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The future of food conference

REPORT




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Executive summary

On 20 November 2019, a few days before the new European Commission took office, and following the announcement of a new Green Deal for Europe, with a new sustainable food policy from farm to fork, EIT Food and Friends of Europe hosted the first 'Future of food conference' in Brussels.

The event offered an opportunity to discuss the future priorities of the EU's research and innovation programme and food policy agenda, engaging around 170 EU and national officials, industry representatives, academic experts, farmer and consumer organizations in a series of breakout sessions and roundtables. The sessions looked at the challenges and opportunities in three key areas: consumer participation; protein production and consumption; digitalization. The roundtables delivered recommendations for R&I projects and policy interventions dealing with those challenges and opportunities.

In 2019, the EU reached an agreement on the main priorities of its next framework programme for research and innovation (R&I), Horizon Europe. Central to the event discussions was the idea of R&I acting as a "GPS" to help decision-makers understand the direction which policy needs to follow, to transform the food system. To chart this direction, the event brought together representatives of the EU food research community and EU policy community.

This report summarizes the outcomes of this meeting. Its recommendations and ideas are the views of conference participants. They do not represent the position of EIT Food or Friends of Europe. Nevertheless, we hope they can serve as a source of inspiration for those involved in shaping the future of food through Horizon Europe and the EU Green Deal's "sustainable food policy from farm to fork".

Reaching the second UN Sustainable Development Goal of zero hunger by 2030 and achieving food security, while coping with obesity, malnutrition, climate change and biodiversity loss poses huge challenges to our society.

The agrifood sector must fully commit to sustainable agriculture and food systems. But a sustainable scenario means huge transformative changes, driving deep and far-reaching transitions to the food sector, plus changing the prevailing economic models. It requires getting consumers to change their food behaviour and making sure they feel part of the food chain and they trust it. It means also managing properly the impact of this transition to protect potential losers, particularly among farmers and SMEs. Thinking in a food system way and forming partnerships will be crucial for supporting change.

As the leading EU food innovation initiative, EIT Food is committed to support this process, through its innovation, education, business creation and public engagement activities, collaborating with all stakeholders in the agri-food sector.

Recommendations for future Research & Innovation projects and Policy Interventions

A set of concrete recommendations for future Research and Innovation projects as well as for potential Policy Interventions were defined following the outcomes of the different workshops. All are focused on what Europe can do to turn solutions into impact and deliver on a promising food future, taking a whole society, whole economy approach. Priorities of the workshops centred on taking consumers on board to revolutionise the food system, proteins: the battle for the centre of the plate, and on transforming food production and consumption with digitalization.

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Challenges and Opportunities	**Recommendations for future R&I projects**	**Recommendations for potential policy interventions**
Co-create a new vision for a food system that meets society's balanced needs	• Call on input from different parts of the food system and develop 'impact pathways' to understand the full impact of food value chains • Encourage micro-simulations throughout the food system to encourage experimentation with transformative food systems • Be honest and aware of trade-offs, e.g. a more nutritious food may be more expensive or a food that is nutritious and cheap may not be sustainable • In Horizon 2020/Europe, ensure that all food investment can demonstrate sustainability, and each research project has mandatory soil fertility targets.	• Increase EU funding to support the new vision for Europe's food system • Set specific EU wide targets for food like those for energy; integrate food within National Energy and Climate Plans (NECPs) or have food-specific contributions working towards an overarching aim • Increase food education for all • Encourage citizens to engage with food issues at their own level, e.g. through enabling spaces
Data and digital: ownership, sharing, transparency and trust	• First, assess the existing supply chain and understand how vertically integrated value-chains work: What are the existing bodies? How do they operate? • Secondly, set up an Ethical Body Data Centre, to establish the business model for food sector data. This ethical body could be responsible for: i) setting the conditions under which data are generated (e.g. from research); ii) determining which entity is credible; iii) setting governance; iv) operations by sector or by country • Set up a single platform using AI and blockchain technologies to foster supply chain transparency and food labelling information • Set up field labs to test innovation (living labs), acting at the local level, and to create local ecosystems	• Introduce regulatory or policy measures to address data and digital issues in the food sector, such as positive incentives and a legal definition of the model and its governance for data collection, connection and availability. • Develop open source/access best practices database for knowledge transfer among parties • Develop consumer engagement labs that exercise RRI principles and are inclusive/ open to vulnerable groups in particular • Create a level playing field for small producers/SMEs via subsidies and exemptions, enabling everyone to access standardisation and certification, and facilitating access to market

