JOINT **CONFERENCE**

Data4Food 2030 × TITAN

Innovative Approaches to Build Sustainable Supply Chains and a Fair Data Economy for a Better Food System

17 / 18

June — 2026 — Sparks, Brussels, Belgium

CONFERENCE **HIGHLIGHTS**

oral presentation slots

poster presentations

awards for young scientists

SME marketplace with **exhibitors**

awards for SMEs

dedicated **networking**

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Foreword

Focusing on "**Innovations to build sustainable supply chains in a fair data economy for a better food system**", the conference showcased the results of the two major European projects while bringing together researchers, industry leaders, startups, policymakers, and investors. It highlighted how innovative technologies can strengthen agrifood supply chains, advance the fair data economy, and support the transition to a more sustainable food system. Besides presenting project outcomes, the conference was designed to facilitate dialogue and initiate future collaborations. By connecting science, industry, investment, and policy, it seeked to create new partnerships and accelerate real-world impact.

Participants engaged with 4 thematic tracks:

1. **Enhancing food safety and reducing food fraud**
2. **Driving informed decisions for consumers**
3. **Building sustainable and traceable supply chains**
4. **Developing the data economy through data spaces**

This event would not have been possible without the dedication of the members of the Organising Committee and Scientific Committee:

TITAN	**DATA4FOOD2030**
Isabelle Guelinckx, ILSI Europe, Be	Mireille van Hilten, WUR, NL
Edward Sliwinski, EFFoST, NL	Eva Maes, ILVO, Be
Andrea Colafranceschi, ILSI Europe, Be	Isabelle Piot-Lepetit, INRAE, Fr
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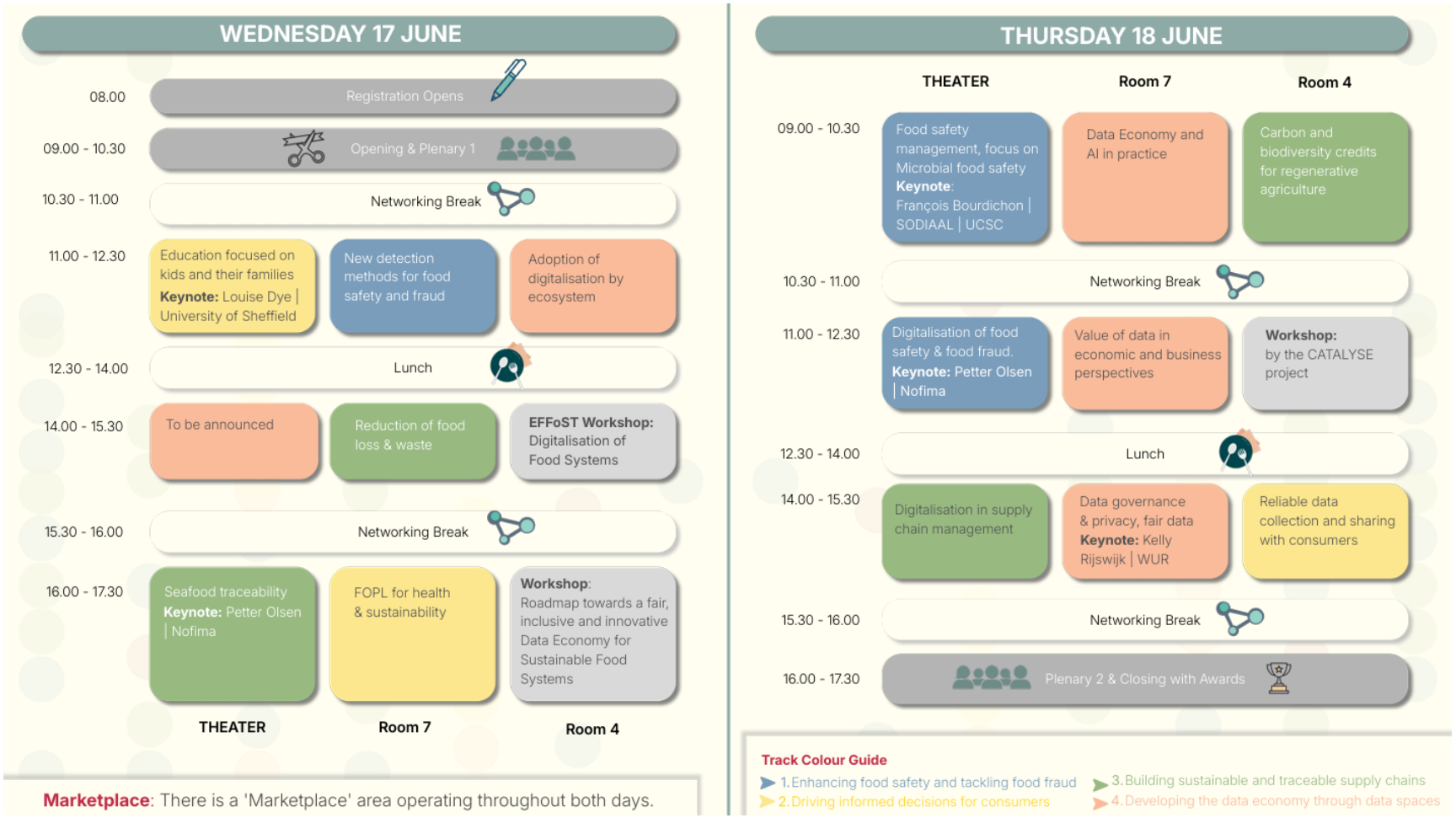
Afroditi Karapliafi, EFFoST, NL	Dimitra Fourkalidou, Reframe Food, Gr
Gabriela Versteeg, EFFoST, NL	

We are grateful to all contributors—organising committee, consortium partners, speakers, poster presenters, and attendees—for making this conference a success. We hope this collection of abstracts will serve as a valuable resource for advancing research, innovations and collaborations in the field of food supply chain transparency and fair data economy.

Program overview of the Conference



Abstract of Oral Presentations

Opening Session

Collaborative Research for Food System Transformation.

Roberta Sonnino

Abstract not available

EU policy developments in support of food system transformation.

Wim Haentjens

Head of Sector for Bioeconomy DG Research & Innovation European Commission

In his keynote, Wim Haentjens from the European Commission's Directorate-General for Research and Innovation (DG RTD) presented the EU policy perspective on food systems transformation, highlighting the strategic role of research and innovation (R&I), digital technologies, and data-driven solutions in creating sustainable, resilient, and competitive food systems.

The presentation revisited the foundations of the Food 2030 framework, developed in response to the "perfect storm" facing global food systems: increasing population demands, persistent malnutrition and obesity, environmental degradation, and climate pressures. The EU adopted a systemic approach to R&I programming recognising the interconnected nature of food-related challenges and identifying key intervention pathways, including digital and data transformation, alternative proteins, food waste reduction, and urban food system transitions. In this framework, both Horizon Europe projects entitled TITAN and DATA4FOOD2030 were funded.

While the urgency to transform food systems remains high, the current geopolitical and economic context has added new priorities, particularly competitiveness, resilience, and strategic autonomy. Haentjens stressed that food and agriculture are strategic sectors for Europe, requiring continuous investment to maintain economic performance while achieving environmental and social goals. Digital technologies, data infrastructures, and artificial intelligence are considered essential enablers of this transformation, provided that their benefits are distributed fairly across the food system.

The European Commission continues to place food system transformation at the centre of its policy agenda, with strengthened support for R&I and increasing focus on the full innovation and investment journey—from scientific discovery to market uptake and large-scale deployment. Future research agendas and funding instruments will therefore prioritise not only the development of innovative solutions but also their

scaling and implementation, ensuring that Europe can translate research excellence into tangible societal and economic impact.

Fair and Inclusive Digital Innovation for Agrifood Systems Transformation.

Henry Burgsteden

Office of Innovation, Food and Agriculture Organization

Abstract not available

Track 1. Enhancing food safety and reducing food fraud

Session | *New detection methods for food safety and fraud*

Faster and Decentralized Cultivar identification: A Miniaturized DNA-Based Strategy for Transparency in the Olive Value Chain

Lidia Barreira [1], Marta Prado[1], Andrey Ipatov [2], Carla Teixeira [2], M. Pilar Calo-Mata [1]

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Olive oil is among the food commodities most vulnerable to adulteration, driven by its high economic value, compositional complexity, and increasingly globalized supply chains. Among the different fraudulent practices, the substitution of local cultivars with alternative ones is one of the most commonly reported forms. However, current methods of analysis are time consuming and not amenable to be implemented in decentralized settings. The development and implementation of rapid, cost-effective, and portable analytical solutions are particularly important to enable routine monitoring and on-site verification, thereby strengthening transparency along the olive oil value chain and protecting both consumers and legitimate producers. We report the development of a custom SNP genotyping assay, which enables highly specific, and reproducible detection of allelic variants using fluorescence-based real-time PCR. The approach employs allele-specific fluorescent probes that hybridize to target DNA sequences during amplification, each containing a fluorophore–quencher pair that generates a signal only upon perfect complementarity with the corresponding SNP allele. The proposed approach demonstrates that a reduced panel of highly informative SNP markers can effectively be used for cultivar identification in olive-derived matrices. We have developed a miniaturized device to perform this analysis onsite. The device is a compact fluorescence detection box for analyzing multiple reaction tubes, integrating UV and green LEDs for controlled excitation, a darkened chamber to reduce interference, and an ESP32-based camera for image capture. Fluorescence is identified using an image-based machine learning model (Edge Impulse), with sequential illumination enabling discrimination between FAM and VIC despite their similar spectra. The system provides a low-cost, portable, and automated solution for fluorescence analysis.

EFF-CoP – Strengthening the fight against food fraud through novel education methods

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The EFF-CoP (European Food Fraud Community of Practice) project aims to revolutionise the combat against food fraud and enhance transparency in food supply chains. By establishing a Research and Innovation ecosystem, EFF-CoP bridges the gap between researchers, governments and industry.

This presentation will outline some of the educational practices and training-related outcomes developed within the project. This work includes an extensive inventory of existing training courses on food fraud prevention and detection, resulting in a searchable database on the EFF-Hub website. The mapping was paired with the Hennessy-Hicks Training Needs Analysis (TNA) Questionnaire to find gaps between available materials and required knowledge. This assessment was validated by the European Food Fraud Education group, another initiative of the project consisting of a collaborative network of educators teaching food fraud prevention and detection.

Moving forward, insights from the TNA will inform the creation of a serious game. This will expand upon the project's educational toolkit, which recently featured an educational escape room and serious game, during the Authentic Food Festival & Conference at the end of May.

FishTell – Testing fish freshness using a portable NIR/ML technology

Isabel Hoffmann [1], Hugo Alves [1]

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Fish freshness is an issue of major concern for the fish industry. Traditional evaluation methods, such as sensory evaluations and laboratory assays, are time-consuming, and require trained personnel and/or laboratory equipment. Near-infrared (NIR) spectroscopy coupled with machine learning (ML) is a promising tool for the determination of the K value (Zhou *et al*., 2019), which is considered a robust readout of fish freshness (Ehira *et al*., 1987; Hong *et al*., 2017; Jia *et al*., 2021). The K value is based on adenosine triphosphate (ATP) breakdown into downstream molecules that occurs post-mortem (Saito *et al*., 1959; Huss, 1995). A K value of less than 20% indicates very fresh fish (e.g., suitable for raw fish consumption, as required for sashimi in Japan, where quality standards include K value determination), 20-40% categorises fish that is still fresh but needs cooking before consumption, and a K value of more than 40% is found in fish unsuitable for human consumption. Tellspec developed a portable NIR/ML-based quantification method to estimate the K value in real-time in sea bass, a key Mediterranean species, scanning either at skin or lateral muscle level. Following established sampling protocols (Özogul *et al*., 2005; Zhou *et al*., 2019), this project analysed a robust dataset covering a wide K value range and the initial results confirm that predicting K value in sea bass using a portable NIR sensor is technically feasible. Moving forward, Tellspec aims to increase sample diversity to improve predictive capacities and expand to other species to support EU-level policy for testing raw fish before consumer delivery, similarly to Japanese practices for raw fish consumption. Further optimisation and larger datasets will enable real-time, on-site fish freshness assessment for suppliers, retailers, regulators, and consumers, enhancing food safety while reducing waste by helping divert still-fresh fish to cooking/processing instead of discarding.

Miniaturized DNA Extraction and Colorimetric LAMP Modules for On-Site Detection of Sesame Traces on Food and Food Processing Surfaces

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Undeclared allergens and cross-contamination during food production represent major risks for individuals with food allergies. Even trace levels can trigger severe reactions. There is a clear need for sensitive, accurate, and portable tools that can support real-time allergen monitoring in food processing environments. Loop-Mediated Isothermal Amplification (LAMP) coupled with a simple sample preparation strategy; offers high specificity and sensitivity in short time. This study presents the development of two miniaturized modules for on-site allergen detection: a DNA extraction unit based on Microscale Solid-Phase Extraction (μSPE), and a LAMP module with colorimetric detection for rapid DNA analysis. Both modules are designed for integration into a micro–Total Analysis System (μTAS), enabling a streamlined workflow from sample collection to visual detection. This system was tested on bakery preparation mixes and with swabbed stainless-steel surfaces contaminated with sesame traces to mimic food production facilities. Performance was assessed against a commercial extraction kit and qPCR. The results reveal that the extraction module provides DNA of sufficient quality for amplification, while the colorimetric LAMP module enables rapid, sensitive, and user-friendly naked-eye detection of sesame DNA without the need for complex instrumentation. The combined performance of both modules highlights their potential for effective on-site allergen monitoring. Ongoing work focuses on full system integration and validation with complex, low-DNA-content samples. This integrated approach supports improved allergen risk management, enhances food safety practices, and contributes to more reliable and transparent food labelling.

