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animal
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force

A European Public-Private Partnership



10th Seminar of the Animal Task Force

21st April 2021: 9:30 - 13:00

Remote meeting

Seminar report

Table of contents

Welcome and Introduction	5
Setting the scene: Vision from an EU policy maker	5
Towards an agriculture supportive of biodiversity: Synergies between biodiversity and soil organic matter	7
Governance and cooperation	8
Healthy soils and biodiversity: what ruminants can do that cropping systems cannot?	9
Good practices of industry driving production	10
Questions & Answers	11
Panel discussion	12
Closing remarks	16

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-being¹”. “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 was 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 results 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 for cooperation and R&I to support an animal production system able to contribute to ecosystems remediation**, both in soils and on biodiversity.

Format and aim of the 10th ATF Seminar

This Seminar is a follow up of the ATF-EAAP Special Session held during the EAAP Annual Meeting on December 1st, 2020. It aims to engage discussion with farmers, industries, scientists, policy-makers and with the society. In relation to livestock’s contribution to biodiversity and healthy soils, the seminar’s aims are 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

9:30 Opening

By Frank O'Mara, Teagasc, ATF President - [@FrankOMara8](#)

9:35 Setting the scene: Vision from an EU policy maker

By Humberto Delgado Rosa, Director for natural capital, DG Environment, European Commission - [@EU_ENV](#)

9:50 Towards an agriculture supportive of biodiversity: Synergies between biodiversity and soil organic matter

By Vincent Manneville, Idele - [@InstitutElevage](#)

10:05 Governance and cooperation

By Alex Datema, BoerenNatuur - [@BoerenNatuurNL](#)

10:20 Healthy soils and biodiversity

By Donal Sheehan, the Bride project - [@bride_project](#)

10:35 Good practices of industry driving production

By Miguel Ángel Higuera, ANPROGAPOR - [@anrogapor1](#)

10:50 Questions & answers

11:30 Panel discussion

HOW TO MOVE FORWARD TO IMPROVE THE POSITIVE CONTRIBUTION OF LIVESTOCK AND REMEDIATE BIODIVERSITY AND SOILS HEALTH?

Moderated by Jean-Louis Peyraud, past ATF President - [@PeyraudJean](#)

With the audience, the speakers and Tiago Domingos, Terraprima

12:30 Closing

Welcome and Introduction

The ATF President Frank O'Mara opened the 10th ATF seminar. Over 194 participants from industry, research, policy making, civil society, farmers' organisations were counted.

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

All presentations and replays are available on the [ATF website](http://www.animaltaskforce.eu).

Setting the scene: Vision from an EU policy maker

By Humberto Delgado Rosa, Director of Unit D: Natural Capital, DG Envi, European Commission - @EU_ENV - https://ec.europa.eu/info/departments/environment_en

Humberto Delgado Rosa is Director for Natural Capital, DG Environment, European Commission. He is experienced in European and international environmental policy, particularly biodiversity and climate change issues.



Way before humans, healthy ecosystems have always included large wild herbivores, shaping the ecosystem. Humans have to a large extent replaced these wild animals by livestock. **Farm animals have historically**

played an important role in the European environment and culture, and they are often an integral part of ecosystems and traditional landscapes that they have to a large extent shaped. Livestock nowadays uses a considerable share of agricultural land, being grazing areas for livestock or fodder production. It is now around 60% of the agricultural land that is used for animal production. But traditionally, livestock was fed with grass and by-products, which is no longer true in many places in Europe. The past mixed-farming model, which used to combine farm animals and crops, is becoming an exception, while such mixed model was closer to mimic natural ecosystems including the role of large herbivores in it.

As a result of the increasing agricultural intensification, the variety of animal farming systems is leaning towards more intensive farms in many parts in Europe. Those systems lay very much apart the normal ecological role of herbivores. A significant share of the livestock production is nowadays achieved in animal farms with no crops nor grazing areas. 67% of the cereals grown in the EU are used as feed for livestock consumption and grazing areas are decreasing in most Member States. In the current political landscape, livestock production is very often in the spotlight, associated with significant environmental impacts. We should seriously consider those impacts as well as the positive contribution from livestock. Starting with greenhouse gas emissions, the agricultural sector is responsible for some 10.3% of emissions, 70% of those come from the livestock sector. In some parts of Europe with big concentrations of animal production, we face severe pollutions of soil, water and air. More than 80% of the nitrogen of agricultural origin in aquatic environment is somehow linked to livestock farming activities. 90% of the ammonia emissions of the agricultural sector are linked to livestock farms.

