Destination - Fair, healthy and environment-friendly food systems from primary production to consumption

National, EU and global food systems are facing sustainability challenges, from primary production to consumption that could jeopardise food and nutrition security. The farm to fork strategy, and its follow-up initiatives, aim to address these challenges and supports transition to more resilient and environmentally, socially and economically sustainable food systems on land and at sea that provide healthy diets for all and respect planetary boundaries. It is key to ensuring that the fit for 55 package[126] and the European Green Deal[127] are successful and the UN Sustainable Development Goals (SDGs)[128] are achieved. Research and innovation (R&I) under this destination will steer and accelerate the transition to sustainable, safe, healthy and inclusive food systems from farm to fork, ensuring food and nutrition security for all and delivering co-benefits for the environment, health, society and economy.

Sustainable, climate neutral and biodiversity friendly farming systems provide economic, social (including health), environmental and climate benefits, and are the main prerequisite for food and nutrition security. For farmers, who are the backbone of food systems and principal managers of natural resources, the new common agricultural policy (CAP) and the European Green Deal set ambitious targets and objectives concerning the sustainability and safety of feed, food and non-food production. These targets and objectives are included in the core European Green Deal policy priorities, in particular the farm to fork strategy, the EU biodiversity strategy for 2030, zero pollution ambitions and climate action, and their follow-up initiatives. R&I in line with the strategic approach to EU agricultural research and innovation[129] will be key enablers for achieving these ambitious targets and objectives.

The **partnership on 'Accelerating farming systems transition: agroecology living labs and research infrastructures'** will unlock the potential of agroecology to make agri-food systems environmentally friendly and regenerative, climate-neutral, inclusive, competitive and resilient. It will enable farmers and value chain actors to successfully apply agroecology principles thanks to: i) a stronger R&I system integrating science and practice; ii) increased knowledge on the benefits, challenges and potential of agroecology for farming, food and society; iii) improved sharing of and access to knowledge, place-based tailored solutions and innovations; and iv) improved and transformative governance and policies.

Besides the partnership, R&I under the destination will help farmers in monitor and manage natural resources (e.g. soil, water, nutrients, biodiversity, etc.) in innovative, sustainable ways by, among other things, boosting organic food and farming in line with the action plan for the

126 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0550&from=EN
127 EUR-Lex - 52019DC0640 - EN - EUR-Lex (europa.eu)
128 THE 17 GOALS | Sustainable Development (un.org)
129 https://ec.europa.eu/programmes/horizon2020/en/news/final-paper-strategic-approach-eu-agricultural research-and-innovation

development of organic production[130]. New knowledge and innovative solutions will also promote plant health, reduce farmer's dependency on pesticides and reverse biodiversity loss.

Through the **partnership on** '**Animal health and welfare**', farmers and other actors will be better equipped to protect animals against infectious diseases, including zoonoses, and to improve animal welfare, while reducing the dependency on antimicrobials, maintaining productivity, improving food safety and quality, and protecting the environment and public health. In addition to the partnership, sustainable livestock production will be enhanced by improved knowledge on nutritional requirements and innovative on-farm practices and technologies for optimised production and use of local feedstuffs. A common EU approach to optimise the management of the co-existence of outdoor livestock systems and wildlife will be implemented by integrating science, local knowledge and practice on the preservation, protection and valorisation of wildlife and agro-pastoral systems.

Synergies will be created with other destinations and instruments. Under the Mission 'A Soil Deal for Europe', 100 living labs and lighthouses will be established to lead the transition towards healthy soils by 2030[131]. Thanks to R&I, farming systems will also maximise the provision of a wide range of ecosystem services from more sustainably managed EU agro-ecosystems and landscapes and help reverse the loss of biodiversity while ensuring resilient primary production (Destination '*Biodiversity and ecosystem services*'). R&I under the Destination '*Land, ocean and water for climate action*' will better equip farmers to make a significant contribution to climate-neutrality and become more resilient to climate change. Farmers will be empowered and interconnected by means of advanced digital and data technologies (e.g. AI, IoT, and robotics) that support sustainable farming approaches (Destination '*Innovative governance, environmental observations and digital solutions in support of the Green Deal*'). New sustainable business models and strengthened EU quality schemes will improve the position of farmers in value chains and enable them to seize opportunities provided by the green transition (Destination '*Resilient, inclusive, healthy and green rural, coastal and urban communities*'). Effective agricultural knowledge and innovation systems (AKIS) will speed up innovation and the uptake of R&I results from farm to fork (Destination '*Innovative governance, environmental observations and digital solutions in support of the Green Deal*').

Better evidence-based knowledge and analytical capacity will help policymakers develop and implement effective policies, in particular the CAP post 2027, the contingency plan and sustainable food systems framework law, enabling farmers to transition to sustainable and resilient farming and food systems (Destination '*Innovative governance, environmental observations and digital solutions in support of the Green Deal'*). Furthermore, knowledge and innovative solutions generated under Horizon Europe will be circulated and tested in local innovation projects and networks that are financed by rural development programmes, and

130 https://eur-lex.europa.eu/resource.html?uri=cellar:13dc912c-a1a5-11eb-b85c-01aa75ed71a1.0003.02/DOC_1&format=PDF

131 https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/soil-health-and-food_en

which are managed by the European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-AGRI).

Sustainable fisheries and aquaculture contribute directly to environmentally friendly, resilient, inclusive, safe and healthy food production by providing highly nutritional proteins, lipids and micronutrients for a healthy diet. Sustainable aquatic production can and should account for a much bigger proportion of our overall food consumption. Following the farm to fork strategy, production methods should make the best use of nature-based, technological, digital and space-based solutions, optimising the use of inputs (e.g., nutrients and antimicrobials), therefore increasing climate-neutrality and resilience and safeguard aquatic biodiversity. R&I in fisheries and aquaculture will contribute to the relevant Food 2030 pathway for action 'food from oceans and freshwater resources'[132]. It will support the 'strategic guidelines for a more sustainable and competitive EU aquaculture for the period 2021 to 2030', that propose specific actions on, e.g. i) access to space and water, ii) human and animal health, iii) environmental performance, iv) climate change, v) animal welfare, vi) the regulatory and administrative framework, and vii) communication on EU aquaculture. In addition, the new EU algae initiative - to unlock the full potential of sustainable algae-based food and alternative feed sources - can support the transition to sustainable food systems. R&I will also contribute to the success of the common fisheries policy and deliver compliant, inclusive, diversified ecosystem-based fisheries approaches to allow fisheries management to adapt to different realities, including in the international context. The destination will also support the new policy initiative on the sustainable blue economy and its offshoot initiatives, including the Sustainable Blue Economy Partnership.

R&I will help fisheries and aquaculture become more precise, technologically advanced, and fully embedded in the natural and socio-ecological context including by reducing the footprint on aquatic biodiversity. It will better equip fisheries and aquaculture to become more resilient to the adverse consequences of climate change and to make a significant contribution to climate neutrality. It will enable the European aquaculture industry to achieve its full potential to ensure global food security in terms of volume, methods, variety of species, aquatic species welfare, safety and quality of products and services.

R&I will help to provide a better understanding of the impacts of climate change in terms of habitat change and ecological functioning and the consequent repercussions on stock shifts, species composition, health, and altered growth and reproduction rates. This will help in the adaptation of fishing vessels, fishing gear and catch methods to reduce their carbon footprint as well as help in their adaptation to the changing climate regime. It will also enable aquaculture to: i) become more sustainable – by using resources in a highly efficient manner - and climate-neutral; and ii) adapt to a changing climate and its consequences, such as temperature rise, acidification, altered water quality and availability, extreme weather events, and other emerging risks, notably in geographical areas particularly vulnerable to climate change impacts such as the EU's outermost regions (defined in article 349 TFEU).

[132] https://op.europa.eu/en/publication-detail/-/publication/86e31158-2563-11eb-9d7e-01aa75ed71a1

Sustainable, healthy and inclusive food systems rely on systemic, cross-sectoral and participatory, multi-actor approaches and on integration between policy areas at all levels of governance. Food systems are to be understood as covering, 'from farm to fork', all the sectors, actors and disciplines relevant to and connecting i) environment protection requirements, ii) natural resources, iii) primary production on land and at sea, iv) food processing and packaging, v) food distribution and retail, vi) food services, vii) food consumption, viii) food safety, ix) nutrition and public health, and x) food waste streams. An important driver for transforming food systems should be the integration of sectors, actors and policies[133]. This should occur in order to better understand the multiple interactions between the actors and components of current food systems, the lock-ins and potential leverage points for synergistic changes and of the interdependencies of outcomes (linkages between nutritional climate and sustainability outcomes). Such implementation/approaches can provide solutions that maximise co-benefits with respect to the four priorities of the Commission's Food 2030 R&I initiative:

- nutrition and health, including food safety;
- climate and environmental sustainability;
- circularity and resource efficiency;
- innovation and empowering communities.

This destination will deploy solutions to the 10 Food 2030 pathways for action[134] and will help build innovation ecosystems to bring together relevant public and private sector actors, researchers and society. R&I will provide food-related businesses, including those involved in food processing and packaging, retail, distribution, and food services, with opportunities and incentives to stimulate environmentally friendly, healthy, circular and diversified practices, products and processes that are biodiversity-friendly, climate-neutral and less reliant on fossil fuels. It will also help devise tools and approaches that enable the shift to healthy, sustainable diets and responsible consumption for everyone, boosted also by social innovation, technology, behavioural change and marketing standards, and by inclusively engaging with different consumers, citizens and communities. R&I will accelerate the transition to sustainable, healthy and inclusive food systems by:

- eradicating micronutrient deficiencies in vulnerable population groups;
- developing new high quality, healthy, minimally processed and sustainable food products and processes;
- assessing innovative and novel foods based on sustainable alternatives sources of proteins;

133 Scientific Advice Mechanism, Towards a sustainable food system - Publications Office of the EU (europa.eu)

134 https://op.europa.eu/en/publication-detail/-/publication/86e31158-2563-11eb-9d7e-01aa75ed71a1

- preventing and reducing food loss and waste to tackle environmental and climate challenges, including through improved marketing standards;
- unlocking and maximising the potential of the microbiome to improve food safety, fight food waste and develop alternative sources of proteins;
- networking and exchanging knowledge on food fraud and food safety and exploring the influence of climate change on food safety;
- developing new strategies and detection methods on products derived from new genomic techniques, and strengthening the resilience of European food systems;
- promoting citizen science and creating smart tools to improve diets.

R&I will also:

- reduce the environmental impacts of and pollution from food value chains (see Destination '*Clean environment and zero pollution*');
- help transform urban food systems, including via the use of nature-based solutions in the context of the New European Bauhaus initiative (see Destination '*Resilient, inclusive, healthy and green rural, coastal and urban communities*'); and
- improve the governance of food systems and further develop digital and data-driven innovation ecosystems for sustainable, healthy and inclusive food systems (see Destination '*Innovative governance, environmental observations digital solutions in support of the Green Deal*').

In addition, R&I under the **partnership on 'Sustainable food systems for people, planet and climate'** will accelerate the transition towards sustainable, healthy and inclusive food systems in Europe and beyond via EU-wide targeted research and innovation. It will help to close knowledge gaps, increase health and food literacy, and deliver innovative solutions, e.g. social innovation, which provide co-benefits for nutrition, the environment, climate, circularity and communities. It will also leverage investments and align multiple actors towards common goals and targets and help further build up the European Research Area in order to support the transformation of sustainable food systems at various scales from local to global.

The EU also aims to promote a ***global transition to sustainable food systems***. It's relationship with Africa is a key priority. Targeted R&I activities, in particular under the EU-Africa Partnership on Food and Nutrition Security and Sustainable Agriculture (FNSSA) and global initiatives involving international research consortia, will help achieve this ambition and contribute to the AU-EU High Level Policy Dialogue (HLPD) on Science, Technology and Innovation.

In line with the farm to fork strategy, and its promotion of global transitions on sustainable food systems, a comprehensive and integrated response to current and future challenges

benefiting people, nature and economic growth in Europe and in Africa will be provided. Advances will be made particularly in the following key areas: agroecology, including agroforestry, food safety and fair trade.

In encouraging multi-actor approaches and to be more effective in achieving impact, the proposals in this destination shall, where relevant, be complementary or build on synergies with the activities of the EIT Knowledge and Innovation Communities, such as EIT Food.

Where appropriate, proposals are encouraged to cooperate with actors such as the European Commission Knowledge Centre for Global Food and Nutrition Security[135] and the Africa Knowledge Platform[136], also for the purpose of dissemination and exploitation of results.

Expected impact

Proposals for topics under this destination should set out a credible pathway contributing to **fair, healthy, safe, climate- and environment-friendly, sustainable and resilient food systems from primary production to consumption, ensuring food and nutrition security for all within planetary boundaries** in Europe and across the world.

More specifically, proposed topics should contribute to one or more of the following impacts:

- enable **sustainable farming systems** that i) provide consumers with affordable, safe, healthy and sustainable food, ii) increase the provision of ecosystem services, iii) restore and strengthen biodiversity, iv) minimise pollution and pressure on ecosystems and greenhouse gas emissions, v) foster plant, animal and public health, vi) improve animal welfare, and vii) generate fair economic returns for farmers;

- enable **sustainable fisheries and aquaculture,** in marine and inland waters**,** increasing aquatic multi-trophic biomass production in a way compatible with the protection of aquatic ecosystems and biodiversity, and the diversification of fisheries and aquaculture products, for fair, healthy, climate-resilient and environment-friendly food systems with a lower impact on aquatic ecosystems and improved animal welfare;

accelerate the transition to **sustainable, healthy and inclusive food systems,** delivering co-benefits for climate change mitigation and adaptation, environmental sustainability and circularity, sustainable healthy diets and nutrition, food poverty reduction, empowered citizens and communities, and flourishing food businesses, while ensuring food safety and the economic sustainability of EU food systems during the transition.

The following call(s) in this work programme contribute to this destination:

Call	Budgets (EUR million)		Deadline(s)
	2023	2024	

135 https://knowledge4policy.ec.europa.eu/global-food-nutrition-security_en
136 https://africa-knowledge-platform.ec.europa.eu/

HORIZON-CL6-2023-FARM2FORK-01	196.50	92.50	12 Apr 2023
HORIZON-CL6-2024-FARM2FORK-01		95.00	22 Feb 2024
HORIZON-CL6-2024-FARM2FORK-02		69.00	22 Feb 2024 (First Stage) 17 Sep 2024 (Second Stage)
Overall indicative budget	196.50	256.50	

Call - Fair, healthy and environmentally-friendly food systems from primary production to consumption

HORIZON-CL6-2023-FARM2FORK-01

Conditions for the Call

Indicative budget(s)[137]

Topics	Type of Action	Budgets (EUR million)		Expected EU contribution per project (EUR million)[138]	Indicative number of projects expected to be funded
		2023	2024		
Opening: 22 Dec 2022 Deadline(s): 12 Apr 2023					
HORIZON-CL6-2023-FARM2FORK-01-1	COFUND	30.00	30.00	Around 60.00	1
HORIZON-CL6-2023-FARM2FORK-01-10	RIA	9.00		Around 9.00	1
HORIZON-CL6-2023-FARM2FORK-01-11	RIA	10.00		Around 5.00	2
HORIZON-CL6-2023-FARM2FORK-01-12	CSA	2.00		Around 2.00	1
HORIZON-CL6-2023-FARM2FORK-01-13	RIA	7.00		Around 7.00	1
HORIZON-CL6-2023-FARM2FORK-01-14	RIA	10.00		Around 5.00	2
HORIZON-CL6-2023-	RIA	8.00		Around	1

137 The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

138 Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

FARM2FORK-01-15				8.00	
HORIZON-CL6-2023-FARM2FORK-01-16	IA	10.00		Around 5.00	2
HORIZON-CL6-2023-FARM2FORK-01-17	CSA	4.00		Around 4.00	1
HORIZON-CL6-2023-FARM2FORK-01-18	CSA	4.00		Around 4.00	1
HORIZON-CL6-2023-FARM2FORK-01-19	IA	7.00		Around 7.00	1
HORIZON-CL6-2023-FARM2FORK-01-2	COFUND	20.00	40.00	Around 60.00	1
HORIZON-CL6-2023-FARM2FORK-01-20	RIA	10.00		Around 5.00	2
HORIZON-CL6-2023-FARM2FORK-01-3	CSA	8.00		Around 4.00	2
HORIZON-CL6-2023-FARM2FORK-01-4	CSA	1.00		Around 1.00	1
HORIZON-CL6-2023-FARM2FORK-01-5	RIA	12.00		Around 6.00	2
HORIZON-CL6-2023-FARM2FORK-01-6	RIA	5.00		Around 5.00	1
HORIZON-CL6-2023-FARM2FORK-01-7	IA	12.00		Around 6.00	2
HORIZON-CL6-2023-FARM2FORK-01-8	IA	5.00		Around 5.00	1
HORIZON-CL6-2023-FARM2FORK-01-9	COFUND	22.50	22.50	Around 45.00	1
Overall indicative budget		196.50	92.50		

General conditions relating to this call	
Admissibility conditions	The conditions are described in General Annex A.
Eligibility conditions	The conditions are described in General

	Annex B.
Financial and operational capacity and exclusion	The criteria are described in General Annex C.
Award criteria	The criteria are described in General Annex D.
Documents	The documents are described in General Annex E.
Procedure	The procedure is described in General Annex F.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G.

Enabling sustainable farming systems

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-FARM2FORK-01-1: European partnership on accelerating farming systems transition – agroecology living labs and research infrastructures

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 60.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 60.00 million.
Type of Action	Programme Co-fund Action
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: The funding rate is 50% of the eligible costs. This is justified by the pooling of proposers' in-kind contributions and in-house activities and by the nature of activities to be performed. Beneficiaries may provide financial support to third parties. The support

	to third parties can only be provided in the form of grants. As financial support provided by the participants to third parties is one of the primary activities of the action in order to be able to achieve its objectives, the EUR 60 000 EUR threshold provided for in Article 204(a) of the Financial Regulation No 2018/1046 does not apply. The maximum amount to be granted to each third party is EUR 10 000 000 for the whole duration of Horizon Europe.
Total indicative budget	The total indicative budget for the duration of the partnership is EUR 150 million.

Expected Outcome: In line with the European Green Deal, this partnership will contribute to the objectives and targets of the new common agricultural policy (CAP), and of the EU farm to fork strategy for a transition to fair, healthy, environmentally-friendly and more resilient food systems from primary production to consumption, and in particular pursuing the ambition to boost agroecology. Moreover, the Commission Communication 'Safeguarding food security and reinforcing the resilience of food systems'[139] highlights innovation through agroecology as one of the tools that can mitigate pressure on input costs without hurting production capacity, leading to long-term progress in productivity. Agroecology is a dynamic and holistic approach that contributes positively to healthier ecosystems and biodiversity, including in soils. Agroecology aims at supporting the transition of agri-food systems towards more sustainable practices by connecting science, practice and society and by triggering the adoption of a set of policies to promote sustainable agricultural practices. Given the potential of agroecology to deliver positive impacts for the transition towards environmental, climate, economic and social sustainability of Europe's farming systems, the partnership will deliver solutions that will support the implementation of several other European Green Deal strategies and initiatives, notably: the EU biodiversity strategy for 2030; the action plan for the development of organic production; the EU zero pollution action plan; the 2030 climate target pact; the EU soil strategy for 2030, the sustainable carbon cycles, and the EU bioeconomy strategy. The partnership will constitute a unique instrument that will help connect agroecological research across Europe. Its expected outcomes will contribute to the impacts of various Destinations under Cluster 6 of Horizon Europe, notably Destination 'Fair, healthy and environmentally-friendly food systems from primary production to consumption', as well as to the Sustainable Development Goals (SDGs), in particular SDGs 2, 3, 6, 12, 13 and 15.

The partnership's activities are expected to contribute to all of the following expected outcomes:

- Increased capacities of farmers and actors of the land-based primary production value chains across Europe to implement agroecological practices that contribute to sustainable

139 https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/key_policies/documents/safeguarding-food-security-reinforcing-resilience-food-systems.pdf

ecological, climate, environmental and productivity impacts, and to inclusive, competitive and resilient agri-food systems.

- A Europe-wide network of existing and new agroecology living laboratories and research infrastructures is set. Knowledge sharing and multi-stakeholder co-creation of agroecological innovations at various scales is ensured. A framework for data management, indicators, and tools to monitor agroecology transition is put in place.

- A robust European R&I system for agroecology integrating science and practice is put in place. The direction for expanding existing and building up new collaborations, boosting knowledge creation and sharing, and co-creating place-based and tailored solutions through agroecology living laboratories ('living labs') and research infrastructures is set. The understandings of the technical and socio-economic performance and the uptake of agroecology in Europe are improved.

- The science-policy dialogue on agroecology is strengthened. Scientific support and technical demonstrations for the development, implementation, monitoring and evaluation of relevant EU policies is provided. Evidence-based, systems-oriented and transformative governance and policy-making are supported.

- EU and national/regional agroecological research and innovation agendas from the EU and Member States and Associated Countries are complementary, leading to the co-creation and implementation of a long-term pan-European strategic research and innovation agenda.

Scope: The European partnership on 'Accelerating farming systems transition: agroecology living labs and research infrastructures' is one of the actions included in the farm to fork strategy, which calls for the promotion of agroecology as one of the sustainable farming approaches with capacity to help meet the European Green Deal objectives in relation to agri-food systems. Living laboratories are multi-stakeholder, real-life settings that place the user at the centre of innovation and operate as instruments for farmers, research organisations, companies, citizens, local and regional authorities, etc., for the co-creation of solutions following a multi-method approach. Agroecology living labs are characterised by very strong local embeddedness, multi-stakeholder involvement by a large diversity of origins, and knowledge intensiveness in the pursuit of and the innovations needed and produced. They can operate at different scales: typically farm, landscape or regional levels. Research infrastructures provide a wide range of services for research communities working in a long-term perspective.

The partnership should coordinate research and innovation programmes on agroecology between the EU and its Member States and Associated Countries and trigger combined actions. It should mobilise key partners and stakeholders, including ministries, funding agencies, research performing organisations, regions, local authorities, research infrastructures, living laboratories, farmers, advisors, industry, consumers, etc.

The partnership's co-created Strategic Research and Innovation Agenda (SRIA) should include calls for research projects and activities to boost place-based and multi-stakeholder co-creation of solutions. As such, it should boost fundamental research on agroecology through to applied research, and should give rise to ready-to-use solutions for scaling up in real-life environments. The partnership should cover issues pertaining to the transition to agroecology in all agricultural production systems, including but not limited to conventional agriculture, organic farming, agroforestry, permaculture, regenerative agriculture, urban farming, etc. Ultimately, the partnership should significantly contribute to filling existing knowledge gaps on agroecology, addressing geographical/territorial specificities in the EU and Associated Countries.

Delivering on the partnership's ambitions requires the implementation of the following portfolio of activities to be achieved during the partnership's lifetime:

- Support transnational research and innovation activities, as defined in its SRIA, on the challenges and potential of agroecology in addressing biophysical, climate, social and economic dimensions of sustainability, as well as for reducing environmental impact and resource use, at farming, local environment and broader societal levels. This should include supporting research in and on agroecology living labs as tools to foster agroecology transition.