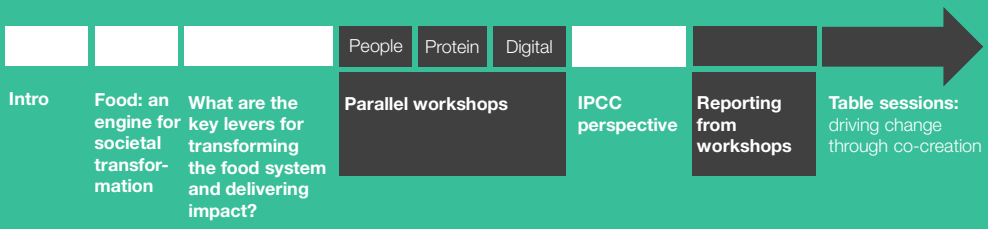
Challenges and Opportunities	Recommendations for future R&I projects	Recommendations for potential policy interventions
Enable new market opportunities for farmers	• Help farmers to see the added value of smart and data-driven farming, also through better collection of best practices and scaling up to find good initiatives • Create technologies to help small farmers supply bigger retailers • Smarter 'agropreneurship': low-cost and easy-to-use platforms to help farmers access data and information that can be used easily and quickly, so they can market their products more efficiently and feed people more sustainably • Develop new farming models, backed by knowledge on how to effectively combine traditional and new farming technologies • Offer training for farmers on the adoption and use of new technologies, plus business development education • Develop a closer connection between consumers and farmers/producers, especially through blockchain technology	• Support new market opportunities for farmers (e.g. smart/vertical/ farming, protein from insects/unusual plants, and new use of land formerly set aside for food production) with regulatory and policy interventions • Recognise variability in EU legislation, as much EU food is size-graded • Avoid offering too many subsidies, to prevent risk of land for food farming being turned over to energy production (windmills/ solar panels) • Support small farmers with marketing issues, so they can put their products (including seeds) onto the market • Ensure support for small and big farmers is evenly distributed, through policy structure and innovation funding: small farmers lack the funds needed for development yet are more flexible and can be quicker in adopting new innovations • Foster a major mindset change among big farmers to grow more products that are more sustainable and healthier
Ensure ethics and fairness in the transition	• Define the meaning of 'transition' by investigating 'what a just transition can look like in the EU food system' (e.g. food as a human right, not just a commodity) • Help small farmers in the transition, e.g. by ensuring that the use of digital technologies is done in their interest and not only for large corporations, and by testing new solutions in the field with those farmers • Empower farmers by involving them in the co-creation of new products, services and business models • Develop more R&I projects targeting the role of Europe's small food processors and small retailers in the food system • Develop digital tools to inform consumers about the transparency of the supply chain (e.g. ethical production, without forced labour or child labour)	• Establish prizes and awards for the most sustainable companies/industries, to attract public attention and create a reputational reward for those who are fair and just • Communicate the sustainability of certain products/companies with information that is not too simplistic and superficial • Incentivise farmers through grants to modernise their production, but avoid renationalising the EU's CAP or giving Member States too much discretionary power • Tackle the distortions due to taxation and subsidies, so that the most sustainable food options are not the most expensive: this will generate different price signals and shift consumers in a new direction