The conversion to less intensive practices is necessary if we want to get to sustainability. Intensive farms would need to process the manure and export it, which does not configure a sound way for a sustainable approach. Nutrients are a very important planetary boundary which is already beyond the safe zone, including within the EU. We would need a reduction of 70% of nitrogen losses and a reduction of phosphorus losses by some 50%. Indeed, a lot of these losses are linked to livestock farming. It is not surprising that you will find in the EU Biodiversity 2030 and in the Farm to Fork Strategy the objective of reduction of nitrogen losses by 50% by 2030, leading to a reduction of the use of fertilisers by some 20%.

Extensive livestock systems, if properly managed, can indeed provide significant benefits to the environment. They can contribute to preserve valuable ecosystems such as grassland, attractive landscapes and they can help provide some significant ecosystem services, including healthy soils and soil organic matter. **Healthy soils underpin all agriculture production** and a series of ecosystem services from carbon sequestration, climate regulation, water purification, nutrient regulation, etc. **Soil organic matter**, in addition to providing nutrients and habitats to the organisms in the soil, improves the water holding capacity of soils, soil fertility, microbial function and carbon sequestration, plus reducing risks of erosion and resilience to compaction of soil. **Building up soil organic matter is very important because it requires decades to prevent and reverse losses.** It is critical to sustainable agriculture that the organic wastes are returned to agricultural land to avoid soil nutrient mining. **The spatial disconnect caused by the segregation and industrialisation of livestock systems is identified as a major constraint to this sustainable nutrient recycling.** Science does show that soil organic carbon stocks tend to be much higher in organic farming than in non-organic farm systems. Differences are mainly influenced by practices like mixed-farming systems which helps recycling the organic matter and the forage legumes in crop rotation and can be applied to any production system. This shows the importance of a sustainable soil management and the role of livestock through this mixed farming approach. We are in the European Commission preparing a new soil strategy that is planned to be adopted later this year, currently under stakeholder consultation.

Intensive livestock farming and overgrazing generate problems like soil infertility or desertification. **Sustainable soil management and new management techniques including integrated and extensive crop-livestock farming are required if soil productivity and environmental quality are to be maintained.** The extensive animal farming that uses local forage resources and grazing and contributes to preserve local breeds and varieties is better adapted to environmental and climate conditions, only requiring few external inputs in terms of feed, energy, while providing ecosystem services and valorising grassland biodiversity. In essence, extensive livestock grazing properly managed is a key activity to preserve permanent grasslands which very often are in protected areas. We do have many types of valuable grazing ecosystems in Europe, as those linked to pastoralism and agroforestry, in which animals play a role to maintain ecosystems and prevent forest fires.

As a conclusion, the increasing intensity of livestock farming systems is a challenge from the environmental point of view, but there are many examples that show that extensive livestock systems are actually part of the solution by increasing the economic basis for rural areas. So, we should ensure that the new CAP legislation is fit for these challenges to transition to a more sustainable agriculture including sustainable animal farming and regenerative grazing. That would help the achievement of the targets of the Biodiversity strategy and the Farm to Fork strategy.

Towards an agriculture supportive of biodiversity: Synergies between biodiversity and soil organic matter

Vincent Manneville, Idele - @InstitutElevage - www.idele.fr

Vincent Manneville is a senior scientist with expertise in livestock production systems and environmental analysis. After 7 years as farmer, he has been specialising in the management of environmental issues and assessment of livestock farms sustainability and support to agro-ecological transition, with a focus on biodiversity preservation and assessment in dairy farms and on the determination of characterisation indicators and evaluation of the effect of agricultural practices on soil fertility in mixed-farming systems.



Vincent Manneville shows the state of carbon in soils in the EU that is marked by a decreasing organic matter content and biodiversity. Soils are an essential component of ecosystems that regulate and control many ecological processes like climate change, chemical fertility, biological fertility, water quantity and quality. In the literature, two different concepts define soil biodiversity: the concept of yield “*Capacity of soil to produce the desired crops*”, and the concept of biological activity and sustainability: “*Capacity of soils to provide essential nutrients for crop growth, to support biological activity and provide a favourable soil structure*”. The latter was used in a study conducted in France focused on soil organic matter as an indicator for soil biodiversity.

