FOOD 2030 Pathways: Future Research & Innovation Needs in view of the transition to sustainable, healthy, safe and inclusive food systems

Introduction

The purpose of this survey is to gather your opinion on how EU research and innovation can accelerate the transition to sustainable, healthy, safe and inclusive food systems.

This survey will take about 30-40 min of your time.

You will be asked questions about:

1. Your awareness of FOOD 2030 and of the Green Deal proposal
2. 10 selected ‘Pathways for Action’ that support the transition to sustainable, healthy, safe and inclusive food systems
3. Research and Innovation actions and needs related to each of these Pathways

The survey focuses on clarifying R&I needs that:

- are relevant to achieve the FOOD 2030 priorities
- are relevant to reach the targeted impacts that are outlined in the strategic orientations document of Horizon Europe, in particular for Cluster 6 “Food, Bioeconomy, Natural Resources, Agriculture And Environment” (pages 113-114);
- could be addressed by R&I actions described under Intervention Area “Food Systems” (strategic orientations document, pages 123-125).

It is an open survey to which a wide range of stakeholders are encouraged to participate.

The deadline for completion is Thursday 27 February 2020, 18h00 CET.

A summary of the results of this survey will be made available by European Commission services. Results will serve as input to a workshop entitled “FOOD 2030 Pathways: Future Research & Innovation Needs in view of the transition to sustainable, healthy, safe and inclusive food systems” (4 March, Brussels).

PART 1: General questions

* First Name
• Last Name

• Type of Organisation
  - Research/Academia
  - Civil Society Organisation/NGO/Foundation
  - Private sector/agriculture
  - Private sector/food industry
  - Private sector/food service
  - Private sector/retail
  - Public Sector/ EU Institutions
  - Public Sector/ Local, regional and national
  - Public Sector/ International
  - Other

• Country of Organisation
  - Afghanistan
  - Albania
  - Algeria
  - Andorra
  - Angola
  - Antigua and Barbuda
  - Argentina
  - Armenia
  - Australia
  - Austria
  - Azerbaijan
  - Bahamas
  - Bahrain
  - Bangladesh
  - Barbados
  - Belarus
  - Belgium
  - Belize
  - Benin
  - Bhutan
  - Bolivia
  - Bosnia and Herzegovina
  - Botswana
  - Brazil
  - Brunei Darussalam
  - Bulgaria
Burkina Faso
Burundi
Cabo Verde
Cambodia
Cameroon
Canada
Central African Republic
Chad
Chile
China
Colombia
Comoros
Congo
Costa Rica
Côte D'Ivoire
Croatia
Cuba
Cyprus
Czechia
Democratic Republic of the Congo
Denmark
Djibouti
Dominica
Dominican Republic
Ecuador
Egypt
El Salvador
Equatorial Guinea
Eritrea
Estonia
Eswatini
Ethiopia
Fiji
Finland
France
Gabon
Gambia
Georgia
Germany
Ghana
Greece
Grenada
Guatemala
Guinea
Guinea Bissau
Guyana
Nauru
Nepal
Netherlands
New Zealand
Nicaragua
Niger
Nigeria
North Korea
North Macedonia
Norway
Oman
Pakistan
Palau
Panama
Papua New Guinea
Paraguay
Peru
Philippines
Poland
Portugal
Qatar
Republic of Moldova
Romania
Russian Federation
Rwanda
Saint Kitts and Nevis
Saint Lucia
Saint Vincent and the Grenadines
Samoa
San Marino
Sao Tome and Principe
Saudi Arabia
Senegal
Serbia
Seychelles
Sierra Leone
Singapore
Slovakia
Slovenia
Solomon Islands
Somalia
South Africa
South Korea
South Sudan
Spain
Sri Lanka
PART 2: FOOD 2030 - a policy framework for research & innovation

EU policies and objectives, including the European Green Deal proposal, emphasize the importance of the transition to sustainable, healthy, safe and inclusive food systems from ‘farm to fork’. The forthcoming ‘Farm to Fork’ strategy on sustainable food will be key in order to roll out such transition.

FOOD 2030 stresses the important role of R&I to achieve EU goals related to food and nutrition and to deploy new opportunities and solutions to benefit people and planet, and to make the transition of food systems fair and just. You can quickly find out more on FOOD 2030 from this 2 min video.

