TITAN

Transparency solutions for transforming the food system

Summary of interesting publications on topics relevant to the TITAN project

May 2024

ENABLING INFORMED CHOICES BY CONSUMERS

Publications

PAPER

Food Control

Detection of saffron adulteration with Crocus sativus style using NIR-hyperspectral imaging and chemometrics

Saffron is a valuable spice that is often adulterated. This study proposes using near-infrared hyperspectral imaging (NIR-HSI) and chemometrics as a fast and cost-effective method for detecting and quantifying adulteration in saffron stigmas.

Malavi, D., Nikkhah, A., Alighaleh, P., Einafshar, S., Raes, K., & Van Haute, S. (2024).

REPORT

WHO

WHO global strategy for food safety 2022-2030: towards stronger food safety systems and global cooperation

The vision of the WHO Global Strategy for Food Safety 2022-2030 is to ensure that all people, everywhere, consume safe and healthy food so as to reduce the burden of foodborne diseases. With five interlinked and mutually supportive strategic priorities, the strategy aims to build forward-looking, evidence-based, people-centred, and cost-effective food safety systems with coordinated governance and adequate infrastructures.

REPORT

JRC Publication Repository

Fighting fraudulent and deceptive practices in the agri-food chain

This Technical Report presents challenges, opportunities and good practice examples in relation to the implementation of Article 9(2) of Regulation (EU) 2017/625. The purpose of this technical report therefore is to promote the uniform interpretation and application of the provisions of Article 9(2) of Regulation (EU) 2017/625.

Winkler, B., Maquet, A., Reeves-Way, E., Siegener, E., Cassidy, T., Valinhas, D. O. T., Verluyten, J., Jelic, M., & Muznik, A. (n.d.)

REPORT

EU Publications

Fighting fraudulent practices in the agri-food chain

This Commission overview report outlines how Member States fight fraud along the agri-food chain. Fraud in the agri-food chain affects industry and consumers economically, undermines consumer trust and may lead to serious health issues.

REPORT

WUR

Report on protein intake in the general population and in relevant subgroups in the Lifelines cohort, on behalf of the report Gezonde Eiwittransitie of the Health Council of The Netherlands

The advice was drawn up by the temporary Protein Transition Committee of the Health Council and tested by the Standing Committee. The draft advice has also been submitted to a panel of external experts for comment. The composition of the committee and the expert panel can be found at the back of this advice.

Zhu, Y., & Navis, G. (2023)

REVIEW

2DII

Market review of environmental impact claims of retail investment funds in Europe

research objective was to assess current environmental marketing claims as found in marketing materials related to retail funds across Europe based on the updated UCPD guidelines.

PAPER

Agricultural Economics

On the willingness to pay for food sustainability labelling: A meta-analysis

The premium prices for sustainability labels are largely heterogeneous depending on the information disclosed. Generic and specific messages seem not to differ in terms of consumer acceptance. Not all facets are equally important as social issues tend to be less considered. Policy interventions should combine hard and soft measures to holistically achieve sustainability in the food system.

Piracci, G., Lamonaca, E., Santeramo, F. G., Boncinelli, F., & Casini, L. (2024).

ARTICLE

FOODS

Food Risk Analysis: Towards a Better Understanding of "Hazard" and "Risk" in EU Food Legislation

For risk communication, it is important to understand the difference between "hazard" and "risk". Definitions can be found in Codex Alimentarius and the European Union (EU) General Food Regulation (EC) No. 178/2002. The use of these terms as synonyms or their interchange is a recurrent issue in the area of food safety, despite awareness-raising messages sent by EFSA (European Food Safety Authority) and other interested entities

Cioca, A., Tušar, L., & Langerholc, T. (2023).

PAPER

Journal of Food Protection

Radiofrequency Inactivation of Salmonella in Black Pepper and Dried Basil Leaves Using In-package Steaming

Radiofrequency (RF) heating has been extensively studied for pasteurizing low-moisture foods. Currently, bulk foods are treated with radiofrequency; potential cross-contamination may occur during packaging of pasteurized products. As an alternative, in-package RF processing was evaluated for Salmonella inactivation on black peppercorns and dried basil leaves and prevention of cross-contamination during storage postprocessing.