- Build a European network of new and existing living labs and research infrastructures for knowledge sharing and co-creation of agroecology innovations, at various scales. The network will constitute a key platform for the development and co-creation of innovations to address the technical, economic, institutional and policy-related challenges of agroecology transition for both individuals and collectives across Europe.

- Improve access to and use of services provided by research infrastructures and other relevant initiatives, for long-term measurement, observation and experimentation in support of agroecology.

- Improve the sharing and access to knowledge and innovation on agroecology, and improve the capacities of farmers and actors of the agri-food chain to take up agroecology innovations, as well as reinforce the agricultural knowledge and innovation systems for agroecology across Europe, considering culture, gender, and youth aspects.

- Build a monitoring and data framework with indicators and tools to monitor and measure the progress of agroecology transition, its social, economic, environmental and climate performances and impacts, and improve data valorisation and sharing.

- Put in place robust mechanisms for science-policy dialogue to support the development, implementation, monitoring and evaluation of policies (research and sectorial) with a view to contributing to improved governance and policies, as well as institutions that are better equipped to support agroecological transition.

- Design and implement communication, knowledge sharing and dissemination activities to improve stakeholder and wider public engagement in agroecology transition.

The partnership is open to all EU Member States, as well as to Countries Associated to Horizon Europe. Partners are expected to provide financial and/or in-kind contribution, in line with the level of ambition of the proposed activities. The partnership should be open to include new partners over its lifetime. Its governance should allow for engaging a broad range of stakeholders, together with the full members of the partnership. Guidelines, standards and legislation in the field should be taken into consideration, to facilitate the marketing of the methods and products developed in the partnership.

To ensure that all work streams are coherent and complementary, and to leverage knowledge and innovation investment potential, the partnership is expected to foster close cooperation and synergies with the Horizon Mission 'A Soil Deal for Europe', with the existing European Partnership Biodiversa+, and with other relevant future partnerships, in particular Sustainable food systems, Agriculture of data, and Animal health and welfare.

Cooperation with the JRC may be envisaged, in particular for actions related to monitoring and measuring progress of agroecology transition, as well as for improving data valorisation. The JRC may provide expertise on EU-wide data and indicators to monitor agroecology transition.

The partnership should allocate resources to cooperate with existing projects, initiatives, platforms, science-policy interfaces, and/or institutional processes at EU level, and at other levels where relevant to the partnership's goals.

Proposals should pool the necessary financial resources from the participating national (or regional) research programmes with a view to implementing joint calls for transnational proposals resulting in grants to third parties. The partnership will provide financial support to third parties as one of the means to achieve its objectives. To explore the full range of financing options available under Horizon Europe, the general annexes of the main Work Programme setting out the general conditions applicable to calls and topics for grants should be considered.

To achieve the international cooperation objectives, and given the global dimension of agroecology, collaboration with strategic third country partners with proven added value in the field of agroecology transition is strongly encouraged. In particular, the participation of legal entities from international countries and/or regions, including those not automatically eligible for funding, is encouraged in the joint calls and/or in other activities of the partnership. Cooperation with international organisations may be considered.

Applicants are expected to describe in detail how they would carry out this collaborative work in practice.

Efforts should be made to ensure that the data produced in the context of this topic is FAIR (Findable, Accessible, Interoperable and Re-usable).

This topic should involve the effective contribution of social sciences and humanities disciplines.

In order to enhance the societal impact of the activities, the approach should empower citizens to contribute to the co-design/co-creation/co-assessment of research and innovation agendas/contents/outcomes.

Cross-articulation with the other data spaces, and notably with the European Open Science Cloud should be foreseen, exploiting synergies and complementarities of the different approaches.

The Commission envisages to include new actions in future work programme(s) to continue providing support to the partnership for the duration of Horizon Europe.

The expected duration of the partnership is seven to ten years.

HORIZON-CL6-2023-FARM2FORK-01-2: European partnership on animal health and welfare

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 60.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 60.00 million.
Type of Action	Programme Co-fund Action
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: The funding rate is 50% of the eligible costs. This is justified by the pooling of proposers' in-kind contributions and in-house activities and by the nature of activities to be performed. Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. As financial support provided by the participants to third parties is one of the primary activities of the action in order to be able to achieve its objectives, the EUR 60 000 EUR threshold provided for in Article 204(a) of the Financial Regulation No 2018/1046 does not apply. The maximum amount to be granted to each third party is EUR 10 000 000 for the whole duration of Horizon Europe.
Total indicative budget	The total indicative budget for the duration of the partnership is EUR 180 million.

Expected Outcome: In line with the European Green Deal, this partnership will contribute to the objectives and targets of the new common agricultural policy (CAP) and the EU farm to fork strategy, for a transition to fair, healthy and resilient animal production systems, including the reduction of anti-microbial usage and improvement of animal welfare. A successful proposal will support research and innovation to help policy makers, animal health industry and other relevant actors to provide society with reassurance on the prevention and control of infectious animal diseases with appropriate means, where antimicrobials are prudently used, where animal welfare is respected and improved, thus contributing to sustainable animal farming and harvesting and the protection of public health and the environment.

The expected outcomes of the topic will also contribute to other impacts of Destination 'Fair, healthy and environmentally-friendly food systems from primary production to consumption', as well as to the Sustainable Development Goals (SDGs), in particular SDGs 2, 3, to the One Health approach and to the CAP. It will contribute to the climate adaptation strategy, by fostering adaptation to climate change of livestock production.

The partnership is expected to contribute to all the following expected outcomes:

- Animal health and welfare research and innovation agendas from the EU and Member States and Associated Countries are complementary, leading to the co-creation and implementation of a long-term pan-European strategic research and innovation agenda, strengthening the European Research Area in the area of animal health and welfare.
- A robust European R&I system for animal health and welfare is put in place. The direction for expanding existing collaborations and building up new ones, boosting knowledge creation and sharing, is set.
- The animal health and welfare research community at large benefit from and use an improved comprehensive knowledge framework integrating relevant EU, national/regional data and information infrastructures to improve transnational research.
- Preparedness against upcoming and emerging threats to animal health, including zoonoses and vector-borne diseases, is strengthened for both animals and humans.
- Animal welfare is promoted and strengthened, including adaptation to climate change.
- Farmers, the veterinary profession and other actors in animal production have increased access to innovative methodologies and products for animal infectious diseases and animal welfare monitoring and control.
- Increased evidence-base is provided to animal health and welfare policymakers.

Scope: The partnership should coordinate research programmes and activities on animal health and welfare between the EU and its Member States and Associated Countries and trigger combined action.

It should mobilise key partners and stakeholders, including ministries, funding agencies, research performing organisations, research infrastructures, farmers, industry, etc.

The partnership should address terrestrial livestock and aquatic animals. Wildlife and companion animals will be addressed when there is a potential threat to public health or health of production animals.

The partnership's co-created strategic research and innovation agenda should include calls for research projects, as well as integrative activities. As such, it should boost fundamental research through to applied research, and should give rise to ready-to-use solutions, seek uptake of results and provide science-based policy advisory activities.

Delivering on the partnership's ambitions requires the implementation of the following portfolio of activities to be achieved during the partnership's lifetime:

- To support transnational research and innovation activities, as defined in its Strategic Research and Innovation Agenda (SRIA).
- To facilitate the cooperation between all major actors on the monitoring, prevention and control of animal infectious diseases and on animal welfare issues. Actions will be undertaken to strengthen alignment of research and innovation programs and joint integrative activities among research performing organisations and other actors and stakeholders to organise education and training activities, mobility schemes, networking; to optimise research infrastructures and resources, including networking.
- To boost research and to increase the evidence-base to develop products, indicators and tools for monitoring, control and improvement of animal health and animal welfare from farming to slaughtering, notably through joint research activities organised both among research performing organisations in the partnership and through launching open joint calls.
- To support surveillance, detection, risk assessment and alert communication, prevention, including selective breeding for relevant phenotypes and feeding supporting health and welfare, interventions including vaccines and treatments, socio-economic assessment on animal health and welfare.
- To enhance cross-sector cooperation and collaboration to prevent the spill-over of pathogens between animals, food, the environment and humans in a One Health perspective. The partnership will contribute to a multidisciplinary approach across sectors dealing with animal health and animal welfare, public health, food safety and the environment, including adaptation to climate change, in particular regarding zoonoses and antimicrobial resistance.
- To ensure general and targeted communication on the outputs of the partnership and dissemination of its deliverables to partners, policymakers, national and international stakeholders, and all other possible users, to stimulate their uptake and implementation.

- To regularly update the partnership vision and strategy, in particular to address new needs, for instance emergencies, policy implementation, stakeholders' interests, societal demands.

The Partnership is open to all EU Member States, as well as to countries associated to Horizon Europe. Partners are expected to provide financial and/or in-kind contribution, in line with the level of ambition of the proposed activities. The Partnership should be open to include new partners over its lifetime. Its governance should allow for engaging a broad range of stakeholders, together with the full members of the Partnership.

Guidelines, standards and legislation in the field should be taken into consideration, to facilitate the marketing of the methods and products developed in the partnership.

Proposals should pool the necessary financial resources from the participating national (or regional) research programmes with a view to implementing joint calls for transnational proposals resulting in grants to third parties. Financial support provided by the participants to third parties is one of the means of this action to achieve its objectives.

To ensure that all work streams are coherent and complementary, the partnership is expected to foster close cooperation and synergies with the existing European Partnership Biodiversa + and with relevant future European Partnerships, in particular 'agroecology living labs and research infrastructures'[140], 'sustainable food systems for people, planet & climate'[141], 'one health AMR[142]' and 'pandemic preparedness'.

The partnership should allocate resources to:

- Cooperate with existing projects, initiatives, platforms, science-policy interfaces, at EU and other levels, where relevant to the partnership's goals;

- Engage with relevant EU bodies in charge of providing scientific advice for policy making in the area of animal health and welfare, such as the European Food Safety Authority and the European Medicines Agency, and other EU bodies, where relevant to the partnership's goals.

To achieve the international cooperation objectives, and given the global dimension, not least of animal health, collaboration with strategic third country partners with proven added value in the field of animal health and welfare is encouraged. In particular, the participation of legal entities from international countries and/or regions including those not automatically eligible for funding, is encouraged in the joint calls and/or in other activities of the partnership. Cooperation with international organisations may be considered.

140 HORIZON-CL6-2023-FARM2FORK: European partnership on accelerating farming systems transition: agroecology living labs and research infrastructures

141 HORIZON-CL6-2023-FARM2FORK: European partnership on sustainable food systems for people, plant and climate

142 HORIZON-HLTH-2024-DISEASE-09-01: European Partnership: One Health Anti-Microbial Resistance

Applicants are expected to describe in detail how they would carry out this collaborative work in practice.

Efforts should be made to ensure that the data produced in the context of this topic is FAIR (Findable, Accessible, Interoperable and Re-usable).

Cross-articulation with the other data spaces, and notably with the European Open Science Cloud should be foreseen, exploiting synergies and complementarities of the different approaches.

This topic should involve the effective contribution of social sciences and humanities disciplines.

The Commission envisages to include new actions in future work programme(s) to continue providing support to the partnership for the duration of Horizon Europe.

The expected duration of the partnership is seven to ten years.

HORIZON-CL6-2023-FARM2FORK-01-3: Improving yields in organic cropping systems

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 8.00 million.
Type of Action	Coordination and Support Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the

	Research and Training Programme of the European Atomic Energy Community (2021-2025). [143].

Expected Outcome: A successful proposal should support the objectives of the farm to fork strategy to transition to fair, healthy and environmentally-friendly food systems from primary production to consumption, notably the objective to promote and increase organic farming[144] in Europe, in line with the farm to fork and biodiversity strategies' target of at least 25% of the EU's agricultural land under organic farming by 2030 and a significant uptake of agroecological practices. Activities will support the implementation of specific actions in the action plan for the development of organic production[145]. Given the potential of organic farming to contribute to the EU's climate ambition, this topic will contribute to the objective of a climate-neutral land sector by 2035 and a climate-neutral economy by 2050.

Project results are expected to contribute to all of the following expected outcomes:

- Increased and accelerated availability, accessibility and adoption of strategies and approaches that improve yields of crops grown under organic conditions, including organic-targeted plant breeding
- Enhanced climate, environmental and economic performance of organic farming systems
- Increased networking and knowledge exchange among all relevant actors in the Member States and Associated Countries, contributing to a strengthened research and innovation ecosystem of organic production in Europe
- Provision of data, scientific support and recommendations for the development, implementation and evaluation of EU policies and initiatives relevant for organic production

Scope: Promoting the use of more sustainable farming practices is a EU policy objective enshrined in the European Green Deal and its related strategies. Boosting organic farming, one of the objectives of the farm to fork and of the EU biodiversity strategies, can greatly contribute to achieving this ambition. Moreover, the Communication 'Safeguarding food security and reinforcing the resilience of food systems'[146] highlights the role that organic farming can play in reducing EU's dependence on external inputs.

Reaching at least 25% of the EU's agricultural land under organic farming will require among other elements, a significant increase in current conversion rates. One of the obstacles that hinders conversion to organic farming is the fact that several crops grown under organic

143 This decision is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

144 https://eur-lex.europa.eu/eli/reg/2018/848/oj

145 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0141R%2801%29

146 https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/key_policies/documents/safeguarding-food-security-reinforcing-resilience-food-systems.pdf

conditions achieve lower yields per hectare as compared with those produced under conventional farming practices. Closing the yield gap is therefore important in order to further improve the economic competitiveness and resilience of the sector, as well as to increase farmers' adoption of organic production

At the same time, closing of the yield gap should not compromise the principles and objectives of organic farming, in particular with regard to the recycling of nutrients. Moreover, it is important that approaches and strategies aiming at bridging the yield gap in organic farming are holistic and take into consideration the implications on the entire farming system.

By using a participatory approach, proposals should set up a European-wide network of testing, experimentation and demonstration sites to test, co-create and showcase practices and strategies that improve yields of crops produced under organic conditions. In this context, proposals should:

- Identify the most relevant crops in organic production for which yields can be sustainably improved in the short term, and propose crop-specific strategies with due attention to local and site-specific practices. This should consider cost-effectiveness analysis comparing with conventional farming production, in order to evaluate the economical sustainability of the strategies proposed.

- Give due attention to holistic approaches, such as those that contribute to improving organic-tailored plant varieties and appropriate use of breeds and varieties, and building soil fertility and optimal nutrient management (e.g., integrated plant-animal production systems, use of manure as fertiliser, nutrient recycling, introduction of crop rotations and intercropping, use of leguminous crops, circular approaches for maintaining and increasing soil organic matter, locally-specific optimization of water use, etc.). Nursery techniques for the production of suitable organic plant reproductive material should also be considered.

- Organise and implement advisory activities, exchange of knowledge and best practices as well as dissemination of results, including the development of practical guidelines and decision-support tools for farmers. These activities should also engage farmers involved in low-input farming, agro-ecological or circular farming, to facilitate cross-fertilisation and mutual learning.

- Identify remaining gaps (including normative gaps where relevant) and prepare a research and innovation roadmap to boost yields of crops produced under organic conditions. For these activities, proposals should ensure collaboration with relevant activities carried out under other actions in Horizon Europe, and ensure coherence with and contribution to the Strategic Research and Innovation Agenda of the future partnership ''Accelerating farming systems transition: agro-ecology living labs and research infrastructures'' and its successive updates.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of the main stakeholders (farmers, breeders, researchers, advisors, industry, etc.). Proposals should cover a representative range of pedo-climatic conditions across Europe and a wide range of crops (arable and perennial) reflecting the diversity of the European organic plant production sector. Proposals should ensure synergies and build on the results from previous and/or ongoing research projects. Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic, and ensure synergy with relevant activities carried out under other initiatives in Horizon Europe, including under the topic HORIZON-CL6-2023-GOVERNANCE: 'Developing an EU advisory network on organic agriculture', HORIZON-CL6-2024-GOVERNANCE: 'Organic farming thematic network to compile and share knowledge ready for practice', and the future partnership 'Accelerating farming systems transition: agroecology living labs and research infrastructures'. In order to better address some or all of the expected outcomes, as well as to promote learning and cross-fertilisation with activities carried out outside of Europe, international cooperation is encouraged.

HORIZON-CL6-2023-FARM2FORK-01-4: Towards research and innovation beyond farm to fork strategy targets for pesticides after 2030

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 1.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 1.00 million.
Type of Action	Coordination and Support Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the

	Research and Training Programme of the European Atomic Energy Community (2021-2025). [147].

Expected Outcome: The successful proposal should support the implementation of the farm to fork strategy, the EU biodiversity strategy for 2030 and the EU climate policy under the European Green Deal. Activities will contribute to the transition to fair, healthy and environmentally friendly food systems from primary production to consumption, notably the target to reduce by 50% the overall use and risk of chemical pesticides and reduce the use by 50% of the more hazardous pesticides.

Project results are expected to contribute to all of the following expected outcomes:

- Improved understanding of main knowledge gaps as well as of drivers and barriers to go beyond the farm to fork targets for chemical pesticides;
- Increased networking and knowledge exchange across Europe promoting a reduction in pesticide use and risk beyond the farm to fork targets;
- Research needs for further reductions or phasing out chemical pesticides in agriculture are identified.

Scope: The use of chemical pesticides in agriculture harm non-target organisms including humans, contaminates the soil, water and the wider environment, and cause biodiversity decline in agricultural areas. The European Green Deal has set new targets and defined a roadmap to reach its objectives through multiple strategies and action plans, including the farm to fork and the EU biodiversity strategy for 2030. Ambitious targets have been set for agriculture, namely the goal of reducing by 50% the use and risks of chemical pesticides, as well as the use of more hazardous pesticides, by 2030.

Research has shown that well-designed integrated pest management programmes can control weeds and pests in an ecologically friendly manner; however, today's farming still relies significantly on chemical treatments to ensure farm yields and profits. A key challenge is to assess the impact on sustainability (environmental, social, economic) of going beyond these 2030 targets of pesticide reduction aiming for further reductions or even phasing out chemical pesticides in EU agriculture, starting with the most hazardous ones, while sustainably coping with the consequences of climate change, such as heat, drought and extreme precipitation, or pressure from invasive pests and diseases. In order to achieve this, a stronger R&I ecosystem should be put in place that would be able to contribute with sustainable solutions, assess the challenges of further reductions or phasing out chemical pesticides on food systems, including food security and affordability, and connect the different ongoing efforts and initiatives.

Proposals should:

147 This decision is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

- Establish a network that promotes close cooperation among relevant research and innovation actors (including social sciences) and networks across the EU and Associated Countries;

- Provide a comprehensive analysis and understanding of knowledge gaps and new research paradigms to be addressed towards a sustainable (and beyond farm to fork targets) agriculture;

- Identify, map and foster pesticide use and risk reduction related activities in the EU, Associated Countries and worldwide, including programmes and demonstration facilities, all along the agri-food chain;

- Identify the challenges and opportunities for primary producers and other actors of the agri-food chain to drive the transition towards a sustainable (and beyond farm to fork targets) agriculture;

- Provide recommendations on the future research needs in agricultural sciences, as well as in technical, social, economic and policy sciences, aiming for further reductions or phasing out chemical pesticides in agriculture taking in consideration climate change, increased pressure from pests and diseases, and other challenges.

Proposals should consider arable and perennial crops. Proposals should build and capitalise on the outcomes of other relevant EU-funded research projects and initiatives under Horizon 2020 [148], Horizon Europe [149], and other programmes/initiatives (such as COST actions, PRIMA). Activities should ensure alignment and complementarity with those carried out under the future partnership 'Accelerating farming systems transition: agroecology living labs and research infrastructures' and the European Mission 'A Soil Deal for Europe". Proposals must implement the 'multi-actor approach' including a range of actors to ensure that knowledge and needs from various sector, researchers, farmers, advisory services, agri-food industries, consumers and NGOs are brought together.

HORIZON-CL6-2023-FARM2FORK-01-5: Advancing vaccine development for African swine fever

Specific conditions	
Expected EU contribution per	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately.

148 Horizon 2020 projects: SPRINT (Grant agreement ID: 862568), IWMPRAISE (Grant agreement ID: 727321), NOVATERRA (Grant agreement ID: 101000554), WeLaser (Grant agreement ID: 101000256), Bioschamp (Grant agreement ID: 101000651), novIGRain (Grant agreement ID: 101000663)

149 Projects under the following Horizon Europe topics: HORIZON-CL6-2022-FARM2FORK-01-02: Socio-economics of pesticide use in agriculture, HORIZON-CL6-2023-GOVERNANCE-01-21: Developing EU advisory networks to reduce the use of pesticides, HORIZON-CL6-2022-FARM2FORK-02-01-two-stage: Agroecological approaches for sustainable weed management, HORIZON-CL6-2023-FARM2FORK-01-7: Innovations in plant protection: alternatives to reduce the use of pesticides focusing on candidates for substitution.

project	Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 12.00 million.
Type of Action	Research and Innovation Actions

Expected Outcome: A successful proposal will support research and innovation to help policy makers and economic operators reduce the burden of African swine fever (ASF), thus contributing to a safeguarding animal health and the economic resilience of the sustainable livestock industry.

Activities under this topic will contribute to the following expected outcomes:

- Improved capacity to develop ASF pilot vaccines and their companion DIVA tests for the possible prevention and/or eradication of the disease in domestic pigs and wild boars;
- Vaccination strategies for both wild boar and domestic pigs, addressing different objectives and needs (e.g. eradication in wild boar; emergency or preventive use in domestic pigs).
- Increased international cooperation on a possible ASF vaccine.

Scope: ASF is a devastating viral disease that has showed its potential for very serious and rapid spread, not only in Europe, but throughout the world. It has a serious socio-economic impact on farming sector and is of major importance in the international trade of animals and animal products. While strict control measures including in particular biosecurity, culling of infected pigs, appropriate management of wild-boar populations, have contributed to reduced spread of the disease, concerns are raised on the possibility to eradicate the disease without vaccination in the long-term.

Global research efforts are starting to show some promising results, but further work on the development of effective and safe ASF vaccines is needed, as an additional tool to re-inforce control and eradication strategies currently in place.

All the following elements should be incorporated:

- Address the necessary steps for developing pilot vaccines against ASF for domestic pigs and wild boars;
- Address the necessary steps to develop companion DIVA tests, where feasible.
- Decipher pathogen genetics/genomics and immune response of the host, to develop innovative approaches to African swine fever vaccine development, at least including those virus types circulating in Europe. Study different types of vaccines and modern techniques to develop novel ASF vaccines;

In order to achieve the expected outcomes, international cooperation is encouraged in particular with North America.

The selected project should take into consideration the EU animal health regulatory framework.

Proposals should ensure adequate involvement of stakeholders from the European Medicines Agency, veterinary authorities, farmers and hunters. Involvement of the pharmaceutical industry is highly recommended.

While it is expected that proposals will present innovative approaches to ASF vaccine development, the projects could consider the relevant activities and outputs of past or ongoing EU funded research, such as VACDIVA[150] and DEFEND[151], and of other international projects on ASF vaccine and build on them where appropriate. They should contribute to the relevant objectives of the Star-Idaz International Consortium[152].

