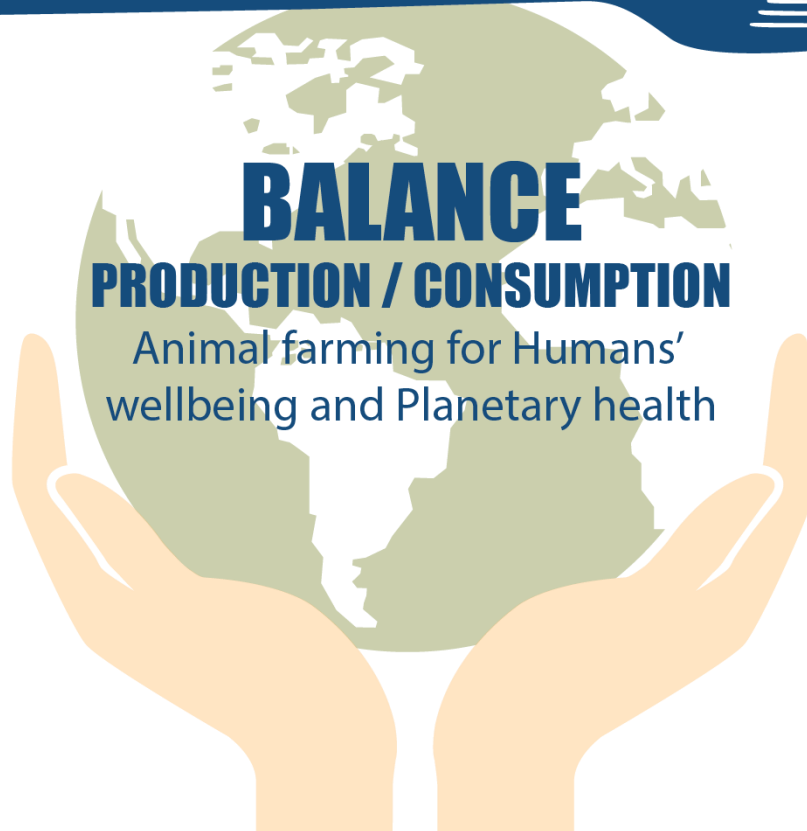


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A European Public-Private Partnership



Animal Task Force & EAAP Special Session
Monday 27th Aug. 2018 13:55 - 18:00
EAAP Annual Meeting 2018 - Dubrovnik, Croatia

Session report

BALANCE PRODUCTION / CONSUMPTION

Animal farming for Humans' well-being and planetary health

Animal Task Force & EAAP Special Session
EAAP annual meeting 2018
August 27th, 2018 – Dubrovnik, Croatia

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The EAAP and Animal Task Force (ATF) Special Session during the EAAP Annual Meeting aims to bring together animal science with practice of animal production and connect researchers, policy-makers, industry representatives and societal organisations. Every year, a different topic is addressed in this half-day session. This year, we want to address the topic “**BALANCE PRODUCTION / CONSUMPTION: Animal farming for Humans’ well-being and planetary health**”.

Background

It is often communicated in the media and among the general public that European citizens should reduce their consumption of animal products/proteins. Very often, the justification is both based on human health and sustainability point of views (use of resources, impact on climate, environmental footprint, AMR, animal welfare...).

Can we find a consensus on recommended shares of animal products in our diets, at the junction of human health and planetary health? What share of animal-derived food in our diet is desirable from the environmental and health point of views? What does it mean for animal production in the EU and globally?

Format of the EAAP & ATF Special Session

The session would like to engage discussion with farmers, food processors, industries, retailers, nutritionists, scientists, and also with the society.

Most important findings will be discussed with a panel. The outcomes of the session will be discussed in more details during the **ATF seminar, in Brussels, on 7th Nov. 2018**, where a large panel of European stakeholders will be invited.

Aim

The Special Session aims to contribute to:

- **Engage a dialogue with various stakeholders;**
- **Support knowledge development and innovation, foster ownership by farmers and industries;**
- **Address how research and innovation can help 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.

