ECsafeSEAFOOD

Priority environmental contaminants in seafood: safety assessment, impact and public perception

Grant agreement no: 311820

Deliverable D7.7

Stakeholder analysis and workshop reports

Due date of deliverable: M40

Actual submission date: M39

Start date of the project: 02/2013 **Duration:** 48 months

Organisation name of lead contractor: Aeiforia

Revision: V1

Project co-funded by the European Commission within the Seventh Framework Programme (2007-2013)	
Dissemination Level	
PU Public	x
PP Restricted to other programme participants (including the Commission Services)	
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CO Confidential, only for members of the consortium (including the Commission Services)	

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1. Introduction

The activities reported in this deliverable were performed in Work Package 7 (WP7).

The overall aim of WP7 is to effectively communicate and disseminate the project outputs to key stakeholders (particularly policy makers and food producers) and the wider public and guarantee their uptake in order to reduce public health risks. The specific objectives of this WP are:

- 7.1. To compile and identify the new knowledge and outcomes generated within the project.
- 7.2. To identify the targeted stakeholders and end-users to whom the new knowledge should be transferred.
- 7.3. To develop clear and practical information based on the ECsafeSEAFOOD project results customised to the final end user.
- 7.4. To determine the most suitable means of dissemination to be used taking into account the type of knowledge to be transferred and the end-users to whom it will be transferred.
- 7.5. To ensure a well informed uptake of project results by society at large, policy and decision makers and food producers.
- 7.6. To validate the quality of the research through the dissemination of the results among the scientific community by the publication of articles in specialised scientific journals.
- 7.7. To closely liaise with European and National authorities to ensure an optimum uptake of project outputs and its dissemination throughout the wider public, providing critical information on how to approach effectively all targeted audiences.

WP7 consists of the following tasks:

- Task 7.1. Development of the detailed “Communication and Dissemination Plan”
- Task 7.2. General Dissemination
- Task 7.3. Knowledge Transfer
- Task 7.4. Identify and consult key stakeholders for exposure assessment and related ECsafeSEAFOOD activities such as data mining and targeted interviews

The main goals of Task 7.4 are:

(i) to identify the most relevant EU and international bodies generating regulatory frameworks for exposure assessment;
(ii) to identify stakeholders and end-users (e.g. regulators, industry, SME, consultants) involved in exposure assessments, communication and management, and their major areas of activity;
(iii) to gather the specific relevant EU and potential EU country specific regulatory risk assessment frameworks requiring exposure assessment;
(iv) to gather the stakeholder needs throughout generic surveys and focus groups;
(v) to gather regulatory frameworks for risk assessments from other major agencies outside the EU to put EU exposure assessment procedures into perspective.

The relevant activities conducted for the stakeholder consultation included in this deliverable (D7.7) aim to gather stakeholders' needs through generic surveys and focus groups (issue iv of the previous list).

The "Stakeholder Map" in T7.3 was a prerequisite to organise the interaction with stakeholders, identify their needs and perform gap analyses to deliver the main research activities reported in WP 2-5.

In particular, the activities conducted were a 2-round stakeholder survey, and two separate stakeholder workshops. In general, community participatory research is of growing importance in defining, studying, and solving complex exposure and risk issues (Burger et al., 2013; Van Wezemael et al., 2013). An important component of successful environmental policy and management is stakeholder consultation related to their involvement in environmental issues that are important to them. The term ''stakeholder'' refers to everyone involved or interested in a particular site, problem, or potential issue (risk or benefit), including governmental agencies, regulators, scientists, companies, health professionals, social scientists, citizens' groups, and the general public (Burger, 2011). Public consultation has been defined as "a flow of information conveyed from members of the public to the sponsor of the initiative, following a process initiated by the sponsor" (Rowe and Frewer, 2005). In a similar vein, stakeholder consultation in our specific case refers to collecting information conveyed from stakeholders. Many risk assessors, managers, and public policy officials recognize the importance of including all stakeholders when dealing with environmental problems in an informative, iterative and interactive manner (Walters and Hilborn, 1978; Lee, 1999). Directly involving stakeholders can result in collecting data and conducting analysis about both contaminants and potential risks that provide desired information to help stakeholders and researchers alike, in making informed decisions (Burger et al. 2001, 2007; Burger and Gochfeld 2009; Verbeke et al., 2015). The information obtained from this stakeholder consultation contributes to an improved common understanding on seafood safety between different sectors and actors.

The improvement of seafood risk management and risk communication, through the involvement of stakeholders will contribute to reduce public health risks from seafood consumption. In order to make research results accessible and exploitable, and responding to actual stakeholders' demands, a consultation with stakeholders is needed.

2. Stakeholder survey

The stakeholder survey was carried out following the Delphi methodology. The final aim of the survey was to consult stakeholders for exposure assessment and to identify the gaps in communication among stakeholders and gaps to deliver the main the output of research activities in Work Packages 2-5.

2.1. The Delphi method

Delphi methodology allows a group of individuals to express their opinion on a complex problem, to interact in some way, and to revise their views, with their anonymity guaranteed. The opinions of participants are collected over a number of rounds through the administration of a questionnaire, and controlled feedback of each round results is provided to participants (Linstone and Turoff, 1975). The advantages of this method are that there is no group pressure, it allows access to more geographically dispersed expertise, greater dialogue with respondents, and the possibility for participants to review their responses (Mullen, 2003; Rowe and Wright, 1999; Frewer et al., 2011). The main drawbacks of this method mainly refer to administrative complexity, time required to complete the various rounds, self-selection bias, low response rates, and potentially high attrition rates (drop-out rates between rounds), although it does not always occur (Wentholt et al., 2012).

A 2-round Delphi was used in this study. The first round questionnaire (administered in April-May 2014) was followed by a second round questionnaire (March-April 2015) with fewer but more focused questions, including comments and results of the first questionnaire. This second questionnaire was only administered to respondents of the first round questionnaire.

The aim of this Delphi survey was not to achieve consensus among respondents, as often Delphi studies do, but to collect all differing opinions and arguments for those opinions.

2.2. First round

The general structure of the first stakeholders' questionnaire consisted of the following parts:

- General information (type of stakeholder, size of the enterprise, country, gender, working experience)
- Data availability
- Communication among stakeholders
- Seafood safety assessment and mitigation strategies
- Perceived health risk and consumers' information needs: this part of the questionnaire drew inspiration from the consumer survey, carried out within the project (WP3), with the aim to compare two different perspectives, and see whether or not stakeholders have a realistic perception of consumers' needs and knowledge of this issue.

All questions, excluding those about the general information, were structured according to a 5-point Lickert scale, with two values corresponding to a positive attitude, a central value corresponding to a neutral attitude, and two values corresponding to a negative attitude. A sixth option was included to allow respondents to say “I do not know” or “I have never heard about it”.

2.3. Second round

The second stakeholders’ questionnaire consisted of the following parts:

- General information (type of stakeholder and country): these questions allow to analyse the results per stakeholder category, and to compare the whole sample of respondents (EU and non-EU) with the EU sample.
- Data availability
- Communication among stakeholders
- Seafood safety assessment and mitigation strategies

All questions included in this questionnaire refer to the topics, with unclear response trends in the first round questionnaire. The structure of the questions varied: multiple-choice, yes/no, open questions were included. Moreover, results from the first round were presented and respondents were asked to re-think about the topic and review their answers. The 5-point Lickert scale was not used in this round, since we wanted to have clearer answers, with fewer possibilities to give indefinite results.

3. Data collection procedure

The survey was written in English and project partners within the consortium were asked to translate into their local languages. The partners who volunteered translated the first-round questionnaire into: French, Spanish, Portuguese, Italian, Slovenian, Dutch, and Danish. The second-round was translated into French, Spanish, Portuguese and Italian (i.e. the languages with more than 5 respondents in the first round). Stakeholders were invited to participate in the survey through an email invitation, containing the link to the questionnaire. Contact names were drawn from the stakeholder database (finalised by AquaTT in WP7).

The database was created in the project to facilitate the communication with stakeholders. Stakeholders were organised by their area of influence (national, regional, EU or international), their nationality, category (i.e. Policy Makers, Seafood Producers/Processors, National Agencies and Consumer Organisations, etc.) and field (i.e. food safety, public health). Currently, the stakeholder database comprises 665 contacts but is being updated on a regular basis. Stakeholders in the ECsafeSEAFOOD database were categorised according to different types. In the survey the following types were addressed:

- Decision and Policy Makers: Authorities and individuals at International, European, National, Regional and local level, with competences in marine food, public health, food safety and marine environment.
- Food producers and processors: seafood producer companies, with special focus on SMEs, seafood producer associations and cooperatives, seafood processors, spin-offs in the sectors of Food Safety, Public Health and Consumer organisations.
- National Agencies/Consumer Organisations: EU and National (or Regional) agencies related to Food Safety, Public Health and Food Consumer organisations.
- Other stakeholders: Any other stakeholder with an interest in ECsafeSEAFOOD and its outcomes (e.g. NGOs, environmental organisations and groups, media, etc.)

The second-round questionnaire was only administered to the first-round respondents.

The survey was created, sent, and managed through Survey Monkey, an online survey software. This software was chosen because it offers with limited costs, a user-friendly interface (for both researchers and participants), the researcher has complete creative control, a participant database can be created and used to manage communications, the data is securely stored (encrypted), responses are viewable immediately, no data entry is required (beyond participant contact information), and a summary of the results is available in different formats (spreadsheets, pooled data, etc.) (Donohoe and Needham, 2008).

3.1. First round

On 11th April 2014 the fieldwork started. The questionnaire was sent to 531 stakeholders, both from EU and non-EU countries. During the data collection period, from 11th April to 16th May, two reminders were sent to stakeholders who had not responded yet: the first one 10 days before the closing date, and the second one 5 days before the closing date.

3.2. Second round

As far as the second round is concerned, the fieldwork started on 18th March 2015. The questionnaire was sent to 91 stakeholders, both from EU and non-EU countries. During the data collection period, i.e. from 18th March to 26th April, two reminders were sent to the stakeholders who had not responded yet: the first one 10 days before the closing date, and the second one 5 days before the closing date.

4. Description of the sample

4.1. First round

An overview of the total sample is given in the following tables (Tables 1-2). 91 questionnaires were completed over the total amount of 531 (response rate of 17%).

Most respondents were from the EU (66 over 91, i.e. 72.5%). However, non-EU stakeholders were also well represented (25 over 91, corresponding to 27.5%). Table 1 reports the origin of stakeholders. The highest number of respondents was from Italy (17), followed by Portugal (11). However, such data do not reflect the information about the response rate obtained in each country, since the database from which stakeholders were selected does not include the same number of stakeholders per country.

Table 1. Overview of respondents per country.

Country	% of stakeholders in total sample of respondents	Country	% of stakeholders in total sample of respondents
Italy	18.7	United Kingdom	2.2
Portugal	12.1	Germany	1.1
Spain	8.8	Morocco	1.1
Brazil	7.7	India	1.1
France	5.5	Russian Federation	1.1
Belgium	4.4	Seychelles	1.1
United States of America	4.4	Singapore	1.1
The Netherlands	3.3	Slovenia	1.1
Bulgaria	2.2	Switzerland	1.1
Denmark	2.2	United Arab Emirates	1.1
Finland	2.2	Uruguay	1.1
Greece	2.2	Philippines	1.1
Mexico	2.2	Nigeria	1.1
Kenya	2.2	Iraq	1.1
Ireland	2.2	Unknown	1.1
Poland	2.2		

39.6% of respondents were policy and decision makers, 19.8% were agencies and consumer organisations, and 5.5% were food producers and processors. 35.2% chose the “other” option, specifying that they belong to different categories like government, consultancy, laboratories and food control, research and development, etc. (Table 2a).