HORIZON-CL6-2023-FARM2FORK-01-6: Towards sustainable livestock systems: European platform for evidence building and transitioning policy

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 5.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the

150 https://vacdiva.eu/
151 https://defend2020.eu/
152 https://www.star-idaz.net/

	Research and Training Programme of the European Atomic Energy Community (2021-2025). [153].

Expected Outcome: Increasing sustainability, viability and resilience of climate friendly agricultural production are key objectives of the farm to fork strategy. The adoption and enhancement of more biodiversity-friendly farming systems is among the objectives of the EU biodiversity strategy for 2030. In line with these objectives, the successful proposal will support policy makers with science-based evidence on the impacts and externalities of livestock farming as part of the food system and wider ecosystem.

Activities under this topic will contribute to all of the following expected outcomes:

- Assembled collation of comparable and sound data on positive and negative impacts and externalities from the terrestrial livestock sector in accordance with internationally agreed methodology
- Quantitative, qualitative and monetized evidence of the social, economic and environmental impacts and externalities of different livestock production systems (extensive, intensive, organic, different animal species), and their relation to particular food systems (e.g., short supply, circular, market oriented…) as well as trade-offs/synergies assessed at farming and landscape scale
- Recommendations/policy advice on more effective tools in mitigating negative externalities and increasing positive externalities in different terrestrial livestock production systems
- Ensured more intensive and broader communication and dissemination of evidence-based knowledge in the EU and beyond, and make it accessible to all stakeholders groups, citizens and civil society at large.

Scope: The current debate on positive or negative impact and values of animal production is based on abundant contradictory data and on the difficulties in quantifying natural processes linked to agricultural production and land use. Negative and positive impacts and externalities, including potential trade-offs, should be deeply investigated in different types of farming systems, practices and environments. The project will build on a wide range of scientific information, reports, expert opinions and other available material such as databases.

The following elements should be incorporated:

- Provide a comprehensive study on the positive and negative impacts and externalities of terrestrial livestock farming systems in different social, economic and environmental contexts across Europe at farm, landscape and regional levels

[153] This decision is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

- Mapping of research and innovation projects as well as complementary initiatives, vision papers and reports on impact and externalities of different terrestrial livestock farming systems (extensive, intensive, organic, different animal species) within different food systems

- Develop methods and indicators to measure the scale, range and degree of identified externalities in different livestock systems

- Generate data on the aggregated effects of environmental, social and economic externalities available to allow the assessment of net global impact. Elaborate potential scenarios at national, regional levels through the use of existing or improved modelling

- Improve the understanding of the co-benefit of livestock systems for biodiversity and ecosystem services, land use/change, circularity, GHG emissions/savings, energy consumption, air/water/soil quality, human diet/health, animal health and welfare, food and nutritional security

- Provide new and improved evidence to support decision makers, public authorities, other organizations and stakeholders in the assessment of the socio-economic and environmental impacts and externalities of terrestrial livestock production systems around Europe, building on the specific elements above

- Communicate sciencebased evidence of the impacts of terrestrial livestock systems on climate, environment, biodiversity and ecosystem services as well as potential for improvement towards sustainable livestock systems. The socio-economic dimension should be considered.

In order to better address some or all of the expected outcomes, international cooperation is encouraged. The project will seek to engage a dialogue with and feed into any relevant structure or organization at European level and beyond such as Standing Committee on Agricultural Research (SCAR) [154] , FAO, Livestock Environmental Assessment and Performance Partnership (LEAP, FAO) [155] , Global Agenda for Sustainable Livestock (GASL)[156], etc.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of the main stakeholders involved in terrestrial livestock production systems and their sustainability (e.g., farmers, advisory services, policy makers, producers, land managers, ecology and nature conservation experts, social scientists and other relevant actors).

This topic should involve the effective contribution of Social Sciences and Humanities (SSH) disciplines.

154 https://scar-europe.org/
155 https://www.fao.org/partnerships/leap/en/
156 http://www.livestockdialogue.org/en/

HORIZON-CL6-2023-FARM2FORK-01-7: Innovations in plant protection: alternatives to reduce the use of pesticides focusing on candidates for substitution

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 12.00 million.
Type of Action	Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
Technology Readiness Level	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.

Expected Outcome: A successful proposal should support the farm to fork strategy to transition to fair, healthy and environmentally-friendly food systems from primary production to consumption, notably the target to reduce by 50% the overall use and risk of chemical pesticides and reduce the use by 50% of the more hazardous pesticides by 2030.

Project results are expected to contribute to all of the following expected outcomes:

- Increased availability of widely accessible and cost-efficient alternatives for prevention and (bio)control of plant pest with improved environmental performance (e.g., reduced effects on non-target organisms, natural resources, humans and the environment);
- Reduced reliance on hazardous plant protection products and favour low risk plant protection solutions, to sustain crop productivity and food security while contributing to sustainable agriculture and/or forestry;
- Minimized pesticides impact on human and animal health, terrestrial and aquatic ecosystems, drinking water, soils and the food chain.

Scope: The use of chemical pesticides in agriculture contributes to soil, water and air pollution, biodiversity loss and can harm non-target plants, insects, birds, mammals and amphibians. The Commission is taking action to reduce the overall use and risk of chemical pesticides by 50% and the use of more hazardous pesticides by 50% by 2030. Significant

efforts are required to develop alternatives to critical active substances used in plant protection. Active substances with certain properties defined in Regulation (EC) No 1107/2009 are considered as candidates for substitution[157]. For Plant Protection Products (PPPs) containing these active substances, Member States are required, when assessing an application for authorisation, to evaluate if these PPPs can be replaced (substituted) by other adequate solutions (chemical or non-chemical). Proposals should target one or more pesticides candidates for substitution in the EU and those pesticides which have been reported to be losing their efficiency due to the emergence of resistant pests.

Proposals should:

- Develop and test alternative approaches, tools, strategies, agents, and/or substances (either conventional, natural-based, or biological) for prevention (promoting prophylaxis measures) and/or (bio) control of plant pest [158] with improved environmental performance (e.g., reduced effects on non-target organisms, natural resources and the environment) and acceptable efficacy, enlarging the toolbox of integrated pest management (IPM);

- Improve current agronomic, ecological, cultural, and traditional practices to increase the resilience of agricultural production against biotic stresses;

- Assess the social, economic and environmental issues associated with the proposed innovative solution, including trade-offs, the impact on labour, safety culture, and risk management on farms;

- Demonstrate the safety of alternatives in accordance with established scientific risk assessment methodology and relevant EU regulatory frameworks related to their manufacturing and placing on the market.

- Set up demonstration sites in Europe to promote participatory demonstration activities, and the exchange of knowledge and best practices among farmers.

- Support capacity building, training and education enabling farmers/growers to the proposed solution reducing the use and risk of pesticides.

Proposals must implement the ‘multi-actor approach’ including a range of actors to ensure that knowledge and needs from various sectors such as researchers, farmers, advisors, and industry including SMEs are brought together.

---

157 These are plant protection products containing active substances that meet the cut-off criteria as set out in points 3.6.2. to 3.6.5 and 3.8.2 of Annex II to Regulation (EC) No 1107/2009 or are identified as candidates for substitution in accordance with the criteria in point 4 of that Annex.

158 A pest is defined here as any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products (EU legislation, Regulation 2016/2031)

Where relevant, proposals should seek complementarities and synergies, while avoiding duplication and overlap, with relevant actions funded under Horizon 2020[159]. Proposals should specify how they plan to collaborate with other proposals selected under this and other relevant topics[160], for example by undertaking joint activities, workshops or common communication and dissemination activities. Proposals should allocate the necessary resources to cover these activities.

The possible participation of the JRC in the project will consist of supporting the assessment of the social, economic and environmental issues associated with the proposed innovative solution, including trade-offs, the impact on labour, safety culture, and risk management on farms.

In this topic, the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Enabling sustainable fisheries and aquaculture

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-FARM2FORK-01-8: Using automatic species recognition and artificial intelligence to fight illegal fish discards and revolutionise fisheries control

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 5.00 million.
Type of Action	Innovation Actions
Technology Readiness Level	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.

Expected Outcome: In line with the European Green Deal objectives, both the farm to fork strategy and the common fisheries policy aim to ensure that fishing and aquaculture are ecologically, economically and socially sustainable and provide a source of healthy food for EU citizens. The successful proposals should unequivocally contribute to phase out the practice of discarding unwanted fish and improving catch-reporting data by using automatic species recognition and artificial intelligence to analyse data sources, such as video footage,

[159] Projects from topic SFS-04-2020 - Integrated health approaches and alternatives to pesticide use: NOVATERRA (Grant agreement ID: 101000554), WeLaser (Grant agreement ID: 101000256), Bioschamp (Grant agreement ID: 101000651), novIGRain (Grant agreement ID: 101000663)

[160] For example, HORIZON-CL6-2023-GOVERNANCE-01-21: Developing EU advisory networks to reduce the use of pesticides

rapid DNA-based assays and sensor data in real-time through, for example, internet of things or similar monitoring systems.

To ensure that fisheries are ecologically, economically and socially sustainable and provide a source of healthy food, the EU needs to close the possible loopholes in the legislations that could potentially allow for illegal and unsustainable fishing practices. To be successful, the EU needs to have in place a technologically advanced and effective fisheries monitoring and control system and the digitisation of fisheries is a key element (notably through the use of techniques such as artificial intelligence, sensors and robotics). This objective will also contribute to the headline ambition "A Europe fit for the digital age".

The selected project is expected to contribute to all of the following outcomes:

- Effective methods, tools and systems for species automatic recognition, analysis of Remote Electronic Monitoring video footage, rapid DNA-based assays and sensor data in real-time, and enhanced integration of results into the reporting systems used by fishers to report catches to competent authorities;
- Enhanced capability to monitor and control illegal discarding practices at sea and increased ability by EU Member States to fully implement the Landing Obligation;
- Implementation of ad-hoc sensors for the detection of discards and take advantage of the data from the Copernicus network, namely from its Maritime Surveillance Service;
- Optimal fishing operations and fishing processing and enhanced EU ability to collect, exchange and analyse data;
- Improved monitoring capabilities, including processing activities on board fishing vessels, and ultimately support to a sustainable management of marine biological resources.

Scope: Proposals should develop innovative and cost-effective solutions for automatic species recognition and quantification and assessment of health status of species (e.g., presence of parasites), and automatically analyse Remote Electronic Monitoring video footage, rapid DNA-based assays and sensor data in real-time. They should also develop mechanisms to ensure that the data collected by the cameras and sensors to be automatically analysed cannot be tampered with and that the system can automatically identify cases of system malfunction or missing information. Additionally, proposals should test the suggested solutions in real conditions, including the development of at least three pilot cases in three different European seas. They should also analyse vulnerabilities, dependencies and critical infrastructure in expanding the use of the solutions to Europe and worldwide (e.g., Regional Fisheries Management Organisations and Sustainable Fisheries Partnership Agreements).

Moreover, proposals should investigate possibilities for the integration of the results of the artificial intelligence analyses for the purposes of automated catch recording and reporting recommend effective designs of remote monitoring systems to cover processing activities on board of fishing vessels, and explore the possibilities of the system to contribute to the

identification of parasites in processed fish (e.g. via DNA-based assays). They should also recommend standardised remote electronic monitoring formats for the exchange of the information between different control authorities or to be used for scientific purposes, including standards based on FLUX that could be potentially proposed for recognition by UN/CEFACT.

Also importantly, proposals should analyse how fisheries data, containing private information, can be shared in an anonymized and safe way complying with EU data protection rules (General Data Protection Regulation).

Finally, they should explore and recommend strategies to overcome possible resistance, by all stakeholders/parties, to the implementation of the innovative solutions and propose different ways for effective implementation.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Transforming food systems for health, sustainability and inclusion

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-FARM2FORK-01-9: European partnership on sustainable food systems for people, planet and climate

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 45.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 45.00 million.
Type of Action	Programme Co-fund Action
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: The funding rate is 30% of the eligible costs. Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. As financial support provided by the participants to third parties is one of the

	primary activities of the action in order to be able to achieve its objectives, the EUR 60 000 EUR threshold provided for in Article 204(a) of the Financial Regulation No 2018/1046 does not apply. The maximum amount to be granted to each third party is EUR 10 000 000 for the whole duration of Horizon Europe.
Total indicative budget	The total indicative budget for the duration of the partnership is EUR 175 million.

Expected Outcome: Food systems are among the central leverage points for the transition; they are inextricably linked with the well-being of people and planet. This is reflected in the farm to fork and EU biodiversity strategies, which are at the heart of the European Green Deal. They identify ambitious targets and objectives for redesigning parts of the food system, outline actions, and pledge to monitor the progress towards them. The UN Global Food Systems Summit 2021 has addressed these issues globally. A successful proposal will contribute to the European Green Deal priorities, especially to the farm to fork strategy, and will deliver co-benefits on each of the Food 2030 priorities: nutrition for sustainable healthy diets, climate and environment, circularity and resource efficiency, innovation and empowering communities. The Partnership will also contribute to the common agricultural policy / common fisheries policy, circular economy action plan / blue economy, sustainable aquaculture, single market for green products, Europe's digital decade, 2030 climate target plan, Waste Framework Directive, bioeconomy strategy and action plan, and the EU zero pollution action plan.

The Partnership will coordinate, align, and leverage European and national R&I efforts to future-proof food systems for co-benefits through an integrated and transdisciplinary systems approach. The Partnership will provide the scientific evidence, as well as the collaborative experience among practitioners and citizens, to support the transformation of local, national, European and global food systems.

The partnership is intended to contribute to all the following expected outcomes:

- Accelerated transformation of local, national, European and global food systems, making them safe, sustainable, within planetary boundaries, healthy, fair and trusted – for everyone;
- Sustained multi-stakeholder EU partnership for R&I on food systems transformation with global-to-local linkages and a core strategy on food systems;
- Enabled EU-wide committed food innovation policy and a strong foundation for a European Research Area for food systems;
- Enhanced changes in the way we eat: safe, healthy and sustainable food are standard for all in the diverse food environment, via dietary shifts; changes in the way we process and

supply[161] food: supply-side and process innovation towards carbon neutrality, product diversity and circularity, changes in the way we connect with food systems: Citizen engagement and consumer trust in reoriented food systems; and changes in the way we govern food systems: Leverage points for local, national, EU and global transition pathways – incentives, boundary settings and co-creation.

Scope: The future health of Europe's people and the planet lies on our plate. The way in which food is produced on land, in fresh water and in oceans, as well as in aquaculture systems, fished, processed, packaged, distributed, valued, prepared, consumed, wasted and recycled should change to ensure that environmental, social and economic sustainability of food become core assets of EU's food systems, along with food safety and food security. Research and Innovation (R&I) is a critical resource for the EU in the transformation towards Sustainable Food Systems[162] for People, Planet & Climate (SFS). The prime condition for success is that a wide diversity of actors join forces in a Partnership – with a mission for change and willingness to contribute to joint actions.

There is consensus about the need for transformation of the current types of production, processing, distribution, and consumption in linear food chains towards circular food systems functioning within planetary boundaries. The sustainable food systems will provide food that is safe, sustainable healthy, fair and trusted for/by everyone. This transition needs an overarching food systems approach to address several challenges in an integrative manner and empowering all relevant stakeholders, diverse voices and geographical regions. This partnership does not address primary production as growing food, agricultural production and other specific aspects related to it, will be covered in the Horizon Europe Partnerships on Agroecology and Animal Health and Welfare.

This Partnership will provide a food systems R&I platform connecting local, national and European platforms, R&I programs and combining in-cash and in-kind resources in support of the transition to sustainable European food systems by 2030.

The European Partnership under Horizon Europe Sustainable Food Systems for People, Planet & Climate should be implemented through a joint programme of activities. These should target high impact, relevance for stakeholders and capacity building, ranging from research, innovation to coordination and networking activities, including training, dialogue, communication and dissemination activities in all research and innovation projects of the Partnership. Emphasis should be given to demonstration, upscaling and experimentation calls that strengthen collective intelligence and effect meaningful transformations through informing all of the stakeholders on the best science, data and insights from across the food systems:

The Partnership should aim to achieve the following objectives:

---

[161] Food supply does not refer to agricultural production, but to food processing, extraction and combination of ingredients, and food preparation (such as by the catering and restaurant industry).

[162] IPES-Food (2017). Unravelling the Food–Health Nexus: Addressing practices, political economy, and power relations to build healthier food systems. The Global Alliance for the Future of Food and IPES-Food. Available at: http://www.ipes-food.org/reports/

- Develop work programmes as implementation steps of the high-level Strategic Research and Innovation Agenda (SRIA) defining key activities;
- Pool R&I resources by joint calls for R&I projects based on commonly developed Strategic Research and Innovation Agenda (SRIA) and a Roadmap;
- Establish a Food systems knowledge Hub of hubs with a central Hub (or Platform) for understanding when food systems are evolving sustainably (in what contexts, with which actors, etc.), and a network of transformative research and innovation labs (FS-labs or 'hubs') for systemic innovations at different scales;
- Provide place-based solutions in the FS Labs, exploring them as living labs to test sustainable food systems pathways, like policy and city labs, experimental restaurant environments, etc.;
- Provide the frame for developing system approaches with sustainable outcomes in the Hub of hubs;
- Enable knowledge sharing, and scaling - adapting knowledge systems, innovation platforms and science-policy interfaces for ensuring impact; while making use of data and technology where it adds value. The science based collective intelligence will effect meaningful transformation. Proposals are encouraged to cooperate with actors such as the European Commission's Joint Research Centre (JRC). The JRC may provide expertise on how to strengthen the relationship between scientists and European policy makers and to promote research and collaboration on food systems science.

When it comes to food systems, it is important to recognize that all food producers, including aquaculture and fisheries, as well as retailers and processors have a key role as intermediaries between production and consumption. Alignment of private and public goals is a condition for success of public strategies. In particular, innovative food businesses implementing the European Green Deal, farm to fork and bioeconomy objectives could play a lighthouse role. Stakeholders from the quadruple helix[163] (i.e. policymakers, businesses/industry, researchers, and civil society), from different sectors of the food system, should be brought together on this overarching platform, with the aim of strengthening science-policy-society interfaces and increase transformative potential.

Partners are expected to provide financial and/or in-kind contributions for the governance structure, the joint calls and other dedicated implementation actions and efforts for national coordination. The partnership is expected to mobilise EU, national and regional capacities to leverage investments, including from the private sector and foundations, increase up-scalability and market accessibility for the developed solutions and thus increase the return to investments.

[163] https://op.europa.eu/en/publication-detail/-/publication/6e54c161-36a9-11e6-a825-01aa75ed71a1

Proposals should pool the necessary financial resources from the participating national (or regional) research programmes with a view to implementing joint calls for transnational proposals resulting in grants to third parties.

The Partnership is part of a "partnership landscape" that needs to avoid overlaps and build synergies for win-win collaboration and solutions, in particular with the Partnerships Accelerating farming systems transition: agroecology living labs and research infrastructures, Agriculture of Data and Animal Health and Welfare. Proposals should pool the necessary financial resources from the participating national (or regional) research programmes with a view to implementing joint calls for transnational proposals resulting in grants to third parties.

The Partnership should allocate resources to cooperate with existing projects, initiatives, platforms, science-policy interfaces, institutional processes at EU level, and at other levels where relevant to the partnership's goals. Proposals should pool the necessary financial resources from participating national (or regional) research programmes with a view to implementing coordinated calls for transnational proposals that provide grants to third parties.

This topic should involve contributions from the social sciences and humanities disciplines.

The expected duration of the partnership is seven to ten years.

The Commission envisages to include new actions in its future work programmes to provide continued support to the partnership for the duration of Horizon Europe.

HORIZON-CL6-2023-FARM2FORK-01-10: Eradicate micronutrient deficiencies in the EU

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 9.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 9.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.

Expected Outcome: In line with the European Green Deal priorities, the farm to fork strategy for a fair, healthy and environment-friendly food systems, and the EU's climate ambition for 2030 and 2050, the successful proposal will support R&I to eradicate micronutrient deficiencies in the EU and Associated Countries. It will contribute to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, dietary shift, sustainable healthy nutrition and safe food, food poverty reduction and empowerment of communities, and thriving businesses.

The main objective of this topic is to contribute to the eradication of micronutrient deficiencies and reduction of nutrition inequalities across EU and Associated Countries at different levels (e.g. countries, regions, urban/rural/coastal areas) and for different communities of vulnerable groups such as infants, elderly, pregnant women, people with food intolerances/allergies, people with metabolic disorders on the one hand, and migrants and low income groups on the other hand.

Project results are expected to contribute to all of the following outcomes:

- Improved knowledge of the true prevalence of human micronutrient deficiencies across EU and Associated Countries and development of proposals for optimal interventions to eradicate micronutrient deficiencies in different target groups;
- Improved knowledge and understanding of micronutrient functionality and metabolism during food digestion at different critical periods of life;
- Reduction of nutrition inequalities by providing solutions at a general population level across EU and Associated Countries;
- Eradication of micronutrient deficiencies by providing solutions particularly for the vulnerable population groups in shifting towards healthier diet;
- Better understanding of the health costs resulting from micronutrient deficiency.

Scope: Globally, more than 820 million people have insufficient food intake and many more consume low quality diets that cause 2 billion of people with micronutrient deficiencies and 2 billion of people overweight or obese. Micronutrient deficiencies have a direct impact on individuals and on societies, resulting in poorer health, lower educational attainment and decreased capacity to work and earning potential. The elderly, pregnant woman, children, people with chronic disease and poorer population groups or people socially isolated are particularly at risk. Even if modern food distribution has largely eliminated seasonal gaps in fruits and vegetables, only a limited number of edible crops (2 %) are currently used for the human diet. Therefore, it is still possible that individual diets are not varied enough to ensure adequate dietary quality and prevent micronutrient deficiencies. Climate change and increased atmospheric CO2 can directly alter (micro) nutrient content of crops and livestock products. Processing also alters the nutrient composition of foods (e.g. by removal of the part of the grain that contain beneficial nutrients such as fibre, protein and micronutrients) and, potentially, nutrient bioavailability (e.g. change of structure with treatment with high

pressure/temperature). In Europe, studies suggest substantial variability in micronutrient intakes such as vitamins D and E, iron, iodine, magnesium, potassium, selenium and zinc according to sex and among different population groups and countries.

Micronutrient deficiencies are preventable and the choice of interventions should be based on the root cause, the scope and severity of the micronutrient deficiencies. Proposals for interventions/solutions need to be coherent with national/Associated Countries and EU food and health laws and policies. Where relevant, activities should build on and expand the results of past and ongoing research projects and collaborate with relevant initiatives.

Standardized methods should be used for collecting missing data and/or for updating them using existing data/studies/cohorts to generate better quality data on population micronutrient statuses to plan and target proposals for policy makers to develop intervention programs and propose them mechanisms to monitor their progress.

Proposals are expected to address all of the following R&I activities:

- Develop specific micronutrient biomarkers to facilitate screening of high-risk populations/individuals and to identify the optimal intervention.

- Map and monitor the specific vulnerable groups suffering from micronutrient deficiencies at national/regional/rural/urban/coastal levels for different gender, age, socio-economic and cultural groups in EU and Associated Countries to determine the root cause and the true prevalence of the micronutrient deficiencies, identify their specific needs for optimal health/development.

- Explore the determinants and barriers of micronutrient deficiencies in different geographical zones. Utilize big data and artificial intelligence to elucidate the complex links between micronutrients, diets, health and development of diseases.

