transfer and Innovation organisations*




---

## Table of contents

About the ROADMAP research project .....	2
Project consortium .....	3
<b>Table of contents .....</b>	<b>4</b>
<b>List of acronyms and abbreviations .....</b>	<b>5</b>
<b>1 Summary.....</b>	<b>6</b>
<b>2 Introduction .....</b>	<b>7</b>
<b>3 Results .....</b>	<b>8</b>
3.1 Networking cocktail dinatoire.....	8
3.2 Final event.....	9
3.2.1 Attendance .....	9
3.2.2 Sessions and summary of discussions .....	10
3.2.2.1 <i>The ROADMAP project: A Bird's-Eye view</i> .....	10
3.2.2.2 <i>What have living labs taught us?</i> .....	12
3.2.2.3 <i>Guided Multi-Actor Round Table Session</i> .....	12
3.2.2.4 <i>ArMoR project session</i> .....	16
3.2.2.5 <i>A review of ROADMAP's achievements</i> .....	17
<b>4 Conclusion.....</b>	<b>19</b>
<b>5 Annex.....</b>	<b>20</b>
5.1 Policy briefs .....	20
5.2 The ROADMAP booklet .....	20



## List of acronyms and abbreviations

ROADMAP	Rethinking the use of antimicrobials in livestock production systems
ENoLL	European Network of Living Labs
EFFAB	European Forum of Farm Animal Breeders
AHE	Animal Health Europe
FVE	Federation of Veterinarians of Europe
FEFAC	European Feed Manufacturers' Federation
PO	Project Officer
REA	Research Executive Agency
ENSV-FVI	National School of Veterinary Services
GMO	Genetically Modified Organisms
AM	Antimicrobial
AMR	Antimicrobial Resistance
AMU	Antimicrobial Use
EU	European Union
RUMA	Responsible use of Medicines in Agriculture Alliance
FA	Feed advisors
DK	Denmark
LL	Living Lab
EPRUMA	The European Platform for the Responsible Use of Medicines in Animals
UK	United Kingdom
DG AGRI	Directorate-General for Agriculture and Rural Development
DG SANTE	Directorate-General for Health and Food Safety
AMCRA	Antimicrobial Consumption and Resistance in Animals
DISARM	Disseminating Innovative Solutions for Antibiotic Resistance Management
RIA	Research and Innovation Actions
F2F	Farm-to-Fork
EC	European Commission
SAB	Stakeholder Advisory Board
iMAP	integrated Modelling Platform for Agro-economic Commodity and Policy Analysis
JRC	Joint Research Centre
AHW	Animal Health and Welfare



---

## 1 Summary

Effective communication and dissemination of scientific project results is essential, and the ROADMAP final event in Brussels in April 2023 provided an opportunity for stakeholder participation and discussions. The event included a networking cocktail dinatoire and a presentation of project results, with a policy event on the second day. The hybrid format allowed for online participation, and 30 stakeholders participated overall, providing insights and suggestions for further work.



## 2 Introduction

Effective communication and dissemination of (scientific) project results are essential as it allows for broadcasting its significant findings to all stakeholders. For this reason, the ROADMAP final event was organised on the 25<sup>th</sup> and 26<sup>th</sup> of April, 2023, at the University Foundation in Brussels. On the 25<sup>th</sup>, a networking cocktail dinatoire was hosted, and the 26<sup>th</sup> of April was dedicated to the presentation and overview of all project results, including a policy event. The event's second day was hosted in a hybrid format, allowing online participation. The full agenda can be reviewed in Figure 1.

Figure 1 Agenda of the ROADMAP final event

**FINAL EVENT**  
25 & 26 APRIL – BRUSSELS  
AGENDA

**DAY 1 – 25 APRIL**

17.30h -19.30h Networking drinks and dinner 🍷

**DAY 2 – 26 APRIL**

9:00h Registration & welcome coffee

9:30h The ROADMAP Project: A Bird's-Eye View  
Nicolas Fortané

10:10h Discussion

10:30h Coffee Break ☕

11:00h What have Living Labs taught us?  
Mette Vaarst (AU) & Bernadette Oehen (FiBL)

11:40h Discussion

12:00h Guided multi-actor round table session  
Nancy De Briyne (FVE); Paula de Vera (COPA-COGECA); David John (Animal Health Europe);  
Luben Goranov (DG SANTE)