Soil organic matter groups all organic constituents, of plants, animal or microbial origin, processed or not, present in the soil. It provides soils with biological activity, availability of fertilisers and structural stability. **The study shows that the biological activity under permanent grassland is much higher in terms of soil fertility than in other systems, namely specialised cropping systems.** Integrating temporary grassland in crop rotations and spreading organic matter is key to preserve biological and ecological services provided by soils. The team has compared two types of farms, either in mixed farming combining annual crops and dairy cows, or specialised crop production farms, using a method to calculate the humic balance at farm level. Results show that livestock systems with annual crops have a global positive balance of organic matter compared to annual crops specialised systems. They conclude that mixed-livestock systems preserve ecological services as climate change, water quality and food production, while specialised annual cropping systems as they are managed today are not able to preserve nor restore soil functions and associated services. **Livestock farming, mixed-farming systems and complementarities between crops and livestock will offer opportunities to restore the loss of biodiversity in European agricultural landscapes, to improve soil fertility, health and stability and may support climate change mitigation strategies.**

[More information in the slideshow](#)

Governance and cooperation

By Alex Datema, farmer - BoerenNatuur - @BoerenNatuurNL - www.boerennatuur.nl

Alex Datema is a dairy farmer in the North of the Netherlands. Owner of a dairy farm with 120 milking cows and 70 hectares of grassland. On his farm, he practices meadow bird protection on 15 hectares of grassland. This means delayed mowing of grassland, herb-rich grassland and creating wet spots on grassland. He is also the chairman of BoerenNatuur (farmersnature), a national umbrella organisation for all the 11,000 farmers involved (40 cooperatives/groups of farmers) that take part in the agri-environmental schemes. Those farmers carry out farmland bird protection and landscape maintenance. The association is covering the whole country. Since 2015, it changes its system. In the past, farmers had individual contracts with the government. It was looked at from the farmers perspective and from what the farmer could do on his/her farm. Now they look at it from a habitat for birds or species approach, at regional level. That means the cooperatives have the responsibility to organise the whole schemes. Regional governments have goals towards the maintenance of species and have money to set up contacts with farmers via cooperatives. In the past, we had to manage 13,000 individual contracts between farmers and the government, while now there are only 40 contracts between cooperatives and governments. The habitat approach at regional level is also more efficient and the farmers feel more responsible. 100% of the budget is paid out to farmers from regional authorities. Farmers have also gained in professionalism and developed a knowledge network. Monitoring is done by cooperatives in collaboration with NGOs.



We have achieved happy farmers, with a much more flexible system as the cooperatives engage on behalf of a group of farmers for 6 years, so that responsibilities are shared among several farmers who can engage for a shorter term. In addition to landscape, biodiversity and nature, the association is looking to a nature inclusive agriculture and a system change including climate solutions, environmental issues like nitrogen, water quality and quantity. The association proposes goals to farmers instead of “measures”. The goals are area-specific and set at farm level so that the farmer knows what he/she has to do to reach the goals and he/she can be an entrepreneur. The association is asking for multiple forms of rewards for farmers, not only to reach yields, but also ecosystems services. The future of agriculture is to combine functions of production of food with functions of production of nature. Cooperation between farmers is very important to make sure we can reach a beautiful future for farmers.

[More information in the slideshow](#)

Healthy soils and biodiversity: what ruminants can do that cropping systems cannot?

Donal Sheehan, farmer - the Bride Project - @bride_project - www.thebrideproject.ie/

Donal Sheehan is a dairy farmer from Castlelyons in East Cork, Ireland. He milks 72 cows on “Blossom Farm” and is also one of the people involved in the BRIDE (Biodiversity Regeneration In a Dairying Environment) Operational Group European EIP Agri. His involvement in the project came about as a result of the need to halt the decline in biodiversity in intensive farmland and to raise awareness among local farmers of its importance. He is also involved in the DANU project.



He explains why biodiversity is in decline for 50 years, in relation to productivity objectives at lowest cost, excessive sprays, fertilisers, stock, machinery, a land seen as the new quota, maximising it to make an income. Also, no financial value is put on the non-productive part of the farm and extensive farming is still seen by some as “not real farming”. In addition, the industry needs to take more responsibility for the decline in biodiversity – farmers have been publicly blamed.

The BRIDE project encourages farmers to retain at least 10% of their farm for nature and to improve the other 90% of agricultural land. Every farm is mapped for the percentage of habitats on each farm. 15 measures can be chosen by farmers to improve biodiversity. In return, they are financially compensated in a moderate way. He shows the different measures and variety of habitats/infrastructures that a farmer can choose to apply on his farm. The habitats are scored on the quality and the farmers are paid according to the result. This Results-Based Payment (RBP) delivers a higher payment for higher quality habitats.

