



11th Seminar of the Animal Task Force
18th November 2021 - 9:00 - 13:00
University Foundation, Brussels
& Webinar

Seminar report

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PROGRAMME

9:00 Opening

By Frank O'Mara, Teagasc, ATF President

9:05 Summary of the outcomes of the ATF-EAAP LFS one-day symposium

By Tommy Boland, University College Dublin, EAAP Commission Livestock Farming Systems

9:15 Public policies: vision from a policy maker

By Wolfgang Burtcher, European Commission, DG Agri

9:30 How can EU livestock avoid soya feed? Vision from an NGO

By Alain Peeters, WWF-Belgium

Developing the use of by-products

9:45 Vision from feeding industry on the potentials from by-products in the EU in animal feed

By Anton Van Den Brink, FEFAC & EFFPA

10:10 Farmers increasing forage in the diet instead of concentrates: example of grass-fed products in areas of intensive use of concentrates

By Angus Nelles, farmer in the UK

10:25 Use of inedible feed in the pork industry, feed efficiency: sustainability metrics, calculating tools, including C footprint

By Sandrine Espagnol, IFIP

Towards mixed crop production

11:00 Dual purpose crop production across a diversity of livestock systems in the EU

By Patrick Carré, Terres Inovia

11:15 Governance: examples of crop farmers & livestock farmers collaboration

By Tom Barry, Biogold Agri Ltd. & Signpost Programme

11:30 Panel discussion

Moderated by Frank O'Mara, ATF President

With the audience, speakers & Marc Cornelissen, Plants for the Future ETP

12:30 Closing

Background

One of the controversial aspects of livestock production is the resource competition for feed and food production that requires a disruptive shift in resourcing animal feeding and in European agriculture. Only 20-25% of annually produced terrestrial agricultural biomass (crops and grasslands) is edible as human food. Thus, animals are very useful to convert the remaining 75% into edible food and manure that is a source of nutrients and carbon for plants and soils. This is basically a virtuous circle. However, in response to increased market demand and economic pressure, some agricultural systems and territories have become **increasingly specialized**. At the same time, productivity in the agricultural sector has largely increased and mixed farming systems **integrating crop and livestock production** have strongly declined in some countries or regions. Modern agriculture has developed with livestock and crop production becoming more intensive, and at some places more specialised and spatially separated which has resulted in an **imbalance in nutrient flows with negative impact on the environment**. To achieve the conditions required to deliver more sustainable farming systems, it is essential to **develop science-based management strategies that reduce the current reliance on non-renewable resources** and securing the production in an increasingly unpredictable climate. Such solutions focus on **sustainable land use and the interconnection of arable and livestock systems as part of a circular and sustainable bio-economy at different scales**.

Format and aim of the 11th ATF Seminar

This seminar is a follow up of the one-day symposium of the Animal Task Force & the EAAP Livestock Farming Systems commission, Monday 30th August 2021, EAAP Annual Meeting 2021 – Davos, Switzerland. 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.**

Welcome and Introduction

The ATF President Frank O'Mara opened the 11th ATF seminar. Over 330 participants from industry, research, policy making, civil society and farmers' organisations were counted in the room and remotely.

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.

More information:

www.animaltaskforce.eu

[@AnimalTaskFrc](https://twitter.com/AnimalTaskFrc)

[ATF YouTube channel](#)

All presentations and videos are available on the [ATF website](#).

Summary of the outcomes of the ATF-EAAP Livestock Farming Systems Symposium, August 30th, 2021

By Tommy Boland, University College Dublin & EAAP Commission on Livestock Farming Systems - [@PallasTb](#) - www.ucd.ie



Tommy Boland is from a mixed farming background in the South-East of Ireland and is currently Prof. of Ruminant Nutrition and Sheep Production in University College Dublin, Ireland. He holds the role of Associate Dean of Research, Innovation and Impact, Vice-President of the Agricultural Science Association and Secretary of the Livestock Farming Systems Commission of the EAAP.

On the behalf of Michael Lee, President of the EAAP Commission Livestock Farming systems, Tommy Boland introduces the outcomes of the symposium delivered in the EAAP annual meeting, introduced by the President of EAAP, Isabel Casasús. The food vs feed competition requires a shift in resourcing of animal feeding and towards a sustainable agriculture. Only 25% of annually produced terrestrial biomass is edible as human food, therefore animals are very useful to convert non-edible food into valuable food and manure is a source of nutrients for plants and carbon for soils. Since the 1960s, in response to market demands and economic pressures, some agricultural systems have become increasingly intensive and in many cases more specialised and spatially separated, resulting in an imbalance in nutrient flows and higher impacts on the environment. At the same time, productivity of the agricultural sector has largely increased and mixed systems integrating crop and livestock systems have declined in the European Union. To deliver more sustainable systems, it is essential to develop science-based production systems implementing circular bioeconomy principles at various scales, reducing the pressure on the environment and climate, while securing production under an increasingly unpredictable climate.