13:00h Lunch Break 🍴

14:30h Poster session

15:00h The ArMoR Project: Keeping the momentum towards reduced AMU  
AVANT & FARM-CARE: Luca Guardabassi

15:30h Coffee break ☕

16:00h A review of ROADMAP's achievements

17:00h Closing

Networking drinks and snacks 🍷



---

## 3 Results

### 3.1 Networking cocktail dinatoire

On the 25<sup>th</sup> of April, before the final conference, an informal network cocktail and dinner were organised at the final event location (University Foundation Brussels). Travelling or local stakeholders were invited for a casual get-together in which discussions and networking were facilitated. In total, five stakeholders joined the project partners for a drink and some food.

*Table 1 Stakeholder attendance registry for the networking cocktail dinatoire*

<b>Name</b>	<b>Organisation</b>
Koen Vervoort	ENoLL
Peter de Herdt	MSD Animal Health
David John	AnimalHealthEurope
Diana Teixeira	AnimalHealthEurope
Phil Dawber	Cornwall Dairy Vets





### 3.2 Final event

The ROADMAP final event was held on the 26<sup>th</sup> of April at the University Foundation in Brussels. The meeting started with a welcome reception at 9:00, after which the project's most valuable results were presented over different sessions, with varying formats and varying partner participation. The full programme can be found in Figure 1. To allow for easy participation, we hosted the event in hybrid form, where 70 people could attend in person and others could register for the online session. Moreover, the online session was equipped with simultaneous translation to both French and Spanish. The same interpretation options were provided for those attending in person.

#### 3.2.1 Attendance

The stakeholder attendance for online and offline participation can be found in Table 2. In total, 30 stakeholders participated, of which 18 attended the event in person, and 12 could follow the event online. The participating stakeholders represented various stakeholder groups, including pharmaceutical companies, veterinary and farmer organisations, and policy makers. Efforts were made to represent different stakeholder groups, which is reflected in the participant list.

*Table 2 Stakeholder attendance registry for the second day of the ROADMAP final event*

	<b>Name</b>	<b>Affiliation</b>	<b>In-person/Online</b>
1	Bárbara Barbosa	EFFAB	In-person
2	Arnaud Bouxin	FEFAC	In-person
3	Clare Carlisle	AnimalHealthEurope	In-person
4	Phil Dawber	Cornwall Dairy Vets	In-person
5	Nancy de Briyne	FVE	In-person
6	Peter de Herdt	MSD Animal Health	In-person
7	Paula de Vera	COPA and COGECA	In-person
8	Yael Dotan	FVE	In-person
9	Luben Goranov	DG SANTE – European Commission	In-person
10	Ana Granados Chapatte	EFFAB	In-person
11	Luca Guardabassi	University of Copenhagen	In-person
12	Wiebke Jansen	FVE	In-person
13	David John	AnimalHealthEurope	In-person
14	Jan Vaarten	FVE	In-person
15	Koen Vervoort	ENoLL	In-person
16	Eva Litjes	ZLTO	In-person
17	Diana Teixeira	AnimalHealthEurope	In-person
18	Alina Kozacenko	PO/REA	In-person
19	Amandine Gautier	ENSV-FVI	Online
20	Alison Burrell	Animal Health Ireland	Online



21	Balazs Libisch	Institute of Genetics and Biotechnology, MATE University, Gödöllő	Online
22	Basile Pasquereau	ANSES	Online
23	Bertrand Ridremont	BRIDge Conseil 49	Online
24	Els Goossens	Boerenbond VZW	Online
25	Ibrahima Kouma	Ministère des Ressources Animales et Halieutiques	Online
26	Isabel Blanco Penedo	SLU	Online
27	Lucy Coyne	National Office for Animal Health	Online
28	Michelle McGrath	Animal Health Ireland	Online
29	Olivier Oben	Anitom	Online
30	Winnie Aketch	International livestock research institute	Online

### 3.2.2 Sessions and summary of discussions

#### 3.2.2.1 The ROADMAP project: A Bird's-Eye view

The day's first session focused on the ROADMAP project's overall results. The presentation was initiated by the project coordinator Nicolas Fortané with assistance from other project partners. The presentation can be reviewed [here](#), the video can be found on YouTube [here](#). The discussion can be summarised as follows:

- **How do you motivate farmers in France to AM-free products?**

It depends on the companies and the agreements. It's based on private initiatives, 2-4 cents. It also depends on the origin of feed, `GMO-free..etc, but there is a bonus for economic incentive.