Challenges and Opportunities	Recommendations for future R&I projects	Recommendations for potential policy interventions
Bringing people together: producers, retailers, consumers	• Create a framework for local innovation infrastructures (living labs), enabling different food system actors to interact and test the efficacy of new ideas (technologies, methodologies, policy initiatives, etc.) for public engagement and replication elsewhere • Develop apps to foster local connections between different actors in the food system	• Create an Erasmus-like programme for the food sector. This would support mobility for different actors, so they better understand the functioning of the entire food system, in the context of broader societal learning • Develop national/regional/local food system dialogues – akin to the French IPODE initiative • Build tools to foster exchanges of food ideas/innovations between cities (e.g. twinning) and support valuable campaigns (e.g. promoting milk or vegetable consumption in schools)
Behaviour change: target everyone, include everyone	• Fund food system projects that tackle the four areas below and involve all actors/audiences (farmers, manufacturers, retailers, NGOs, media and consumers): 1. Gathering research on best practices around behaviour change: What has worked and what hasn't? What is the latest research? 2. Public education: with the findings from area 1, devise education programmes to foster behaviour change among the different actors/audiences and make these programmes available to EU Member States 3. Implementation of actions: set up voluntary actions and incentives to foster behaviour change among all actors/audiences. 4. Evaluation: repeat what worked and change the tactics of those that failed	• Introduce regulatory incentives and disincentives, and campaigns to highlight these incentives. These incentives should focus on achieving: i) better access to healthy food, ii) fair pricing of food, ii) healthier convenience food

1. **Luisa Crisigiovanni**, Secretary-General at Altroconsumo
2. **Andy Zynga**, Chief Executive Officer at EIT Food
3. **Marco V. Sánchez**, Deputy Director of the Agricultural Development Economics at the Food and Agriculture Organisation of the United Nations (FAO)

Conference report

Overview of the conference



Waste not, want not: the urgent need to transform Europe's agrifood sector

If the world can achieve food sustainability, despite climate change and rising food demand, then we will be able to save the planet. This ray of hope emerged during the 'Future of food conference' in Brussels on 20 November 2019, jointly organised by EIT Food and Friends of Europe.

A number of worrying facts formed the backdrop to the discussion. Climate change threatens our ability to ensure global food security. At the same time, global population growth and changes in dietary patterns require an increase in overall food production by more than 60% to feed 10 billion people by 2050.

Hundreds of millions of people around the world still go to bed hungry, while there is a growing global epidemic of overweight and obesity, now affecting some two billion adults.

In Europe's affluent societies, the permanent availability of food has reduced its perception as a highly valued and critically important product, as almost one-third of total food production is being wasted. Highly publicised food contamination and authenticity scares have led to consumer concerns over the complexity of the global food system, undermining confidence in the transparency, safety and integrity of the food value chain.

"Food is wrapped up with our well-being and emotions, as well as every aspect of our society and physical world," noted the moderator **Dharmendra Kanani**, Director of Insights at Friends of Europe, adding that there's increasing awareness that what we eat affects the planet and the economy. He urged conference participants to come up with policy ideas and recommendations on food system reforms for the new EU mandate.

Reflecting on how far the food system has come since humans first domesticated livestock and developed their ability to control fire, **Andy Zynga**, CEO of EIT Food – Europe's leading food innovation initiative – highlighted the fact that food innovation started many thousands of years ago and it still continuing its journey today. However, many of today's major innovations, such as harvesters, only arrived in the last century. "Intensive farming has delivered huge yield increases and helped to keep famine at bay, but climate change is here, so we must urgently change our farming practices," he added. Zynga said the European Green Deal is a great opportunity for the EU to transition to a more sustainable food system, leveraging all tools at our disposal, including the upcoming Horizon Europe R&I programme.

Sustainability is the only solution

It's a huge challenge for the world to reach the second United Nations Sustainable Development Goal of zero hunger by 2030 as well as achieving food security, noted **Marco V. Sanchez**, Deputy Director of Agricultural Development Economics at the Food and Agriculture Organization of the United Nations (FAO).

Over 820 million people worldwide go hungry and this number is rising, in the South especially. "Many people, even in high-income countries, are moderately or severely food insecure (i.e. unable to obtain a sufficient amount of healthy food on a day-to-day basis). This leads also to malnutrition, including overweight and obesity," added Sanchez. He referred to a new FAO report, 'The State of Food Security and Nutrition in the World 2019', which said the main drivers of these trends are poverty, inequalities and marginalisation. However, in many countries, rising hunger is driven by conflict, climate variability, or economic slowdowns and downturns.

According to a new FAO foresight analysis, to feed millions more and to feed everyone better, the agrifood sector must fully commit to sustainable agriculture and food systems. This could bring us closer to the goal of zero hunger, with statistics suggesting that those going hungry globally would reduce from a figure of 11.7% today to just 3.5% by 2050, if the agrifood sector could be transformed.