In the morning session, Jean-Louis Peyraud and Amrit Nanda presented the outcomes from the ATF & Plants for the Future ETP's workshops held in 2018-2020. Six recommendations for research and innovation were developed ([position paper](#) & [policy brief](#)) with a view to improve the contribution of livestock to sustainable food systems. Then the speakers Michael Lee, Max Schulman, Tomás Tubritt, Olaf Sass and Ruud Tijssens presented findings and challenges around the development of more nutritious plants and of the European protein industry for feed in crop rotation, in relation to farmers revenue. The optimisation of grazed pastures was also discussed, along with its contribution to soil health. Cross fertilisation between farmers, the feeding, plant and animal breeding sectors towards the integration of cropping and livestock systems has been highlighted as a pathway towards addressing the multiple challenges faced by livestock in the EU. The mobilisation of food waste has been mentioned as a major potential for animal feed, together with mixed systems integrating intercropping and two or more livestock species. The panel discussion underlined the broad diversity of livestock systems in Europe that offer a large array of solutions across livestock species and the need to take advantage of farmers peer learning.

In the afternoon session, Ruud Tijssens highlighted the value of animals in valorising inedible feed from marginal lands and the need to invest in the development of new sources of proteins for feed. Jean-Louis Peyraud and Anne Mottet highlighted the capacity of animals to valorise non-edible biomass and suggested new methodologies to include the proportion of inedible feed in the diet and land not suitable for human food into feed efficiency calculations. Donagh Hennessy evaluated four different livestock systems from the perspective of a land use efficiency of food systems. Phyllis Wanjugu Ndung'u and Shirley Tarawali extended the discussion to smaller livestock systems. The discussion went on suggestions for R&I, around circularity, valuation of biodiversity, economic performance, value chains. Better understanding the nutrient value of crops is essential. Cropping systems should be more integrated to livestock systems to better support the agroecological services that societies require. Finally, it is essential to support LCA refinement to develop robust metrics to better inform consumers and food labelling about the multiple roles and externalities of products.

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Public policies: vision from a policy maker

By Wolfgang Burtscher, European Commission - DG Agri - @EU Commission - @EUAagri
https://ec.europa.eu/info/departments/agriculture-and-rural-development_en



Wolfgang Burtscher has been Director-General of DG Agriculture and Rural Development since April 2020. From 2009 to 2020, he was Deputy Director-General in the Directorate-General for Research and Innovation of the European Commission and in that function he was responsible for wide range of research and innovation policy development and implementation issues including research and innovation in the fields of agriculture, food and health.

The topic of today is very important for the CAP. Livestock has many positive externalities. Do we really have a comprehensive holistic overview of what livestock farming produces in terms of external benefits? And are we promoting sufficiently those roles? We are at a point in the implementation of the CAP reform where all agricultural productions must make huge efforts. The meeting of today is very timely and I hope it will be able to influence national strategic plans and favour and promote mixed crop livestock farming systems' contribution to more sustainable farming. Livestock is at the heart of many challenges: methane emissions, deforestation, human health, changing of diets, animal welfare, nitrate soil. Do we have sovereignty in the EU, looking at dependence from the inputs, fertilisers, deforestation due to soya production... Replacing imports of soya by locally produced protein is challenging due to competition with imported soya and available arable land. Yesterday (17.11.2021), the European Commission has adopted a plan towards a decrease of deforestation. The EU protein plan is also a policy driver. The Farm to Fork strategy has given a new impetus to reduce climate impacts and support the on-going transition towards more sustainable livestock farming and reducing the dependency on critical feed material such as soya grown on deforested land. The aim is to foster EU grown plant proteins, the use of alternative feed materials, facilitate a better use of European feed resources, the use of feed additives. In the future CAP, we will also try to provide the relevant incentives, tools and instruments. We will finance sectorial interventions through operational programmes that member states may implement in the plant protein sector, ecoschemes and interventions that reward the integration of legumes in rotation with a mixture of crops and grass. This strongly depends on member states to make use of these opportunities. The European Commission has also worked on developing a plant observatory.

Shall we go towards some more regional integration of mixed crop livestock systems? A more balanced distribution of livestock may help to avoid overconcentration of environmental problems. However, it cannot be achieved through administrative processes only. There must be market drivers that support such a process. We really appreciate that ATF has taken up this issue of decreasing specialisation of crop and livestock production, which has led to a shortening of crop rotation. We feel that specialisation should be mitigated and a long-term strategy for livestock sustainability from an agroecological perspective should focus reconnecting livestock and crop production at farm and regional levels, allowing livestock to play its role in circular agrifood systems, closing nutrient cycles by favouring organic fertilisers to replace synthetic fertilisers and by exploring the ability of animals to recycle into the food chain not edible biomass. The recoupling of animals and plants is interesting in the context of the development of organic farming where livestock provides organic matter. The Organic Action plan will support farmers biodistricts fostering the sustainable management of local resources based on organic principles, in a way that remunerates farmers better.