- **Other reasons include not seeing AMR as a problem.**

In Sweden, they saw it as a threat to their own health and children but not to animals. Indeed, for the long term on their production. They are not aware of the public health problems.

- **Drivers of changes for vets? What are their needs?**

It is an opportunity for the Vet professionals to position their relations with farmers and the tools they use for AMR. It's a long-lasting trend with newly implemented regulations. To embrace AMR to have them moving towards. Strengthening the vet network, increased visits, monitoring... Vets also must change since the animal health market is also changing. AMR and AMU are maybe newer, but the change in the animal health sector is more extended and significant.

(FVE) It is important that they know more and fulfil their new roles. The new EU veterinary medicine regulation strengthens the position of Vets to play as an initial player.

- **High diversity in countries between sectors. Is It possible to compare the countries and show the most successful?**



There is an extensive toolkit to address the issue and engage with actors. 10 years ago, the action plan didn't consider the diversity of the sectors, and profiles. The comparison wasn't an objective for ROADMAP but to understand the diversity to tailor practices and solutions.

There are also some components in countries that are successful; increasing awareness across all actors, including consumers, monitoring the potential risks, regulate the use are crucial elements in all countries with the best results.

#### **Negative media coverage on farmers affects use? (Animal Health Europe)**

Vets and farmers have been pointed out as harmful usage, but the main problem is what is AMR (animal, environment, farm, public health...). Does it engage with all actors properly? This is the room for improvement for AMR.

**Jonathan Rushton** -The interventions' cost-effectiveness should be considered in new regulations and policies regarding different scopes.

60% of the literature was on dairy cattle. Data is kept from other sectors since it's too integrated and closed in the pigs and poultry sectors. Business secrets were more in action since data wasn't shared. There is much heterogeneity even within the same species in interventions and farm types, so it's challenging to devise one intervention to solve the problem.

**FVE** – Intersectoral collaboration is important in some countries. UK has RUMA, Belgium AMCRA. Having organisations like this helps give the direction and implementation of change. Coordination among actors within the sector is essential. It is wider in dairy cattle to share experiences, so it was easier to decrease AMU.

- **New business models in poultry and pig vets have been targeted because they used a lot, and now it is declined. But now they must find new income sources such as management, diet... Are there other examples in other countries? In the cattle sector, it is solved.**

In every country, it is a big challenge. Developing a new business model is challenging focusing. Only on preventive medicine. The role of vets in the poultry and pig sector is more preventive but changing also. Services are different. Initially, they were based on treatments and interventions, but now it is changing to monetise from advisory services. They have so many competitors from companies. But it is also a cultural shift in the role of vets.

- **FEFAC – Debate between vets and farmers. Role of farm advisors and particularly feed advisors. To which extent are their role integrated in these results, and are they evaluated on the consistency of the messages to farmers?**

In an integrated context they are taken into the team. In less context, vets and feed advisors have conflicts. FA is giving advisory free, whereas the vets must charge for this. In the Netherlands, it is being regulated. It should be studied elsewhere, but it should be.

**Ana**- there is negative pressure on farmers. The advisors on breeding and feed they are all important.

- **Are the farmers motivated or resistant? Is facing resistance a driver of change or not?**

Resistance isn't a big issue. Is it a public health or animal health problem? The specific difficulty is to see the problem globally.

The business model for vets; in DK is not allowed to get paid for antibiotics and only for advice. This was a drive for change.



### 3.2.2.2 *What have living labs taught us?*

The second session of the event on the 26<sup>th</sup> focused on the concept of Living Labs, how they were implemented in the ROADMAP project and what the most important and exciting results were. The presentation was chaired by Mette Vaarst, with support from the leaders of the different living labs. The presentation slides can be reviewed [here](#). The recording of the session is found [here](#). The discussion after the session is summarised as follows:

- **ENoLL- what are Action labs?**

This is the room where things are brought into the world and could be an extended group as a subgroup of LLs and work in parallel—part of the LL. It is part of the third phase, where the aim is to test and validate.

