Nutrition Bulletin



DOI: 10.1111/nbu.12127

# Stakeholder engagement in food and health innovation research programming – key learnings and policy recommendations from the INPROFOOD project

**R. Gemen*, J. Breda†, D. Coutinho‡, L. Fernández Celemín*, S. Khan§, S. Kugelberg†, R. Newton‡, G. Rowe¶, M. Strähle**, L. Timotijevic§, C. Urban**, M. Zolotonosa†† and K. Hadwiger‡‡**

*European Food Information Council (EUFIC), Brussels, Belgium;
†World Health Organization Regional Office for Europe, Copenhagen, Denmark;
‡Sociedade Portuguesa de Inovação (SPI), Porto, Portugal;
§University of Surrey, UK;
¶Gene Rowe Evaluations, Norwich, UK;
**Wissenschaftsladen Wien – Science Shop Vienna, Austria;
††European Network of Science Centers and Museums (Ecsite), Brussels, Belgium;
‡‡Life Science Center, University of Hohenheim, Germany

## Abstract

Europe recognises the need for technological innovation along with the importance of bridging the gap between science and society. The European Commission has developed a strategy to foster public engagement and a sustained two-way dialogue between science and civil society, and has set up a framework for Responsible Research and Innovation. The EU-funded project INPROFOOD aimed to find new ways to establish dialogue and mutual learning among stakeholders meant to inform subsequent work and future initiatives towards Responsible Research and Innovation. More specifically, INPROFOOD aimed to: (1) increase understanding of the landscapes of food and health innovation research programming; (2) adapt, test and evaluate the application of different stakeholder engagement methods to the area of food and health innovation research programming, which included European Awareness Scenario Workshops, PlayDecide games and an Open Space conference; and (3) to develop an action plan to progress towards Responsible Research and Innovation in this domain. The latter entailed a so-called Mobilisation and Mutual Learning Action Plan, which lays down a concrete framework for inclusive stakeholder involvement at different stages of the research and innovation process, with tangible key actions in five priority areas.

**Keywords:** food and health innovation, inclusive research programming, Mobilisation and Mutual Learning Action Plan (MMLAP), Responsible Research and Innovation, stakeholder/public engagement

*Correspondence:* Raymond Gemen, Nutrition & Health Manager, Nutrition & Health, European Food Information Council (EUFIC), Tassel House, rue Paul-Emile Janson 6, B-1000 Brussels, Belgium.
E-mail: raymond.gemen@eufic.org

DISCLAIMER: João Breda and Susanna Kugelberg are staff members of the WHO Regional Office for Europe. The authors alone are responsible for the views expressed in this publication and they do not necessarily represent the decisions or the stated policy of the WHO.



 

## The INPROFOOD project

With the world's current societal challenges, including those related to food, nutrition, health and the environment, Europe recognises the need for technological innovation along with the importance of bridging the gap between science and society. Since the beginning of this millennium, in particular, there has been a series of action plans and programmes, launched by the European Commission (EC), setting out a strategy to 'foster public engagement and a sustained two-way dialogue between science and civil society' (EC 2013a). More recently, this has led to the development of a framework for 'Responsible Research and Innovation' – Box 1. Accordingly, the EC is engaged with Responsible Research and Innovation via the new EU Research and Innovation programme (Horizon 2020) in promoting actions that cultivate institutional change in order to catalyse the uptake of Responsible Research and Innovation (EC 2010a, 2010b).

'Towards inclusive research programming for sustainable food innovations' (INPROFOOD), an EU-funded project (Seventh Framework Programme) comprising a consortium of 18 partner organisations from 13 countries, aimed to find new ways to establish dialogue and mutual learning among stakeholders. The INPROFOOD project, which ran for a period of 3 years (2011–2014), gained insight meant to inform subsequent work towards Responsible Research and Innovation, such as the Horizon 2020 EU research and innovation programme.

**Box 1: Responsible Research and Innovation**

Responsible Research and Innovation can be defined as a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the acceptability (ethical), sustainability and societal desirability of the innovation process and its marketable products in order to allow a proper embedding of scientific and technological advances in our society (Owen *et al.* 2012). The Responsible Research and Innovation framework within the European Commission has been developed since 2010, as part of the 'Science in Society' Action Plan (2007–2013), which has been transformed into 'Science with and for Society' (SwafS) under Horizon 2020 (EC 2013a).

The different strands of the project aimed to:

(**1**) increase understanding of the landscapes of food and health innovation research programming;
(**2**) adapt, test and evaluate the application of different stakeholder engagement methods to the area of food and health innovation research programming;
(**3**) develop an action plan to progress towards Responsible Research and Innovation in this domain. Figure 1 provides a schematic overview of the project illustrating all the activities involved.

This article presents an overview of INPROFOOD's key findings according to the aforementioned strands and concludes with a vision for building upon this work, accompanied by tangible recommendations for stakeholder involvement in food and health innovation research programming. These recommendations are incorporated in a Mobilisation and Mutual Learning Action Plan (MMLAP) (EC 2012), which was developed based on the research conducted within the project, guiding policy development on inclusive stakeholder engagement for sustainable food innovations.

## Investigation into current processes of food and health innovation research programming

### Current structures of research programming

Desk research conducted across 11 different countries[1] set out to identify funding instruments and strategies related to food and health research and innovation, the prevailing modality of funding, and how research programming takes place (*i.e.* agenda setting, prioritisation of topics and allocation of resources).