The optimised recovery of effluents, diversification of rotations have expected benefits on soil fertility, biodiversity, reduced use of pesticides. The development of technical services (genotyping) may enable to reach a higher level of self-sufficiency in soya production. The role of livestock as a recycler can also be valorised in a circular sustainable bioeconomy, using low-cost feed, grass, co-products, food processing by-products, food waste, could provide a significant non negligible part of EU protein needs. I would be interested to hear from you what possibilities you see in this context.

The CAP policy will play a key role towards a sustainable livestock farming. We need a case-by-case approach, instead of a one size fits all solution. Measures tailor made at regional or even local level and a combination of tools, among which ecoschemes, capital supports, rural development interventions, etc... Measures aiming at reconnecting livestock and crop production at regional level, crop rotations, temporary grassland for feeding systems, investment in agroforestry systems including animals, valorising manure as fertiliser, setting up farm anaerobic digesters producing renewable energy from agriculture residues. We need huge research and innovation if we want effective crop livestock systems, complementarily to on-going Horizon 2020, EIP Agri and Era-Net projects.

Last week, the EC has published a communication on contingency planning to make sure the issue of food safety and food security remains a priority.

How can EU livestock avoid soya feed? Vision from an NGO

By Alain Peeters, WWF-Belgium - [@WWF Belgique](https://www.facebook.com/WWFBelgique) - <https://wwf.be/fr/a-propos-wwf-belgique/conseil-administration>



Alain Peeters is an agroecologist with 40 years of experience in agricultural and environmental research and environmental protection and management. He was professor for agronomy for 20 years, a pioneer of organic farming in Belgium and Europe, one of the founders of Agroecology Europe and its Secretary General. In the last 10 years, he developed agroecological systems in commercial farms and is now working with groups of farmers for supporting them in their transition.

Alain Peeters shows the increase of monogastric production is highly correlated to soybean imports. This began in the 1960s, and led to a large conversion of permanent grasslands into annual crops including maize, increase of pesticide use and contributed to deforestation in South America, along with emissions of huge amounts of CO₂ in the atmosphere and mineralisation of soil organic matter in these regions, by destruction of those habitats. This induced the replacement of animal feed by human food in livestock diet. Historically, farmers would never have used food for feeding livestock even monogastrics, using a food-waste common-sense principle. In an ideal world, ruminants should be fed on grass only, and monogastrics should eat grass and food waste as a complement. Maize production replacing grasslands, soy became necessary. A CIVAM study says that grassland-based systems (compared to high-input systems based on maize, soybean, fertilisers, pesticides), with less land, fewer animals and less investment, generate more income, create more jobs, protect the environment better, are more resilient to economic stresses. Grass is also an “all-inclusive feed”, while maize is unbalanced to feed ruminants. Agroecology Europe has published a synthesis paper comparing conventional and agroecological systems in livestock farming. The latter perform better in economic terms. It also generates better quality products. Complement to grass feeding can be produced on farm/region, knowing that lucerne is for example more productive than soybean in terms of protein. This can also contribute to reduce GHG emissions and increase C sequestration in grassland soils.

We should improve the balance between beef and pork meat, as ruminants are needed for developing sustainable agriculture, as they are not only methane emitters, but in a context where the price of N fertilisers will increase hugely in relation to the price of fossil energy, we need nitrogen fixing legumes like perennial forage legumes, using ruminant manure as a fertiliser. There is a virtuous cycle. It has been demonstrated that those principles can feed Europe (IDDRI TYFA study, 2018). Grassland means more biodiversity, more carbon stored in vegetation and sequestered in soil. It recycles also methane as a short-lived greenhouse gas transformed into carbon dioxide, and via photosynthesis into vegetation including grass consumed again by ruminants.

As a conclusion: we should be producing animal products on grass not on food, feeding livestock with human food should be stopped. Ruminants should be fed mainly grass. Monogastrics should be fed partly with grass and partly with human food waste. In order to develop sustainable agroecological

systems, the proportion of ruminants to monogastric animals should be increased. Finally, we should eat less but better quality meat, produced mainly on grass.

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Developing the use of by-products

Vision from feeding industry: Food-feed competition concepts to demonstrate nutrient efficiency in feed production

By Anton Van Den Brink, FEFAC & EFFPA - [@FEFAC EU](#) - [@EFFPA EU](#)

<https://fefac.eu/> - www.effpa.eu



Anton van den Brink works for the European Compound Feed & Premixes Association (FEFAC) since 2013 as Senior Policy & Communication Manager. He is actively engaged on sustainability-related topics connected to European compound feed manufacturing, such as responsible soy sourcing, environmental footprinting, circular economy, nutrient efficiency and food waste (see “Feed Sustainability Charter 2030”, September 2020, facilitating commitments to action at national level). In 2021 he co-lead the project of upgrading the FEFAC Soy Sourcing Guidelines. Anton is also Executive Director of EFFPA, the European Former Foodstuff Processors Association.

