On the 21st of May, the National R&D Institute for Food Bioresources – IBA Bucharest organized the Policy Lab Workshop which preceded the conference “Circularity and Resources Efficiency of Food Systems under the Romanian Presidency of the European Council auspices with the support of The Ministry of Research and Innovation (MCI), The Executive Unit for Financing Higher Education, Research, Development and Innovation (UEFISCDI), The University of Agronomy and Veterinary Medicine, Bucharest (USAMVB) and The Academy of Agriculture and Forestry Sciences “Gheorghe Ionescu-Şișești” (ASAS).

The workshop had three sections: a plenary session, breakout sessions and the final presentation and conclusions.

The Welcome speech has been presented by: Nastasia Belc, Director General IBA Bucharest.

The plenary session included four presentations supported by representatives of the European Commission DG Research & Innovation Agri-Food Chain, Flemish Government - Department of Economy, Science & Innovation Research Division, The Research Council of Norway- Department for Environment and the Bioeconomy, IBA Bucharest/ASAS.

Maria Vasile, PhD, Policy Officer, DG Research & Innovation, Agri-Food Chain – Unit F3, European Commission. Her professional background is in food - graduated in Food technology at Dunarea de Jos University, Galati, Romania, with a special focus on agro-alimentary products - Master at University of Perugia, Italy and food biotechnology PhD at University of Bologna, Italy.

She is responsible for two thematic files - related to “new proteins” and “food and non-communicable diseases (NCD)”- of the FOOD 2030 policy framework.

FOOD 2030 initiative, which is being deployed via EU R&I Frameworks programmes (Horizon 2020 and Horizon Europe) is catalysing and aligning research and multiple forms of innovation: technological, open, social, institutional and governance innovation – to address nutrition for sustainable and healthy diets, climate-smart, environmentally sustainable and circular food systems, and empower communities.

Maria Vasile presented “Food 2030: a European vision for a global change”, a European initiative which started during the 2015 MILAN EXPO.

The presentation emphasis the need for a food systems approach which can help address the global problems: population growth, urbanization, resource scarcity, climate change, malnutrition, food waste and to increase the level of R&I impact in EU. FOOD 2030 is about applying a food system approach across the four research and innovation priorities of Nutrition, Climate, Circularity and Innovation.

There is a need: to structure EU R&I systems by convening EU services, MS & stakeholders for R&I programme alignment and leveraging of funds; to connect the "whole food value chain" via R&I: 'land & sea, 'farm-to-fork-to-gut-and back', producer-to-consumer, engaging all actors, to scale up R&I: 'digital' take-up, open innovation & open science, investment, education, skills and capacities. And this can be done by raising the political profile of R&I for
FNS (next FP9 & MFF). Further, FIT4FOOD2030 Project Coordination and Support Action for the implementation of the R&I FOOD2030 policy framework was presented with its aims and expected outcomes.

The conclusions are that the Fit4Food2030 Policy Labs:

- will help build up FOOD 2030 relevant national strategies and/or actions across different government departments (agriculture, health, environment, research), together with other actors (researchers, industry, civil society organizations, media, foundations).
- will build trust amongst themselves and a common vision/set of objectives that they can work on also beyond the life of the project.
- will be able to convene around this issue in the longer term, even after the project has ended.

**Liselotte De Vos** is a Policy Advisor in the Research Division of the Department of Economy, Science and Innovation of the Flemish Government. She holds a Masters' degree in Bioscience Engineering from the University of Ghent. After graduation, she started her career with the Flemish Government as a policy advisor for the Flemish Public Waste Agency, followed by a position in the Department of Economy, Employment and Internal Affairs and Agriculture where she was responsible for Climate Policy.

After a reorganisation of the Flemish Government in 2006, she joined the Department of Economy, Science and Innovation where she was responsible, among others, for science communication policy. She is currently responsible for the support, strategy and international cooperation of the Flemish Life Science research institutes and researchers and more specifically for the field of agro-food research.

She is a national delegate for the Programme Committee of Horizon 2020’s Societal Challenge 2 (Food Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research and the Bioeconomy). She is also a member of the Governing Board of JPI FACCE and the States Representative Group of IMI 2. Together with the Flemish Department of Agriculture and Fisheries and the Department of Well-being, Public Health and Family, she is the coordinator of the Flemish Policy Lab in the Fit4Food2030 project.