Programme

Animal products and a healthy diet

14:00 **Vision from nutritional science**

Maria João Gregório

14:15 **Vision from the food industry**

Sergiy Smetana

Animal products, planetary health and resource efficiency

14:30 **Climate impacts of livestock farming**

Martin Scholten

14:45 **Resource use of livestock farming**

Badi Besbes

15:00 **Sustainability of various diets**

Thomas Nemecek

Prospects in production

15:15 **Finding a sustainable balance in EU livestock sector**

Annabelle Williams

15:30 **Economic consequences: different scenarios in production**

Roel Jongeneel

15:45 Coffee break

16:15 **Panel Discussion**

With all speakers, audience, moderated by Martin Scholten

17:45 **Closing**

Welcome and Introduction

The ATF Chair Jean-Louis Peyraud opened the ATF & EAAP Special session, by introducing the goal of the afternoon, introducing the Animal Task Force, and outlining the programme. The session was introduced by EAAPs president, Matthias Gauly. About 80 participants were counted.

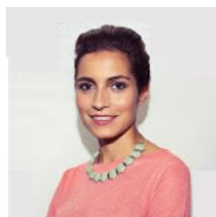
The Animal Task Force (ATF) promotes a sustainable and competitive animal production in Europe. We are a public private partnership of experts from knowledge institutes and industry representative organisations from across Europe. We work closely together with EAAP on setting the European agenda for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

For more information: www.animaltaskforce.eu @AnimalTaskFrc

Animal products and a healthy diet

Vision from nutritional science

By Maria João Gregório, Portuguese Directorate-General of Health
www.alimentacaosaudavel.dgs.pt / www.nutrimento.pt @DGsaude



Maria João Gregório is a Nutritionist, Professor at the Faculty of Nutrition and Food Sciences of University of Porto, Researcher at Chronic Diseases Research Center (CEDOC) of Universidade de Lisboa and Advisor of the Director of the Portuguese National Program for the Promotion of Healthy Eating of the Directorate-General of Health.

There is an increased consumption of meat and proteins from dairy foods worldwide from 1961 per kg per person per year, with variabilities according to species (FAO, EEA). The recommended protein intake is estimated at 0.66 g/kg body weight for the average population. In general, it should be recommended to increase our intake of certain foods (fruits, nuts, fish, vegetables, vegetable oils, whole grains, beans, yogurts, and to a lesser extent of cheese, eggs, poultry, milks), while the consumption of some other foods (like unprocessed red meat) should decrease slightly, or more drastically (refined grains, starches, sugars, processed meats, high sodium foods and industrial trans-fats).

“Why should we reduce consumption of animal foods?” The evidence is not clear as it involves complex factors that are interlinked. The risk differ according to other risk factors in lifestyle. Maria João gives the example of saturated fats. We should acknowledge the nutritional benefits of animal based food for their high quality and bioavailable proteins, particularly for some segments of the population like elderly people that appear to require even 1.0 to 1.3 g/kg/day dietary protein to optimize physical function. There is consensus in international dietary recommendations that animal source foods are part of a healthy and balanced diet, at recommended amounts in the context of a dietary pattern that meets recommendations for fruit, vegetables, whole grains, nuts, seeds and legumes and does not exceed them for added sugars, sodium and saturated fats.

[More information in the slideshow](#)



Vision from the food industry

By **Sergiy Smetana, German Institute of Food Technologies** www.dil-ev.de @FoodLCA

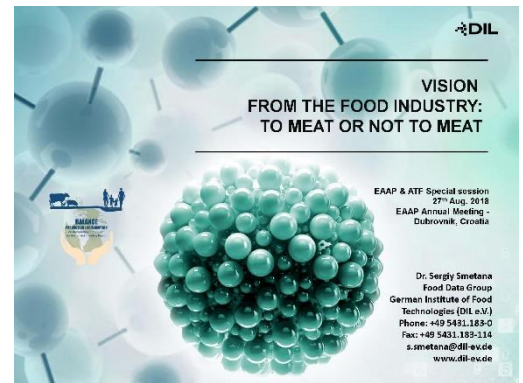


Sergiy M. Smetana works as Head of Food Data Group at the German Institute of Food Technologies (DIL e.V.). The main focus of his current activities includes working with many companies on sustainability assessment of innovative food processing technologies and food systems.