Livestock sourcing in feed in the EU+UK (825 mt. in 2020, including 549.4 mt forage, 164.9 industrial compound feed, 110.9 feed materials used on farm). FAO study 2017 on human inedible feed sets the record of 86% of livestock feed is inedible by humans. The Ambition 2 of the FEFAC Feed Sustainability Charter, 2030 “Foster sustainable food systems through increased resource and nutrient efficiency”, aims to reduce nutrient losses by 50% in a context of circular economy, preservation of soil fertility, use of co-products. Based on this ambition, FEFAC tries to assess the share of human inedible feed at EU level as “non-food grade feed ingredients” to focus on quality aspect of feed ingredients. It is also working on defining the “circular feed” concept, which raise methodological challenges. Elaborating on the circular feed would allow to directly qualify the origin of a feed ingredient, step away from a binary approach, and possibly give the most science-based approach to nutrient efficiency, with possibly a connection to environmental footprinting. The “feed-food competition” concept drives discussions about the potential of using feedstuffs currently not allowed in feed for food-producing animals. This would allow to make an inventory of potential future bio-resources and identify legal and non-legal hurdles while respecting feed safety. Looking at potential for further optimizing nutrient cycles through animal nutrition, FEFAC suggests to look into indirect solutions as well like ‘intermediate organisms’ (insects, algae, micro-organisms) to upcycle bio-resources currently not allowed in feed for food-producing animals, and the end of the “waste” criteria in feed ingredient sourcing to consider recycling. Those show that market acceptance are key elements in these discussions (e.g. former foodstuffs).

Finally, we see growing competition in the bio-economy for ‘residual flows’ between feed/bioenergy/bio-based materials production.

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Farmers increasing forage in the diet instead of concentrates: example of grassfed products in areas of intensive use of concentrates

By Angus Nelles, farmer in the UK - www.thistleyhaugh.co.uk



Angus Nelles and his brother Duncan hold the Thistleyhaugh family farm situated in Northumberland and covers 560 ha running along the river Coquet, UK. The farm has been in the family for over 100 years. It converted to organic in 2005. The enterprises include: 2000 Lleyn ewes, 250 suckler cow herd, 1,700 organic outdoor pigs, 1,000 bird Christmas poultry enterprise with small abattoir on site, a farm Bed & Breakfast and holiday cottage business.

Financial was one main driver in moving to an all forage-based system. Also, they realised they were only using 50% of the grass they were growing. This implied to make the best use of land. They needed to know about grassland management, as the skills had been lost many years ago, about dry matter requirements of different stock classes, the feed budgeting, functional genetics... they learned by trial and error, a lot through peer learning. Today, the farm grows mixed species including legumes as key drivers in performance. Marginal land is being used for the maintenance of dry breeding stock. The presence of ruminants enhances biodiversity, rotational grazing plays a big role. The summer period is critical to prepare for winter that dictates the stoking density on the farm, using stockpiled grass. This is even more important without having grain as a buffer. This takes time and learning. They have 15 years working relationship with an organic arable farm. The livestock farm manages the clover leys in rotation with other crops that allows nitrogen fixation, which bring crop farmers an income stream. It allows the livestock farm to upscale without costly land investment. Including sheep help insect biodiversity and soil health. They have parasite free pastures due to clean grazing and very high-performance levels. The collaboration is a win-win for both sides. It takes trust and skill sets. Benchmarking for the last 15 years has shown us the farm is consistently in the top 25% of producers when it comes to whole farm margins. The profitability of our business is not affected by purchased feed, fertiliser costs or chemical costs. The profitability of our business is affected by management decisions, so learning is so important. Most of the time there is nobody else to blame if it does go wrong. We go by the motto "You never fail, you only learn". Data and genetics play a big role. Collecting data helps us to ensure we are using the right genetics for a forage-based system. This means maternal genetics.

What is stopping this model from becoming mainstream? Who is promoting the system? Not the supply industries, as there is nothing to supply (sell). Grassland management is a skill that has been lost, feeding with grain is a much easier pathway. Agricultural educational establishments still do not recognise it as a mainstream system for beef and lamb production in the UK. This model has to be driven by farmers who might see it as a viable option.

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Use of inedible feed in the pork industry, feed efficiency: sustainability metrics, calculating tools, including C footprint

By Sandrine Espagnol, IFIP - @IFIP_inst_porc - <https://ifip.asso.fr/fr>



Sandrine Espagnol is a senior environmental engineer in charge of the environmental assessment of pig husbandry systems at IFIP-Institut du Porc. She deals with modelling the environmental fluxes, assessing by LCA current and innovative livestock systems, focusing of different feeding strategies, manure management, and dealing with several scales from the pig unit to the territory. She leads a national French network involved in the environmental assessment of livestock farming.

The challenge is to be able to feed everyone and have sustainable pig farms. We need sustainability metrics to steer pig farms, with a holistic view to avoid transfers of pollution and trade-offs. The issue is to produce food with less environmental impacts. The most common indicator is to measure efficiency (ratio between means and result), at animal level, like nitrogen excretion vs feed intake. At LCA level, efficiency measurements enable to compare technical performances of different systems in terms of impacts (climate change, eutrophication, acidification, land occupation, energy consumption).