[www.ewi-vlaanderen.be](http://www.ewi-vlaanderen.be)

Liselotte De Vos presented “Flemish Fit4Food2030 Policy Lab”. After a general view on the role and function of the policy labs in the Fit4Food project, she presented the Flemish Policy Lab. In the Flemish Policy Lab, relevant departments (Department of Agriculture and Fisheries, Department of Economy, Science and Innovation, Department of Wellbeing, Health and Family) collaborate and discuss with various stakeholders to create a platform for cross-disciplinary policy for a better alignment with European policy. In March 2016, the Government of Flanders presented its new strategic outlook for the future: “Vision 2050: a long-term strategy for Flanders”. This forward-looking policy document sets out a vision for an inclusive, open, resilient and internationally connected region that creates prosperity and well-being for its citizens in a smart, innovative and sustainable manner.

The Flemish Fit4Food2030 Policy Lab was structured in four levels: the coordinators, a core group of stakeholders based on a small number of stakeholders which function as an advisory board to the coordinator group and consists of highly relevant actors, a larger stakeholder group of relevant actors and general public.
The following General Policy recommendations were concluded: coordination, and integration of initiatives; multidisciplinary approach (also social aspects); support citizen initiatives; flexible legislation: novel food, food safety <-> food losses, circularity <-> manure/fertilisers; education for adapting consumer behaviour; stimulating sustainable production methods instead of rules; feedback loop of R&I system; procurement for school meals; food bank: more sustainable food.

The following R&I Policy recommendations were highlighted: more money; funding programmes for the whole agro-food chain; focus on smaller projects; less administration; interdisciplinary research: obligation in R&I instruments; cooperation between Policy, Research and Funding Agencies; bigger Agro-Food cluster (Flanders Food).

Trond Einar Pedersen has a DPhil from SPRU (Science and Technology Policy Research) University of Sussex, Brighton, UK (2002). The topic of the thesis is technology and innovation in Norwegian mechanical industries is studied with an emphasis on how specialization and sophistication is a result of the exploitation of advanced knowledge and competence in construction (product design), and collaboration between firms, their customers, technological infrastructure and suppliers.

Pedersen has 16 years experience from research with emphasis on innovation and technological innovation as systemic phenomenon in firms, industries, regions, and nations, including studies of innovation systems e.g. mechanical industries, the energy sector, food industry, tourism and ICT.

He has performed a great number of case studies, firm visits and interviews, which have fed into his competence, a competence that has an emphasis on innovation in non-research intensive industrial activity and innovation as (driven by) something else (and more) than research. For the last eight years Pedersen has worked as special adviser in the Research Council of Norway, with responsibility for promoting bioeconomy research and innovation.

Trond Einar Pedersen presented “Policy Lab Norway-The need for Collaboration in R&I on Food, Health and Sustainability”. In his presentation he gave participants an overview of the work on promoting change in the food system in Norway. In 2010, a Report on Food and Health (status, knowledge gaps/needs, and prospects of innovation) concluded the need for collaboration to promote food and health. In early 2018, it was decided to choose FOOD and HEALTH in the process of narrowing down the topic.

The aim of Policy Lab Norway is to: improved R&I-system that promote food, health and sustainability; fund Research and Innovation through calls (researcher led projects; industry led projects; first and foremost: collaboration projects).

The results obtained so far are: network building, making people meet; build consciousness about the topic among different researchers, actors; common mindset; establish confidence between actors, in particular those with different mindsets; common understanding of the food system, visions, challenges, bottlenecks; identification, organization, ranking of topics; road map for R&I, visions; flash reports.

The presentation also showed some aspects where progress is needed: participation from a bigger variety of actors; collaborate with similar initiatives; sustainability, research and innovation; funds for calls.
Denisa Eglantina Duță is Scientific Director of IBA Bucharest, with experience in the field of food technology, food quality and design, food biotechnologies, food safety.

She acquired her PhD in Industrial Engineering within University Dunarea de Jos Galati, Faculty of Food technology (2005), being trained in the physical chemistry laboratory of the Institute of Food Research Norwich UK (Marie Curie fellow).

After seven years of work experience in food industrial sector, she joined the National Institute of Research&Development for Food Bioresources IBA Bucharest (2002).

Denisa was a national delegate for COST actions in the field of Food and Agriculture (2010-2014) and since 2018 she was nominated Review Panel Member for COST domain Agriculture and Industrial biotechnology.

