



Report on a multi-actor living lab meeting focusing on calf rearing.

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Executive summary

The ROADMAP project (<https://www.roadmap-h2020.eu/>) 'Rethinking the use of antimicrobials in livestock production systems' showed that the use of living labs gave multi-stakeholder groups the opportunity to develop context relevant strategies and solutions at multiple levels to foster a prudent use of antimicrobials. These strategies and solutions can be shaped and adopted by many different stakeholder groups in livestock farming sectors.

This workshop evaluated the perceived benefits of living labs to the participants from Belgium, Denmark, Switzerland, and the UK. The living labs validated the issues that are known to exist in relation to calf production and highlighted the importance of tools and protocols to improve animal health and welfare, reduce antimicrobial use (AMU) and ultimately produce a more valued product.

It was agreed that the living labs had brought AMU to the fore and highlighted the issues in the veal/dairy beef rearing sectors. Participants thought that living labs should continue in some form ideally with more participants and in person. They felt they were a useful way of sharing challenges and ideas and that ongoing communication was important.

Dairy calves are often seen as a low value, unwanted by-product, housed in sub-optimal buildings and cared for on an ad-hoc basis. They may be transported long distances often via markets, to veal or finishing farms. During this process they mix with other calves, transmitting and contracting disease, which is further exacerbated by immunological stress, subsequently requiring treatment with antimicrobials.

Participants discussed three hypothetical scenarios for bringing about lower AMU. The first, keeping calves on the farm of birth for longer, could have benefits by improving the calves' immune system and enabling them to better respond to future disease challenges. But participants stated that having adequate facilities and staff time on farm to keep calves for longer could be an issue.

The second scenario was around improved sharing of information between farms when calves move. This would give farmers along the supply chain more information about the calves' health and disease status at the farm of birth, enabling informed decisions on future management. For instance, if they mix calves from different farms, to match the groups, so that calves with more similar status were grouped together (e.g., same vaccination programs). Information from further along the supply chain back to the farmer at the farm of birth would guide colostrum management or vaccination programs for instance. The potential draw backs would be extra costs for administration, more test samplings, and more time spent on registration and reporting.

In the third scenario a "yellow card" system targeting farms with the highest AMU, as is practiced in the Danish pig sector was discussed. This has proven successful in the Danish pig sector and could help create new norms around AMU. It was pointed out that it could be difficult to identify "problem" farms in the calf rearing sector when calves are routinely moved between farms along the production chain.

Introduction

This workshop was part of a wider project, ROADMAP (<https://www.roadmap-h2020.eu/>), focusing on the use of antimicrobials in different livestock systems in 11 countries.

The broad aim of this research was to investigate how farmers and farm workers manage the health of their animals and consider the role of antimicrobials within this. This aspect of the project focuses on care practices relating to calf-rearing, the challenges calf rearers face, possible solutions to these challenges and the ways systems differ across Europe. In order to meet this aim Living Labs¹ were organised in Belgium, Denmark, Switzerland and the UK. The participants of this meeting were members of these Living Labs.

¹ A Living Laboratory is an open innovation research environment that supports a co-development approach to design, develop and validate innovations, services and solutions. Using a collaborative and user centric approach, Living Laboratories create solutions for real-life problems.



Figure 1 Participants on a farm visit as part of the study tour

We were interested in encouraging calf rearers and stakeholders in the UK dairy beef / European veal industry to share calf care practices; their experience of managing calf health; the challenges and opportunities faced by calf rearers; and the changes that could potentially overcome or lessen these challenges. We also explored stakeholders' thoughts on the different systems they may have experienced in the UK and EU.

The workshop was part a of a wider calf rearing 'study tour' centred around the Bristol area of the UK. In total fifteen participants were present: five from Belgium, one from Switzerland, two from Denmark and eleven from the UK. Their affiliations can be found in Appendix 1 below.

Exercise 1

What was the outcome of the Living Labs?

