

Livestock and protein controversies and uncertainties: perspectives from researchers and civil society

A joint project by the Food Climate Research Network, the Eating Better alliance and the Livestock, Environment and People project

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Summary

Debates around sustainable livestock and protein are often highly contentious. This report sets out the results of a project that aimed to identify research questions around livestock and protein that civil society deems to be of particular importance.

We conducted a series of interviews with senior representatives of civil society organisations, primarily based in the UK. We followed this with an online workshop where a selection of civil society representatives and academic researchers (from the University of Oxford's [Livestock, Environment and People](#) (LEAP) project) discussed research priorities.

Based on both the interviews and workshop we identified five main themes within which civil society and researchers wanted to see more research or better communication of existing research (see the box below).

Research gaps agreed on by both civil society and researchers

1. Good protein, bad protein? Society, economy and health

Civil society and researchers raised questions regarding the health, economic and social impacts of producing and consuming different sources of protein, including red meat, processed meat, legumes, highly processed plant-based foods, cultured meat and foods, as well as the impacts of food from different production systems such as grass-fed livestock or agroecological crop systems.

2. Measuring methane: GWP* and its implications

More clarity was sought on the implications of using GWP* instead of GWP₁₀₀ to measure the climate impacts of methane, specifically on what GWP* has to say about the significance of ruminant agriculture and how important the GWP*/GWP₁₀₀ debate is in the context of other factors such as land use change, animal welfare and farmers' livelihoods.

3. Salvation by soils: are soils a climate solution?

Participants wanted more information on the extent to which soils and regenerative farming practices offer a climate solution, how soils behave under different conditions, the benefits and drawbacks of "regenerative agriculture" and whether soils can continually sequester carbon in some circumstances through an ongoing increase in soil depth.

4. Just transitions: fairness for farmers and other people

Participants wanted to know whether protein transitions can be done in a way that treats farmers and other people in the food supply chain fairly, encompassing economic concerns but also culture, practical knowledge and global justice.

5. The public: attitudes and actions on protein shifts

Civil society felt there is a need for more understanding of how behaviour change happens or could happen in the context of polarisation around food topics, how the public understands research outputs and how opinions are influenced by values and beliefs.

Although there was much overlap between civil society and researchers as to which topics need more research, we noted several differences in how civil society and researchers tended to approach uncertainties in debates around sustainable protein. Speaking broadly, researchers wanted to identify specific researchable questions whereas civil society preferred to discuss issues more holistically; for researchers a guiding principle is impartiality whereas civil society often advocates for particular courses of action; researchers also tend to think of research results as providing a sound factual basis for debates, whereas civil society can be more sensitive to how research is likely to be interpreted and used by various audiences.

These differences influence the type of questions that researchers and civil society ask and the research that they would like to see performed, and more work may be needed to increase mutual understanding in order for the academic and NGO communities to fully collaborate in identifying research questions that make the greatest contribution to healthy sustainable diets. We set out several suggestions for more productive dialogue between researchers and civil society in the future, including hosting explanatory webinars and reviewing the literature on different dialogue methods.

Purpose and method

This project explores areas of contestation or uncertainty in debates on sustainable livestock and protein. It focuses on debate topics that civil society feels are being held up by a lack of scientific evidence or where clarity is missing, and where more research or better communication could be particularly useful in resolving disagreements.

The original aim of this project was to **identify a shortlist of priority research questions** based on discussions between **researchers and civil society**.

We conducted a series of detailed semi-structured interviews with leading figures in civil society (primarily based in the UK) and followed this with a workshop involving both civil society and academic researchers from Oxford's **LEAP** project to identify key issues of concern. **Appendix 1** provides further methodological details.

Throughout this process, it became clear that there are important differences between these two groups in how they tend to view the role of scientific research, how they tend to engage with research questions, what they perceive to be key knowledge gaps, and what research they think is needed to fill them. The idea of “developing research priorities” sometimes meant different things, given their **differing objectives and perspectives**. These differences need time to be explored if they are to be overcome so that a robust and shared set of research questions can be achieved. This was time we did not have, since the constraints brought on by the COVID-19 pandemic required us to run the workshop in a shortened form online.

We have therefore reoriented our focus in this report towards how each group tended to deal with knowledge uncertainties and reflect on each other's perspectives on knowledge gaps. In the remainder of the document, we use the term “civil society” as a shorthand for those particular civil society representatives who were involved in the interviews and workshop. Similarly, we use the word “researchers” to refer to those particular academics who took part in the workshop.

It is important to emphasise that although we draw comparisons between these two separate groups, our aim is not to stereotype. Rather, our reflections on their differences are intended to be indications of the general tendencies we observed, not descriptions of rigid, monolithic categories. We realise that civil society and researchers have different roles – both legitimate – and hence different objectives and ways of operating in the world. Furthermore, within both communities can be found a wide range of views and approaches that will not be fully represented by those expressed in our workshop.

Using these insights, we also make some suggestions for ways to enhance understanding between civil society and researchers and **develop more constructive collaboration** and mutual exchange of ideas.

The work we have done in this project will inform the development of a variety of engagement activities that will be carried out by a new initiative, *Table*, currently being set up by the University of Oxford, Wageningen University and Research and the Swedish Agricultural University¹. We see this small project as the first iteration of a process that could be revised in the future, incorporating lessons we have learned. A refined version of the same process could, for example, be re-run with another group of stakeholders (such as policymakers, media or the food industry) or focus on a different topic. The lessons from this project may also be of use to the LEAP project's science communication work.