Food safety: a competitive asset to share with your peers

François Bourdichon [1]

[1] SODIAAL International Paris France

"Food Safety is precompetitive" might be one of the most misleading phrases wrongly promoted in Food Safety Conferences.One should refer to the 2019 FAO Mantra that preludes the launch of the World Food Safety Day: "If it isn't safe, it isn't food" (https://www.fao.org/newsroom/story/If-it-isn-t-safe-it-isn-t-food/en). Food safety is freedom to operate. And food safety per se is one of the most competitive asset of a food business regardless of its size. If one does not produce safely, one has nothing to seel and will be very fast out of business. Food Safety Culture is now part of the EU Regulation Framework (EU/REG 2021/382). Apart from KPI boards in factory settings, it emphasize the central role of food safety (and by extension quality) to ensure business continuity. To stay ahead of the pack, innovation is also needed in food safety. The landscape is however pretty challenging between regulatory hurdles and sometimes hard to define return of investment. This is the scope of the EU Project CATALYSE (https://thecatalyseproject.eu/): scientific innovation into food safety action through community of practice and best practice sharing.There lies the paradox in food safety: it is indeed competitive, but not an asset one can keep for itself. It has to be communicated with all stakeholders: regulatory, consumers association, competitors. During the talk, we will discuss how you make it happen internally from a company's perspective, and how you share it with your peers (and also learn from them).

Advancing microbial surveillance in plant-based foods through innovative molecular approaches: outcomes from the TITAN Project

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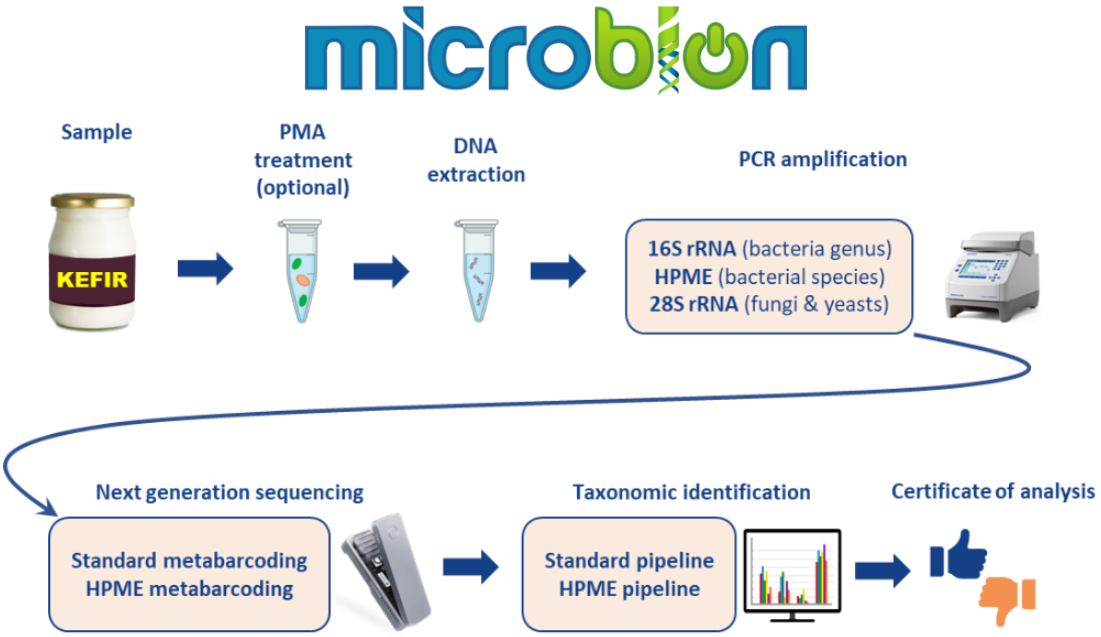
The rapid expansion of the plant-based food sector is increasing the need for innovative tools to ensure microbiological safety across increasingly complex production and supply chains. While conventional culture-based methods remain essential, they often require long analysis times and may not fully capture microbial diversity in novel food matrices. In this context, advanced molecular technologies provide valuable complementary solutions, enabling faster, more sensitive, and more informative detection of microbial hazards.Among microorganisms of concern, species of the genus Bacillus, particularly Bacillus cereus, represent a significant risk for plant-derived products. These bacteria can produce toxins linked to foodborne illness and form highly resistant endospores able to survive adverse conditions such as heat treatment and low water availability. Rapid identification and characterization of these microorganisms is therefore essential to support effective food safety management. Within the TITAN framework, advanced molecular approaches were evaluated to enhance microbial surveillance in plant-based food matrices. Third-generation sequencing, implemented using the portable MinION platform, was investigated as an innovative tool for real-time microbial DNA analysis. Its long-read capability enables rapid taxonomic profiling and facilitates identification of Bacillus species directly from complex samples, reducing reliance on time-consuming culture enrichment. In parallel, loop-mediated isothermal amplification (LAMP-PCR) was assessed as a rapid screening method targeting toxin-associated genes linked to Bacillus cereus. This approach provides reliable results in a short timeframe and requires minimal laboratory infrastructure, making it suitable for routine and decentralized testing. The combined use of long-read sequencing and LAMP assays enables rapid taxonomic profiling alongside targeted toxin gene detection.Overall, results from the TITAN project demonstrate a complementary approach to enhance microbial risk assessment in plant-based foods through faster detection and improved surveillance, supporting more effective food safety management for producers, regulators, and other stakeholders. The proposed screening approach may also benefit the infant food sector and the monitoring of fermentation-derived ingredients.

High resolution analysis of multi-species probiotics and fermented foods by NGS innovative molecular markers for product label verification

Antonio Del Casale[1], Alessandro Roncador [1], Ilenia Campedelli [1], Fabio Fracchetti [1] Manola Zanetti [1], Chiara Tezza [1], Marta Tebaldi [1], Patrick De Marta [1]

[1] Microbion Srl Verona Italy

Analysis of the microbial composition of multi-strains probiotic and fermented products is a challenging task. NGS metabarcoding brought great advantages as fast analytical method to understand the microbial communities' composition for research purposes. However, its application in industrial settings for quality control and stability check of probiotics, fermented foods and other products containing microbes, is very limited by the low biodiversity of species used for manufacturing of such products and by the lack of standard methods that can distinguish strains belonging to same species. The newly developed method brings together **fast and standardized approach of NGS metabarcoding** with an improved accuracy in distinguishing close related species and subspecies; therefore, it allows the verification of the microbial composition reported on labels through the combination of standard markers and **Highly Polymorphic and Modular Extragenic** markers (HPME). HPME markers are intergenic highly variable sequences flanked by conserved coding sequence that allows PCR primers design. The protocol includes DNA extraction, PCR amplification, full-length markers sequencing on Oxford Nanopore Technologies (ONT) platform, and an in-silico comprehensive analysis based on the comparison against a manually curated qualified database. The method has been first validated on mock communities and then successfully applied for the identification of all species and subspecies present commercial probiotic products and drinkable milk kefir products of the Italian market, which have been produced using different microbial cultures and therefore claiming to bring different bacterial communities to the consumer. **The combination of 16S and HPME based metabarcoding allowed to distinguish phylogenetically close related species and sub-species, revealing the actual microbial biodiversity of each product.** While all probiotics analyzed confirmed the species and subspecies reported on labels, on the other hand, in milk kefir samples some species claimed were not detected in the product (40%). Interestingly, in some milk kefir samples we analyzed the yeast populations with similar approach, detecting additional species not reported on labels. Moreover, our method can be further improved by implementing a Propidium Monoazide (PMA) step, that allows to focus the analysis to the viable cells only, for a more accurate verification of the viable biodiversity claimed in the product label.



Caption: NGS metabarcoding workflow

Mapping food safety educational material resources: Classifying quality material and identifying gaps and priorities for future learning materials

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Food Microbiology, Wageningen University & Research, Wageningen, the Netherlands

The increasing complexity of food systems, driven by technological developments, emerging hazards, and evolving regulatory requirements, creates a growing demand for high-quality educational resources in food safety. Understanding the extent to which existing materials address current educational needs is essential for supporting effective knowledge transfer and capacity building across the food sector. Therefore, a systematic assessment of publicly available food safety educational resources was conducted to identify areas where additional educational development is needed. Educational materials were collected through an extensive search of online repositories, educational platforms, webinar libraries, scientific dissemination channels, and general web-based sources. To ensure broad applicability and accessibility, the search focused on identifying food safety resources relevant to different stakeholder groups, including the interested public, students, professionals, and experts. The search covered five stakeholder-prioritised thematic areas: control measures, detection methods, digitalisation and artificial intelligence, hygiene by design, and packaging innovations. Additional attention was given to cross-cutting topics identified as important by stakeholders, including emerging risks, food microbiological analysis and techniques, food safety culture, regulatory compliance, and tools for monitoring and detecting hazards. The identified materials were subjected to a three-stage evaluation process based on predefined scientific, educational, and technical criteria. Approximately 7,000 resources were screened, of which fewer than 5% met the established quality requirements. Suitable materials were classified, described, and incorporated into the repository to facilitate their accessibility and use by different target audiences. Among the selected resources, materials were predominantly found in the domains of control measures and food safety culture, while resources addressing new tools for monitoring and detecting hazards were particularly limited. In addition, limited availability was identified for topics including emerging risks, packaging innovations, and detection methods. These findings reveal substantial differences in the availability of quality educational resources across food safety domains and demonstrate the need for targeted educational development in underrepresented areas. To address these gaps, a new portfolio of food safety educational materials is being developed, including webinars, videos, podcasts, online learning modules, and other digital resources tailored to the needs of diverse stakeholder groups.

Session | *Digitalisation of food safety & food fraud*

Detecting, and preventing food fraud by identifying discrepancies in data – Methods and approaches

Petter Olsen
Nofima

Abstract not available

DjustDetect: Data sharing platform for more efficient and effective GMO and NGT control

Isabel Taverniers [1] Kathleen Van de Walle [1], Pieter-Jan De Temmerman [1], Samuel Bosch [1], Stephanie Van Weyenberg [1], Marc De Loose [1]

[1] ILVO Merelbeke Belgium

Ensuring compliance with the EU General Food Law - more specifically, with the regulatory framework governing GMOs (genetically modified organisms) and products derived from NGTs (new genomic techniques) - is fundamental for guaranteeing consumer protection, transparency, trust and safety in the agri-food chain. In this regulatory context, the availability, accessibility, and intelligent use of data have become useful tools. One of the aims of the DETECTIVE project is to improve the traceability of products made with NGTs by using a knowledge-based, data-driven approach. The project is building a federated data space, called DjustDetect. The goal is to compile data and information, to make it accessible through the data sharing platform DjustConnect, and to use it in function of data-driven approaches for GMO/NGT detection. The shared responsibility of operators and competent authorities in meeting EU food law requirements is the starting point in this presentation. It shows how both traceability and enforcement efforts can be substantially improved through the use of federated data spaces and advanced analytical tools, including AI and machine learning. By developing interconnected databases and knowledge graphs, authorities gain the ability to conduct more targeted, risk-based official controls. Heterogeneous data sources - such as existing GMO- and NGT-databases (containing e.g. DNA sequences and detection methods), plant variety registers, breeders and seed producer registers, satellite imagery and other regional data sources – will be integrated into a secure, harmonized platform. Using knowledge graphs and Machine-Learning tools, the system will enable advanced data search, analysis, and insight generation. These insights will help identify critical points in value chains where NGTs or GMOs in general are present that are not compliant with the legislation. End users of such ML-based tools can be government agencies, enforcement laboratories, food businesses, and farmers. Ultimately, the aim is to reach more with less efforts. Systematic data collection, structured, trustable and interoperable data sharing, and advanced analysis tools are essential tools in Good Regulatory Science. Analytical confirmation and data-driven proactive risk

management will become complementary essentials in the rapidly evolving landscape of GMO and NGT detection and control.

Food Safety trends across Europe: Insights from the 392-million-entry Comprehensive European Food Safety database (CHEFS)

Floor van Meer

Wageningen University

Abstract not available

AI-E abled Supplier Risk Intelligence Using FOODAKAI for Due Diligence and Risk Ranking

Babis Thanopoulos
Agroknow

Abstract not available

AI-Based Automated Pollen Analysis and QR Transparency for Honey Origin Screening

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Reliable information on the botanical and geographical origin of honey is essential for consumer trust, market differentiation and compliance with emerging European Union (EU) labelling requirements. Melissopalynology is a main method used to characterise honey origin through pollen analysis, but its manual, labour-intensive and expert-dependent nature limits routine use by beekeepers, packers and quality-control operators. HoneyAI is an affordable automated digital microscope combined with artificial intelligence (AI) for on-site honey analysis by non-expert users (pollen, yeasts, crystals and more). Within the TITAN project, HoneyAI has been further developed as a digital screening tool to support verification of declared botanical and geographical origin. The system does not replace official confirmatory laboratory methods or make legal fraud determinations; instead, it identifies pollen profiles, atypical pollen assemblages or inconsistencies with declared origins, enabling producers and control bodies to prioritise suspicious batches for expert follow-up. Region-specific AI models have been trained using representative pollen datasets to improve screening performance for target origins, and the platform has been assessed for its capacity to distinguish naturally occurring pollen from exogenous corbicular pollen potentially added through fraudulent practices. Complementary indicators, including yeast quantification and starch detection, provide information on quality risks and potential non-compliant practices such as the use of exogenous syrups in bee feeding. In parallel, HoneyAI has been evaluated and adopted through the InnoBuyer programme with Spain's Laboratorio Arbitral Agroalimentario (LAA), an official agri-food control laboratory, supporting application in inspection workflows. A key innovation is the integration of a QR code linked to each analysed batch. The QR interface, commercially launched in Spain by summer 2025 and already used by few honey packers, provides consumers with accessible, data-based information on botanical and geographical origin, real pollen images and educational content explaining pollen, monofloral honeys and local honey production. By connecting automated AI-based microscopy with consumer-facing transparency, HoneyAI offers an affordable technology to strengthen producer responsibility, support risk-based fraud screening and prepare the sector for just landed new EU origin-transparency directives for labelling.

Track 2. Driving informed decisions for consumers

Session | *Education focused on kids and their families*

Promoting positive dietary change - from behavioural to reformulation strategies focused on children and adolescents.