The concentration of animal productions in Europe is very efficient from an economical point of view. But it causes a lot of environmental problems, reflected in a situation where agriculture is more directed to feed animals than provide food to humans. We see a system change towards a sustainable transition, where new products like meat substitutes find new market opportunities, sometimes leading a change in market, like in Germany. Meat substitutes are technically more and more advanced in efficiency, nutritional profile and even environmental impacts. By default, however, they are not more sustainable than meat, despite of some misconceptions: e.g. the environmental footprint of in-vitro meat currently is very high due to energy use.

As food waste in households is a challenging issue for sustainability, one of the solutions should be the combination and circulation of food products as a source biomass for future food products. Some simulations in Germany show that a reduction of -50% of meat consumption would only enable an improvement of 2-4% of the total German carbon footprint. Thus, other factors of importance should be looked at such as land use, water footprint, economic and social factors. Finally, all participants are invited to attend a conference on novel trends/developments in food production systems and sustainability in Berlin 22-25 Sept. 2018.

[More information in the slideshow](#)



Animal products, planetary health and resource efficiency

Climate impacts of livestock farming

Martin Scholten, WUR, Global Research Alliance on Agricultural (GRA) on Greenhouse gases

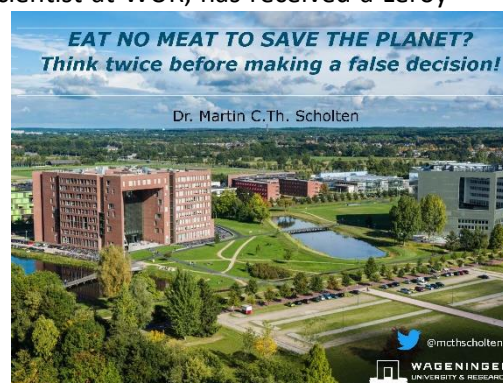
<https://globalresearchalliance.org/> www.wur.nl/en.htm @mcthscholten
@WURanimal



Martin.C.Th. Scholten is an ecologist, member of the Board of Directors of Wageningen University & Research responsible for Animal Sciences, Livestock Research, past-president of the Animal Task Force and co-chairman of the GRA on agricultural greenhouse gases. “Eat no meat to save the planet?” is a public opinion often heard among policy makers. Martin will explain why GRA did not go for it. Following the publication of the “Livestock’s long shadow” (FAO, 2006), GRA has published a practical guide demonstrating mitigation options to reduce GHG at farm from livestock.

At present, one third of crop materials are not being used. We should use the potential of planet earth and make sure we generate a high level of organic composed soil. The game changer is to move from an agriculture aiming at production efficiency (sustainable intensification) to an agriculture looking at an “ecological resource use efficiency”, considering ecosystems (soils, plants, animals, microorganisms...), maximising interactions and reducing waste, by using smart feeding (precise use of feeding, inedible feed and byproducts) and smart fertilisation (use of animal manure as fertiliser and by-product). This approach is completely new. Imke de Boer, scientist at WUR, has received a Leroy Award for its research that extends LCA methodologies in calculating the suitable share of animal based proteins in the diet with a circular use of resources (optimum is 45%). The Dutch government will launch a new policy in September towards circularity in agriculture and food systems, based on simulations on the potential mitigation of Dutch GHG emissions via circularity. The GRA has also just decided to build up knowledge on circularity.

[More information in the slideshow](#)



Resource use of livestock farming

By **Badi Besbes, FAO**

www.fao.org

@FAO



Badi Besbes is Senior Animal Production Officer, Head of the Animal Production and Genetic Resources Unit of the FAO Animal Production and Health Division.