The Danu project is also an EIP Agri operational group funded by the EU (2018-2023). It focuses on improving the biodiversity under the ground, the soil organic matter, the soil biology and the carbon sequestration potential on 4 plots. The carbon organic matter is monitored, as well as water filtration, earthworms, compaction and soil biology. In the course of the project, fertiliser application has been reduced significantly and nutrient allocation has been distributed with the aim to feed the soil rather than the plant as well as to achieve a better slurry and soil management. The anthelmintic use on livestock has also been reduced to improve manure quality and multi-species swards have been planted.

Finally, on his own farm, best practices have enabled him to improve biodiversity, soil health, reduce nitrogen and he is very near to eliminating pesticides. As a conclusion, if the soil is healthy, the plants will be healthy, which will produce nutrient dense food. Livestock and nature have evolved side by side but there needs to be a balance back to nature.

[More information in the slideshow](#)

Good practices of industry driving production

Miguel Ángel Higuera, ANPROGAPOR - @anrogapor1 - www.anrogapor.es

Miguel Ángel Higuera Pascual is a DVM from the Universidad Complutense (Madrid), where he also took the II Course on specialisation in swine livestock. He works as Director of the Porcine Livestock Producers National Association (ANPROGAPOR). He is involved in three working groups at COPA-COGECA: Swine Meat, Environment, and Animal Health and Welfare, but also with FESASS (European Federation for animal health and health safety) and UECBV (European Livestock and Meat Trades Union).



He gives the example of the Iberico pork production in the Dehesa forest Region spread over Spain (3 million of ha) and Portugal. It is a human-made natural ecosystem distributed over the provinces of Salamanca, Cáceres, Badajoz, Huelva, Seville, Córdoba and Ciudad Real. It is a Mediterranean forest with acidic soils and scattered trees, especially holm oaks and cork oaks, with scrubland such as rockroses and broom. Wild animals are present in the ecosystem. The domesticated animals like Iberian pig, Retinta cow, Merino sheep are kept in dedicated areas. The Dehesa ecosystem produces holm oaks and cork oak that supports the rearing of Iberian pigs, wood pruning for charcoal, production of corks sheets; pastureland between trees for livestock farming, as well as areas of cereal cultivation for animal feed. The forest is maintained through trees selection. Different breeds of pigs are kept in the area under the umbrella of the Iberico name together with the beef and sheep production. Two decrees support the quality standard in the production of meat. The density of animals in the Dehesa is fundamental. In Spain, 15 pigs per ha is considered as intensive production, while below this is as considered extensive. The density of animals is also determined according to the density of trees on the farm area. There are 5 labels with different quality standards defining minimal age at slaughter, average weight of herd at the start and objective in terms of carcass weight, diets, as well as seasonal production, certified by a certification body every month, under official controls. The economic sustainability is ensured by the production of premium top high quality products. The payment for the Dehesa farmer owner could be 10 times higher than conventional farm pigs. This production illustrates a perfect union between animal production and the environment that is very typical to the region.

[More information in the slideshow](#)

Questions & Answers

Moderated by Frank O'Mara, with:

Humberto Delgado Rosa (HDR) DG Envi - HDR
Vincent Manneville (VM), Idele
Alex Datema (AD), BoerenNatuur - AD
Donal Sheehan (DS), The Bride Project
Miguel Ángel Higuera (MAH), ANPROGAPOR

Humberto, you painted a very large picture of livestock systems in terms of sustainability issues. You outlined a role for extensive livestock systems. Do you see any role for intensive or semi-intensive livestock systems and how do we deal with the lesser provision of food provision? If you have only extensive livestock, you will have very little animal manure to go back to soils and croplands: how do you keep soils healthy without livestock and manure?

HDR The priority for food provision is to be sustainable. How to solve the problem of food availability? We should work on reducing food waste, addressing healthy diets and the epidemics of obesity in Europe. The debate on evolving diets also counts. More sustainable livestock systems like agroecology could help tackle the issue. The more systems are intensive, the more likely they are to be unsustainable. We should keep our ecosystems healthy with the contribution of livestock, as a matter of balance. We have areas with huge stocks of manure and areas where we lack animal farming and manure. A balanced extensive system should have enough animals and a proper management mimicking what wild herds would have done in the past to ensure soils remain healthy, with a right balance between animals, ecosystems and soils.