Most respondents work for big enterprises with 250 or more persons employed (68.1%) (Table 2b). In the sample it was also observed a prevalence of respondents with a long working experience in the field of food safety: 61.5% with more than 10 years’ experience and 23.1% with 5 to 10 years’ experience (Table 2c).

An oversampling of female respondents was observed, i.e. 59.3% females and 40.7% males for the total sample of respondents (Table 2d).

Table 2. Overview of the total sample (stakeholder category, enterprise size, working experience, and gender).

a) Category	number of stakeholders			% of stakeholders		
	total	EU	non-EU	total	EU	non-EU
policy and decision makers	36	24	12	39.6	36.4	48.0
agencies and consumer organisations	18	15	3	19.8	22.7	12.0
food producers and/or processors	5	4	1	5.5	6.1	4.0
other	32	23	9	35.2	34.8	36.0
b) Enterprise size	**number of stakeholders**			**% of stakeholders**		
	total	**EU**	**non-EU**	**total**	**EU**	**non-EU**
250 or more persons employed	62	48	14	68.1	72.7	56.0
50 to 249 persons employed	9	5	4	9.9	7.6	16.0
10 to 49 persons employed	10	4	6	11.0	6.1	24.0
fewer than 10 persons employed	10	9	1	11.0	13.6	4.0
c) Working experience	**number of stakeholders**			**% of stakeholders**		
	total	**EU**	**non-EU**	**total**	**EU**	**non-EU**
more than 10 years	56	46	10	61.5	69.7	40.0
5 to 10 years	21	11	10	23.1	16.7	40.0
1 to 5 years	11	8	3	12.1	12.1	12.0
less than 1 year	3	1	2	3.3	1.5	8.0
d) Gender	**number of stakeholders**			**% of stakeholders**		
	total	**EU**	**non-EU**	**total**	**EU**	**non-EU**
female	54	38	16	59.3	57.6	64.0
male	37	28	9	40.7	42.4	36.0

4.2. Second round

In the second round, 37 questionnaires were completed among the 91 sent (response rate: 41%). According to Frewer et al. (2011), 72% response rate is acceptable for online Delphi surveys in the area of agriculture and food. Therefore, we had a rather low response rate. A possible reason could be the time that elapsed between the first and the second round (11 months), which is rather long compared to the most successful Delphi surveys. Another reason could be that the second-round questionnaire included very specific questions, which could be too difficult for some first-round respondents.

The respondents were mostly from the EU (28 over 37, i.e. 75.7%). Figure 1 reports the origin of stakeholders. The highest number of respondents were from Italy and Spain (6 respondents each), followed by Brazil (5).

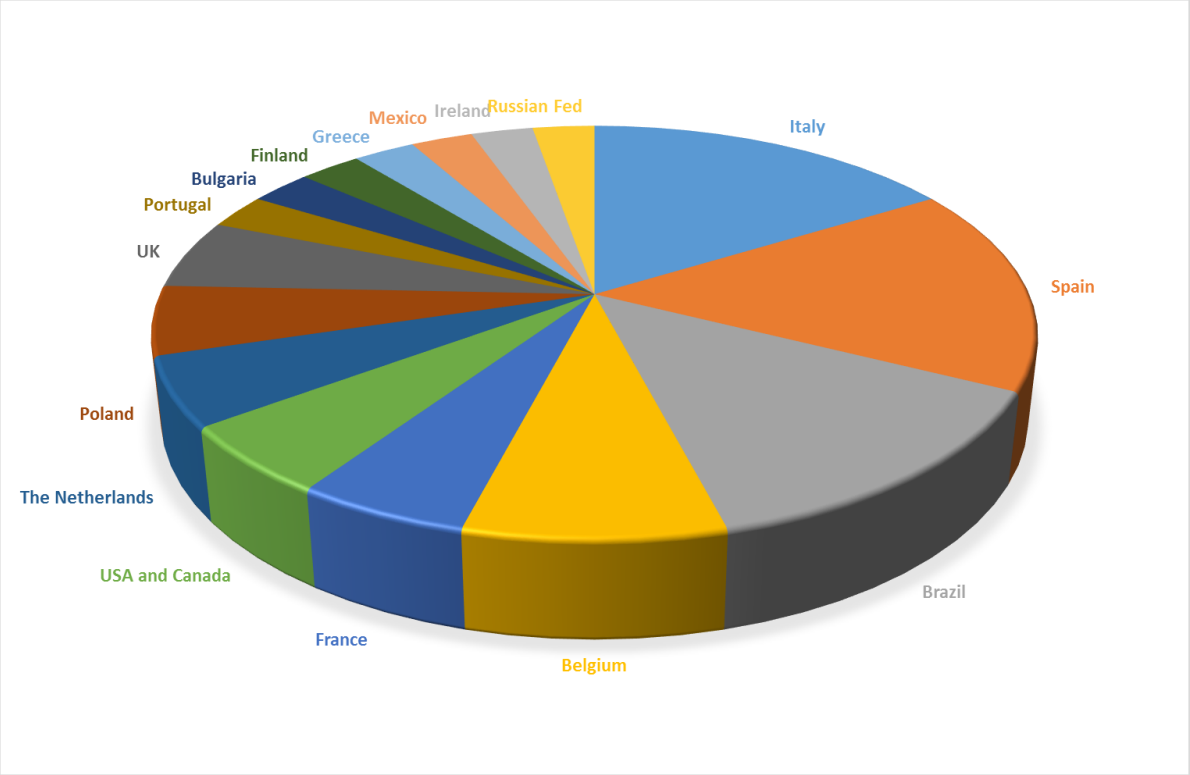

Figure 1 - Overview of country represented in the second-round survey.

14 respondents were policy and decision makers (37.8%), 7 were agencies and consumer organisations (18.9%), and only 1 was food producer/processor (2.7%). In contrast, 15 respondents belong to the "other" category (40.5%).

5. Methods

5.1. First round

Descriptive statistics were applied to gain general information about the data and the sample: mean values, standard deviations and frequency distributions were calculated. Secondly, independent sample t-tests and ANOVA ($p < 0.05$) were used to assess possible differences between EU and non-EU respondents, as well as between different stakeholder categories (i.e. policy and decision makers, agencies and consumer organisations, food producers and processors and others) (Tediosi et al, 2015).

5.2. Second round

Given the small size of the respondent sample and its heterogeneity, it was not possible to carry out statistical analysis as it done in the first round. In this round only frequency distributions (and percentages) were calculated.

6. Results

6.1. First round

6.1.1. Data availability

The first section of the questionnaire investigated the available information about different contaminants.

Data showed that the levels of information regarding environmental contaminants are heterogeneous. It is considered to be satisfactory (values ranging between 1 and 3) for microorganisms and viruses, parasites, trace elements, dioxins, pesticides and pharmaceuticals, but unsatisfactory for algal toxins (3.02), hormones (3.11) and plastic additives (3.60) (values above the neutral point). This means that either there is not sufficient information about these contaminants, the information is not available or is not sufficiently well disseminated to stakeholders. This result is coherent with the fact that plastic additives, algal toxins, and hormones are emerging contaminants, i.e. substances that have not historically been considered as contaminants and, as a consequence, are not well known and mostly not regulated.

The application of ANOVA revealed that no significant differences were registered among stakeholder categories, but some differences between EU and non-EU respondents (Table 3). Both respondent groups agree that the information level for plastic additives is unsatisfactory (above the neutral point), whereas both groups tend to disagree about hormones, pharmaceuticals, and algal toxins. EU respondents consider that the information is sufficient for algal toxins, but insufficient for hormones and pharmaceuticals. In contrast, non-EU stakeholders state the opposite.

Table 3. Mean ratings on the information level of different contaminants: comparison between EU and non-EU respondents (standard deviation is reported too)

Contaminants	EU	Non EU	Total
	mean± St. dev.	mean± St. dev.	mean± St. dev.
Algal bio-toxins	2.86±1.40	3.50±1.37	3.02±1.40
Microorganisms and viruses	2.47±1.20	2.46±1.34	2.47±1.30
Parasites	2.45±1.27	2.65±1.40	2.51±1.27
Trace elements	2.45±1.03	2.28±1.51	2.41±1.27
Dioxins	2.67±0.99	2.54±1.38	2.64±1.30
Pesticides	2.85^{a}± 1.44	2.16^{b} ±1.28	2.69±1.45
Pharmaceuticals	3.23^{a}± 1.34	2.36^{b} ±1.35	2.99±1.41
Hormones	3.27±1.37	2.71±1.20	3.11±1.34
Plastic additives	3.19±1.20	3.73±1.40	3.60±1.26

Scale: "The information level is… 1= satisfying, 2= quite satisfying, 3= neutral, 4= rather unsatisfying, 5= unsatisfying"
Different superscripts letters indicate significantly different means (ANOVA, alpha<0.05)

Moreover, stakeholders were asked to indicate where data are mostly lacking in the field of seafood safety. Mean values show that more data is required (values between 1 and 3) for all areas included in the question. According to the total sample of respondents, data is particularly lacking in "The

transfer of contaminants between the environment and seafood" (lowest mean: 1.80). The highest value was scored for "Seafood farming and wild catching practices" (2.32) (Table 4).

Table 4. Mean value ranking of the areas where more data is required (standard deviation is reported too)

Areas where more data is required	Policy and decision makers	Agencies and consumer organisations	Food producers and processors	Other	Total
	Mean ± St. dev.	Mean ± St. dev.	Mean ± St. dev.	Mean ± St. dev.	Mean ± St. dev.
The habits of seafood consumers	2.56[a] ± 1.16	2.44[a] ±0.98	2.00 [b] ±0.00	1.83[b] ±0.78	2.26±1.02
Seafood farming and wild catching practices	2.31±1.06	2.56±0.92	2.20±0.84	2.22±0.79	2.32±0.93
Priority environmental contaminants in seafood	1.64[a]±0.99	2.33[b]±1.03	2.60[b]±1.52	1.78[a]±0.66	1.88±0.96
Non-regulated contaminants	1.64[a]±1.02	2.47[b]±1.01	2.00[b]±0.71	1.77[a]±0.72	1.87±0.94
Regulated contaminants	2.08±1.11	2.78±1.11	2.40±0.90	2.06±0.91	2.23±1.05
Specific case studies/monitoring	2.11±1.09	2.25±0.86	2.20±0.45	2.25±0.84	2.19±0.93
The effects of cooking methods on seafood safety	2.44±1.16	2.17±1.10	2.00±1.00	2.03±1.00	2.22±1.08
The effects of climate change on marine environment and seafood	2.17±1.12	2.33±1.14	2.20±0.45	2.13±1.13	2.19±1.09
The transfer of contaminants between the environment and seafood	1.82±0.90	1.89±0.96	1.60±0.55	1.74±0.89	1.80±0.89
Seafood risk-benefit assessment	2.03±0.97	2.33±1.24	2.00±0.00	1.72±0.99	1.98±1.02
Toxicity of environmental contaminants	1.94±0.98	2.50±1.03	2.25±0.5	2.03±1.09	2.09±1.02

Scale: "More data are required… 1= to a great extent, 2= moderately, 3= neutral, 4= not much, 5= not at all"
Different superscript letters indicate significantly different means (ANOVA, $p<0.05$)

It is interesting to note that policy and decision makers require more data mostly on priority environmental contaminants and on non-regulated contaminants (1.64), whilst agencies, consumer organisations and food producers and processors indicate the need for data targeting the transfer of contaminants between the environment and seafood as the first option (1.60 and 1.74, respectively).