“More fuel for the food/feed debate” echoes to recent publications from FAO on the efficiency of livestock production that aim to inform the public debate. The growing global demand for animal source food hides huge discrepancies across countries (4 kg to 100 kg meat per person per year in average). We need a global database on livestock feed. Existing figures on resource efficiency have to be refined, as they currently do not consider inedible feed, feed produced on land not suitable for food production, nor the diversity of production systems. The majority of feed consumed by animals are not edible by humans (86% of the dry matter), making ruminants actually positive contributors to protein production. Modest improvement in feed conversion ratio can prevent further expansion of arable land dedicated to feed production. Some misleading figures on water consumption (e.g. 15,000 L/kg beef) still consider green water falling on grasslands and crop fields absorbed by plants (92%), while blue water is less than 10% of the total. To support good practices in water use, the LEAP partnership has produced guidelines for water use assessment in livestock [link](#). Circular bio-economy has a tremendous potential (see Japan). In developing countries, livestock has also many other functions (traction, manure, savings...).

[More information in the slideshow](#)



More fuel for the Food/Feed debate

What are the resources used by livestock?
How to optimize production systems?

Anne Mottet and Badi Besbes
Animal Production and Health division

EAAP-ATF special session – Dubrovnik – 27th August 2018

Sustainability of various diets

By **Thomas Nemecek, Agroscope**

www.agroscope.admin.ch

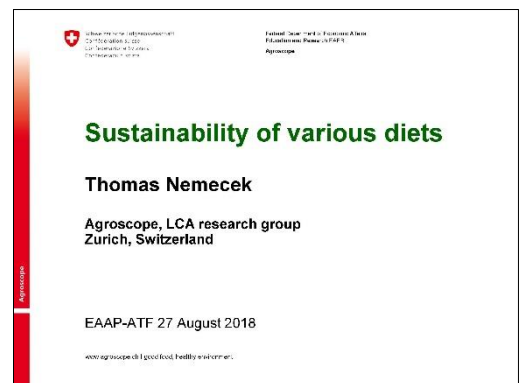
@Agroscope



Thomas Nemecek is working as deputy leader of the LCA research group and senior researcher at Agroscope in Zurich, Switzerland. His field of research is the environmental life cycle assessment of agricultural production systems, cropping systems, animal production systems, food supply and nutrition.

The environmental impacts of protein-rich productions are highly variable. On a protein basis, animal based products have higher impacts than plant based products, contributing to 56-58% food's emissions, despite providing just 37% of protein and 18% of our calories. Then the main issue is: *"can animal productions be produced with sufficiently low impacts to redress this vast imbalance or will reducing animal product consumption deliver greater environmental benefits?"* The study looks at different scenarios in global diets, and concludes that animal-product free diets could reduce most environmental impacts by 50%, while halving consumption could reduce them by one third. Another study conducted by Agroscope has looked at environmental impacts of 5 different scenarios (following nutritional requirements, or food pyramid or eviction of food waste) in the Swiss population. An optimisation model of the Swiss food system was combined to environmental impacts based on LCA to find optima with lowest environmental impacts, the implications for the composition of the diet, land use, animal herds, and food and feed imports were assessed. As a conclusion for livestock farming, implementing optimised diets would lead to a reduction of animal herds for meat production, while dairy cattle would remain at a similar level with a slight intensification. The reduction of animal herds would allow the permanent grassland being managed less intensively.

[More information in the slideshow](#)



Prospects in production

Finding a sustainable balance in the European livestock sector

By **Annabelle Williams, RISE Foundation**

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Annabelle Williams is the Managing Director at RISE, a public utility Foundation and a Brussels based think tank. The Foundation has just conducted a study *"What is the Safe Operating Space for EU Livestock?"* ([link](#)) to contribute to the policy debate. It will be released during a conference on Sept. 13th in Brussels.

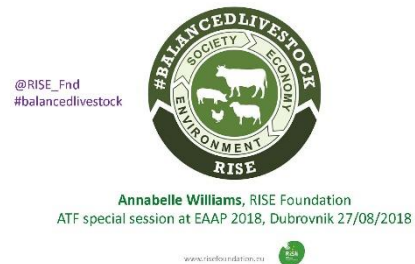
The central idea of the report is that for millennia, crop and animal agriculture can be said to have been in balance, yet 150 years of rapid population and economic growth combined with technical change have led to an imbalance, where the impact of the sector on the environment and health are far outweighing the benefits that livestock production brings. And this only expected to grow in line with consumption projections. With its report, RISE wanted to better understand where the balance lies, and how to get there. The idea of a Safe Operating Space (SOS) for EU livestock came about as a conceptual way of applying a scientific framework to determining the size and composition

of the sector which would both recognise the benefits of the sector, whilst limiting the negative impacts of the sector. As an exploratory approach in its early days, the setting up of boundaries is tricky and would require more work on biodiversity, soils, AMR and animal welfare. Despite this, initial calculations show that EU livestock production and consumption are not in an SOS.