Vincent, in your annual crop system, was the soil supplemented with manure? Is it an option to improve specialised-cropping systems by the addition of cover crops and green manures or digestates to make the soil as healthy as in the system which includes animals? What metrics would a farm need to monitor to assess the annual budget available to calculate the stocking rates and or tonnes of stored/preserved manure application to use?

VM We consider that the minimum level of organic matter should not be below 2.5% so that the soil preserves its fertility. However, the humic balance of the current system specialised in annual crops has a deficit of 50 tons per year and we can predict that in twenty years' time, this soil will be at a critical threshold of organic matter. Consequently, it is unlikely that the annual crop system alone will be able to compensate this deficit. Effluents from methane digestate is a nitrogenous fertiliser rich in mineral nitrogen. In addition, the carbon in this digestate is refractory, i.e. it consists of lignin that is not accessible to microorganisms. Digestate inputs will stimulate microorganisms to consume labile organic matter in the soil, i.e. reduce the soil OM stock. The simple humic balance method should be rehabilitated in order to control soil OM requirements and animal & plant OM supplies in an operational and pragmatic way. Carbon storage to limit the effects of climate change depends on this soil management

Donal, how many farmers are in the Bride and Danu projects? In relation to your own farm, did you have to reduce the stocking rate or the milk output as a result of measures you introduced to improve the biodiversity? Do Bride and Danu projects quantify the changes in aboveground plant diversity?

DS In the Bride project, we have 42 farmers, including equine and beef farmers. The Danu project has 12 farmers (tillage and grassland farmers). In my own farm, the milk output did not suffer as I kept having the aim of holding production, improving biodiversity and maintaining an income at the same time. It is especially proper grassland management that is a lever for bringing back biodiversity. Most of the measures are dealing with increasing the field margin, hedgerows, small measures having little impact on production and cost, but huge effects on

biodiversity. Bride has conducted surveys on pollinators, birds and on botanics at the beginning of the project that will be repeated in 2023.

Miguel Ángel, what is the average size of the farms in the Dehesa area? Are there intensive (indoor) pig farms operating within the Dehesa? What is the antibiotics use between Dehesa pigs vs conventional in Spain? What are associated risks (ASF, predators)?

MAH The average farm within the Dehesa has around 3,000-5,000 ha to produce 3,000-4,000 animals per year, but there are a lot of small producers, so there is a lot of variability. Dehesa can have intensive farms set up apart. Some steps of production of the animal have to be done on the farm. In intensive production, it is possible to use antibiotics, otherwise very limited in extensive production. There are problems of transfer of diseases between wildlife, especially wild boars and domestic animals in the area (Aujeski disease and tuberculosis), so the control programmes have to include also wild animals.

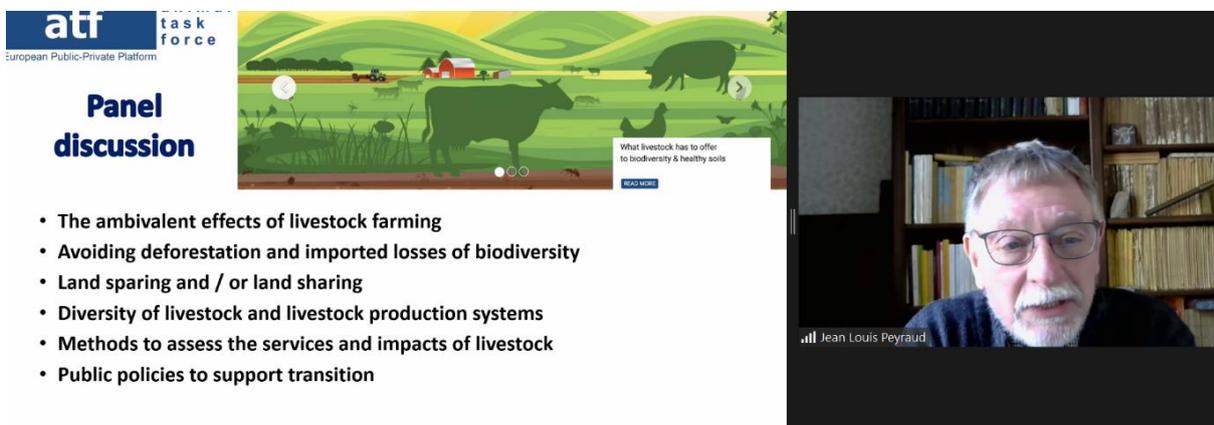
Panel discussion

The panel consisted out of all speakers:

Humberto Delgado Rosa (HDR) DG Envi - HDR
Vincent Manneville (VM), Idele
Alex Datema (AD), Boerennatuur - AD
Donal Sheehan (DS), The Bride Project
Miguel Ángel Higuera (MAH), ANPROGAPOR
and Tiago Domingos (TD), Terraprima.