Respondents classified as “other” require more data particularly on seafood risk-benefit assessment (1.72) (Table 4).

Respondents specified that additional areas with more information needed are:

- ecosystem impacts, human health impacts;
- human epidemiology;
- risk communication relatively to Fukushima radiation and fish/seafood imports and exports;
- pesticides, microplastics (including nanoplastic particles);
- seafood contamination from third countries;
- origin of commercialised seafood.

6.1.2. Communication among stakeholders

The communication between the different groups of stakeholders is generally considered to be poor (mean values between 1 and 3). Indeed, communication between food producers/processors and consumer organisations was the poorest (2.30) (Figure 2). The frequency distribution chart shows that 25-39% of respondents chose the neutral option. Please note that this is the only question where values 1 and 2 represent a negative attitude, and values 4 and 5 represent a positive attitude (Figure 3).

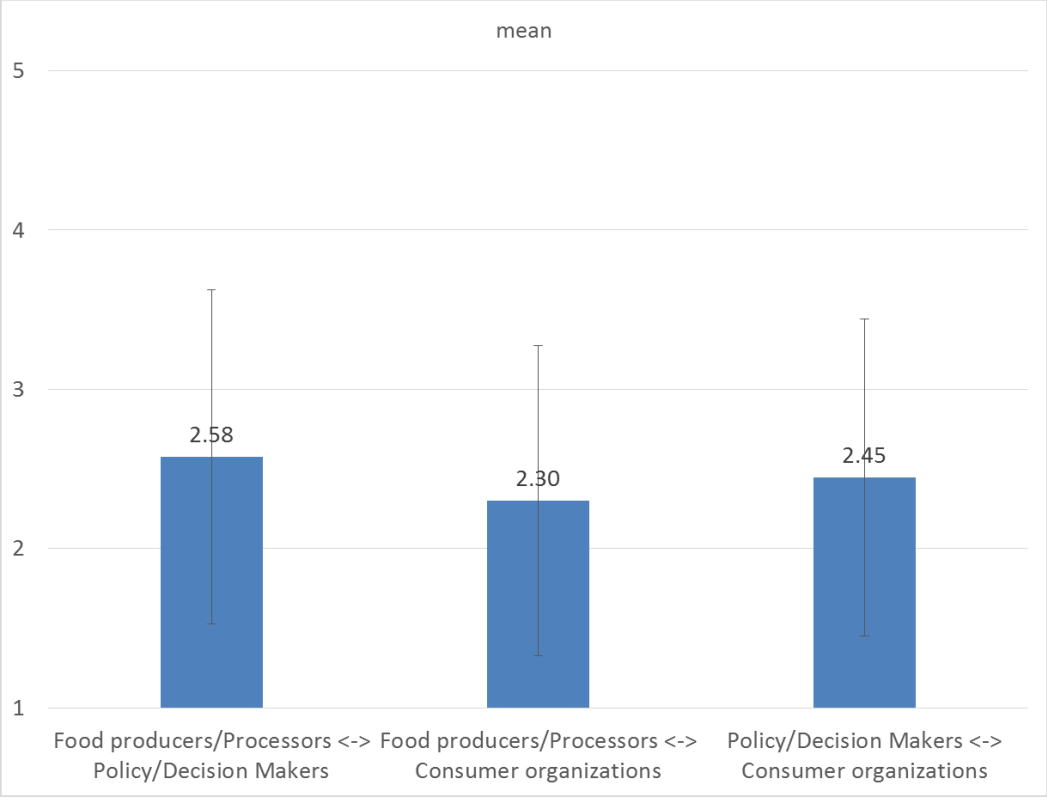

Figure 2. Mean values of responses about communication between different stakeholder groups (Scale: “Communication is… 1= very poor, 2= poor, 3= neutral, 4= efficient, 5= very efficient”)

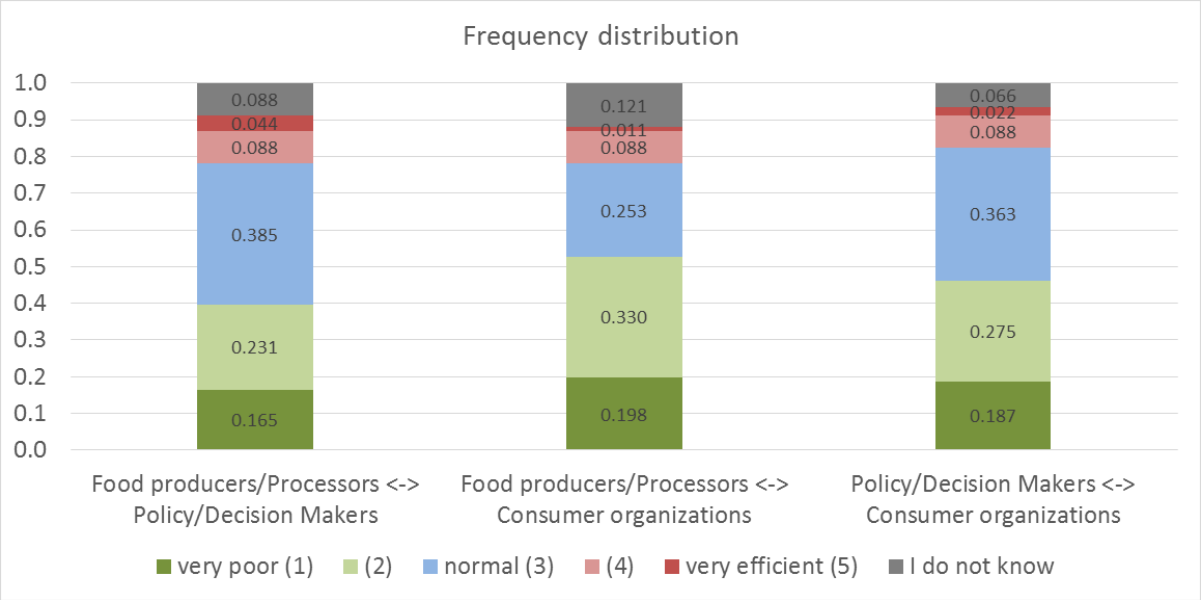

Figure 3. Frequency distribution of responses about communication between different stakeholder groups (1=very poor, 2=poor, 3=normal, 4=efficient, 5=very efficient)

The mean values obtained in the question about communication channels show that all proposed options are useful to obtain information related to seafood safety: online tools, publicity materials, workshops and seminars, policy briefings, training, media and scientific publications (Table 5). Overall, the lowest value (i.e. the most useful communication channel) was obtained for online tools (e.g. websites, social networks and digital platforms) (1.67). Scientific publications were also considered to be "useful to quite useful", scoring a value between 1 and 2 (1.74). A significant difference between EU and non-EU respondents was registered for training. Indeed, non-EU stakeholders stated that training is the second most useful communication channel (1.57) whilst in the case of EU stakeholders training is the fourth communication channel, following online tools, scientific publications, and workshops and seminars (Table 5).

Table 5. Perceived usefulness of communication channels and media (mean and standard deviation): comparison between EU and non-EU respondents

Useful communication channels and media	EU	Non EU	Total
	Mean± St.dev.	Mean± St.dev.	Mean± St.dev.
Online tools	1.69±0.94	1.64±0.99	1.67±0.95
Printed or digital publicity materials	2.34±1.12	2.13±1.12	2.28±1.12
Workshops and seminars	2.06±1.00	1.92±0.91	2.02±0.97
Policy briefings	2.48±1.20	2.83±1.17	2.57±1.20
Trainings	2.17^{a}±1.10	1.57^{b}±0.90	2.01±1.08
Media	2.40±1.21	2.04±1.34	2.30±1.25
Scientific publications	1.83±1.05	1.52±0.65	1.74±0.97

Scale: "This communication channel is… 1= useful, 2= quite useful, 3= neutral, 4= rather useless, 5= useless"
Different superscript letters indicate significantly different means (ANOVA, $p<0.05$)

6.1.3. Seafood safety assessment and mitigation strategies

Overall, stakeholders highlighted that the biggest challenge in relation to seafood safety is that the general public is not adequately informed. Nonetheless, respondents agree with all problems/limitations indicated for seafood safety (mean values below the neutral point). When comparing EU and non-EU countries, it was found that a significant difference exists related to the implementation of the legislation. Non-EU respondents consider that the most relevant problem is that "implementing the legislation is difficult" (1.74), whereas EU respondents think that the most relevant problem is that "general public is not adequately informed" (2.14) (Table 6). Such discrepancy might be due to the different legislation and implementation processes in Europe and outside Europe.

Table 6. Problems and limitations related to seafood safety: comparison between EU and non-EU countries (standard deviation is reported too)

Problems and limitations related to seafood safety	EU	Non EU	Total
	Mean± St.dev.	Mean± St.dev.	Mean± St.dev.
It is difficult to access toxicological data	2.69±1.08	2.21±0.83	2.54±1.03
Adequate Information Technologies tools for risk assessment are unavailable	2.70±1.16	2.36±0.95	2.62±1.12
There is a lack of fast screening and detection techniques	2.25±1.04	2.17±1.34	2.22±1.13
Communication among stakeholders is ineffective	2.71±1.08	2.43±1.16	2.63±1.11
General public is not adequately informed	2.14±0.93	1.79±1.02	2.04±0.96
The legislative framework is complex	2.22±1.13	1.87±1.01	2.13±1.11
Implementing the legislation is difficult	2.35^{a}±1.06	1.74^{b}±0.96	2.19±1.07
There is insufficient scientific information	2.45±1.10	2.58±1.38	2.49±.17

Scale: 1= "This is a problem related to seafood safety": totally agree, 2= agree, 3= neutral, 4= disagree, 5= totally disagree
Different superscript letters indicate significantly different means (ANOVA, $p<0.05$)

Concerning the best strategy to increase seafood safety, overall respondents indicated the "development of databases, risk assessment and mitigation tools" (1.56). This is closely followed by the "development of guidelines and recommendations to reduce public health risks and increase consumer awareness" (1.57). This is consistent with the indications of respondents stating that the biggest problem about seafood safety is that the general public is not adequately informed. However, all strategies listed in the question are considered to be a good means to improve seafood safety (all mean values below 2 except "the increase in the number of contaminants monitored": 2.16) (Table 7).