- **Involve stakeholders interested in change. But the stakeholders are also the ones who are affected. Most of the LLs need more staff clear definition of LLs. When the LLs are led by a researcher, they should not act also as panel managers. Having different panel managers would build trust, who knows all the stakeholders.**

Only in some of the cases the researchers were facilitators. It's relevant to have a facilitator take on that role. Open-minded people are, of course, more prone to also join, but some stakeholders were facing challenges they also learned a lot. Sometimes they only know the system they are in and not about other systems. Common understanding creates room for action and improvement.

In France, we had a facilitator who knew the system and sector well. After each meeting, there was debriefing and feedback from observers joining in LLs. It was good that the facilitator wasn't trying to push his ideas but more mutually in a relaxed way.

- **We are losing momentum in the AMU discussion. We need better animal health and welfare with a holistic approach. Do the LLs steer the way to understand what is new phase steering it?**

We had 3 LLs where the context changed, and the focus also changed. Systemic changes are also very important.

### 3.2.2.3 *Guided Multi-Actor Round Table Session*

As seen on the agenda, the third agenda point was a guided multi-actor round table session, this session was explicitly directed towards policy. The round table session included stakeholders from different sectors: Nancy de Briyne (FVE; veterinarians), Paula de Vera (COPA-COGECA; farmers); David John (AnimalHealthEurope; pharmaceutical industry); Luben Goranov (DG SANTE; European Commission). Under the project coordinator Nicolas Fortané, these sector representatives were guided through a discussion supported by materials presented to the participants beforehand. The supplied materials consisted of 4 policy briefs); and a booklet containing general project information and results. The recording of the round table is found [here](#).



---

The discussion is summarised in the coming sections.

- **How do you perceive the changing farming practices? How do you see from your point of interest what are the main trigger of action and which other actors should be pushed or included?**

*David (AHE):* Farming is facing a lot of economic, environmental, and diversity pressure. Any solutions for AMU reduction must be compatible and synergistic with other problems. Otherwise, we will struggle a lot.

*Luben (DG Sante):* Solutions that cater for all aspects of the problems identified. Overarching is the structure and the rule everybody plays according to. New regulations came into force last year. Setting the rules of the game is done by DG SANTE. Yield increase, restrictions of pro – meta- phylactic use and AB used for humans as well. Collection of data in the use of AMBs. 50% of the reduction of AMU is aimed at by 2030. How do we involve other actors? That will allow the MSs to adapt their measures in a more adapted way so that farmers could achieve the targeted goals.

EC reserved 3 million for hands-on training for vets and farmers, in situ and online participation with all member states with food-producing animals for AMR. Designed on the train-the-trainer principle. Learning about the new obligations and new measures per MS. These trainees will share the information. Online participants are also able to learn themselves.

*Nancy (FVE):* How do we motivate the farmers? Farmers have changed already as vet professionals. 70% decrease already. There is no one miracle solution for all. There must be a combination of all available solutions. Data collected per species could help us to decide where we can reduce the use. Some farmers are locked-in in husbandry since it's very hard to make these changes for housing and equipment which funds could support.

*Paula (COPA-COGECA):* The basic principles are sustainable and healthy livestock production. We are committed to one health concept environment, human, and animals should be considered. Prevention is better than cure. Farmers have been evolving and changing for decades. At the same time, the advancements in science and technology have been even faster. Farm technologies are also advancing the last two decades, and farmers are willing to change. How can we better advance? Main point is that the EPRUMA platform is important for other organisations to achieve the targeted health of animals. Collaboration with EPRUMA, including society and consumers, is important.

- **Non-vets are buying antimicrobials at low prices and selling to farmers in bulk companies. Is that making it better to reduce the use of AM in farms?**

*David (AHE):* Pharma companies had a shift, profit shifted from AM to vaccines and other preventive measures and smarter solutions. 50% comes from vaccines. We see the move in pharma companies.

*Luben (DG SANTE):* There are quite restrictions in prescribing and use of AMs. Metaphylactic prescriptions require confirmation of vet and is controlled very strictly.

*Nancy (FVE):* Each member state has different level of corporates active in the sector. These are mostly on companion sector since its more profitable. Few are very active in farm animal sector. For them



---

AMR what they see as social sustainability responsibility. We haven't seen a prescription from corporates only maybe in UK where you have a few.

- **Funding for farmers pays a lot for change for the environment, health, and welfare, and also for vets to regulate all these changes. Could there be some regulations to fix prices or not to use AMs when consequences?**

Nicolas - There are also market-led initiatives, as mentioned in the presentation.