In relation to your work?

The living labs validated the issues that are known to exist in relation to veal, dairy beef and dairy calf production. They highlighted the importance of tools and protocols to guide farmers, improve health and welfare, and ultimately less AMU and produce a better animal.

Gaining a better understanding of the different systems across the UK and EU and an understanding of shared problems and in some cases potential solutions, were seen as a major outcome of the living labs. The living labs highlighted differences in medicine recording systems and software systems, and in particular in the UK, the lack of knowledge exchange regarding medication and vaccination between livestock vendor and purchaser.

Creating contacts and networks, and knowledge gained and exchanged was thought to be valuable. The



Figure 2 Facilitator recording discussion

meetings and the presentations from a variety of sector relevant speakers during the UK living labs had provided interesting and thought-provoking information and had encouraged many of the UK calf rearers to consider alternative approaches to antimicrobial use.

For the industry?

It was agreed that the living labs had brought AMU to the fore and highlighted issues in the veal, dairy beef and dairy calf rearing sectors that posed a challenge to reducing AMU. These included the mixing of calves from different farms, and the lack of information on medication and vaccination.

Participants said they had learnt about the different systems across Europe within the dairy and calf rearing sectors. They felt that there were similar problems and issues and that the veal, dairy beef and dairy calf rearing sectors have a major role to play in the reduction of AMU.

It was highlighted that farmer organisations were not represented in any of the living labs and that in most, retailers did not engage with the process. While the living labs could not create change in multiple aspects of calf production, they have sown the seeds. By highlighting the lack of integration across the sector and the need for change, it is hoped that there will be a transition to enable the reduction of AMU.

While many farmers and vets accept current and historic practices, the relationship between them is changing from purely prescribing medication to advising and discussing herd health plans and protocols. The living labs have helped to highlight the value of this dialogue and bring new ideas to the industry.

Should the living lab continue, if so, how?

Participants thought that living labs should continue in some form, ideally with more participants. They felt they were a useful way of sharing challenges, and that ongoing communication was important. Ideally, they would take place in person though that was perceived to be ambitious, and that they would be national and international. They should follow up opportunities for change and continue to investigate further issues and solutions.

In the UK it is hoped that the Agriculture and Horticulture Development Board (AHDB) will take over the facilitation of the existing living lab² and that the Bovine Health Service in Switzerland will do the same.

It was acknowledged however, that running and participating in living labs was challenging and tiring and there is a risk of creating an 'echo chamber'³ as people are generally looking at an issue from a similar point of view.



Figure 3 Comments recorded on sticky notes

² AHDB have taken over the organisation of the UK living lab.

³ Echo chambers can change our perspective, making it difficult to understand opposing viewpoints and more likely to be taken in by false information.

Exercise 2:

Personal Insights

As well as the points raised when asked about the outcome of the living labs in exercise 1, people were asked if there were any personal reflections they wished to highlight.

The responses could be roughly grouped into four clusters. Knowledge exchange, AMU on farm, confidence and industry related. The comments are listed below. It is interesting to note that not only did participants appreciate the opportunity for knowledge exchange, sharing and learning, but that some had reviewed their own farm protocols and were thinking more about AMU. In addition in some cases the living lab experience had helped them better understand the industry and improved their self-belief in the way they were working.

Knowledge exchange, connections and contacts:

- Appreciation of different cultural approaches.
- Networking/ making new contacts.
- Knowledge exchange, meeting interesting new people.
- Met some incredible and inspiring people- other farmers and vets, researchers etc.
- Understanding better different perspectives/challenges/ideas.