Key to FOOD 2030 is that it advocates a system approach to research and innovation policy to deliver on 4 priorities:
1. NUTRITION for SUSTAINABLE AND HEALTHY DIETS
2. CLIMATE smart and ENVIRONMENTALLY SUSTAINABLE food systems
3. CIRCULARITY and RESOURCE EFFICIENCY of food systems
4. INNOVATION and EMPOWERMENT OF COMMUNITIES

More detail on FOOD 2030 priorities can be found [here](#).

• **Question:** How familiar are you with FOOD 2030?
  - [ ] First time I hear about it
  - [ ] Partially aware
  - [ ] Fully aware

• **Question:** How familiar are you with the EU's Green Deal Proposal?
  - [ ] First time I hear about it
  - [ ] Partially aware
  - [ ] Fully aware

PART 3: FOOD 2030 "Pathways of Action"

**What is a “Pathway of Action”?**
"Pathways for Action", as developed under Food 2030, aim to provide an *evidence-based intervention logic to future-proof food systems* through R&I action and investment.

Each of these pathways is set to deliver impact on not just one but multiple policy priorities (referred to as "co-benefits"). *For example: alternative proteins and dietary shift can help climate mitigation and nutritional health; however, such a shift will also have some negative impacts such as on animal farming.*

Under FOOD 2030, 10 Pathways for Action have been identified:

1. **Governance and Systems Change**: improving the governance of R&I policy for food systems to deliver change
2. **Urban Food System Transformation**: promoting the re-shaping of urban food environments towards sustainable, healthy, inclusive and resilient ones
3. **Food from the Oceans**: increasing the supply of food from oceans and fresh water resources in a sustainable way
4. **Alternative Proteins and Dietary Shift**: foster the shift to sustainable and healthy diets and to increase the share of alternative proteins
5. **Halving Food Waste**: halving food waste (and losses) and rethinking food packaging
6. **The Microbiome**: leveraging our insights and understanding of the microbiome across all parts of the food system
7. **Personalizing Nutrition**: empowering individuals and healthcare professionals to adapt their diet for better health and sustainability
8. **Food Safety Systems of the Future**: setting a new world reference for food safety and food authenticity while tackling emerging challenges and creating new knowledge
9. **Transforming African Food Systems**: supporting the sustainable development of African Food Systems
10. **Food Systems and Data**: leveraging data and digital technologies to future proof food systems

In what follows, and for each Pathway of Action, we will ask your opinion about:

1. **the importance** (in terms of impact) of different R&I actions (closed question)

2. **important and urgent R&I needs** that you want to detail (open question, optional)

R&I needs can be related to (a) addressing specified **knowledge gaps** (b) developing, testing and demonstrating innovative **solutions to systemic challenges** or (c) building the **capacity of research and innovation systems**. For these actions to be effective and provide systemic solutions, attention should be given to citizen and multi-actor engagement upstream and throughout the R&I process.

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**PATHWAY 1. GOVERNANCE AND SYSTEM CHANGE**

Improving the governance of R&I policy for food systems to deliver change

- On a scale of 1 to 3, indicate how others rate your knowledge of this pathway
  - Low
  - Medium
  - High - You are pathway expert

Please rate each R&I action according to its importance. Importance is to be assessed in function of impact.

<table>
<thead>
<tr>
<th>R&amp;I Action</th>
<th>I don't know</th>
<th>Low importance</th>
<th>Medium importance</th>
<th>High Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;I Action 1: Mapping and monitoring of food systems, markets and behaviour (actors across the food system, consumers)</td>
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<tr>
<td>R&amp;I Action 2: New knowledge, insights, data models and methods to support policy development and support decision making, especially to enhance climate resilience.</td>
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<td>R&amp;I Action 3: Engaging society for the future of food systems</td>
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<td>R&amp;I Action 4: Boosting demonstration and testing of solutions to systemic problems</td>
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<td>R&amp;I Action 5: Supporting and investing in innovation deployment</td>
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</tbody>
</table>
R&I Action 6: Improve education and training to support transition

* R&I Action 7: Developing R&I strategies and aligning R&I policies.

OPTIONAL QUESTION: Are there important and urgent R&I needs that you want to highlight and detail (knowledge gaps, solution development, testing, demonstration, capacity building)?

500 character(s) maximum

OPTIONAL QUESTION: Which other R&I action has high importance and is missing in the above list?