"A sustainable scenario means huge transformative changes and achieving more by producing less," said Sanchez. We must be more aware of all aspects of our food and change our behaviour towards it, whilst being more proactive in facing the challenges driving food insecurity and malnutrition." Sustainability can be achieved through smarter and more intensive farming, the adoption of innovative new technologies and processes, reduced livestock emissions, and healthier diets mainly based on plants.

"To be sustainable, the world's income must also be more equally distributed within and across countries," added Sanchez. He explained that this requires not just tackling the way in which food is produced, but also the way it is distributed, so that people have more access to food and at a higher quality.

Transforming Europe's food system

In the plenary session on innovation in European food production and consumption, four panellists debated the merits of high-quality research, entrepreneurship and investment, as well as policies. All agreed that systemic and transformative change is urgent.

The agrifood system is no longer fit for purpose if we want to ensure the conservation of depleting resources, fight climate change and meet the needs of a growing population with new demands and expectations when it comes to health, lifestyles and the environment.

"Time is running out, with 9 billion to feed by mid-century and climate change threatening chaos for our planet and food system, so we

must decarbonise six times faster than planned," said John Bell, Healthy Planet Director at the European Commission DG for Research and Innovation.

Bell spelled out some worrying climate change challenges for agrifood, especially if temperatures rise by a predicted 3.2°C. Where will humans grow or produce food? And where will they get their protein?

"We need to consider driving deep and far-reaching transitions to the food sector, plus changing our economic model away from gross domestic product," said Bell. Hence the importance of the new European Green Deal, designed to make the continent climate-neutral by 2050 and to transform Europe in the process. He said it will frame the pathways, transitions and means to achieve sustainability – with food at the centre of public policy, while EU research and innovation will also play a major role.

"This sustainability drive is the EU's 5th great mission," Bell added. "We'll see the massive mobilisation of all EU departments – it'll be the political equivalent of a bazooka for sustainability!" However, he acknowledged that not everyone is yet onboard, especially when it comes to creating a circular economy. The EU will also introduce a 'just transition fund', to help poorer Europeans to cope with the associated costs of sustainability.

Andy Zynga, CEO of EIT Food, was also enthusiastic about the potential of the European Green Deal to boost food system transformation. He said it will enable the EU to transition from innovation and investments through Horizon 2020 to the new Horizon Europe innovation programme.

Behaviour change a key driver

Everyone in the food value chain must sign up to this EU sustainability transition, starting with food producers, agreed the panel. **Luisa Crisigiovanni** Secretary-General at Altroconsumo, the Italian consumer body, said it's important to also consider the demand side, and not just producers. However, getting consumers to change their food behaviour won't be easy. She cited a recent Eurobarometer survey on people's food choices, indicating that cost is a key consideration whereas sustainability ranks last.

"Europeans must feel part of the food chain and feel they are contributing to change, such as reducing food wastage," she said, noting that this is an area where consumer bodies can support sustainability. "We also need to increase people's trust in food's origin and quality, especially the safety of new foods introduced to the market." Solutions to the trust deficit could involve better communication, more transparency, clearer labelling, and enhanced public-private cooperation.

A business perspective

Is money an issue for the food sector's sustainability, wondered the moderator. "Agrifood attracts lots of investment and can deliver profits

1. **Tamsin Rose**, Senior Fellow at Friends of Europe
2. **Luke Disney**, Head of Communications, Banking for Food and Corporate Affairs at Rabobank
3. **Gert Meijer,** Chair of the European Technology Platform (ETP) ‘Food for Life’ and Deputy Head for Corporate Regulatory and Scientific Affairs at Nestlé
4. **John Bell**, Healthy Planet Director at the European Commission Directorate-General for Research and Innovation

for companies," replied **Luke Disney**, Head of Communications, Banking for Food and Corporate Affairs at Rabobank, which is itself active in food and agriculture in 40 countries and works throughout the food chain. In 2018, the agrifood sector attracted some €15 billion.

Disney acknowledged several agrifood investment constraints. For instance, the sector sometimes struggles to absorb all the money flowing in or it fails to direct capital to the right places.