She is also member of the Romanian Academy of Agricultural and Forestry Sciences.

She has been involved in different national and international projects: ERANET SUSFOOD, Eureka, ERASMUS+, Leonardo da Vinci, SEE, COST Actions, FP7, H2020.

www.bioresurse.ro

Denisa Duță presented “Policy Lab Romania”. In the first part of her presentation she highlighted the main drivers of change for 2050 and the need to change and adapt the functionality of food system. Then she explained the initiation process of policy lab Romania in Nov 2017, when a call for countries to run a FIT4FOOD2030 Policy Lab for food system transformation was launched. The main objective of these policy labs is to support the EC in developing and implementing the FOOD2030 policy framework and to align research and innovation policies and programs on Food and Nutrition Security. Two policy lab coordinators were nominated from: MCI and ASAS.

A core group was organised composed of representatives from main authorities (MCI, ASAS, Ministry of Agriculture and Rural Development, IBA Bucharest, National Technology Platform Food for Life) except Ministry of Health. The first Workshop-Policy makers’ Round table (18 May 2018 Bucharest) was supported by MCI and 3 main challenges were highlighted: building up a food waste mitigation strategy 2020-2030; innovative management systems for food authenticity; issues about food chain stakeholders’ collaboration. The 2nd Workshop with more than 40 stakeholders especially from food industry (Food Ingredients Trade Fair 11 October 2018, Sibiu), focussed on main challenges and trends for the Romanian Food System with regard to the four key Food and Nutrition Security priorities: Nutrition for sustainable and healthy diets; Climate smart and environmentally sustainable food systems; Circularity and resource efficiency of food systems; Innovation and empowerment of communities. The 3rd Workshop was focussed onCircularity and Resource Efficiency of Food Systems (21 May 2019 Bucharest) on 3 main sub-topics: food waste/food plastics-packages/food safety related to circularity. The aim of this workshop was to analyse the state of the art of the food system, to do a visioning exercise and to start to draft a roadmap.

The second part of the workshop was devoted to policy lab exercise in separate discussion groups.

The group 1, 30 participants, covered the topic Food waste/Food plastics.

The group 2, 20 participants, covered the topic Food safety.

The last presentation was sustained by Katherine Flynn.
Katherine Flynn has a PhD in Biology, 15 years in university teaching and 20 years in government and non-profit research and management.

Her work on gender- and age-specific estrogen effects yielded 20+ peer-reviewed papers, and more recent work on food science and food safety resulted in papers, invitations and guest editing.

At SAFE consortium since 2002, she participates in European projects, contributes to papers and organizes workshops. She is also Project Manager for ISEKI-Food Association since 2018 and involved in Horizon and Erasmus projects and organization management.

https://www.safeconsortium.org/

Katherine Flynn presented “SAFE consortium in the Circular Bioeconomy”. In her presentation she gave a short overview of the safe consortium - The European Association for Food Safety - a non-profit international association founded in 2002 with the aim to keep food safety on the agenda. Further she explained the importance to move from a linear bioeconomy that is no longer working to a circular bioeconomy and several principles (from 2016 EEA report): Eco-design; Repair, refurbishment and remanufacture; Recycling; Economic incentives and finance; Business models; Eco-innovation; Governance, skills and knowledge. Thus food chain by-products can be converted into high added value products and this approach can result in Zero Waste in the food chain. The name “Waste” was changed to “side stream”. These bio side streams are processed in biorefineries and materials of different value are produced. The products made from sustainable processing of bio side streams range from high volume and low value such as biofuel to lower volume and higher value such as food and pharmaceuticals. Then she explained different types of bio-refineries: Yellow biorefineries (used to convert cellulose and xylose in dry feedstock into ethanol for biofuel but also new methods have produced new, food materials: oligosaccharides which have prebiotic potential). She highlighted the fact that furans are formed from heat treatment of glucose and pentose in the wood based stock and nothing is known about potential toxicity of furans in food, so the thermal processing of biomass intended for food or feed needs careful testing.

Red biorefineries- sometimes refers to slaughterhouse side streams and sometimes to crustacean shells. Modern agriculture is very efficient and there is little side stream from today’s slaughterhouses – most of the animal is used. Nonetheless feathers from chickens and bristles from pigs, both high in protein and with tremendous potential as animal feed, have found very little use. It has therefore been suggested that „RED BIOREFINERY“ should refer not to slaughterhouse side streams but to crustacean shells.