Table 7. Perceived potential of possible strategies to increase seafood safety: ranking according to mean values of the total sample (mean and standard deviation)

Strategies to increase seafood safety	Mean± St.dev.
Development of databases, risk assessment and mitigation tools	1.56±0.78
Development of guidelines and recommendations to reduce public health risks and increase consumer awareness	1.57±0.87
Improvement and promotion of already existing tools and guidelines	1.68±0.77
Development of innovative toxicological tools to test contaminants in realistic conditions	1.83±1.00
Enhancement of analytical methods to identify and measure contaminants	1.91±1.02
Intensification of monitoring activities	1.96±0.97
Increase of the number of contaminants monitored	2.16±1.04

Scale: "This is a good strategy to increase seafood safety": 1= totally agree, 2= agree, 3= neutral, 4= disagree, 5= totally disagree

6.1.4. Perceived health risk and consumers' information needs

The last part of the questionnaire investigated how consumers perceive risks associated with environmental contaminants. Mean values show that, according to stakeholders, consumers perceive seafood spoilage as the most significant risk (value equals to 1.99). This is the only risk that scored less than 2 (i.e. very significant risk). Four risks are considered to be insignificant (values ranging between 3 and 5): seafood poisoning with plastic residues (3.44), with pharmaceuticals and personnel care products (3.33), and with endocrine disruptors (3.38) (Table 8).

Table 8. Stakeholders' ranking of risks (as they might be perceived by consumers) related to environmental contaminants (mean and standard deviation)

Perceived risks associated with environmental contaminants	Mean± St.dev.
Seafood spoilage	1.99±1.14
Seafood poisoning with microorganisms and viruses	2.44±1.39
Seafood poisoning with trace elements	2.57±1.45
Seafood poisoning with parasites	2.76±1.30
Seafood poisoning with pesticides	2.79±1.42
Seafood poisoning with persistent organic pollutants	2.88±1.38
Seafood poisoning with algal bio-toxins	2.92±1.37
Seafood poisoning with dioxins	2.94±1.42
Seafood poisoning with antibiotics	3.09±1.37
Seafood poisoning with pharmaceuticals and personnel care products	3.33±1.32
Seafood poisoning with endocrine disruptors	3.38±1.43
Seafood poisoning with plastic residues	3.44±1.42

Scale: "This risk is…1= significant, 2= quite significant, 3= neutral, 4= rather insignificant, 5= insignificant"

In addition, stakeholders mention that consumers are generally interested in the wide range of information proposed in the questionnaire (Table 9), apart from "feed used during farming", which scored the highest value (i.e. above the neutral attitude, 3.08), and "the harvesting method" (3.00). The most interesting information appears to be shelf-life (1.60) (Table 9).

Table 9. Stakeholders' expectations about the kinds of information consumers are interested in (mean and standard deviation)

Information that consumers are interested in	Mean± St.dev.
Shelf-life	1.60±0.88
Safety guarantee	1.86±1.11
Quality mark	1.88±1.05
Origin	1.92±1.09
Contaminant levels	2.14±1.21
Certified seafood products	2.20±1.17
Type of production (Wild/farmed seafood)	2.26±1.15
Use of additives	2.28±1.28
Use of genetically modified feed	2.29±1.21
Date of capture	2.36±1.35
Eco-labelling schemes	2.45±1.26
Traceability	2.46±1.20
Sustainability	2.52±1.31
Environmental friendliness	2.52±1.19
Batch number for product identification	2.87±1.41
Animal welfare	2.93±1.26
Harvesting methods	3.00±1.19
Feed used during farming	3.08±1.28

Scale: "In this information, consumers are… 1= very interested, 2= interested, 3= neutral, 4= not very interested, 5= not interested at all"

Related questions about perceived risks and consumer information needs were asked to European consumers in five countries (Belgium, Ireland, Italy, Spain and Portugal; n=2824) through a web-based survey (Jacobs et al., 2015). In that study, the extent to which consumers were worried or not worried about possible seafood safety risks was measured on a scale from "very worried" (1) to "not worried at all" (7) with the inclusion of an option "never heard about it". Different possible issues were listed, including algal biotoxins, plastic residues, heavy metals, dioxins, bacteria and viruses, parasites, pesticides, pharmaceuticals, antibiotics, and hormones. Heavy metals raised the highest concern among consumers. Although stakeholders expected that consumers might not be very worried about plastic residues and pharmaceuticals (see Table 9), rather high mean scores of 3.71 (± 1.79), 3.92 (± 1.81) and 3.96 (± 1.82) were obtained for these contaminants in the study of Jacobs et al. (2015).

In addition, some statements were asked to consumers in the ECsafeSEAFOOD consumer study (in WP3) regarding health risk perception, such as "I do not want to eat seafood very often because I am afraid of food poisoning from seafood spoilage". This statement ranged from "totally disagree" (1) to

"totally agree" (7). By contrast with the expectation of stakeholders that seafood spoilage would be seen with the highest risk by consumers, the consumer study yielded a mean score of 2.82 (± 1.72) for this statement. This suggests that, in general, some disagreement exists on the fact that consumers refrain from eating seafood because of being afraid of food poisoning through spoilage; whereas stakeholders believe this is a major issue for consumers, this issue does not seem to be a major barrier according to consumers' responses. In general, a low health risk perception and a high health benefit perception regarding seafood consumption were observed among consumers (Jacobs et. al., 2015).

The degree of interest in the information listed in Table 9 was scored on a 7-point scale ranging from 1="not interested" to 7="very interested" in the consumer survey (Jacobs et al., 2015). The stakeholders' perception about the expected consumers' interest in information schemes generally coincides with the interest levels indicated by consumers. Consumers have indicated an interest in all information schemes presented to them (mean score higher than the neutral point of 4). Both results of the consumer survey and the stakeholder survey show that consumers have a higher interest in information about health than in information about sustainability.

6.2. Second round

6.2.1. Data availability

In the first questionnaire, stakeholders were asked to indicate where more data was required in the field of seafood safety. Since response mean values showed that more data were required for all areas included in the question, in the second round stakeholders were asked to indicate the three areas where data are lacking most. "Non-regulated contaminants" (20.2%), "The transfer of contaminants between the environment and seafood" (19.3%) and "Seafood risk-benefit assessment" (11.9%) were identified as the areas where the information is mostly lacking (Figure 4).

6.2.2. Communication among stakeholders

The second round was also focused on communication among stakeholders in order to better understand the results in the first round. Firstly, respondents were asked if they could confirm that communication is generally poor. Secondly, "yes" respondents (78.4%) were asked to state at least one reason why communication was considered as poor. Table 10 gathers all answers collected. They were grouped in order to make them more accessible, useful and readable. The headings of the table aim to group the different and specific reasons that are summarized in the fields below. Hence, the main reasons why communication is considered to be poor are:

- The lack of suitable communication channels
- Limitations in the communication process
- The lack of discussion, consultation, and coordination
- The lack of interest to solve the seafood safety problem
- Limitations in policy
- Different needs, goals, and interests

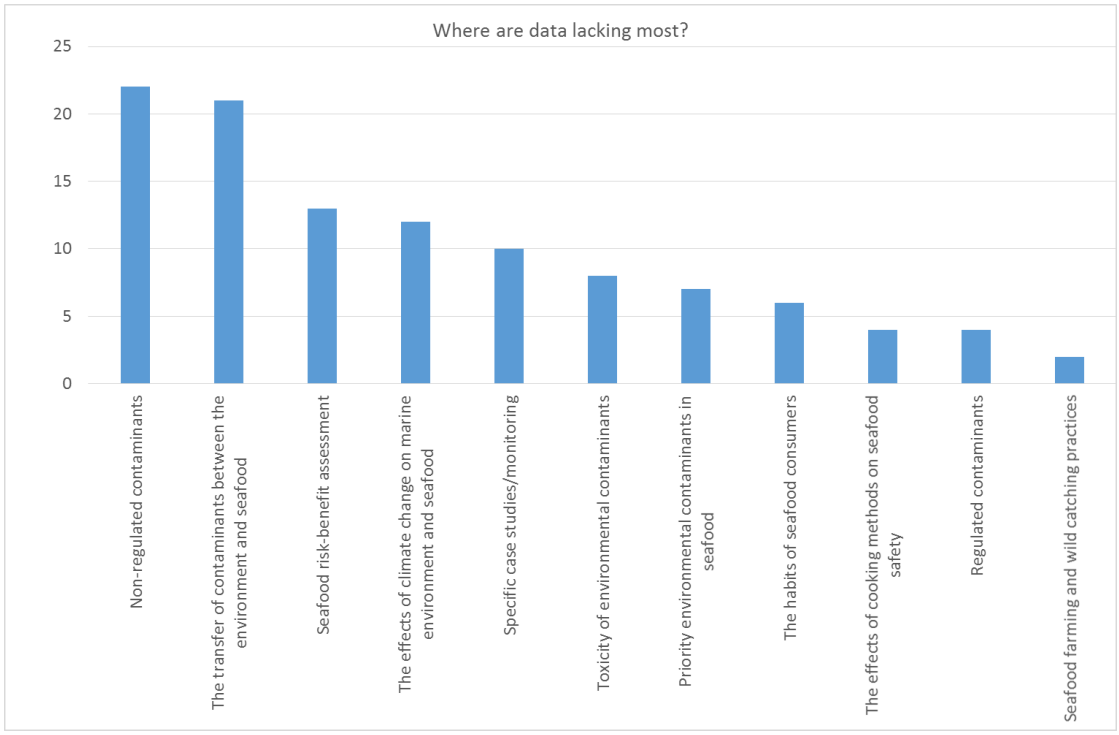

Figure 4 –Ranking of the items where data are lacking most (number of responses is shown)

In the first-round stakeholder survey a question investigated the usefulness of different communication channels for obtaining information on seafood safety, where all proposed communication channels were perceived as being useful. Therefore, in the second-round survey, respondents were asked to specify the 3 most useful communication channels: online tools (24.3%), media (18%) and scientific publications (16.2%). Workshops and seminars followed with 17 responses (15.3%) (Figure 5).

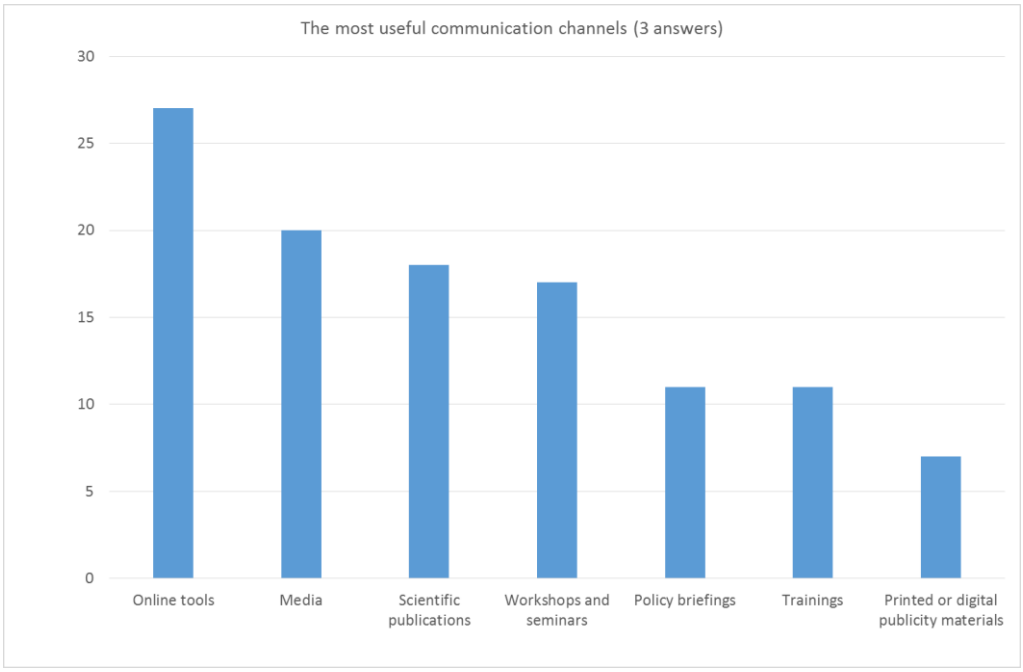

Figure 5 – Ranking of the most useful communication channels (number of responses is shown).