Livestock and protein: a critical and contentious area

¹ Named Table, the new initiative will explore how and why people disagree when they talk about food, with a focus on identifying whether disagreements are driven by science or personal values.

The topic of livestock and protein is critical to societal and scientific debates on human and environmental health. Discussions on these topics tend to become polarised and are riddled with contestation or ambivalence. Research findings, although often crucial to resolving differences in understanding, are sometimes distorted or taken out of context as they make their way through to civil society, policymakers, the media and the public. At times, stakeholders from these sectors are also critical of the research process itself, for example regarding research that fails to account for the dynamics of real-world situations, or that draws conclusions that are too generalised.

Introducing civil society and academic researchers

Civil society: Close to the debate

We chose to engage with civil society (i.e. non-governmental organisations – NGOs) because of their important role in raising awareness of livestock and food sustainability concerns, and in shaping debates. With a strong focus on the policy implications of livestock problems and futures, they are often ahead of the curve when it comes to identifying important questions and highlighting areas of uncertainty. What is more, as a sector, they also represent a diversity of perspectives on the livestock question and are sensitive to some of the disagreements between stakeholders which can cause confusion, block action or boil over into hostilities.

We engaged primarily with representatives of UK NGOs, with some from North America. The NGOs we approached advocate for different – sometimes opposing – positions with respect to livestock and had a variety of interests, ranging from specific concerns (such as animal welfare, food security and nutrition, meat consumption, alternative proteins and farm workers) to broader consideration of sustainable food systems. These NGOs were most frequently focused on UK issues, but were also often highly aware of and concerned with the global food sustainability context.

Researchers: Close to the data

The researchers we engaged with for this project were all part of Oxford's LEAP project. The LEAP project researches the health, environmental, social and economic impacts of meat and dairy production and consumption. Participants represented a cross-section of the disciplines involved in LEAP, including modellers, physicists, social scientists and nutrition scientists, albeit with a greater representation of the natural as opposed to the social sciences. Their research spanned both the global and the UK national context and focused on a range of livestock-related topics, such as the environmental and health impacts of livestock production and consumption, consumer behaviour, and developments in the alternative protein sector.

The rest of this report

Section 1 sets out five broad themes that were identified as areas of concern during the interviews and reflects on how both civil society and researchers viewed these topics. **Section 2** compares how researchers and civil society think about knowledge gaps. **Section 3** reflects on what we learned from the interviews and workshop and makes suggestions for future work.

Details of the interviews and the workshop can be found in the **Appendices** and in the **intermediate report**.

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1. Themes

This section sets out the main insights on the broad themes identified throughout the process, drawing on both the interviews and the workshop². Anonymous quotes from participants are interspersed throughout the report. All emphasis in the quotes has been added by the FCRN.

1.1 Good protein, bad protein? Society, economy and health

The social, economic and health dimensions of different types of protein-rich foods dominate current stakeholder discussions about what constitutes healthy and sustainable food systems. Specific concerns raised by civil society interviewees include:

- What are the **comparative health effects** of different protein sources (including red meat, processed meat, legumes, highly processed plant-based foods and cultured meat) and different production systems (such as grass-fed livestock, grain-fed livestock, and conventional, organic or agroecological crop systems)?
- What are the **socioeconomic implications** of producing different types of protein? Concerns included impacts on livelihoods, the affordability of different protein types, and the power structures and degree of consolidation in the supply chains of plant-based meat substitutes.

Civil society perspectives

Civil society interviewees tended to think about the question of **“What is good protein?”** in a holistic, interconnected manner, stressing the importance of looking at many interconnected aspects of what makes a protein ‘good’ (such as health, livelihoods, rural cultures and environment) and also the **potential trade-offs between different goals**.

Civil society generally thought about the **broad impacts on society** of shifts in the production and consumption of protein. Interviewees were concerned about the impact on farmers’ livelihoods of messages to eat less meat and often raised questions over **who controls the supply chains** of plant-based meat substitutes. For example, it was pointed out that some large meat companies are rebranding themselves as “protein companies” and questioned whether society really wants these players to continue to dominate the food system. That said, another viewpoint was that that plant-based and cultured meat alternatives could potentially help to redistribute power to smaller producers by making use of local agricultural produce or be suited to small-scale production systems and infrastructure, micro-brewery style. Others pointed to the potential of unprocessed pulses, which they argue may be better for health, environmental and equity outcomes than highly processed meat or plant-based alternatives.

“How much do you care about processing? And by processing I don’t just mean the health consequences of processing, but [the] **socio-economic system that produces processed foods.**”

- Civil society representative

² An analysis of the interviewees is available in the [intermediate report](#). See [Appendix 2](#) for the research questions suggested by the workshop participants.

Researcher perspectives

Several researchers stressed the importance of framing issues in a way that can be expressed as **research questions**, i.e. which can be examined with a clear methodology and where data are available. Civil society raised the concern that research can isolate issues from their societal context and, by favouring only those issues where data exist or where suitable methods can be applied, tends to narrow down topics of interest. For example, some interviewees were concerned that the way observational research on the health impacts of red meat consumption is reported is overly simplistic, and that cohort studies can be hard to translate into an understandable set of risks, because of many confounding factors.

“...people are **holding these meat substitutes to [a] higher standard**. [So] people in general [...] are concerned because they contain salt, for example, ignoring the fact that nine times out of ten when people cook meat, they add salt. It’s just that it’s been added for you.”