It was moderated by Jean-Louis Peyraud, INRAE, former ATF President.

Tiago Domingos, M.Sc. in Engineering Physics (IST) and Ph.D. in Environmental Engineering (IST), is an associate professor in Environment and Energy at IST, University of Lisbon, and CEO of Terraprima. His main research areas are Ecological Economics and Modelling. Tiago Domingos introduces a **system that aims to restore lands** after millennia of inadequate management, losses of soil organic matter in areas where soil tillage has destroyed soil fertility, and increasing fire risk. Developed in the 1970s in Portugal, the system was widely implemented through the Terraprima - Portuguese Carbon Fund project, which was considered the best climate solution in Europe in 2013, in the European Commission's "A World You Like with a Climate You Like" contest. Priority was to increase the soil organic matter using legumes, grasses, and well-managed grassland to improve the belowground productivity, as well as biodiversity, making the most of a **sympiosis between trees and pasture** in silvopastoral conditions. The system allowed a very fast increase in soil organic matter and hence in carbon sequestration.



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Panel discussion

- The ambivalent effects of livestock farming
- Avoiding deforestation and imported losses of biodiversity
- Land sparing and / or land sharing
- Diversity of livestock and livestock production systems
- Methods to assess the services and impacts of livestock
- Public policies to support transition

What livestock has to offer to biodiversity & healthy soils
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Jean-Louis Peyraud

We know effects of livestock farming on biodiversity and soil health is ambivalent. How can livestock avoid deforestation and imported losses of biodiversity?

- HDR Policy makers are addressing deforestation related to imports in the Green Deal and the Farm to Fork strategy. Conceiving livestock farming in more agroecological farming will give one of the most optimal solutions.
- TD Increasing the supply of European protein for livestock production, in particular legumes, is necessary. We also need more production and human consumption of grain legumes. They are not as efficient as forage legumes in fixing Nitrogen, but essential in avoiding deforestation.
- AD The society is asking biodiversity from farmers, we have no choice but to manage it.
- MAH All the sector has to limit imports of soy linked to deforestation. We are also importing Nitrogen both for feed and fertilisers to feed not only animals but also crops. How can we use manure and slurry for farmers to feed the fields? How to increase protein production in Europe? In the future, authorising the processing of animal by-products for animal feed can be an opportunity to reduce the dependency on imported soy.
- DS As a farmer, 5 years ago, I've had a carbon audit. It took into account costs and carbon wastes to produce milk on the farm. Surprisingly, we were quite low to produce a kilo of milk. But it was not taking into account feed imported. Part of the problem is if I want to purchase grain or feed for livestock, I have to compete with other countries. My neighbour is a cereal farmer but I can't buy from him as his crops are more expensive than imported feed.

We may reconcile production and biodiversity at plot or farm level, following the "land sharing" strategy, or we may intensify production on some fractions of the landscape, to keep the rest as nature, which is the "land sparing strategy". Is it still possible to achieve production objectives while maximising services provided by farming? At what scale?

- HDR In the Biodiversity strategy and the Farm to Fork strategy, this is not an issue of either or, there is room for both approaches. On land sparing, we do aim to have 30% of the European land protected by 2030, which does not mean no agricultural activity. Within those 30%, we do aim to have a third of that really protected, undisturbed. In grassland, we do need human led interference to ensure natural processes. In the Biodiversity strategy, we aim to bring back 10% of landscape features into agricultural land as they were lost extensively and they may offer increased biodiversity and productivity through ecosystem services like pollination... There are parts of areas that may benefit with bringing in wild animals where human led livestock is not present to introduce elements that can improve production and services around landscape, nature, biodiversity, soil...
- AD There is room in the EU for both approaches and we need both. It depends on the landscape and how the country is organised. In the Netherlands where we have a very productive agriculture, there are 17 M people living on a very small area. So in my opinion this is not possible to choose for land sparing, as my neighbours also want a beautiful landscape, we still need to have a very high production level because we have high costs. That can be completely different in Poland where there are much larger landscape and there is still room for nature to develop besides in land sparing. It depends on the area and what society asks from us. Modern technologies will make it easier to choose for land sharing in the future, using robots and drones to control our plots. In ten years, maybe we can have this discussion at a pasture scale.
- DS I agree we need both, more than ever. If you have an industrialised agricultural country, you have limited landscape value, while if you have several habitats with woodland, hedgerows, it is much more attractive and more acceptable to keep people leaving in the landscape and that will lead to a better rural communities and people who are proud of their farmers. Farmers make a huge contribution to rural communities, they need to be recognised for that, rewarded

and paid for ecosystem services. They are doing much more than providing food, they can also provide very positive (or negative) effects on the environment.