*David (AHE):* Large investments in farms, you need a certain predictability to see if you can invest and if it's going to be useful in 10 years. One of the issues is that we keep facing many changes very quickly. That changes where and how you invest.

- **Jonathan – In the EU we don't pay our vets for their mistakes; we expect them to make these mistakes. We have been good in subsidising in infrastructural changes and production. Can we make these infrastructural changes for AMR as well?**

*Luben (DG Sante):* DG AGRI can answer these.

*Nancy (FVE):* The funding will be more important once the animal welfare regulation comes into force in the coming months. Regarding the AMR, there are still problems in some countries, and we have to make sure in these countries that vets are not paid for AMU. In some countries, vets are like doctors. You don't pay them because the state pays them. So you can control the situation easier. And in future, we might face that we don't have any vets left in rural areas.

*Paula (COPA-COGECA):* Our experience is on pesticides and animal welfare. DG AGRI and SANTE think that the CAP is a tool to finance, but the budget is limited. SANTE is willing to find other ways to fund it, but these must be defined. Eat less, pay more, so if consumers are willing to pay vets for these services, this could be a solution. There is a lot of collaboration between vets and farmers and national initiatives to implement.

*David (AHE):* It's just not vets. We also have farm advisors (feed, breeding...). DISARM was trying to bring these different actors to discuss, not to give different advice to farmers.

- **We are asking the farmers to change their status-quo. We can also make the current status-quo less desirable. Like taxing in pesticides in Denmark. So farmer could be more motivated to change. Farmers are not stupid, and they are in the current system because they have incentives, and these are attractive.**

*Paula (COPA-COGECA):* For pesticides, we know that every member state has their national system. EU can't actually put a hand on that. In current socio-economic state these are quite a burden for the farmers. We can make it more targeted for AMR and we should also put more focus on better investment in RIA + training rather on punishing the farmers.

*David (AHE):* Taxing AMs was discussed but it got complicated. There are some AMs are more preferred since they weren't being used by humans but if there will be a transition it shouldn't be a burden on farmers, human and governments for administrative purposes.



- **Jan Vaarten – EU has been very successful in efficiently producing food. We want to change this towards quality. However, we cannot make society change with us since they have to pay more. Why can't we better market good quality food produce in a better way?**
- **Nicolas – Should we zoom out from the only AMR problem and instead link it with other issues in animal production? Climate change, environment, animal welfare... In the field, people have more concerns and issues.**

*Nancy (FVE):* If we look at the pig sector with African swine fever and lots of other problems we need to look at them separately. So we need to look holistic. We need to use synergetic effects and keep in mind the trade-offs. We have to be predictable and have policies consistent.

*Paula (COPA-COGECA):* One of the most important things to achieve this would be animal health v. plant health. Vets know about animal health; they visit farms, give advice...etc. Under the F2F concept, how biosecurity works in extensive systems as well. External biosecurity is becoming more critical.

*Luben (DG Sante):* All these are interrelated. EC has taken an ambitious Green Deal step. F2F strategy which tries to address them all and come together. There is no silver bullet.

- **One Welfare One Health – consumers' willingness is crucial. We have some alternatives, security measures, feed and aroma therapies. In France, there is no rule for aroma therapy or alternative therapy... These could also cause a lot of problems. Shouldn't these also be regulated?**

*David (AHE):* We have rules on herbal medicine in the EU. There is a market for feeding the plants directly to benefit animals. But it isn't easy to measure the impact. It is a difficult area to regulate.

*Nancy (FVE):* Even though they might be beneficial it is regulated. In EU, we have two authorisation mechanisms, central and national. In some countries, there are so many medicines, AM and alternatives, while in others you have narrow spectrum AMs. If you don't have one, how can they prescribe? Also, vaccines...etc. there is no single market

*Luben (DG Sante):* For herbal medicines, there are no regulations for animals apart from their general quality and pureness. Next year EC will be publishing a report to simplify the registration of homeopathies.