AMU on farm:

- Helped me to improve calf health and lower my use of antibiotics on my own farm.
- Brought AMU to the fore of farm management decisions.
- Made me question my own protocols on farm /best practice.
- Practical knowledge about calf rearing practices and the diversity of approaches / systems.
- Getting to know the problem to see method.
- Confidence in direction of travel on farm,

Confidence:

- Re-enforcing ideas from others and feeling I can take 'farmer led' conversations higher up within work to push ideas more.
- Confidence to continue path.
- Having /getting the opportunity to meet interesting people who support you in finding solutions for unexpected common (or similar) problems,
- Learn/see that there are so many other ways to do something, and they may be better or worse but mainly different.
- Encourage farmers/rearers and networks, focussing on women in dairy.

About the industry:

- How complex the industry is- at sector levels- government, farm, vet, advisors, research.
- Understanding some of the great things we as an industry do!
- Insight in the main 'players' in the veal calf sector.
- Inspiring to hear and see cultural differences on all levels of 'cattle businesses' related to thoughts and actions on AMU, mortality /death and legislation

Exercises 3 and 4:

What are the main drivers of antimicrobial use in relation to calves and what are the common problems across our countries regarding calves?

On many dairy farms across Europe, dairy calves are kept in less-than-ideal conditions. While farmers may invest heavily in the best buildings and new technology for their cows, calves are often seen as a low value, unwanted by-product, housed in sub-optimal buildings and cared for on an ad-hoc basis. Once old enough to leave their farm of birth calves may be transported long distances often via markets, to veal or finishing farms. During this process they mix with other calves, transmitting and contracting diseases, further exacerbated by immunological stress, thus requiring antimicrobial treatment.

It was agreed that historically farmers saw bull calves as a waste, and many were slaughtered at birth. Heifer calves were better cared for as they were most likely to be dairy replacements, but in the main calf rearing was and still is, seen as a low priority, often gaining little respect. Although all calves now have some value, rearing them well can result in financial losses, so it is difficult to insist on a high standard of care. However, the increased use of sexed semen and a growing market for dairy beef in the UK, or veal in Europe, may increase their value and improve care throughout the industry.

While most farmers try to do the 'right thing' within the limitations of their situation, they and their vets are often pragmatic about deaths and disease, e.g., *'it's that time of year'* and many also have a desire to follow tradition, finding change difficult.



Figure 4 Dairy calves in coats

Conventional farmers have always had access to antimicrobials and in the past were encouraged to use them prophylactically. In some cases, vets still rely on the sale of drugs as an income stream. Changing the farmers and vet's mindset by increasing understanding of alternatives will take time, education and in many cases, financial incentives.

While some countries are highly regulated, others rely on voluntary farm assurance schemes to improve health and welfare. So far, this method has been quite successful, but more stringent legislation may yet be required to further reduce AMU.

A lack of knowledge about the volume of antimicrobials being used is an issue. While the pig and poultry industry are required by law to electronically record antimicrobial use and make that data available, in the UK the cattle system lags behind. This is in part due to the complexity of devolved governments, multiple software packages in use on farms and the complexities of the cross over between the dairy and beef sectors.

In Denmark, government legislation has been a major driver of change in AMU and according to participants, there is a certain amount of trust between industry and government. In the UK, Switzerland and Belgium, the primary motivators of change in AMU are through industry self-regulation. Certification schemes like Red Tractor and Farm Assurance are the preferred method of regulation in the UK while legislation is also important in Belgium and Switzerland.

Exercise 5:

How would the following scenarios influence AMU?

Participants were divided into three groups and asked to consider one of the following hypothetical scenarios.

Group 1. Keeping calves on the birth farm for longer

This was a discussion about keeping calves on the farm of birth for longer than is the norm, before moving them to another farm. Participants thought that if the calves were older when they travel their immune systems may be better able to cope with the stress of transportation and subsequent exposure to disease when mixing with other calves. However, this scenario could also lead to compromised calf welfare as not all farmers have good calf rearing protocols and in many cases calf rearing is still seen as a 'chore.' Extending the time on farm could result in financial hardship due to increased feed costs and potentially extra costs due to TB testing⁴.