One of Rabobank's responses to these challenges is to work with others, such as in the AGRi3 Fund (Forest, Farmers, Food), an initiative with UN Environment. This partnership for forest protection and sustainable agriculture aims to unlock at least US$1 billion in finance for deforestation-free, sustainable agriculture and land use. Many agri-businesses have expressed interest in participating.

"This is a new type of cooperation, but it's indicative of the fact there's plenty of good innovation and cooperation in the food value chain," said Disney. He praised the increasing vertical integration of the private and public sectors, alongside farmers, within other agrifood consortia. "That's important, because we need systemic change, not small adjustments, on the path to sustainability."

Partnerships in this sector are crucial for supporting change, agreed **Gert Meijer**, Chair of the European Technology Platform (ETP) 'Food for Life'; and Deputy Head of Corporate Regulatory and Scientific Affairs at Nestlé. He said that the ETP has identified a research and innovation strategy, by thinking in a food system way and by forming partnerships.

This strategy aims to restore consumer trust in primary food producers and processors, so that they feel able to eat more healthily. Meijer added that the ETP's labelling initiatives have so far not been very successful at getting people to shift to healthier diets.

"We need all stakeholders in the food system, from business to government, to join forces," said Meijer. Plus more public-private partnerships to drive research in the sector and to grow investment in it. "PPPs are not so much a bazooka for sustainability as a guided missile!"

Meijer had two further recommendations. The importance of moving from value chain thinking to food system thinking, and ensuring that sustainability knowledge is transferred to food SMEs, as they make up 99% of the sector.

European consumers increasingly want healthy, nutritious and affordable food. Farmers struggle to match their rising demands, and to make a living while meeting environmental rules. To compound problems, the land needed to produce so much of our food is also under increasing pressure from human activities and global warming.

The IPCC perspective: land is a critical part of the solution

"Agriculture, alongside deforestation and peatland damage, accounts for a fifth of greenhouse gas

emissions," warned **Koko Warner**, from the UN Climate Secretariat and co-author of the IPCC's new 'Climate Change and Land' report. "Land is stressed by greenhouses gases and the way we produce food today – which is destroying ecosystems and natural systems. We need to feed our population and to fight climate change."

She noted that land is a critical part of the solution for a good future, because land provides the basis for all human needs. Moreover, land is a food producer and a huge carbon sink for absorbing greenhouse gases. So we need a major rethink on how we produce food, because today the food system accounts for a third of greenhouse gases and this share is still growing.

Despite the scale of the food challenge, Warner remarked there is hope and opportunities. Besides the 2015 Paris Agreement, the UN Climate Secretariat has an agricultural work programme on land use and forests. She said Europe is motivated and well positioned to act, thanks to factors like its wealth, highly educated population, the growing demand for nutritious food, and focus on protecting biodiversity. European collaboration is also beneficial, because this will become increasingly necessary as the impacts of climate change becomes more disruptive to the food supply chain.

"European consumers, producers and retailers should gather to talk more about the food sector – with a view to adjusting EU policy," said Warner. Producers are under a lot of pressure, so they must be supported and their concerns heard. Consumers want to be reassured about their food and to trust its quality.

Further opportunities lie in R&D, in fields such as waste reduction, precision farming, sustainable solutions (permaculture, forestry and farming), and new technology (sensors, drones, artificial intelligence, Internet of Things). Together these can ensure access to quality food for all, while better adapting the food system to nature and society.

Food system solutions will also be found in dynamic management resources, including regulation, climate change management and technology. "Transformative change brings benefits, including fewer greenhouse gases from the transport of food, income diversification for farmers, and more equitable benefit-sharing along the full food chain," said Warner. She agreed the path ahead is difficult, but said the potential results – better and more nutritious food and a more secure food supply system – are worth the effort.

Parallel workshops

Three workshops – consumer participation, proteins and digitalization – examined the challenges and opportunities of transitioning to a more sustainable food system in Europe. Each of the three workshops was opened by a short video[1] showing consumers interviewed by EIT Food on the same questions discussed in the workshops.

Participants engaged in a lively discussion and came up with a series of challenges and opportunities presented to the following plenary session by the moderator.