Table 10 – Reasons why communication among stakeholders in considered to be poor.

Lack of suitable communication channels	Communication limitations	Lack of discussion / consultation / coordination	Lack of interest to solve the problem	Policy limitations	different needs, goals, interests
No centralised/single/recognised communication channel	Communication basically takes place via scientific literature, which leads to search contacts by email	Unknown reasons cannot be communicated	Decision Makers are not interested in the problem	Lack of consolidated food policy	Different needs
No established channels	Lack of consumer organisations as valid interlocutors	Environmental contamination remains an issue that is to be solved by all parties working together	Insufficient stimulus to improve	Regulator programs are at different levels: federal, provincial, regional	Different worlds, concerns
Absence of structures that bring together all stakeholders	We don't know how to do risk communication very well	Decision Makers never talk, they just decide	Lack of interest to improve	Specific legislation for seafood	Each category is concerned with "their " business
There is no well-established network to foster this kind of discussion	Different languages	Lack of coordination	Lack of commitment of the competent authorities	Differences in the federal policies versus the state policies	Different interests
Lack of exchange forums	Unsuitable consumer education	Lack of consultation / Discussion	The industry is usually uninterested in knowing these issues		Different goals to achieve
Fragment lines of communication	The authorities do not disseminate accurate information and in a suitable language				For manufacturers the most important is profit
	Different levels of knowledge				Segmentation / conflict between different actors

6.2.3. Seafood safety assessment and mitigation strategies

In the first-round questionnaire, the following question was included: "Please indicate to what extent you agree or disagree with the following statements related to seafood safety". Respondents tended to agree with all of statements reported in the question. Since these statements identify problems related to seafood safety that could be addressed, stakeholders were asked to select the most important and urgent ones. The survey results indicated that the biggest problem about seafood safety is that adequate Information Technologies tools for risk assessment are unavailable (27%), followed by "general public is not adequately informed" (21.6%) (that was the option which was perceived as the most relevant problem in the first round) (Figure 6).

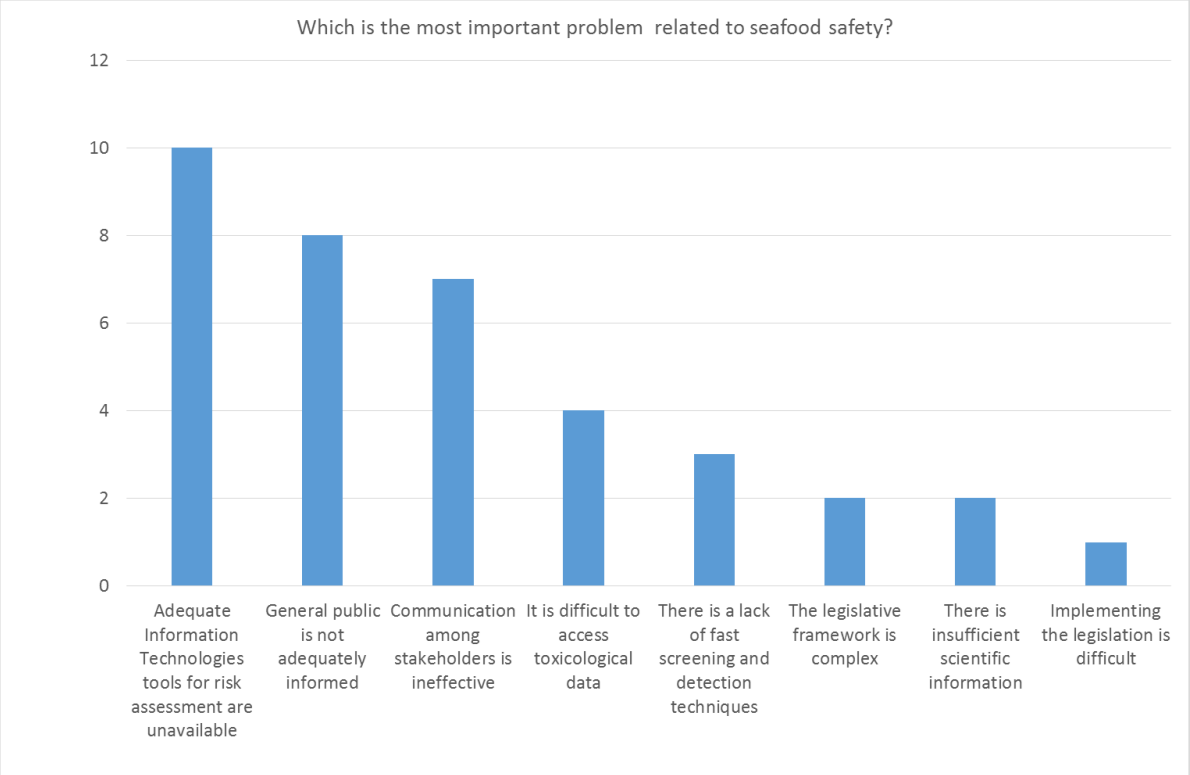

Figure 6 – Ranking of the most important problems related to seafood safety (number of responses is shown).

Since the ECsafeSEAFOOD project will develop guidelines and recommendations for stakeholders with the aim to reduce public health risks and increase consumer awareness, this questionnaire focused on this aspect, by asking the best way to communicate/disseminate guidelines and recommendations, among conferences and face-to-face meetings, websites, handbooks and best practices manuals or brochures (results shown in Figure 7). Since guidelines and recommendations can target different stakeholder groups, it is interesting to present the results also by stakeholder category. The majority of respondents (42.9%) from agencies and consumer organisations, as well as policy and decision makers prefer conferences and face-to-face meetings. In contrast, food producers and processors chose handbooks and best practices manuals (100%; please note that in this second round only 1 producer/processor completed the questionnaire). Stakeholders belonging to the "other" category

consider websites as the best way to communicate/disseminate guidelines and recommendations (40%) (Table 11).

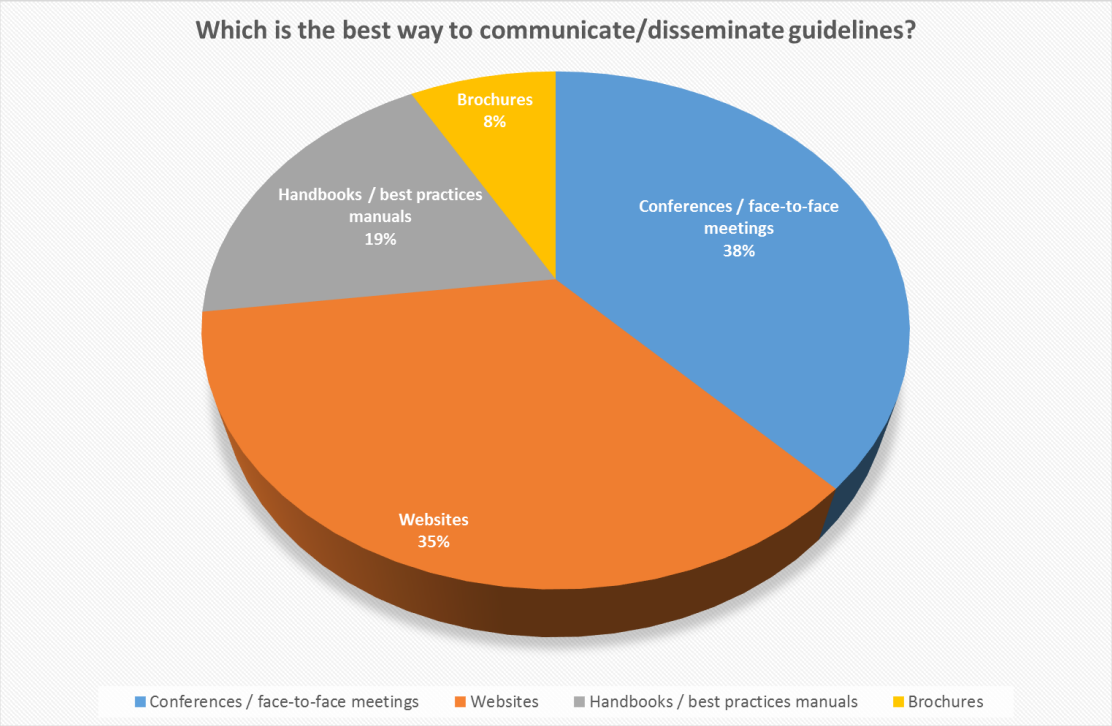

Figure 7 – The best ways to communicate / disseminate guidelines (% is shown for the proposed items).

Table 11 – The best ways to communicate / disseminate guidelines for the different stakeholder groups.

Response	number of stakeholders				% of stakeholders			
	Agency and consumer organisation	Food Producer / Processor	Policy and decision maker	Other	Agency and consumer organisation	Food Producer / Processor	Policy and decision maker	Other
Conferences / face-to-face meetings	3	0	6	5	42.9	0.0	42.9	33.3
Websites	2	0	5	6	28.6	0.0	35.7	40.0
Handbooks / best practices manuals	0	1	3	3	0.0	100.0	21.4	20.0
Brochures	2	0	0	1	28.6	0.0	0.0	6.7
TOTAL	7	1	14	15	100.0	100.0	100.0	100.0

7. Limitations

The statistical analysis carried out in this study included descriptive statistics with the aim of gaining a general insight into stakeholders' opinions and needs related to seafood and seafood safety. A relevant issue concerns the representativeness of the different stakeholder groups, as the different groups did not include the same number of respondents per group. There are relevant differences in the number of respondents for each stakeholder category. This is due to the fact that: (i) the database did not include the same number of stakeholders per category; (ii) and that different response rates were observed for the different categories. The food producer/processor sample included only 5 respondents (in the first round), being reduced to 1 in the second round.

Heterogeneity in the number of respondents per group was observed, as well as for gender and location.

8. Conclusion

The current survey highlighted the need to obtain more information particularly for plastic additives, algal toxins and hormones. In addition, more information is also needed for most topics addressed in seafood safety, particularly non-regulated contaminants, transfer of contaminants between the environment and seafood, and seafood risk-benefit assessment.

Concerning communication between the different groups of stakeholders, respondents consider that communication is still poor. The most unsatisfactory communication is between food producers/processors and consumer organisations. Online tools appear to be the most useful communication channel to obtain information about seafood safety, followed by media and scientific publications.