In Switzerland where dairy production is dominated by small businesses and cattle are often grass fed, calves may be kept until five months of age. However, in Belgium, Denmark and the UK where there is limited space on the dairy farm to rear anything but replacement heifers, calves often are moved on at a much younger age, often prior to weaning.



Figure 5 Group discussions

⁴ UK calves below 40 days old are not TB tested.

In such a scenario, consideration would need to be given to how calves are categorized. Animals should be judged by weight for their breed, and age should be a consideration.

Ultimately such a system needs to be financially viable to make it sustainable.

Group 2. Ensuring that there is contact between the dairy farmer and the calf farmer.

The majority of dairy calves, which are not required as replacements in the dairy herd, are moved at a young age to rearing units. In some cases these units get calves from dairy farms where they have a contract to receive calves and know the supplier. There is frequent contact, and discussions around specific issues or challenges can take place. This contact enables an option to ensure good conditions for the calves, and as far as possible to keep them disease free, hence antimicrobial treatment may not be required.

In contrast, a large number of calves of unknown origin go to rearing units via large collection centres, or sales, where they mix with many more calves, before reaching their final destination. So irrespective of the distance between farms, or whether they are exported to another country (e.g. in Belgium, it is estimated that 'only' 13% are from another country) the farmer at the unit has no knowledge of calves' history so little chance to act in relation to the status of the calves received from different farms.

If there was contact between the seller and the buyer there would be a greater chance of knowing the vaccination / treatment status on the farm of birth, thereby being able to group calves with others of similar status, or keep them isolated at arrival, if facilities allowed, and thereby avoid antibiotic treatment. Similarly, the dairy farmer could receive feed-back if their calves were in a poor condition and could improve their system. This may motivate dairy farmers to take better care of the calves, contrary to the 'out-of-sight-out-of-mind' attitude when sending calves to farms to which they have no contact.

Ensuring contact via integrated data on internet-platforms, or via passports for example, that stay with the calves, would give information about their destination, and vaccinations and disease treatments. Such information could be valuable for managing the calves, or alternatively refusing to receive calves from farms having a poor welfare record.

A financial benefit could be connected to such system, e.g. that rearing farmers could pay a better price for calves from farms which ensured good colostrum-practices, certain vaccinations, or other desirable routines, thus making such efforts more financially viable.

The disadvantages of pushing systems for better information sharing is that not all countries have integrated internet-based platforms or systems in place, and certainly not for export and trade between countries. Furthermore, it would require more time for registration and administration, and therefore also be more costly.

Group 3 - 'Yellow card' / greater sanctions for high AMU

The third scenario was a "yellow card" system whereby farmers who use the most AMU receive a "yellow card" from the relevant government authorities and must reduce their usage. Such a system exists in the Danish pig sector. However, there was some concern that the data is not yet available in the UK to confidently initiate such a system. There would have to be a distinction between dairy calves, dairy beef and suckler beef systems to accurately measure the AMU in each sector. Because calves, particularly male calves, are likely to be moved between farms for rearing, it would be difficult to allocate "problem" AMU accurately to one farm. If farmers are penalised for high AMU, they might put off treating their animals resulting in farms later in the production system treating health problems that could have been prevented sooner. Nonetheless it was noted that benchmarking AMU could be a powerful tool to motivate reductions in use.

Appendix 1: Affiliations of Participants

Belgium	<ul style="list-style-type: none">• Animal Health Care Flanders,• Practising Vet,• University of Ghent internal medicine,• FOD (Federal Public Service Health, Food Chain Safety and Environment),• FAGG (Federal Agency for medicines and health products),
Denmark	<ul style="list-style-type: none">• Bovine Herd Health, University of Copenhagen.• Aarhus University
Switzerland	<ul style="list-style-type: none">• Swiss Cattle Health Service
UK	<ul style="list-style-type: none">• Veterinary Medicines directorate• Agriculture and Horticulture Development Board (AHDB)• Dairy farmers and calf rearers• Farm animal vet.• Researcher

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