- Further study the functionality, bioavailability, risk/benefits of the micronutrients during critical periods of life. Understand the specific mechanism of food digestion (e.g. the effect of the matrix, role of the gut microbiome, interaction with other ingredients/nutrients) to enable to advise for optimal combinations of foods to maximise bioavailability, or to incorporate, where appropriate, micronutrients in food products in order to be taken efficiently.

- For the vulnerable groups, develop innovative solutions/strategies/programme, through an integrated food-based approach instead of food supplementation and fortification (e.g. fresh and diversified food naturally rich in (micro)nutrients of concern which are under-consumed including old/neglected fruit and vegetable crops) for different geographical zones and for different communities and evaluate their effective impact on micronutrients deficiencies.

- Develop innovative and effective tools to improve education, communication and training on healthy nutrition and diets in order to avoid micronutrient deficiencies which are adapted to various socio-economic groups of the populations in respect of cultures,

ages, gender, needs at different level (e.g. public authorities, health care providers, education systems). These tools should be available to policy makers, responsible national authorities to support their efforts for health promotion, disease prevention and care.

- Provide recommendations, guidelines and cases studies underpinned by scientific evidence that are coherent with relevant national and EU food law and policy and that could be used by policy makers to design coherent, safe and sustainable micronutrient deficiency programmes. Provide evidence in the form of a cost/benefit analysis of the proposed measures and the costs of not acting.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of academia, research-technology organizations, food businesses and other relevant actors of the value chain and take into account sex and gender analysis. Relevant advice of European Food Safety Authority (EFSA) has to be taken into account.

HORIZON-CL6-2023-FARM2FORK-01-11: New detection methods on products derived from new genomic techniques for traceability, transparency and innovation in the food system

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 10.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
Technology Readiness Level	Activities are expected to achieve TRL 4-5 by the end of the project – see General Annex B.

Expected Outcome: The successful proposal will be in line with the European Green Deal priorities and the farm to fork strategy for a fair healthy and environmentally friendly food system, as well as with the EU's climate ambition for 2030 and 2050. The farm to fork strategy aims to accelerate the transition to sustainable farming and food systems. It recognises the role that new innovative techniques may play in increasing sustainability, provided they are safe for consumers and the environment while bringing benefits for society as a whole. In addition, one of the strategy´s main priorities is to ensure traceability and

authenticity, and to enhance transparency. In this context, the successful proposals should contribute to ensuring traceability and authenticity, enhancing transparency and promoting innovation in the area of new genomic techniques.

Although existing detection methods may be able to detect even small alterations in the genome, this is sometimes not sufficient to confirm the presence of a genetically modified organism/product (GMO) regulated under Directive 2001/18/CE or Regulation 1829/2003, as the same alteration(s) could have been obtained by conventional breeding, which is not subject to the GMO legislation.

The existing approaches for the detection of GMOs cannot be applied in all cases. Various products obtained with new genomic techniques, as defined by European Commission, Joint Research Centre 2021[164], do not contain targets (e.g., promoters/terminators for screening purposes or event-specific sequences) on which GMO detection is largely based.

The challenge to identify certain genetically modified products is not always related to the available methodologies, but rather to the difficulty to differentiate against non-regulated products.

Some of the above mentioned challenges have been identified by recent literature[165] and the European Network of GMO Laboratories (ENGL) report of 26 March 2019 (JRC116289) which, referring to gene editing derived plant products, concluded that validation of an event-specific detection method and its implementation for market control will be feasible only for products carrying a known DNA alteration that has been shown to be unique (i.e. the alteration should be specific for the gene edited organism/product). The same consideration might apply for cisgenesis applications combined with gene editing. Under the current circumstances, market control will fail to detect unknown genome-edited plant products. The report notes that several issues regarding the detection, identification and quantification of genome-edited products will require further consideration, as its findings are currently based on theoretical assessments.

Project results are expected to contribute to all of the following expected outcomes:

- Reliable detection methods to address the challenges described;
- Development and validation of detection tools for enforcement authorities as well as for developers and agri-food operators;
- Empower enforcement authorities, developers and agri-food operators for the authenticity and traceability of products obtained through new genomic techniques;

164 New genomic techniques : state-of-the-art review 2021, https://data.europa.eu/doi/10.2760/710056

165 Genome-Edited Plants: Opportunities and Challenges for an Anticipatory Detection and Identification Framework. 2021. Alexandra Ribarits, Michael Eckerstorfer, Samson Simon and Walter Stepanek. Foods 2021, 10(2), 430; https://doi.org/10.3390/foods10020430; Detection of genome edits in plants—from editing to seed. 2021. Raymond D. Shillito, Sherry Whitt, Margit Ross, Farhad Ghavami, David De Vleesschauwer, Katelijn D'Halluin, Annelies Van Hoecke, Frank Meulewaeter. In Vitro Cellular & Developmental Biology - Plant 57:595–608. https://doi.org/10.1007/s11627-021-10214-z

- Enable informed consumer choices by enhancing transparency and traceability across the food chain;

- Enable innovation in the food system linked to new genomic techniques.

Scope: Proposals are expected to contribute to the development and validation of detection methods of products obtained through new genomic techniques, including all of the following activities:

- Examine innovative ways and/or specific markers that would allow for distinction between products resulting from new genomic techniques subject to the GMO legislation and products that are not subject to the GMO legislation. This should not only entail the detection of specific mutations, but also of other markers in the genome that are specific for the genotype containing the mutation/s. The methods should be able to distinguish between identical mutations obtained through different techniques;

- Development and validation of reliable detection methods including when possible quantification. Such methods could focus on products with known mutations (i.e. DNA sequence known) or on products with unknown mutations;

- The proposed detection methods should focus on a wide applicability of all or a subgroup of products, allowing for a screening approach. These methods should be assessed on pure products as well as on mixtures typical of food or feed products in the market. Proposals should always include plant-based products and may include also animal and/or microorganisms-based products.

- The proposal could also focus on the detection of unintended mutations or insertions (foreign DNA, CRISPR-Cas sequences, etc);

- The proposals could also include digital/virtual/AI modelling aspects along with the detection methods alternatives;

- The development and validation of standardized methodologies and the contribution to future standardisation processes is encouraged.

Proposals are encouraged to cooperate with actors such as the European Commission's Joint Research Centre (JRC) Knowledge Centre for Food Fraud and Quality, which provides expertise in food science, authenticity and quality of food supplied in the EU. Proposals could also foresee the involvement of the European Network of GMO Laboratories (ENGL).

Activities are expected to achieve TRL 4-5 by the end of the project. Proposals should define clearly the TRL starting point for each involved technology and the plan to reach more advanced TRL.

Applicants should seek synergies and capitalise on the results of past and ongoing research projects (including projects under the same topic) in the areas of food and feed chain traceability and new genomic techniques. Therefore proposals should include a dedicated

task, appropriate resources and a plan on how they will collaborate with other projects funded under e.g. the topic HORIZON-CL6-2021-ZEROPOLLUTION-01-08. In order to achieve the expected outcomes, international cooperation is encouraged.

HORIZON-CL6-2023-FARM2FORK-01-12: Thematic network ensuring food safety by translating research and innovation into practice

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 2.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 2.00 million.
Type of Action	Coordination and Support Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). [166].

Expected Outcome: In line with the farm to fork strategy the successful proposals will support food safety in the food system. Despite the continued generation of new knowledge and innovative solutions through funded European projects on how to ensure food safety in the food supply chain, they are often insufficiently exploited/known and widely applied by end-users for different reasons (official control authorities, food business operators, food safety risks assessors, etc.). Innovative ideas from practice are also insufficiently captured, exchanged and spread. Food safety knowledge and innovation ecosystems are insufficiently connected.

[166] This decision is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

Project results are expected to contribute to all of the following expected outcomes:

- Widespread use of existing new knowledge and innovative solutions by end-users (practitioners) on the ground ensuring food safety;
- Improved flow of knowledge and innovative solutions with end-users through more dynamic interactions and new collaboration methodologies to ensure food safety along the food supply chain;
- Better incorporation of end-users needs into the activities of research and innovation ecosystems, which would generate a better targeted and shared research agenda for innovation-driven food safety research, including the multi-actor approach. Greater user acceptance and adoption of the collected solutions generated;
- Improved skills and long-term availability of training and education material and on-line communities for end-users on how to ensure food safety

Scope: Proposals are expected to contribute to the creation of a thematic network in the area of food safety, including all of the following activities:

- Development of a community of practice to foster knowledge exchange between end-users and research and innovation ecosystems who will work together. Traditional and local food products should be taken into consideration in this community of practice;
- Proposals must implement the 'multi-actor approach' and ensure adequate involvement of academia and research-technology organizations, etc. with end-users (official control authorities, food businesses, industrial clusters, etc.) and other relevant actors of the food chain;
- Compilation of a comprehensive description of the state of food and feed safety practices, procedures, systems and technologies (including not only technologies for food safety hazards detection but also preventative approaches as well as food equipment/systems hygienic design best practices, and existing big data and/or artificial intelligence tools applied to food safety). Proposals should focus on the cost/benefit aspects of the practices and innovations collected and build on existing and new available knowledge, data and models enabling the practical implementation of solutions;
- Creation of tailor-made communication materials summarizing, sharing and presenting, in a language easily understandable for end-users, existing best practices and innovations that are close to implementation into practice, but not sufficiently known by end-users;
- Identification and mapping of possible relations and synergies with other networks, projects, initiatives and policy and funding instruments at regional, national and European level, that could help disseminate and exploit knowledge and results showing the added value of these inter-connections as well as to put in place mechanisms ensuring the future sustainability of the community of practice. Dissemination via public

events, publication of case studies, dissemination papers and reports, and the creation of an on-line collaborative space that remain active in the long-term including the availability of materials for training and education;

- Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under the topics HORIZON-CL6-2021-FARM2FORK-01-07, HORIZON-CL6-2021-FARM2FORK-01-16 and HORIZON-CL6-2021-FARM2FORK-01-17.

- Proposals should run for minimum 3 years.

HORIZON-CL6-2023-FARM2FORK-01-13: Cultured meat and cultured seafood – state of play and future prospects in the EU

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 7.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 7.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposal should also coordinate potential overlapping or complementary work with the European Food Safety Authority (EFSA).

Expected Outcome: In line with the European Green Deal priorities, the farm to fork strategy for a fair, healthy and environment-friendly food system, the biodiversity strategy for 2030 and the EU's climate ambition for 2030 and 2050, the successful proposal will support R&I to promote the production, provision and safe consumption of alternative sources of protein, and dietary shifts towards sustainable healthy nutrition, contributing to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, sustainable healthy nutrition and safe food, food poverty reduction, empowerment of communities, and thriving businesses.

Cell-based agriculture, and especially cultured meat (also called in vitro meat, lab-grown meat, artificial meat, cellular meat or cell-based meat) and cultured seafood, could be considered as a promising and innovative solution to help achieving the objectives of the farm to fork strategy for fair, safe, healthy and environmentally-friendly food systems. However, the potential environmental impact and impact on sustainability aspects need to be thoroughly assessed and safety established.

As such, the objective of this topic is to develop knowledge on the sustainability aspects relevant to this subject (i.e. environmental, economic, and social). It does not aim to help developing the market of cultured meat and cultured seafood in the EU.

Project results are expected to contribute to all of the following expected outcomes:

- Full understanding and up-to-date knowledge provided to food system actors on environmental, economic and social aspects of cultured meat and cultured seafood, including on ethics.
- Additional knowledge provided on potential challenges of and opportunities offered by cultured meat and cultured seafood to reduce greenhouse gas (GHG) emissions, air, water and soil pollution, resource depletion and impact on ecosystems, generation of wastes, and on human health.

Contribution to the farm to fork objectives and Food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities (e.g., meeting the needs, values and expectations of society in a responsible and ethical way).

Scope: In 2020, cultured meat and cultured seafood knew a boost in interest outside Europe, with the first authorisation for marketing cultivated meat products in Singapore and a large increase in investment. In Europe, this sector is starting to attract investments as well (the EU invested through REACT-EU in lab-grown meat[167]). At present, cell-based food products are not marketed in the EU. Such products require a pre-market authorisation before they can be placed on the EU market and, depending on the techniques used, this authorisation may need to be via either the GMO legislation or the novel food regulation. Once an application for the authorisation of these products is submitted to the Commission, the European Food Safety Authority (EFSA) will carry out the safety evaluation of these products, including whether they are nutritionally disadvantageous.

Few studies have been developed to understand the impact of the cultured meat cycle (production, consumption, waste) on the environment, and its link to social and cultural aspects. Rough estimates based on a life cycle assessment suggest lower GHG emissions, land requirements and water use compared to conventional meat. Conclusions on energy use depend on the methodology used and assumptions made. Cultured meat and cultured seafood also face social and cultural challenges.

Proposals are expected to address the following:

- Study the social aspects related to cultured meat and cultured seafood (potential benefits and risks): including the consumers' perception on cultured meat and cultured seafood, animal welfare, religious and ethical aspects, health aspects (for example impacts on obesity or NCDs, nutrition aspects) beyond safety risks eventually assessed by EFSA, etc.

[167] https://www.independent.co.uk/news/science/beef-culture-grown-eu-lab-sustainable-b1942580.html.

- Study the economic aspects (potential benefits and risks): including how to reduce the high infrastructure costs and high-cost raw materials, as well as scaling up in a cost-effective way (including through reaching out to start-ups in this field to understand the difficulties and potential); and the "cost of inaction" (economic impact of not having such investments in the EU and Associated Countries).

- Study the environmental aspects (potential benefits and risks) considering the entire life cycle by using the Environmental Footprint methods, including elements on carbon footprint, pollution, impacts on biodiversity, resource use, and considerations on how the released land from livestock production could be utilised within the bioeconomy system, etc. and develop a comparison of the overall environmental impact of cultured meat/seafood vs. conventional meat/seafood. Particular attention should be given to the assessment of the energy intensiveness of cultured meat and cultured seafood production. Livestock co-products, such as leather, pet food, cosmetics, fertilisers, other chemicals, etc., should also be considered, as well as food waste and packaging issues.

- Study technical problems relating to the production of cultured meat and cultured seafood and identify possible solutions that could improve the economic viability, circularity and overall sustainability.

- Identify new sources of ingredients for the cultured meat and cultured seafood to increase the sustainability aspects of the products (including the nutritional value).

- Identify, explore and study scenarios of market penetration and consumer acceptance of cultured meat and cultured seafood and conduct LCA analysis to assess the environmental and sustainability impact/benefits each scenario would result in (considering issues such as the availability of energy for different levels of uptake of this technology).

- Explore the current and possible future impacts for the farmers (including aqua-farmers) and industry, including economic viability, challenges and opportunities for the farming sectors, etc.

- Proposals should involve a multi-disciplinary consortium of independent researchers that should organize conferences and meetings gathering a wide range of food system actors. International cooperation is strongly encouraged. Where relevant, activities should build and expand on the results of past and ongoing research projects (e.g., Meat4all, CCMeat). The proposals should also consider projects selected under HORIZON-CL6-2021-FARM2FORK-01-12 and HORIZON-CL6-2022-FARM2FORK-01-07. The project should have a clear plan as to how it will collaborate with any other relevant project funded under other relevant topics. They should participate in joint activities, workshops, focus groups or social labs, and common communication and dissemination activities, and show potential for upscaling. Applicants should plan the necessary budget to cover these activities.

This topic should involve the effective contribution of SSH disciplines.

HORIZON-CL6-2023-FARM2FORK-01-14: Providing marketing solutions to prevent and reduce the food waste related to marketing standards

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 10.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). [168].

Expected Outcome: In line with the European Green Deal priorities, the farm to fork strategy for a fair, healthy and environmentally friendly food system, and the EU's climate ambition for 2030 and 2050, and the Commission communication "Safeguarding food security and reinforcing the resilience of food systems", the successful proposals will support R&I to prevent and reduce food losses and waste [169]. They should therefore contribute to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation),

[168] This decision is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

[169] Definition of food waste included in the Waste Framework Directive: *Food waste means all food as defined in Article 2 of Regulation (EC) No 178/2022 of the European Parliament and of the Council that has become waste*. Food waste does not include losses at stages of the food supply chain where certain products have not yet become food as defined in Article 2 of Regulation (EC) No 178/2002, such as edible plants which have not been harvested. Such products would be considered food losses. In addition, food waste does not include by-products from the production of food that fulfil the criteria set out in Article 5(1) of Directive 2008/98/EC, since such by-products are not waste.

biodiversity, environmental sustainability and circularity, sustainable food consumption, food poverty reduction and empowerment of communities, and thriving businesses.

Projects results are expected to contribute to all the following outcomes:

- Better understanding of the impact of food marketing standards on the generation of food waste along the supply chain[170], including the food waste generated between stages of the supply chain, and for various commodities.
- Improved market access to foods that do not meet marketing standards but are still safe to eat.
- Better understanding of the purpose and nature of private marketing standards and the underlying reasons for establishing such standards.

Contribution to the Food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities.

Scope: Food marketing standards are standards individuals and businesses comply with to be able to put food on the market or to sell to a particular buyer. These standards include or may include requirements about technical definitions, classification, presentation, marking and labelling, packaging, production method, conservation, storage, transport related administrative documents, certifications and time limits, restriction of use and disposal, …

As these standards focus on quality, they are different from food safety standards (foods that do not comply with marketing standards can still be safe to eat).

The marketing standards applied to food marketed in the EU exist at different levels and in different forms:

- International standards[171].
- EU marketing standards, contained in the Common Market Organisation (CMO) Regulation, the CMO secondary legislation and the "Breakfast Directives".
- National marketing standards set up by governments of Member States
- Private marketing standards.

Proposals should address all the following points:

---

170 The Commission Delegated Decision (EU) 2019/1597 establishing a common EU methodology to measure food waste outlines the following stages of the food supply chain: primary production; processing and manufacturing; retail and other distribution of food; restaurants and food services and households. https://eur-lex.europa.eu/eli/dec_del/2019/1597/oj

171 E.g. the United Nations Economic commission for Europe (UNECE) standards, the Codex Alimentarius standards, or international guidelines such as the Organization for Economic Cooperation and Development (OECD) schemes. These standards serve or may serve as a basis for standards adopted at EU or national level or for private standards.

- Provide estimates of the amounts of food waste resulting from the application of the above-mentioned marketing standards along the food supply chain. In particular, estimates of the amounts of food waste due to interactions between the stages and actors of the value chain should be provided. These estimates should be differentiated according to the responsible marketing standard(s).

- Assess trade-offs between food waste prevention/reduction objectives and other objectives pursued by marketing standards (e.g. keeping food of unsatisfactory quality off the market, providing clarity and transparency on the market, facilitating the functioning of the internal market; responding to consumers' and society's expectations).

- Assess the underlying reasons for setting up private marketing standards, including aspects related to consumers expectations.

- Identify solutions that would enable to improve the business potential for suboptimal foods not meeting market standards yet still safe to eat. This should include the identification of alternative marketing channels or models (including processing and other destinations), whilst ensuring the highest possible value for their valorisation and considering trade-offs between the different valorisation options. The most promising interventions and good practices already in place for similar foods or food categories should be considered.

- Provide recommendations/solutions to food businesses, owners of marketing standards and regulators on how to prevent/reduce food waste due to marketing standards.

- Some recommendations may help design marketing standards or support future policy development, in order to prevent and reduce food waste.

- Implement the multi-actor approach (see eligibility conditions) by conducting inter- and trans-disciplinary research and involving a wide range of food system actors.

The proposal activities should be performed at least for fruits and vegetables. Applicants may choose to cover additional commodities from the following food types: cereals, fish, meat, dairy and eggs.

The proposal activities should be performed across several Member States, in different parts of the EU.

Proposals should build on past or ongoing research projects and ensure synergy with relevant initiatives, including the Commission's EU Platform on Food Losses and Food Waste[172] and the evaluations already carried out by the European Commission in view of the revision of EU marketing standards and date marking rules. Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and any other relevant topic, e.g. by participating in joint activities,

[172] https://ec.europa.eu/food/safety/food-waste/eu-actions-against-food-waste/eu-platform-food-losses-and-food-waste_en

workshops, etc. Selected proposals under this topic will thus need to work together and adapt their initial work plan. Communication and dissemination activities should also be grouped and coordinated in a complementary manner.

Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.

This topic requires the effective contribution of SSH.

HORIZON-CL6-2023-FARM2FORK-01-15: Fostering resilient European food systems in a changing world

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 8.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 8.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.

Expected Outcome: In line with the recent communication on "Safeguarding food security and reinforcing the resilience of food systems"[173] and the farm to fork strategy, the successful proposal will support the implementation of the communication "Contingency plan for ensuring food supply and food security in times of crisis",[174] thereby enhancing the resilience of European Union food systems in a changing world, as well as taking into account developments on the farm to fork strategy's proposal for a legislative framework for sustainable food systems.

Project results are expected to contribute to all of the following expected outcomes:

- Better understanding of the short- and long-term drivers of change that may affect food systems at different levels (global, national, regional, urban/rural areas level) and put food security at risk.

[173] https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/key_policies/documents/safeguarding-food-security-reinforcing-resilience-food-systems.pdf.

[174] https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12770-EU-food-supply-and-food-security-contingency-plan_en.

- Better understanding of the vulnerabilities, dependencies and critical infrastructures of the food systems in the EU and worldwide, where this may have implications for the EU and Associated Countries.

- Improved preparedness to deal with risks that may threaten the nutritionally appropriate EU and Associated Countries' food supply and food security by making use of available data and platforms (including on weather, climate, biodiversity, socio-economic and markets data).

- Enhanced resilience of nutritionally appropriate food supply and improved food security in the EU and Associated Countries, in a changing world.

- Contribution to the farm to fork objectives and Food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities (e.g., meeting the needs, values and expectations of society in a responsible and ethical way).

Scope: Food is necessary to sustain life. Ensuring food supply is an objective set out in Article 39 of the Treaty on the Functioning of the European Union. The food systems in the European Union have been reliable and supplied more food than demanded. They proved to be resilient to large-scale disruption caused by the COVID-19 pandemic. However, the surge in global commodity prices, further accelerated by Russia's invasion of Ukraine, highlights again the need for EU agriculture, fisheries, aquaculture and food supply chains to become more resilient and sustainable. In an increasingly complex and uncertain world, which is already experiencing unprecedented environmental and climate changes, and in which the state of global geopolitical tensions is high, sustaining the ability of food systems to provide enough food for all that is as nutritious and meets dietary needs is likely to be a substantial challenge for Europe in the future.

Understanding what drives our food system, both externally and internally, on a short-term basis and in the long-term, and how we can measure or monitor the drivers of change and their impacts on the food supply and food security is vital if we want to give policymakers and businesses better tools for making food systems more sustainable and more resilient to diverse shocks and stresses (such as pandemics, geopolitical disruptions, conflicts and economic sanctions, extreme climatic conditions, environmental changes, natural disasters or energy price increase). The project should not only point to some serious vulnerabilities, (inter)dependencies and critical infrastructure of the food systems, but also offer indications for policymakers and businesses about where to direct efforts and investments to improve resilience.

Proposed activities should cover all of the following aspects:

- Analyse vulnerabilities, (inter)dependencies and critical infrastructure of the EU and Associated Countries' food systems in the global context.