Wason, S., Rojas, R. V., & Subbiah, J. (2024).

ARTICLE

Foods

The Prevalence and Compliance of Health Claims Used in the Labelling and Information for Prepacked Foods within Great Britain

In the EU and Great Britain (GB), all health claims (HCs) on food must be authorised before use and should comply with Regulation 1924/2006. In GB, all HCs, authorised or not, are listed in the Great Britain Nutrition and Health Claims Register. This study reviews the prevalence and compliance of HCs on prepacked foods sold within three GB supermarkets and via their grocery shopping websites.

Coates, E., Pentieva, K., & Verhagen, H. (2024).

ARTICLE

Nature

Powerful 'nanopore' DNA sequencing method tackles proteins too

With its fast analyses and ultra-long reads, nanopore sequencing has transformed genomics, transcriptomics and epigenomics. Now, thanks to advances in nanopore design and protein engineering, protein analysis using the technique might be catching up.

Seydel, C. (2024).

Reports

REPORT

FAO

Thinking about the future of food safety - A foresight report

This publication, which is intended for a broad audience, explores several cross-cutting issues as identified through the FAO food safety foresight programme. Climate change, which is a defining challenge of our times, also has repercussions on food safety that can affect our health and well-being. As the emphasis on sustainability increases, the concept of circular economy is gaining attention in various sectors, including food and agriculture.

PAPER

University of Lincoln

Executive Summary: What works to prevent food fraud

This study was undertaken to guide the FSA and the National Food Crime Unit (NFCU) on the development of future strategies and operational activities to improve food fraud prevention

PAPER

LSHTM

School meals and food systems: Rethinking the consequences for climate, environment, biodiversity, and food sovereignty

This White Paper explains how implementing planet-friendly school meal programs can provide far reaching co-benefits for public health and human capital. The paper proposes that to maximize the transformative potential of school meal programs, governments should focus on two sets of policies.

REPORT

FAO

Early warning tools and systems for emerging issues in food safety

FAO, in partnership with Wageningen Food Safety Research (WFSR), developed this technical background document to raise awareness of predictive early warning tools that can identify imminent and emerging food safety issues, and contribute to the prevention of food safety emergencies, while supporting the development of capacities for their use.

REPORT

Food Authenticity

EU Report - Fighting fraudulent practices in the agri-food chain

This Commission overview report describes how Competent Authorities in Member States deliver their obligations to combat food fraud under Article 9(2) of the Official Control Regulations (2017/625).

REPORT

Public Health Nutrition

Do financial constraint and perceived stress modify the effects of food tax schemes on food purchases: moderation analyses in a virtual supermarket experiment

The research aims to investigate whether financial constraint and perceived stress modify the effects of food-related taxes on the healthiness of food purchases.

Djojosoeparto, S. K., Poelman, M. P., Eykelenboom, M., Beenackers, M. A., Steenhuis, I. H., Van Stralen, M. M., Olthof, M. R., Renders, C. M., Van Lenthe, F. J., & Kamphuis, C. B. (2024).

REPORT

JMIR Formative Research

User Requirements in Developing a Novel Dietary Assessment Tool for Children: Mixed Methods Study

The prevalence of childhood obesity and comorbidities is rising alarmingly, and diet is an important modifiable determinant. Numerous dietary interventions in children have been developed to reduce childhood obesity and overweight rates, but their long-term effects are unsatisfactory. Stakeholders call for more personalized approaches, which require detailed dietary intake data.

Van Der Heijden, Z., De Gooijer, F., Camps, G., Lucassen, D., Feskens, E., Lasschuijt, M., & Brouwer-Brolsma, E. (2024).