The work revealed that, for most countries examined, the national ministry or department related to education, science or research was involved in the funding of food and health research – in many cases via intermediary organisations. With the exception of Greece, other ministries were also involved, typically the ministry or department related to food or agriculture. Aside from national government funding, Portugal, Spain, Germany and Italy also have regional government funding instruments for research. All of the 11 countries analysed have some form of public–private partnerships, and many have public–private partnerships related to nutrition.

[1]Reports were carried out for Austria, Denmark, Germany, Greece, Italy, The Netherlands, Portugal, Scotland, Slovakia, Spain and the UK.

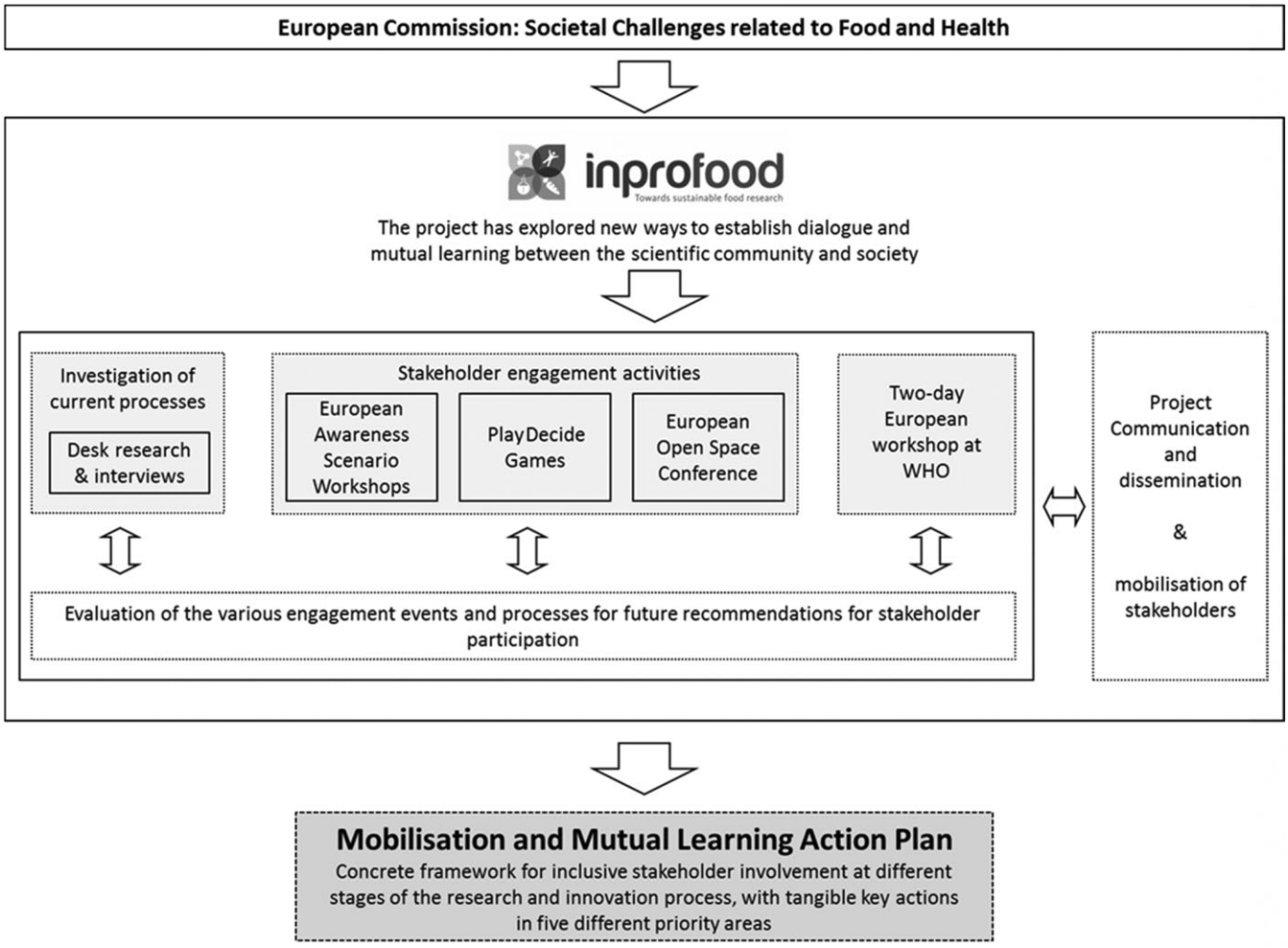


**Figure 1** Schematic overview of INPROFOOD's activities.

Stand-alone strategies and programmes on nutrition or food and health were lacking in most countries; more often, food and health/nutrition was embedded in general strategies. Food and health innovation research was even less established in such strategies. Only one country (the UK) had a specific strategy on food and health research innovation, although Germany's innovation-focused High Tech Strategy 2020[2] included food/health as a priority area.

In some countries (Austria, Slovakia, Spain and the UK), the findings showed that predominantly responsive-mode (scientist-led) decisions were being made on research topics. Sometimes, even when the national government had established thematic priorities for research, there was still evidence of scientist-initiated topics. Research priorities in Scotland, Italy and Greece were determined by technical committees formed with relevant ministries, which were therefore more centrally led. In Greece, priorities were strongly influenced by EC priorities because a substantial amount of their research funding came from the Commission. Last, although no documentation was evident for The Netherlands or Denmark, it is possible that they may both use a centralised, or strategic-mode, and a responsive-mode, or scientist-led, determination of research priorities.