- Researcher

In the workshop, some researchers pointed out that while it is simple (albeit expensive) to measure the nutritional composition of individual products from different production systems (e.g. grass-fed versus grain-fed meat), doing so would be of limited relevance because consumers rarely report their dietary intake with sufficient detail to indicate production methods. In many observational studies the health effects depend not only on what is consumed but whether it substitutes for other foods. For example, it is unclear to what extent meat alternatives are actually *replacing* consumption of meat in the diet, rather than being *additionally* consumed.

“Why have we become so **obsessed with protein?** [...] Certainly [in] high-income countries, protein is absolutely not an issue.”

- Researcher

“The problem is [**cell-based meat**] then buys into the fallacy of this massive protein need. [...] You’ll still have Type II diabetes, you’ll still have cardiovascular disease and so forth if you eat the same quantities as people do of normal meat.”

- Civil society representative

Finally, both civil society and researchers agreed that the **level of attention given to protein** should be queried in the Global North, where people generally already eat enough of this nutrient. It was suggested that the fetishisation of protein can mean people think they need to eat more of it, the risk being that they will consume more animal products and avoid shifting towards plant-based alternatives.

1.2 Measuring methane: GWP* and its implications

Many interviewees raised questions around the measurement of methane's climate warming impacts, often drawing on research and communications that have recently come out of the University of Oxford about GWP* (versus GWP₁₀₀). The interest here centred mostly on the UK context, although there were also concerns about how using GWP* affects the fair allocation of methane budgets to developing countries. For context on the GWP* debate, see the FCRN's recent piece [Methane and the sustainability of ruminant livestock](#).

Civil society perspectives

Many interviewees were concerned that a narrow focus on one scientific topic, such as GWP*, could **obscure the bigger picture** and cause debates to neglect other important factors such as land use change, the carbon opportunity cost of not using land to grow trees, nitrogen leakage, animal welfare, nature conservation and farmers' livelihoods.

There were considerable differences between NGO interviewees in how they **interpreted the significance of GWP* for ruminant agriculture**. Some argued that GWP* illustrates the minor contribution of ruminants to climate change, as compared to the fossil fuel industry. Others argued that GWP* shows the large potential climate benefits that could be realised by reducing methane emissions from ruminants.

"As a metric [GWP*] might be [...] interesting but it strikes me that it has embedded within it a **status quo bias**. [...My] understanding of the science is that livestock are responsible for about a quarter of a degree of temperature at the moment. [T]he fact that **we're choosing to hold a quarter of a degree when we have the option not to**, obviously has lots of negative consequences."

- Civil society representative

"...it is also important to recognise that we have got some really really big decisions to make anyway - and [methane and GWP* are] are part of the story but [are] **not the whole story**"

- Civil society representative

"I don't think we can just keep not talking about **animal welfare**... We can't lock into the next 30 years a model which depends on systemic cruelty to animals."

- Civil society representative

Other interviewees perceived the research and communications on GWP* as having a **bias towards the status quo**, for example that the current messaging on GWP* does not make it clear that elevated (but constant) methane emissions contribute to an elevated global temperature. The argument here was that it is a choice to maintain atmospheric methane concentrations that are higher than the historical baseline.

Researcher perspectives

In the workshop, most of the researcher contributions on GWP* came from one particular perspective, so this report cannot be fully representative of diverse academic viewpoints on methane.

It was noted that a weakness of conventional GWP₁₀₀ is that it does not clearly communicate what needs to be done – as regards policy interventions – to mitigate climate change. To address this concern one fruitful avenue for further research on GWP* might be to **develop worked examples** (for example, based on real or hypothetical livestock trends) that could help people understand the policy implications of GWP*. We note that this viewpoint aligns with what we heard from civil society, in that there is confusion over how GWP* should affect policy actions. We further add that it could be useful for researchers to explain how GWP* might work from a consumer perspective, for example on carbon labels.

From a policy perspective, it was seen as useful to directly address what agriculture needs to do and why. It was argued that current climate policies conflate two ideas: how can agriculture continue to produce similar products in a way that isn't overly environmentally damaging, versus what is the most environmentally efficient diet? It was suggested that it would be useful for policymakers to explore the space between what we *can* do and what we *need* to do, as well as investigate where a broad consensus can be reached between these two points.

1.3 Salvation by soils: are soils a climate solution?

In its 2017 *Grazed and Confused?* report, the FCRN tried to add clarity to the debate around whether grazing livestock can sequester carbon. Nevertheless, the issue of carbon sequestration – both in soils and in above-ground biomass – remains a contentious and live topic, and it was identified by many interviewees as a major area where further research is required.

*“I’ve been in loads of meetings about **soil** and depending on which researcher you’re talking to **they say different things.**”*

- Civil society representative

*“We need to **embrace [restorative agriculture] or we need to kill it** and can’t do either because the evidence isn’t there.”*

- Civil society representative

Interviewees wanted to see either more research or synthesis of existing research on **how soils behave under different conditions**, with a strong interest in the UK context. For example, how is **soil carbon sequestration** affected by variables such as climate, grazing, crop rotations, agroforestry, soil microbes or ploughing? In particular, there was some disagreement over whether **soils can offer ongoing carbon sequestration** through a sustained increase in soil depth under certain management conditions.

Interviewees also wanted to see more evidence on the benefits and drawbacks for climate and soil health of various practices that fall under the umbrella of **regenerative agriculture** (which is often understood to include practices such as agroforestry, holistic grazing or stockfree organic farming).