As far as seafood safety assessment and mitigation strategies are concerned, respondents indicated that the biggest problem associated with seafood safety is that adequate Information Technologies tools for risk assessment are still unavailable. The best strategy to increase seafood safety is the development of databases, risk assessment and mitigation tools, as well as guidelines and recommendations to reduce public health risks and increase consumer awareness. Therefore, appealing, clear and objective material should be prepared and distributed throughout the diverse communication channels to reduce health risks and increase consumer awareness. Overall, the best way to communicate and disseminate guidelines and recommendations is through conferences and face-to-face meetings. However, communication and dissemination could be more effectively differentiated among the different stakeholder groups (conferences and face-to-face meetings for agencies, consumer organisations and policy and decision makers. In contrast, handbooks and best practices manuals should be envisaged for seafood producers and processors, and websites for other stakeholders.

Stakeholders were asked to evaluate consumers' perception of health risks related to seafood and their information needs. Although stakeholders perceive that seafood spoilage is considered to be the highest risk perceived by consumers, consumers generally disagree that seafood spoilage is a reason for them to be afraid to consume seafood. Contrasting with stakeholder perception, consumers highlighted a certain degree of concern about plastic residues, pharmaceuticals and antibiotics. The stakeholder perception about information needs generally coincides with information schemes indicated by consumers as the most interesting, namely those related to health compared to sustainability.

9. First stakeholder workshop

The first stakeholder workshop was targeted to consumer organisations and producers/processors, and focused on risk and benefit perception of seafood consumption on human health (including vulnerable groups).

9.1. Objectives of the workshop

The aim of the workshop was to investigate what information is needed about seafood benefits and risk assessment and how it should be communicated to the general public and to vulnerable groups of consumers in order to reduce public health risks from seafood consumption. In particular:

- Evaluate the information availability about seafood benefits (minerals, fatty acids, etc.) and risks (as far as non-regulated and regulated environmental contaminants are concerned)
- Present project results on consumer risk and benefit perception in different European regions
- Understand risk and benefit perceptions of consumer organisations and producers/processors associated with seafood consumption
- Identify the appropriate strategies to effectively communicate to consumers, whilst maintaining a strong seafood sector and promoting consumer confidence in seafood industry
- Inform on the achievements of the ECsafeSEAFOOD project regarding emerging contaminants in seafood.

9.2. Methodology and workshop description

The first stakeholder workshop was organised within the Slow Fish 2015, the 7th international festival of good, clean & fair fish, on 14th-17th May.

During Slow Fish, held biennially in Genoa (Italy), academics, researchers, small-scale fisherman, representatives of public bodies and enthusiasts meet to discuss sustainable fishing and seafood production, responsible fish consumption and the health of marine and freshwater ecosystems. A large market, conferences, meetings, workshops and tasting sessions make Slow Fish a unique event entirely dedicated to the world of fish. This year event gave special attention, among others, to the problems of pollution.

The agenda is provided in Appendix III. The topics are listed below:

- Achievements of the ECsafeSEAFOOD project regarding the monitoring of non-regulated contaminants in seafood
- Risk and benefit assessment related to seafood consumption
- Consumer and producers'/processors' needs and risk perception of seafood consumption on human health – Identification of the knowledge gaps in seafood safety

Potential stakeholder participants were taken from the stakeholder and end-user database produced in the project (Deliverable 7.4). Food producers/processors and consumer organisations were invited to participate, particularly those included in the database. Moreover, additional contacts were included, found on the web. In particular, it was explored the European Atlas of the Seas and the "List of the recognized producers organisations in the fishery and aquaculture sector" (Official Journal of the European Union, 2008/C 163/05) (for producers and processors) and the BEUC website (http://www.beuc.org/), where additional consumer organisations were found. Also a number of Slow Fish exhibitors were added to the list of potential participants. Overall, more than 180 stakeholders were invited to participate at the workshop. Invitations were sent via email.

Despite the number of invitations sent very few registrations to the workshop were obtained. Eventually, in an effort to increase participant numbers, the workshop was made open to anyone who wanted to participate, without the need to register. In the end, there were 24 participants (the majority of whom were visiting the event) (Figure 8).

Figure 8 – Participants at the first stakeholder workshop in Genova.

The workshop included a number of presentations, multiple-choice questions, and an open discussion. The first part dealt with risks and benefits of seafood consumption and was followed by a number of multiple-choice questions for the participants to answer. A voting system was used, which allowed instant feedback. The questions are listed below:

1) What do you perceive as the main risks associated to seafood consumption?
- Chemicals (heavy metals, dioxins, residuals, micro-plastics)
- Algal bio-toxins
- Parasites and microorganisms
- Other (please comment)

2) What do you perceive as the main benefits associated to seafood consumption?

- Omega-3 fatty acids reduce the risk of coronary diseases
- A high consumption of seafood during pregnancy and the first year of life improves the baby's growth capacities
- Seafood fat is important in the prevention of certain chronic diseases
- Other (please comment)

3) What information is mostly lacking about risks from seafood consumption?
- Toxicity of environmental contaminants on human health
- Transfer of contaminants between the environment and seafood
- The effects of cooking methods on seafood safety
- Other (please comment)

4) Which is the weakest step of risk management of contaminants in food?
- Exposure assessment
- Availability of risk management techniques
- Result monitoring
- Availability of data on consumption patterns/habits
- Availability of data on contaminants
- Consumers being unaware of the risks
- Difficulties in communicating risk
- Other (please comment)

The second part focused on communication strategies and was followed by an open discussion rather than by multiple-choice questions, because of time constraints.

9.3. Workshop results

According to respondents the main risk associated to seafood consumption is chemicals (78%) (Figure 9), whereas the main benefit is omega-3 fatty acids which are known to reduce the risk of coronary diseases (83%) (Figure 10).

The question on the lack of information about risks from seafood consumption gave more balanced results (Figure 11). 52% stated that information is lacking mostly about the transfer of contaminants between the environment and seafood, whilst 39% selected the toxicity of environmental contaminants on human health. The last question referred to the different steps of risk management (Figure 12). 43% of respondents stated that the weakest step of risk management is the availability of data on contaminants.

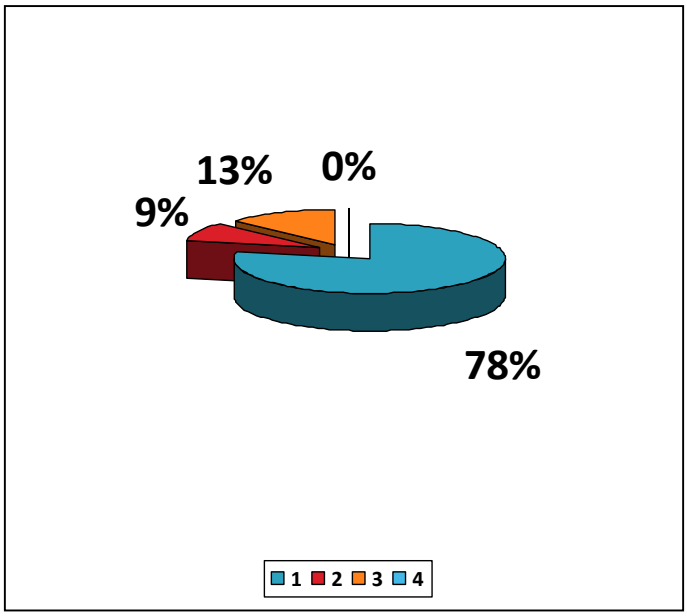

Figure 9 – Results of Question 1: What do you perceive as the main risks associated to seafood consumption? (1=chemicals; 2=algal bio-toxins; 3=parasites and microrganisms; 4=other)

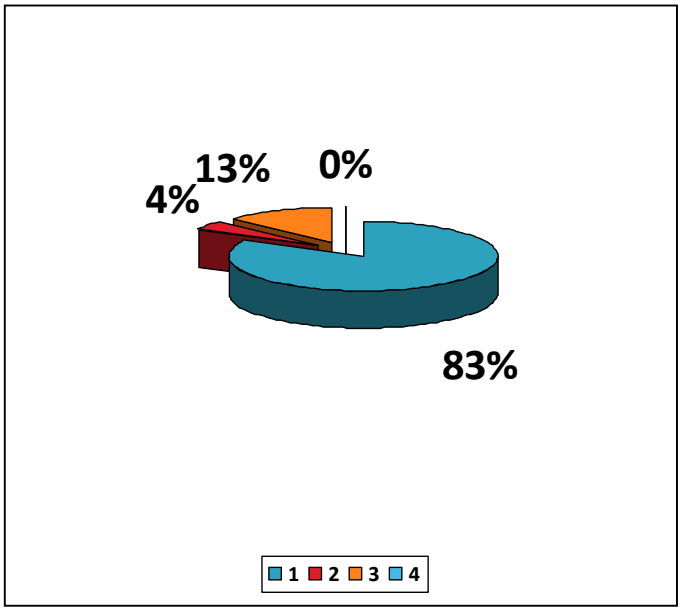

Figure 10 – Results of Question 2: What do you perceive as the main benefits associated to seafood consumption? (1=Omega-3 fatty acids reduce the risk of coronary diseases; 2=A high consumption of seafood during pregnancy and the first year of life improves the baby's growth capacities; 3=Seafood fat is important in the prevention of certain chronic diseases; 4=other)

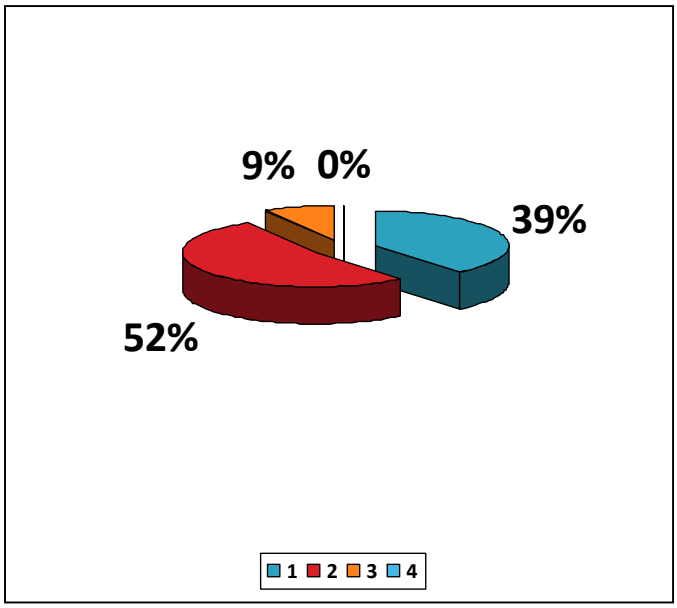

Figure 11 – Results of Question 3: What information is mostly lacking about risks from seafood consumption? (1=Toxicity of environmental contaminants on human health; 2=Transfer of contaminants between the environment and seafood; 3=The effects of cooking methods on seafood safety; 4=other)

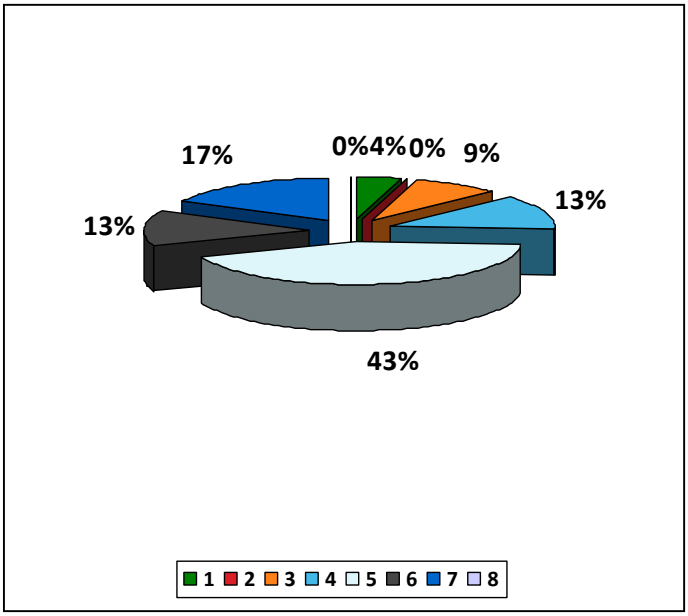

Figure 12 – Results of Question 4: Which is the weakest step of risk management of contaminants in food? (1= Exposure assessment; 2=Availability of risk management techniques; 3=Result monitoring; 4=Availability of data on consumption patterns/habits; 5=Availability of data on contaminants; 6=Consumers being unaware of the risks; 7=Difficulties in communicating risk; 8=other)

9.4. Limitations

It should be noted that the questions asked during the workshop were prepared beforehand for stakeholders with some knowledge of issues related to seafood safety (i.e. producers/processors and

consumer organisations). Eventually most part of the participants (20 over 24) were consumers (general public), who are not always well informed about the topics of the questions. To a certain extent this issue limits the validity of the results.