Among options for moving livestock into an SOS, the report suggests to 1. advance technological and innovation solutions to reduce the impacts of current production 2. Shift and reduce consumption. RISE believes that whilst there are many very promising innovative advances in reducing the impact of the sector, these will not be enough and in addition to supporting innovation in the sector, a step reduction in consumption is unavoidable. The Foundation envisages a transition over 2 to 3 decades. RISE called on the EU to take action by setting up a formal inquiry to investigate the livestock issue and better measure the boundaries, specifically: where is the safe operating space for EU livestock; what adjustments in production and consumption are necessary to get to it and what would be the impacts on health, environment and economy of these changes.

[More information in the slideshow](#)

What is the Safe Operating Space for EU Livestock?



Economic consequences of scenarios of animal production in Europe

By **Roel Jongeneel, WUR**

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Roel Jongeneel is senior researcher and policy and market analyst at Wageningen Economic Research.

Economic assessment aims to evaluate optimal goods and services provision satisfying consumer preferences, ranked to the order of importance and considering efficiency and cost considering the use of resources. The supply/demand balance should be embedded within planetary boundaries and doughnut for human activities described in the background for an SOS. Some policy scenarios simulating a meat consumption reduction comprise a lot of uncertainties; they would seriously affect the EU agriculture as 60% of the agricultural value added comes from the livestock sector.

Many of the current simulations completely lack the policy setting that would be required to come from status quo to a desired state. I see these “incomplete scenarios” being taken up in the societal debate as if an automatic “remake” of consumers and food supply chains is possible with a push on a button. Food systems comprise many actors, which each have their space in which they have freedom to act according to their own desires and interests, and are indeed very complex. The treatment of externalities of production and consumption via policy instruments is not easy. Effects of measures are difficult to predict. Agricultural sectors, downstream industries, retailers and consumers are connected via markets, that interact with other markets, not only locally, but also regionally and at world level. Taking into account the position of the EU in a world market context and thinking along the policy changes that would be needed to replicate the current scenarios, I consider them as very unrealistic.

Strong measures would be needed to induce a significant change in consumption. Impacts will depend on policy measures but are likely to be serious. In case consumption would go down by 50%, prices are likely to go down by an order of magnitude of 10%. This would induce EU production to go down by 10-15%, while EU exports could grow by more than 400%. Whereas halving EU consumption has a positive effect on health, the estimated impact on climate is limited since worldwide production only decreases by 1%. Such a scenario would result in a decline in farmers' income and lead to farm exits, but the main part of the sector is likely to continue its activities. Those impacts would be mitigated in case livestock farmers would be rewarded by retailers, consumers or society. When one would also reduce EU animal protein production by 50%, one would need to introduce production rights, followed by a buy-out scheme to reduce production. This is a revolutionary intervention and on that will cost a large amount of money. Practically, it might be more interesting to see changes for climate and health as a more stepwise process and to look how the EU CAP could help the current agricultural system to make the necessary transformation, while taking care about local (health) as well as global impacts (climate; GHG emission impacts).

[More information in the slideshow](#)



Panel discussion

The panel consisted out of six panellists:

- Maria João Gregório (MJG), Portuguese Directorate-General of Health
- Sergiy Smetana (SSM), German Institute of Food Technologies
- Badi Besbes (BB), FAO
- Thomas Nemecek (TN), Agroscope
- Annabelle Williams (AW), RISE Foundation
- Roel Jongeneel (RJ), WUR

Martin Scholten (MS) moderated the discussion and opened the panel session with a slide [-link](#).



“Are human health and planet health aspects of animal based food fairly considered by the speakers?”

Public: Maria and Thomas seem to have different views about the recommended protein content in the diet. I advise to consider amino acids content. Can we estimate the SOS of plants production?

