atf animal task force
A European Public-Private Partnership

EAAP
European Federation of Animal Science

Animal Task Force - EAAP 8th Special Session

Tuesday 1st December 2020 - 14:00 - 17:15

EAAP Annual Meeting 2020 – remote meeting

Session report

WHAT LIVESTOCK HAS TO OFFER TO BIODIVERSITY AND SOIL HEALTH?

Animal Task Force & EAAP 8th Special Session

EAAP virtual congress

December 1st, 2020

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Since 2013, the ATF-EAAP Special Session during the EAAP Annual Meeting aims to bring together animal science with practice of animal production and connect researchers, policy-makers, industry representatives and societal organisations. Every year, a different topic is addressed during this half-day session. http://www.eaap.org/.

Background

"The continuous, accelerating decline in biodiversity is of particular concern as biodiversity provides the fabric of life with a range of ecosystems services which are crucial for human well-being[1]". "Main direct drivers of biodiversity loss, in order of their importance, are land use change, overexploitation (through intensive agriculture, forestry and fishing practices), climate change, pollution and invasive species"[2]. 2020 is the year of biodiversity with the UN aiming to develop a post-2020 framework.

Livestock is often blamed for its contribution to biodiversity losses but the reality is more complex. The effects of livestock on biodiversity are variable across farming systems and livestock production can also make a positive contribution to biodiversity objectives and preservation of habitats.

Very often, research initiatives on soil fertility do not include animal farming. Still, livestock is a reservoir of solutions to increase soil C-sequestration, biological fertility, organic matter, etc. In some cases, it generates in negative impacts as emission of reactive N and dissemination of medicine residues or antimicrobial resistance.

ATF would like to explore the different **pathways, needs in cooperation and R&I to support an animal production able to contribute to ecosystems remediation**, whatever in soils and on biodiversity.

Format of the 8th EAAP & ATF Special Session

The session would like to engage discussion with farmers, industries, scientists, policy-makers and with the society. Most important findings will be discussed with a panel. The outcomes of the session will be discussed with a large panel of European stakeholders during the **ATF seminar, in Brussels, on 21st April 2021.**

Aim

The Special Session aims to contribute to:

- **Engage a dialogue with various stakeholders;**
- Address **how research and innovation can support the livestock sector;**
- **Provide input to European research and innovation agendas and to public policies** to secure Europe's role as a leading global provider of safe and healthy animal-derived products;
- **Support knowledge development and innovation;**
- **Foster ownership by farmers and industries.**

[1] https://www.ipbes.net/assessment-reports/eca

[2] Orientations towards the Strategic Plan implementing the research and innovation framework programme Horizon Europe

PROGRAMME

14:00 Setting the scene: Assessment of livestock impacts and positive contributions to biodiversity and soil health
Felix Teillard, FAO - *@FAOclimate*

14:15 Setting the scene: Trade-offs between livestock, biodiversity and soils health and approaches towards positive impacts
Alberto Arroyo Schnell, International Union for Conservation of Nature - *@IUCN*

14:30 Farmers best practices to mitigate or remediate biodiversity losses
Seán Finan, farmer representative of the European Council of Young Farmers (CEJA) - *@finan_sean @_CEJA_*

14:45 Animal genetic resources and breeding goals for biodiversity-rich livestock systems
Sipke J. Hiemstra, Centre for Genetic Resources - Wageningen University & Research - *@HiemstraSJ @WUR*

15:00 Good practices of industry driving production
Dionys Forster & Robert Erhard, Nestlé - @Nestle

15:15 Questions & answers

15:45 Panel discussion: ways forward, R&I
Moderated by Frank O'Mara, Teagasc, ATF president - *@FrankOMara8*
With the audience, the speakers and Patrick Worms, EURAF European Association for Agroforestry - *@EURAF_AF*

17:45 Closing

Welcome and Introduction

The outgoing ATF President Jean-Louis Peyraud and outgoing EAAP President Matthias Gauly opened the 8th ATF & EAAP Special Session.