9.5. Conclusion

The major outcomes of this workshop were that we should not provide too technical and detailed information to consumers. The best communication channel is trusted organisations/people, which would increase the involvement of producers and processors. It would be helpful to disseminate information in local languages too, in order to reach a higher number of stakeholders, including categories which do not necessarily speak English.

The workshop had a rather low number of registered participants. It was hypothesised the following reasons:

- Stakeholders could not be reimbursed of their travel costs. Some members of consumer organisations, when invited to the workshop, raised this issue.
- According to some participants, producers and processors are not very interested in the topic because they are more interested in the commercial side of their activities (direct communication).
- The English language might be a barrier, especially for some stakeholder categories (e.g. producers/processors) and countries (like Italy, for example)

Although the initial consultative aim of the workshop could not be fully achieved (because of the low number of registered participants), the workshop turned out to be a good opportunity to disseminate the project. It provided an opportunity to meet relevant people in the field of environment, fishermen associations, consumers, and researchers, and discuss with them about the work being carried out in the project.

10. Second stakeholder workshop

The second stakeholder workshop was targeted to the European Commission (EC) and other policy and decision makers involved in the implementation of the Marine Strategy Framework Directive (MSFD).

10.1. Objectives of the workshop

The main objectives of this workshop were to:

- Get insight into the steps and actions ECsafeSEAFOOD should take to allow ECsafeSEAFOOD's results to be used for the implementation of the Marine Strategy Framework Directive (MSFD) – Descriptor 9 (Contaminants in fish and seafood for human consumption) and Descriptor 10 (Marine litter), and any other relevant policy
- Strengthen the role of science in supporting safe seafood policy and establish robust communication channels between science and relevant policy makers

10.2. Methodology and workshop description

The second stakeholder workshop was initially organised in Brussels to take place on the 24th November 2015. It was hosted at the Lombardy Region Delegation offices. However, due to the exceptional security events in Brussels, the ECsafeSEAFOOD workshop organizers decided to postpone the event to 21st January 2016.

The consortium selected Brussels as the ideal location to enable an easier access of policy makers to the workshop.

The agenda is provided in Appendix IV. It includes a first part devoted to oral presentations (by internal and external speakers to the project consortium) and a second part devoted to the discussion.

Potential stakeholder participants were taken from the stakeholder end-user database produced in the project (Deliverable 7.4). Moreover, additional contacts were included, particularly those suggested by the EC contacts. In particular, people working at the EC, FAO, and EFSA were invited, together with other contacts from National Food Safety Authorities, NGOs and different project partners. Overall, more than 1,000 invitations were sent by email, together with the informational leaflet reported in Appendix V.

In total 27 people were present at the workshop. 18 registered participants, 7 speakers (5 belonging to the project consortium and 2 policy makers) and 2 consortium members (see Appendix VI). A moderator was present to facilitate the discussion. Two photographs taken during the workshop are included in Figures 13-14.

Figure 13 - Participants at the second stakeholder workshop in Brussels.

Figure 14 - Participants at the second stakeholder workshop in Brussels.

The discussion included open questions and some multiple-choice questions (using a voting system software). The open discussion focused on the following topics:

1) How can the project best support the activities for the implementation of the MSFD?
2) What are the specific needs in terms of presenting the information?
3) What are the categories of stakeholders that need to be involved in the valorisation of the results of the project?
4) What are the categories of stakeholders that need to be involved in the valorisation of the results of the project?
5) Regarding environmental contaminants, in which area results are still inefficiently provided by science?
6) What are the future improvements that you would see for the online tool?

Moreover the following multiple-choice questions were administered to all the participants:

- Are the current results/products of the project relevant for the policy implementation?
    1) Yes, I strongly agree
    2) Yes, I somehow agree
    3) Neither I agree nor disagree
    4) No, I somehow disagree
    5) No, I strongly disagree
- Is accessibility to scientific and monitoring information in the field of seafood safety a problem?
    1) Yes, I strongly agree
    2) Yes, I somehow agree
    3) Neither I agree nor disagree
    4) No, I somehow disagree
    5) No, I strongly disagree
- What is the main policy area of national competence where the project can have a positive contribution?
    1) Food safety
    2) MSFD
    3) Nutrition and human health
    4) Chemicals and materials regulation
    5) Consumer information
    6) Other

10.3. Workshop results

According to participants' opinions the project could support the activities for the implementation of the MSFD. This is confirmed by results shown in Figure 15: the majority of respondents (92%) believe that the project results are relevant for the implementation of the MSFD. Only 8% chose the neutral attitude.

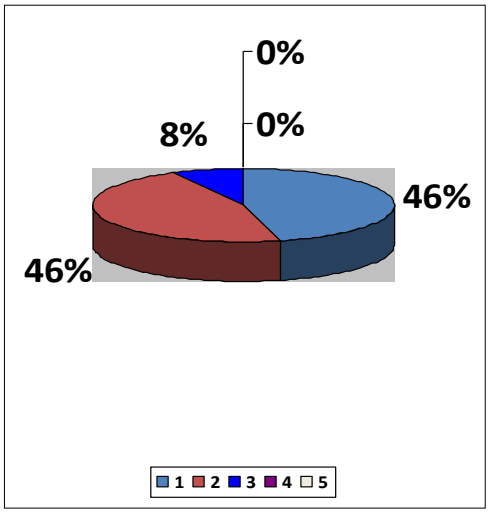

Figure 15 - Percentage of responses to the question: Are the current results/products of the project relevant for the policy implementation? (1-Yes, I strongly agree; 2-Yes, I somehow agree; 3-Neither I agree nor disagree; 4-No, I somehow disagree; 5-No, I strongly disagree)

In particular, the project could provide a preliminary screening to say which contaminants can be of real concern, and possibly give an idea of the levels. Presently, the levels set by the legislation are "achievable" levels based on actual statistical data, but not necessarily safe. The project could give more information on this.

In the participants' opinion the project could have a positive impact also in other policy areas besides MSFD (13%), like food safety (53%), nutrition and human health (27%), and chemicals and materials regulation (7%) (Figure 16).

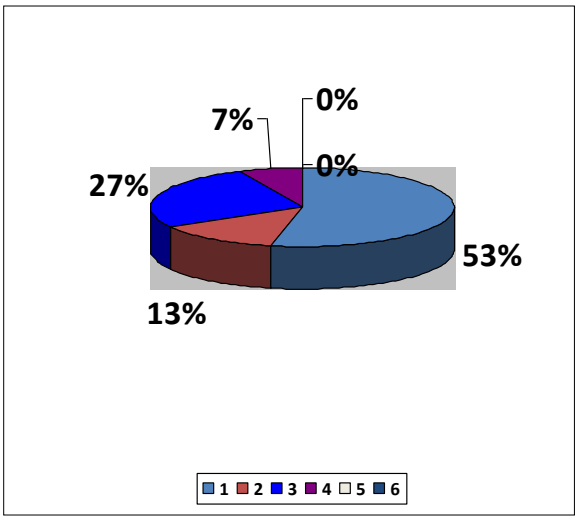

Figure 16 - Percentage of responses to the question: What is the main policy area of national competence where the project can have a positive contribution? (1- Food safety; 2-MSFD; 3- Nutrition and human health; 4- Chemicals and materials regulation; 5- Consumer information; 6-Other)

Figure 17 reveals that 87% of stakeholders think that the accessibility of scientific and monitoring information is a problem. The rest of respondents (14%) do not agree with this statement.

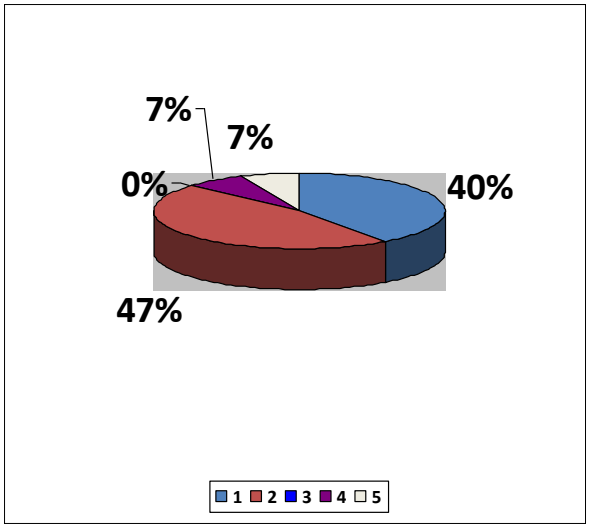

Figure 17 - Percentage of responses to the question: Is accessibility to scientific and monitoring information in the field of seafood safety a problem? (1-Yes, I strongly agree; 2-Yes, I somehow agree; 3-Neither I agree nor disagree; 4-No, I somehow disagree; 5-No, I strongly disagree)

As to the specific needs in presenting the information in the field of seafood safety, the main point raised in the workshop was that scientific information should be simplified before being communicated to the general public. It is also really important to give balanced messages.

According to attendees, policy makers and consumers should be involved to valorise the project results. Despite the fact that seafood producers/processors and the industry are considered to have limited interest in these issues due to the commercial aspect of their activities, still they show interest in knowing whether or not their products are safe. The workshop participants stated that people should not use safety issues for commercial reasons (for example by prompting their seafood as safer than others' to outcompete other producers in the market).

The discussion also aimed to investigate in which area information about environmental contaminants are still inefficiently provided by science. The main opinion was that information are lacking in different fields; for example the transfer of contaminants between the environment and seafood, and the role of microplastics in the transfer or in the accumulation of other contaminants. Moreover, there is a need of standardisation in the sampling/monitoring activities. Also toxicological data are missing for example related to the metabolisation of chemicals and algal blooms. For instance data on halogenated and brominated dioxins are missing, whilst data on dioxins are abundant. Additionally, it is really necessary to have clear sources of data.