Public: Can we have a holistic approach? Will it have an impact to only focus on livestock farming, even only on agriculture? Agriculture has already reduced its impacts by 20%. What about the contribution of other sectors whose impacts are still increasing (e.g. transportation, energy production)?

Public: Do we consider lifestyle in recommendations? If I go to the Doctor, he will ask me whether I exercise enough. But our chicken and pigs do not exercise enough. Drinking too much water has also drawbacks. We have not enough holistic views.

MJG: I’m sorry if I did not focus on health benefits of meat consumption. We really need to eat meat in a healthy diet. A lot of nutrients are difficult to find in other foods and we cannot produce essential amino acids. Meat provides a good balance and bio-availability of amino acids and a good quality of proteins). The recommended balance in amino acids is more difficult to reach with a vegan diet.

AW: Whilst the report focuses on the livestock sector, not least because of the more prominent impact of the sector, RISE recognises that all sectors have to reduce their negative impacts (i.e. in GHG emissions). Many advances have already been made but seeing a lack of advance in another sector as a reason to stop the transition cannot happen. Rather there are many synergies between sectors which can collaboration to collectively reduce their impact.

MS: When you consider sectors separately, you take out opportunities for a holistic approaches.

AW: I agree that sectors may have very strong synergies (like agriculture and transports).

SSM: Consumption of meat is beneficial when you do not overconsume or under-consume. We should assess direct and indirect impacts on health, like AMR related to antibiotic use.

- BB: Nutritional requirements should consider specific needs of childhood and pregnant women. Consumption of animal products is essential in developing countries of Asia and Africa, where 30% women suffer from anemia 25 % of children under the age of five suffer from stunting due to a lack of consumption of meat.
- MJG: Some groups are indeed at risks of lacking proteins. Low income people are vulnerable when meat is expensive and the nutritional quality of food given to these people is very low. In Portugal, we have a food aid programme for low income people.
- MS: In standard Life Cycle Assessment, ruminants are the bad guys due to methane. How do you come to a conclusion that they can also play a role in the Swiss scenario?
- TN: Beef has higher greenhouse gases emissions than pork and poultry, but they can use feed sources not suitable for human nutrition (grassland, part of crops...). Part of grasslands could be used for crop production, other parts cannot. There is a good perspective in using meat as a by-product of milk production. This is still not clear how much human edible feed is used in general. Note that instead of growing e.g. silage maize on arable land for the cattle, you could produce potatoes, red beans, etc. for human nutrition.
- RJ: We need to position things in a global perspective of agriculture providing food.

Questions to the panel:

- Public: What about planet health and biodiversity? How do we preserve soils if we increase crops?
- Public: Methane production of cows represents 40% of all agricultural emissions. What is the potential of genetic selection to address this issue?
- Public: How to maintain animal welfare while reducing the use of resources in a context of intensification?
- Public: A speaker mentioned that livestock fulfils a role in valorising food waste. One of the SGDs is to reduce food waste? What does that mean for the future role of livestock?
- Public: Do we have an idea of the burden represented by food from animal origin vs lifestyle in non-communicable diseases?
- Public: Thomas says the future of the Swiss production is milk with grass and wheat. How to improve wheat without animals? Can we expect production of wheat in Switzerland or EU may compete with wheat production in Ukraine, Russia? In France, over 300 farms were monitored on pesticides, showing a success in reducing pesticides in mixed farms but not in specialised farms.
- Public: Can we consider the SOS on a global scale? If EU reduces its production, we might import from countries where production is less sustainable.
- Public: About using breeding to reduce GHG: why not use the large diversity of solutions to solve the problem?
- BB: My colleagues at FAO show that by applying existing good husbandry practices and existing technologies (nutrition, animal health, breeding...), we could already cut emissions by up to -30% at global level. We need a mind-set change in developed and developing countries. We can also partially offset emissions by fixing carbon in soil with improved pasture management.
- RJ: Russia is a key supplier in the world since this year and a competitive player. In some EU member states, cereals production is not competitive, but a minimum will always stay due to necessary crop rotation requirements.
- TN: We have assessed environmental impacts in order to evaluate how much can be reduced by changing production systems and diets. In these systems, there will still be animals and

manure. About the role of mixed farms, yes, there are good examples and studies showing they have an important role in balancing nutrients.