The Animal Task Force (ATF) promotes a sustainable and competitive animal production in Europe. We are a public private partnership of experts from knowledge institutes and industry representative organisations from across Europe. We work closely together with EAAP on setting the European agenda for research and innovation in the animal domain.

For more information:

www.animaltaskforce.eu @AnimalTaskFrc

www.eaap.org/ @EAAPofficial

All presentations are available on the ATF website.

SETTING THE SCENE: Assessment of livestock impacts and positive contributions to biodiversity and soil health

By Félix Teillard, FAO

www.fao.org - @FAOclimate

Félix Teillard holds a PhD in agroecology from INRAE. For several years, he has been responsible for the work on livestock impacts on wild biodiversity within the animal production division of FAO. He is now a consultant for FAO and the World Bank on livestock, biodiversity and climate change. He gives the big picture of livestock in relation to biodiversity. It has a negative side, as livestock contributes to all drivers of biodiversity loss, but more than other sectors, when livestock systems are managed in a sustainable way, they can have great value in boosting plants species richness in grassland, maintaining high-quality grassland habitats, contribute to the health of grassland ecosystems and providing a range of ecosystem services.

There are challenges around the assessment of biodiversity in livestock systems: a large diversity of impacts, complex globalised supply chains, biodiversity is intrinsically complex and is difficult to express with a unique currency. Among other initiatives, the FAO LEAP partnership has published guidelines for the evaluation of livestock impacts on biodiversity. It reflects a consensus at sector level. The scope is large, considering local to global scales, upstream and downstream of the farm, positive and negative impacts, relevant to a diversity of actors, objectives, regions, production systems. Two methodological avenues have been considered: 1. Life cycle Assessment (LCA) and 2. Ecological indicators. LCA is a standardised tool oriented to decision making. It is adapted to larger scales, globalised supply chains, suitable for baseline, scenario analysis, limited in scope as they focus on impacts of land use on species extinctions, overlooking positive impacts. Ecological indicators are more suited to smaller scale territories, customised assessments according to priorities, constraints by important data collection efforts. The LEAP guidelines provide a list of indicators. Felix Teillard gives examples of biodiversity assessments using those methods.

Finally, the positive impacts of livestock on biodiversity could contribute to the global commitments on biodiversity by bringing synergies with land restoration, grassland biodiversity, biomass productivity, SOC storage, livestock productivity. But in practice we need more evidence and accurate metrics to implement and promote those synergies.

More information in the slideshow

SETTING THE SCENE: Trade-offs between livestock, biodiversity and soils health and approaches towards positive impacts

By Alberto Arroyo Schnell, International Union for Conservation of Nature
https://www.iucn.org/fr - @IUCN

Alberto Arroyo Schnell is responsible for the management and coordination of the policy team at the IUCN European Regional Office in Brussels, as well as for the IUCN European Work Programme. The organisation involves a large number of governments, environmental NGOs and land users. Agriculture is a priority domain for nature conservation to achieve sustainability targets. It is a fundamental human activity that depends on natural processes (soil fertility, water recycling, pollination…). It poses a threat to it and has impact on climate change while it also suffers from climate change. Actually, unsustainable agricultural practices pose a major threat to biodiversity. Sustainable agriculture is the only way forward. What is it? According to the organisation of FAO, this would include the "*management and conservation of the natural resource base*". IUCN has published a report called *"Approaches to sustainable agriculture"*. There are very different approaches to sustainable agriculture. To fine-tune the terminology, they ended-up with a list of 14 key approaches to sustainability, from sustainable intensification to agroecology. In most cases, they have practitioners. In some cases, they have a marker or a label associated to them. They have a number of commonalities, but also their diversity is a strength in itself. The choice of approach depends very much on local contexts and specific priorities.