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Changing dietary behaviour and influencing consumer choice to bring about health benefits and increase consumption of healthier more sustainable products is challenging. Telling people what and what not to eat often fails for reasons which range from taste and cost to understanding and proximity of the message to the health outcome. Increasing fibre intake is a good example – people may hear that eating more fibre is beneficial for health and can prevent diseases but if those diseases occur later in life or if the foods suggested as high in fibre are not appealing, palatable and accessible the intention to consume more fibre will not translate to behaviour. Fibre intake has been promoted by public health campaigns across Europe. Simultaneously, the food industry has implemented reformulation and innovation efforts to increase fibre in products with varying degrees of success. Despite these efforts, fibre intakes have remained low in many European countries including the UK and remain below the current recommendations. There are excellent examples of public health-industry partnerships which aim to increase fibre intake. For example, the Danish Wholegrain partnership (DWP) aimed to make it easier for Danes to consume wholegrain by increasing availability and make wholegrain a natural part of the daily diet. The DWP was successful in increasing products available carrying a wholegrain label, almost doubling fibre intake of the population as a whole. In this presentation we focus on how to apply learnings from the DWP to the UK (and by implication other European countries). This presentation will consider barriers to changing diets and strategies that can be employed ranging from reformulation to exposure in anchor institutions such as schools e.g. via school breakfast programmes. Strategies to improve fibre intake in schools can improve attendance, punctuality and behaviour and narrow the gaps between children who are most deprived and their peers and could reduce health inequalities in the long term. The resources required to achieve a healthy diet have been significantly impacted by the cost of living crisis and food at school has become an important buffer for families. Health by stealth approaches which consider reformulation to increase fibre in familiar foods/products could be one of the most effective methods but requires technical innovation in terms of taste, texture, acceptability and affordability.

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Taste lessons – A sensory-based food education programme for primary schools

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Smaaklessen (“Taste Lessons”) is a food education program for Dutch primary schools, aiming to support the development of healthy and sustainable eating behaviors through sensory-based learning. The program is grounded in experiential learning theory and engages children with food through all five senses. The lessons are structured around five key pillars: taste, health, food production, consumer skills and cooking. Educational materials are designed with a positive and playful approach, while being objective and free from commercial influences. Smaaklessen is closely aligned with national curriculum frameworks for food education (SLO), core learning objectives in Dutch primary education and international goals such as the Sustainable Development Goals. Over the past two decades, research has examined the effects of Smaaklessen on children’s food-related attitudes, preferences and behavioral intentions. Effect studies show that Smaaklessen increases children’s knowledge about food and makes them more willing to try unfamiliar food and to consume a more varied diet. In combination with the EU School fruit and vegetable program, Smaaklessen has been shown to further increase fruit and vegetable consumption, particularly among children who receive less stimulation for healthy eating at home. Key working elements underlying the effectiveness of Smaaklessen include familiarization with new flavors and textures through repeated exposure, experiential learning, learning in a positive and safe environment and parental involvement.

Fruttalù - An educational activity designed to stimulate learning about food sustainability issues.

Martina Giulianelli [1]

[1] OpenDot Foundation ETS Milano Italy

Food education in schools is key to shift citizens' behaviours towards sustainable eating, by targeting children with the goal of building their knowledge and awareness for future informed choices. However, the food topic is not yet included in the school curriculum, and the way food educational resources are designed is often ineffective, not only because of the complexity of the topic but also due to these resources not being embedded in teachers' and educators' approaches and processes. We are OpenDot, a foundation based in Milan (Italy) committed to social innovation, co-designing solutions with and for people and communities; and we are part of CUES, an EU-funded project addressing the urgent need for a more sustainable food system that benefits the environment, society, and the economy. Within CUES OpenDot has been creating and testing FRUTTALU', an educational path for children aged 8-10, including those with migrant backgrounds, conceived to stimulate learning about food sustainability concepts - such as seasonality and food origin - through play, imagination, and collaboration. The work originated and developed from the dialogue with the Community Education Pact of Valdilana - grouping over thirty local organisations such as NGOs, municipalities, sports associations, and schools in the area of Valdilana (Italy) collaborating on children education - that have helped shape the format of the educational path. FRUTTALU' is grounded on concepts such as inquiry-based learning, peer-to-peer exchange, experimentation, and the role of teachers and educators as facilitators. Through an engaging storytelling and design-futuring methodology, children are brought into the imaginary planet of Fruttalù, a magical place where animal guides and talking fruits and vegetables lead them in exploring foods, knowledge and information. The educational path is divided into 3 steps - discovery, awareness and action - and it's supported by a personal diary which accompanies children in daily investigation around the topic of sustainability of food, and which also functions as a qualitative research tool for understanding the impact of the methodology. FRUTTALU' is currently tested in the Pettinengo school with 21 students, including children with migrant backgrounds and in June, we will bring results useful for evaluating the effectiveness of the methodology and content proposed.

Co-created school-based Intervention to Promote Adolescents' Healthy Eating: Insights from the Tuscany Living Lab

Chiara Ferravante [1]

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Promoting healthier and more sustainable eating behaviors in adolescents is a public health priority and a shared global challenge. In the Piana di Lucca and Valle del Serchio District Zones (Tuscany Region, Italy), the prevalence of overweight and obesity among youth reflects eating habits that diverge from Mediterranean Diet recommendations. Within the European FEAST project (feast2030.eu), the Tuscany Living Lab designed and implemented a co-created school-based intervention with middle and high school students to promote healthier and more conscious eating habits. A total of 110 students from two secondary schools participated in a longitudinal observational study. A baseline questionnaire was administered to assess eating habits, food literacy and factors influencing dietary behaviors. These findings informed a co-creation process in which students contributed to defining priorities and topics. The resulting intervention consisted of seven theoretical and practical modules focusing on food literacy and specific eating behaviors such as consumption of breakfast, legumes, fruit and vegetables, as well as reducing intake of sweets and junk food. Ten months later, a follow-up questionnaire was administered, and qualitative feedback was collected to explore perceived benefits and engagement. Pre-post descriptive analyses indicate a significant overall improvement of 30% in adherence to the Mediterranean Diet ($p=0.004$). Notable increases were observed in the consumption of legumes (23%), a second daily serving of fruit (22%), and an additional serving of vegetables (17%), alongside a significant rise in the perceived ease of consuming fruit and vegetables ($p<0.0001$). Food literacy improved by 40% ($p=0.0147$). Qualitative analyses highlighted a strong appreciation for the intervention and offered valuable inputs for shaping new projects. To facilitate replication, an "Education Toolkit" with ready-to-use resources for middle and high school teachers was developed.

Session |*Labelling for health & sustainability*

NutriScore - general / BEL

Laurence Doughan, Belgian Ministry of Health

Abstract not available

Uncovering food purchase patterns with Hidden Markov Model

Anna Ruokolahti, Tampere University

Abstract not available

Open Food facts: A food knowledge commons for Transparency, Open data, and Informed choices.

April Bilbrey, Open Food Facts

Abstract not available

Impact of looking at food through a single health and environmental sustainability lens - the Sus-Health Index

Joe Livingstone [1] , Leona Lindberg [1], Eva Leanne Thomas [1], George Hutchinson [1], Beatrice Smyth [1], Jelena Vlajic [1], Anne Nugent [1], Jayne Woodside [1], Paul Brereton [1]

[1] Queen's University Belfast Belfast United Kingdom

Changes in dietary patterns are essential to reduce diet-related environmental impacts whilst contributing to good health. This work takes the concept of a single measure for expressing the nutritional *and* environmental impact of a food or meal (the Sus-Health Index) and demonstrates its utility in real-life settings in Europe. The Enviroscore and Nutrient Profiling Model (NPM) are used to calculate the environmental impact and nutritive value of a meal. The scores are then combined using the composite indicator methodology and a 1:1 weighting to produce the Sus-Health Index. The index can be presented quantitatively or qualitatively on a scale of A (best score) - E (worst score). The index was applied and tested using a framed field experiment methodology in commercial restaurants, first in Belfast, Northern Ireland, and then in Seinäjoki, Finland, the latter facilitated by Queen's University Belfast, University of Helsinki and the Seinäjoki University of Applied Sciences. Following the experiment in Belfast, the experimental protocol was digitalised (as part of the TITAN project) to allow participants to complete the questionnaire and menu choices on their mobile phones and in additional languages. Three treatments were used in each experiment: 1) Menu 1- baseline menu with meal descriptions; 2) Menu 2- menu with meal descriptions and corresponding Sus-Health scores; 3) Menu 3- menu with meal descriptions, corresponding Sus-Health scores and price adjustments (20% discount) for meals with A-B Sus-Health scores. Meal selections were made for each menu and the menu served was selected at random. 111 participants took part in Belfast with a further 125 participants in Seinäjoki. In Belfast the addition of Sus-Health labels increased the choice of A-B meals selected from 50% in Menu 1 to 64% in Menu 2, while price adjustments resulted in a further increase to 77%. In Finland the Sus-Health labels increased the choice of A-B meals from 63% to 73%, while price adjustments resulted a decrease to 70%. These results indicate that the Sus-Health Index was successful at influencing consumer meal choices within these restaurant settings, offering a low-cost and effective means of influencing consumers to make improved food choices in the out-of-home sector. An online tool is also under development as part of the TITAN project to allow a wider range of consumers (and industry practitioners) to access Sus-Health Index information and apply it to their own recipes.

Session | *The importance of healthy school meals and education for kids and adults*

Update on results from SchoolFood4Change project

Peter Defranceschi, ICLEI

Abstract not available

Gaming aspects in education

Kristin Hetze, GE AR

Abstract not available

Giant Leaps: "Future of Food Challenge" - Educating the next generation on alternative proteins

Gloria Bevilacqua, Europe Media / Raquel Diaz Flores, EFFoST

Abstract not available

TITAN online Education

Anna Alekseeva, EFFoST

Abstract not available

Session | *Reliable data collection and sharing with consumers*

Food businesses as co-designers of communication strategies, tools and sustainability practices to consumers

Marianna Faraldi [1] Gabriele Rivoltella [1]

[1] TECNOALIMENTI S.C.p.A. Milan Italy

CUES is a research and innovation project funded by the European Union's Horizon Europe programme that addresses a key constraint affecting the transition towards more sustainable food systems: the widening gap between sustainability practices along the food value chain and how consumers understand and trust them. The project aims to foster a Triple Change in the food system, across culture, food value chains and policy, by starting from the premise that sustainability information is not neutral or self-explanatory, but socially constructed, interpreted and negotiated within everyday food environments. Against this backdrop, CUES investigates how sustainability-related information can be designed, contextualised and communicated in ways that are meaningful, credible and actionable for citizens. Methodologically, CUES adopts an Intervention Research approach, integrating the co-development, implementation and evaluation of practical solutions in real-life settings. This approach is operationalised through nine targeted interventions and a series of policy dialogues, all developed within a structured multi-actor participatory framework. Continuous interaction among stakeholders ensures that project activities are grounded in real-world practices and that outcomes emerge iteratively rather than being predefined. Actors from across the food value chain are involved throughout all phases of the project. Within this framework, food businesses are positioned not merely as subjects of regulation or sources of data, but as key intermediaries linking production practices, regulatory requirements and consumer expectations. Their role extends beyond compliance to active co-design of communication strategies, tools and practices aimed at enhancing transparency, traceability and trust, drawing on their operational knowledge, market experience and consumer-facing communication expertise. Food value chain change is fostered through a participatory process implemented through interactive sessions conducted in four countries (Iceland, Italy, Hungary and Greece). These sessions support the joint identification of challenges related to transparency and traceability, the definition of key sustainability messages, and the co-design of context-specific communication solutions. Digital tools are tested to improve the clarity, accessibility and impact of food-related information, with the ultimate goal of enabling more informed and reflective consumer decision-making.

Governance as the Foundation of Consumer Data-Sharing in Digital Food Systems

Xuelin Zhang [1] Siavash Farahbakhsh [1], Eva [1]

[1] ILVO Merelbeke-Melle Belgium

This research aims to explore the role of data and digitalization in supporting informed food-related decisions by consumers, especially in the context of healthy diets, sustainability, and trust in food systems. While apps, QR codes, AI-based tools, and blockchain are often promoted to guide consumer decisions, they only work well if the underlying governance structures make sure data is collected, shared, managed, and presented properly. Building on conceptual development and iterative design processes within the Horizon Europe research project, FoodDataQuest, a governance framework was developed to link the food value chain with the data value chain. This framework covers interoperability, strategy, governance, the infrastructure, and processes to enable meaningful data flows toward consumers. Ongoing UCs have shaped the development of AI-based nudging concepts for healthier, more sustainable diets, as well as dashboards that show social and environmental information in a clear way. In parallel, within the Horizon Europe project SPOON**,** a governance framework for citizen-generated food and consumption data helped explore how rules and structures affect the responsible data-sharing and data-use and perceived value of personal data in food contexts. The results suggested that simply having digital tools was not enough. Helping consumers made informed choices also relied on data governance, which ensured transparency, fairness, data sovereignty, and alignment with what consumers care about.

Data4Food Case Study 6: Towards globally harmonized and scalable sustainability assessment for all food

Emil Georgiev [1], Koen Boone [1] Roel Helmes [1], Tummers Joep [1], Erin Killeen [2]

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[2] THE SUSTAINABILITY CONSORTIUM Tempe, AZ United States

D4F Case Study 6. This abstract presents our case for globally harmonized and scalable sustainability assessment for all food, and a practical theory of change that helps retailers, financiers, governments, and consumers embed sustainability in everyday decisions. The core need is one consistent way to measure product-level environmental impact across all food categories. Our early approach—global, harmonized, short questionnaires (via The Sustainability Insight System (THESIS), by The Sustainability Consortium) to collect primary data—proved difficult to scale due to high data collection costs and low response rates. Moreover, the use of incompatible methods for product environmental assessment produced non-comparable results, reducing usability for retailers and, in turn, eroding suppliers' incentives to invest in better data. Attempts have been made to break through this situation by developing digital-twin models for all possible food supply chains worldwide, including their associated emissions. Using simple product specific information that is easily available for all products (e.g., ingredients, packaging, location of production, processing and consumption) and connecting these to harmonized emission models yields to consistent, transparent, and reproducible first-pass impact estimates at the product level (even when suppliers provide no data). Because these first-pass results are immediately useful for portfolio screening, procurement, finance, and consumer communication, they create credible demand signals that motivate suppliers to submit more specific product data. As higher-quality data flows in, estimates converge toward decision-grade precision while keeping burden low. We illustrate the concept with two use cases: (1) linking THESIS with a tool producing these digital twins in two contrasting categories (Milk; Curtains) to show how harmonized mappings and integrated scorecards translate hotspots into operational levers; and (2) the Global Sustainability Transition Alliance (GSTA), which develops an open and harmonized methodology and background database so different digital twin models lead to the same results. The outcome is a path that reduces dependence on closed databases, accelerates harmonization, improves reproducibility and scalability, and in this way establishes a level playing field—enabling all stakeholders to integrate sustainability into procurement, product design, portfolio management, investment, and policy decisions.