SUPPLY CHAIN SUSTAINABILITY

Publications

REPORT

Context Group

Sustainability ranking of top dairy companies

The dairy industry faces some unique challenges on its sustainability journey as it competes with the growing alternatives market and meets changing consumer expectations. These challenges exist in the global marketplace but vary in different regions and cultures. They include carbon and methane emissions, animal welfare, soil health, biodiversity, and social issues.

ARTICLE

Nature

Globally representative evidence on the actual and perceived support for climate action

Mitigating climate change necessitates global cooperation, yet global data on individuals' willingness to act remain scarce. In this study, a representative survey across 125 countries was conducted, interviewing nearly 130,000 individuals. Our findings reveal widespread support for climate action.

ARTICLE

Nature Reviews Bioengineering

Smart food packaging commercialization

Smart food packaging technologies can actualize real-time, in situ food quality monitoring, increasing food safety and decreasing food waste. Here, we detail challenges that hinder the commercialization of such smart packaging systems and identify opportunities to facilitate their translation from prototype to product.

Khan, S., Hosseinidoust, Z., Li, Y., Filipe, C. D. M., & Didar, T. F. (2024).

Reports

PAPER

World Economic Forum

Biodiversity Credits: A Guide to Support Early Use with High Integrity

This guide covers some of the ways in which companies could support value-creation through the use of biodiversity credits. By taking early action on biodiversity credits, companies can help improve and accelerate the development of guardrails for integrity and credibility in the market, even while standards and guidance are evolving.

REPORT

WBCSD

Unlocking Sustainable Futures: The Case for Beyond-Value-Chain Actions Explored in New WBCSD and Bain & Company Report

The World Business Council for Sustainable Development (WBCSD) and Bain & Company, in their insightful report "The Case for Beyond-Value-Chain Actions", delve into the compelling reasons and practical approaches for companies to adopt beyond-value-chain actions.

ARTICLE

Philip Morris International

Perfect Forest™

Perfect Forest™ is PMI's nature-based solutions (NbS) concept to preserve forest resources. We believe that constant effort at the landscape level is key for transforming our relationship with forest ecosystems and local stakeholders.

GUIDE

UNDP

Blue Economies and Nature-based Solutions

This resource guide provides advice on how to better integrate marine and coastal components within National Determined Contributions (NDCs) for enhanced climate action. It presents the concepts of blue economy, blue carbon ecosystems and nature-based solutions (NbS) and discusses opportunities for their inclusion in NDCs.

REPORT

UNDP

UNDP's Food & Agricultural Commodity Systems Strategy 2020-2030

UNDP has developed its new Strategy for Food and Agricultural Commodity Systems (FACS) to focus its vision and enhance its support to transform FACS. FACS are fundamental to the sustainable development of the 170 countries UNDP supports.

REPORT

Eurostat

Key figures on the European food chain – 2023 Edition

The publication responds to interest in the European Commission's Farm to Fork Strategy, which is an integral part of the European Green Deal that sets out to make Europe the first climate-neutral continent by 2050. The Farm to Fork Strategy aims to establish a sustainable food system in the European Union (EU) that is fair, healthy and environmentally-friendly

REPORT

Feedback Global

Blue Empire - How the Norwegian salmon industry extracts nutrition and undermines livelihoods in West Africa

This report exposes how the expansion of the Norwegian salmon farming industry has come at the expense of communities and fish populations in the Global South.

REPORT

FSE

The Economics of the Food System Transformation

This report identifies the elements of what a transformation from today's food systems to an inclusive, health-enhancing and environmentally sustainable global food system entails. It shows that such a transformation is not only biophysically and technically feasible; it offers immense economic benefits to societies across the world.

REPORT

Farmforce

The First Mile Traceability Barometer Report

This report seeks to provide an insightful analysis of the EUDR's influence on the agricultural industry. The aim is to enable stakeholders to comprehend the regulatory landscape, make informed decisions and embrace sustainable practices & regulations.