**FEFAC- There are some plants that are not medicines but can benefit the animal and help to cope with pathogens. There is a legislation for feed additives, safety is paramount to be used as a feed additive and efficacy is also significant factor. The second aspect is the synergies about all the challenges that need to be solved. Proteins are a potential problem for many reasons. When you reduce protein, it doesn't mean a reduction in production. This may not be sufficiently disseminated. There is not always a cost attached to a specific technique. Denmark's studied this a lot in piglets, which provided us with a lot of knowledge.**

**There are tradeoffs but also standard features, AM resistance... due to intensive production. How to make sure that we focus on a solution in a larger scope to an intensive system but from trade-off perspective that might not be a solution?**

*Paula (COPA-COGECA):* There is a misperception of intensive farming. Farmers are ready to tackle all the new restrictive regulations on intensive agriculture. However, in these farms, they have a high level of biosecurity. Biosecurity standards are high. Densities could be discussed, which are tackled in the





legislation, but this can be updated. All are related to each other in the sector. There will be trade-offs from one side and not from another. It should be evaluated well and overall to understand the best practices in all systems across the EU.

- **If we stay in the limits of the system, the emission could also be controlled in means of taking up by the environment.**

*Paula (COPA-COGECA):* We must assess the situation from all different aspects.

- **Luca - EU has succeeded a lot on AMR. Most member states are aligning now. What is the political goal? Do we want an AM-free production? Animal welfare is then compromised. And at the market, we pay more for coke than chicken. The natural weaning of pigs is 20 weeks, whereas we wean 3-4 weeks. This period is the most disease problems occur. We need to raise awareness about AMR, animal welfare and that they must pay more to eat meat.**

*David (AHE):* We have lots of targets in the EU. Realistically is removing unnecessary use. What is unnecessary use? Denmark has probably removed this part. If you get technological and husbandry advances, what is necessary today might be unnecessary tomorrow.

*Luben (DG Sante):* Overall objective is removing unnecessary use for prudent use. There is a way to progress—room for improvement for some other member states.

*Nancy (FVE):* We can look into what we achieved and achieve more. The goal is to reduce AMR, and even if we reduce it in animal part, reducing AMR is still there for humans. One health approach shows we can't do it alone just for animals. A joint approach is needed. As vets, we want to give animals a good quality of life worth living. So we need to adapt the system to animals and not the other way around like has been done until now. But that must be done in the context of the market.

#### 3.2.2.4 ArMoR project session

The ROADMAP project is part of the ArMoR cluster which is formed as part of the Horizon Results Booster. This joint effort includes visibility and promotion at project events organized by participating projects. For this sake, Luca Guardabassi was invited to present both the AVANT project and the FARM-CARE project, which are also part of the ArMoR project cluster. The presentation is linked [here](#), and the session can be reviewed [here](#). The discussion is summarized as follows:

- **Methodology of the survey, if any public made an informed decision?**

The survey was based on phone interviews in four countries: Spain, Denmark, Poland and Germany.

- **80% of consumers want to reduce AMU in animals, and 70% know of the negative impacts. Could this be mixed with residues where we had in ROADMAP?**

More and more research shows that AMR is mainly linked with the AMU in humans rather than animals, where transmission is minimal. So even though there might be confusion, there is awareness.

- **Four alternative groups and two will be tested. Why were the other two not tested?**

Immunostimulants were already in the market but bankrupted during corona. EMA did not authorise faeces therapy.





- **Additional information on the high-fibre diet tested in AVANT in weaning piglets?**

Quantity and quality of the fibre in the diet requires silo investments in farms increasing trials.

- **Technical interventions cannot replace AMU, so are there other management-based solutions?**

If we go for an AM-free production, we need more drastic changes to keep the animal health and welfare levels the same or better, which would cost more. A top-down approach could work to have this achieved.

- **Do you have control farms in the FARM-CARE project?**

There are control groups on the same farms.

- **Could you detail the interventions in the FARM-CARE project?**

Synergies of faecal transplantation and diet are also going to be looked at. AVANT has alternatives, while Farm-care has interventions in Ireland and Colombia. They are different interventions. One on humans is cleaning clothing and hygiene implementation for the farmers and farm workers—a metagenomic approach to analyse the faeces in pigs, farmers and family members. The hospital pen will be separate for the sick piglets; it's also not treating unnecessarily the healthy piglets.

#### 3.2.2.5 A review of ROADMAP's achievements

The final session of the day revolved around a review of all results presented from the ROADMAP project during the day. This session was initiated to be a guided discussion with our stakeholder advisory board members (SAB) as a panel, led by Carol Kyle as a facilitator. Similar to the multi-actor round table session, the SAB was informed beforehand and received the policy briefs and the result booklet. The following SAB members were present and part of the review: Ana Granados Chapatte (EFFAB); Jan Vaarten (FVE); Koen Vervoort (ENoLL) and Arnaud Bouxin (FEFAC). To review the recording of the session click [here](#). The summarized discussion is portrayed below.