Impacts of traditional and organic production are higher, due to lower technical performances, use of straw in buildings, access to outdoor using space and generating nitrates leaching. Focusing on land occupation, since 20 years, a large part of land has been saved in France. This space could be used for other production. GIS Elevage Demain has produced a new indicator called “net protein efficiency” comparing protein content in animal products vs protein content in plants and considering edible and non-edible parts in plants and pigs. Applied for different pig systems, it shows that conventional systems are more efficient using this metrics.

What do we have to do to optimise the systems using those metrics? At animal level, to continue reducing nitrogen in feed to reduce nitrogen excretion. At LCA level, we need to add an objective to reduce gaseous emissions due to manure management in pig units and reduce impacts of the feed produced. At a territory level, we have to increase recycled nitrogen from pig unit manure to feed, and increase the use of co-products and reduce the use of mineral fertilisers in the system. We also need to reduce the edible part of feed and increase the edible part of animals. GEEP (*Gestion Environnementale des Elevages Porcins*) is a tool available for farmers using part of those indicators to assess and monitor their environmental performances and compare it to other farmers. Around 600 farmers are using it, with the support of 110 trained advisors.

Efficiency is a quite central concept to environmental assessment of pig production, where intensification is often associated with higher efficiency. In this production, optimisation of the systems will need to combine environmental footprint and diversified stakes to consider: animal welfare, quality of life, profitability... in a changing context: adaptation to climate change, new farmers, new consumers and search for compromise with multicriteria optimisation. There is place and relevance for a diversity of livestock systems, some based on industrial ecology, others on agroecology. Choice should be made at macroscopic level of territorial agricultural systems linked to food systems.

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Towards mixed crop production

Dual purpose crop production across a diversity of livestock systems in the EU

By Patrick Carré, Terres Inovia - [@terresinovia](#) - [www.terresinovia.fr](#)



Since 2001, Patrick Carré has been involved in the processing of rapeseed (reduction of energy consumption, quality of meals), sunflower (dehulling) and soybean (inactivation of trypsin inhibitor in decentralized processing units). In 2021, he joined Terres Inovia as a process expert on processes with a main focus on mechanical extraction, pulse processing and the effect of thermal treatments on the digestibility of meals.

Oilseeds (rapeseed, sunflower, soybean) are multipurpose crops resulting in both oils and meals. Oils are partly used to produce biodiesel (41%), the rest is available for food. 100% of the meal is consumed by livestock. Oil has a much higher economic value and profitability, with a few multinational operators holding an oligopolistic market, using sizing of processing units for economies of scale. The extraction of oil results from a mature highly optimised process with high yields. The added value is much higher for rapeseed. The mainstream of rapeseed and sunflower processing is given in the slides. The biggest determinant of profit of an oil-mill is oil yield, the second is processing costs, third is oil quality and meal quality comes last. There are conflicts and technical hurdles in objectives between oil yield and meal quality and between processing costs and meal quality. Patrick Carré illustrates it with rapeseed and sunflower meals. To address the demands from feed actors for local, traceable, non-GMO, no use of solvents some value chain actors have started to decentralise production using mechanical extraction only leading to better protein quality.

The sector uses 10% of arable land today in the EU, which is important for crop rotations. In processing, oil extraction prevails on meal quality in oil-mills. Dehulling and milder thermal treatment could significantly improve meals quality. Some perspectives of progress in meal quality rely on oilseeds breeding (in sunflower: hullability, in rapeseed: protein content) and on the emergence of decentralized oil mill that pay greater attention to protein uses. Competition with food: Protein by products from oilseed require heavy processing to become edible by humans, so the transformation by animals is not a so poor solution regarding the valuation of proteins.

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Governance: crop farmers & livestock farmers collaboration

By Tom Barry, Biogold Agri Ltd. & Signpost Programme - [@TeagascSignpost](https://biogoldagri.ie) - <https://biogoldagri.ie>



Tom Barry is a tillage farmer from Cork, in the south of Ireland. Tom is the managing director of Biogold Agri Limited, a grain drying and storage company, which he founded in 1995. Following his graduation with a BSc (Biochemistry) from University College Cork in 1991, he returned to the family dairy farm which he converted it to a tillage operation. Tom combined his academic knowledge with his farming experience to diversify and establish a sustainable grain drying and storage business, creating employment in his local rural area. He has pioneered the reduction of artificial fertilisers in crop production by substituting organic materials, such as pig and cattle slurries, without crop yield reductions. Tom is a Teagasc signpost farmer.

Having a low C footprint is one of the main objectives. It is being achieved by combining tillage and livestock together, using organic manure sourced locally. Continuous tillage lands have a very high requirement for slurries for organic matter to feed the growing crops and soil fertility. Organic matter in soil is releasing tiny amounts of nitrogen to growing winter barley plant over winter period, which builds a high yielding crop and very healthy crops that require lower levels of protection from fungicides. This provides better physical structure in the soil.