Harmonizing food environment labelling across Europe: The LIFE Eco Food Choice project

Zoe Coudert / Koen Boone , ADEME & Wageningen Social & Economic Research

Abstract not available

Empowering Sustainable Food Choices: A Dual Dashboard Approach Integrating Farm-to-Fork Data

Esther Van Parys [1] Ella Deroo [1], Eva Maes [1], Stephanie Van Weyenberg [1]

[1] ILVO Merelbeke-Melle Belgium

To address the increasing demand for climate-conscious food production and healthier diets, Use Case 3 of the FoodDataQuest Project is developing a proof-of-concept (PoC) web application that delivers product-specific insights on sustainability and social impact. Through developing both a consumer and retail dashboard, both up- and downstream key challenges are tackled such as fragmented data sources, limited transparency in product sustainability, and the absence of dietary guidance. The retail dashboard demonstrates the technical feasibility of integrating diverse datasets, including Life Cycle Assessment (LCA) data from dairy and pig farms, circular feed impact data and animal welfare scans. This enables retailers to make informed procurement decisions and support climate action at farm level. Parallel to this, a consumer-facing application is being developed to provide personalized dietary advice. Based on user-provided and open-source data, we will generate consumer personas reflecting dietary habits and purchasing preferences. These personas will guide tailored recommendations that emphasize circularity through combining personal data with supply chain insights. Next-generation barcodes are being explored to enhance product traceability and consumer engagement. Ultimately, the use case aims to validate and share primary farm data together with non-conventinal datasets e.g. animal wellfare, social indicators and circularity with food processors and retailers, feeding into tools that promote healthier and more sustainable purchasing choices. This approach represents a novel integration of environmental and social data streams, empowering both retailers and consumers to make informed, sustainable food decisions.

Sustainable public purchasing for schools and city canteens

Tamara Bruning, City of Ghent

Abstract not available

Track 3. Building sustainable and traceable supply chains

Session | *Reduction of food loss & waste*

Technology application for food loss measurement in primary production: inspiration from the Foulou project

Wouter Maes, Ghent University

Abstract not available

Development of a fully automated inventory system for the hospitality sector

Charlotte Aschim, TotalCtrl

Abstract not available

Mapping and quantifying food Waste Flows in the Amsterdam Metropolitan Area using complementary data approaches

Guo [1] Heuer [1], Harbers [1], Sileryte [2], Genke [1]

[1] Wageningen Food & Biobased Research Wageningen Netherlands
[2] GeoFluxus Rotterdam Netherlands

This study estimates food waste generation in the Amsterdam Metropolitan Area (AMA) to support circular economy strategies in urban food systems. It uses two complementary methods: a bottom-up approach based on administrative waste registration data and a top-down approach based on national statistics, sector studies, and standard loss factors. The bottom-up approach uses detailed waste records. These are processed using machine-learning-based classification of waste descriptions and linked to economic activity codes to identify food-related waste across different stages of the supply chain. This method provides detailed spatial information on where food waste occurs, but it is limited because not all food waste is identifiable, and some flows are missing or incomplete. To complement this, a top-down approach estimates food waste across primary production, processing, retail, and food service sectors using aggregated production data and literature-based loss rates. This provides a broader system-level view of food waste generation. Comparing the two approaches shows that they provide different but complementary insights. Administrative data helps locate and map waste flows, while the top-down method captures losses that are not recorded in official waste systems. Differences between the two methods are especially large in upstream stages of the supply chain. Overall, combining both approaches provides a more complete understanding of food waste in the AMA and supports the development of better-informed circular economy policies and targeted interventions in food systems.

The Pomurje Model: Joining Regional Forces to Reduce Food Loss and Waste in Short Food Supply Chains

Tomaz Zadravec [1]

[1] ITC MURSKA SOBOTA Murska Sobota Slovenia

Food loss and waste (FLW) is fundamentally a coordination problem. Producers lack visibility into market demand, processors are not aware of surplus, and consumers and institutions rarely receive timely signals. In Slovenia's Pomurje region, a predominantly agricultural area where FLW exceeds the national average, this fragmentation is both visible and costly. Addressing it requires regional actors to recognise that the problem is shared and that joining forces is worth the effort. The ZeroFLW case study, developed within the DATA4FOOD project, is exactly such a regional effort. At its centre is the Green Point (Zelena točka) short food supply chain, connecting over 70 local farmers, food processors, logistics actors, and retail and HORECA partners with consumers and public institutions. ITC – Innovation Technology Cluster, operating the EDIH AGRIFOOD hub and an ENOLL-certified Living Lab, served as the orchestrating actor, facilitating a multi-year co-creation process with all stakeholders. The outcome is two complementary regional tools. The DIH AGRIFOOD Data Space (DADS) allows every actor, such as farmers, processors, retailers, advisors, municipalities, and institutions to share data on their own terms, under agreed governance rules, without surrendering ownership or control. The CircEco surplus marketplace connects this data layer to direct action, enabling actors to match, redirect, and valorise surplus food before it becomes waste. For data providers, this means better planning, reduced post-harvest losses, and improved surplus matching. For data users and FLW community actors such as developers, policymakers, the Statistical Office, cities, and educational institutions, it creates a trusted, operationally validated source of regional FLW intelligence. Grounded in a living lab process and inclusive multi-stakeholder co-creation, the Pomurje model demonstrates that a rural region can develop systemic, scalable solutions when the right actors commit to sharing both data and responsibility. This session shares the lessons of that journey and what other regions can replicate.

From Time Pressure to Waste Reduction: Digital Efficiency in the Fresh Produce Ecosystem

Vincent Rosso [1]

[1] Consentio Barcelona Spain

In the fast-paced world of fresh produce, effective time management is critical, particularly given the unique challenges posed by the perishable nature of products. This practice abstract delves into a targeted suite of tools by Consentio, crafted not only to optimize productivity but also to play a pivotal role in reducing food waste—an even more pressing concern in the realm of fresh produce, where time is a significant obstacle due to the limited shelf life of goods.

Session | *Seafood traceability*

Traceability and fraud in seafood supply chains, and the potential role of blockchain technology

Petter Olsen [1]

[1] Nofima Tromsoe Norway

Traceability is very important in supply chains for food, but the concept is often misunderstood, and a variety of conflicting definitions exist. This presentation will clarify and define what traceability is, and what the components of a traceability system are. An overview of drivers for implementation of improved traceability systems will be presented, with particular emphasis on the relevance of traceability when it comes to preventing and detecting food fraud. Food fraud, and a variety of related terms, was recently defined in the European “EN 17972:2025 - Food authenticity and fraud – Concepts, terms, and definitions” standard which will be briefly outlined. To ensure some degree of authenticity and integrity of the data once recorded, basing your traceability system on blockchain technology / Distributed Ledger Technologies (DLTs) can provide an advantage, and this presentation will attempt to answer the question “Should your (sea)food traceability system be based on blockchain technology?”.

Do you know where your seafood is coming from? The long journey of seafood traceability

Sébastien Metz [1], Daniel Verweij [2] Marieke De Ruyter de Wildt [2]

[1] Sakana Consultants Brest France
[2] OpenFoodChain Amsterdam Netherlands

The global seafood industry is a complex, multi-billion-dollar network that spans oceans, continents, and cultures, feeding billions of people worldwide. However, behind every fillet of fish or shrimp cocktail lies a hidden journey, one often damaged by environmental degradation, human rights abuses, and opaque supply chains. As consumers increasingly demand transparency, sustainability and ethical sourcing, the concept of seafood digital traceability has emerged as a critical tool to bridge the gap between catch and plate. But what does digital traceability truly entail and how can it help solve the problem? Based on a pilot developed during the Titan project, this presentation explores the intricate path seafood takes from fishing vessels, aquaculture farms and coastal communities to supermarkets, restaurants and homes. It explores the difficulties of contemporary seafood supply chains, where child exploitation, forced labour, illegal, unreported, and unregulated (IUU) fishing, and false labelling are still widespread. With reports of modern slavery on fishing vessels and in seafood processing companies, the need for robust traceability systems has never been more urgent. Technological innovations such as blockchain, DNA barcoding and satellite monitoring are revolutionising how we track seafood. However, implementing these systems is not without obstacles: fragmented regulations, lack of industry-wide standards, and the sheer scale of global trade create significant hurdles. The presentation will highlight how the fish chain was developed, based on an open-source blockchain technology and how it was adapted to match the specific requirements of seafood traceability, including the use of the standard developed by the Global Dialogue on Seafood Traceability. It will address the role of certification schemes like MSC (Marine Stewardship Council), BAP (Best Aquaculture Practices) and ASC (Aquaculture Stewardship Council) in driving accountability. Beyond technology and policy, the discussion will emphasise on the hurdles facing companies that want to implement such solutions, from sectoral acceptance and mistrust, to irreconcilable silos.

Main outcomes of VeriFish EU project

Siân Astley, EuroFir

Abstract not available

TunaTech: AI-powered fishing efficiency and end-to-end traceability

Iratxe Arraibi, Zunibal

Abstract not available

Multi-stage image based approach for fish detection and weight estimation

Axel Streit, WU

Abstract not available

Session | *Sustainability in food production and processing*

Supporting SME-s in their innovation journey.

Dušan Pevac, Future Systems Hub

Abstract not available

The development of carbon credits in almond farming

Felipe Nuncio, Agri MarketPlace

Abstract not available

An introduction to biodiversity credits

Casper Zulim de Swarte, ex-WBC

Abstract not available

A Continental Framework for Biodiversity Risk Assessment in Europe Under Climate and Land-Use Change: Supporting Nature-Positive Decisions Through BioFIN

Siham Eddamiri[1] , Christopher Brewster[1,2]

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[2] Data Science Group, TNO, Kampweg 55, Soesterberg, 3769 DE, The Netherlands

Biodiversity loss in Europe threatens ecosystems and the services they provide, driven by climate change, land-use change, and other anthropogenic pressures. Essential ecosystem functions are increasingly undermined, as reflected by rapid responses in indicator bird species, which serve as reliable indicators of ecosystem health. Despite policy initiatives such as the European Green Deal and the EU Biodiversity Strategy, there remains a lack of scalable and transparent frameworks for quantifying biodiversity risk at the European level. Existing approaches remain limited by insufficient integration of ecological change into financial and investment decision-making. To address this gap, we developed an integrated framework within the BioFIN-EU project. Using indicator bird species, we combined historical and projected climate data, land-cover datasets, and machine learning methods. We derived bioclimatic variables (BIO1–BIO19) under multiple Shared Socioeconomic Pathways and developed ensemble species distribution models using Random Forest, XGBoost, LightGBM, CatBoost, and Support Vector Machines to predict habitat suitability up to 2060. We further developed a composite biodiversity risk index integrating habitat loss, climate change pressure, land-cover pressure, and conservation capacity, enabling the identification of ecological hotspots, vulnerable regions, and potential climatic refugia across Europe. The proposed framework supports financial decision-making by identifying where ecosystem degradation may generate economic losses, reduce natural capital value, and increase transition risks for biodiversity-dependent sectors. It also supports biodiversity governance, conservation planning, restoration prioritization, climate adaptation, and investment prioritization under emerging nature-related disclosure and sustainability requirements.

ENVIRODIGITAL: New software to assess, reduce and communicate the environmental footprint of food and drink products

Saioa Ramos, AZTI

Abstract not available

Paulig portfolio assessed against 8 different sustainability metrics

Karin Jonnson, Paulig Group

Abstract not available

Enhancing Sustainable Agri-Food Supply Chain Traceability through Agricolus Digital Decision Support

Matteo Cardinali [1]

[1] Agricolus srl Perugia Italy

Climate change, rising input costs and increasing sustainability requirements are making agricultural decision-making more complex and uncertain, both at farm and supply-chain level. Farmers and agri-food stakeholders are required to improve efficiency, reduce environmental impacts and ensure transparency, while operating under increasing climate variability, price volatility, rising production costs and stricter environmental and market requirements. Within the TITAN project, Agricolus enhances its digital decision support platform with advanced, lot-level traceability tools designed for agri-food supply chains. The solution has been specifically developed and tested in tomato and rice production systems, addressing the operational, economic and sustainability challenges of these value chains. The traceability functionalities have been co-designed with farmers and agronomists, ensuring alignment with real farm-level practices and decision-making processes. The platform integrates heterogeneous data sources, including field records, satellite imagery, monitoring technologies, weather conditions, agronomic and forecasting models, decision support systems and sustainability indicators. This integrated digital framework enables continuous, lot-level traceability from the field to downstream stages, providing a comprehensive and structured view of production data to support transparency, sustainability assessment and informed decision-making along the supply chain. By combining decision support and traceability, Agricolus supports data-driven farm management, optimised use of inputs such as water, fertilisers and crop protection products, and the monitoring of key sustainability indicators related to resource efficiency and environmental impact. The approach improves transparency and comparability along the supply chain, supports sustainable production practices and contributes to more resilient and competitive agri-food systems in the context of climate change.

Building resilient food systems with traceability technology - The first 100% traceable and EUDR compliant chocolate bars.