- TD On the global scale, there are situations where we need land sparing, and deforestation is one of the reasons. If we increase the amount of food we are producing in Europe, we will reduce the need for import of proteins, and hence deforestation. At a more local scale, there is a lot where we can work on due to the heterogeneity of the landscape. We can have situations with very intensive agriculture that allows field margins and heterogeneity, and a macro-management of the landscape and biodiversity promoting actions. Technology is critical. With big data, remote sensing, metagenomics, increased massive understanding of the ecology of agricultural systems, we can think of ecological intensification and manage precisely the ecology of the system like the microbiology of the soil, the biodiversity... this can be done even in land sparing systems. Finally, it puzzles me why the EU aims to have 25% of land area for organic farming. Although organic farming works well with consumers, the concept does not have at its basis a scientific definition. There's a lot of good ways of doing land sharing, but many of them are not compatible with organic farming (like precision application of herbicide or N). I really cannot understand this policy aim of the EU of setting a land sharing goal in Europe with organic farming, with its lower productivity, especially as we need land sparing on a global scale, so Europe has to produce enough so that it does not import deforestation.
- MAH I agree we have to integrate the countryside, the farmers, the society. In Spain, we face a problem of depopulation in rural areas. If we increase too much the technology in rural areas, this will reduce people employment in those areas, while we need to take care of rural areas and landscape to avoid fires, increase of pathogens, etc.
- HDR Organic farming is one target of the Biodiversity and the Farm to Fork strategy. Organic farming is the best regulated agroecological practice, it is proven scientifically that organic farming delivers better for nature. For EU citizens, organic farming looks like more natural food. It's an over statement to say that organic farming does not allow for land sharing. I very much agree on the pathway of ecological intensification that can tap from technology: robots, drones, satellites can all help us towards a more sustainable agriculture, including from an agroecological perspective. And precision farming can evolve to deliver nature-based solutions (a drone bringing the right parasite to deal with a pest or a robot mechanically removing weeds instead of herbicides...). I see no incompatibility whatsoever between organic farming and these goals of a more agroecological agriculture, including from land sharing.
- TD If we are capable of developing an agroecological system which is science based, which organic farming is not (it is a philosophical concept), would that fit into the policy aims of the European Commission?
- HDR The Biodiversity Strategy aims to foster the development of agroecological practices, agroforestry, sylvopastoralism, in general, of which organic farming is a specific case. I would doubt that we can say that organic farming is not science based. Within agroecology, a special slice is organic farming, all the rest, the wider transition to more agroecological approach is everywhere, putting the curser closer to nature delivery and getting far away from chemical inputs and their drawbacks.

There are good examples showing ruminants and even pigs can manage biodiversity on large landscapes, on low producing systems compared to what we consume at European level even with a dietary transition. How can we manage a variety of intensive and extensive systems providing as a whole sustainability to a territory?

- MAH Applicable innovations are a way to combine various systems approaches. The efficiency of the Dehesa system is very poor. Organic systems can improve their efficiency by looking at feed conversion rates to avoid feed waste. We need standards that can ensure products quality.

AD This is a hard discussion, not used to focus on that area. From my own farm, now we have largely decreased our use of fertilisers, thanks to regulations on the use of fertilisers and our own manure. We need to set goals for farmers to work on it. If you want to have low impacts on the environment, on the one hand it sounds great to have very high industrial agriculture because you have a very low impact per kg produced, but the waste per ha may be much higher. It depends very much on what you are looking at, on what kind of agriculture we need in the future, how much food we need to produce. We can learn a lot from the past, mainly that we are able to make great changes in the way we farm if farmers are given the right tools and goals. A goal of having 25% of organic farming is not the right goal to set for every farmer. If you want to set a right goal, you need to say *“we need a lot of food, in such a way that we do not harm the environment and we produce as much food ourselves”*. Then we have techniques to support farmers and the support of the society.