Across all of the countries analysed, little documentation was evident regarding the stages of research programming and the level of stakeholder engagement. Where documented, it mainly focused on industry and academic communities and neglected the wider public(s) involvement.

[2]The High Tech Strategy 2020 is a high-level policy document outlining the strategy for priority areas deemed important for economic growth.

### Decision-making processes of research programming

Following assessment of the precise structure of food and health research funding and programming, qualitative semi-structured interviews were conducted to further explore the decision-making process in the development of publicly funded research programmes with a food and health research component. This was carried out for all of the countries[1] as detailed above, with the exception of Denmark. To do this, it was decided to focus on existing publicly funded programmes that included public–private partnerships. This was because all participating countries had such programmes and also because there were fewer restrictions to information in public programmes than in private programmes in general. In total, 68 interviews were conducted across ten different countries.

Analysis of the interviews showed that although there was emphasis on stakeholder engagement including civil society groups, such engagement was not practised in most strategic funding cases examined; rather, only government and research community stakeholders, and sometimes industry stakeholders, were engaged. In the few cases where the engagement of civil society groups occurred (the UK and Scotland), the effect of the engagement activity in terms of influencing the direction of research was difficult to assess. In the cases of responsive mechanisms, which are ostensibly driven by scientists and determined on merit, other factors ranging from current trends in research to social/professional connections were thought to influence the process. Some Slovakian interviewees expressed concern about the emphasis on the quality of applications because this can sometimes be disadvantageous for new or early career stage researchers and researchers working with industry. It is likely however that this situation exists in other countries (*e.g.* a UK interviewee specifically noted this as a barrier to innovation).

Overall, although there were some study limitations (*e.g.* the response rate and accessibility to key actors in the research programming process), the findings shed some light on areas that would need redressing to enable more inclusive research programming. First, the interviews revealed that, within both strategic and responsive mechanisms, power asymmetries may influence research programming (*e.g.* via experts supporting their own fields, large research institutes having greater weight in European agenda setting, and industry lobby). The second observation that surfaced was a (perceived) lack of transparency, although there were differences across countries. More transparency would help resolve some of the non-merit-based factors that have been mentioned. Third, a proposed avenue to explore, which may facilitate greater innovation, is to fund less established researchers. Finally, there is a need to incorporate appropriate mechanisms to respond to the concerns and input of public and civil society stakeholders that goes beyond merely seeking of their input. This has been one of INPROFOOD's main objectives and will be addressed in the next section.

## Stakeholder engagement in food and health research programming

Societal engagement and participatory practice have increasingly become part of public policy decision making and implementation (Papadopoulos 2011), although it may not as yet have been widely practised, given INPROFOOD's analyses of current processes in food and health innovation research programming (see previous section). There are various reasons why linking society to research and innovation is essential. Involving the broadest possible range of stakeholders (including, among others, public organisations, business associations and civil society organisations) in research and innovation is seen as a value as it increases democratic legitimacy of those making decisions about allocation of public resources to research. In addition, greater societal involvement in these decisions is thought to have a substantial benefit as it broadens the range of societal needs, perspectives and values that can be addressed through publicly funded research (EC 2013b). Other motives include improvement of the level of reflection of science and, thus, the societal utility, adaptability and robustness of scientific knowledge. Moreover, by considering both the demand and user sides in research programming, this may potentially lead to increased global market success.

The challenge of societal (or stakeholder) participation (in research programming) is to make it transparent: to define what it is, its precise objectives (*i.e.* what will be the expected outcomes and how are these intended to be used) and how it should be carried out (Kallis *et al*. 2006; Geissel 2008; Abels 2009). In stakeholder engagement, representativeness (of the relevant communities involved) may not be attainable, but diversity is. If a broad diversity of stakeholders (with respect to professional background and mission) devise similar conclusions independently, then these results should be considered relevant. The critical test for any stakeholder engagement activity is that non-participants are able to trust the procedures and outcomes. Such a confirmation can only be established by having public debates on the outcomes and the process itself, which

requires disseminating the outcomes and information about the process widely.

INPROFOOD has adapted, tested and evaluated several stakeholder engagement formats that aimed to foster dialogue and mutual learning between stakeholders – industry, academia and civil society – in the context of food and health innovation research programming. The objectives of these were, first, to gain insight into the methods and challenges of stakeholder participation, so as to be able to provide recommendations for policy development, and second, to collect information on current issues in food and health research by engaging with over 3000 Europeans from more than 20 countries. Boxes 2–4 explain the stakeholder methods applied within INPROFOOD in more detail: European Awareness Scenario Workshops, PlayDecide games and an Open Space Conference, respectively. The findings from these activities formed an important 'building block' of the MMLAP, which will be discussed later.

The findings of these stakeholder engagement events were presented during a 2-day INPROFOOD workshop, entitled 'The voice of citizens in food, nutrition and health research innovation', held at the World Health Organization (WHO) Regional Office for Europe. The main objective was to bring together European stakeholders in an open dialogue to discuss societal challenges of food, nutrition, health and the environment, and to develop strategies of how key stakeholders, including the civil society, can be involved in the research programming in this field. Twenty-one Member States and 31 non-governmental organisations (NGOs) and universities were represented at the workshop. The workshop contained interactive sessions with facilitator-led breakout groups. The workshop outcomes (INPROFOOD project website) then fed into the MMLAP.