SSM: The livestock industry has made huge efforts to valorise food wastes for animal feed. What was considered as waste is now called a by-product or side stream. This brings complexity and raises safety and logistic issues but certainly animal production has a role. About the potential of animal breeding: quite a lot of things could be done (GHG emissions, etc...).

MS: Microalgae, insect from the circular economy can also be used.

MJG: According to Portugal metrics, lifestyle is main risk factor. Highest risks lie in high intakes of salt, low consumption of fruits, vegetables, pulses and nuts, high consumption of processed meat.

AW: Agreed that biodiversity is a crucial aspect of SOS. We have only calculated 4 aspects of SOS to trial the concept. Addressing biodiversity would require more research. Some boundaries need to be addressed at local or more global scale. The level of nitrification and GHG are unsustainable. Do we keep producing at the same rate just because we want to protect the sector? Do you think efficiency gains are enough? We could not find the evidence in the literature.

What does that mean for livestock production in Europe: reducing quantity or improving quality?

MS: If you have to make a decision, not black and white, but saying 80% should be done in EU, could you raise your hands if you think EU livestock should reduce in quantity (5 persons) or quality (20 persons)?

BB: The solution is going both ways. Where there is overconsumption, there is room to reduce.

AW: We need to move forward with both. In our report, we acknowledge that research and innovation have done a lot. We just don't think it's enough.

MS: Annabelle, when you say research and innovation is the "old agenda", it's not stimulating to go for the quality. The reduction might be the result of improving quality of the systems. A Dutch report recently suggests a reduction of 70%-80% of livestock production. The outcomes were brought in the newspapers.

AW: We recommend the EC to fund a full study on identifying the SOS. If what you say is right, that we can bring all the impacts down, this is perfect. The report already addresses options brought by the circular agriculture.

Public: You should all be in Brussels on 13th Sept for the release of the RISE report. Some conclusions in the report are not correct. One terrible word is "Old Agenda". It's demotivating so much the sector to improve. We have been improving a lot with old measures. We have now to introduce new measures like breeding on GHG emissions. This is not an "Old Agenda".

Public: About biodiversity, the smaller the scale, the less problematic it is. If we improve in quality of livestock production, we should include all of the pillars of the EU about preserving rural landscapes, rural communities, giving people an income. Livestock production is also a way of life, it maintains rural communities in a large part of Europe. If you decide to reduce quantity, what are people going to do? Maybe move to big cities?

Public: Circularity has been presented as a very positive solution. Can it have negative effects, for example on products quality?

Public: We should improve quality, making the most use of circularity and agroecology. This can lead to a decrease in quantity as a result, but it cannot be an objective as at the same time the world needs more meat. Up to now, we have been working on productivity and it still continues.

Now, we need to address environmental issues as a priority, connecting crops and livestock. At present, we source 50% our nitrogen from manure, the rest from mineral fertilisers. If you can manage very well manure with new techniques, you can save on mineral fertilisers. Placing environmental issues at the centre of research and innovation objectives is not an old agenda.

- RJ: From an economic perspective I would like to add that biodiversity service delivery is a special transaction where the farmer delivers a survey whereas the policy maker operates as a demander. If you ask farmers to bring biodiversity, you should compensate it to farmers. This is like paying them a price and mimic a (virtual) market situation. I hear several people still talking about subsidizing farmers. Paying a price and buying something from someone is a normal transaction. We should not call this compensatory payment a subsidy (just as you are not “subsidizing” the baker when you buy your bread in his shop).
- BB: FAO promotes agroecology as one of the approaches of sustainable food and agriculture systems. Circular economy is one of the element of agroecology.
- MJG: In nutrition, improving quality and decreasing quantity will both have benefits. Very often, we are eating much more than we need, we should reduce our consumption of everything.
- SSM: Quantity and quality are two sides of the same problem. Looking at quality, we should consider end-product’s quality. The nutritional quality of crops has reduced, they are now empty of nutrients. Quantity is somehow enough, but the distribution should be improved.
- TN: I would support the statement that we should use all options in the food value chain to reduce GHG. We should encourage responsibilities by all stakeholders. We have to choose either to improve production in small steps or bigger steps and switch systems. We have to reduce on the consumption side and use a synergistic effects by avoiding the products with the highest impacts.
- AW: Well noted for the old agenda. We do believe things are going forward, we will take that into consideration. This is not an attack on the livestock sector. We believe the change is inevitable. We need to have strategic plan to support it over 2-3 decades. As the daughter of a livestock farmer. I’m very aware of how livestock farming is integrated to our communities. And that is exactly why we need a long term strategic approach. Because if we don’t start now to see how we can gradually adapt, it is the agricultural sector that will suffer. The EU has the capacity to address this study.
- MS: We all agree that we have a transition in front of us where the agri-food systems will change. Livestock, like to other parts of the agri-food, has to cooperate and integrate to the transition. There is a plea for political support in the transition.