The report highlights supporting activities towards a more sustainable agriculture: genetic improvement, precision farming, mixed farming systems, integrated farming tools, pasture based and free-range farming, landscape and ecosystem approaches, supporting socio economic activities… some are tools that may not have been designed with sustainability in mind, others are activities with a scope that may extend beyond agriculture. Many of these approaches share similar environmentally friendly practices, in particular crop rotation, inclusion of cover and companion crops, mixed crop and intercropping, reduction of synthetic pesticides and mineral fertiliser use, no or minimal tillage, lower livestock densities, managed grazing, free range…

Above all, we are lacking a common vision for what a sustainable agriculture and livestock sector should look like in the future. The challenge for policymaking is to enable a dialogue and create the market or regulatory environment that will help define priorities according to local contexts, helping farmers to follow the societally desired path.

Questions:

Public What is the difference between agroecology/sustainable intensification?

AAS Agroecology works much more with using ecological principles. There are different ways of expressing very close concepts.

Public How do you look at possible negative trade-offs between biodiversity and climate goals, as it relates to livestock systems?

AAS Metrics are still not perfect to capture this.

More information in the slideshow

Farmers best practices to mitigate or remediate biodiversity losses

By Seán Finan, CEJA

https://www.ceja.eu/ - @_CEJA_ - @finan_sean

Seán Finan is a Vice President of the European Young Farmers organisation CEJA. He served as the 35th President of the Irish Young Farmers organisation Macra na Feirme from 2015-2017. He is a beef farmer on a grass-based finishing system in county Roscommon in the West of Ireland. His enterprise is finishing business.

His objective as a farmer is to maximise the amount of high quality grazed grass and produce high quality nutritive animal-based products. Among other challenges encountered on the farm, soils fertility varied significantly across the farm and farm income and viability are not yet ensured. As a representative of the sector, he does see an increased awareness on environment and biodiversity considerations.

Fostering soil health is an important concern on the farm. His objective is to improve soil fertility and nutrient management. He also hopes to improve soil structure and resilience by using cover crops and multispecies swards, with an aim to gain resilience to cope with periods of more frequent droughts and heavy rainfalls. He takes samples from the soil to measure soil quality several times a year and discusses it with his farm advisor from Teagasc. He uses liming to adjust soil pH, which is a critical indicator for soil fertility. Forage crops provide a source of high quality protein winter feed and contributes positively to the soil structure. Fostering biodiversity on the farm is another important objective. He aims at protecting habitat by using grassland and rotational grazing, by reducing chemical fertilisers. He hopes to fully eliminate the use of pesticides and herbicides.

Farmers are delivering public good. Seán Finan sees himself as a custodian of the countryside turning inedible protein (grass from his farm) into edible protein (meat and milk). He believes measurement and monitoring at farm level are very important. Access to education and training is key. We need an acknowledgement from policy makers that livestock farming is key to foster biodiversity and soil health. We need a better understanding between environmentalists and farmers. He would like that net emissions from soil, hedgerows would be considered, instead of gross emissions.

Questions:

Public Does increased on farm biodiversity on farm pay off?

SF This is not a question of paying off or not. Biodiversity is key to a well-functioning farming system. We need to increase biodiversity and raise environmental consciousness, we have no choice on this, consumers will demand additional standards. Biodiversity has value to protect habitats.

Public What is your vision on payment for environmental services, CAP instrument?

SF There is an increased focus on environmental measures in the new CAP. Ecosystem services to be delivered will be included. At the same time, we face the challenge of a decreasing budget. Farmers will be expected to do more with less funding, while they need to be rewarded. We need to develop communication strategy, for farmers to understand their role, for consumers to know the valuable work taking place on farm.

More information in the slideshow

Animal genetic resources and breeding goals for biodiversity-rich livestock systems

By Sipke J. Hiemstra, Centre for Genetic Resources - Wageningen University & Research
https://www.animalgeneticresources.net/ - @HiemstraSJ - @WUR

Sipke Joost Hiemstra is Director of the Centre for Genetic Resources, the Netherlands (CGN) of Wageningen University & Research. At European level, he is chair of the Steering Committee of the European Regional Focal Point for Animal Genetic Resources (ERFP). His presentation aims to address breeding goals and farm animal genetic diversity, in the context of more biodiversity-rich future livestock systems.