REPORT

MERIDIA

Cooperatives and the state of field data quality for EUDR compliance

This report presents key findings from a study on the state of field data quality for EUDR compliance among farmer cooperatives in the Cavally region of Côte d'Ivoire. The study aimed to assess cooperatives' data management practices and identify areas for improvement to ensure compliance with the EU Regulation on Deforestation-Free Products (EUDR).

REPORT

MSC

The MSC UK Tuna Shopper Report has landed

The MSC UK Tuna Shopper Report provides a clear picture of the evolving sustainable tuna landscape in the UK retail sector.

REPORT

IUCN

Exploring the future of vegetable oils

The report emphasises the importance of respecting the rights of and supporting smallholder and local oil production systems due to their positive socio-economic outcomes and contribution to food security. The report acknowledges that within each vegetable oil system, there are both good and bad actors and outcomes, and urges for a nuanced perspective.

Meijaard, E., Virah-Sawmy, M., Newing, H., Ingram, V., Holle, M., Pasmans, T., Omar, S., Van Den Hombergh, H., Unus, N., Fosch, A., De Arruda, H. F., Allen, J., Tsagarakis, K., Ogwu, M., Diaz-Ismael, A., Hance, J., Moreno, Y., O'Keeffe, S., Slavin, J., . . . Sheil, D. (2024)

Publications

REPORT

CTAC North America

Real-time data sharing in supply chains: Opportunities and challenges

The sooner data is at hand, the earlier we can act. Big data analytics and Artificial Intelligence (AI) can improve supply chain and logistics management. Analytics is about what is, what may be, and what are options if we wish to influence the course of things building on operational and ecosystem data. Analytics and data sit at the core of digitalization.

PAPER

IFT

Making food systems more resilient to food safety risks by including artificial intelligence, big data, and internet of things into food safety early warning and emerging risk identification tools

This review provides an overview of existing and experimental applications of artificial intelligence (AI), big data, and internet of things as part of early warning and emerging risk identification tools and methods in the food safety domain.
Mu, W., Kleter, G. A., Bouzembrak, Y., Dupouy, E., Frewer, L. J., Natour, F. N. R. A., & Marvin, H. J. P. (2024).

PAPER

Food Unfolded

Generative artificial intelligence in innovation management: A preview of future research developments

Artificial intelligence (AI) has become an important part of our daily lives. Beyond chatbots and self-driving cars, AI is making significant strides in the agrifood industry. Find out how AI could reshape the entire food chain
Tempelaere, A. (2023).

ARTICLE

Journal of Business Research

Digital Transition in Sustainable Food Systems – Policy Support

This study outlines the future research opportunities related to Generative Artificial Intelligence (GenAI) in innovation management. To this end, it combines a review of the academic literature with the results of a Delphi study involving leading innovation management scholars.
Mariani, M., & Dwivedi, Y. K. (2024)

REPORT

EuroChoices

Innovation in the Farm Office for Smart Sustainability Reporting

Farms face an increasing administrative burden due to the push for a more sustainable agri-food system. Farms are required to demonstrate compliance with various sustainability schemes, and this trend is expected to intensify with a more performance-based CAP and new directives and regulations. The need for smart data reporting is emphasised, with a focus on minimising the administrative burden, creating useful systems and indicators for farm management, and ensuring auditability

Poppe, K. J., Vrolijk, H. C., & Van Asseldonk, M. A. (2024).

Reports

REPORT

ICC UK

Make climate and environment action everyone's business

This toolkit shares business insights, knowledge, and tools to support a green transition, by focusing on key sustainability and environmental topics — biodiversity, circular economy, net zero, climate contract clauses, supply chain digitalisation, and sustainability reporting frameworks. It is designed to be a resource for businesses seeking to embed sustainability as a core component in operations.

Southworth, C., & Bruce, S. (2023).

REPORT

ACCIÓ

Analysis of the deep tech startup ecosystem in Catalonia 2022

The aim of this report is to agree on the definition of deep tech and determine its scope and the technologies and companies that can be considered deep tech. The report also studies global trends and impact and maps the ecosystem of deep tech startups in Catalonia.