Civil society perspectives

In the workshop, there was some debate around terminology. The term “regenerative” was seen by some in civil society as being conceptually narrower than “agroecology” – focusing on soils rather than a whole-farm approach – and at risk of being co-opted by corporate players. Note that neither term was formally defined by participants.

*“I think [the term] **regenerative has been co-opted** [by] a few industry players.”*

- Civil society representative

“There’s a lot of people saying we should be rewilding or reforesting a huge amount of land, which will have big implications for ruminant livestock and livelihoods in rural areas and habitats as well and biodiversity... [...T] here’s something we could do that’s slightly less than complete reforesting the whole of the uplands... maintaining livelihoods and [...] highly nutritious ruminant meat at the same time as creating biodiversity and carbon stocks. But it’s an **optimal rather than maximal** solution.”

- Civil society representative

concerned with soil microbes, and others with erosion). Therefore, a review of expert evidence on soil science – particularly on the soil depth question – was seen as potentially useful, particularly to help policymakers understand the limits of current evidence and areas of disagreement among experts.

Linking to this point, one suggestion from researchers was to look at the political ecology of soil scientists – i.e. who is saying what and what their assumptions and interests are – to see whether this can illuminate why there are seemingly contradictory messages coming from soil science.

One viewpoint within civil society was the importance of achieving yields in a number of different outcomes of a system (an “optimal” approach) rather than maximising the performance of a single aspect such as carbon sequestration (a “maximal” approach).

Researcher perspectives

Civil society and researchers both indicated that they hear different messages from different soil scientists, and that the reasons for the differences are not clear. We note that some of the scientific disagreement over the potential of soil carbon sequestration could be because of the different disciplines within which soils are studied (for example, some soil scientists might be more

“That would be useful in its own right [...] if we had [a] few **soil scientists to pitch into a review** and they spun it all quite differently. [That] would be valuable for policymakers just to know there really isn’t much certainty about this.”

- Researcher

“**Political ecology of soil scientists...** If we did actually dig into that, that might explain why there are so many different messages.”

- Researcher

1.4 Just transitions: fairness for farmers and other people

The concept of – and the need for – a “just transition” was raised by many interviewees. This term broadly refers to the need to **treat people fairly** (including those who are marginalised or vulnerable) during transitions in patterns of production, distribution and consumption (including but not limited to livestock and animal products). During the interviews and the workshop, participants used this concept loosely in relation to a diversity of issues such as the risk of farmers losing income or their entire livelihood, as well as questions of culture, practical knowledge and global justice. As the concept was not defined explicitly, important questions about what we mean by “just” and about who gets to decide the goals of transitions remained implicit and merit further exploration.

Civil society perspectives

Many of the civil society representatives were mindful of the socio-ethical implications for farmers of a transition away from livestock. For example, some interviewees questioned whether it is fair to ask farmers to give up their present way of life, particularly if they run a family farm or if they are part of

a rural community with strong cultural links to livestock. One spoke of farmers being rejected by their neighbours after giving up their livestock.

Regarding the North-South aspects of ethics in global protein transitions, civil society representatives often spoke of the need for **fairness and sensitivity to culture and context** when discussing transitions in livestock production. There was seen to be a risk that messages about plant-based diets could be perceived as patronising by audiences in the Global South in the sense of telling people what to eat – particularly since these messages could be viewed as hypocritical given that meat and dairy consumption are high in the Global North.

Civil society representatives also mentioned **practical barriers** that would need to be surmounted if food systems are to change significantly. Some suggested supporting farmers financially to lessen the risks of moving to different production systems such as agroecology. Others noted that it can be hard for farmers to access practical knowledge and training on alternative farming methods, particularly for those with relatively low chemical or mechanical inputs.

Several civil society representatives emphasised that the concept of just transitions should be applied not just to farmers but to **everyone in the food system** (including workers in transport, retail, restaurants and so on), including consideration of global North-South justice for farmers, consumers and countries. However, we did notice that many interviewees were talking about farmer livelihoods rather than the rest of the supply chain – particularly **livestock farmers in the UK**. We speculate that this could be because farming is obviously linked to food in the public consciousness and because farmers and “traditional” farming landscapes are often valued and celebrated (e.g. on TV programmes such as **Countryfile**) in ways that supermarket delivery drivers, for example, are not (although COVID-19 has perhaps raised awareness of the many essential workers that keep the food system running).

“The title ‘Fairness for farmers’ is inappropriate... It’s for **all workers in the food system**... They’re all important.”

- Civil society representative

In the workshop, some civil society representatives called for more mapping of **global money and power flows**. They wanted more information on who benefits financially from protein transitions, and on the type and number of jobs associated with consolidated and decentralised systems. One civil society representative said the default assumption of civil society appears to be that decentralisation is beneficial, but noted that, in practice, consolidated food systems are sometimes economically more resilient, because they are perceived too big to fail and therefore more likely to draw state support.

Researcher perspectives

Researchers noted that a review of existing literature on employment transitions in other sectors (such as energy) might be relevant to similar transitions within food. There was consensus between researchers and civil society on this point in the workshop. It was felt that food researchers have a lot to learn from other sectors of the economy and should avoid being trapped within a “silo” of research specific to food.

“**...employment transitions are not entirely new.** We’ve had mining communities be put out of work and we’re also engaged in a very public and well-rehearsed conversation about automation.”