There are 3 levels of biodiversity: at ecosystem level, at species level, and genetic diversity within species at breed or DNA level. Recent assessments show clearly that global biodiversity is threatened due to multiple factors, including negative impacts of livestock production. In 2019, a report published by FAO stated the importance of conservation and sustainable use of biodiversity in food and agriculture.

A large proportion of all local livestock breeds is at risk of extinction. More efforts are needed to conserve and promote the use of genetic diversity within species. Livestock systems cannot function without biodiversity. Biodiversity contributes to productivity, performance and resilience of livestock systems. Farm practices have impact on biodiversity at farm level, but also at landscape level or globally. While livestock systems can have a positive impact on biodiversity, they have also been a driver for global biodiversity decline at farm level, landscape level and globally.

A transition is needed in the livestock sector, considering the negative side effects of the currently dominant, specialised, intensive livestock systems. Future livestock systems should be based more on agro-ecology and circularity principles. Moreover, livestock systems should be better recognised and valorised by the market for the variety of ecosystem services they provide.

Sipke J. Hiemstra reports positive impacts of livestock grazing and showed two different future scenarios. Scenario A implies further intensification and specialisation, high input & output per ha, and a low added value per kg of product, with a land sparing organisation, largely separating agriculture and nature conservation. Scenario B is nature-inclusive and biodiversity friendly, 100% grazing, lower input/output per ha, a higher added value per kg product, and payments for ecosystem services and biodiversity. It is evident that breeding goals should be different for the two scenarios. In scenario B, animals need to be able to better cope with lower feed quality or feed scarcity, laying the emphasis on traits like animal robustness, resilience, but also animal behaviour in relation to human and predators. Trends towards more (bio)diverse livestock production systems can provide opportunities for breeds that are currently at risk. It is important to maintain a broad genetic base for future breeding (genetic diversity between and within breeds). Breeding programmes should be focused both on genetic improvement of breeding goal traits and on long term conservation of genetic diversity.

Questions:

Public How do you suggest to proceed with breeding programmes that focus both on genetic improvement and the preservation of biodiversity? Should this be included in a single selection goal or would you suggest different indexes depending on the farmers' objectives?

SJH A balanced approach is needed. Genetic improvement of breeding goal traits should go together with maintaining genetic diversity and minimizing inbreeding rates in breeding programmes

Public Is it best to aim for dual-purpose breeds, or to use sexed semen for replacements and improved beef merit of other calves from the dairy herd?

SJH Both are options to increase the beef output from dairy farms.

More information in the slideshow

Good practices of industry driving production

By Dionys Forster & Robert Erhard, Nestlé
https://www.nestle.com/ - @Nestle

Dionys Forster and Robert M. Erhard are both Raw Material Sourcing Leads at Nestlé. Nestlé has two ways of sourcing: from large industries or directly at farm gate/cooperative level. End of 2019, Nestle sourced through Farmer Connect from about 550 K farmers, in this context Nestlé also trained about 430 K farmers on good agricultural practices.

As part of Nestlé Farmer Connect, Nestlé has rolled out its Sustainable Agricultural Initiative, which is all about Sustainable Agricultural Practices. More recently Nestlé started to work on "Sustainable intensification of Agriculture". Since 2019, sourcing programmes have to be in alignment towards a zero net emission ambition.

A project on farm sustainability assessment held in Chile delivered key facts and figures for a whole sustainability programme in 2011, including biodiversity, soil health, GHG emissions, animal welfare, environment, human health. From the assessment, the farmer is paid a premium upon a point system. Farmers are invited to choose intervention measures that are the most appropriate for their farm. Over the time, the project has monitored progress and transformation towards biodiversity conservation, soil health improvement, GHG emissions reduction, and others. Transformation is dependent on the farmer's own capability and willingness, as well as on the attractiveness of the price premium. It is supported by a marketing and communication action.