REPORT

The Green Block

The Green Block Report 2023

This groundbreaking initiative marks a transformative stride toward leveraging the potential of Web3 and Artificial Intelligence (AI) in fostering sustainability. The Green Block's inaugural report stands testament to its commitment to creating the landscape of Environmental, Social, and Governance (ESG) projects in Web3 and AI on a global scale.

REPORT

BCG

Accelerating Climate Action with AI

This report aims to provide policymakers, corporate decision makers, and climate leaders with a clear and concise understanding of the role that artificial intelligence (AI) can play in climate action.

Dannouni, A., Deutscher, S. A., Dezzaz, G., Elman, A., Gawel, A., Hanna, M., Hyland, A., Kharij, A., Maher, H., Patterson, D., Jones, E. R., Rothenberg, J., Tber, H., Texier, M., Ziat, A., & Boston Consulting Group. (2023).

REPORT

EU Commission

New Report: Food 2030 Research and Innovation – Pathways for action 2.0

This publication provides an update on the European Commission's Food 2030 initiative and aims to guide future research and innovation policy reflections related to Horizon Europe, the farm-to-fork strategy, the European Green Deal and beyond.

ARTICLE

FAO

World Food Forum: The pivotal role of Artificial Intelligence (AI) and digital tools in making agrifood systems climate resilient

New technologies help farmers manage crops and livestock, detect pests and diseases and optimize the use of labour, fertilizers, pesticides, feed and water

PUBLICATION

WHO

Ethics and governance of artificial intelligence for health: Guidance on large multi-modal models

This guidance addresses one type of generative AI, large multi-modal models (LMMs), which can accept one or more type of data input and generate diverse outputs that are not limited to the type of data fed into the algorithm.

BOOK

WHO

Managing the Digital Transformation – Aligning Technologies, Business Models, and Operations

This book provides the key technologies involved in an organization's digital transformation. It offers a deep understanding of the key technologies (Blockchain, AI, Big Data, IoT, etc.) involved and details the impact, the decision-making process, and the interplay between technologies, business models, and operations.

BOOK

FAO

E-agriculture in action: Blockchain for agriculture

The growth of ICT in the last decade has provided many opportunities to overcome some of the challenges faced by the agriculture sector. Recent developments such as the increase in the use of mobile-broadband access devices, the Internet of things (IoT), drones, smart networks, capacity for big data analytics, and artificial intelligence have provided agriculture stakeholders with some key tools and technologies to improve production and marketing processes, for example, in agriculture and allied fields.

Publications

ARTICLE
Nature

The state of food systems worldwide in the countdown to 2030
This Analysis presents a recently developed food system indicator framework and holistic monitoring architecture to track food system transformation towards global development, health and sustainability goals.
Schneider, K. R., Fanzo, J., Haddad, L., Herrero, M., Moncayo, J. R., Herforth, A., Remans, R., Guarin, A., Resnick, D., Covic, N., Béné, C., Cattaneo, A., Aburto, N., Ambikapathi, R., Aytekin, D., Barquera, S., Battersby, J., Beal, T., Molina, P. B., . . . Wiebe, K. (2023).

PAPER
Global
Env. Change

Synergies of interventions to promote pro-environmental behaviors – A meta-analysis of experimental studies
Addressing the threat of climate change requires effective environmental regulation to induce pro-environmental behavior. In this meta-study, we investigate the potential synergies between policy interventions by rigorously assessing their comparative effectiveness when used individually versus in combination.
Alt, M., Bruns, H., DellaValle, N., & Murauskaite-Bull, I. (2024).

REVIEW
Foods

Global Food Security and Sustainability Issues: The Road to 2030 from Nutrition and Sustainable Healthy Diets to Food Systems Change
In the first part of this review, a summary of some challenges that occur in the governance of food system transformation is given. Through a case study of plant-based proteins and their biological and chemical modification as diets shift towards alternative proteins, we demonstrate that resource-efficient food systems and food waste, through system transformation, are useful in understanding both (i) how food system transformation has ensued and (ii) how the required transformation is prohibited.
Varzakas, T., & Smaoui, S. (2024).