150 character(s) maximum

PATHWAY 2. Urban Food System Transformation:
Promoting the re-shaping of urban food environments towards sustainable, healthy, inclusive and resilient ones

* On a scale of 1 to 3, indicate how others rate your knowledge of this pathway
  ○ Low
  ○ Medium
  ○ High - You are pathway expert

Please rate each R&I action according to its importance. Importance is to be assessed in function of impact.

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<tbody>
<tr>
<td>R&amp;I Action 1. Improve food production (e.g. Short food supply chains)</td>
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<td>R&amp;I Action 2. Innovate food supply and distribution (e.g. Green public procurement for healthy and sustainable meals; gastronomy and food service)</td>
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<tr>
<td>R&amp;I Action 3. Ensure social and economic equity (e.g. Healthy food environments, enhancing urban social resilience to ensure urban food and nutrition security)</td>
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<td>R&amp;I Action 4. Improve governance (e.g. Mapping of local food systems, analyses of governance models, study impact of urban food policies)</td>
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500 character(s) maximum

OPTIONAL QUESTION: Which other R&I action has high importance and is missing in the above list?

150 character(s) maximum

## PATHWAY 3. Food from the Oceans:
Increasing the supply of food from oceans and fresh water resources in a sustainable way

- On a scale of 1 to 3, indicate how others rate your knowledge of this pathway
  - Low
  - Medium
  - High - You are pathway expert

Please rate each R&I action according to its importance. Importance is to be assessed in function of impact.

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<tbody>
<tr>
<td>R&amp;I Action 1 Increase availability of aquatic biomass, within planetary bounderies</td>
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<tr>
<td>R&amp;I Action 2. Boost sustainable aquaculture innovation (including building climate resilience)</td>
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<td>R&amp;I Action 3 Improve biological knowledge and management tools for fisheries and aquaculture</td>
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<td>R&amp;I Action 4 Implement monitoring programs for risk assessment (animal health, emerging risks, pollutants…)</td>
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<td>R&amp;I Action 5 Improve consumer knowledge and perception on seafood. Develop labeling strategies for awareness and fraud control</td>
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<td>R&amp;I Action 6 Diversify species, products and processes to reduce the environmental impact</td>
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<td>R&amp;I Action 7 Reinforce R&amp;I capacity to support this pathway</td>
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OPTIONAL QUESTION: Are there important and urgent R&I needs that you want to highlight and detail (knowledge gaps, solution development, testing, demonstration, capacity building)?
OPTIONAL QUESTION: Which other R&I action has high importance and is **missing** in the above list?

PATHWAY 4. Alternative Proteins and Dietary Shift:

Foster the shift to sustainable and healthy diets and to increase their share of alternative proteins

- On a scale of 1 to 3, indicate how others rate your knowledge of this pathway
  - Low
  - Medium
  - High - You are pathway expert

Please rate each R&I action according to its importance. Importance is to be assessed in function of impact.

<table>
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<tr>
<td>R&amp;I Action 1. Fill knowledge gaps on health-related and environmental aspects of alternative proteins sources</td>
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<td>R&amp;I Action 2. Increasing market uptake of alternative proteins</td>
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<td>R&amp;I Action 3. New processing methods and technologies (e.g. for pulses, algae)</td>
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<td>R&amp;I Action 4. Stimulating and connecting actors of the food system for the production and provision of alternative proteins</td>
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<td>R&amp;I Action 5. Bioavailability of protein sources</td>
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<tr>
<td>R&amp;I Action 6. The potential of controlled-environment farming in 2030</td>
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<tr>
<td>R&amp;I Action 7. Regulatory science and right policy mix for alternative proteins</td>
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<tr>
<td>R&amp;I Action 8. Dietary shift: Developing healthier and sustainable food environment (access to healthy products)</td>
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</table>
R&I Action 9. Dietary shift: Changing behavior across the food system towards sustainability and health

- R&I Action 10. Dietary shift: Strengthen education on food systems

OPTIONAL QUESTION: Are there important and urgent R&I needs that you want to highlight and detail (knowledge gaps, solution development, testing, demonstration, capacity building)?

*500 character(s) maximum*

OPTIONAL QUESTION: Which other R&I action has high importance and is missing in the above list?

*150 character(s) maximum*

PATHWAY 5. Halving food waste:

Halving food waste (and losses) and rethinking food packaging

- On a scale of 1 to 3, indicate how others rate your knowledge of this pathway
  - Low
  - Medium
  - High - You are pathway expert

Please rate each R&I action according to its importance. Importance is to be assessed in function of impact.