## Evaluation of the stakeholder engagement events

A novel aspect of INPROFOOD was the existence of a separate evaluation work package, the aim of which was to evaluate the various engagement events and processes according to a consistent approach. This was felt to be critical – in order to ensure transparency, identify the existence or absence of bias, and to validate the outputs for policy makers and other observers. The evaluation was based on three criteria or sets of criteria: the first was the organiser's aims (as stated in the project's description of work); the second was a normative criterion called 'Information Translation', which looks at an engagement process as an information system, and identifies places where information is 'lost' or not elicited in the first place (Horlick-Jones *et al*. 2007); and the third was the implicit evaluation criteria of the participants, as inferred from their responses to a number of open questions in a participant questionnaire (given to attendees at the end of all the evaluated events). This approach allowed the various perspectives of potentially interested parties (*i.e.* researchers, academics, policy makers, practitioners) to be considered. Event performance was assessed (against these criteria) via document analysis, participant and organiser questionnaires, and event observation – allowing an audit trail of physical proceedings and the opinions of most of those involved. Comprehensive evaluation reports on the events are available from the authors upon request.

Unfortunately, it is beyond the scope of this article to provide an extensive summary of results, but there are a number of relevant observations. First, results appeared to endorse the value, relevance and utility of the evaluation scheme (and its three sets of criteria). The importance of using a 'normative' scheme was confirmed because – as with many other projects and processes – the organisers' aims were revealed to be insufficiently specified to provide a single evaluative reference point (*i.e.* the stated aims were not sufficiently comprehensive and coherent to be used as the only criteria for evaluating the goodness of the stakeholder processes – without the risk that external observers might contest the results). Furthermore, the fact that many of the revealed participant criteria from the different events directly addressed issues related to 'information translation' suggests that the particular normative scheme used here was an apt one to adopt. Second, as might be expected, each event had its positives and negatives – and learning from the latter might help ensure the more proficient implementation of similar events to these in the future [and indeed, there was evidence of improvements in some European Awareness Scenario Workshops on the second and third rounds in certain countries from which the partners had taken the evaluation results more seriously (than others) and made amendments to their subsequent event designs]. Third, the evaluation raised the issue of effective recruitment of balanced participant samples (a degree of imbalance was evident in all events), with recommendations provided to try to account for this in the future. Fourth, the importance of professional facilitation and the comprehensive recording of participant views and interactions, in order to counter 'information loss', was highlighted. And fifth, the appreciation of participants for being invited to take part and participate in discussions with relevant stakeholders on the key theme of INPROFOOD was

**Box 2: European Awareness Scenario Workshops**

INPROFOOD's core stakeholder engagement activity entailed the adaptation, organisation and evaluation of a series of European Awareness Scenario Workshops. These workshops were in a format specifically designed to stimulate discussion and participation; to bring together different stakeholders who, by means of deliberation, plenary presentations and group discussions, could help to jointly develop scenarios for common solutions on certain issues (Andersen & Jæger 1999; Danish Board of Technology 2008).

The general objective of the European Awareness Scenario Workshops was to bring together stakeholders to develop shared visions of research programming that promote socially, environmentally and economically sustainable food innovations. Participating stakeholders were from public organisations, business associations and non-profit organisations with and without business ties. The workshops were targeted at food producers; food processing industries and retailers; environmental and social non-profit organisations; patient groups and associations of doctors; policy makers; research funders of all sizes; control authorities; professional and parents associations; and patent offices. Organisations were asked to send a delegate with some affinity to health, food production, sustainability, development of policies and/or research funding policies (see Table 1). To reduce imbalances of power between workshop participants, workshops were conducted in three series (*i.e.* each of the participating countries ran three workshops[3] in which the stakeholders were grouped according to their level of hierarchy/influence). The criteria used for three categories of stakeholders – 'large', 'medium' and 'small' – are explained in more detail in Table 1.

A toolkit for identical implementation of the European Awareness Scenario Workshops across the different countries involved was developed to enable comparison (Strähle *et al.* 2012). This toolkit comprised guidance on a transparent recruitment process, structured briefing material for trained facilitators and a briefing paper for participants. The briefing paper gave a short overview on what food innovation is about and on the dimensions of research programming, clear explanations on how to conduct the workshop (*e.g.* to avoid power imbalances during discussions) and how to report accurately. To ensure stakeholder recruitment was more transparent and as non-arbitrary as possible, two recruitment schemes were introduced, one based on stakeholder databases compiled from public sources, the other on open calls for participation (Strähle *et al.* 2012; Urban & Strähle 2012a, 2012b, 2012c; Wissenschaftsladen Wien 2013). Both schemes involved eligibility and a selection of participants based on lottery draws. More details on this can be found on the INPROFOOD project website (www.inprofood.eu). The briefing paper for participants, which included information about research programming and some background information, was based on the Joint Programming Initiative *A Healthy Diet for a Healthy Life's* Vision Paper (Joint Programming Initiative 2010; EC 2011).

In total, INPROFOOD organised 35 European Awareness Scenario Workshops in 13 different countries[4] between October 2012 and September 2013. Participating stakeholders were from public organisations, business associations and non-profit organisations with and without business ties. Altogether, 529 people participated in the 35 workshops, sent as official delegates of their organisations. To our knowledge, this was the largest transnational stakeholder engagement using scenario workshops to date.