- Researcher

One suggestion was to offer training and reskilling to farmers who might be put out of work by a transition towards more plant-based diets, so that they can find employment in other land-based activities, such as forestry. This could both be a good use of their existing knowledge of land

management and a more sympathetic approach than simply supporting people through forced unemployment.

“If we’re going to move to a model of a considerable amount of rewilding, then there are lots of people in the farming community who know about how to work land [...] and so there might be [a] research piece about the willingness for those people to be **reskilled and put to work doing other stewardship-type things**. And it might detract away from the otherwise unpleasant framing of ‘Sorry lads, you’re out of work’.”

- Researcher

1.5 The public: attitudes and actions on protein shifts

Interviewees mentioned several areas of uncertainty as to how behaviour change happens in society. This theme was not discussed extensively during the workshop and we therefore only report on civil society insights in this section. The interviewees felt that more understanding is needed on how the public understands research outputs, and how people’s values and belief systems influence how they interpret messages. There was consensus that food debates can be held up by polarisation, tribal thinking and stereotypes (particularly around what sort of person eats a particular type of diet).

Civil society perspectives

Some interviewees wanted both researchers and civil society to find **ways of communicating that do not alienate their intended audience** by appearing, for example, elitist, know-it-all, politically biased or uncaring.

Furthermore, some interviewees stressed the importance of communicating recommended dietary changes in a way that does not make people feel personally attacked, especially where particular food practices are an important part of their personal identity (somewhat stereotypical examples might be BBQ culture in Texas or a fondness for grazed landscapes in the Lake District or the Scottish Highlands).

One interviewee called for further research into **behavioural interventions** that are assessed as likely to be both feasible and impactful by the food industry, but that currently have a limited evidence base (which the interviewee attributed to academia’s lack of understanding of how industry works). See, for example, the report [Playbook for guiding diners toward plant-rich dishes in food service](#) for specific suggestions, particularly pages 62-63 for conclusions.

2. Comparing civil society and researcher perspectives

This section draws on the insights from each of the topics in [Section 1](#) to profile some of the approaches that researchers and civil society generally take to uncertainties in food debates. Again, we stress that not every individual within civil society or academia will approach discussions in the ways identified below. Rather, we want to draw out general tendencies, as a starting point for further discussion, on the basis that better mutual understanding of how researchers and civil society work and approach debates could be beneficial for future dialogue processes.

2.1 Ideas about scientific reductionism

The value and limitations of scientific reductionism were a topic of discussion and sometimes mutual frustration for participants in the workshop.

Some civil society representatives argued that **research that focuses on one narrow topic** (such as GWP*) is “reductionist” and does not fully account for the complexity of the system within which it is likely to be used.

Reflecting on this concern, some researchers were concerned that this critique of research as “reductionist” might sometimes be used to **dismiss important scientific evidence**, particularly to discredit evidence that doesn't suit a favoured narrative.

The word “reductionist” has different connotations to researchers as opposed to civil society. Reductionism is intrinsic to the scientific method, in that experiments generally aim to isolate the effects of a single factor. However, it can sometimes be used pejoratively by civil society, with reductionist approaches compared unfavourably with “**holistic**” ones, which seek to obtain an integrated view of multiple connected issues.

Not all scientific disciplines are reductionist to the same extent, and there are differences between, say, **the social and the natural sciences** in this respect. Whereas the natural sciences use structured experiments to test falsifiable hypotheses, the social sciences make use of a wide range of methodologies, some of which put less emphasis on reductionism, falsification or reproducibility and more on laying out the complexities of perspectives or societal dynamics. Most researchers who participated in the workshop were natural scientists and many of the civil society representatives alluded to the natural sciences when discussing scientific evidence, which may explain why debates over reductionism featured heavily in the workshop.

Scientific research can be of critical value in clearing up disputes by breaking down areas of controversy into **questions that are researchable** (for example, the carbon footprint of specific meat alternatives) and constructing an evidence base that increases our knowledge and enables one to discriminate between valid and invalid assumptions and arguments. Indeed, researchers generally had a strong focus on identifying questions that are well-defined, that can be answered with an

“I get frustrated that some papers are so narrow in their scope. That while they present their findings clearly, they don't properly think about the wider relevance and context of their findings. [Y]ou can read a paper about [say] the carbon footprint of [something], but in the absence of actually contextualising that in the broader picture of how significant their answers really are [...] - I think [this] gets in the way of clear thinking, and it **allows people to use a kind of partial or incomplete picture of the evidence**. That's probably the area that is most difficult.”

- Civil society representative

appropriate experiment or methodology and for which data, whether quantitative or qualitative, can be gathered.

At the same time, food and livestock issues are complex and scientific research (particularly natural scientific research) is in many fields limited by a focus on individual factors – although this is not necessarily the case in the field of systems science, which explicitly accounts for the interactions between many factors. For example, a carbon footprint is only one of many types of environmental impact, and discussion of meat will also need to consider health, socio-cultural, ethical and economic implications. Some researchers pointed out that there are important questions that have no clear-cut answers, and where decisions will involve making value judgements; this is the domain of policy making.

One potential danger of a reductionist approach to research is that researchers might sometimes believe that simply providing “scientific facts” is sufficient to resolve disagreements, thereby **overlooking the importance of how research questions are framed** in the first place. In other words, the topics that researchers tend to study and the questions that researchers choose to ask can affect how the results are perceived and impact how different actors use the results to influence the food system – such as whether research on grazing looks only at the carbon footprint or if it also explores issues such as cultural importance and soil health. Civil society might argue that the topics to which the (reductionist) scientific method is applied and the areas for which funding is available can steer societal perspectives about what is “proven”, “factual” or “important”.