A second case in Switzerland includes a farmer organisation called IP-Suisse grouping 20,000 farmers that represent one third of all farms in Switzerland. Round 2012, the association marked its development of an innovative scheme together with a research organisation that went beyond national regulation for ecosystem services payment. The farmer association built upon a point system and developed an internet platform where farmers can sign out and declare their practices. A research organisation is doing a monitoring and review upon biodiversity criteria. Since 2016, this programme has been extended to Nestlé suppliers for the confectionary factory. The scheme has been valorised through an old famous chocolate brand called "Cailler" certifying sourcing from "Swiss farmer milk".

Biodiversity and environmental schemes can deliver true value to farmers and consumers. A simple point system and mechanism for price premiums can accelerate transformation towards biodiversity and soil health and lead to measurable impacts on the agricultural landscape. Respecting the farmer's will to develop its own biodiversity roadmap is key to successfully implement those schemes. And communication may build on elements to valorise products towards consumers.

Questions

Public How can farmers get an extra amount of money within those frameworks promoting biodiversity?

DF Farmers sign up to a point system. Above the threshold, the farmers gets the premium. The system has been very successfully implemented by Nestlé in Chile and Switzerland according to the development level of the production system.

More information in the slideshow

Q&A and panel discussion

The panel consisted out of all speakers and Patrick Worms, EURAF - http://euraf.isa.utl.pt/welcome - *@EURAF_AF.* Patrick Worms was trained as a molecular geneticist and is the Senior Science Policy Advisor of World Agroforestry, the world's only global institution devoted to the study of trees in agricultural landscapes. He is also president of the European Agroforestry Federation.

FOM Frank O'Mara, Teagasc, ATF President, moderator
PW Patrick Worms
FT Felix Teillard
AAS Alberto Arroyo Schnell
SF Seán Finan
SJH Sipke J. Hiemstra
DF Dionys Forster
RE Robert Erhard

Public LCA has shortcomings: it calculates net effects of a functional unit and some very important components of agricultural systems are not captured as they are complex, like soil carbon, biodiversity, and overall the sustainability in a long term perspective. Climate labelling is assessing products on a one-dimensional criteria, while we want to direct farmers towards multiple dimensions of sustainability. Can we improve LCA methodologies or do we need another tool?

FT LCA is fine when there is not a lot of information available. In a second step, any assessment needs to be complemented with more details. LCA is more valuable to quantify the impact of broad land use categories such as 'permanent grassland', 'intensive grassland' or 'cropland'. It has room for improvement, it is very data-oriented and may make use of remote sensing data. When we complexify, it gets difficult to use LCA then we need to switch to a more locally relevant tool. Biodiversity is too complex for such a tool, so we need complementary approaches.

RE There has been a massive proliferation of tools. I would welcome indicators around carbon sustainability combined with carbon in a unified approach for measuring the European sustainability.

How can agroforestry improve biodiversity in livestock systems?

PW A lot of research on silvopastoral systems combining trees with livestock suggests that they speed up ecosystemic processes. Animals manure the trees, leading to faster growth; the trees provide fodder, shade and buffering of water cycles, accelerating animal growth. So even with this very simple system of three species (one tree, one animal and one grass species) we see that bodiversity enhances the overall biological productivity compared to two species (one animal and one grass species). Multiplying the species numbers accelerates the biological processes engine. Thus, biodiversity contributes directly to profits (soil fertility, tree fodder, timber, wood, fruits, honey, animal welfare etc.) But there is a deep knowledge gap about those systems, which explains why so few farmers adopt them.

How can farmers embed those practices? What is the most problematic?

SF Each farm is different, so the measures should be quite specific. CAP and practitioners should have access to a wide list of measures of options for farmers to implement the most suitable on their farm.

AAS Environmentally friendly practices have been identified across a variety of livestock systems, which will be important to embrace towards a transition to sustainable agriculture.

Livestock has a non-deserved reputation regarding biodiversity and health, what are your views?

AAS Livestock producers are indeed in the spotlight. It will be important to acknowledge and promote already existing and facilitate the uptake of additional good practices – e.g. grassland can offer avenues for good practices, including for biodiversity and climate. Throughout, it will be necessary work towards meeting crucial biodiversity and climate targets, and consider the evolving consumer demand, which is increasingly embracing choices which are healthy for people and the environment.