Across the different countries involved, participants deliberated on aspects covering the whole research programming cycle. This ranged from decisions on research areas and funding, quality criteria, project designs and exploitation of results, to the monitoring and evaluation of research programmes. Generally, there was agreement across workshops on what constitutes socially acceptable research programming (Strähle *et al.* 2014a, 2014b, 2014c). Not surprisingly, there was wide support for involving stakeholders at several stages of research programming instead of leaving the decision making (of funding and/or research topic selection) to a selected group of individuals or one specific person. There were different views, however, on the how, whom and the

[3]In four countries (Belgium, France, Spain and the UK), the workshops with the stakeholder categories 'medium' and 'small' (see Table 1) were merged due to low numbers of participating stakeholders. This resulted in a total of 35 workshops.

[4]The countries included were Austria, Belgium, Denmark, France, Germany, Greece, Italy, The Netherlands, Portugal, Slovakia, Spain, Turkey and the UK.

**Box 2:** *Continued*
desired extent of involvement required. Other outcomes that surfaced in different countries were that: unbalanced influence should be avoided at all times; that publicly funded research results should be made available in an unbiased way to a wide audience, independent of the outcome; and that interdisciplinary research is the preferred mode of action. There is also a need to improve the political legitimacy of stakeholder engagements (*i.e.* their transparency and credibility). In most workshops, participants disapproved of too much influence by a single stakeholder group (*e.g.* large-scale industry). There was a demand to put the social benefit of research first, for independent decision making based on clear criteria and rules, with more involvement of smaller organisations and companies, civil society organisations, public entities, and small- to medium-sized enterprises, as well as for the avoidance of monopolies on research topics. Other findings concerned research assessment; participants proposed developing more solid forms of assessment than bibliometric indicators. In terms of research management, the administrative burden should be reduced and time frames of research projects extended to allow for long-term and in-depth studies. Numerous other issues came up, but less frequently, typically with conflicting views among participants.

To summarise this section on the European Awareness Scenario Workshops, there is broad interest across stakeholder categories to be involved in food and health innovation research programming. However, according to the European Awareness Scenario Workshop participants, certain improvements are needed for more inclusive research programming. Stakeholder engagement is currently perceived as not being transparent enough; often it is unclear who is involved, why they are involved, how they became involved, at what stage, and if or how the results will be used by policy makers or indeed others. All this should be defined beforehand. Participation standards should be developed which tackle these issues and meet basic requirements of transparency, credibility and balanced interests, at least in those activities in which policy making or policy makers are involved. Non-arbitrary recruitment procedures would be a good starting point. Further steps would entail having a closer look at potential conflicts of interests and setting up mandatory transparency databases with uniform robust criteria for defining stakeholder groups – such as civil society organisations – and differentiating them from others. Other aspects include unbiased briefing materials for participants, making it clear from the beginning what will be done with the results, and communicating the outcomes and the process to a wider public.

All in all, scenario workshops bring together interest groups that do not usually come together on an equal footing in such numbers to fully engage with each other. The setting of European Awareness Scenario Workshops that switched between mono- and multi-stakeholder groups and joint creation of scenarios allowed for focussed and result-oriented deliberations.

readily evident and pervasive throughout all of the events. In short, the events, in combination, managed to successfully attract many relevant stakeholders and enable them, in a variety of ways, to address a key policy issue in a productive and positive manner, albeit that certain aspects of each of the events could have been enacted more effectively. However, by providing a rigorous and nuanced evaluation, noting negatives as well as positives, this can only add to the overall credibility of the project and its processes in the eyes of critical external observers.

## Dissemination and communication activities supporting stakeholder engagement

An efficient and effective dissemination and communication strategy, particularly within 'Science in Society' projects (see Box 1), is crucial to successfully inform and engage stakeholders. An additional effort was made to reach out to the underrepresented stakeholders involved in the research and development process, typically representatives of civil society, aiming to engage and mobilise them to tackle the challenges at hand. Research has indeed highlighted the relevance of not only communication and dissemination, but also dialogue, as a means to broaden public engagement with science and technology (Abelson *et al.* 2003; Technopolis Group and Frauhnofer ISI 2012; Barroso's Science and Technology Advisory Council 2013).

Therefore, within INPROFOOD, dissemination and communication actions were employed both as a way to raise awareness of the project and its activities, and to support and facilitate the engagement and mobilisation actions of the project. There was a common project branding and materials were translated into various languages to support national activities.

**Table 1** The criteria applied for the three categories ('large', 'medium' and 'small') of stakeholders (non-profit organisations without business ties, business organisations, public organisations) for the European Awareness Scenario Workshops

| | | Stakeholder categories | | |
|---|---|---|---|---|
| | | Large | Medium | Small |
| Stakeholders | Non-profit organisations without business ties | National non-profit organisations or national divisions of international non-profit organisations | All non-profit organisations in a country, but no umbrella or international organisations | See Medium |
| | Business organisations | National business associations, but no single enterprises | Regional and local business associations and small-to-medium enterprises (according to the European Commission's definition, no large enterprises) | See Medium |
| | Public organisations | Governmental organisations and universities | Governmental organisations and public administration bodies (state or regional level), faculties of public universities | Governmental organisations and public administration bodies (state or regional level), institutes of public universities |

As emphasised in the document *Communicating EU Research & Innovation: A guide for project participants* (EC 2014), INPROFOOD sought to strategically plan its dissemination activities – by developing a project dissemination plan – as well as targeting communication actions at the different stakeholders, tailoring the messages, language and communication channels, and tools used according to the specific stakeholder group at hand.