Marieke De Ruyter, Open Food Chain

Abstract not available

Introduction to the program to evolve the MSC standards to embed digital traceability and using interoperability

James Cardwell, MSC UK

This presentation introduces the Marine Stewardship Council's Traceability Enhancement Program (TEP), an initiative designed to strengthen trust, transparency, and digital assurance across seafood supply chains. The MSC is the leading independent ecolabel and certification program for wild-capture seafood with over 20.9% of global marine catch engaged in the program. Its theory of change links certified sustainable fisheries, through certified supply chains, market demand, and consumer confidence. Against a backdrop of growing regulatory requirements (EU IUU Regulation, U.S. SIMP and FSMA-204, and emerging rules in Asia),, the presentation highlights the increasing need for standardized digital traceability to combat illegal, unreported, and unregulated fishing (IUU) and food fraud, in an industry that remains highly fragmented and often paper-based.

The TEP aims to evolve the MSC Chain of Custody requirements, so certificate holders collect traceability data in standardised, digital formats aligned with GS1 EPCIS and the Global Dialogue on Seafood Traceability (GDST) interoperability standards. The program aims to enable automated verification of traceability data through an interoperable digital tool capable of randomized checks, anomaly detection andred-flag scoring, to streamline the third-party audit process, while protecting commercially sensitive data. By adopting event-based traceability through Critical Tracking Events (CTEs) and Key Data Elements (KDEs), the TEP seeks to support the adoption of common data standards across diverse seafood supply chain actors with varied systems and technological maturity, to exchange data more seamlessly. Proposed benefits include improved sector alignment on traceability data capture, flexibility for partners to choose digital systems that fit their needs, reduced audit burden, faster traceback testing, and more frequent data verifications, to increase assurance of the MSC program.

The presentation concludes with a phased timeline from pilots and technical testing through expanded real-world supply-chain trials, policy development, voluntary rollout, and a longer-term pathway toward 2030.

Uncovering the optimal fit between organizational structures and digital tools within the selected EU Agri-Food Supply Chain Networks

Dengxiao Lang [1] , Verena Otter [1]

[1] Wageningen University & Research Wageningen Netherlands

Efforts to enhance transparency and sustainability in European agri-food supply chain networks (AFSCNs) are increasingly linked to digitalization. Yet adoption outcomes differ widely across sectors and firms. A key challenge is understanding how organizational structures and contingencies shape the ability of agri-food SMEs to integrate digital tools into their relational and operational networks. Existing studies provide partial insights into technological readiness and stakeholder interactions, but rarely investigate how digital tools interact with organizational structures and managerial decision-making processes at the supply-chain level (Otter and Robinson, 2024). This research presents the conceptual and methodological foundation for an agent-based modelling (ABM) framework that aims to uncover the optimal fit between organizational structures and digital tools in EU AFSCNs. Building on the Contingency-Netchain-Performance (CNP) framework (Lazzarini et al., 2001; Otter et al., 2014) and the results from prior project work on stakeholder identification, stakeholder classification, and transparency-related norm strategies. It integrates internal and external firm contingencies and examines how they shape managers' strategic choices regarding digital tool adoption. Secondary data and empirical survey data from 250 SMEs across several EU countries will be used to parameterize the ABM. The model will simulate decision dynamics across netchain actors, exploring how different organizational and technological configurations influence supply-chain collaboration patterns and SME performance. The expected contributions include: an empirically grounded modelling approach for digital transparency governance, novel insights into contingency-specific adoption pathways, and actionable recommendations for SMEs and digital start-ups navigating transparency-driven transformation. Reference: Lazzarini SG, Chaddad FR, Cook ML (2001) Integrating supply chain and network analyses: The study of netchains. *Journal on Chain and Network Science* 1, 7-22 Otter V, Engler A, Theuvsen L (2014) The influence of the interplay of supply chain network relationships on farmers' performance in the Chilean NTAE sector. *Journal on Chain and Network Science* 14, 149-169 Otter V and Robinson DM (2024) Transparency and changing stakeholder roles in the digital age of sustainable agri-food supply chain networks. *Front. Sustain. Food Syst.* 8:1449684. doi: 10.3389/fsufs.2024.1449684.

R&I pathways for blockchain implementation in the agri-food sector – the findings of TRUSTyFOOD project

MariannaFaraldi Faraldi [1], MariannaFaraldi Faraldi [2]

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European policies envision a future which is characterized by a sustainable, resilient, and fair agrifood sector. Blockchain can play an important role in fostering such transition, but only if we learn from the past mistakes and try to plan new pathways. TRUSTyFOOD project, funded by the European Commission under the Horizon Europe Framework Programme, dedicated the last three years mapping and collecting information on existing applicative use cases, hearing from supply chain players and experts making emerge evidences and supporting future policy decisions in this regard. 13 beneficiaries in the TRUSTyFOOD consortium and more than 200 external stakeholders from 19 countries contributed to the achievement of the strategic ouputs summarised in a R&I Roadmap, three more technical White Papers, one Policy Brief, and a 'Framework of Services' intended as a "one-stop-shop" for stakeholders throughout the food supply chain to access information and insights related to blockchain implementation. The speech will briefly present where Europe stands today, the intrinsic value of Blockchain exploitable in the global agri-food sector, the enabling conditions for success stories, who can benefit more from blockchain considering that it is not a one-size-fits-all solution applicable horizontally to each firm, challenges to implementation and suggested areas for improvement. Three strategic transdisciplinary research areas have been identified to close the gap between technological potential and practical adoption and quickly move towards the achievement of the visions to 2030-2050 where digitalisation is confirmed as the baseline and blockchain is embedded: (i) Capacity building and skills development, (ii) Technical needs and digitalisation, (iii) System economics. Blockchain in agri-food sector represents a digital tool able to reshape the food system and to make it more transparent, accountable, safe and sustainable, but it is important to push urgent policy actions for the creation of regulatory frameworks domain-specific as well as investments in R&I able to overcome current challenges. Europe stands at a decision point where strategic R&I investment can position us as the global leader in responsible blockchain adoption for sustainable food systems. Not acting now means falling behind regions that are moving more decisively, weakening food safety and crisis response, as well as missing the opportunity for green and transparent food systems.

Track 4. Developing the data economy through data spaces

Session | *Adoption of digitalisation by ecosystem*

Update of Results from FishEUTrust,

Sian Astley, Eurofir

Abstract not available

From data to decision with AI,

Kata Kerekes, SYREON Research Institute

Abstract not available

Stakeholder Typology and Norm Strategies for Digital Transparency in EU Agri-Food Supply Chain Networks

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The European agri-food sector is undergoing a digital transformation to enhance sustainability and traceability. Yet the adoption of digital tools remains uneven. A key barrier is the lack of a systematic understanding of how diverse stakeholders perceive transparency, exert influence, and choose to engage. Existing research lacks a robust, empirically grounded framework for classifying stakeholders and designing norm strategies in digitalized agri-food supply chain networks (AFSCNs). This study investigates how stakeholders in EU AFSCNs can be classified in the context of digital transparency, and how differentiated norm strategies can support more effective engagement. We developed an integrated stakeholder typology by combining Savage et al.'s (1991) stakeholder evaluation model, Mitchell et al.'s (1997) salience theory, and Kujala et al.'s (2022) stakeholder engagement theory. Five focus group discussions were conducted in five supply chains (tuna, dairy, pork, tomato, sugar beet). Structured content analysis and a weighted scoring procedure assessed each stakeholder's transparency influence, interest diversity, and engagement level. The resulting composite scores enabled classification into four categories: supportive, mixed blessing, marginal, and non-supportive. In response, the study proposes four tailored norm strategies – empowerment, navigation, integration, and stimulation – that can guide collaborative transparency initiatives. The analysis highlights substantial heterogeneity across supply chains and shows that governance frictions often arise from misaligned expectations and uneven engagement capacities rather than from technology alone. The framework offers practical support for SMEs, digital providers, and policymakers seeking to advance digital transparency in European agri-food networks. **Reference** Kujala, J., Sachs, S., Leinonen, H., Heikkinen, A., & Laude, D. (2022). Stakeholder Engagement: Past, Present, and Future. *Business & Society*, *61*(5), 1136–1196. https://doi.org/10.1177/00076503211066595 Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of Who and What Really Counts. *The Academy of Management Review*, *22*(4), 853–886. https://doi.org/10.2307/259247 Savage, G. T., Nix, T. W., Whitehead, C. J., & Blair, J. D. (1991). Strategies for assessing and managing organizational stakeholders. *Academy of Management Perspectives*, *5*(2), 61–75.

Planting Digital Ecosystems: Enabling Societal-Digital Readiness for Sustainable Traceability in Kenyan–Netherlands Agri-Food Supply Chains

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Digital traceability and visibility systems are increasingly promoted as key infrastructures for building sustainable supply chains and a fair data economy in food systems. In Kenyan–Netherlands agri-food value chains, these systems promise greater transparency of product and information flows, improved sustainability reporting, and stronger governance of ethical sourcing. Yet adoption remains uneven and shaped by socio-institutional barriers. We conceptualize adoption as the planting of a digital ecosystem into an existing supply chain ecosystem. This ecosystem must deal with conflicting data standards, reporting metrics, user interfaces, governance logics, and embedded assumptions about what counts as sustainable. We address the following research question: *What supply chain characteristics can enable or constrain effective adoption of digital traceability systems?* Using an abductive approach, we explore digital readiness alongside societal readiness through semi-structured interviews across tiers, platform artifacts, sustainability reports, contracts referencing digital requirements, and training materials. By framing traceability systems as socio-technical governance interventions, this study extends digital readiness frameworks to incorporate human and societal dimensions and offers a foundation for assessing readiness and supporting sustainable transformation across global agri-food networks.

How Satelligence supports sustainable commodity food chains through real-time satellite monitoring.

David Den Ottolander, Satelligence

Abstract not available

How CEADS is facilitating the data exchange in the European agrifood sector: possible valorisations

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To unlock the value of agricultural data while upholding high standards of privacy, security, and ethics, a federated European data space for agriculture is being created. This Common European Agricultural Data Space (CEADS) is a flagship initiative under the European Commission's Digital Europe Programme and European Data Strategy. Building on the preparatory AgriDataSpace project and aligned with the Data Governance Act, AI act and Data Act, CEADS aims to deploy and operationalize a trusted, interoperable data space for the agrifood sector, including public administrations. It addresses key challenges such as existing data silos, limited data availability, heterogeneous maturity of Data Sharing Initiatives (DSI) across Member States, and insufficient data valorisation. 8 use cases are at the heart of CEADS and are defining solutions for these typically Data Space challenges, as for the agricultural specificities such as farmers trust, consent management, and data-ownership. The use cases are supported by a Technical Team, a Governance, Business, and Ethical Team and an Ecosystem Team to maximize the value creation. Via the CEADS Common Vision, a Collaboration Framework was defined to facilitate the collaboration among the different teams within CEADS. The DSSC Blueprint Building Blocks are being used as a reference to validate and ensure that all essential services are provided to roll-out a successful and robust Data Space. The use cases are the pilot environments for testing and validating these CEADS building blocks. Through a lean, multi-actor innovation approach and three consecutive minimum viable product cycles (MVPs), CEADS integrates technical infrastructure, governance and business models. CEADS is working towards valuable CEADS services facilitating data exchange and innovation, attracting many agrifood organisations across Europe.

Evolution of data driven innovation and data reuse along the European fresh produce chain from farm to fork

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This session presents a case study that develops a basic data space in the fruit and vegetables chain, to facilitate the sharing of data gathered during the transport and trade of produce. With the help of smart returnable transport items, equipped with IoT technology, data is continuously collected along the chain, not imposing an additional installation of complex infrastructures, but enabling the seamless data exchange in the circular economy. The data space connects stakeholders along the fruit and vegetables chain, enabling the exchange of data about produce and environmental conditions. A focus of the presentation will be on the underlying approach for a decentralised end-user management as well as a secure authentication and authorisation of individuals or organisations. The approach is based on open-source data space connector technology, built following most recent specifications of the Data Spaces Business Alliance and making use of W3C-standardised verifiable credentials for end-user authentication. A specific focus will be put on the potentials of combining open source, accepted Internet standards and the decentralised management of a trusted data exchange. Besides outlining the challenge to establish a first version of the data space, the presentation will also include a roadmap for the medium to long-term evolution of the data space.

The Future Data Economy in Data Spaces

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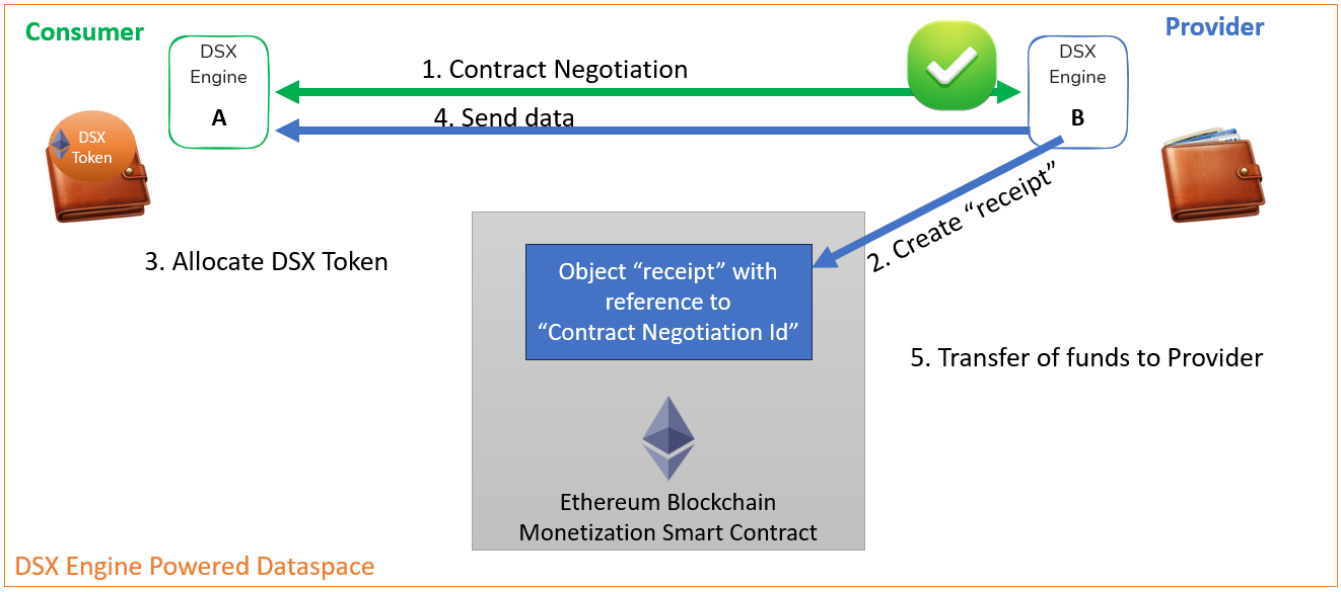
Data spaces are a modern approach to decentralized data exchange that enable interoperability, transparency and confidentiality. By combining modular Eclipse Dataspace Components (EDC) with blockchain, they support open data ecosystems like the DIH AGRIFOOD Data Space (DADS). The EU regards agrifood as key for data-driven innovation and is building European data spaces to link providers, users and intermediaries into a shared data market that supports innovation, efficiency and new business models. Building such spaces is complex and requires pooling legal, governance, business, sociological and technological expertise. In Slovenia, the non-profit Digital Innovation Hub AGRIFOOD connects farmers, advisers, processors, digital solution providers, researchers and policymakers; its multi-actor cooperation demonstrates that data-space challenges can only be solved through joint efforts and open platforms. DADS is organized federatively so participants retain control over their data while sharing rules remain uniform. A Rulebook adapted from Finland's Fair Data Economy model defines membership, ethics, contracts and governance. It integrates legal, governance, business and technical elements to protect data rights, ensure transparent decision-making and foster fair value sharing. The DSX Engine provides secure, interoperable and scalable infrastructure, positioning DADS as not just a platform but a vision for agriculture based on trust, data sovereignty and shared benefits. More broadly, the future data economy treats data as a strategic resource like capital or labour. Under the EU's European Strategy for Data, data spaces are central mechanisms for secure and sovereign data sharing; the EU plans to incentivise sharing to stimulate the data economy. In these decentralised systems, providers can be compensated for sharing information. DADS illustrates this by using DSX Engine connectors built on EDC and aligned with Gaia-X and IDSA protocols. A monetisation extension employing the x402 protocol and blockchain-based ERC20 coin exchange automates payments and supports flexible billing models such as pay-per-request. Through these mechanisms, DADS shows how a data space can maintain sovereignty and interoperability while enabling fair compensation.