How to improve methodologies to assess services and impacts of livestock on biodiversity? Currently, LCA considers mainly nutrient flows, overlooking biodiversity and soil fertility, long-term sustainability and flows. Is there a risk that decision based on current LCA data may lead us to counterproductive solutions (e.g. ruminants are not only creating GHG emissions but also maintaining grassland)? How to develop good indicators showing a holistic view of the performance of the systems?

AD In the Netherlands, dairy farmers are developing a biodiversity monitoring with 7 performance indicators, that has the aim of giving an overall view of biodiversity on farm level, including not only what the farmer is doing, but also CO₂, N, the amount of proteins grown on the farm (not imported). This is a way to show the farmer how he is doing. Other firms use it to reward the farmer, like the large bank Rabobank: if they score high on the biodiversity monitor they have to pay a lower interest than other who score bad.

HDR The problem is not LCA vs other methodologies. The problem is in whatever methodology to stick to a certain reductionism. Only taking into account GHG would lead to the ecological non-sense conclusion that you need no ruminants as they emit methane. You need to consider all components of the environment, the most complex of which is biodiversity. In all the strands of methodologies, LCA, environmental footprint, natural capital accounting approaches all need to incorporate biodiversity indicators. There are very good approaches coming in. I would say: *“use the indicators you may, use the methodologies you may, they will not be perfect but should steer towards best practices and approaches”*.

DS The Bride project has designed a farmland biodiversity index based on the amount of land that is in a biodiversity managed area. It has also a quality score based on the assessment of habitats. Both are shared with farms and enterprises.

TD It is much more difficult to measure biodiversity than GHG. With remote sensing, we can expect to have more capability in reasonable and cost-effective ways, combined with adequate decision support systems for farmers. On GHG, Terraprima already has a tool that calculates the farm balance and the life cycle.

What is the role of public policies and markets for achieving more sustainable livestock systems? What rewards can be offered to farmers to change systems? How can we reintroduce livestock in areas where it has disappeared?

HDR The CAP offers the right tools to steer transition towards sustainability. The eco-schemes, together with agro-environmental measures of the rural development, will be a crucial tool to bring in what is missing, like livestock in such a way as to provide not only meat but also landscape, biodiversity, healthy soils as a deliverable from the farmer.

AD Now we want farmers to work on landscape, biodiversity, climate change. We could choose to either offer the farmers a higher milk price, or pay them directly for the maintenance of landscape. I think the second choice is better: we should reward for exactly what we ask to produce. If we want that the farmer produces not more milk but good milk, we should ask for

it, together with biodiversity. The new CAP is making a small step in that way, but it does not have enough money for all farmers to make that kind of choices on their farm.

- MAH Not all the farmers are happy with new CAP. Changes by law have to be made slowly and supported by sufficient money, otherwise farmers will be against. Pig farmers do not have direct payments from the CAP. All direction of production has to be driven by the market. Public policies have to offer the ways to harmonise, avoid misunderstanding, prevent the fraud on high quality products and legislation to be sure everyone is going in the same direction.
- TD The places where we most dramatically need to introduce livestock are places where there is no livestock right now, like in Portugal, in areas occupied by forest that led to very big fires in 2017. This is a necessity, but this is a hard solution when there are no longer rural communities there. We need eco-schemes incorporated into rural development policies supporting local communities.

Closing remarks

By Frank O'Mara, ATF President

We saw today the big challenges around environmental issues that are especially difficult for intensive livestock and specialised cropping systems. We underlined the importance of animal manure for soil health, organic matter and soil carbon content. Livestock systems are very important for the maintenance of well-managed intensive or extensive grasslands. We have seen that you can have highly productive grasslands and pasture that still have a high biodiversity. We discussed land sparing vs sharing approaches and underlined the need of both. We concluded that we need to reward farmers upon results or outcome-based payments, not just for the adoption of different measures. About biodiversity, there is no one size fits all solution, and it is not easy to measure. We should work further on on-farm assessment tools, evaluate systems for all environmental strands, including services and impacts in an integrated way, considering impacts on farmer incomes.

Save the date for the two next ATF events, on the theme: ["Going beyond the feed versus food competition, crops and livestock together to address food and nutrition security"](#):

- One-day symposium, in cooperation with the EAAP Livestock Farming Systems Study Commission, during the EAAP meeting in Davos, August 30th, 2021
- 11th ATF Seminar, Brussels, November 19th 2021.