What can be expected from changing consumer choices?

- Public: With meat production decreasing, price will increase. It may become a luxury product not accessible to the poorest and create a problem for society health.
- Public: We should agree on giving the right information to consumer. One of Thomas’ slides says that soybean is much more beneficial to climate than meat. That is not true if you consider the nutrient density (cf. Swedish study).
- SSM: Very hard question. Statistics show that despite all labels and information, consumers make unconscious choices, independent from nutritional profile. They continue to consume fast foods, sugar, etc. When you go to an average supermarket, the time needed to read all labels is incredible. That’s why they simply do not work.
- Public: There is definitely an agenda against meat consumption.

MJG: From my experience, it's very difficult to change behaviours. Providing information is not enough. Nutritional policies have a main strategy to inform people, but it has no success. The food environment has an important role. Soft drinks are sold at lower price than fruits.

MS: If we promote some foods to be healthier, their price go up and consumption goes down?

RJ: If you want to change consumer preferences, demand will increase and price will go up. Low income are also the most sensitive to tax. That is why I think that there are limitations to what you can do with taxes, maybe not theoretically, but surely politically.

Public: We should look at the full food consumption rather than focus on specific food products.

Public: What we learn from economics, is that switching consumption is not a matter of convincing but rather of taxes. Then, if it is true that bovine consume lot of resources, its price will go up.

SSM: Nutritional recommendations are very general. What about people with health problems.

Public: We should consider the entire diet. Diet is not an addition of different foods but a combination of interactions. The same at production level due to circularity. We should consider the nutrient quality of food. Vegetarians need to eat more crops to get the same amount of nutrients than in animal food because their nutrient density is lower. When consider nutrient density and availability, the vegetarian diet has a higher Ca footprint.

MJG: In nutritional science, we are increasing research on the whole diet.

MS: As an ecologist, I can say that (bio)diversity contributes to a healthier planet.

How Science can contribute to stimulate this way of thinking around variety, system thinking, circularity, balanced food production and consumption...?

Public: Even in this room, we are falling into the trap to give simple answers to complex questions. Maybe the role of science is to say to politicians that we don't live in such a simple world that simple answers can address our problems. We need to produce a consensus. We need to consider the livestock sector and synergies within the whole agricultural sector.

Public: We must bring consumer the right information. We should improve LCA modelling approaches to incorporate the less emissions scenarios and technologies that already exist to show their potential. Food does not only provide nutrients, but also cultural experience, how to estimate the value of this? Cultural habits are not easy to change.

Public: To me, the 2 priorities for science for the next decades are: 1. to decrease methane emissions from the management of feed and genetics; 2. carbon storage in soils with smart solutions. They also embark agroecology, feed efficiency, food quality...

Public: Science should be much more engaged with early adopters.

Public: We should separate consumption of animal products and production in discussions. We need a safe SOS in production, but not generated by policies inducing other consumption patterns.

Public: We need Science to be a lot more collaborative, engaged with early adopters, allowing for a change in systems, towards circularity, including animals.

Closing remarks

By Jean-Louis Peyraud, ATF President

He thanks the speakers and the audience for the fruitful debates. He invites all participants to continue the discussion during the ATF Seminar of November the 7th, 2018, in Brussels, where policy makers and European stakeholders are invited [-link to the programme](#).