Caption: The Future Data Economy in Data Spaces

From agrifood products to tourism enhanced experience: Harnessing data for Mallorca's wine and almond sectors

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The Circular Economy 4 Tourism (I4DATA) case study focuses on Mallorca's almond and wine sectors, two culturally significant crops facing contrasting economic trajectories. While viticulture generates over 25% of the Balearic agrarian income, almond cultivation has sharply declined due to socio-structural challenges and environmental pressures. Amid these challenges, agritourism offers a promising way to link agriculture with tourism, fostering viability for economic, sustainability, and rural initiatives. I4DATA aims to contribute to a fair, sustainable, and inclusive data economy by mobilizing stakeholders, co-creating a data sharing initiative (DSI), and fostering cross-sector innovation between agriculture and tourism. Despite progress in data-sharing agreements and interactive dashboards that enhance trust, decision-making, and marketing, challenges remain. These include data fragmentation, infrastructural gaps, and limited digital literacy. This case study highlights the transformative potential of data visualization to enhance decision-making and integrated agricultural and tourism data to support sustainable rural development, create new business models, and strengthen Mallorca's regional identity. The I4DATA case study demonstrates that even limited, structured data sharing can act as a catalyst for innovation, efficiency, and collaboration within Mallorca's wine and almond sectors. By combining interactive dashboards, co-created analytical tools, and formal collaboration agreements, stakeholders who traditionally relied on manual practices and fragmented information began to recognize the value of data and to integrate it into both operational and strategic decision-making. While implementation was often constrained by limited data availability and non-processable formats, the case highlights how structured efforts can initiate a shift toward a more data-informed culture in Mallorca's wine and almond sector. Importantly, the project also revealed the potential of cross-sectoral innovation, showing how integrating agricultural and tourism data could unlock new insights and value-creation opportunities across sectors. Crucially, I4DATA shows that fostering such a transformation requires more than technology: trust-building, stakeholder engagement, and clear governance mechanisms are essential to overcome initial reluctance to share information.

Building a Food Intake data ecosystem in care contexts

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Adequate and personalised nutrition is a key determinant of health outcomes, particularly in care settings. However, its positive impact can only be realised when food that is provided is actually consumed. Today, food intake data in care environments remain fragmented and inconsistently captured, limiting both nutritional optimisation and food waste reduction. The COOCK+ project FINE (Food INtake Ecosystem) addresses this challenge by laying the foundations for a structured, FAIR-oriented data ecosystem for food intake as a stepping stone towards a broader health data space. FINE is a collaborative initiative by ILVO, imec, Flanders' FOOD and VIVES, combining expertise in food and nutrition research, digital technologies, data governance and stakeholder engagement. Leveraging AI and computer vision, the project is developing a system that enables automated and user-friendly capture of food intake data at individual level in care contexts, including insight into plate waste, and explores how these data can be linked to existing food and health data sources in a secure and ethical manner. A practice-driven, multi-actor methodology is applied, including stakeholder analysis, co-creation workshops, iterative development of food intake monitoring set-ups and an objective FAIR data scan. In parallel, attention is given to ethical, legal and organisational aspects, with the aim of lowering adoption barriers and increasing data awareness among care actors and food companies. The results of FINE provide concrete tools, guidelines and lessons learned on food intake data capture, data interoperability and governance, and demonstrate the added value of structured data reuse for nutritional care, food waste prevention and value-based healthcare. This contribution presents the project approach, key insights and implications for building future-proof data ecosystems at the intersection of food, health and care, in line with the ambitions of Data4Food2030.

Data Economy for Food Systems – Getting knowledge from case studies

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The contribution aims at presenting the Data Economy for Food Systems (DE4FS) conceptual framework developed by the European project Data4Food 2030. The primary focus is to describe the structure, functioning, and evolution of the DE4FS. Based on a literature review that goes beyond the economic and technological aspects, the framework includes considerations on environmental, political, ethical, and social aspects, such as fairness, inclusiveness, or the quality of life. The literature review includes articles from different disciplines and provides a syntehsis of aspects coming from the scientific literature on the Data economy, Food systems, and the Service ecosystems perspective. To ensure the operability and usefulness of the DE4FS conceptual framework, the use cases of the Data4Food 2030 project, who are stakeholders involved in this DE4FS, were asked to provide feedback on the different identifed components and layers of the DE4FS. Based on their specific contexts, the stage of development of their solutions, their integration in food value chains and their intensity of digitallization, they provided their views of what the DE4FS is and how the conceptual faremwork can be used to better understand their contribution to the DE4FS. Based on both the literature review implemented and the inputs of the Daat4Food 2030 case studies, theis contribution shows how the main components and layers of the DE4FS are connected together by the process of value co-creation based on both tangible (e.g. products, assets, infrastructure) and intangible (e.g. skills, knowledge, comptences) resources.

TITANS4FOOD: A Trans-national Validation of a Digital Platform for Healthy and Sustainable Food Literacy across Spain, Finland and Poland

Ana Baranda [1] Alejandra Bermúdez [1], Noelia Da Quinta [1], Kamilla Bargiel-Matusiewicz [2], Natalia Ziółkowska [2], Satu Kinnunen [3], Andrea Martínez [4], Amparo Roca [4], Antonio Vicente [4], Jelena Meinilä [3], Maijaliisa Erkkola [3], Elena Santa Cruz [1]

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The transition toward healthier and more sustainable food systems requires not only innovation in production but also a profound shift in consumption patterns, where the consumer acts as a critical driver within the supply chain. In the framework of the European project TITAN, this study presented the trans-national validation phase of TITANS4FOOD, a multimodal digital platform designed to integrate human and planetary health literacy in preadolescents. Developed through a collaborative co-creation process involving a multidisciplinary panel of stakeholders and children, the platform provided tailored educational resources for both adults and children, alongside an AI-based chatbot and a collaborative space-themed game for children. Following a successful interventional study that proved the platform's ability to improve conceptual literacy regarding healthy eating habits and the environmental impact of diet, the next step assessed the platform's broader applicability and cultural acceptance. For this aim, a comprehensive qualitative evaluation was implemented across three distinct European contexts: Spain, Finland, and Poland. The objective was to evaluate the platform's feasibility and detect potential socio-cultural, political, or infrastructural barriers hindering its adoption in different educational systems. The methodology involved a multi-stakeholder approach through focus groups with children (aged 10–12) and semi-structured interviews with key actors, including educators, parents, policy makers, and health professionals. The evaluation specifically examined the three core functionalities, the AI-based chatbot, the space-themed game, and the educational content and topics addressed, analysing user interest, the appropriateness of the delivery style, and the perceived learning value. Participants also provided feedback on visual appeal, language adaptation, and potential missing elements to better align the tool with local educational realities.By analysing feedback on tool usability, interest, and cultural relevance, this phase provided insights into how digital data-driven tools can democratize food information and bridge the persistent "knowledge-action gap" in diverse populations. Ultimately, this research highlighted the role of informed citizens in a fair data economy, showing that fostering critical consumer skills from childhood is a fundamental leverage point for building more resilient and sustainable food supply chains.

From IoT Data Access to Trustworthy Agricultural AI: A Sectoral Evaluation of the New EU Digital Omnibus after the Data Act and AI Act

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Research Question: To what extent does the new EU Digital Omnibus Initiative address the remaining sectoral issues after the Data Act and AI Act, and what is the way forward? This study critically examines the sectoral implications of the European Union's horizontal digital framework, specifically the Data Act (Regulation 2023/2854) and the AI Act (Regulation 2024/1689), on the agri-food industry. It argues that while the Data Act serves as an "enabler" by mandating IoT data access, and the AI Act functions as a "regulator" for mitigating the risks deriving from AI algorithmic systems, a disconnect remains between these horizontal rules and the specific operational realities in the digitalisation of the agri-food sector. The analysis discusses to what extent these horizontal regulatory interventions addressed sectoral concerns, and highlights the unresolved issues regarding ag-data access and re-use, as well as the AI-related risks in the agri-food sector. Furthermore, this study provides a legal analysis of the proposed Digital Omnibus Regulation (DOR) proposal (COM(2025) 837 final) from the sectoral perspective, assessing its capacity to resolve these sectoral frictions through amendments in the Data Act and AI Act. It also investigates what other provisions can be amended with DOR to more effectively address the sectoral issues.The abstract proceeds as follows. First, it outlines the main sectoral concerns emerging from the (use of/access to) data and use of artificial intelligence in the agri-food sector, with particular attention to data access, re-use, trust, and risks. Second, it analyses how the EU Data Act and the AI Act seek to address these issues through horizontal rules, and evaluates the extent to which they provide functional solutions in practice. Then, it introduces the Digital Omnibus Regulation proposal and explains its relevance as an adjustment mechanism within the EU's broader digital acquis. Building on these foundations, it identifies policy directions and regulatory options for closing remaining gaps in the agri-food context, including possible refinements to the omnibus proposal and the case for targeted sector-specific intervention where necessary.Concluding that the DOR is a necessary but insufficient remedial tool from the sectoral perspective, and arguing for a dedicated sector-specific regulatory intervention(s) or a strengthened Code(s) of Conduct to ensure a functional and equitable ag-data economy.

Towards a European Data Space: lessons learned from a regional data sharing initiative

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The development of Common European Data Spaces is a central pillar of the European Data Strategy, yet their practical implementation remains challenging, particularly in sectors characterised by a broad range of actors, strong local embeddedness, and sensitive data practices. This chapter examines the development and scaling of agricultural data sharing initiatives (DSI), through a qualitative analysis of a mature agrifood DSI (DjustConnect), experiences with cross-border bridges between DSIs, and the early coordination phase of the Common European Agricultural Data Space (CEADS). This research is based on a Data4Food2030 use case, in which the Belgian DjustConnect has been connecting with 2 other DSIs in Europe. The objective was to interact and analyse the aspects of the connection, test different connection scenarios and governance mechanisms, and demonstrate the value of the cross-border collaboration in real business cases. These practice-based insights into the development and scaling of an agricultural data space have been gathered during a facilitated expert workshop. The study analyses how key concepts, including trust, consent, governance, interoperability, and value creation, are enacted and transformed from regional to inter-DSI, and to European levels. The findings highlight scaling as an ongoing, non-linear socio-technical process shaped by organisational contexts, institutional constraints, and human agency. The results show that consent and trust in agricultural DSIs operate as lived practices requiring negotiation, transparency, and sustained engagement, rather than as purely technical or legal mechanisms. Human agency is expressed through motivation, relational work, and boundary-spanning roles and emerges as a critical enabling condition for both local as cross-border succes. While existing frameworks provide valuable guidance, the analysis reveals agriculture-specific requirements related to domain knowledge, organisational legitimacy, and trust-based intermediation. By situating empirical insights within the broader European data space agenda, this research contributes to ongoing discussions on how data spaces can scale responsibly. It argues that the success of CEADS depends not only on technical interoperability and governance frameworks, but also on sustained support for local DSIs and the human and organisational capacities that enable data spaces to function as trusted infrastructures within the agricultural data economy.

AgriSyncAI - Transforming AgriFood supply chains with predictive analysis and sustainability focus

Marlies Temme & Nadim Al Khoury, AgriCom

Abstract not available

Data Economy Toolkit for Data Spaces

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The transition towards a European data economy requires practical tools that help companies move from theoretical data space concepts to real implementation. Within this context, the *COOCK Data Economy* project has developed a **Data Economy Toolkit** as a concrete, implementation-oriented result supporting agri-food companies in adopting data space principles and technologies. The toolkit is developed by ILVO's Technologie & Food division, together with KU Leuven, combining sectoral expertise with advanced knowledge in digital regulation and data governance. The toolkit enables companies to operationalise data space concepts within their company by connecting three essential dimensions that are typically addressed separately: business value creation, technical implementation, and regulatory compliance. It consists of three integrated modules: A **Business Model Playbook**, helping companies design collaborative data-driven value creation strategies in multi-actor data ecosystems. A **Technology Radar and Sandbox Environment**, allowing companies to explore and test data space technologies such as decentralised data sharing, trusted connectors, and identity frameworks in a safe environment. A **Regulatory Navigator**, translating complex EU data legislation into sector-specific, actionable guidance aligned with the European data strategy led by the European Commission. The toolkit directly addresses key barriers identified in industry: lack of sector-specific translation of research knowledge, uncertainty around regulatory implementation, and limited access to test environments at implementation-ready maturity levels. Through data labs, sandboxes, and demonstration use cases, companies can experiment with data space participation before committing to full deployment.