Challenges and opportunities were summarized in six key themes. Each theme was discussed by two parallel roundtables, which were given the task of delivering recommendations to the EU for future R&I projects and policy interventions.

[1] People: https://www.youtube.com/watch?v=JPtuiKaBYqQ
Protein: https://www.youtube.com/watch?v=_vlHoB4Jpl8
Digitalization: https://www.youtube.com/watch?v=Hag8T2dS5XM

PARALLEL WORKSHOP I

Taking consumers on board to revolutionise the food system

With the participation of: **Anna Wissman**, Coordinator of the Network on Food Policy Councils; **Alexandra Nikolakopoulou**, Head of Unit, Food Information, Composition and Waste at the European Commission Directorate-General for Health and Food Safety; **Brij Sahi**, Chief Executive Officer at SwissDeCode

Co-create a new vision for a food system that meets society's balanced needs

The food system should be citizen-led, locally based and bring together multiple stakeholders and enable actors who don't usually meet to share ideas. Forums facilitating this 'open participatory process' should be long-lasting and inclusive. The challenge now is to 'nudge' producer, retailer and consumer behaviour to make the food system more sustainable.

Food value chains must be shortened to increase efficiency and sustainability, by reducing food transportation. Food policy should be designed locally, with buy-in from cities and local authorities to ensure success in the EU's Green New Deal and farm-to-fork scheme.

Data and digital: ownership, sharing, transparency and trust

Technology has great potential in the food industry, although this is still poorly communicated. For instance, DNA testing of food would increase transparency, enabling consumers to understand what is in their processed food and protecting consumers with life-threatening food allergies. So technology can increase trust between the consumer, producer and retailer.

It would be useful to create an online evidence registry, gathering all successful food policies and making these publicly available. Policymakers could use this registry to improve policy and scale up initiatives.

Ensure ethics and fairness in the transition

Food labelling should be easier to understand, for example there should not be 60 different words for sugar, and the consumer should be able to know immediately whether a food product has sugar in it.

Bringing people together: producers, retailers, consumers

Food organisations and institutions must work collaboratively, while NGOs should collaborate with institutions to bring specific issues to the table. In Cologne, for example, 1,000 people volunteered to create a written action plan on urban agriculture, backed by an online

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1. **Marja-Liisa Meurice**, Director CLC North-East at EIT Food
2. **Linda Grieder**, Chief Executive Officer at RethinkResource
3. **Pekka Pesonen**, Secretary-General of COPA-COGECA

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consultation. This participatory approach helped engage citizens in the process and fostered a sense of collective ownership.

Behaviour change: target everyone, include everyone

We need mass public education and engagement on food, supported by social media and increased advertising. Committee anchor institutions, such as schools, can open up conversations and influence consumer behaviour. Children from an early age should be educated about food waste, nutrition and sustainability.

Food is an emotional topic, so there must be credibility before there is trust. The credibility of (new) food and/or food systems requires increased public understanding. Technology can be employed to increase public trust in food, while taxation systems can incentivise positive behaviour by making healthier and more sustainable products less expensive, and vice-versa. For example, PlantLab, a Dutch company, and EIT Food created focus groups[2] to see if citizens like the idea of commercially growing vegetables indoors on walls (vertical farming). Most participants had not or had heard very little about vertical farming. Nevertheless, after explaining what vertical farming is, including its advantages and disadvantages, the majority saw the potential of using the technology for food production.

Food is also universal, so how do we engage people from low-income backgrounds who don't participate in these conversations, or the elderly and other subjects who normally are not interested in these issues?

We should ignore negative groups and those reluctant to change food systems. By focusing efforts on those who want to change, others will likely follow.

[2] More about the project: https://www.eitfood.eu/public-engagement/projects/cultivating-engagement-a-citizen-participation-forum-on-vertical-farming

PARALLEL WORKSHOP II

Proteins: The battle for the centre of the plate

With the participation of: **Helene Miller**, European Regulatory Affairs Specialist at Aleph Farms; **Pekka Pesonen**, Secretary-General at COPA-COGECA; **Gijs Schilthuis**, Head of Unit for Policy Perspectives at the European Commission Directorate-General for Agriculture and Rural Development

Co-create a new vision for a food system that meets society's balanced needs

The food system must be inclusive, sustainable and high in nutrition. It should also be fair to farmers and support them. The European Commission must support the development of new protein options, but farmers remain the key producer of protein for the foreseeable future.