Also, the reduction in carbon footprint by using increased organic material on our tillage farms are impressive and immediate. Correct application of these organic slurries has reduced bagged fertilizer requirement on spring barley by 50% and by 33% on winter crops. Considering that approximately 70% of the carbon footprint of tillage is due to artificial fertilizer use, the increased precise application of organic materials is very beneficial to environment without sacrificing yield potential. If proper mechanisms are put in place to move the excess nutrients from dairy and pig units to the continuous tillage lands, then we can solve the problem of excess animal slurries on livestock farms and reduce the carbon footprint of our tillage production. Tom explains some principles around the application of slurries and various considerations around crop rotation, which are not easy practices to implement.

Challenges ahead around research and innovation reside in the evaluation of soil types (slurry nutrient retention, carbon build-up in soil, carbon footprint for each farm). In Ireland, increase in tillage lands is required, as the tillage industry has declined by 42% since 1980 and 15% in the past decade. This requires also EU supports for tillage farming (slurry storage on tillage farms, coupled financial supports for tillage farmers embracing efficient slurry use with accompanying reduction in artificial fertilisers).

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Panel discussion

With the audience, the speakers, moderated by Frank O'Mara, ATF President and Marc Cornelissen, Plants for the Future ETP - [@Plant ETP](#) - www.plantetp.org



Marc Cornelissen has a 37-year track record in crop research and development working for Plant Genetic Systems, AgrEvo, Aventis, Bayer and at present BASF. Since 2018, he is focused on the migration towards crop innovation enabling sustainable farming. The Plant ETP represents the plant sector from fundamental research to crop production and distribution and aims to bring forward an integrated vision and action plan on education, research and innovation.

Summary of discussions:

In LCA, when looking into energy of proteins, should we look at the balance and storing of energy in the system in pig production?

Sandrine Espagnol: "LCA is not the only answer to measure environmental impacts. It is part of an assessment. With LCA you don't see the recycling part nor the territory level, so it must be completed with energy and protein consumption for example. Still, it considers the efficiency of the system, which is key."

Isn't it the time to look at assessment methodologies for evaluating our practices in EU, looking at our ecological footprint?

Wolfgang Burtscher: "The LCA enables to measure some aspects of sustainability. But there is also a certain level of social acceptance and perceptions of our practices. Sandrine Espagnol has shown in organic farming, in a LCA logic, animal welfare is not safeguarded. What is more important: animal welfare or environmental footprint? As policy makers, we really need metrics to quantify the impacts of policies on biodiversity? The core of the CAP will be to support the delivering of public goods, it will really need to be supported by facts and figures."

What about cultured meat?

Wolfgang Burtscher: "You cannot ban research, including on cultured meat. We need more sustainable food systems, if we only look at the ecological footprint, maybe cultured meat is a good opportunity, but if we also look at landscape, biodiversity, if we want to keep our model of society... It raises the question of societal demand for those products as well as human health impacts. There is a lot of processing in new foods. The healthiness of foods is increasingly scrutinised about our primary products. I would also expect that new categories of food meet high requirements for human health. Is there a societal demand for this kind of food?"

Alain Peeters: "The tragedy of the Western culture is reductionism of analytical approaches. Reductionism in science has been very efficient in the 18th - 19th centuries for understanding simple processes. Today we are not able to understand complex systems that need holistic approaches. Our way of thinking in medicine, agronomy, in all domains, shows the weakness of reductionism. We should stop thinking to cows as only methane emitters. A cow is much more, cultured meat is typically an example of a reductionist approach."

Would you consider using by-products from human food in your production system?

Angus Nelless: "Probably yes, not for ruminants, but for monogastrics".

What are your views on megafarms in pig and dairy production?

Sandrine Espagnol: "Megafarms could be good for environment, but I agree there is no acceptance for them. It's part of our challenges for the future. Megafarms could be efficient, provide money for farmers to invest in very good technologies to reduce emissions to the environment if it's connected to an area able to valorise the quantity of slurry, meaning we have a territorial management. But I

think it will be more and more complicated to have such farms, because of animal welfare too, the size of pig units expected to be lower.”

Did you look at going from smaller to bigger farms in terms of environmental footprint? What about distributing animal manure?

Sandrine Espagnol: “Yes, in terms of environment, we have a good perspective, with the LCA approach because we measure efficiency and because we have higher efficiency in bigger systems. We must adapt the size of the farm to the territory to make proper use of animal manure, this needs a territorial management that is missing today.”

Anton van den Brink: “The size-based approach is a problem, we should avoid considering that large size farms are de facto bad and extensive systems de facto good (see figures on the footprint of conventional vs organic systems, etc...). We should take a science-based approach to it. Different models coexist. As a feed industry, we will adapt to it. We see a trend to move towards using feed from the farm itself.”

Marc Cornelissen: “We may also rethink the business scope of megafarms where the end goal is to arrive at a sound overall economics below. If a megafarm would integrate smartly backwards and forwards and incorporate multiple businesses operations, you would not have the immediate requirement of being profitable at each stage of the process. One would measure at the end point. Take for example Tesla: it has basically integrated all processes from start to end, up to selling the car to the customer. They manage their business processes with agility and end up with advanced products and overall profitability. With respect to megafarm, I would expect that the economically viability grows by extending the business scope”.