Caption: COOCK-Project 'Data economy in the Flemish agrifood sector'

Leveraging mobile technology and data analytics to enhance price transparency and market linkages along the maize value chain

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Efficient market linkages remain a major challenge along the maize value chain, particularly in determining fair and transparent pricing between farmers and factory buyers. Information asymmetry, limited access to real-time market data, and weak coordination often result in exploitation, post-harvest losses, and reduced profitability for both producers and processors. This study proposes the development and application of a mobile-based digital platform designed to assist value chain actors in determining optimal selling prices at the farm gate and buying prices at the factory level. The proposed mobile application integrates real-time market data, production costs, transportation costs, demand levels, and regional price trends to generate data-driven price recommendations. By leveraging digital technology, the system enhances transparency, reduces reliance on intermediaries, and enables informed decision-making for farmers, traders, and factory operators. The platform also facilitates direct communication and market linkages between producers and buyers, improving efficiency and reducing transaction costs. This research adopts a data-driven approach to evaluate how mobile technology can strengthen sustainable food systems by improving market access, price fairness, and income stability for maize farmers while ensuring consistent supply for processors. The findings are expected to demonstrate that integrating mobile technology within the maize value chain can enhance market efficiency, promote equitable pricing, and contribute to sustainable agricultural development. Ultimately, the study highlights the potential of digital innovation at the intersection of data, technology, and sustainable food systems to transform agricultural markets, empower stakeholders, and support long-term food security.

Monitoring the data economy for food systems: the Data4Food2030 monitor

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The rapid digitalisation of agriculture and food systems has led to a growing volume of data, new forms of data sharing, and emerging data-driven business models. These developments are often discussed under the umbrella of a “data economy for food systems”, yet remain difficult to observe and assess in a systematic way. While policy strategies increasingly rely on data to support the green and digital transition, there is still limited empirical capacity to monitor how the data economy in food systems develops.In the Data4Food2030 project, the Data4Food2030 monitor is developed (monitor.data4food2030.eu): a monitoring instrument designed to make the data economy for food systems in Europe more visible. The monitor approaches the data economy as a dynamic and evolving system shaped by multiple actors, infrastructures, governance arrangements and legal and ethical conditions.The development of the Data4Food2030 monitor followed an iterative process combining conceptual desk research, empirical analysis, and continuous expert engagement. These interactions served to validate indicator choices and to test the relevance of the monitor’s outputs for different user groups.The monitor distinguishes nine dimensions: Data and information, Actors & Network, Skills, Economy & Business, Legal, Technology, Food System Activities, Environment, Social & Ethics. Across these dimensions, the monitor integrates a diverse set of indicators derived from official statistics, project-generated data, case study insights, and external data sources. In addition, the monitor includes a catalogue of Data Sharing Initiatives, allowing initiatives to be documented, compared, and situated within the broader data economy landscape.Early insights point to significant heterogeneity in the development of the data economy across regions and food system segments, persistent gaps in digital capabilities and data access, and tensions between innovation, competitiveness, and inclusiveness. Emerging patterns of experimentation with data sharing, platform-based coordination, and new governance arrangements are also monitored.As the Data4Food2030 project concludes, the monitor stands as a scalable instrument that can support future research, policy evaluation, and strategic reflection. By making the data economy for food systems observable, it contributes to more informed debates about how digitalisation can support fairer, more inclusive, and more sustainable food systems in Europe.

EIT Food Training programs

Pamela Pokorny, EIT Food

Abstract not available

EIT Food Future Farm Lab,

Pamela Pokorny, EIT Food

Abstract not available

Towards a responsible Data Economy for Food Systems: The role of trust in Socio-Cyber-Physical systems

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The digitalisation of the food system is nowadays more rule than exception. The technical part of the digitalisation process involves inputs like hardware, software and data that together undertake 'activities', which results in outputs which can inform decision making. And, ideally, there is a feedback loop with information going back to those who provided the inputs. This can be seen at different scales, from on farm, across a chain or sector and beyond. It also ranges across a huge amount of stand-alone technologies to a (technological) system of systems like the data economy, with a high level of IT integration that operates in a business ecosystem with a large number of stakeholders (Wolfert et al., 2021). A data economy for food systems thus "encompasses a process of co-creating value by human and non-human actors, linked to digital technologies and food related activities, supported by data sharing and exchange of knowledge, competences and skills to provide agrifood products and services" (Meulman et al., 2025, p.14). The data economy for food systems can therefore be conceptualized as a socio-cyber-physical system (SCPS), whereby there is an increasing influence of the cyber domain on physical and social domains, impacting on social relations (Rijswijk et al., 2021). Trust is a key component in relations which can be highly impacted by, and in turn can influence, the data economy. Digital technologies potentially facilitates transparency, optimalisation and efficacy in the food system, thereby increasing the level of trust among actors in the food system. However, wrong development, use or governance of digital technologies can also reinforce current power structures and exclusion mechanisms, resulting in a lack of trust. This keynote will dive into this dynamic between trust and digitalisation, focusing on the impact on SCPS like the data economy for food systems.

Towards a Responsible Data Economy: Ethical, Legal and Social Aspects in Dataspace Development

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Digitalisation is rapidly transforming agrifood systems, bringing ethical, legal and social aspects (ELSA) to the foreground of debates on responsible innovation and data governance. The uptake of digital tools in European agrifood enterprises is shaped not only by technical and economic considerations such as interoperability, data availability, or expected returns, but equally so by social factors such as trust, perceived fairness, legal clarity, and governance arrangements that define how data can be accessed, shared, and reused. This presentation explores how such ELSA dynamics are experienced within emerging Data Sharing Initiatives (DSIs) that aim to establish dataspaces capable of supporting a European agrifood data economy. These DSIs function as multi-actor ecosystems wherein infrastructures, organisational practices and normative expectations intersect, with the aim of becoming building blocks for the forthcoming Common European Agriculture Data Space (CEADS). By showing how ELSA considerations shape the development and adoption of dataspaces, we illustrate how issues such as trust, equity, accountability, and legal robustness co-determine the digital transformation in agriculture and aim to provide insights for future governance, design and policy efforts aimed at building a responsible Data Economy for Food Systems (DE4FS).

Developing interoperability and data sharing: On the importance of socio-economic dimensions supporting technical aspects

Isabelle Piot-Lepetit [1] Antsaniaina Raharijaona[1]

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Interoperability is at the core of the development of digital solutions and technologies aiming at supporting the development of foods systems towards more sustainability and fairness. Especially, interoperability fosters data sharing between digital solutions and along supply chains. Initiatives are developing to ensure that the technical and technological aspects of interoperability are pushed forward. However, stakeholders and end-users remains cautious and are not always willing to allow access to their data. Most often, the reasons limiting data sharing go beyond technological aspects to encompass socio-economic factors, which are not always well understood, identified, or taken into account. The objective of this research is to provide information on the socio-economic factors underlying the deployment of interoperable solutions and technologies to foster data sharing based on literature review and interactions with actors of the Data Economy for Food Systems. More specifically, this contribution presents a literature review, implemented using the PRISMA approach, of above 100 scientific papers that explores the socio-economic factors influencing interoperability and provides a clustering of these factors based on the different dimensions of the DE4FS framework. Then, the contribution presents the outcomes of a workshop gathering real-life practitioners, the case studies of the European Data4Food 2030 project, to capture their experience and expertise on the socio-economic factors they consider as fostering or hindering the implementation of interoperability. Finally, a comparison of the results of the literature review and the real-life experience is made and a SEM modelling approach is implemented to quantify the degree of importance of the identified socio-economic factors that support the deployment of interoperability in the data economy as well as the direction of their interrelationship.

Fairness and inclusion in socio-cyber-physical systems: exploring futures for the data economy for food systems

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The rapid datafication of agrifood systems has led to the emergence of a data economy for food systems, which supports the operation of a business ecosystem with a high level of IT integration and a continuously increasing number of diverse stakeholders. While this offers opportunities for innovation, efficiency, and improved decision-making in the realm of agrifood systems, it also raises critical concerns around power imbalances, exclusion, and unwanted forms of inclusion. Addressing these concerns is essential for equitable and just futures of agrifood systems, thus highlighting the urgent need to ensure that this data economy develops in a fair and inclusive manner. For this paper we develop a framework grounded in conceptualizations of fairness, inclusion, and data justice. The integration of these concepts allows for a systematic assessment of fairness and inclusion in Social-Cyber-Physical Systems (SCPs), such as the data economy for food systems. We present three scenarios for the future of the data economy for food systems to assess fairness and inclusion in an SCPS. These scenarios are constructed in the context of the EU Horizon Data4Food2030 project and cocreated with stakeholders from six European countries. In participatory workshops, stakeholders were encouraged to shape desirable futures for the data economy for food systems. These scenario narratives form the basis of our analysis. Applying our conceptual framework to these scenarios, we study the scenarios to evaluate to what extent they are fair and inclusive. We identify where stakeholders have successfully addressed these dimensions and/or where they have lacked to grasp these aspects. In addition, we highlight opportunities for enhancing attention to fairness and inclusion in futures for the data economy and pathways towards fair and inclusive data economy for sustainable food systems. We further discuss the potential applicability of this framework to other examples of socio-cyber-physical systems, offering guidance for fostering fair and inclusive data-driven innovations in complex system contexts.

The Transparency Paradox: Assessing the Risks of Data-Driven Governance for a Sustainable Food System

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Transparency of the food system is increasingly promoted as an important approach towards achieving environmental sustainability. However, this shift frequently precipitates a 'transparency paradox' where the sharing of information inadvertently reinforces asymmetrical power relations. This paper critiques prevailing linear interpretations of 'track and trace' models, which often overlook the dynamic inequities and power imbalances within global value chains. This paper interrogates the impacts, risks, and complexities of transparency within the EU food system, specifically regarding transparent processes such as production, distribution, and data-sharing protocols. Furthermore, it evaluates the extent to which transparency can address the 'wicked problems' inherent in implementing environmental, social, and governance (ESG) frameworks.' Drawing on evidence from approximately 130 semi-structured interviews and focus groups with key European food system actors – including industry leaders, trade bodies, and NGOs – the study examines the risks inherent in current data-sharing protocols. Our findings suggest that top-down mandates, such as those within the EU Green Deal, exhibit structural deficiencies that risk undermining the economic interests of vulnerable actors. By exposing competitive data without adequate safeguards, such policies can reduce the competitive edge of those in the lower echelons of the food system. Ultimately, we argue that transparency is not a monolithic objective; rather, achieving meaningful environmental, social, and governance outcomes requires a shift from 'one-size-fits-all' formulas towards multiple, context-driven definitions. Such an approach is essential for creating an enabling environment that protects the vulnerable while fostering a more sustainable future for the food system.

Abstract of Poster Presentations

Building sustainable supply chains

Influence of wheat bran on technological and nutritional properties of high-fiber pan bread

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Recently, grain-based foods, particularly high-fiber products, have been strongly recommended because of their positive role in decreasing the risk of lifestyle-related diseases such as cardiovascular disease, colon cancer, and type 2 diabetes. Bread and baked products are a fundamental diet component for numerous individuals globally and are the most important source of dietary fiber. Therefore, there has been a growing focus on enhancing the nutritional value of bread. High-fiber bread, as a sustainable product, is rich in polysaccharides, proteins, phytochemicals, vitamins, and minerals that can benefit health. However, cereals are known to contain antinutritional factors (ANFs) that may restrict their consumption. The main ANFs that exist in wheat flour include phytic acid, raffinose, condensed tannins, saponins, and trypsin inhibitors. Phytic acid can form complexes with Fe+2, Zn+2, Ca+2, Mg+2, Cu+2, and Mn+2, which can adversely affect the bioavailability of essential minerals. Moreover, bran affects negatively the technological and rheological characteristics of bread samples. This study aimed to analyze the ingredients, develop high-fiber bread, and evaluate the technological and nutritional properties of high-fiber bread. Therefore, wheat flour was replaced with wheat bran at 10 and 15% (w/w) levels. We used fermentation with phytase-active lactic acid bacteria (LAB) to reduce phytic acid content. The findings indicated that the incorporation of phytase-active LAB resulted in a decrease in phytic acid levels, with complete degradation observed in certain samples. Additionally, bread samples produced with phytase-active LAB had higher acidification rates and moisture content, along with lower hardness compared to the control samples. Moreover, sample bread made with phytase-active LAB had a longer shelf life, which may be due to the acid-producing attributes of LAB. The results showed that phytase-active LAB could be an appropriate starter culture in bread-making due to their potential to support sustainability by improving the digestibility of high-fiber foods through the breakdown of phytates, which enhances mineral absorption.