Data and digital: ownership, sharing, transparency and trust

There is a clear need for testing and transparency throughout the meat system and the new protein systems. DNA technologies and blockchain technologies will enable new levels of trust between producers and consumers. This will be vital for new products, such as lab-grown meats, where trust is likely to be very low at first.

Enable new market opportunities for farmers

One way of reducing emissions in the protein system is to encourage the sustainable growth of plant-based proteins. Thanks to new farming techniques, crops such as lentils and cultivated fungi can be carbon sinks, reducing the impact of proteins from greenhouse gas emitting animals. By switching to plant-based proteins, we can use less water and reduce the amount of methane released into the atmosphere. Alternative protein crops can provide farmers with new market opportunities, especially when they are converted into higher-added value products, appealing to consumers' taste and preferences.

Ethics and fairness in the transition

If the transition to different food production and consumption patterns needs to be fair, there are multiple aspects and potential trade-offs to consider. Everyone needs protein, so it must be available and affordable for consumers. Society must also be fair to farmers during the transition and understand who the winners and losers might be.

For meat farmers, a switch to protein crops may be prohibitively expensive and may not suit their land. A just transition must ensure that those farmers who are able to switch are helped to do so, whilst those that can't receive support to supplement their income from other sources.

Bring people together: producers, retailers, consumers

If people are to adopt new meat alternatives, particularly laboratory-grown meat, they must be connected with the producers. Producers should educate consumers on the processes behind these new meats and reassure consumers the product is safe. Moreover, producers must discuss the base ingredients and other resources used, including their carbon and water footprints.

Lab-grown meat may seem a scary new technology today which many consumers do not trust yet. But in the future, this perception might change and the technology might become widely accepted. However, farmers in this protein workshop said there will always be a hunger for traditionally produced meat.

Behaviour change: target everyone, include everyone

Proteins, particularly meat consumption, are a key area to focus on for behavioural changes.

If the protein sector is to achieve sustainability, average meat and fish consumption per person must be reduced. It will require a combination of nudge tactics for consumers, making vegetarian alternatives more appealing. This can be done through education, pricing and cultural changes.

Reducing meat consumption requires people to change their diets and what they put on their plate, rather than just removing the meat. This means teaching people how to cook vegetarian dishes, by teaching new dishes and showing how these can be substituted into existing family favourites. Education is key to ensuring that nutrition levels are maintained, whilst encouraging people to reduce their meat consumption.

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1. **Wolfgang Wohlgemuth**, Senior key expert on future human-machine interaction at Siemens AG Digital Industries

2. **Brij Sahi**, Chief Executive Officer at SwissDeCode

3. **Cécile Huet**, Deputy Head of Unit for Robotics and Artificial Intelligence at the European Commission Directorate-General for Communications Network, Content and Technology

PARALLEL WORKSHOP III

Transforming food production and consumption with digitalization

With the participation of: **Cécile Huet**, Deputy Head of Unit for Robotics and Artificial Intelligence at the European Commission Directorate-General for Communications Network, Content and Technology; **Linda Grieder**, Chief Executive Officer at RethinkResource; **Wolfgang Wohlgemuth**, Senior Key Expert on R&D Future of Human Machine Interaction at Siemens Digital Industries

Co-create a new vision for a sustainable food system

Society needs clear objectives for a future food system and the changes we can expect for the money invested in technology, including digital technologies. A major aim is to increase the food supply chain's efficiency, transparency and to open the local ecosystem via new flows of information, connecting food producers and consumers.

A further goal is to merge 21st century technology (digitisation) with technology from the 20th century (biology). However, digitisation is only one tool for the food system.

Key challenges include addressing the lack of trust in machines making decisions and producing high-quality food. How can the digital revolution support the food revolution?

Data and digital: ownership, sharing, transparency and trust

Data widely helps with food and consumption, including ethics, the environment, and traceability risks. Digitisation can enable 'last minute' purchases (avoiding food waste), fresh food collection in rural areas, and support forward forecasting (i.e. for crop planting).