RE Livestock farmers are targeted by different groups regarding their impact. But livestock is an integral part of a healthy diet and part of the environmental solutions. There are dietary imbalances and in some regions less animal proteins are recommended while in others more may be required. A transition is needed to a more circular food systems which will help to achieve a sustainable future.

FT This reputation has benefited the sector a lot. It has been very criticized so far, in particular since the "Livestock long shadow" report that shed a light on impacts of the livestock. The bad reputation has helped the sector to better respond and improve practices. Clearly livestock has a role in resource use, biodiversity extinction, etc. Negative impacts like deforestation in Brazil strike public's attention more than positive impact. This is why assessments have a role to play to provide a complete picture.

What can be done in intensive systems to improve biodiversity and soil health?

FT We need sustainability standards for feed production and feed traceability. Both land sharing and land sparing (meaning sparing some land for conservation) have value. Intensive systems have to mitigate other externalities like pollution.

AAS There are sustainable avenues to explore, such as sustainable intensification or ecological intensification. What is clear is that the agricultural sector needs to transition to a sustainable form, as do other sectors like oil, gas, or pesticides – and this is not only necessary for the environment but it is also demanded by society.

SF We need to know what we can do on farm and where we start from, looking at practices to improve soil fertility and minimise impacts, thanks to knowledge transfer and advisory services. In Ireland, Teagasc has been working on multispecies swards with a good commitment on biodiversity, like on genomics and efficiency from animals with an aim to reduce C footprint.

PW Intensive monocropping, whether for food or feed, is highly dependent on expensive external inputs. You could reduce those costs by diversifying cropping systems, adding trees, applying holistic grazing management... All these approaches incorporate ecosystemic parameters in the management of the farm, with measurable positive impacts on profits and environmental parameters.

How to quantify impacts and outcomes of measures and good practices related to biodiversity and soil health?

DF We have developing a trustful baseline for a biodiversity scheme including a number of measures at farm and landscape levels. We perform independent assessments.

RE To increase biodiversity and organic matter in soil. There are also places where Agriculture does not make sense, places that should simply belong to nature

What are the R&I gaps that need to be addressed?

Public To which extent can we develop legumes (forages and grain) in Europe to avoid deforestation embedded with soy imports?

FT We need an integrated assessment of biodiversity, soil health, carbon sequestration, ecosystem services, taking stock of all schemes at farm/country schemes that provide a strong body of evidence.

SJH I fully agree with suggestion to look at more integrated assessment of livestock systems, including biodiversity aspects. From an animal breeding point of view it is important to anticipate trends towards more diversity in future livestock systems, as a result of context specific optimization of systems. Resilience of systems and resilience of livestock are key topics for R&I. And regarding the currently underutilised livestock breeds, it is a matter of "use it or lose it". More research is needed to investigate breed characteristics in the context of the production systems where they fit, and where they provide. Both economic and landscape values.

AAS We do not have yet a good system of metrics on biodiversity, climate, contribution/impacts of grassland etc. This would help a lot in policy interventions. What Patrick said is very important: we are missing a vision for the future of agriculture to fulfil the requirements of societies.

DF How to develop business models around biodiversity and soil health and communicate better with consumers. There is a lot of potential. But to do so, metrics and methods are needed. Nestlé has committed towards zero net climate emissions, which requires investment across value chains. GHG mitigation measures will benefit to a large extent also biodiversity, etc. But monitoring system will have to be solid. The current LCA methods and tools are heavily administrative and show shortcomings. We will need automated systems to retrieve indicators from farms/suppliers to understand their footprint and take the appropriate sourcing decisions.

FOM The European Farm to Fork strategy has proposed FADN to provide an assessment baseline as well as to improve labelling on the sustainability of foods. In your presentation, you show 2 case studies including labelling and branding. Do we need more R&I in this area?