There was general consensus among the INPROFOOD partners that, although labour-intensive, face-to-face (through meetings, workshops or seminars) and one-to-one communication was the most effective way for transmitting information on the project and receiving feedback from stakeholders, digital tools, such as the project website, newsletters, social networks and directed emailing (to some extent), supported the mobilisation of stakeholders to participate in the project engagement activities by informing them about the scope of the actions and the potential relevance for them.

Gaining feedback from stakeholders (directly from stakeholders or through the project partners) was found to be of paramount importance for improving the communication and dissemination actions and ensuring the maximisation of their impact.

## From research findings to policy recommendations

The various research activities conducted within INPROFOOD have led to a better understanding of current processes of food and health innovation research programming throughout Europe, and of the main actors that are involved in it. Furthermore, it has produced valuable learnings on how best to engage with society on science and technological innovation – from the conduct of a variety of participatory formats – and on how to tackle some of the associated barriers. INPROFOOD's main challenge was to carefully interpret these findings, and to translate them into tangible recommendations for well-designed, evidence-based practices that support policy development on inclusive stakeholder engagement for sustainable food innovations.

The MMLAP, in which these recommendations are incorporated, aims to stimulate dialogue and cooperation between science and society at different stages of the research and innovation process. INPROFOOD's vision of the MMLAP is that policy makers at national and European levels will establish a two-way communication channel with the relevant stakeholders to debate research needs and stakeholder involvement. Its mission is therefore to promote a transparent and democratically legitimate participatory approach to food and health innovation research programming, which: (1) demonstrates a clear benefit to public health; (2) supports and enhances a whole-of-society approach; and (3) is based on transparency, accountability, integrity and mutual respect.

The objectives of the MMLAP are: (1) to propose a set of good practice principles for stakeholder engage-

**Box 3: PlayDecide games**

PlayDecide is a discussion game format that facilitates the take-up of participatory methods, and stimulates the exchange of experiences and knowledge (PlayDecide 2014). The aim of the game is not only to discuss but also to come up with common solutions and strategies, informing the policy-making process. Cards covering facts, issues and personal stories on a chosen topic form the basis for a 2-hour discussion within a group of between five and eight participants, led by a facilitator. The main outcome of the game is the voting on four policy options, which are uploaded to a dedicated website allowing comparison with other games.

The aim within INPROFOOD of using PlayDecide was to engage young people in the debate on food and health-related challenges, to raise awareness about the related issues and to identify solutions. The content of the game, with the topic 'Healthy Diet and Lifestyle', was specifically developed by the project partners Ecsite and EUFIC, and can be freely downloaded (www.playdecide.eu/play/topics/healthy-diet-and-lifestyle). Within the context of the high prevalence of obesity, the policy voting options enquired about the degree of government regulation vs. the level of citizen's own responsibility in making diet and lifestyle choices.

Seventeen science centres and museums, located in ten European countries and Israel,[5] engaged with 2757 young people aged 14–21 (mostly 15–16 years). A total of 1960 participant votes were uploaded to the game's website, with the majority choosing the 'less extreme' policy option preferring a blend of both government responsibility in providing guidelines and recommendations – not regulations – and individual freedom; 'Government should provide guidelines on a healthy diet and lifestyle and regulate food labelling to enable healthier food choices. It should encourage physical activity'. Common topics discussed across the 11 countries were eating disorders, education, food waste, diets, fast food, governmental vs. individual responsibility, food pricing, advertising, body image and social aspects.

The games' facilitators reported that many young people believe that lifestyle choices should be left to citizens (*i.e.* it is their personal responsibility to choose to have a healthier lifestyle). However, participants also stated that governments have an important role to play and should help citizens by regulating certain areas. The young people also voiced that they often feel lost in the plethora of information on diet and health, expressing the need for a trusted and coherent source of information.

Evaluation of the games' performance showed that the format was very successful in engaging young people for the purpose of informing policy formation. The fact that participant voices can be heard at a European level was considered a great motivator. Moreover, participants indicated that the game helped their learning as well as shaped their opinion.

ment in food and health innovation research programming; (2) to propose a set of actions to increase stakeholder involvement at different stages of research programming; and (3) to propose a set of mechanisms to improve democratic legitimacy in such stakeholder involvement.

To this end, the MMLAP sets out five priority areas – linked to the stages of research programming – for stakeholder involvement in food and health innovation research programming, accompanied by a number of key actions for each priority area. INPROFOOD's full MMLAP is publicly available on the project's website (www.inprofood.eu). Some examples of tangible recommendations are as follows:

- At a *national cross-sectorial policy level*, the priority area is to open up policy discourse on stakeholder involvement in food and health for input and assessment that involves the whole of society. A key action to support this priority area is to build commitment among national governments of different sectors – health, agriculture, education and research – to open up for an inclusive policy debate on food, health and research. The second key action is to define stakeholders using robust criteria (*i.e.* to develop clear distinctions between different types of stakeholders according to their affiliations, membership and funding sources). This will facilitate transparency and also help ensure the participation of marginalised groups.
- At a *research programme level*, the priority area is to develop a strategy to specify the role and contribution of stakeholder engagement in developing research and innovation programmes. One key action is that research

[5]Countries that facilitated the PlayDecide games were Croatia, Czech Republic, Estonia, France, Germany, Israel, Italy, Norway, Slovenia, Spain and the UK.