PAPER
Food Hub

Food Systems – A Story of Transformation
This position paper has been created to share with you a systems thinking perspective on the evolution of our food systems. The paper is crafted as a narrative to illuminate the broader changes taking place in the world.

Reports

REVIEW
National Food Strategy

The Plan
Part one includes recommendations, intended to help the most disadvantaged families eat well, protect the UK's high food standards and ensure proper scrutiny of any trade deals. Part Two takes a close look at how the food system really works, the damage it is doing to our bodies and our ecosystem, and the interventions we could make to prevent these harms.

STUDY
JRC Publications Repository

Risks and vulnerabilities in the EU food supply chain
This study investigates the risks and vulnerabilities affecting food supply and food security in the EU, including differences across Member States, sectors and stages of the EU food supply chain.
Bertolozzi-Caredio, D., Severini, S., Pierre, G., Zinnanti, C., Rustom, R., Santoni, E., & Bubbico, A. (n.d.).

REPORT
OXFAM

Climate Equality: A planet for the 99%
If no action is taken, the richest will continue to burn through the carbon we have left to use while keeping the global temperature below the safe limit of 1.5°C, destroying any chance of ending poverty and ensuring equality. The world needs an equal transformation. Only a radical reduction in inequality, transformative climate action and fundamentally shifting our economic goals as a society can save our planet while ensuring wellbeing for all.

REPORT
WTO

Trade Policy Tools for Climate Action
Trade Policy Tools for Climate Action looks into the trade policies that governments could consider as part of their strategies for climate change mitigation and adaptation. The publication covers ten policy areas where governments have introduced measures to support the transition to a low-carbon economy, improve the flow of climate-friendly goods and services, decarbonize supply chains, and build resilience to extreme weather events and climate change.

REPORT
FAO & WHO

CODEX – 60 years of standards
The CODEX publication is the Annual Report of the activities of the Joint FAO/WHO Food Standards Programme, Codex Alimentarius. This is the seventh year of publication in this format.

REPORT
World Bank

The Development, Climate, and Nature Crisis: Solutions to End Poverty on a Livable Planet
The World Bank's Country Climate and Development Reports (CCDRs) intends to identify opportunities for each country and priorities for investments and reforms.

REPORT

Institut Russeau

Road to Net Zero – Bridging the Green Investment Bank

A new Institut Rousseau study, involving more than 150 experts, researchers and volunteers from 20+ organisations across Europe, including economists, engineers and public policy experts from across Europe, reveals that €40 trillion investment is needed to put Europe on the path to climate neutrality, while keeping Europe in the global race for competitiveness, in line with the EU's strategic autonomy agenda. The study assesses both public and private investments (and extra-investments, compared to a baseline scenario extending current trends and policies) needed for the EU to meet its climate targets.

REPORT

Eurohealth

A Europe that cares, prepares, protects: Strengthening the EU Health Union

To mark the 2024 Belgian Presidency of the Council of the European Union, the Belgian health presidency team and the European Observatory on Health Systems and Policies worked together to reflect on a selection key priority for the next Commission's agenda with regard to the European Health Union. These priorities can be grouped in three thematic clusters: a Europe that cares, prepares, and protects.

REPORT

European Committee of the Regions

Healthier environment for healthier lives: impacts of the European Green Deal on human health

This report provides an overview of the main health determinants associated with climate change, pollution and environmental degradation, and presents 10 specific case studies where measures have been put in place at the local and regional level to address these issues. From these examples, and a review of publicly available evidence, a consideration of impacts from local and regional measures on environmental determinants and health is made.

REPORT

Harvard Business School

ESG: From process to product

The main objective is to intentionally allocate capital and influence investees with measurable financial, environmental and/or social outcomes. The key characteristics are those of intentionality and measurability with the additional characteristics of materiality and additionality serving to enhance their overall significance.

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