- **General comments and has it reached its objectives?**

*Jan (FVE):* Multi-disciplinary project and joint conservation on where this is going. For AMR and AMU ROADMAP is connecting theory and practice. A very good step forward but there is still more to do.

*Koen (ENoLL):* From a living lab perspective, creating this recognition and experiencing ex-ante research and stakeholders is achieved. The first step has been done. Not all LLs will survive and if some of them would want to go further, they need to take more steps.

*Arnaud (FEFAC):* Recognition of different actors contributing to AMR, specifically nutrition which is a part of the solution. Nutrition needs to be covered better, since nutritionists were not at the project.

*Ana (EFFAB):* How it evolved even with the pandemic is quite important. You have taken the first step with LLs, and it is important that the relationship between farmers and vets are being taken into account. Horizontal relations with other projects for AMR are also crucial.



- **What's the next step?**

*Jan (FVE):* New initiatives based on ROADMAP with wider LLs and continue with this then it would be more sustainable.

*Koen (ENOLL):* LLs start small and get bigger because they fail. There are more failures than successes. How should you continue at regional or local? If 12 LLs want to survive, they need to keep close and keep going and learn from each other. Start networking at local, regional, and European international levels. ENOLL has agriculture WG and it's open, in link with JRC.

*Ana (EFFAB):* National and regional level taking into account differences in production systems and environment, training vets and farmers on AMR.

- **The feed sector is not mentioned in National Action Plans. This is also the case in Vietnam. Why isn't this sector represented sufficiently?**

*Arnaud (FEFAC):* Feed was considered the main problem. The feed industry is the usual suspect since it is commercial. Efficacy is measured, but feed formulations could be improved with many nutrients. Increase the visibility like iMAP from JRC on feed additives to screen the effectiveness to increase transparency.

- **Feed is very much improved in the poultry and pig sectors. Is it the feed formulation or to improve feed additives?**

*Arnaud (FEFAC):* It is both a combination. A mix of elements also needs to be known and this could be per farm which is an additional difficulty. At farm level, it is quite important, but at national level it is more about screening.

*Jan (FVE):* HealthyLivestock project to improve AHW and to reduce the need for AMU. Biosecurity advancements improve the resilience of animals which depends a lot on husbandry, feed...etc

- **Resilient or robust animals?**

*Ana (EFFAB):* Robustness is a part of resilience. It is difficult definition also per species.

*Jan (FVE):* Resilience could be changed and inherited while an animal is robust.

⇒ EC asks for circular diets. Nutrition and diets are important for AHW and performance.

*Ana (EFFAB):* What do you mean by performance, in breeding is using less and producing less excrete.

*Koen (ENOLL):* When you have fragmented systems you first have to collect different systems. If you want to become sustainable you can continue. There are 3 levels of LLs, macro (with infrastructure), micro and meale. Services of LLs will not be only about benchmarking and networking, but also knowledge sharing, participatory approach. Creating service portfolio for them.



---

**Total reduction or keeping the drugs working?**

*Jan (FVE):* First aim is to have effective and available antibiotics both for humans and animals. If you need to keep using it, then there is a problem. Then you should look into the real problem whether its husbandry, management. They should be a safety net.

Every use of AM you trigger the selection of the resistance strains. Having new products, is very difficult looking at the RI of pharma companies. So we have to be careful using the ones we have. If there are new AM it will probably be used for humans.

## 4 Conclusion

The ROADMAP project's final event was an interactive event in which there was plenty of stakeholder participation and discussions. All the important stakeholder groups were represented, either as participant, invited round table guest or as a stakeholder advisory board member. The hybrid option provided an opportunity for people to follow the event online too. In total 30 stakeholders participated over the two different platforms.

Altogether, the discussions have provided insights and suggestions for further work inside and outside the ROADMAP project.



---

## 5 Annex

### 5.1 Policy briefs

In total, the project has delivered 8 policy briefs. All briefs can be found and reviewed on the project website: <https://www.roadmap-h2020.eu/policy-briefs.html>

### 5.2 The ROADMAP booklet

A collection of valuable ROADMAP results was bundled in the ROADMAP booklet. The digital version of this booklet is available on the website in the final event section: <https://www.roadmap-h2020.eu/final-event.html>.