**Box 4: Open Space Conference**

Open Space Technology is an approach developed about 30 years ago and is distinctive for its initial lack of a formal agenda (Owen 2012, 2013). Instead, participants that can include more than 1000 people create the agenda themselves. Typically, an Open Space Conference has a clear main topic, and at the start participants who are placed in a large circle propose topics for discussion. These topics are placed on a bulletin board in time slots forming the agenda. Breakout discussion sessions are 'self-organised', being led by the person who proposed the topic. Participants can decide for themselves which discussion they wish to attend, and can leave and enter another discussion at any time – according to the 'law of two feet'. The conference is led by a facilitator who explains the method at the start, indicates when time slots finish and wraps up the events afterwards.

INPROFOOD conducted an Open Space Conference entitled 'Food and Health Research 2020: How can we shape the future of research in food and health?' The event took place in November 2013 in Brussels, Belgium, and attracted around 70 participants from 18 countries, representing a range of different stakeholder groups, ranging from NGOs in the food and health sectors, industry associations, food companies, researchers and public authorities including ministries. In total, the participants proposed 18 discussion topics, which were then divided over three time slots throughout the day. Dedicated rapporteurs captured the information from the discussions by taking minutes, and a specially designed reporting form was filled in by a selected note taker in each discussion group.

The 18 self-organised breakout discussion sessions covered a wide range of topics, which can be placed within five main categories: (1) food, diet and health; (2) information, communication and education; (3) engaging civil society; (4) engaging industry; and (5) knowledge and research. The three topics with the highest participation rates concerned 'the involvement of different actors in food and nutrition research', the general question of 'how can healthy food/eating be defined?', and 'education and communication' around food and health. The latter was a recurring topic that appeared in 10 of 18 discussions. These topics are elaborated on further in the book of proceedings (INPROFOOD 2014).

and innovation councils and research funders should develop a framework that sets the roles and boundaries of societal actors in influencing the orientation of the research through well-considered participative governance structures.

- At the *executing research level*, the priority area is to evaluate and assess the impact of public participation in research. One key action is that higher education authorities and research and innovation funding organisations develop an evaluative framework to assess research excellence that relies less on bibliometric indicators or rankings.

## Reflections on 3 years of INPROFOOD

The broader picture that has emerged from the INPROFOOD project is that transparent stakeholder engagement in (food and health innovation) research programming is still in its infancy and not part of the institutional culture in many countries. The findings from the activities undertaken within INPROFOOD show that there are important barriers to public participation in research, linked both to participation fatigue and structural and organisational hurdles to implement a legitimate participatory design in policy making. Stakeholders across Europe call for actions to improve stakeholder involvement, both in terms of heterogeneity and legitimacy of such engagements. Rules and guiding principles to safeguard against favouritism, closed clubs, lobbying and conflicts of interests should be set at all stages of research programming and agreed upon by all stakeholders.

INPROFOOD has made an important step towards mobilising action – raising awareness, identifying the barriers and proposing possible solutions – and the MMLAP lays down a concrete framework for inclusive stakeholder involvement, with tangible key actions for the different priority areas. At the same time, it has to be acknowledged that more in-depth analyses – at European, national, sub-national level – would give vital insight on how to ensure inclusive stakeholder involvement in these different contexts. More specifically, these analyses should focus on providing a better understanding of: whom to involve, when to involve them, as well as the purpose and expected outcomes of the involvement. The MMLAP has been distributed to key actors involved in research programming on national and European levels.

## Acknowledgements

INPROFOOD (Towards inclusive research programming for sustainable food innovations) has received

funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under Grant Agreement No. 289045.

## Conflict of interest

All authors declare to have no conflict of interest to disclose.

## References

Abels G (2009) Citizens' deliberation and the EU democratic deficit: is there a model for participatory democracy? Tübinger arbeitspapiere zur integrationsforschung 1/2009. Available at: Archive of European Integration http://aei.pitt.edu/11419/ (accessed 05 December 2014).

Abelson J, Forest PG, Eyles J *et al.* (2003) Deliberations about deliberative methods: issues in the design and evaluation of public participation processes. *Social Science & Medicine* **57**: 239–51.

Andersen IE & Jæger B (1999) Scenario workshops and consensus conferences: towards more democratic decision-making. *Science and Public Policy* **26**: 331–40.

Barroso's Science and Technology Advisory Council (2013) Science for an informed, sustainable and inclusive knowledge society. Available at: http://ec.europa.eu/archives/commission_2010-2014/president/advisory-council/documents/stac_policy_paper_no_1_290813.pdf (accessed 28 October 2014).

Danish Board of Technology (2008) Workshop methods. Available at: http://www.tekno.dk/subpage.php3?article=1235&toppic=kategori12&language=uk (accessed 14 November 2014).

EC (European Commission) (2010a) Horizon 2020 – Responsible research & innovation [Online]. Available at: http://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible-research-innovation (accessed 28 October 2014).

EC (European Commission) (2010b) Work Programme 2011, Capacities, Part 5, Science in Society 2011. C(2010)4903. 19th July 2010. [Online]. Available at: http://ec.europa.eu/research/participants/data/ref/fp7/89154/s-wp-201101_en.pdf (accessed 14 November 2014).