Many questions are raised about food data – such as how to collect, measure and sort it. We need more transparency on this data and their use, to encourage the flow of data and ensure it is correctly owned. Data sharing on food is important, especially to get farmers to evolve their methods, and it should stay accessible to citizens.

We need to check where technology helps the food system, e.g. through barcodes and apps which provide information on food products' quality and health risks. But technology shouldn't be pushed at any cost and farmers must be involved.

Data and sensors are easy to use in monoculture, but remember that Europe is complex, with different environments and different consumers. Digital tools can be complex for farmers, so technology must be used with care. How do we apply lessons learned in one area to other areas?

Ethics and fairness in the transition

Digitisation and technology can help with business social compliance (tracking social issues in value chains) and ensuring respect of human rights in food production. Questions remain over food technology's economic impact: how do we measure it, how is this impact distributed (i.e. who are the winners and losers); should we focus on economic issues, the environment or health?

Goals include developing technology for responsible production and ensuring digitisation benefits all users (small companies, farmers and consumers) and the whole ecosystem. Can we help farmers invest in new technology? Through digitization, big food companies can make more efficient production streams. But most producers are small, so can they get any help to benefit from the efficiency gains?

Enable new market opportunities for farmers

Digital can bring more efficiency and quality in agriculture and food production. Promising technology includes distributed sensors, robotics (e.g. milking cows), Artificial Intelligence, Internet of Things, precision farming (up to 90% less fertiliser/pesticides), and precision fermentation.

When data about more efficient and sustainable farming practices are collected and shared with consumers, they can allow consumers to see a product's added value. This can open up new market opportunities for the farmers, and in turn it can attract young farmers to the profession or ensure existing farmers keep their jobs.

Digital technology can also help link farmers who have under-utilized by-products or side-streams with companies which may have the process and technology to exploit those streams and convert them into valuable products. For instance, the jam industry's raspberry seeds, formerly waste, can be included as exfoliants in cosmetic products. This is what the circular bioeconomy is about. It can limit waste disposal costs and generate profits from efficiency gains.

Behaviour change: target everyone, include everyone

Through the use of modern technologies, reaching out to people in the food system has never been easier. It is therefore important to ensure that everyone is included, and that communications campaigns target everyone. From producers to consumers, the whole producer and consumer chain must be aware of the expectations of each other. This will enable to improve the quality of the products as well as the health of the consumers while easing the life of the producers by guarantying predictability in production and stability in revenues.

Summary of afternoon roundtable discussions

In the afternoon, Koko Warner gave the audience an insightful presentation on the intertwined relationship between climate change and food. Koko is one of the Lead Authors of the 2019 International Panel on Climate Change (IPCC) Special Report on 'Climate Change and Land'. She is also the Manager for Impacts, Vulnerabilities and Risks at the United Nations Framework Convention on Climate Change (UNFCCC).

As a follow up, rapporteurs from the morning workshops came together to discuss the results from the various parallel workshops. They outlined the main statements and points made during their morning workshops and identified 6 key challenges and opportunities to further develop:

1. **Co-create a new vision for a food system that meets society's balanced needs**
2. **Data & digital: Ownership, sharing, transparency and trust**
3. **Ensure ethics and fairness in the transition**
4. **Enable new market opportunities for farmers**
5. **Ensure ethics and fairness in the transition**
6. **Behaviour change: target everyone, include everyone**

Stemming from this, small table conversations composed of rapporteurs and participants from the conference ran in parallel on challenges and opportunities that were identified from the morning workshop. Each table 'inherited' from one of the six themes identified at lunch time and provided a set of concrete recommendations to promote to the EU. Each roundtable lead ensured the focus is on what the EU can do to turn solutions into impact.

Outcomes of this exercise led to a set of recommendations for future Research and Innovation and Policy Interventions listed on page 2 to 4 of this document.

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2. **Alexandra Nikolakopoulou**, Head of Unit, Food Information, Composition and Waste at the European Commission Directorate-General for Health and Food Safety

3. **Hélène Miller**, European Regulatory Affairs Specialist at Aleph Farms

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