Development of Gluten-Free Millet and Palakkadan Matta Rice Bread to Support Sustainable Diets and Informed Consumer Choices

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The rising prevalence of coeliac disease and gluten sensitivity has increased the demand for gluten-free bread alternatives; however, the absence of gluten often results in poor texture, reduced shelf-life, and lower sensory acceptability. There is therefore a need for nutritionally enhanced gluten-free products that also support sustainable diets and informed consumer choices. Millets such as finger millet, foxtail millet, and kodo millet are nutrient-dense, climate-resilient grains rich in dietary fibre, minerals, and antioxidants, making them suitable candidates for sustainable food innovation. This study aimed to develop gluten-free bread using millet flours and Palakkadan Matta rice flour and to evaluate their sensory, physio
chemical, and nutritional properties. Five bread formulations were analyzed, including a wheat-based standard (212), a gluten-free control using rice flour and potato starch (621), and three millet-based gluten-free formulations with varying proportions of finger millet, foxtail millet, red Matta rice, and kodo millet (199, 122, and 262). Proximate composition, including carbohydrate, moisture, ash, protein, and fat content, was determined, along with texture profile analysis (firmness) and color parameters (L*, a*, b*). Sensory evaluation was conducted by a panel of 10 semi-trained judges assessing appearance, elasticity, aroma, taste, bitterness, and overall acceptability using a 9-point hedonic scale. Statistical analyses, including analysis of variance (ANOVA), chi-square, and Kruskal–Wallis tests, were applied
to identify significant differences. The millet-based breads showed carbohydrate contents ranging from 22% to 24% and lower moisture levels (46.89–47.71%) compared with wheat bread (51.75%). Ash content was higher in millet-based breads, indicating increased mineral availability, while protein content ranged from 10.21% to 10.36%, slightly lower than wheat bread (11.35%). Fat content ranged from 15.41% to 15.84%, reflecting the natural lipid content of millets. Gluten-free formulations exhibited greater firmness than wheat bread, while sensory analysis showed no significant differences in appearance, aroma, or elasticity, although several panelists preferred the flavor complexity of millet-based breads. These findings demonstrate the potential of millet-based gluten-free bread to support sustainable food systems, healthier consumer choices, and diversification of future food supply chains.

A standardised measurement framework for digital and game-based food loss and waste interventions (SG-FLW)

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The EU Waste Framework Directive mandates comparable food waste monitoring across Member States, yet data reported under the 2019 harmonised methodology still diverge in definitions, system boundaries, and quantification methods. A parallel challenge exists for citizen-facing digital tools (mobile applications, platforms, citizen-science systems, and sensor-enabled dashboards) deployed to change household food waste behaviour: these tools generate heterogeneous evidence, and almost none convert outcomes into metrics compatible with life cycle assessment (LCA). Without a common data-quality standard, outputs cannot be compared, aggregated, or linked to EU monitoring and Sustainable Development Goal (SDG) 12.3 reporting. We address this gap with the Serious Games for Food Loss and Waste framework (SG-FLW), a five-dimensional ordinal protocol evaluating the measurement-chain completeness of any digital intervention targeting food loss and waste (FLW). Its five dimensions (Baseline standardisation, B; Mechanism evidence, K; Direct behavioural measurement, D; Environmental conversion, E; Longitudinal monitoring, L) are each scored 0 to 3, yielding a reproducible profile that characterises evidence quality independently of platform type. The protocol draws on Grading of Recommendations, Assessment, Development and Evaluations (GRADE), Kirkpatrick's evaluation model, the Theory of Planned Behaviour (TPB), ISO 14040 to 14044, and Reach Effectiveness Adoption Implementation Maintenance (RE-AIM). We applied SG-FLW to thirty-five published interventions. A systematic interoperability deficit emerged: tools capturing mechanism evidence report no verifiable waste reduction; those achieving moderate certainty through objective behavioural data lack mechanism traceability. No intervention converts outcomes into LCA-compatible indicators. Only one includes longitudinal follow-up. Beyond retrospective assessment, SG-FLW can function as a data specification standard, where developers and data-space architects set target profiles ensuring interoperability with national monitoring systems, LCA databases, and SDG 12.3 dashboards.

Strategic Transparency in the Food Industry: Empowering Consumers Through Systemic Change

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The Communication Toolkit is a practical guide for food value chain actors on how to create and capture value through transparency across the food value chain. It is grounded in the dynamic capability framework (Teece,2018) and draws on desk research and a multi-actor participatory approach, including eight co-identification and co-creation workshops held in Italy (TCA), Greece (KEPKA), Iceland (LOKI Foods) and Hungary (KLT) during 2024 and 2025. These activities resulted in creating the Toolkit into three sections: “Awareness”, “Action”, and “Aspiration”. The “Awareness” section explains the strategic value of transparency and how it creates value for individual food value chain actors as well as for the wider food value chain. The “Action” section presents the intervention Scenarios identified through the co-creation workshops, organised into three context-based pathways: one for short food value chains (Scenario A), one for collective branding in large food manufacturing firms (Scenario B), and one focused on the empowerment of smallholders (Scenario C). It also provides a step-by-step guide to implementation, highlighting digital communication solutions that strengthen transparency and trustworthiness within food value chain Business Models. The “Aspiration” section focuses on considerations for scaling up interventions, describing how actors can sustain and expand impact once an intervention and its digital tools become part of everyday operations. This Communication Toolkit is designed for a broad range of food value chain actors; however, it is specific for each Scenario: In Scenario A, primary actors of the food value chain, such as farmers, smallholders, agricultural producers, livestock producers, NGOs, and consumer organisations and in general Producers in short food value chains, can more specifically apply this Scenario. In Scenario B, food value chain actors such as large food manufacturing firms, orchestrators, certifiers, and cooperatives may take on coordinating roles and apply Scenario B. In Scenario C, secondary actors of food value chains, such as technology providers, knowledge institutes, associations of small-scale producers, service providers, and NGOs, can directly enable primary actors' participation and engagement.

Development of Functional Gummies using Moringa and Whey Protein concentrate

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The study was structured into 4 phases to develop gummies using Moringa pod powder (MPP) and whey protein concentrate (WPC). A standardized method was developed in the first Phase 1, using Response Surface Methodology (RSM) studying 3 variables viz., ratio of total sugars, acid mixture and level of pectin. The optimal formulation identified a 0.20 ratio of liquid glucose to sucrose, 2.25 %, acid mixture (malic acid: trisodium citrate; 3:1) and 4.00 %, pectin providing gummies with desirable sensory and textural properties. The optimized product was having 3 %, WPC and 1.5 %, MPP of total sugars. The developed MPP-WPC gummies were evaluated for its chemical composition, physicochemical properties, sensory attributes, textural characteristics and microbial quality, giving a moisture content of 24.91 %, protein 1.76 %, fat 0.76 %, ash 0.44 and total carbohydrates 72.19 %. The MPP-WPC gummies had desirable sensory scores above 8.0, while textural attributes showed hardness (39.21N), cohesiveness (0.042), springiness (3.54 mm), gumminess (1.62 N) and adhesiveness 0.88 Nmm). MPP-WPC gummies had titratable acidity of 1.27 % Malic acid, pH 2.82, water activity (aw) 0.717, vitamin C 1.69 mg/100g, total dietary fibre 1.797 and calcium 30 mg/100g. The developed gummies were stored at 27◦C when packed in PET jars, and subjected to microbial and physico-chemical analysis at every 7 days, giving a shelf life of 28 days. The optimized product was subjected to consumer preference study giving good responses. Hence MPP-WPC gummies were formulated using natural ingredients giving a final cost of ₹ 125 for 250g pack size.

PigLink ensures interoperability in pig farming

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Nowadays, pig farmers have a wide variety of equipment at their disposal for collecting data. This equipment is increasingly connected, which facilitates data collection and the development of decision-making tools. However, each piece of equipment is generally associated with a dedicated application, with its own dashboard, and without any link to other tools. To enable data sharing, equipment manufacturers must therefore carry out specific developments with each partner concerned. As a result, farmers are not taking full advantage of these digital advances. The Data4Food2030 case study “PigLink” proposes a way to facilitate data flow between equipment and management tools. The PigLink gateway promotes data interoperability by providing an open normative framework with standardized interfaces as Web APIs. This standardization makes it possible to manage all collected data, regardless of its nature and collection channel. Each data provider must first ensure compatibility with PigLink. They must carry out the necessary IT developments to enable access to the data collected by their equipment on farms, in accordance with the PigLink standard established for each domain. Data standardization is at the heart of PigLink, ensuring the same format for the same data for everyone. Each farmer must describe their farm, creating each building with its rooms and pens. They must then select the equipment compatible with PigLink on their farm and link each piece of equipment to its associated building, room or pen. This ensures that the data is linked to its location. Data interoperability is thus guaranteed. Each data user can then query PigLink to receive the data they are interested in, in accordance with the PigLink standard established for the desired domain. To do so, however, they must request access to the data and obtain consent from the data provider and the farmer concerned. This double consent system is integrated into PigLink. By facilitating access to data for all the farmer’s partners, Piglink improves pig farm management by eliminating multiple data entries and enabling more detailed analyses, centralized on a reduced number of dashboards.

Informing consumers about food production

Front-of-Pack Nutrition Labelling in Chile: How Micro, Small and Medium-Sized Food Enterprises Respond

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We examined the responses of Micro, Small, and Medium-sized Enterprises (MSMEs) in Chile to the implementation of Law 20.606, specifically the mandatory Front-of-Pack Nutrition Labelling (FOPNL). While the impact of FOPNL on large industries and consumer behavior is increasingly documented, the specific challenges and actions of smaller enterprises remain under-researched as much as the potential use of data-driven approaches to enhance MSME competitiveness. Utilizing a descriptive approach, this case study analyses distinct food processing companies to identify the factors that foster or limit their compliance and engagement with this new regulation. The findings reveal that MSME responses are shaped by a complex interplay of internal capabilities, access to financial and technical support, market and value chain dynamics, consumer preferences, product characteristics, and processing options. While public support has been concentrated in awareness campaigns and labelling training, the study reveals broader implications. It highlights gaps in support measures regarding finance, technical services, product development and reformulations, food composition tables, standardized and sanitary-certified food processing, communicating with consumers and formal business development. The study concludes with a conceptual model and policy implications, aiming to inform further studies, policy frameworks and data-driven approaches to improve the sustainability and competitiveness of MSMEs navigating food labelling regulations.

More about the projects

TITAN

The project TITAN provides an extensive platform for the development of a wide range of innovations that aid transparency and address societal and planetary health to make the food system fair, healthy, and environmentally friendly.

TITAN will develop 15 innovative solutions including exploiting DNA-based Rapid Detection Methods, Blockchain, AI, and IoT to

- enhance transparency in agri-food businesses with a focus on SMEs,
- improve food choices by providing more transparent information to the consumer,
- enhance food safety and authenticity of products and
- provide improved information on the health and sustainability of food products.

DATA4FOOD2030

Data4Food2030 aims to improve the Data Economy for Food Systems by expanding its definition, mapping its development, performance, and impact, and creating new insights and opportunities for policy, business, and society.

The project provides a comprehensive platform to strengthen the data economy for food systems and support the transition towards fair, inclusive, sustainable, and innovative food systems in Europe.

Data4Food2030 will develop knowledge, monitoring tools, case studies, stakeholder dialogues, future scenarios, recommendations, and a roadmap to:

- enhance understanding of data-driven innovation in food systems,
- monitor the development and impact of the data economy for food systems,
- identify drivers, barriers, and opportunities for fair and inclusive data sharing,
- support data-enabled business models and EU data spaces for food systems,
- and provide policy recommendations for a more competitive, transparent, sustainable, and resilient European food system.

TITAN Consortium

Project Coordinator

ILSI EUROPE

EFFoST

FOCOS FOOD CONSULTING... STRATEGICALLY

AGRICOLUS

AGRI MARKETPLACE FAIRTRADE MADE EASY

AI TALENTVM

UNIVERSITÀ CATTOLICA del Sacro Cuore

FOODSCALE HUB

openfoodchain

microbion

TU Delft

Agroknow

CONSENTIO CONNECT . BUY . SELL

AZTI MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

TOTALCTRL

WAGENINGEN UNIVERSITY & RESEARCH

INRAE

Symbeeosis

UNIVERSITY OF HELSINKI

UNIWERSYTET WARSZAWSKI

INL INTERNATIONAL IBERIAN NANOTECHNOLOGY LABORATORY

QualityChain

CARDIFF UNIVERSITY PRIFYSGOL CAERDYDD

QUEEN'S UNIVERSITY BELFAST

UNIVERSITY OF SURREY

SAKANA

USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA

Open Call Pilots

Pilots for Food Safety

tellspec Beam your health up

Micr(o)fy.AI AI-POWERED AUTOMATED MICROSCOPY

Urtech Water

ColorSensing tracking true colors

Pilots for Sustainability

PRIMO PRINCIPIO

agricom Collaborative Agricultural Planning

zunibal

Pilots for Health

flavofood VERENIGING

CHEFCHAIN.

Data4Food 2030 Consortium

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reframe.food

INRAE

ILVO Flanders Research Institute for Agriculture, Fisheries and Food

ATB

theLisboncouncil think tank for the 21st century

VUB VRIJE UNIVERSITEIT BRUSSEL

netcompany intrasoft

EFFoST

EuroFIR European Food Information Resource

BSC BALTIC STUDIES CENTRE

SZKOŁA GŁÓWNA GOSPODARSTWA WIEJSKIEGO

TSE Toulouse School of Economics

EURO POOL SYSTEM

ANYSOLUTION

ITC INOVACIJSKO TEHNOLOŠKI GROZD INNOVATION TECHNOLOGY CLUSTER

AGRIFOOD DIGITAL INNOVATION HUB

WIRELESSINFO

IO OI LAKES

ifip Institut du porc

University of Maribor Faculty of Electrical Engineering and Computer Science

ÚHLAVA obecně prospěšná společnost

Luke NATURAL RESOURCES INSTITUTE FINLAND

Case Studies

Premium Grain Chain **(PGC)**

IO OI LAKES

Luke NATURAL RESOURCES INSTITUTE FINLAND

PIGLink – from farmers to consumers

ifip Institut du porc

AgData Interoperability – Towards a European Data Space **(TEUDS)**

ILVO Flanders Research Institute for Agriculture, Fisheries and Food

Short Food Supply Chain **(Zero FLW)**

ITC INOVACIJSKO TEHNOLOŠKI GROZD INNOVATION TECHNOLOGY CLUSTER

AGRIFOOD DIGITAL INNOVATION HUB

University of Maribor Faculty of Electrical Engineering and Computer Science

Real-Time Fresh Data **(DIRECT)**

EURO POOL SYSTEM

ATB

The Sustainability Insight System **(THESIS)**

WAGENINGEN UNIVERSITY & RESEARCH

Circular Economy 4 Tourism **(I4DATA)**

ANYSOLUTION

Inter-Sectorial Data as a Service **(ISDaaS)**

ANYSOLUTION

ÚHLAVA obecně prospěšná společnost

Mapping and valorizing food loss and waste data in the Amsterdam Metropolitan Area **(AMA)** to improve the circular economy **(AMAFLOW)**

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