- Establish an observatory for the main socio-economic, political, health, technological and environmental drivers of change, including short-term shocks and long-term stresses, to which the food systems were/are/might be exposed and develop an early warning system. For long-term developments, use of foresight is encouraged.

- Advance and/or develop innovative methods/models/tools, including exploratory modelling and capacity for managing deep uncertainties, to identify/evaluate/manage potential risks and improve risk scenario building for EU and Associated Countries' food security.

- Map and prioritize the risks that the different drivers of change pose to the food systems.

- Scan and benchmark what is already being done by government, civil society, and the private sector to reduce the risks and improve the capacity to deal with the various drivers of change.

- Develop innovative solutions and evidence-based recommendations for strategies and best practices on what policymakers, businesses, civil society, scientists, teachers, and other environmental and food system operators (can) do through policy, research, education, community action, or other means to enhance substantially the resilience of the food systems, and thereby ensure food security.

- Explore and mobilize the potential of new technologies, (integrated) information and communications technology (ICT) solutions and big data in improving preparedness for food security crises and the flow of information during crises.

- Establish a regular dialogue with the European Commission and the European Food Security Crisis preparedness and response Mechanism (EFSCM) with the goal to provide relevant contributions supporting the implementation of the communication "Contingency plan for ensuring food supply and food security in times of crisis".

Proposals are encouraged to cooperate with actors such as the European Commission's Joint Research Centre (JRC) and its Data-Modelling platform of resource economics.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of public authorities and civil society organisations, consumers, the private sector and other relevant actors of the value chain.

This topic should build on the knowledge provided by the assessment reports established by IPCC (Intergovernmental Panel on Climate Change), IPBES (Intergovernmental science Policy Platform on Biodiversity and Ecosystem Services) and IRP (International Resource Panel).

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other relevant projects and existing research infrastructures, and ensure synergy with relevant activities carried out under other initiatives in Horizon Europe.

Collaboration and complementarity with the European Partnership on "Sustainable Food Systems for People, Plant and Climate" is encouraged. This topic should involve the effective contribution of SSH disciplines. In order to achieve the expected outcomes, international cooperation is encouraged.

HORIZON-CL6-2023-FARM2FORK-01-16: Microbiomes fighting food waste through applicable solutions in food processing, packaging and shelf life

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 10.00 million.
Type of Action	Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: International organisations with headquarters in a Member State or associated country are exceptionally eligible for funding. The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Technology Readiness Level	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.

Expected Outcome: The successful proposal should be in line with the European Green Deal priorities, the farm to fork strategy and Food 2030 priorities[175] for a fair healthy and environmentally friendly food system, as well as with the EU's climate ambition for 2030 and 2050. It will support innovation to foster advances related to microorganisms for safer, healthier and more environmentally friendly food, thus reducing food waste. This is in addition to contributing to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, dietary shift, sustainable healthy nutrition and safe food, food poverty reduction and empowerment of communities, and thriving businesses.

Projects results are expected to contribute to all of the following expected outcomes:

175 https://ec.europa.eu/info/publications/food-2030-pathways-action-research-and-innovation-policy-driver-sustainable-healthy-and-inclusive-food-systems-all_en

- Applicable innovative and/or business solutions in food processing and packaging and targeting spoilage and/or pathogenic microorganisms in perishable foods to extend shelf life and address food loss and waste.

- Significant measurable improvements in development of microbial preservatives for the food industry as an alternative to chemical ones. Develop an evidence based robust and responsive policy framework for microbiome control in the food system.

- Clearly explain how the proposal will deliver co-benefits to each of the Food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities.

Scope: Proposals should aim for a holistic approach to realize the full potential that microbiome innovation has in terms of addressing food, health, environmental challenges and related economic problems and opportunities, to extend food shelf life and provide sustainable solutions in food processing and packaging.

Proposals are expected to address all the following:

- Develop microbial indicators of unexpected contaminants or environmental changes in food (e.g., during processing and packaging) and exploring possible microbial-based pathways to prevent food spoilage and reduce food loss and waste.

- Develop applicable microbiome business solutions for food packaging aiming to reduce/control/limit spoilage microorganisms in perishable foods to extend shelf life

- Develop, test and evaluate approaches that combine (meta)genomic or alternative microbiome indicator data in an inter- and transdisciplinary approach, to dynamically predict shelf life.

- Develop models and tools for controlling and predicting shelf life and risk of foodborne infection for improved decision making

- Demonstrate the safety of the developed approach, in accordance with relevant EU regulatory frameworks, related to its placing on the market.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of academia, research-technology organizations, small-medium enterprises (including start-ups), food businesses and other relevant actors of the value chain.

In order to achieve expected outcomes international cooperation is strongly encouraged, in particular in the framework of the International Bioeconomy Forum.

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and other relevant topics. They should participate in joint activities, workshops, focus groups or social labs, as well as organise common communication and dissemination activities and show potential for upscaling. Applicants should plan the necessary budget to cover these activities.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Targeted international cooperation

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-FARM2FORK-01-17: EU-African Union cooperation – linking the activities of the Food and Nutrition Security and Sustainable Agriculture (FNSSA) partnership and those of the Pan-African Network for Economic Analysis of Policies (PANAP)

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 4.00 million.
Type of Action	Coordination and Support Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: If eligible for funding, legal entities established in all African Union Member States* may exceptionally participate in this Coordination and support action as a beneficiary or affiliated entity. * "African Union member states" includes countries whose membership has been temporarily suspended. Due to the scope of this topic, legal entities established in all African Union member states* are exceptionally eligible for Union funding.* "African Union member states" includes countries whose membership has been temporarily suspended. International organisations with headquarters in a Member State or associated country are exceptionally eligible for funding. The following additional eligibility criteria apply: due to the specific challenge of this topic, in addition to the minimum number of participants set out in the General Annexes, consortia must include at least five independent legal entities established in Africa. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
Legal and financial set-up of the Grant	The rules are described in General Annex G. The following exceptions apply:

Agreements	Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). [176].

Expected Outcome: In line with the European Green Deal priorities and in particular the farm to fork strategy, and in support of the African Free Trade Area, the successful proposal will contribute to the African Union (AU)-EU High Level Policy Dialogue (HLPD) on Science, Technology and Innovation, and its priority on Green Transition (and the respective R&I partnerships on Food and Nutrition Security and Sustainable Agriculture and Climate Change and Sustainable Energy), as well as to the implementation of the short-term actions outlined in the working document of the AU-EU Innovation Agenda, aiming to translate R&I efforts into tangible business, development and employment opportunities in Africa and Europe.

Projects results are expected to contribute to all of the following expected outcomes:

- Improved alignment of activities of the FNSSA Research and Innovation Partnership and of the Pan-African Network for Economic Analysis of Policies (PANAP) in the scope of EU-AU cooperation, supporting the implementation of the FNSSA 10-year roadmap and the global transition towards sustainable food systems, providing end users with co-benefits in terms of evidence-based policy analysis supporting food and nutrition security and sustainable agriculture.

- Provide opportunities for exchange in sustainable agricultural and food system policy development and related studies between EU and AU in the context of the EU-AU FNSSA Research and Innovation Partnership and in the framework of PANAP.

- Support African agricultural and food systems policy making process through enhanced cooperation in the area of economic, social and environmental impact (including biodiversity) analysis of policy options for food systems, nutrition performance, agri-food trade, and development of rural areas.

- Fill in the gap between researchers and decision-makers, by fostering dialogues to better understand the duties and responsibilities of stakeholders.

Scope: Proposals should address the following:

- Reinforcing capacity building on policy definition and impact analysis by aligning European and African training and capacity building programmes, including exchange

[176] This decision is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

opportunities and networking with EU-AU and intra-Africa partners, and developing partnerships between universities.

- Designing actions that will support current and future activities under the PANAP network, building on the FNSSA roadmap and ensuring synergies and complementarities with the FNSSA partnership.
- Providing methods and strategies to promote recognition of the value of integration of scientific support within policy development in Africa and in Europe.
- Using digital technologies and information systems as a means to accelerate the translation of research results into policies.

The consortium selected for funding is encouraged to cooperate with actors such as the European Commission's Joint Research Centre (JRC). The possible participation of the JRC in the project could consist in the JRC joining the project steering committee, to ensure a strong contribution of the project to the goals and activities of the PANAP network.

HORIZON-CL6-2023-FARM2FORK-01-18: Support for the implementation of a sustainable platform for the EU-African Union cooperation under the Food and Nutrition Security and Sustainable Agriculture (FNSSA) partnership

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 4.00 million.
Type of Action	Coordination and Support Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: If eligible for funding, legal entities established in all African Union Member States* may exceptionally participate in this Coordination and support action as a beneficiary or affiliated entity. * "African Union member states" includes countries whose membership has been temporarily suspended. Due to the scope of this topic, legal entities established in all African Union member states* are exceptionally eligible for Union funding.* "African Union member states" includes countries whose membership has been temporarily suspended. International organisations with headquarters in a Member State or associated country are exceptionally eligible for funding.

	The following additional eligibility criteria apply: due to the specific challenge of this topic, in addition to the minimum number of participants set out in the General Annexes, consortia must include at least five independent legal entities established in Africa. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). [177].

Expected Outcome: In line with the European Green Deal priorities and in particular the farm to fork strategy, and in support of the African Free Trade Area, the successful proposal will contribute to the African Union (AU)-EU High Level Policy Dialogue (HLPD) on Science, Technology and Innovation, and its priority on Green Transition (and the respective R&I partnerships on Food and Nutrition Security and Sustainable Agriculture and Climate Change and Sustainable Energy), as well as to the implementation of the short-term actions outlined in the working document of the AU-EU Innovation Agenda, aiming to translate R&I efforts into tangible business, development and employment opportunities in Africa and Europe.

Projects results are expected to contribute to all of the following expected outcomes:

- Support to the implementation, functioning, consolidation and possible enlargement of a sustainable, and therefore long-term, platform for the EU-Africa Research & Innovation FNSSA partnership in the form of an International Research Consortium (IRC).
- Creation of a knowledge platform for sharing information on relevant research activities and results concerning the FNSSA roadmap.
- Maintenance and better coordination of EU-Africa research and innovation activities and investments in food nutrition security and sustainable agriculture in line with the FNSSA roadmap, thereby maximizing complementarities and avoiding duplication of efforts by supporting FNSSA Working Group.

Scope: Food and Nutrition Security and the Sustainability of Agriculture (FNSSA) are top priorities in the 'Green Transition' of the EU and Africa. It is recognised that there will be

[177] This decision is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

more opportunities to achieve these common goals if the EU and Africa join forces. Therefore, the EU and the AU have adopted an enhanced Research & Innovation cooperation as their core strategy and approved a 10-year FNSSA Roadmap. To boost this FNSSA partnership, the Horizon 2020 project LEAP4FNSSA, has been tasked to establish a bi-continental platform to advance FNSSA, in the form of an International Research Consortium. It is expected that the International Research Consortium will be launched before the end of 2022 under the coordination of the project LEAP4FNSSA.

Proposals should address the following:

- Building on the work done by the Horizon 2020 project LEAP4FNSSA, the selected proposal should provide the necessary support to the implementation and the activities of the International Research Consortium.
- Building up and consolidation of a formal research cooperation between the EU and the AU on the issue of food nutrition security and sustainable agriculture, supporting the implementation of the FNSSA 10-year roadmap.
- Providing support in updating the FNSSA roadmap with new R&I priorities based on identified knowledge gaps as well as in identifying and developing joint flagship initiatives.
- Providing support to the establishment of the governance of the International Research Consortium and the set-up of working groups as necessary for the working of the International Research Consortium.
- Contributing a sound method for the analysis of the results of ongoing R&I activities, and the analysis of research gaps.
- Facilitating public access and knowledge sharing through a single online knowledge platform, with access to information and data from the existing database developed under the Horizon 2020 LEAP4FNSSA project.
- Organising the interaction with relevant projects and initiatives.

Activities will build on other initiatives which implement the FNSSA roadmap such as the ERA-Nets LEAP-AGRI and Food Systems and Climate (FOSC). Synergies with the European Commission’s Knowledge Centre for Global Food and Nutrition Security will be explored.

The consortium selected for funding is encouraged to cooperate with actors such as the European Commission’s Joint Research Centre (JRC). The possible participation of the JRC in the project could consist in the JRC joining the project steering committee.

HORIZON-CL6-2023-FARM2FORK-01-19: Support to the markets and trade of agroecological food products under the Food and Nutrition Security and Sustainable Agriculture (FNSSA) partnership

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 7.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 7.00 million.
Type of Action	Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: Due to the scope of this topic, legal entities established in in all African Union member states* are exceptionally eligible for Union funding. * "African Union member states" includes countries whose membership has been temporarily suspended. International organisations with headquarters in a Member State or associated country are exceptionally eligible for funding. The following additional eligibility criteria apply: due to the specific challenge of this topic, in addition to the minimum number of participants set out in the General Annexes, consortia must include at least three independent legal entities established in Africa. The places of establishment of at least two of these legal entities must be in the same geographical region of Africa (as defined by the African Union: https://au.int/en/member_states/countryprofiles2). The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.

Expected Outcome: In line with the European Green Deal priorities and the farm to fork strategy for a fair, healthy and environment-friendly food system, and in support of the African Free Trade Area and of the climate objectives of the African Union and the EU, the successful proposal will contribute to the AU-EU High Level Policy Dialogue (HLPD) on Science, Technology and Innovation, and its priority on Green Transition (and the respective R&I partnerships on Food and Nutrition Security and Sustainable Agriculture and Climate Change and Sustainable Energy), as well as to the implementation of the short-term actions

outlined in the working document of the AU-EU Innovation Agenda, aiming to translate R&I efforts into tangible business, development and employment opportunities in Africa and Europe.

Projects results are expected to contribute to all of the following expected outcomes:

- Improved assessment systems for agroecological food systems with co-benefits for producers, climate, biodiversity and citizens,
- Assessment of certification schemes, testing innovative solutions (e.g. digital solutions) with agro-food systems/certification actors, such as fair agricultural trade, ministries in charge and border regime management.
- Contribution to the joint EU-AU Innovation Agenda.

Scope: Agroecology[178] is a holistic approach that relies on and maximises the use of ecological processes to support agricultural production. By working more with nature and ecosystem services, it has the potential to increase farms' circularity, diversification and autonomy, while preserving/enhancing biodiversity, and drive a full transformation of farming systems and agricultural value chains, from input substitution and beyond. Agroecological farming systems therefore have great potential to enhance the sustainability performance of agriculture and agricultural value chains that contribute to the objectives of the EU farm to fork strategy and the FNSSA partnership.

Proposals should address the following:

- Conducting a scoping exercise on existing agroecological initiatives in Africa, including an analysis of what has worked or failed, and why.
- Increased competitiveness of the agroecological production for safe and nutritious food in Africa with improved quality and transparency in local, regional and international markets.
- Supporting training, and capacity building for actors in agro-ecological businesses and fair trades.
- Organising demonstration and networking events with relevant actors of the food chain, ranging from producers to final users, including administrations relevant for promoting agro-ecological food products.
- Implementation of the new technologies, including internet of things and artificial intelligence, to bring transparency to the agro-ecology food value chain.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of the farming sector and all other relevant food chain actors.

178 http://www.fao.org/3/i9037en/i9037en.pdf

This topic should involve the effective contribution of social sciences and humanities (SSH) disciplines.

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under topics HORIZON-CL6-2021-FARM2FORK-01-03: Digitalisation as an enabler of agroecological farming systems and HORIZON-CL6-2021-CLIMATE-01-05: Agroecological approaches for climate change mitigation, resilient agricultural production and enhanced biodiversity.

The consortium selected for funding is encouraged to cooperate with actors such as the European Commission's Joint Research Centre (JRC). The possible participation of the JRC in the project could consist in the JRC joining the project steering committee and supporting the consortium to disseminate results of the activities developed by the project.

HORIZON-CL6-2023-FARM2FORK-01-20: EU-Africa Union – food safety

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 10.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: at least three partners from Africa and at least two from the same region as defined by the African Union (https://au.int/en/member_states/countryprofiles2). Due to the scope of this topic, legal entities established in in all African Union member states* are exceptionally eligible for Union funding. * "African Union member states" includes countries whose membership has been temporarily suspended. International organisations with headquarters in a Member State or associated country are exceptionally eligible for funding. The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.

Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. The maximum amount to be granted to each third party is EUR 60 000.

Expected Outcome: In line with the European Green Deal priorities and the farm to fork strategy for a fair, healthy and environment-friendly food system, and in support of the food safety systems of the African Union and the EU, the successful proposal will contribute to the first priority of the AU-EU High Level Policy Dialogue (HLPD) on Science, Technology and Innovation on Food and Nutrition Security and Sustainable Agriculture.

Regional integration, including through greater trade in goods and services, is one of the key aspirations of the African Union's (AU) Agenda 2063. The launch of the African Continental Free Trade Area (AfCFTA) has the potential to significantly accelerate growth and sustainable development, doubling intra-African trade and food trade in particular. While strong local food systems are a backbone of food security, trade contributes to resilient food systems by balancing between markets. The promotion of trade needs to take a start from the local, national and regional level to integrate food safety practices into all aspects of food production, distribution, marketing and consumption. Food safety is a pre-condition for food trade. It aligns with the recent AU decision to establish the Africa Food Safety Agency to ensure the coordination of food safety at the continental level[179]

Projects results are expected to contribute to all of the following expected outcomes:

- Improved African food safety systems,
- Building blocks for improved food safety in Africa, improving climate, environment and food systems, reducing losses by mycotoxins, enhancing local transformation, local markets and regional trade, while reducing impacts on environment, biodiversity, health and society.

Scope: Proposals are expected to address the following:

- Contribute to a better understanding of food safety in the informal sector by generating data and evidence on trade actors in the informal sector. Improve the understanding of informal trade operations and ways to improve food safety for better access to nutritious food for urban and rural populations.
- Assess and recommend ways to maintain the informal sector`s participation towards possible integration into the formal food system. Explore ways for its access to

[179] https://www.fao.org/food-coalition/take-action/detail/en/c/1321182/

infrastructure such as labs to be able to respond and manage the food safety risks along the chain."

- Address regulatory aspects, including the risk of over regulation. Develop solutions towards a quality culture from the SME level going forward, including opportunities of better organization of SME in view of lower cost for certification and conformity assessment.
- Pilot training systems to help the informal sector towards compliance with food safety and quality schemes.
- Improve tools to improve risk assessment of health risks, including long term risks of mycotoxins. Risk assessment and other evidence should inform the regulatory systems.
- Contribute towards the development of a food safety strategy for Africa, including monitoring and an early warning system.
- Contribute to a better understanding how fermentation can reduce mycotoxin levels in food products.
- Identify solutions and business cases to improve microbiome based approaches such as traditional and new food fermenting, drying and coating processes for reducing food waste and promoting longer shelve lives. Develop approaches for scale-up.
- Adapting to climate change: reducing increased risks to food safety
- Implement the multi-actor approach by involving a wide range of food system actors and conducting trans- and inter-disciplinary research including an effective contribution of SSH disciplines.

Innovation: Proposals should foresee a space for mentoring and accelerating innovative business concepts, including social innovation and upscaling in view of African or European food business entrepreneurs and start-ups with special consideration of women and the diaspora using cascading funding opportunities. Proposals may involve financial support to third parties e.g. to academic researchers, start-ups, SMEs and other multidisciplinary actors, to, for instance, develop, test or validate developed assessment approaches or collect or prepare data sets or provide other contributions to achieve the project objectives... Consortia need to define the selection process of organisations, for which financial support will be granted. Maximum 20% of the EU funding can be allocated to this purpose.

Call - Fair, healthy and environmentally-friendly food systems from primary production to consumption

HORIZON-CL6-2024-FARM2FORK-01

Conditions for the Call

Indicative budget(s)[180]

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million)[181]	Indicative number of projects expected to be funded
		2024		
Opening: 17 Oct 2023 Deadline(s): 22 Feb 2024				
HORIZON-CL6-2024-FARM2FORK-01-1	RIA	5.00	Around 5.00	1
HORIZON-CL6-2024-FARM2FORK-01-10	RIA	18.00	Around 6.00	3
HORIZON-CL6-2024-FARM2FORK-01-11	RIA	9.00	Around 4.50	2
HORIZON-CL6-2024-FARM2FORK-01-2	RIA	10.00	Around 5.00	2
HORIZON-CL6-2024-FARM2FORK-01-3	CSA	2.00	Around 2.00	1
HORIZON-CL6-2024-FARM2FORK-01-4	RIA	8.00	Around 4.00	2
HORIZON-CL6-2024-FARM2FORK-01-5	IA	6.00	Around 3.00	2
HORIZON-CL6-2024-FARM2FORK-01-6	RIA	10.00	Around 5.00	2
HORIZON-CL6-2024-FARM2FORK-01-7	RIA	9.00	Around 4.50	2
HORIZON-CL6-2024-FARM2FORK-01-8	RIA	9.00	Around 4.50	2
HORIZON-CL6-2024-FARM2FORK-01-9	IA	9.00	Around 4.50	2
Overall indicative budget		95.00		

General conditions relating to this call	
Admissibility conditions	The conditions are described in General

180 The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

181 Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

	Annex A.
Eligibility conditions	The conditions are described in General Annex B.
Financial and operational capacity and exclusion	The criteria are described in General Annex C.
Award criteria	The criteria are described in General Annex D.
Documents	The documents are described in General Annex E.
Procedure	The procedure is described in General Annex F.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G.

Enabling sustainable farming systems

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-FARM2FORK-01-1: Agro-pastoral/outdoor livestock systems and wildlife management

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 5.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the

	Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). [182].

Expected Outcome: In line with the objectives of the farm to fork strategy for a transition to fair, healthy and environmentally friendly livestock production systems, and of the EU biodiversity strategy for 2030, including the conservation status of certain habitats and species, the successful proposal will help policy makers and other actors to monitor and improve the management of farming and terrestrial wildlife relationships, thus contributing to sustainable agriculture and ecosystem services.

Project results are expected to contribute to all of the following outcomes:

- Innovative and sustainable practices and tools at landscape level to prevent and control negative consequences of interactions between livestock and wild animals to protect wildlife and pastoral/outdoor production systems
- Recommendations/policy advice on optimal management at EU level of wildlife and agro-pastoral systems
- Decision-making process on wildlife management and land planning participated by relevant stakeholders
- Improved coordination across Europe in terms of wildlife management, surveillance and data collection systems

Scope: Agro-pastoral/outdoor livestock farming systems, which include a large number traditional activities in Europe such as grazing systems, mountain livestock farming, transhumance, silvo-pastoral and agroforestry systems, offer beneficial effects not only to animal production, e.g., in case of scarce fodder resources, or to animal welfare, but also to habitat maintenance, carbon sequestration, biodiversity conservation and soil protection.

The increased demand for natural resources by human population with the consequent fragmentation of wildlife habitat, together with the increased population of wild animals and the change in land use have often resulted in human-wildlife conflicts. The interactions between livestock farmers and wildlife are more frequent and cause damages to both sides with conflicts in the management of farming systems and natural resources.