Wolfgang Burtscher: “Efficiency of megafarms depends also on input and outputs: when a megafarm imports feed from overseas, and the food exported, this is a megafarm, but do you consider it to be efficient?”

Public: “The efficiency based on energy lays boundaries. We consider the farm to influence the environment, but the boundary can be also considering the C sequestration in the soil, for example in dairy farms we have often hedges, sequestering energy into the soil, which is not considered, so I’m advocating for a carbon balance approach at territorial level, not only the LCA that consider only one side.”

Tom Barry: “I would be against have those megafarms as I’m a huge supportive of family farms. There is much more than economy going on on family farms”.

Which number to take to measure the efficiency of monogastrics? In holistic approaches, we see there are numerous indicators that could be incorporated. What is the room to accept a diversity of opinions?

Wolfgang Burtscher: “You are entirely right. We have to develop a framework for sustainable food. We have permanently to choose what is most important: climate, biodiversity, environment, animal welfare, animal health, human health... There are sometimes conflicting objectives.”

Alain Peeters: “This is politics in a nobel sense.”

Anton van den Brink: “I’ve heard the LCA approach being attacked twice. I’m aware that LCA cannot capture everything. FEAC has been very much involved with the PEF (*Product Environmental Footprint*) about feed. It’s really about defining the rules to include 16 impacts including C footprint, water depletion, ecotoxicity, ozon depletion, etc.). It does provide a panel of impacts. It is a bit product based and we have to see how it is applicable in the food chain in view of a sustainable labelling framework and see how it works with the allocation of impacts, but it is still useful.”

Marc Cornelissen: “I think a debate about LCA is very timely. We need to bring in this discussion the value chain perspective. It is about branding, procurement and sounds economics, so that society can buy sustainable food consciously and can afford it. Sustainability is being embraced by everybody, but it must be achievable financially. Of course, there may be CAP supports, and other financial instruments but this does not make production of sustainable food scalable. The key to success is to

keep prices of sustainable food low while assuring that the production chain still has an intrinsically sound economics. The Farm to Fork strategy offers here a proper frame as it aims to reduce the true cost of food production by calling for novel production approaches lower negative impacts on environment and human health. The second success factor is a harmonised and standardized communication, BtoB and B2Consumer. There are 3 types of possible communications around LCA: there are the measurements linked to a specific production situation, then there is the procurement and branding mechanism in the value chain that may already use a first translation of the LCA data, and lastly there is the communication from retailer to the consumer, that may make use of an easy to understand translation of the original LCA data. Food demand will not go down, and acreage will not grow. If we want to scale sustainable food production, every farmer should be able to participate. So a farmer may want access to a local LCA benchmark and be able to show he improves versus the benchmark so that he can participate in a branding and procurement strategy that is recognised by the retailer. Then I hear biodiversity, soil fertility, which is all very relevant. I think we must choose our battles, today, in 5, 10 years. We need to keep LCA-based communication simple, set priorities and take care that the relative LCA matches with what one wants to steer, and that it matches with what the society hears from communication channels for years. A migration to sustainable agriculture is a very complex process, it is an evolutionary path that needs governance.”

What are the regulations and legislative controls about the use of manure and biosolids to prevent pollution?

Tom Barry: “We have a farm nutrient plan supported by Teagasc advisory services. We are only applying slurry when the weather is dry when the sun is shining, when spring crops are vibrant and ready to uptake it, so it’s absorbed into the soil almost immediately, so we don’t have runoffs. It’s quite different from other people applying on grassland and lots of rain coming afterwards and flowing off, that would be completely unacceptable. We follow this very closely. The challenge for us is to get more research on pig slurry to measure the phosphorus entering the soil, can we apply more organic materials, using more cover crops to absorb nutrients again...”

Wolfgang Burtscher: “People are asking for a simplification of the CAP. We have had systems but maybe not targeted enough. New requirements are difficult to control and imply a burden for the farmers. Happily, we have delegated this to the member states because in the new CAP we are not in charge anymore of doing on the spot controls on the farms because this will be done by member states. The public goods requirements are in terms of controls much more demanding than your area aids”.

With the increase of price fertilisers, will you have more difficulties to source organic manure?

Tom Barry: “I was quite worried about this, as we went into our planting season. So I increased our winter beans from 78 acres to 120 acres, as a mitigation factor. My suppliers of organic matter require me, we have built up a good relationship that will continue. But I do feel we need to settle where our nutrients are going before the end of the year. Up to now, we share the cost of the fertilisers. It’s expensive but it’s worth it.”

Is the protein supply for feed going to limit livestock production?

Wolfgang Burtscher: “Let’s see how new legislation will impact feed imports from other parts of the world. There might be an impact on the availability of feed. Everybody seems to agree that our new requirements are that our livestock should use grassland, if you keep the livestock which we have, does this not lead to overgrazing? Does this limit biodiversity? Wherever you look there are contradictions and challenges.”