DF After 20 decades of certifications and labels, I do believe in brands that have a value and can be trusted in. Now, how do we convey this message? In Switzerland, IP-Suisse farmers organisations are working towards more trust in their products, which Nestlé was able to build on with Cailler chocolate.

SF This is rather complex to establish a sustainability baseline at farm level. In Ireland, assessments are performed based on activity, measurement of emissions. This could change the narrative and negativity we see in the minds of consumers about environmental impacts of agriculture.

PW research is needed into metrics that accurately reflect the complexity of livestock systems. Using the lens of agroecology means looking at a wider set of variables, including social ones, than 'just' P&L. But deciding what to measure to see whether we are holistically going in the right direction is not a trivial challenge. Certification bodies have long checklists, but a wide range of poor producers cannot reach those standards (not necessarily because of poor farming practices, but because of inadequate administrative capacities). We instead need to define a minimal set of proxy metrics that offers farmers the freedom and the support to innovate. To ensure these are effective, we need a lot more R&D on carbon, biophysical and social aspects, financial flows and so on.

FOM SF mentioned it would be good that GHG would be assessed on a net base rather than on emissions. What do you think?

DF We want to go to zero net, not just via a reduction, but also via insetting of carbon in soil and biomass (hedgerows, trees). But the rules of the game and measurement methods are not yet there i.e.: how do we account for reductions and insetting?

Closing remarks

FT I really enjoyed the session. We see a common understanding across actors and scales. Different actors at farm scale and policy scale have identified the same issues. The complexity of biodiversity remains a challenge.

AAS We are all headed in the same direction, there is no other direction to be headed in. The fact that we need to transition to sustainable agriculture is acknowledged but also agreed by the various stakeholders along the food value chain, this is clear from our discussions with them. This includes sectors like this one, or pesticides, or the oil industry – all sectors will need to become sustainable in order to secure their own futures.

SJH Integrating biodiversity in assessment and optimization of livestock systems needs a different mindset. On the breeding part, breeding strategies should anticipate a diversity of future systems and landscapes, and develop tailor-made breeding goals for different systems.

DF I am very happy to have been part of this session. We are all working on objectives and metrics, MRV system needs to be automated, integrated in existing systems, livestock plays a key role, as livestock can be complementary to other systems. We need to be holistic in the assessments to encompass biodiversity and climate change and to bring to the consumer in a trustful way.

PW I agree, this is not only about carbon and biodiversity, it is about a whole way of managing farms in a holistic way. The best farmers will be those that manage the integration of components like livestock, cropland, pastures and trees in much the way a conductor integrates individual musicians into a symphony orchestra. Local forestry is not a single practice, but hundreds of different practices adapted to unique local contexts. Archaeology shows that it has maintained very high human population densities in various places around the world for many millennia. Harnessing that knowledge and aligning it to modern agronomy will help our farmers future-proof their farms!

SF Improving biodiversity and soil health is complex, so we need to simplify the language and organise knowledge transfer. Policy makers need to understand every farm is different and complex and to support young farmers, that are pioneer in precision livestock farming.

Isabel Casasus, incoming EAAP President says that she joined the ATF-EAAP session several times in previous editions. She is very happy of the collaboration with ATF, with a relevant session including various range of participants on a topic that is particularly relevant. We are happy to continue the good collaboration.

Frank O'Mara, incoming ATF President

He thanks the speakers and the audience for the fruitful debates. He invites all participants to continue the discussion during the 10th ATF Seminar of April 21st, 2021, in Brussels, where policy makers and European stakeholders are invited.

ATF promotes multi-functionality in agriculture. We also encourage future development of livestock production systems from a perspective of ecosystem services together with holistic agriculture approaches that link more closely livestock and plant. This aims to better use and protect the properties of agroecosystems and to maximise the use of biomasses of plant and animal origins through recycling and cascading approaches. These holistic agriculture approaches also need to encompass the agroecological domain and would stretch to consumers' global health by integrating from the ecosystem of a healthy soil, plants and animals in good physiological and sanitary conditions and healthy humans. For more info, download the ATF Vision Paper published in February 2019 or visit our website.