Wildlife population, which is worth protecting, occupies wide geographic area and extend across administrative borders, and public administrations face difficulties with regards to the reduction of the impact of wildlife on livestock farming. The implementation of a common

[182] This decision is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

and integrated approach at EU level is required to optimize the management of the co-existence of terrestrial wildlife (large carnivores, ungulates) and agro-pastoral/outdoor livestock systems at landscape level.

The following elements should be incorporated:

- Review of current wildlife management approaches in agro-pastoral/outdoor production systems in the different EU Member States and Associated Countries and assessment of the effectiveness of different prevention measures
- Map the most common types of damages caused and the positive externalities created by wild animals with respect to livestock and crops in Europe. Create an inventory of good practices and infrastructures at farms and regional levels, within a wider wildlife management approach.
- Improve or develop tools/technologies for (real time) data collection and analysis to assess, monitor and control (wild) animal behaviour and damages
- Cost/benefit analysis of current and new farming strategies that preserve, protect and valorise wildlife and pastoralism in different regions and ecosystems. Socio-economic, environmental, cultural and political aspects should be considered.
- Assess stakeholders' (farmers, hunters, conservationists, general public, policy makers…) perspectives and needs (participatory approach) and improve or develop effective instruments to reduce conflicts between livestock farming and wildlife. Identify the most effective measures to mitigate damages and the most common (monetary, non-monetary) compensation mechanisms across Europe.

The proposal should take into account projects funded under the LIFE programme, and interact and engage a dialogue with relevant EU organizations such as EU Platform on Coexistence between People and Large Carnivores[183].

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of the main stakeholders involved in managing wildlife/livestock interaction (e.g., farmers, hunters, game farmers and producers, agricultural advisory services, land managers, ecology and nature conservation experts, animal behaviour scientists, social scientists and other relevant actors).

This topic should involve the effective contribution of social sciences and humanities (SSH) disciplines.

Transforming food systems for health, sustainability and inclusion

Proposals are invited against the following topic(s):

[183] https://ec.europa.eu/environment/nature/conservation/species/carnivores/coexistence_platform.htm

HORIZON-CL6-2024-FARM2FORK-01-2: New healthy and sustainable food products and processes

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 10.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding. The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Technology Readiness Level	Activities are expected to achieve TRL 4-5 by the end of the project – see General Annex B.

Expected Outcome: In line with the European Green Deal priorities, the farm to fork strategy for a fair, healthy and environment-friendly food system, and the EU's climate ambition for 2030 and 2050, the successful proposal will support R&I to develop new food products and processes in conventional or organic production systems. These new products should be healthier and overall more sustainable and based on natural ingredients, tasty appealing to the consumer, affordable and minimally processed.

They should also optimize nutritional, structural and functional food properties of raw materials to enhance health and well-being benefits for EU and Associated Countries citizens and have a low impact on the environment/climate. This will contribute to the transformation of food systems to deliver co-benefits for climate, biodiversity, environmental sustainability and circularity, the shift to healthy and sustainable diets, safe food, food poverty reduction and empowerment of communities, and thriving businesses.

Project results are expected to contribute to all of the following outcomes:

- New knowledge that the food industry can use in the design of new healthy and sustainable food products and processes to improve health and well-being of EU and Associated Countries citizens and with low impact on the environment/climate.
- Alignment in goals of consumers and food solution providers with more healthy, tasty, minimally processed, affordable and sustainable food.

- New market and job opportunities for sustainable food SMEs and industries.

Scope: Several studies in adults found a strong scientific concordance between consumption of ultra-processed foods and a higher risk of developing cancer, irritable bowel syndrome, obesity, type 2 diabetes and hypertension. Evidence is accumulating from mechanistic studies of the plausible causal pathways by which the physical structure and chemical compositions of these foods might cause harm. Additives or cocktail of additives could play a role in the incidence of NCDs and further R&I are needed. It is now widely accepted that a diet rich in plant-based food, such as fruits, vegetables, wholegrain cereals, legumes and nuts, may reduce the incidence of chronic diseases and is also beneficial against obesity and metabolic diseases. Further research is necessary to determine how the structural characteristics of plant-based foods deliver health benefits in modulating digestibility and in improving bioavailability of nutrients and how the physical structure may be modified by processing.

An increasing number of people pay attention to environmental, health, social and ethical issues and they seek value in food more than ever before. Therefore, a food systems' transformation is needed with a shift towards more healthy, safe, affordable, accessible and sustainable food for all, coupled with a respective change in the food production, distribution and consumption involving all the actors of the food chain.

A move to a plant-based diet with less red and processed meat, less salt, sugars, saturated and trans fats and additives, with more whole-grain cereals, fruit and vegetables, legumes and nuts, as well as processing efficiency and reduced losses and wastage along the food supply chains is needed. Where relevant, activities should build on and expand the results of past and ongoing research projects and collaborate with relevant initiatives.

Proposals are expected to address the following R&I activities:

- Develop and optimise new efficient methods/processes to reduce costs (e.g. energy, water, food raw materials) and impact on the environment to produce minimally processed functional food ingredients and food products and assess their nutritional, sensorial, structural and functional properties to enhance health and well-being, including the values provided by the plant/produce microbiome for nutritional qualities and its effects on the human gut microbiome.

- Develop new healthy, sustainable, diversified, minimally processed, reformulated, tasty and affordable food products and assess their nutritional, structural, sensorial and functional properties to enhance health and well-being and to improve nutrition status.

- Demonstrate the safety of the developed food products in accordance with relevant EU regulatory frameworks related to their placing on the market, and generate relevant data for pre-market authorisation,

- Investigate, assess and develop improved predictive realistic models for quantifying effects on human health (risks/benefits) of processing and food ingredients (and/or mixture of them).

- Study and optimise the role of the food matrix structure to make specific ingredients available or not (in case of caloric control) to our digestive system to reach the desired health effects/to combat non-communicable (NCDs).

- Ensure societal acceptance and the consumer buy in of new food products and processes in involving consumer at all stage of the product development process.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of academia, research-technology organizations, food businesses and other relevant actors of the value chain and take into account sex and gender analysis.

Proposals could consider cooperation with of the European Commission's Joint Research Centre (JRC) research infrastructures (Nanobiotechnology laboratory) and its expertise at the interface between the research activities and regulatory aspects. In that respect, the JRC will consider collaborating with any successful proposal and this collaboration, when relevant, should be established after the proposal's approval.

HORIZON-CL6-2024-FARM2FORK-01-3: Thematic network tackling food fraud by translating research and innovation into practice

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 2.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 2.00 million.
Type of Action	Coordination and Support Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding. The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy

	Community (2021-2025). [184].

Expected Outcome: In line with the farm to fork strategy the successful proposals will support increased authenticity, traceability and transparency in food systems. One of the strategy´s main priorities is to tackle food fraud along the food supply chain. The successful proposals should therefore facilitate progress to preventing food fraud by translating research and innovation knowledge into practical applications.

Project results are expected to contribute to all of the following expected outcomes:

- Widespread use of existing new knowledge and innovative solutions by end-users/practitioners (official control authorities, food businesses, etc.) on the ground ensuring that food fraud is tackled;
- Improved flow of knowledge and innovative solutions with end-users through more dynamic interactions and new collaboration methodologies to prevent food fraud in the food supply chain;
- Better incorporation of the needs of end-users into the activities of research and innovation communities, which would generate a better targeted and shared food fraud research agenda for innovation-driven research.
- Improved skills and long-term availability of training and education material and on-line communities for end-users on how to tackle food fraud.

Scope: Proposals are expected to contribute to the creation of a thematic network in the area of food fraud, including all of the following activities:

- Development of a community of practice to foster knowledge exchange between end-users and research and innovation ecosystems who will work together mapping existing food fraud practices. Traditional and local food products should be taken into consideration in this community of practice;
- Proposals must implement the 'multi-actor approach' and ensure adequate involvement of academia and research-technology organizations with end-users (official control authorities, food businesses, industrial clusters, etc.) and other relevant actors of the food chain;
- Compilation of a comprehensive description of the state of new knowledge, practices, procedures, systems and technologies tackling food fraud (including not only technologies for detection but also preventative approaches). Proposals should build on existing and new available knowledge and trends, data and models (including big data tools and/or artificial intelligence applied to food fraud). Proposals should focus on the

[184] This decision is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

cost/benefit aspects of the practices and innovations collected and build on existing and new available knowledge, data and models enabling the practical implementation of solutions;

- Creation of tailor-made communication materials summarizing, sharing and presenting, in a language easily understandable for end-users, existing best practices and innovations that are close to implementation into practice, but not sufficiently known by end-users;

- Identification and mapping of possible relations and synergies with other networks, projects, initiatives and policy and funding instruments at regional, national and European level, that could help disseminate and exploit knowledge and results, showing the added value of these inter-connections. Dissemination via public events, publication of case studies, dissemination papers and reports, and the creation of an on-line collaborative space that remain active in the long-term including the availability of materials for training and education;

- Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under the topics HORIZON-CL6-2021-FARM2FORK-01-07, HORIZON-CL6-2021-FARM2FORK-01-17, HORIZON-CL6-2022-FARM2FORK-01-11 and HORIZON-CL6-2022-FARM2FORK-01-04.

- Proposals are encouraged to cooperate with actors such as the European Commission's Joint Research Centre (JRC) Knowledge Centre for Food Fraud and Quality, which provides expertise in food science, authenticity and quality of food supplied in the EU. Proposals could also foresee the involvement of the European Network of GMO Laboratories (ENGL).

- Cross-articulation with the other data spaces, and notably with the European Open Science Cloud (EOSC) should be foreseen, exploiting synergies and complementarities of the different approaches. Efforts should be made to ensure that the data produced in the context of this topic is FAIR (Findable, Accessible, Interoperable and Re-usable)

- Proposals should run for minimum 3 years.

HORIZON-CL6-2024-FARM2FORK-01-4: Climate change and food safety: effects of climate change on food safety across food systems

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 8.00 million.
Type of Action	Research and Innovation Actions

Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). [185].

Expected Outcome: The successful proposal will be in line with the European Green Deal priorities and the farm to fork strategy for a fair healthy and environmentally friendly food system, as well as with the EU's climate ambition for 2030 and 2050. It will support R&I to foster advances in research related to integrated approaches along the food system for detecting, assessing, and mitigating food safety risks influenced by climate change. This is along with contributing to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, dietary shift, sustainable healthy nutrition and safe food, food poverty reduction and empowerment of communities, and thriving businesses.

Project results are expected to contribute to all of the following expected outcomes:

- Improved understanding of the medium to longer-term climate change impacts in relation to food safety, and the effect these could have on food systems actors from farm to fork;

- Identification, development and widespread dissemination of mitigation and adaptation measures to reduce/prevent climate change-related food safety risks (individual and cumulative risks). Contribution to the farm to fork strategy objectives, in particular the contingency plan for ensuring food supply and food security and deliver co-benefits on each of the Food 2030 priorities as well as contributing to policy and food safety risk assessment needs and priorities, in particular regulatory control and enforcement aspects.

Scope: Proposals should contribute to all of the following aspects:

[185] This decision is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

- Proposals must implement the 'multi-actor approach' and ensure adequate involvement of academia, research-technology organizations, food businesses and other relevant actors of the value chain.

- Anticipate, including through modelling, how climate change may affect food safety in Europe and in particular by increasing the potential for the emergence/re-emergence of new hazards and the changes in exposures and risks;

- Propose methods to monitor the impact of climate change on food safety across food systems and their main critical areas. Explore how climate change could impact risk assessment methods and understand how risk assessment methodologies may need to evolve to meet new climate changed related challenges;

- Analyse the effect of climate change (extreme temperatures, etc.) and its impact with respect to: existing food safety hazards throughout the entire food supply chain (from farm to fork), and risk factors including the appearance of (re)emerging hazards.

- European regions should participate as "demonstrators" areas facilitating research and innovation under different climate conditions;

- Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic or other topics such as the HORIZON-CL6-2021-BIODIV-01-11 and HORIZON-CL6-2021-FARM2FORK-01-16 and ensure synergies with relevant activities carried out under other initiatives such as the One Health European joint programme and the LIFE programme ("Strategic Integrated Projects") due to their regional and climate approach.

- Proposals should also foresee the involvement of the European Food Safety Authority (EFSA) as part of the future action once the project starts.

In addition proposals are encouraged to:

- Increase the use of big data and/or artificial intelligence to elucidate the complex interactions between climate change and food safety. Proposals are expected to develop models to understand these interactions experimented and analysed for their replication potential. Proposals might build on existing and new knowledge, data, and models exploiting the full potential of big data and/or artificial intelligence;

- Explore, map and propose funding synergies strategies among European, national and regional programmes and instruments under this scope in a long-term vision;

- Connect research and innovation activities in this topic with start-ups ecosystems.

HORIZON-CL6-2024-FARM2FORK-01-5: Creating smart and attractive tools to enhance healthy and sustainable food provision, eating and treating of food at home

Specific conditions

Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 6.00 million.
Type of Action	Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Technology Readiness Level	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). [186].

Expected Outcome: The topic is in line with the European Green Deal priorities and the farm to fork strategy for a fair, healthy and environmentally friendly food system, as well as of the EU's climate ambition for 2030 and 2050. This will contribute to the Food 2030 priorities: nutrition for sustainable healthy diets, climate, environment, circularity and resource efficiency, innovation and empowering communities. The EU's farm to fork strategy states that: "European diets are not in line with national dietary recommendations, and the 'food environment'[187] does not ensure that the healthy option is always the easiest one".

The overall aim of this topic and associated R&I activities is to enhance healthy and sustainable diets aligned with national dietary advice by empowerment of citizens and their capacity to eat and cook at home in line with budgetary and time constraints as well as their

[186] This decision is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

[187] European Public Health Alliance (2019) "Food environments are the physical, economic, political and socio-cultural contexts in which people engage with the food system to make their decisions about acquiring, preparing and consuming food." https://epha.org/what-are-food-environments/#:~:text=%E2%80%9CFood%20environment%20refers%20to%20the,%2C%20preparing%20and%20consuming%20food.%E2%80%9D

living situation. The activity will develop tools that can be considered by national competent authorities for implementation. Interventions should not target citizens directly, as full alignment with national policies and advice on nutrition and health needs to be ensured.

Projects results are expected to contribute to all the following expected outcomes:

- Empowered citizens supported by tools and applications to make healthy and sustainable food provision, cooking and eating, and treating of food at home the easiest choice;
- Enhanced uptake of beneficial tools and applications by citizens, especially those who need it most, considering socio-economic characteristics and differences across EU and Associated countries.

Scope: Urban lifestyles have led to more consumption of ultra-processed and packaged food[188]. Cooking skills may enhance healthy and sustainable diets, so supporting consumers provides potential[189]. There are also indications, that social change might be enhanced by encouraging minorities to publicly challenge unsustainable norms during social interactions[190]. This potential can be exploited to drive change in behaviour by citizen engagement.

Proposals are expected to address the following:

- Develop tools and applications that enhance citizens to have a healthy and sustainable food provision, diet and treating of food at home/ or discourage unhealthy and unsustainable choices that can be considered by national policy makers and private actors;
- Include in approaches 'culinary culture dimension' such as based on nationality, religion, culture, regionality and seasonality etc., and time and financial constraints;
- Engage citizens in solutions to create inclusive and sustainable solutions for broad uptake;
- Ensure that national nutritional policies and advice are respected as well as food safety;
- Link solutions to the issue of food waste and to the need to reduce household wastes generally, notably plastics, as part of a circular economy to include all aspects of sustainability tools that can be considered by national policy makers for implementation;
- Take a holistic approach, e.g., delivery (including prepared meals, micro deliveries, decentralised pick-up points) including transport and distribution aspects, short supply chains, marketing, sustainable packaging, recycling and reduction in food waste;

188 FAO. "Urban Food Action (UFA)", 2019

189 Hartmann, C., Dohle, S., Siegrist, M. Importance of cooking skills for balanced food choices, Appetite 65 (65), 125-131, 2013

190 Bolderdijk, W.M., Jans,L. Minority influence in climate change mitigation, Current Opinion in Psychology 41, 25-30, 2021 https://doi.org/10.1016/j.copsyc.2021.02.005

- Develop a sample plan to make available to Member State and Associated Countries authorities for several countries on how to enhance uptake of beneficial tools and applications considering different socio-economic characteristics of citizens and national laws.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of among others health actors, such as nutritionists, doctors and nurses.

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and under the topic HORIZON-CL6-2021-FARM2FORK-01-15: "Transition to healthy and sustainable dietary behavior".

Proposal should apply social innovation and citizen engagement for inclusive and long-term solutions beyond the life cycle of the project and include a strong involvement of citizens/civil society, together with academia/research, industry/SMEs/start-ups and government/public authorities.

This topic should involve the effective contribution of SSH disciplines.

HORIZON-CL6-2024-FARM2FORK-01-6: Citizens' science as an opportunity to foster the transition to sustainable food systems

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 10.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Technology Readiness Level	Activities are expected to achieve TRL 3-5 by the end of the project – see General Annex B.

Expected Outcome: This topic is in line with the European Green Deal priorities and the farm to fork strategy for a fair, healthy and environmentally friendly food system, as well as of the EU's climate ambition for 2030 and 2050. This will contribute to the Food 2030 priorities: nutrition for sustainable healthy diets, climate, environment, circularity and resource efficiency, innovation and empowering communities, and thriving businesses.

Data-driven solutions in food systems also benefit the European Open Data Directive to share public data[191] and envisioned data spaces[192] as well as provide a base of AI deployment as enablers of the European Green Deal objectives.

Projects results are expected to contribute to all the following expected outcomes:

- Better understanding of citizens' food consumption behaviour, the factors influencing choices and drivers that would facilitate changes in behaviour in an inclusive manner towards healthy and sustainable food consumption practices;
- Contribution to positive changes in individual behaviour towards healthy and sustainable food consumption and sustainable food system transformation.

Scope: Currently, consumers are sceptical to share data, least to the government[193]. As there is a need for more data-driven decision making, engaging citizens in research through the provision of data on their practices, choices and attitudes towards the food system provides potential for a more direct citizen engagement in transforming food systems. The approach allows to exchange ideas, solutions, and opinions to encourage Responsible Research and Innovation (RRI) in driving sustainable food system transformation.

Citizen's science[194] is a fast-growing mode of research and innovation[195] that can allow for enhanced food system transformation driven by engagement, trust and transparency. It can leverage relevant private relevant data to take stock of current citizens' behaviour towards the food system, including aspects such as food consumption, marketing and food environment influence, health, mobility, regionality/locality, food-related waste generation and management, etc. by using collective intelligence.

Proposals are expected to address all the following:

- Explore the potential of 'citizen's science' in the food systems domain by engaging and empowering citizens in using and providing data and technology to ensure inclusive solutions to drive sustainable food system transformation by promoting sustainable food consumption, reducing food waste, and creating a resilient food system;

191 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L1024&from=EN

192 DIGITAL WP 2021-2022

193 L. Timotijevic, S. Astley, M.J. Bogaardt, T. Bucher, I. Carr, G. Copani, J. de la Cueva, T. Eftimov, P. Finglas, S. Hieke, C.E. Hodgkins, B. Koroušić Seljak, N. Klepacz, K. Pasch, M. Maringer, B.E. Mikkelsen, A. Normann, K.T. Ofei, K. Poppe, G. Pourabdollahian, M.M. Raats, M. Roe, C. Sadler, T. Selnes, H. van der Veen, P. van't Veer, K. Zimmermann, Designing a research infrastructure (RI) on food behaviour and health: Balancing user needs, business model, governance mechanisms and technology, Trends in Food Science & Technology, Volume 116, 2021, Pages 405-414, https://doi.org/10.1016/j.tifs.2021.07.022, Note: this paper discusses an international research infrastructure.

194 Citizen science n. scientific work undertaken by members of the general public, often in collaboration with or under the direction of professional scientists and scientific institutions (Oxford English Dictionary)

195 wp-11-widening-participation-and-strengthening-the-european-research-area_horizon-2021-2022_en.pdf (europa.eu)

- Identify the challenges and drivers encouraging citizens to share data to ensure inclusive food system transformation;

- Develop and test tools by using data and technology to enhance uptake of healthy and sustainable diets and foster sustainable food system transformation;

- Explore which data types are most useful to share (behavioural data, data from private providers, such as data gathered by relevant apps, stated data…etc.) and how to meaningfully harmonize data to use data for food system transformation by different actors, and which tools to best make use of, such as Artificial Intelligence (AI) while analysing how consumer data can be shared in an anonymized and safe way complying with the General Data Protection Regulation (GDPR) rules;

- Make concrete efforts to ensure that the data produced in the context of this project is FAIR (Findable, Accessible, Interoperable and Re-usable), particularly in the context of real-time data feeds, exploring workflows that can provide "FAIR-by-design" data, i.e., data that is FAIR from its generation;

- Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this and the topic HORIZON-CL6-2022-GOVERNANCE-01-10 "Piloting approaches and tools to empower citizens to exercise their "data rights" in the area of food and nutrition" and HORIZON-WIDERA-2021-ERA-01-60: "A capacity-building and brokering network to make citizen science an integral part of the European Research Area";

- Proposals are encouraged to cooperate with actors such as the European Commission's Joint Research Centre (JRC). The JRC may provide expertise on how to strengthen the relationship between scientists and European policy makers and to promote research and collaboration on food systems science.

- Connect personal data on food to other areas, such as mobility and health and identify synergies; projects shall leverage the data and services available through European Research Infrastructures federated under the European Open Science Cloud and, where relevant, establish synergies with the Data Space for smart communities[11] and make use of open standards and technical specifications, for example the Minimum Interoperability Mechanisms (MIMs Plus);

- Proposals must implement the 'multi-actor approach' and ensure adequate involvement of citizens/civil society, together with academia/research, industry/SMEs and government/public authorities and include social innovation as the solution is at the socio-technical interface and requires social change, new social practices and social ownership;

- This topic should involve the effective contribution of SSH disciplines.

HORIZON-CL6-2024-FARM2FORK-01-7: Impact of the development of novel foods based on alternative sources of proteins

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 4.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 9.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.

Expected Outcome: In line with the European Green Deal priorities, the farm to fork strategy for a fair, healthy and environment-friendly food system, and the EU's climate ambition for 2030 and 2050, the successful proposal will support R&I to promote the production, provision and safe consumption of alternative sources of protein, and dietary shifts towards sustainable healthy nutrition, contributing to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, sustainable healthy nutrition and safe food, food poverty reduction, empowerment of communities, and thriving businesses.

Novel foods are foods that have not been consumed to a significant extent in the EU before 15 May 1997. They can be newly developed, innovative foods, foods produced using new technologies and production processes, as well as foods that are or have been traditionally eaten outside of the EU. Alternative sources of proteins (i.e. other than conventional sources of proteins such as meat and dairy or mainstreamed from classical crops) may be considered as novel foods. Novel Foods can only be authorised in the EU market if they do not pose any risk to human health, the food's intended use does not mislead consumers and are not nutritionally disadvantageous.

Projects results are expected to contribute to all of the following expected outcomes:

- Better and complete information provided about the impact this specific innovation, i.e. the development of novel food (e.g., insect protein, micro and macro algae-based products, microbial proteins, food/aquaculture by-products) would have especially for the food system in terms of sustainability (particularly economic and social aspects).