That said, we noted that researchers in the workshop were in fact **often aware of the importance of how research questions are framed**. One example might be the heavy focus by research on the nutritional attributes of food compared to relatively little research effort expended on the importance of pleasure or social connection derived from food. In another example, a researcher pointed out that studies of the impact of dietary change are sometimes based on models rather than observed dietary patterns, meaning that the results depend on the assumptions used to build the model. Furthermore, researchers were clearly aware that values and other influences can result in scientists coming to different conclusions, as civil society pointed out – hence the call for a review of the “political ecology” of soil scientists alongside a review of the science itself.

“Some of the problem with healthy sustainable scenario modelling is that, basically, **you can pretty much get the answer that you want depending on the data that you put into it.** [...] They just chose crazy vegetarian diets, just said ‘Well that’s a vegetarian diet – oh look, they all eat mountains of cheese.’ [...] So what really is needed is some good data on what people actually eat in response to this change.”

- Researcher

“If we had [a] comprehensive and detailed analysis of that supply chain then we maybe wouldn’t be so concerned about the niggly details of **rebound effects** anyway because we’d be capturing that through the more **holistic framing** anyway.”

- Researcher

2.2 Ideas about knowledge versus advocacy

In general, researchers see their role as being to conduct research **impartially**, whereas civil society representatives see theirs as being to **promote a particular viewpoint, cause, or political position**.

Individual researchers may have a range of views of the part that scientists play driving societal

debates. At least one researcher put it this way: researchers can build scenarios, explain their consequences and **map out the available policy options**. However, they see it ultimately as the job of policymakers to decide what action to take and how much to negotiate and achieve a compromise between different and sometimes competing goals (such as climate mitigation versus individual dietary freedom). Other researchers, however, may be involved in advocacy by **promoting particular policy positions inferred from the results of their research**. We note that this tension between impartiality and advocacy may be particularly strong in fields of research where there is a great perceived need for immediate political action (such as climate change and food).

The normative visions of civil society may be more or less **informed by research**, depending on the particular NGO. Some NGOs see themselves as think tanks and may engage with a wide variety of research and perspectives, whereas other NGOs have a more overt campaigning focus, sometimes on single issues, with evidence sought out that supports their position. In another example, one civil society representative noted that civil society generally (but not uniformly) favours decentralisation, but they didn't make it clear to what extent this consensus is driven by data on the benefits of decentralisation, as opposed to a value system that favours small-scale farming.

In cases where the evidence base is vast, unclear or (apparently) conflicting, such as research on red meat intake and health, some civil society representatives reported spending a lot of time trying to make sense of the evidence so that they could reach a policy conclusion. They wanted to read **syntheses of existing evidence** so that the research is easier to understand and apply. Similarly, some civil society representatives wanted researchers to **reach a consensus on which policies the food system should be following**. Researchers, for their part, might argue that such a consensus cannot always be reached, that scientific evidence alone is not all that is needed for policymaking and that it is the role of policymakers to take the "holistic" view that considers evidence alongside other societal values to advance a particular policy recommendation.

We noted even in cases where there is some scientific consensus, different people – including civil society representatives – **may interpret or use the same evidence in different ways**. A good example is the GWP* debate. When the FCRN published its first Foodsource building block on methane – **Agricultural methane and its role as a greenhouse gas** – we noticed that stakeholders who normally disagree with each other about livestock reacted positively to the piece. This suggested that there is broad agreement over the mechanics of how short-lived greenhouse gases affect global temperatures. However, there was disagreement over what GWP* means for which courses of action we should take. People on social media used the piece to support their *existing* positions, ranging from (we paraphrase) "GWP* shows that cows aren't a problem" to "GWP* shows that livestock are a good target for near-term methane reductions". Similarly, we noticed differences in how civil society interviewees interpreted the significance of GWP*. Those who see livestock as beneficial, e.g. for health or rural livelihoods, may be more inclined to see ruminant methane emissions as justified, whereas those who see livestock as problematic in other regards, e.g. animal welfare or land use, may be more inclined to see them as a suitable target for climate mitigation.

2.3 Ideas about how evidence is communicated and interpreted

In the workshop, there was some discussion about whether the responsibility for **preventing misinterpretations and misrepresentations of evidence** lies primarily with the research community or with civil society, the media or policymakers.

Some of the civil society interviewees pointed out that it would be greatly beneficial to their work if scientists communicated their research with more careful consideration of how their **research outputs might be used or misused** by advocates of various policy positions. In the workshop, however, a researcher was concerned that too great a burden was being placed on researchers to avoid producing research that might be miscommunicated by anyone else.

Our impression is that – depending on the individuals involved – civil society is generally more inclined than researchers to think very carefully about how messages will be received and potentially distorted by different audiences. At least one interviewee said that researchers do not always have as deep an understanding as civil society of the (often unspoken) **nuances and politics-riddled sensitivities and associations of different terms**, such as agroecology and regenerative farming. This could lead to the conclusion that civil society is better placed to communicate research outputs to the relevant audience.

Our reflection is that there is no clear answer to the question of who is responsible for trying to prevent misinterpretations of research, but that in research that relates to societal controversy, researchers might be able to find a balance by **directly acknowledging and refuting the ways in which research is likely to be used** by some advocates or interest groups. Some researchers of course already do so, either in scientific publications or in blog posts. Civil society may have more understanding of how messages are interpreted by different audiences, and hence are well placed to advise researchers on how to communicate their findings in ways that are sensitive to the risk of misinterpretation. However, since some civil society organisations may focus their efforts on communicating research that supports their normative visions, we note that there remains a very important role for science communication that is based primarily in academia and communicates in a less normative way.