<table>
<thead>
<tr>
<th>R&amp;I Action</th>
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<tbody>
<tr>
<td>• R&amp;I Action 1 New insights on the drivers of food losses and waste; on success factors and barriers to reducing and valorising food waste</td>
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<td>• R&amp;I Action 2 Improving and harmonizing food losses and waste measurement and monitoring methodologies</td>
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<td>• R&amp;I Action 3 Impact analysis of food losses and waste prevention actions</td>
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<td>• R&amp;I Action 4 Developing sector-specific guidance</td>
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<td>• R&amp;I Action 5 Improving the information flows and the coordination along the food supply chain</td>
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<td>• R&amp;I Action 6 Better food processing and preservation facilities</td>
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**PATHWAY 6. The Microbiome:**

Leveraging our insights and understanding of the microbiome across all parts of the food system

- On a scale of 1 to 3, indicate how others rate your knowledge of this pathway
  - ☐ Low
  - ☐ Medium
  - ☐ High - You are pathway expert

Please rate each R&I action according to its importance. Importance is to be assessed in function of impact.

<table>
<thead>
<tr>
<th>R&amp;I Action</th>
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<tbody>
<tr>
<td>R&amp;I Action 1 Citizen engagement to better understand the benefits of microbiomes</td>
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<td>R&amp;I Action 2 New generation of scientist on systemic microbiome research</td>
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<tr>
<td>R&amp;I Action 3 Microbiomes for human health</td>
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<tr>
<td>R&amp;I Action 4 Microbiome for more sustainable and climate resilient agriculture</td>
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<td>R&amp;I Action 5 Microbiome for healthier soils</td>
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<tr>
<td>R&amp;I Action 6 Microbiome for tackling AMR</td>
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</table>

**OPTIONAL QUESTION : Are there important and urgent R&I needs that you want to highlight and detail (knowledge gaps, solution development, testing, demonstration, capacity building)?

500 character(s) maximum

**OPTIONAL QUESTION: Which other R&I action has high importance and is missing in the above list?**

150 character(s) maximum
R&I Action 7 Microbiome for heather and taster food

- R&I Action 8 Life Cycle Analysis and risk-benefit assessment of precision fermentation and farm free proteins.

**OPTIONAL QUESTION**: Are there important and urgent R&I needs that you want to highlight and detail (knowledge gaps, solution development, testing, demonstration, capacity building)?

*500 character(s) maximum*

**OPTIONAL QUESTION**: Which other R&I action has high importance and is **missing** in the above list?

*150 character(s) maximum*

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### PATHWAY 7. Personalizing nutrition:

**Empowering individuals and healthcare professionals to adapt their diet for better health and sustainability**

- On a scale of 1 to 3, indicate how others rate your knowledge of this pathway

  - Low
  - Medium
  - High - You are pathway expert

Please rate each R&I action according to its importance. Importance is to be assessed in function of impact.

<table>
<thead>
<tr>
<th>R&amp;I Action</th>
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<th>High Importance</th>
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<tbody>
<tr>
<td><strong>• R&amp;I Action 1. Combating non-communicable diseases through nutrition and diet</strong></td>
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<tr>
<td><strong>• R&amp;I Action 2. Personalizing nutrition for groups and individuals</strong></td>
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<tr>
<td><strong>• R&amp;I Action 3. Combating undernutrition and micronutrient deficiencies</strong></td>
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<td><strong>• R&amp;I Action 4. Unravelling neurological triggers</strong></td>
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<td><strong>• R&amp;I Action 5. Dietary assessment methods</strong></td>
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<tr>
<td><strong>• R&amp;I Action 6. Develop sustainable and healthy dietary guidelines</strong></td>
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</table>
R&I Action 7. Understanding people's food & nutrition behavior

R&I Action 8. Improve food systems communication, education and engagement

R&I Action 9. Digital tools and labeling for citizens and health care workers

R&I Action 10. Human gut microbiome and its impacts on immune system, mental & non-communicable diseases

R&I Action 11. New food products, services & processes

OPTIONAL QUESTION : Are there important and urgent R&I needs that you want to highlight and detail (knowledge gaps, solution development, testing, demonstration, capacity building)?

500 character(s) maximum

OPTIONAL QUESTION: Which other R&I action has high importance and is missing in the above list?