- Solutions that can help achieving the objectives of the European Green Deal, especially the farm to fork strategy, and Food 2030 priorities: nutrition for sustainable healthy

diets, climate and environment, zero pollution, circularity and resource efficiency, innovation and empowering communities (e.g., meeting the needs, values and expectations of society in a responsible and ethical way).

Scope:

- Assess the potential of insect protein, micro and macro algae-based products, microbial proteins and/or food/aquaculture by-products in terms of market development taking into account the farm to fork strategy objectives based on up-to-date/new knowledge about them.
- Assess their economic impact (e.g., price, production cost, share of market, etc.) and assess the impact such development will have on other sectors, across the food and the bio-based systems.
- Assess their social impact (e.g., health aspects, consumer acceptance including considering gender and age aspects, cultural aspects).
- Assess their potential (as well as related risks and trade-offs) to address the most relevant European Green Deal objectives, including environmental ones, compared to conventional sources of proteins (e.g. meat and dairy), and the need to shift to sustainable and healthy diets.
- Implement the multi-actor approach by involving a wide range of food system actors and conducting inter-disciplinary research.
- International cooperation is strongly encouraged.
- Where relevant, activities should build and expand on the results of past and ongoing research projects (especially related to environmental aspects developed by the projects funded under HORIZON-CL6-2021-FARM2FORK-01-12 and HORIZON-CL6-2022-FARM2FORK-01-07, and projects funded under other relevant topics in this Work Programme). Projects should have a clear plan as to how they will collaborate with other projects selected under this topic (if funding of more than one project is possible) and any other relevant topic. They should participate in joint activities, workshops, focus groups or social labs, and common communication and dissemination activities, and show potential for upscaling. Applicants should plan the necessary budget to cover these activities.

HORIZON-CL6-2024-FARM2FORK-01-8: Preventing and reducing food waste to reduce environmental impacts and to help reach 2030 climate targets

Specific conditions	
Expected EU contribution per	The Commission estimates that an EU contribution of around EUR 4.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a

project	proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 9.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding. The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.

Expected Outcome: In line with the European Green Deal priorities, the farm to fork strategy for a fair, healthy and environmentally friendly food system, and the EU's climate ambition for 2030 and 2050, the successful proposals will support R&I to prevent and reduce food waste[196]. They should therefore contribute to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, sustainable food consumption, food poverty reduction and empowerment of communities, and thriving businesses.

Projects results are expected to contribute to all the following outcomes:

- Reliable data on the environmental impacts related to food waste, in particular GHG emissions;
- Better understanding of the food waste prevention efforts that will accelerate EU's progress to reach climate targets and will help reduce environmental impacts (including on biodiversity) across the food supply chain;
- Integration of actions related to food waste prevention/reduction into emission reduction instruments, national energy and climate plans and other relevant EU initiatives;
- Contribution to the farm to fork objectives and to the Food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities.

Scope: Climate change and environmental degradation are recognised as the main challenges to tackle in the European Green Deal. Food waste prevention and reduction could contribute to climate change mitigation and adaptation, pollution reduction, better air quality, biodiversity preservation...

[196] Definition of food waste included in the Waste Framework Directive: *Food waste means all food as defined in Article 2 of Regulation (EC) No 178/2022 of the European Parliament and of the Council that has become waste*.

The 2030 climate target plan sets out to raise the EU's ambition on reducing greenhouse gas emissions to at least 55% below 1990 levels by 2030.

Member States have prepared integrated national energy and climate plans (NECPs) to achieve their 2030 targets.

The Commission brought support and expertise to Member States in the elaboration of their NECP and will continue to do so by supporting the full implementation of the plans, and prepare their update due in 2023[197].

Key policies within the framework of the European Green Deal also include the EU biodiversity strategy for 2030, the farm to fork strategy, and the EU zero pollution action plan.

Proposals should address all the following points:

- Provide reliable quantitative data for several Member States/Associated Countries on the environmental footprint of food waste, based on Life Cycle Assessments, and more specifically the Product Environmental Footprint (PEF) method developed by the European Commission.
- A specific focus on the following Environmental Footprint (EF) impact categories identified in the PEF method is required:
    - Climate change (main focus)
    - Land use
    - Water use
    - Resource use
    - Other relevant categories that could help assess the impacts on biodiversity.
- Combined data for the entire food supply chain but also data for each stage of the food supply chain[198] are expected, including a focus on sorting, storage, logistics and waste treatment. A detailed analysis for relevant food products is also expected.
- Concerning the climate change category in particular, provide estimates on the life cycle GHG emissions due to food waste. Potential double counting of avoided emissions should be analysed. If possible, these data would have to be compared to GHG reductions assumed by Member States in the NECPs – in order to enable measuring of potential impact from food waste prevention measures towards reaching the objectives of NECPs.

197 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0564&from=EN

198 The main stages of the food supply chain identified by the Commission in the Delegated Decision (EU) 2019/1597 establishing a common EU methodology to measure food waste: primary production; processing and manufacturing; retail and distribution; restaurants and other food services; households.

- Elaborate different pathways of food waste prevention/reduction interventions and assess their potential for climate change adaptation/mitigation, reduction of pollution and preservation of biodiversity. The analysis should be carried out for several types of stakeholders.
- Assess the potential for rebound effects due to food waste reduction[199].
- Carry out mapping activities of relevant emission reduction and funding instruments and other EU initiatives in which food waste prevention/reduction could be well integrated.
- Establish a set of recommendations on how to integrate food waste prevention/reduction in those instruments and initiatives (including NECPs).
- Implement the multi-actor approach (see eligibility conditions) by conducting inter- and trans-disciplinary research and involving a wide range of food system actors (including possibly food start-ups).

Proposals should also build on past or ongoing research projects and ensure synergy with relevant initiatives. In particular, they should build on the work done by the Commission's Joint Research Centre in support of the EU Platform on Food Losses and Food Waste[200] and be aligned with the Environmental Footprint method developed by the Commission. The possible participation of the JRC in the project would consist of gathering data collected in the projects into a consistent framework for modelling food waste. It will also ensure that the proposed approach will be compatible with existing databases for the assessment of environmental impacts and aligned with the Environmental Footprint method, helping translating results into policy relevant outputs.

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and any other relevant topic, e.g. by participating in joint activities, workshops, etc. Selected proposals under this topic will thus need to work together and adapt their initial work plan. Communication and dissemination activities should also be grouped and coordinated in a complementary manner.

This topic requires the effective contribution of SSH disciplines.

HORIZON-CL6-2024-FARM2FORK-01-9: Microbiome for flavour and texture in the organoleptic dietary shift

Specific conditions	
Expected EU contribution per	The Commission estimates that an EU contribution of around EUR 4.50 million would allow these outcomes to be addressed appropriately.

199 e.g.: if households save money through reducing waste, they may use this additional income to purchase other products/services with potentially higher environmental impacts. e.g.: impact from reduction of food waste on energy generated from waste.

200 https://ec.europa.eu/food/safety/food-waste/eu-actions-against-food-waste/eu-platform-food-losses-and-food-waste_en

project	Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 9.00 million.
Type of Action	Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: International organisations with headquarters in a Member State or associated country are exceptionally eligible for funding. The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Technology Readiness Level	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B.

Expected Outcome: The successful proposal should be in line with the European Green Deal priorities, the farm to fork strategy and Food 2030 priorities[201] for a fair healthy and environmentally friendly food system, as well as with the EU's climate ambition for 2030 and 2050. It will support innovation to foster advances related to microorganisms for safer, healthier and more environmentally friendly food industry. This is in addition to contributing to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, dietary shift, sustainable healthy nutrition and safe food, food poverty reduction and empowerment of communities, and thriving businesses.

Projects results are expected to contribute to all of the following expected outcomes:

- Applicable business solutions in new precision fermentation/ post-fermentation techniques;
- Develop bioinformatics prediction of smell, texture, colour and taste of microbes to create new nuances and flavours in cooperation with chefs/restaurants;
- New, improved and demonstrated microbial fermentations to yield dairy, fish or meat flavours and textures to plant-based foods and ingredients as well as to exploit flavour and texture enhancing properties of fermented vegetables;
- Clearly explain how the proposal will deliver co-benefits to each of the Food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities.

[201] https://ec.europa.eu/info/publications/food-2030-pathways-action-research-and-innovation-policy-driver-sustainable-healthy-and-inclusive-food-systems-all_en

Scope: The need for a holistic approach to realize the full potential of microbiome innovation has to develop bioinformatics prediction of smell and taste of microbes to create new nuances and flavours.

Proposals are expected to address the following:

- Develop and pilot innovations to provide new precision fermentation/ post-fermentation techniques to foster dietary shift by enhancing organoleptic properties (smell, texture, colour, taste).
- Development of new microbial biomasses that can be a source of micro and macro nutrients for humans.
- Demonstrate the safety of the developed approach, in accordance with relevant EU regulatory frameworks, related to its placing on the market.
- Produce food with higher nutritional quality, and potential for positive effects on the human microbiome.
- Assess the economic and social impact of the products.
- Proposals must implement the 'multi-actor approach' and ensure adequate involvement of academia, research-technology organizations, small-medium enterprises (including start-ups), restaurants, food businesses and other relevant actors of the value chain.
- In order to achieve expected outcomes international cooperation is strongly encouraged, in particular in the framework of the International Bioeconomy Forum.
- Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and other relevant topics. They should participate in joint activities, workshops, focus groups or social labs, as well as organise common communication and dissemination activities and show potential for upscaling. Applicants should plan the necessary budget to cover these activities.

Targeted international cooperation

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-FARM2FORK-01-10: EU-African Union cooperation on agroforestry management for climate change adaptation and mitigation

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

Indicative budget	The total indicative budget for the topic is EUR 18.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: Due to the scope of this topic, legal entities established in all African Union member states* are exceptionally eligible for Union funding. * "African Union member states" includes countries whose membership has been temporarily suspended. International organisations with headquarters in a Member State or associated country are exceptionally eligible for funding. The following additional eligibility criteria apply: the places of establishment of at least two of these legal entities must be in the same geographical region of Africa (as defined by the African Union: https://au.int/en/member_states/countryprofiles2). The following additional eligibility criteria apply: due to the specific challenge of this topic, in addition to the minimum number of participants set out in the General Annexes, consortia must include at least three independent legal entities established in Africa. The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Technology Readiness Level	Activities are expected to achieve TRL 3-5 by the end of the project – see General Annex B.

Expected Outcome: In line with the European Green Deal priorities and the farm to fork strategy for a fair, healthy and environment-friendly food system, and in support of the climate objectives of the African Union (AU) and the EU, the successful proposal will contribute to the AU-EU High Level Policy Dialogue (HLPD) on Science, Technology and Innovation, and its priority on Green Transition (and the respective R&I partnerships on Food and Nutrition Security and Sustainable Agriculture and Climate Change and Sustainable Energy), as well as to the implementation of the short-term actions outlined in the working document of the AU-EU Innovation Agenda, aiming to translate R&I efforts into tangible business, development and employment opportunities in Africa and Europe.

Projects results are expected to contribute to all of the following expected outcomes:

- Improved availability of qualitative and quantitative data pertaining to the contribution of agroforestry to climate change adaptation and mitigation, biodiversity preservation, and to sustainable agriculture;

- Improved management of agroforestry systems (conventional, agroecological and/or organic), including agro-pastoral systems, in Africa;

- Enhanced capacities to evaluate the socioeconomic and environmental performance of agroforestry for climate change resilience;

- A strengthened agroforestry innovation ecosystem for better user acceptance and implementation of agroforestry in the African Union (AU).

Scope: Achieving sustainable agricultural production that fosters both climate change mitigation and adaptation and biodiversity preservation and enhancement is a policy objective that implies finding a balance with farm productivity, socio-economic viability and wider sustainability goals. Agroforestry systems include both traditional and modern land-use systems where trees are managed together with crops and/or animal production systems in agricultural settings. These systems have the potential to increase ecosystem services – including soil carbon sequestration, water retention, erosion control, soil nutrients, pollination, pest- and disease-control – and biodiversity, while improving farming productivity, profitability and sustainability of farmers' incomes. Implementation of agroforestry in the EU and the AU needs to be boosted in order to maximise this potential. The management of agroforestry systems is critical for their positive impact on climate and the environment as well as to ensure a balance with productivity and profitability for farmers. This is essential to promote the uptake and long-term sustainability of agroforestry.

Proposals should address the following:

- Identification of the most suitable plant and animal species and breeds to be used in agroforestry for different geographic regions in Africa, generating sustainable ecosystems with positive impact on local communities, and on women, looking for models where this impact is greater. In vegetation management systems preference should be given to local species, to avoid potential unintended consequences linked to the introduction of alien species;

- Assessment of local multi-purpose agroforestry species and breeds with benefits for food, pharmaceutical uses as well as ecosystem functions for the soil, biodiversity and their functions in a vegetation mosaic;

- Assessment of specific agroforestry management measures aiming at preserving/enhancing biodiversity;

- Assessment of the potential of carbon farming[202] as a possible future business for farmers and foresters, and analysis of its potential to contribute to reaching climate-neutrality in a few decades;

[202] https://ec.europa.eu/clima/eu-action/forests-and-agriculture/sustainable-carbon-cycles/carbon-farming_en

- Identification of the structural needs of agroforestry crops and animals in different geographical regions in Africa, including the analysis of production burdens, suggesting solutions and addressing traceability of all steps in the production chain to measure the effectiveness of solutions;
- Supporting this new value chain with knowledge and capacity building to be efficient, fair, and easily adopted, or not abandoned, by landowners and farmers;
- Establishing local agroforestry pilot plots.

Proposals must implement the "multi-actor approach" including a wide range of actors to ensure that knowledge and needs from various sectors, such as research, farmers/foresters, advisory services, are brought together.

This topic should involve the effective contribution of SSH disciplines.

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic, as well under topic HORIZON-CL6-2021-CLIMATE-01-08: 'Agroforestry to meet climate, biodiversity and farming sustainability goals'.

HORIZON-CL6-2024-FARM2FORK-01-11: EU-African Union – towards climate-neutral, social just fair trade food systems

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 4.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 9.00 million.
Type of Action	Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: at least three partners from Africa and at least two from the same region as defined by the African Union (https://au.int/en/member_states/countryprofiles2). Due to the scope of this topic, legal entities established in all African Union member states* are exceptionally eligible for Union funding. * "African Union member states" includes countries whose membership has been temporarily suspended. International organisations with headquarters in a Member State or

	associated country are exceptionally eligible for funding. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding. The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G. The following exceptions apply: Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. The maximum amount to be granted to each third party is EUR 60 000.

Expected Outcome: In line with the European Green Deal priorities and the farm to fork strategy for a fair, healthy and environment-friendly food system, and in support of the African Continental Free Trade Agreement, the successful proposal will contribute to the AU-EU High Level Policy Dialogue (HLPD) on Science, Technology and Innovation, and its first priority on Food and Nutrition Security and Sustainable Agriculture.

The farm to fork strategy aims to accelerate the transition to a sustainable food system that should have a neutral or positive environmental impact, help to mitigate climate change and adapt to its impacts. New opportunities in EU-African trade are opening-up for trade regimes with co-benefits for producers, climate and citizens. Innovative Information and Communications Technology (ICT) based, traceability and certification schemes should maximise co-benefits while helping to keep the effects of Non-Tariff Measures (NTMs) in particular administrative and transaction costs low.

The African countries signed the African Continental Free Trade Agreement and launched an action plan for Boosting Intra-African Trade with a view to strengthening regional integration. It is also one of the key priorities of the Africa Agenda 2063 and a major step towards African continental economic integration.

Project results are expected to contribute to all of the following expected outcomes:

- Improved assessment systems for sustainable food trade regimes with co-benefits for producers, climate and citizens, biodiversity, assessment of certification schemes (organic, carbon neutral, de-forestation free, conventional), testing innovative solutions with food systems/certification actors;
- Provide data and recommendations for improved Non-Tariff Measure (NTM) regimes;
- Provide solutions to food trade, Ministries in charge, border regime management (digital solutions).

Scope: Proposals are expected to address the following:

- Study the tipping points to scale-up climate-neutral, fair and just food supply;
- Explore the climate, biodiversity and social impacts of food supply (organic and conventional) and linked products due to land-use change;
- Better understanding of the aim, collection, quantification and modelling of NTMs relevant for intra-African and EU-AU trade relations;
- Clearly explain how the proposal will contribute towards scaling-up of business models of climate-neutral fair and just and efficient food supply;
- Implement the multi-actor approach by involving a wide range of food system actors and conducting inter-disciplinary research;
- Link to previous projects on urban – rural food systems for solutions to strengthen resilience of food systems in view of supply and/or price shocks.

Innovation: Proposals should foresee a space for mentoring and accelerating innovative business concepts, including social innovation and upscaling in view of African or European food business entrepreneurs and start-ups with special consideration of women and the diaspora using cascading funding opportunities. Proposals may involve financial support to third parties e.g. to academic researchers, start-ups, SMEs and other multidisciplinary actors, to, for instance, develop, test or validate developed assessment approaches or collect or prepare data sets or provide other contributions to achieve the project objectives... Consortia need to define the selection process of organisations, for which financial support will be granted. Maximum 20% of the EU funding can be allocated to this purpose.

Call - Fair, healthy and environmentally-friendly food systems from primary production to consumption

HORIZON-CL6-2024-FARM2FORK-02

Conditions for the Call

Indicative budget(s)[203]

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution	Indicative number of

[203] The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

		2024	per project (EUR million)[204]	projects expected to be funded
Opening: 17 Oct 2023 Deadline(s): 22 Feb 2024 (First Stage), 17 Sep 2024 (Second Stage)				
HORIZON-CL6-2024-FARM2FORK-02-1-two-stage	IA	12.00	Around 6.00	2
HORIZON-CL6-2024-FARM2FORK-02-2-two-stage	IA	11.00	Around 5.50	2
HORIZON-CL6-2024-FARM2FORK-02-3-two-stage	IA	8.00	Around 4.00	2
HORIZON-CL6-2024-FARM2FORK-02-4-two-stage	RIA	13.00	Around 6.50	2
HORIZON-CL6-2024-FARM2FORK-02-5-two-stage	RIA	7.00	Around 7.00	1
HORIZON-CL6-2024-FARM2FORK-02-6-two-stage	IA	9.00	Around 4.50	2
HORIZON-CL6-2024-FARM2FORK-02-7-two-stage	IA	9.00	Around 4.50	2
Overall indicative budget		69.00		

General conditions relating to this call	
Admissibility conditions	The conditions are described in General Annex A.
Eligibility conditions	The conditions are described in General Annex B.
Financial and operational capacity and exclusion	The criteria are described in General Annex C.
Award criteria	The criteria are described in General Annex D.

[204] Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

Documents	The documents are described in General Annex E.
Procedure	The procedure is described in General Annex F.
Legal and financial set-up of the Grant Agreements	The rules are described in General Annex G.

Enabling sustainable farming

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-FARM2FORK-02-1-two-stage: Increasing the availability and use of non-contentious inputs in organic farming

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 12.00 million.
Type of Action	Innovation Actions
Admissibility conditions	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Technology Readiness Level	Activities are expected to achieve TRL 7-8 by the end of the project – see General Annex B.
Procedure	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage

	proposals will be evaluated blindly.

Expected Outcome: A successful proposal should support the objective of the farm to fork strategy to transition to fair, healthy and environmentally-friendly food systems from primary production to consumption, notably the objective to promote and increase organic farming in Europe, in line with the target of at least 25% of the EU's agricultural land under organic farming by 2030. Activities will support the implementation of concrete actions in the EU action plan for the development of organic production[205] and of Regulation (EU) 2018/848 on the rules on organic production and labelling of organic products[206]. Activities will also support the farm to fork and biodiversity strategies' objective to reduce the risk and use of chemical pesticides by 50% and the use of more hazardous pesticides by 50%.

Project results are expected to contribute to all of the following expected outcomes:

- Increased availability, accessibility and adoption by farmers of cost-efficient alternatives to contentious inputs used in organic farming;
- Fair, reliable and implementable rules on the use of inputs in organic farming;
- Significantly reduced environmental impact of practices and input use in organic farming systems and enhanced organic crop and livestock production;
- Provision of scientific support and recommendations for the development, implementation and evaluation of EU policies and strategies relevant for organic production, in particular on the reduction of contentious inputs as well as on the increased use of alternative products, strategies and solutions;
- Increased networking and knowledge exchange among all relevant actors for organic farming, contributing to a strengthened research and innovation ecosystem on organic farming in Europe that also supports the spreading of research outcomes to farmers involved in low-input farming and/or agroecological production.

Scope: Promoting the use of more sustainable farming practices is a policy objective enshrined in the European Green Deal and its related strategies. Boosting organic farming, one of the objectives of the farm to fork and of the EU biodiversity strategies, can greatly contribute to achieving this ambition, and thereby also contributing to climate ambition as, as organic farming contributes directly and significantly to carbon storage in soils and biomass. Moreover, the Commission communication 'Safeguarding food security and reinforcing the resilience of food systems'[207] highlights the role that organic farming can play in reducing the EU's dependence on external inputs, since organic farming is recognised, among others, for the limitation in the use of off-farms inputs.

205 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0141R%2801%29
206 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32018R0848
207 https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/key_policies/documents/safeguarding-food-security-reinforcing-resilience-food-systems.pdf

The organic legislation authorises the use of a specific set of products with a lower impact on the environment and on the soil. However, some of these substances have a harmful effect on terrestrial and aquatic species, which calls for the need to replace these substances either by lower impact products or methods or by resistant varieties. It is important to continue exploring ways to phase out and replace contentious inputs used in organic farming, and to increase the availability, accessibility and use of alternatives to these products. In doing so, due attention should be given to system approaches that consider the entire farm system, and its relation with the territorial and landscape levels. Moreover, in order to address farmers' needs in this specific area, socially innovative solutions are required.

Proposals should develop scientifically robust and transparent methodologies, building on achievements from previous research activities, notably those funded under the Horizon 2020 call 'SFS-08-2017 - Organic inputs – contentious inputs in organic farming' (projects Organic-PLUS and RELACS).

Proposals should address all the following activities:

- Develop, test and put in the place alternative products and solutions, including to the use of copper fungicides, mineral oils, external nutrient inputs (e.g. manure from conventional agriculture, recycled nutrients) in organic plant production, and to the responsible use of anthelmintics, antibiotics and synthetic vitamins used in organic livestock production.

- Among the alternatives, consider those containing biologically active substances (microorganisms and other naturally occurring substances), invertebrate biological control agents, (micro)biological agents for soil amelioration or cultivation techniques, and considering effective functional biodiversity systems.

- Building on existing demonstration sites and experiments where available and relevant, test the alternatives and, if relevant, their combinations.

- Further develop toolboxes, strategies and technologies for the minimisation or phasing-out of the use of contentious inputs in organic farming.

- Demonstrate the safety of the alternatives, in line with the EU regulatory framework related to their placing on the market, and generate data to enable the registration of the alternatives.

- Deepen analysis and produce data on the efficacy, resource efficiency, climate and environmental impacts of the alternatives developed, compared to the contentious inputs they are to replace. This should include analysis of impact on non-target species and on human health.

- Analyse farmers' and consumers' acceptance of the alternatives developed and consider new governance models/relations among food chain actors. This should include the development of business plans, with the support of Agricultural Knowledge and Innovation Systems (AKIS), and assessment of stakeholders' (farmers, policymakers,

researchers, advisors, companies, consumers, etc.) perspectives and needs to improve already existing policy instruments to reduce the use of contentious inputs and increased availability of alternatives.