Marc Cornelissen: “There is a major issue with the ability to harvest sufficient proteins from protein crops. In case the weather is not an issue, then diseases will be. The acreage projections for those crops are not sufficiently high to be attractive for the companies that have the knowhow to do something. The only way the crops can get improved is thanks to transfer of knowhow and concerted public-private activities where one builds on academic findings and feed SMEs that would like to work on those crops. And these things can be organised, it is a kind of predictive breeding workflow between academia and breeding companies that ultimately should address the livestock needs. This is an

opportunity; Europe could do that. From the Plants for the Future perspective, we would very much like to see that happen”.

Anton van den Brink: “We are looking to the current legislative proposal. The idea that we will phase out imports totally is a fallacy, we won’t get completely rid of soya coming from South America. We have an interest to keep supply chains open and support a sustainable protein production in these countries. It is possible to keep a competitive offer on feed prices, depending on the extent to which a feasible connection needs to be present compared to the consignment of soya placed on the EU market, and the traceability towards the farm. The current legislative proposal proposes a full traceability with 100% geolocation. In practice, this would mean segregated supply chains. Then we must exclude risks and complete zones, which would lead to some price increases. As FEFAC, we are preparing sourcing guidelines, a conversion-free soy concept, free of deforestation. We would like to be allowed to use balance trading systems. Also about the soya, don’t forget about the amino acid profile, digestibility when replacing with rapeseed meal”.

Angus Nelless: “Overgrazing is detrimental to production, so it’s not desired as it reduces our performance. So we can educate ourselves about planned grazing systems”.

Public: “In Italy, grazing is something we cannot afford, we are facing climate change (tornado, desertification, hurricanes...) in the Southern part of the country, we have either marginal lands or sea. Climate change is going up and it is very scaring”.

Alain Peeters: “The agroecological approach to this problem is to develop a system that is more resilient, by using many crop species and cultivars. For instance, some cultivars were selected in organic conditions, taller with more developed rooting systems to compete with weeds. There is a margin for adaptation. The objective should be to increase the soil organic matter by covering soils almost permanently in arable land with cover crops, and crops associated to the main crops, reduction of tillage to reduce soil organic matter mineralisation, this allows an improved water economy. This allows to sequester more carbon and this could be supported by the society. On the longer term, if you reduce tillage which requires a lot power and fossil fuel, if you reduce synthetic N fertilisation, you spare a lot of fossil fuel and you replace by N fixation by legumes, you can reduce very much impact of agriculture on climate change, adapt and mitigate. Adaptation is profitable. No-till systems are also more profitable. A cost reduction policy can pay. You can reduce progressively N fertiliser while restoring soil fertility. Carbon sequestration could be supported by companies and policy makers.”

Public: “The problem is that all solutions have not been designed for the Mediterranean part of the EU. We have to incentivize technical solutions and train people”.

Where do you see opportunities to arrange the regional dimension and have a customised approach around the interaction between crops and animals?

Marc Cornelissen: “Farming in certain areas of Europe already experience impacts from climate change to a level that it puts the business at risk. Farming is not a one-year business, it’s about nurturing your field while having good years and bad years. But if the incidence of bad years in a 10 years span increases due to extreme weather volatility, how do you survive as a farmer? This is a main issue that needs to be addressed. Insurances by themselves do not solve this as a growing on-farm production penalty ultimately leads to supply issues in the value chain. In this respect, I am a very big fan of project Hestia, developed by Oxford University that offers a golden standard farm data repository linking local farm output with local environmental measurements. This offers value for steering towards sustainable farming, but also understanding progressing impacts of climate change on environment and farm productivity”

Sandrine Espagnol: “We are missing a manager of the territorial scale to address territorial challenges. This is a new job for the future”.

Wolfgang Burtscher: “I agree everything goes down to governance. How to organise our societies?”

Public: “We learn that the diversity of the production systems, together with the diversity of the size of farms in territories in the EU are bringing resilience. I agree the value chain is very important, and

economies of scale are good, but you lose the socioeconomic resilience. Instinctively, the mixed farming may bring more resilient/specialised systems.”

Public: “Regional specialisation is a problem. We have economies of scale and of agglomeration. The problem in the EU is not that we have too much livestock, it’s more that we have too much livestock in certain areas. Can we relocate livestock farming from intensive areas? Can we set up huge workflows of manure to serve crop farmers in areas with less livestock farming?”

Alain Peters: “About resilience in relation to farm size: there have been interesting studies comparing large farms from East Germany to smaller farms from West Germany: medium size were found much more agile, flexible, diversified, productive, created more jobs than large ones. Resilience should also be related to volatility of prices on global markets. A solution is to escape from agri-food chains, process products whenever possible and sell them on local markets, with higher acceptance”.

What are the best proven farming methods to improve biodiversity? Why animal-based products cheaper than vegetable drinks or fruit drinks or even water?

Wolfgang Burtscher: “We are not strong in being able to quantify the impact of our measures on biodiversity. We should start doing so in relation to agriculture policies. Hundreds of publications looking only at small aspects of biodiversity”.

Closing

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