EC (European Commission) (2011) European research area: joint programming [Online]. Available at: http://ec.europa.eu/research/era/joint-programming_en.html (accessed 14 November 2014).

EC (European Commission) (2012) Mobilisation and Mutual Learning (MML) action plans on societal challenges. Available at: http://ec.europa.eu/research/science-society/document_library/pdf_06/mobilisation-mutual-learning-work-programme-2012_en.pdf (accessed 28 October 2014).

EC (European Commission) (2013a) Science with and for Society (SwafS) across Horizon 2020. Available at: http://ec.europa.eu/research/swafs/index.cfm?pg=about (accessed 28 October 2014).

EC (European Commission) (2013b) Science with and for Society; Policy: public engagement [Online]. Available at: http://ec.europa.eu/research/swafs/index.cfm?pg=policy&lib=engagement (accessed 28 October 2014).

EC (European Commission) (2014) Guide to successful communications [Online]. Available at: http://ec.europa.eu/research/science-society/science-communication/index_en.htm (accessed 31 October 2014).

Geissel B (2008) Improving the quality of democracy at the local level: german experiences with participative democratic innovations. Paper for the Conference 'Quality of Democracy, Participation and Governance: The Local Perspective'. May 23–24, 2008 – Castello del Buonconsiglio – Trento. Available at: http://www.provincia.tn.it/binary/pat/link_home/geissel_Trento_08_final.1211796325.pdf (accessed 14 November 2014).

Horlick-Jones T, Rowe G & Walls J (2007) Citizen engagement processes as information systems: the role of knowledge and the concept of translation quality. *Public Understanding of Science* **16**: 259–78.

INPROFOOD (2014) Documentation. Available at: http://www.inprofood.eu/documentation/ (accessed 14 November 2014).

Joint Programming Initiative (2010) 'A healthy diet for a healthy life' The vision for 2030. Available at: http://www.healthydietforhealthylife.eu/images/documents/vision_paper.pdf (accessed 14 November 2014).

Kallis G, Coccossis H, Hatzilakou D *et al.* (2006) Deliberative Visioning: a critical view. Observations from a scenario workshop for water management in a Greek Island. ERSA Conference Papers 06. [Online]. Available at: http://www-sre.wu-wien.ac.at/ersa/ersaconfs/ersa06/papers/375.pdf (accessed 14 November 2014).

Owen H (2012) *Open Space Technology. A User's guide*, 3rd edn, revised and expanded. Berrett-Koehler Publishers, Inc: San Francisco, CA.

Owen H (2013). Opening space for emerging order. Available at: www.openspaceworld.com/emergent_order.htm (accessed 11 November 2014).

Owen R, Macnaghten P & Stilgoe J (2012) Responsible research and innovation: from science in society to science for society, with society. *Science and Public Policy* **39**: 751–60.

Papadopoulos Y (2011) Shifts in governance: problems of legitimacy and accountability (synthesising study of the NWO programme 'shifts in governance'). Netherlands Organisation for Scientific Research ISBN/EAN: 978-90-77875-61-2.

PlayDecide (2014) PlayDecide. Available at: http://www.playdecide.eu/ (accessed 6 November 2014).

Strähle M, Urban C & Reimer-Chukwu R (2012) Detailed Plan for the INPROFOOD Scenario Workshops. Final version. Available at: http://www.inprofood.eu/app/download/6289675181/INPROFOOD_D2.1_Workplan_final.pdf?t=1400226841 (accessed 14 November 2014).

Strähle M, Urban C & Reimer-Chukwu R (2014a) Analysis Report 1 on INPROFOOD Scenario Workshops [Online]. Available at: http://www.inprofood.eu/app/download/6289675681/INPROFOOD_D2.2_AnalysisReport1.pdf?t=1400226313 (accessed 14 November 2014).

Strähle M, Urban C & Reimer-Chukwu R (2014b) Analysis Report 2 on INPROFOOD Scenario Workshops [Online]. Available at: http://www.inprofood.eu/app/download/6289675981/INPROFOOD_D2.3_AnalysisReport2.pdf?t=1400226335 (accessed 14 November 2014).

Strähle M, Urban C & Reimer-Chukwu R (2014c) Analysis Report 3 on the INPROFOOD Scenario Workshops [Online]. Available

at: http://www.inprofood.eu/app/download/6289676181/INPROFOOD_D2.4_AnalysisReport3.pdf?t=1407324084 (accessed 14 November 2014).

Technopolis Group and Frauhnofer ISI (2012) Interim evaluation & assessment of future options for Science in Society Actions.

Urban C & Strähle M (2012a) Developing methods for selecting participants for adapted European Awareness Scenario Workshops with stakeholders concerned with food technology and health issues. In: *Quality, Honesty and Beauty in Science and Technology Communication*, (M Bucchi & B Trench eds), pp. 374–6. Proceedings of PCST2012, the 12th International Public Communication of Science and Technology Conference. Florence, Italy, 18–20 April 2012. Observa Science in Society: Vicenza.

Urban C & Strähle M (2012b) The INPROFOOD lottery based stakeholder selection procedures [Online]. Available at: http://www.inprofood.eu/documentation (accessed 14 November 2014).

Urban C & Strähle M (2012c) Selection procedure for the INPROFOOD databases. Available at: http://www.inprofood.eu/documentation/ (accessed 14 November 2014).

Wissenschaftsladen Wien (2013) Scenario workshops on research programming. Available at: http://scenario-workshops.net/ (accessed 14 November 2014).