- Set up demonstration sites that are representative of the diversity of organic farming systems in Europe, to promote participatory activities, and the exchange of knowledge and best practices among farmers.

- Develop training packages targeted to farmers and other actors of the organic agri-food chain, and awareness raising activities towards citizens and consumers, engaging with existing initiatives where relevant.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of the main stakeholders involved in finding alternatives to the use of contentious inputs used in organic farming (farmers, breeders, researchers, advisors, industry, etc.). Proposals should cover contentious inputs used in a range of organically-grown crops (in- and out-door), both arable and perennial, as well as the organic livestock sector. Sectors with high economic relevance in different pedo-climatic conditions and various biogeographical regions should be targeted in a representative way. Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic, and ensure coherence and synergy with other relevant activities carried out under other initiatives in Horizon Europe, including under the topic HORIZON-CL6-2023-GOVERNANCE: 'Developing an EU advisory network on organic agriculture', HORIZON-CL6-2024-GOVERNANCE: 'Organic farming thematic network to compile and share knowledge ready for practice' and the future partnership 'Accelerating farming systems transition: agroecology living labs and research infrastructures'.

To ensure trustworthiness, swift and wide adoption by user communities, and to support EU and national policymakers, actions should adopt high standards of transparency and openness, going beyond ex-post documentation of results and extending to aspects such as assumptions, benchmarks, models and data quality during the life of projects.

Concrete efforts shall be made to ensure that the data produced in the context of this topic is FAIR (Findable, Accessible, Interoperable and Re-usable), particularly in the context of real-time data feeds, exploring workflows that can provide "FAIR-by-design" data, i.e., data that is FAIR from its generation.

HORIZON-CL6-2024-FARM2FORK-02-2-two-stage: Sustainable organic food innovation labs: reinforcing the entire value chain

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 5.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

Indicative budget	The total indicative budget for the topic is EUR 11.00 million.
Type of Action	Innovation Actions
Admissibility conditions	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Technology Readiness Level	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B.
Procedure	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: By producing high quality food with low environmental impact, organic farming plays an essential role in developing sustainable food systems in the EU, an objective that is at the heart of the European Green Deal. Under the European Green Deal's farm to fork and biodiversity strategies, the European Commission has set a target of 'at least 25% of the EU's agricultural land under organic farming by 2030 and a significant increase in organic aquaculture'. To achieve this target and to help the organic sector reach its full potential, the Commission has put forward a new action plan for the development of organic production in the EU[208].

In 2020, 9,1% of the total EU's agricultural land was under organic production. This number hides substantial differences between Member States as regards the share of agricultural land dedicated to organic farming: from 0.5% to more than 25%. These differences are partially due to the lack of structures adequate for organic farm products in some countries. In line with the EU action plan for the development of organic production, the successful proposals will support the establishment of adequate structures that enable the proper channelling of organic production in supply chains allowing farmers to fully benefit from the added value of organic production.

Project results are expected to contribute to all of the following expected outcomes:

208 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0141R%2801%29

- Reinforced local and small-volume processing of organic food;
- Boosted innovative sustainable packaging solutions resulting in reduced waste (in particular of non-renewable and fossil derived plastics);
- Fostered innovative supply and distribution models and short trade circuits;
- Added value to organic agricultural products, improved organic farmers' incomes and their positioning in agri-food value chains;
- Enhanced market orientation and capacity of organic farmers and small and medium scale processors to meet consumer demand for sustainable and healthy diets based on organic food;
- Increased availability, affordability and accessibility of organic food with positive impacts on sustainability, including on biodiversity, on climate, ecosystems services and public health.

Scope: Organic farming has developed mainly at the primary production level, while the processing of organic farm products is less developed and regulated. Besides, the organic sector is characterised by its scattered nature, with imbalances in the food value chains limiting the bargaining power of organic farmers and producers still having access to a limited number of processors and retailers. Therefore, investing in innovative careful processing techniques and sustainable and reusable packaging, streamlining the distribution and logistics of organic produce and agricultural input networks, and achieving a better understanding of quality and safety issues in organic supply chains, in combination with regulations, is important for creating new value for consumers.

This will enable small organic producers, in particular those located in remote areas, to find an outlet for their production and benefit from the added value of their organic certification. However, operators are often reluctant to convert to organics due to the lack of organised and efficient organic commercial supply chains. In addition to the cross-cutting problems faced by agri-food supply chains, organic distribution can entail high operating costs and an imbalance between supply and demand. Exchanging experience and knowledge can encourage the creation of local food markets and short supply chains, and uphold the integrity of the organic quality of the product.

Proposals should establish and animate locally-driven, multi-actor organic food innovation hubs, bringing together researchers, innovators, farmers, processors and others, to:

- Develop, test and pilot innovations in organic small-scale food processing, in particular careful processing, and new, sustainable and reusable packaging (avoiding non-renewable and fossil-derived plastics), optimising the preservation of nutritional quality, reducing perishability and ensuring food safety;
- Foster diverse innovative solutions/approaches that are tailored to the needs of farmers and SMEs, while ensuring links between food processing and primary production, and

adapted to the seasonal character of raw material production and processing in small(er) batches;

- Develop and explore innovative supply and distribution models (including business models, market outlets and marketing strategies, short trade circuits, public procurement, food services), that are adapted to proposed innovative solutions;
- Assess the impacts of the innovative solutions on sustainability (climate, environmental, social, including health, and economic);
- Build a community of practice to share learnings, build capacity and support adoption of innovations at scale.

Proposals should cover a range of crops (indoor and outdoor), both arable and perennial, representative of the organic sector in Europe, as well as the organic livestock sector.

Projects must use the 'multi-actor approach', ensuring adequate involvement of all relevant actors, including farmers and SMEs. Proposals may build on existing research infrastructures, where relevant. Proposals are encouraged to build on past and ongoing EU-funded research and innovation projects, and are strongly encouraged to cluster with ongoing and upcoming projects. Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic, and ensure synergy with relevant activities carried out under other initiatives in Horizon Europe, in particular the topic in this Work Programme HORIZON-CL6-2023-GOVERNANCE-01-20: Developing an EU advisory network on organic agriculture' and the future partnerships 'Accelerating farming systems transition: agroecology living labs and research infrastructures' and 'Sustainable food systems for people, planet and climate'.

HORIZON-CL6-2024-FARM2FORK-02-3-two-stage: Tools to increase the effectiveness of EU import controls for plant health

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 8.00 million.
Type of Action	Innovation Actions
Admissibility conditions	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage

	application (see General Annex E).
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
Technology Readiness Level	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.
Procedure	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: A successful proposal will support the farm to fork strategy for a transition to fair, healthy and environmentally-friendly food systems from primary production to consumption, notably the objective to reduce the use and risk of chemical pesticides by 2030. Activities will support Regulation (EU) 2016/2031[209] on protective measures against pests of plants.

Project results are expected to contribute to all of the following expected outcomes:

- Enlarged availability and accessibility to cost-efficient and user-friendly tools and methods for the detection of plant pests to assist plant health inspectors during import controls;
- Increased the effectiveness of detection of plant pests at import points, by decreasing time and overall costs;
- Knowledge exchange and uptake of the innovative tools are promoted;
- Support plant health inspections and import controls.

Scope: Plant health is of global importance for agriculture, forestry, natural ecosystems, ecosystem services and biodiversity. Plant health is threatened by species injurious to plants and plant products, which now present a greater risk of being introduced into the Union territory owing to globalisation of trade and climate change. The current EU plant health legislative landscape aims at a proactive approach ensuring safe trade and mitigating the impacts of climate change on the health of the crops and forests in Europe.

Research activities should support these measures by contributing to the development of more rapid, reliable and economic innovative solutions and devices that can assist plant health inspectors at the borders. Technologies such as e-noses, acoustic devices, scanners, and

[209] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32016R2031

portable devices for molecular identification of plant pests[210] within hours/minutes of the specimen's sampling often using limited amounts of plant or plant product material, and other relevant solutions, are included within the scope of this topic.

Proposals should:

- Deliver more rapid, robust, and innovative solutions appropriate for detecting and identifying plant pests during import controls;
- Make use of innovative technologies for the detection of a broader spectrum of plant pests;
- Prove cost-benefits of the innovative solutions;
- Promote a wider use of new detection technologies for plant health diagnostics.

Proposals must implement the 'multi-actor approach' including a range of actors to ensure that knowledge and needs from various sectors such as research, plant health services, industry including SMEs are brought together. Proposals should take due account of dissemination to relevant stakeholders to facilitate the uptake of results.

Proposals should specify how they plan to collaborate with other proposals selected under this and other relevant topics, e.g., by undertaking joint activities, workshops or common communication and dissemination activities. Proposals should allocate the necessary resources to cover these activities.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2024-FARM2FORK-02-4-two-stage: Tackling outbreaks of plant pests

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 6.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 13.00 million.
Type of Action	Research and Innovation Actions
Admissibility conditions	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see

[210] A pest is defined here as any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products (EU legislation, Regulation 2016/2031)

	General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
Procedure	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: A successful proposal should support the farm to fork strategy to transition to fair, healthy and environmentally-friendly food systems from primary production to consumption, notably the target to reduce by 50% the overall use and risk of chemical pesticides and reduce the use by 50% of the more hazardous pesticides. Activities will support Regulation (EU) 2016/2031[211] on protective measures against pests of plants.

Project results are expected to contribute to all of the following expected outcomes:

- Find adequate responses for EU quarantine plant pests;
- Enhance capacities to prevent, monitor and (bio)control plant pests following under the scope of this topic;
- Support to relevant EU and Associated Countries' plant health policies.

Scope: Plant health is of global importance for agriculture, forestry, natural ecosystems, ecosystem services and biodiversity. Plant health is threatened by species injurious to plants and plant products, which present a greater risk of being introduced into the Union territory due to globalisation, trade and climate change. The current EU Plant Health legislative landscape helps protect the EU against the introduction of new plant pests as well as tackling existing plant pests more effectively. The prevention of entry and, if arrived within the EU territory, early detection and eradication are part of the plant health policies to avoid significant impacts in agriculture, forestry and environment by plant pests.

211 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32016R2031

Proposals should target one or more plant pest(s)[212] that are either Union quarantine plant pests[213] present in the EU or Union quarantine pests which are priority pests [214] in the EU, and that are of concern for agriculture and/or forestry[215], with the exception of plant pests targeted in Horizon Europe [216] . Research activities should improve methods for an effective implementation of the principles of integrated pest management (IPM), whilst reflecting the move towards innovative biological and other non-chemical control and resistance breeding.

Proposals should:

- Contribute to the understanding of the drivers of plant pest introduction, spread and establishment including the biology of the pest and its interaction with host plants and antagonists, the influence of climate change, ecosystem degradation, and globalisation;
- Develop efficient surveillance methods and strategies for early-detection and (bio)control of the pest(s);
- Extend the range of tools and technologies available for the development of economically and environmentally sound solutions for an effective pest prevention and outbreak management, and if relevant pursue in line with the principles of integrated pest management and taking into account the use of non-chemical or biological control methods;
- Analyse the social and economic implications for farmers, foresters and other economic operators affected by the outbreaks of the plant pest(s) and developing approaches whereby those affected can best cope with the situation;
- If relevant, analyse the ecological impact of plant pest(s) spread and establishment based on the experience obtained from existing outbreaks.

International cooperation with countries affected or threatened by the same pest(s) is strongly encouraged in particular to capitalise on existing knowledge. Proposals must implement the 'multi-actor approach' including a range of actors to ensure that knowledge and needs from various sectors such as research, plant health services, farming/forestry sectors, advisory services, and industry are brought together. Results of activities should benefit both conventional and organic farming.

Proposals should specify how they plan to collaborate with other proposals selected under this and other relevant topics [217] , for example by undertaking joint activities, workshops or

212 A pest is defined here as any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products (EU legislation, Regulation 2016/2031)

213 See part B of Annex II to Commission Implementing Regulation 2019/2072 for pests known to occur in the Union territory

214 See Annex to Commission Delegated Regulation (EU) 2019/1702 for priority pests.

215 Applicants are expected to explain and justify the choice.

216 Plant pests of the topic HORIZON-CL6-2021-FARM2FORK-01-04: Tackling outbreaks of plant pests

217 For example, HORIZON-CL6-2023-GOVERNANCE-01-16: Digital technologies supporting plant health early detection, territory surveillance and phytosanitary measures and HORIZON-CL6-2024-

common communication and dissemination activities. Proposals should allocate the necessary resources to cover these activities.

The possible participation of the JRC in the project will consist of supporting the analysis of social and economic implications for farmers, foresters and other economic operators affected by the plant pest(s) and developing approaches whereby those affected can best cope with the situation.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2024-FARM2FORK-02-5-two-stage: Animal nutritional requirements and nutritional value of feed under different production management conditions

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 7.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 7.00 million.
Type of Action	Research and Innovation Actions
Admissibility conditions	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
Procedure	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: A successful proposal will support the objective of the farm to fork strategy to transition to a fair, healthy and environmentally-friendly European agriculture, and contribute to strengthen the resilience and sustainability of specific farming sectors and preserve biodiversity. It is expected to contribute to limit the reliance of the European agricultural sector to imported feed materials.

FARM2FORK-02-3-two-stage: Tools to increase the effectiveness of EU import controls for plant health

The proposed project will enhance the use of locally produced and more climate-friendly solutions for animal feed without compromising animal performance and productivity. It will focus on existing or alternative source of nutrients using value chain approaches to maximize feed production and feed use efficiency, supporting the local environment and farm circularity.

Activities under this topic will contribute to all of the following expected outcomes:

- Guidelines for processes and policies for improved resource-efficient production, use, and diversification of safe feedstuffs;
- Optimised use of feedstuffs, new plants, forage species and associations at local level;
- Uptake by farmers of practices to diversify sources of feedstuffs and use of natural resources on rangeland, where appropriate;
- (Alternative) Feed production/supply strategies that facilitate self-sufficiency and ensure safety of feed; closed nutrient cycle at local level and diminished environmental and climate footprint;
- Improved systems for facilitating the planning and calculation of the rations/diets of feed adjusted to specific livestock and individual/group animal requirements, and for mitigating the risk of anti-nutritional factors or contaminants in feedstuffs.

Scope: Feed resources are important components of livestock production systems, and their efficient use is the primary determinant of animal performance and productivity. The availability and use of local feedstuffs, including new and underused sources, including alternative protein sources, is a challenge in many livestock farming systems and it has several implications in terms of farm economics, product quality and safety, animal health and welfare. Furthermore, there is the need to design more precise and resilient feeding systems while ensuring requirements of biodiversity protection and restoration.

The aim is to optimise the use of local feedstuffs, shorten supply chains and rely more on local resources. It is important to investigate content, availability and digestibility of nutrients in locally available feedstuffs in different pedo-climatic regions and livestock systems, without compromising feed safety and efficiency.

The following elements should be incorporated:

- Determine and adjust net energy-based nutritional requirements (macro and micronutrients) for local breeds and different management conditions, addressing both conventional and organic livestock farming;
- Assess on-farm practices and equipment to use feedstuffs more efficiently (post-harvest technologies, crops mixture, foraging strategies, rangeland management);
- Take advantage of between and within breed genetic diversity to optimize the use (acceptance and feed efficiency) of local feedstuffs;

- Evaluate the impacts of processing technologies on the efficiency of local feedstuffs
- Improved knowledge on the effects of functional additives (enzymes, gut flora stabilisers, natural plants, vitamins, etc.) on farm-scale animal performance, health and welfare;
- Assess and minimize the risk of anti-nutritional factors or contaminants such as biotoxins in feedstuffs,
- Analyse and monitor the performance of the animal production systems and the quality of animal-based products under novel feeding strategies;
- Determine better indicators of animal nutritional requirements and the nutritional value of locally produced feedstuffs
- Assess the economic sustainability and environmental impact of identified resilient feeding systems and related structural changes (at local level)

If necessary, proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under other topics and ensure synergy with relevant activities carried out under other initiatives in Horizon Europe.

Due to the scope of this topic, international cooperation is strongly encouraged, in particular with China. This topic is within the scope of the Administrative Arrangement between the European Commission and the Ministry of Science and Technology of the People's Republic of China on a Co-funding Mechanism for the period 2021-2024 to support collaborative research projects under the Food, Agriculture and Biotechnologies (FAB) and the Climate Change and Biodiversity (CCB) flagship initiatives.

Actions will contribute to implementing the EU-China Food, Agriculture and Biotechnology (FAB) flagship initiative, which aims to ensure sustainability of agri-food systems, catering for the needs of a growing population, the reduction of food and agricultural losses and waste, and the provision of safe and healthy foodstuffs. Interaction with other actions developed under the EU-China Climate Change and Biodiversity (CCB) Research Flagship and the Flagship on Food, Agriculture and Biotechnologies (FAB) is encouraged if relevant.

Enabling sustainable fisheries and aquaculture

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-FARM2FORK-02-6-two-stage: Minimising climate impact on fisheries: mitigation and adaptation solutions for future climate regimes

Specific conditions	
Expected EU contribution per	The Commission estimates that an EU contribution of around EUR 4.50 million would allow these outcomes to be addressed appropriately.

project	Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 9.00 million.
Type of Action	Innovation Actions
Admissibility conditions	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
Technology Readiness Level	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.
Procedure	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: Selected proposals are expected to contribute to all the following outcomes:

- Contribution to sustainable fisheries for fair, healthy, climate-resilient and environment-friendly food systems with low impact on aquatic ecosystems, supporting the EU common fisheries policy, the European Green Deal and in particular the EU biodiversity strategy for 2030 and the farm to fork strategy;
- Transformation of fisheries to make a significant contribution to climate-neutrality;
- Contribution to more precise, technologically advanced data collection (notably through the use of techniques such as artificial intelligence, sensors and robotics) which encompasses the natural and social ecosystem context;
- Understanding of the resilience potential to climate change of exploited resources and build up the adaptive capacity for fisheries management;
- Preparation of the seafood sector to seize opportunities to harvest shifting stocks in the most sustainable manner, taking into account environmental, social and economic considerations.

Scope: Proposals are expected to investigate the impacts of climate change on biological and ecological processes such as shifts in stocks distribution, abundance and density, fish health, stock productivity, habitats, regime shifts in ecosystems and altered growth, reproduction rates, seafood safety and overall changes in the ecosystem potential production. They should also explore and test innovative measures to mitigate climate change (such as new designs of fishing gears or new fishing strategies that do not resuspend carbon from the seabed or new fishing strategies which improve energy use efficiency or strengthen circularity aspects) and adaptive solutions (such as valorisation of new catches or building resilience actions).

Proposals should include studies representing the whole spectrum of European fisheries, including small-scale fisheries, and the related biotic, abiotic, social and economic conditions. They should follow an interdisciplinary approach and cover both scientific and socioeconomic aspects.

They should build on the work of Horizon 2020 projects ClimeFish and CERES and others and provide applicable approaches and tools to the fishing sector. They should also build on the work of initiatives such as the EMFF-funded studies on "*Climate change and the Common Fisheries Policy: adaptation and building resilience to the effects of climate change on fisheries and reducing emissions of greenhouse gases from fishing"*, and "*Adapting postharvest activities in the value chain of fisheries and aquaculture to the effects of climate change and mitigating their climate footprint through the reduction of greenhouse gases emissions".*

Also importantly, proposals should build synergies with the projects funded under the topics HORIZON-CL6-2023-BIODIV-01-5: Understanding and reducing bycatch of protected species in Destination "Biodiversity and ecosystem services" and 'HORIZON-CL6-2022-CLIMATE-01-02: Understanding the oceanic carbon cycle' as well as with work done under other organisations such as the OECD Committee for Fisheries. Selected proposals should collaborate with each other.

Proposals are encouraged to cooperate with actors such as the European Commission's Joint Research Centre (JRC). The possible participation of the JRC in the project would consist in providing and analysing fisheries.

This topic should involve the effective contribution of SSH disciplines.

HORIZON-CL6-2024-FARM2FORK-02-7-two-stage: Minimising climate impact on aquaculture: mitigation and adaptation solutions for future climate regimes

Specific conditions	
Expected EU contribution per project	The Commission estimates that an EU contribution of around EUR 4.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

Indicative budget	The total indicative budget for the topic is EUR 9.00 million.
Type of Action	Innovation Actions
Admissibility conditions	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
Technology Readiness Level	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.
Procedure	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: Selected proposals are expected to contribute to all of the following expected outcomes:

- Contribution to sustainable aquaculture systems (in marine and/or transitional, and/or fresh waters) for fair, safe, healthy, climate-resilient and environment-friendly food systems with low impact on aquatic ecosystems, supporting the European Green Deal and the farm to fork strategy, the "*Strategic guidelines for a more sustainable and competitive EU aquaculture for the period 2021 to 2030*[218]", and the "*Action plan for the development of organic production*"[219];

- Implementation of innovations, such as dietary shifts and aspects of circularity, for a more sustainable and competitive European aquaculture enhancing aquaculture resilience to adverse consequences of climate change;

- Positioning of European aquaculture production as the global reference for sustainability and quality, increase its competitiveness, reduce EU dependence on imports of fisheries and aquaculture products and create more jobs, especially in rural and coastal regions;

- Contribution to aquaculture production with a reduced environmental footprint, advancing towards climate-neutrality;

218 COM(2021)236 final
219 COM(2021)141 final

- Contribution to technologically-advanced aquaculture production (indicatively through the use of techniques such as artificial intelligence, sensors, internet-of-things and robotics), fully embedded in natural, social, ethical and economic sustainability.

Scope: Proposals are expected to enhance knowledge of the impacts of climate change on aquaculture production at environmental, social and economic levels. They should identify, forecast and assess the main effects of climate change on different aquaculture production systems and on their ecological carrying capacity.

They should consider impacts of climate change such as water availability (e.g., rise in evaporation, decrease in rainfall, extreme weather events like droughts or floods), water quality (e.g., acidification, eutrophication, pollution, contamination), temperature rise, sea level rise, spread of diseases (e.g. recrudescence of endemic and emerging diseases in traditional and recirculating aquaculture systems), reduced fish welfare, invasive species, and other climate related risks.

They should also investigate adaptation and mitigation solutions and opportunities such as technological, social, economic, and biological/ecological aspects, selection of suitable sites, culture methods (including the contribution of organic production and integrated multi-trophic aquaculture), species plasticity and adaptability to changing environments as well as breeding and selection techniques for a more sustainable, productive and resilient production.

Furthermore, they should address aspects of circularity in terms of more efficient use of resources and less negative impacts on marine environment, including reduction, valorisation, and reuse of waste. Indicative aspects could include Life Cycle Assessment approaches such as of feeding systems and valorisation of non-food biomass for feeds and fertilisers.

Proposals should build on the work of Horizon 2020 and EMFF projects, such as ClimeFish and CERES, and provide applicable approaches and tools to the aquaculture sector.

Selected proposals should collaborate with each other.

This topic should involve the effective contribution of SSH disciplines.

Proposals are encouraged to cooperate with actors such as the European Commission’s Joint Research Centre (JRC). The possible participation of the JRC in the project would consist in providing and analysing aquaculture data.