150 character(s) maximum

PATHWAY 8. Food Safety Systems of the Future:
Setting a new world reference for food safety and food authenticity while tackling emerging challenges and creating new knowledge

On a scale of 1 to 3, indicate how others rate your knowledge of this pathway

- Low
- Medium
- High - You are pathway expert

Please rate each R&I action according to its importance. Importance is to be assessed in function of impact.

<table>
<thead>
<tr>
<th>R&amp;I Action 1. Innovation in risk assessment methodologies</th>
<th>I don't know</th>
<th>Low importance</th>
<th>Medium importance</th>
<th>High Importance</th>
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<tbody>
<tr>
<td>R&amp;I Action 2. Control biological and chemical hazards, including emerging risks</td>
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<td>R&amp;I Action 3. Traceability and authenticity in the digital era</td>
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**OPTIONAL QUESTION**: Are there important and urgent R&I needs that you want to highlight and detail (knowledge gaps, solution development, testing, demonstration, capacity building)?

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**OPTIONAL QUESTION**: Which other R&I action has high importance and is **missing** in the above list?

*150 character(s) maximum*

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**PATHWAY 9. Transforming African Food Systems:**

Supporting the sustainable development of African Food Systems

- On a scale of 1 to 3, indicate how others rate your knowledge of this pathway
  - Low
  - Medium
  - High - You are pathway expert

Please rate each R&I action according to its importance. Importance is to be assessed in function of impact.

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<tr>
<td>R&amp;I Action 1. Supporting African food cities &amp; towns</td>
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<tr>
<td>R&amp;I Action 2. Improving food safety for an African Free Trade Zone</td>
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<tr>
<td>R&amp;I Action 3. Combating malnutrition</td>
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<td>R&amp;I Action 4. R&amp;I support for African food entrepreneurs</td>
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<td>R&amp;I Action 5. Nutrition sensitive bio-diverse agriculture, resilient to climate change</td>
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<td>R&amp;I Action 6. Reducing food losses and waste</td>
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<td>R&amp;I Action 7. Data based digital and mobile food solutions</td>
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<td>R&amp;I Action 8. Human gut microbiome and its link to malnutrition and food safety in Africa</td>
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</tr>
</tbody>
</table>
OPTIONAL QUESTION: Are there important and urgent R&I needs that you want to highlight and detail (knowledge gaps, solution development, testing, demonstration, capacity building)?

500 character(s) maximum

OPTIONAL QUESTION: Which other R&I action has high importance and is missing in the above list?

150 character(s) maximum

PATHWAY 10. Food Systems and Data:
Leveraging data and digital technologies to future proof food systems

• On a scale of 1 to 3, indicate how others rate your knowledge of this pathway
  ○ Low
  ○ Medium
  ○ High - You are pathway expert

Please rate each R&I action according to its importance. Importance is to be assessed in function of impact.

<table>
<thead>
<tr>
<th>R&amp;I Action</th>
<th>I don't know</th>
<th>Low importance</th>
<th>Medium importance</th>
<th>High Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>• R&amp;I Action 1. Improving the understanding of the data economy and the free flow of data in food systems (functioning, issues, barriers, opportunities, future policy) with a view to inclusiveness, fairness, sustainability and climate</td>
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<tr>
<td>• R&amp;I Action 2. Enabling platforms and technologies that support data driven innovation in food systems by citizens (including citizen science) and food system actors</td>
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<tr>
<td>• R&amp;I Action 3. Boosting the innovation ecosystem for data-driven solutions that support food system transition</td>
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<tr>
<td>• R&amp;I Action 4. Addressing the digital divide among consumers, supply chain actors and researchers in the food system</td>
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</tbody>
</table>

OPTIONAL QUESTION: Are there important and urgent R&I needs that you want to highlight and detail (knowledge gaps, solution development, testing, demonstration, capacity building)?

500 character(s) maximum
OPTIONAL QUESTION: Which other R&I action has high importance and is **missing** in the above list?

*150 character(s) maximum*

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- The Commission will publish the responses to this questionnaire in a workshop report. You can choose whether you would like your details to be made public or to remain anonymous:
  - **Anonymous**
    - Only your type of respondent and contribution will be published.
  - **Public**
    - Your personal details (name) will be published with your contribution.

- I agree with the [personal data protection provisions](#)
  - **Yes**

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**THANK YOU FOR PARTICIPATING !**

The FOOD 2030 Team

Join the conversation: #FOOD2030EU