3. Reflections and next steps

The original goal of this project was to identify a shortlist of research questions on sustainable livestock and protein that civil society feels to be particularly important, that could be used by researchers as a guide to the future direction of their work. While we identified some common areas where both civil society and researchers want to see more research, we think that a lengthier and larger project would be needed to develop a more detailed, specific and robust list of research questions.

We feel instead that the value of this project has come from its insights into the important differences in how civil society and researchers approach knowledge gaps. We recognise of course that it is impossible to generalise about such broad and diverse groups on the basis of just one small set of interviews and a workshop, but we hope it has characterised the approaches that civil society and researchers take towards research gaps in contentious food debates, paving the way for further productive dialogue between both sectors.

We reflect below on the significance of our observations and make some suggestions for next steps, including work that may be carried out by Table, the new food dialogue initiative being set up by the FCRN/University of Oxford, Wageningen University and Research and the Swedish Agricultural University.

3.1 Limitations of the workshop process

The workshop was originally planned as a physical event held in Oxford, but it was moved online because of the COVID-19 pandemic. We asked participants for feedback on the process. Some of the limitations identified by them and by the research team include:

- The workshop was two hours long with around 40 minutes per breakout group. This left only a few minutes for discussing each individual research question, with **very limited time** for sharing reflections in the final plenary session. Although a full-day event may have been more appropriate, we think that two to three hours is the upper practical limit for virtual events given scheduling constraints and the tiring nature of online calls.

- The virtual format made it difficult to have informal one-on-one or small group conversations that would have been much easier in a physical event. One participant recommended following up with people afterwards to discuss any ideas that had been sparked (which we did). Future events could experiment with virtual mechanisms to encourage **informal networking**.
- The difficulties of reading body language in a virtual event mean that some degree of moderation is necessary to avoid people **talking over each other**. Future events might have a convention of raising one's hand on video to indicate that one wants to speak.
- Some participants expressed uncertainty over the **level of detail** that we wanted in the research questions: should we be aiming for broad areas of research to form an overall research agenda, or should we focus specifically on narrow questions that would benefit most from further interaction between academics and civil society? Future events might have a place for both approaches. Moderators should indicate clearly what is expected of participants.

3.2 Bridging the gaps between civil society and researchers

Here, we recap some of the areas where civil society and researchers prioritise different approaches and, in some cases, offer suggestions on how both sectors can work together productively:

- Researchers often emphasise the importance of identifying **researchable** questions versus civil society's aversion to **reductionism**. Better communication between these two groups could potentially help improve civil society's familiarity with different research methods and processes as well as their strengths and limitations. It might also be beneficial to encourage researchers to use methodologies from systems science and to make civil society more aware of the research that does indeed look at whole, interlinked systems.
- Natural scientists often focus on answering uncertainties at the **quantitative or technical level** (e.g. can soil sustain ongoing carbon removal? Are there sufficiently granular statistics available to determine how nutrition and protein transitions are happening in different sections of society?), while civil society – and also social scientists – might question how technical questions are **framed** in the first place and which research topics are given priority. It is therefore important for civil society, social scientists and other stakeholder groups to be involved in setting research priorities and framing research questions, as we have attempted in this project. The aim here is not for particular stakeholders to control the scientific process. Rather, it is to help both researchers and civil society uncover any assumptions they might not have recognised they hold, ensure that the questions they ask are relevant to society and get ideas of how to rectify any misunderstandings that might arise from a narrowly-defined research question.
- Researchers generally attempt (although they may not always succeed) to carry out research **impartially** while civil society explicitly and legitimately **advocates for particular visions and values**. Researchers vary as to the extent of academic advocacy that they view to be acceptable, which may also be a source of confusion for civil society. There may also be different approaches within civil society as to what extent their advocacy is informed by evidence as opposed to a clear normative vision. Finally, we feel that there is insufficient examination within both communities about how underlying assumptions and values and indirectly influence the work they do.
- Researchers often **map out the consequences** of a variety of policy options (although some also move into the territory of arguing for a particular way forward), while civil society generally wants **clear recommendations**. There can be a lack of clarity over who should be responsible for making decisions based on evidence provided by scientific research.
- There is some uncertainty over whose role it is to **synthesise and summarise** existing research – researchers, civil society or another body?

- Civil society often has a high level of awareness of how different terms and messages may be **interpreted and used by different audiences**. Civil society and researchers might both benefit from civil society discussing their insights in this area with researchers. Civil society and researchers might both be frustrated by uncertainty over who should be responsible for making sure that research is reported correctly – or indeed over whether that is actually a feasible goal in the first place.

3.3 Future opportunities

We have several ideas for processes to enhance mutual understanding between researchers and civil society. The FCRN and LEAP could use these ideas to inform their future programmes of work, including the FCRN's new food dialogue initiative, *Table*.