Blue biorefineries use four principal marine sources: fish cut offs, algae, mussels and other invertebrates. Products are proteins and fats including the highly valued omega 3s. The blue biorefinery is overall highly underutilized. This is not surprising as the blue food source is also highly underutilized: 75% of our planet is water yet only 15% of our food comes from the water. Food safety risks of the blue biorefinery are the same as from blue-based food: heavy metals and POPs which accumulate in fish, as we are all well aware of mercury in tuna and the warnings to pregnant women in particular to limit tuna intake.

Then she presented a 3 ½ minute video made by SAFE member institute Matis in Iceland as an excellent summary of bioeconomy, and particularly blue bioeconomy.

In the end, she gave an example of eco-innovation in the circular bioeconomy: Traditionally the forest industry has not been connected to food and feed production. Here, however wood becomes food: side streams from the wood industry, including liquor permeate and fiber sludge, are rich in monosaccharides and other sugars. These side streams can be used as a carbon source to grow microorganisms which are rich in protein (filamentous fungi, algae, and some bacterial species). The microorganisms, called SCP or single cell protein, are mixed into fish feed replacing other more expensive less sustainable high protein fish feed ingredients. Nile Tilapia was tested with SCP
replacing up to 68% of the standard protein source in their feed—that is fish meal. And the fish grew as well or slightly better than fish fed standard feed. Aquaculture has tremendous potential to provide protein-rich food but feeding farmed fish is problematic. Fish eat fish meal and this is expensive and not sustainable. In Europe we also feed fish high protein soy, but this is mostly imported. Researchers in Iceland and Sweden, where there are plenty of forests and fish propose another diet—a diet made of wood waste.

In conclusion, the circular bioeconomy and food safety must learn to live together.

EFSA regulates novel foods, ingredients and processes and defines anything not ‘significantly’ consumed prior to 1997 as novel. Food innovation must live with, or participate in adapting these regulations. And like all couples, adapting to life together is a challenge.

In the end of the first day, the main conclusions of Policy exercises were summarised:

1. FOOD WASTE/PACKAGING DISCUSSION GROUP:

STATE OF THE ART

- Food waste is produced mainly by households (consumers)
- National policies are in force of food waste management for measuring and reducing food waste (but no clear food waste analysis is done and waste is not clearly quantified in some countries)
- A comprehensive agreement/platform for fighting food waste (whole value chain) is in place in some countries
- Fiscal facilities to organizations/people who donate food (food banks) is implemented in some countries
- Not enough existing solutions with bioresources packaging
- Food packaging is not biodegradable enough

VISION (from different countries perspectives)

- Bigger consumption of healthy products (ex. vegetables) and less meat
- More fresh products
- More short supply chains (regional and seasonal foods)
- Fast recyclable food packaging materials
- In 2030 packaging pollution will be solved by new enzymes production (specific for plastic degradation)
- All bio-based waste is used to make biogas in 2030
- Food waste is reduced by 75% in 2030
- Food reduction 50% in 2030 – 0 waste in 2050
- Norway vision: 30% reduction of food waste by 2025;
  - 50% reduction of food waste by 2030
- 3D printing food
- No plastics
- Only bioresources and biodegradable and compostable food packaging
- Antimicrobial packaging
- Digitalization and biodegradable packaging
- More value of residual side streams: more research and more valorization

DRAFTED ROADMAP

<table>
<thead>
<tr>
<th>The main actions to be implemented:</th>
<th>Responsible organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Quantification of food waste</td>
<td>National authorities</td>
</tr>
<tr>
<td>2 Research and innovation for bioplastics</td>
<td>R&amp;D units and companies</td>
</tr>
<tr>
<td>3 European rules/laws for waste management</td>
<td>Countries + EU</td>
</tr>
<tr>
<td>4 Consumer education (young generations from high school)</td>
<td>Universities + government</td>
</tr>
<tr>
<td>5 Valorization and side production (by products), incentives for companies</td>
<td>Companies and R&amp;D units</td>
</tr>
<tr>
<td>6 Short supply chains</td>
<td>Companies, R&amp;D units and local</td>
</tr>
</tbody>
</table>
2. FOOD SAFETY DISCUSSION GROUP:

**STATE OF THE ART**

- **EU projects** commonly stop after 3-5 years and practical implementation of the results is still limited. (HORIZON EUROPE project with innovation potential should have opportunity to pass their results through review process for better implementation)
- **Laboratory testing:**
  - Costly for detecting contaminants (i.e. pesticides); difficult access for the farmers to the laboratory facilities;
  - Existing rapid methods for contaminants determinations
- **Lack of education** for producers (farmers, industry, suppliers, end users, consumers for a healthy lifestyle)
- **Lack of information for consumers** (unclear information for labels for the end user)
- **Agriculture** (Lack of clear regulation and legal framework for soil agrochemicals)
- **Cooperation** (weak links between food and people health; farmers, producers, processors, retail and consumers rarely work together)
- **Multidisciplinary** (IT not used for traceability and integrity; Interdisciplinary research due to the entire value chain; research looking variety quality for a better health)
- **Regulations** on soils for agricultural purposes
- Not enough **legislation** on food safety related to secondary raw materials (wastes) and by-products; unclear labelling regarding the safety health impact; improve the food safety requirements; harmonization with EU legislation but also a support to implement and correlated between products; increase awareness for using more the food safety standard not only 22000, but all series; the same standards for one category of food in EU
- **Control of food.** Weak control on food, there is a need for more lab testing methods for traceability and authenticity. Need of tools for measuring metrology, traceability and data comparability
- Current existing **dietary guidelines** and generic public health are of limited value in achieving significant improvement to diet, health and sustainable food choices
- Increase the awareness of **certifications organization** for deeper and more real check of the conformity in more details; increase awareness of involved organization for day by day. Maintain of the comply with requirements
- Much money for safety foods for improvement of quality for low application, one real application of legislation on the whole chain of food

**VISION (from different countries perspectives)**

- Food safety to have a boarder approach including social, environmental and nutritional aspects
- Food for people, not for selling = the vision of the producer
- Balanced Nutrition, not eating = eating behavior
- Keeping food safety is costing, but should NOT be negotiated
- Short chains not too much intermediaries (limited by law to 2-3)
- R&D&I will be the future of food policies
- Food chain more transparent
- More healthy years for life
- Power to realize the young people dreams
- Healthy body (without illness)
- Stimulate and encourage small producers for fruit and vegetables
- [Increase] Number (percentage) of 22000 certified organizations applying for unannounced audits will lead to a food safety constant
- Food labels with info about health implications of various chemicals (by QR code or other)
- Trusted checked food provider
- e-commerce ➔ more informative and pictured
A very strict traceability, a more deep policy of storage

<table>
<thead>
<tr>
<th></th>
<th>The main actions to be implemented:</th>
<th>Responsible organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>National policy programs</td>
<td>National authorities</td>
</tr>
<tr>
<td></td>
<td>More control on food chain</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Higher engagement of local authorities for improving local production chains</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enhanced use of national standards on food safety and technical aspects</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Anticipations emerging hazards + risk assessment methods + study exposure</td>
<td>National authorities, R&amp;D units and companies</td>
</tr>
<tr>
<td></td>
<td>Intensify risk communication</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Open data traceability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dedicated research programs based sensitive topics regarding food safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tight collaboration between R&amp;D and policy maker</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Multi sectoral research programs</td>
<td>R&amp;D units and companies</td>
</tr>
<tr>
<td></td>
<td>Health by good quality products (prevention)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interdisciplinary research for preventing the illness caused by unsafety foods</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IT for traceability, integrity, transparency</td>
<td></td>
</tr>
<tr>
<td></td>
<td>New methods of plant breeding in research</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Education</td>
<td>Universities + government</td>
</tr>
<tr>
<td></td>
<td>Multidisciplinary researches</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Food clusters</td>
<td>Companies, R&amp;D units, local authorities</td>
</tr>
<tr>
<td></td>
<td>Development collaborative platforms</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Curricula for training, Educate the farmers, producers, suppliers, consumers</td>
<td>Universities + VET</td>
</tr>
<tr>
<td>7</td>
<td>More involvement of the retail sector, the main interactor with final consumption. Retailers already have large data- basis on behavior of their consumer and they may/ can contribute to the influence of the consumer habits</td>
<td>Stakeholders</td>
</tr>
<tr>
<td>8</td>
<td>Involvement of consumers association in educating people regarding food safety</td>
<td>consumers association</td>
</tr>
</tbody>
</table>