- In **explanatory webinars**, a researcher could explain their research on a specific topic in depth to several civil society representatives. Civil society would have the opportunity to ask questions, query how the research questions were framed and clear up any misunderstandings. This webinar format would be predominantly unidirectional in its communication style so that civil society representatives are not under pressure to think of how best to state their position. Our aim here would be to produce a situation that is conducive to engaging with the subject matter.
- Similarly, **civil society could give explanatory webinars** to researchers (for example, researchers within LEAP). One civil society representative would take time to explain their field of work, the concerns and difficulties they have and their theory of change. In this low-pressure environment, researchers could ask questions about how civil society reaches its policy positions, how researchers could better reach different audiences and how research is used by civil society to effect change.
- Researchers or civil society members could also produce **blog posts** to explain their work, which could be publicised on the websites of the FCRN, LEAP and civil society organisations. Others could engage with the blog posts through a comments section or through writing their own blog post in response.
- The forthcoming *Table* initiative is in the process of **reviewing existing methods of dialogue** between stakeholders. The ideal outcome of such processes would be helping actors understand each other's ways of thinking, including how evidence, values, training and ideological mindsets influence people's conclusions and decisions. This does not mean we need different actors to agree with each other. Rather, the processes would be about better mutual understanding of how people reach their positions and the aims towards which they work.

Appendix 1 – Overview of methodology

The project was structured as follows:

- We carried out 14 semi-structured **interviews** with senior staff members from a variety of NGOs. We asked about their perceptions of debates around livestock, protein and sustainability: issues that they expect to become critical over the next few years, knowledge gaps where NGOs would benefit from more research, contentious debates where different values clash, and areas of frequent misunderstanding.
- We **clustered** their comments and insights into broad themes and **developed a list of possible research questions for each theme (see the [intermediate report](#))**.
- On 21 April 2020, we held a **workshop** to further explore the perspectives we heard during the interviews and then distil the uncertainties, confusions and knowledge gaps into a shortlist of priority research questions. Due to the COVID-19 pandemic, this workshop was held remotely using Zoom rather than in person as originally planned and shortened from a half-day event to two hours. Six of the NGO representatives that had been interviewed attended the workshop (to keep the workshop a manageable size, we did not invite all 14 interviewees), as well as nine researchers from the LEAP project (we tried to invite researchers with a variety of interests and disciplines). During the workshop:
 - We presented the main insights from the interviews along with our proposed research questions that we felt expressed their questions and concerns (see the [intermediate report](#)).
 - Each NGO representative gave their reflections on our interpretation of the interview series.
 - We divided participants into three breakout rooms (smaller virtual chatrooms), each containing at least one NGO representative, three LEAP members and one organiser (from the FCRN or Eating Better). Each group was tasked with identifying the three most important research questions for two or three pre-assigned themes. These research questions could either be from our proposed list or new questions devised by the participants.
 - **Priority research questions (see [Appendix 2](#))** were fed back to the main group in a plenary session.
- The original intention was to follow up with LEAP researchers who took part in the workshop after a few months to see whether and how the project affected the direction of their research. However, given that the focus of this project has changed, we feel that a more appropriate approach would be to follow up with both civil society and researchers about which forms of future engagement they would find most useful (See "[Future opportunities](#)" in Section 3).

Appendix 2 – Priority research questions identified by breakout groups during the workshop

Good protein, bad protein? Society, economy and health

- Why has protein become a **global matter of concern** in the way that it has (i.e. health, environment, etc.), and why now?
 - What are the geographical, cultural and socioeconomic differences in how protein has become a matter of concern? For example, do people in the Global North think they need more protein in their diets, if so why, and which food product/categories do they associate most with protein? The findings have big implications for how transitions towards reduced conventional livestock products might play out and be successfully implemented. This was a particular research agenda highlighted for social sciences.
- How do **dietary practices** related to protein consumption (pastured or intensive meat, alternatives, traditional plant-based diets, etc.) relate to nutrient intake and public health outcomes?
 - A methodological refocus here away from individual products and more on dietary patterns, in recognition that people don't switch neatly or eat only one or two foods.
- What is gained and lost in **keeping production and consumption connected in research** on protein transitions, and how should this be conducted?
 - The breakout group talked about how there are lots of important questions like this that should be explored but that they face methodological challenges - there was doubt over the methodological rigour of being able to determine links between specific farming systems and individual health outcomes, largely because people don't only eat from one type of farming system all the time.
- How is this nutrition transition happening for **different societal groups**?
- What do **different nutrition transitions** look like?
- What are the **nutritional implications** of different types of transitions? (This would need better data on what people eat and effective collaborations with industry to access their data for insights.)

Measuring methane: GWP* and its implications

- **Bigger picture framing** – expectations of different sectors and actors. Optimal versus maximal.
- **What might be reframed?** From “no ruminants because so much methane” to what options might we still have open and what other pros/cons do they have?

Salvation by soils: are soils and trees a carbon solution?

- More **review of basic soil science**, specific applications, expert debate and remaining unknowns (including minimum- or no-till practices).
- **Political ecology of soil scientists.**
- **Agroforestry** as an option – optimal vs maximal.

Just transitions: fairness for farmers

- Review of **employment transitions wider literature** – follow-up applications for food system.
- Clear, comprehensive, global review of food system and supply chains – **flows of power and money.**

- **Implications of alternative food system scenarios**, power and money flows, different levels of consolidation. Imagining a **decentralised** food system.
- What lessons can the food and agriculture sector learn from **other industrial transitions** (e.g. energy)?
- How do we **evidence the benefits of regenerative agriculture** across holistic fronts (e.g. job creation, gender equality etc), and can these be maintained when scaled up?
- How to deal with **stranded assets** from protein transitions?

The public: attitudes and actions around protein shifts

- What **behavioural intervention strategies** are effective at reducing meat consumption and for which customer segments?