The project representatives at the workshop were keen to receive suggestions on how to improve the online tool. Policy makers would like to see the tool before disclosing to the end-users, in order to check what message is released for consumers. Participants also suggested in a more understandable and easier tool for consumers, since the version presented seemed to be rather complicated for them. It was suggested to make different versions for different end-user (e.g. consumers, nutritionists). The main concern is that the negative message created about the risks related to the presence of contaminants would create confusion in the general public. Moreover, in the balance of risks versus benefits, the whole diet should be taken into account (rather than seafood consumption only). Another suggestion was to specify the sources of the databases included in the tool and the possible use of databases from different countries. At present, the tool does not take into account the origin of seafood. Indeed, it is not easy to choose whether or not such variability could be integrated in the tool, as origin is not always known when seafood is purchased.

Other topics were proposed and discussed. Some policy makers suggested that there is a need for a greater involvement of the media in order to reach a wider number of consumers. In general, the EC encouraged greater connections among similar projects, to enhance and improve the network and the circulation of information.

10.4. Conclusion

The workshop was fruitful and useful because it gathered people with different points of view (as science and policy) and fostered the discussion and the exchange of opinions. In this way it was possible to establish connections that can strength the communication among stakeholders. Policy makers were very cooperative and ready to discuss.

It was highlighted that science should transfer results to the outside world. A few opportunities to communicate them to policy were raised during the workshop. For example, the new webpage created by the MSFD Competence Centre and the meetings of the Technical Groups can be an opportunity to present the ECsafeSEAFOOD results.

As for communication to consumers, the main outcome is that information related to seafood safety issues should be simplified before being transferred to them. Moreover the message given needs to be balanced between risks and benefits.

The consultation highlighted that there are relevant topics in the field of seafood safety where information is still lacking, like for example: the transfer of contaminants between the environment and seafood, the presence of microplastics, algal toxins, and the standardisation of sampling/monitoring activities. ECsafeSEAFOOD addresses all these topics, and therefore it can have a relevant impact in this field. Moreover, the project can support the implementation of the MSFD, in particular with a preliminary screening to identify which contaminants could be of concern.

According to the stakeholders who attended the workshop the challenges for the future are the safety of marine environment, the growth of the marine sector, consumer awareness, competitiveness, open science, and innovation.

11. General conclusion

Within the project a stakeholder consultation was performed by means of a Delphi survey and two workshops. Overall this process allowed (i) to get better insights into stakeholders' informational needs, (ii) and to establish connections and improve communication between the project and stakeholders. The consultation was fruitful and useful because it gathered stakeholders with different points of view and fostered the discussion and the exchange of opinions.

The survey and workshops highlighted the need to obtain more information particularly for emerging non-regulated contaminants. In addition, the transfer of contaminants between the environment and seafood, seafood risk-benefit assessment and microplastics in the environment are key issues that also require additional information.

Concerning communication between the different groups of stakeholders, respondents think that communication needs to be improved. Online tools appear to be the most useful communication channel to obtain information about seafood safety, followed by media and scientific publications.

As far as seafood safety assessment and mitigation strategies are concerned, respondents indicated that the biggest problem is that adequate Information Technologies tools for risk assessment are unavailable. The best strategy to increase seafood safety is the development of databases, risk assessment and mitigation tools, as well as guidelines and recommendations to reduce public health risks and increase consumer awareness. Therefore, appealing, clear and objective material should be prepared and distributed through the diverse communication channels in order to reduce health risks and increase consumer awareness. It is important to stress that the information provided to consumers should not be too technical, in order to avoid confusion or unnecessary alarm. Moreover, the message needs to be always balanced between risks and benefits.

In conclusion, the stakeholder consultation described in this deliverable had a positive impact on the project. Policy makers were very cooperative and keen to collaborate. Stakeholders' input helped the project partners identifying the best strategies and channels to communicate results. We believe that this will contribute to the success of ECsafeSEAFOOD, since scientific results need to be effectively communicated in order to be a real and concrete tool supporting policy, industry, and consumers.

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Appendix I. First-round stakeholder survey

ECsafeSEAFOOD: First-round stakeholder survey

According to the United Nations Food and Agriculture Organization, seafood is a high quality and healthy food item and it is also the planet's highest traded food commodity. Yet, some seafood can accumulate environmental contaminants with potential impact on human health. In order to increase seafood safety, and reduce human health risks, the ECsafeSEAFOOD project aims to assess seafood safety issues mainly related to non-regulated priority contaminants and to evaluate their impact on public health. Priority contaminants in seafood are substances with insufficient knowledge, which can be a risk for human health.
ECsafeSEAFOOD is a project funded within the EU 7th Framework Programme and involves 18 partners from 10 European countries; it envisages that its outcome will enable European consumers and authorities to be more confident about seafood safety.
In order to reach its objectives, the project also needs the stakeholders' support and input.

For this reason we would be most grateful if you could devote a few minutes to fill in this web-based questionnaire. Your feedback will impact the progress and outcome of the ECsafeSEAFOOD project. Please note that your answers will be kept strictly anonymous and confidential.

Thank you very much for your cooperation.
For more information please visit www.ecsafeseafood.eu

Team involved: AEIFORIA, IPMA, AquaTT, URV, ICETA, IRTA

General Information

1) Please indicate which category you belong to:
- policy and decision maker
- food producer and/or processor
- agency and consumer organization
- other (please specify)

2) Which is the size of the enterprise you work for?
- fewer than 10 persons employed
- 10 to 49 persons employed
- 50 to 249 persons employed
- 250 or more persons employed

3) How long have you been working in the field of food safety and/or seafood?
- < 1 year
- 1 to 5 years
- 5 to 10 years
- > 10 years

4) In which country are you located?

5) Please indicate your gender.
- male
- female

Data availability

6) How would you define the level of information about the following contaminants?
(Please mark one answer in each row)

	Satisfying (1)	**(2)**	**Neutral (3)**	**(4)**	**Unsatisfying (5)**	**Never heard about it**
Algal bio-toxins						
Microorganisms and viruses						
Parasites						
Trace elements (i.e. heavy metals, like mercury, cadmium, lead; arsenic)						
Dioxins						
Pesticides						
Pharmaceuticals						
Hormones						
Plastic additives						

7) Please indicate to what extent you require more data on the following areas

(Please mark one answer in each row)

	To a great extent (1)	(2)	Neutral (3)	(4)	Not at all (5)	I do not know
The habits of seafood consumers						
Seafood farming and wild catching practices						
Priority environmental contaminants in seafood						
Non-regulated contaminants						
Regulated contaminants						
Specific case studies/monitoring						
The effects of cooking methods on seafood safety						
The effects of climate change on marine environment and seafood						
The transfer of contaminants between the environment and seafood						
Seafood risk-benefit assessment						
Toxicity of environmental contaminants						
Other (please specify)						

Communication among stakeholders

8) How would you rate the communication between the different groups of stakeholders?
(Please mark one answer in each row)

	Very poor (1)	(2)	Normal (3)	(4)	Very efficient (5)	I do not know
Food producers/Processors <-> Policy/Decision Makers						
Food producers/Processors <-> Consumer organizations						
Policy/Decision Makers <-> Consumer organizations						

9) How would you describe the following communication channels used to obtain information on seafood safety?
(Please mark one answer in each row)

	Useful (1)	**(2)**	**Neutral (3)**	**(4)**	**Useless (5)**	**I do not know**
Online tools (e.g. websites, social networks, digital platforms)						
Printed or digital publicity materials (e.g. manuals, leaflets, brochures)						
Workshops and seminars						
Policy briefings						
Trainings						
Media (e.g. television, newspapers)						
Scientific publications						
Other (please specify)						

Seafood safety assessment and mitigation strategies

10) Please indicate to what extent you agree or disagree with the following statements related to seafood safety. (Please mark one answer in each row)

	Totally agree (1)	**(2)**	**Neutral (3)**	**(4)**	**Totally disagree (5)**	**I do not know**
It is difficult to access toxicological data						
Adequate Information Technologies tools for risk assessment are unavailable						
There is a lack of fast screening and detection techniques						
Communication among stakeholders is ineffective						
General public is not adequately informed						
The legislative framework is complex						
Implementing the legislation is difficult						
There is insufficient scientific information						
Other (please specify)						

11) Please indicate to what extent you agree or disagree with the following statements:
The best strategy to increase seafood safety is the... (Please mark one answer in each row)

	Totally agree (1)	**(2)**	**Neutral (3)**	**(4)**	**Totally disagree (5)**	**I do not know**
Development of innovative toxicological tools to test contaminants in realistic conditions						
Increase of the number of contaminants monitored						
Intensification of monitoring activities						
Enhancement of analytical methods to identify and measure contaminants						
Development of databases, risk assessment and mitigation tools						
Development of guidelines and recommendations to reduce public health risks and increase consumer awareness						
Improvement and promotion of already existing tools and guidelines						
Other (please specify)						

Perceived health risk and consumers' information needs

12) In your opinion, how do consumers perceive the following risks associated with environmental contaminants? (Please mark one answer in each row)

	Significant (1)	**(2)**	**Neutral (3)**	**(4)**	**Insignificant (5)**	**I do not know**
Seafood poisoning with trace elements (i.e. heavy metals, like mercury, cadmium, lead; arsenic)						
Seafood poisoning with dioxins						
Seafood poisoning with plastic residues						
Seafood poisoning with pharmaceuticals and personnel care products						
Seafood poisoning with endocrine disruptors						
Seafood poisoning with antibiotics						
Seafood poisoning with persistent organic pollutants						
Seafood poisoning with pesticides						
Seafood poisoning with microorganisms and viruses						

Seafood poisoning with algal bio-toxins						
Seafood poisoning with parasites (e.g. worms, anisakid nematodes, etc.)						
Seafood spoilage						
Other (please specify)						

13) In your opinion, to what extent are consumers interested in the following information?
(Please mark one answer in each row)

	Very interested (1)	**(2)**	**Neutral (3)**	**(4)**	**Not interested (5)**	**I do not know**
Eco-labeling schemes						
Certified seafood products						
Safety guarantee						
Quality mark						
Traceability						
Batch number for product identification						
Date of capture						
Origin						
Sustainability						
Environmental friendliness						
Animal welfare						
Type of production (Wild/farmed seafood)						
Feed used during farming						
Use of genetically modified feed						
Use of additives						
Harvesting methods						
Contaminant levels						
Shelf-life						
Other (please specify)						

Appendix II. Second-round stakeholder survey

ECsafeSEAFOOD: First-round results and second- round questionnaire

Many thanks for your responses to the first stakeholder survey. We now ask you to fill in a second short questionnaire, which constitutes the second phase of this Delphi survey.

Taking the responses from the first round into account, please review the material below and respond to the second round of questions. Remember that your responses are strictly confidential to the research team and that your participation in this project is entirely voluntary. However, we would like to stress the importance of having everyone who responded to the first round to complete the remaining last round. Please note that it only takes a few minutes to fill in this questionnaire. Your feedback will impact the progress of this stakeholder consultation and the outcome of the ECsafeSEAFOOD project.

If, at any time, you would like to discuss the Delphi survey, please do not hesitate to contact Gabriella Fait (gabriella.fait@aeiforia.eu) or Alice Tediosi (alice.tediosi@aeiforia.eu).

Further information about the project is available at www.ecsafeseafood.eu.

First-round feedback and second-round questionnaire

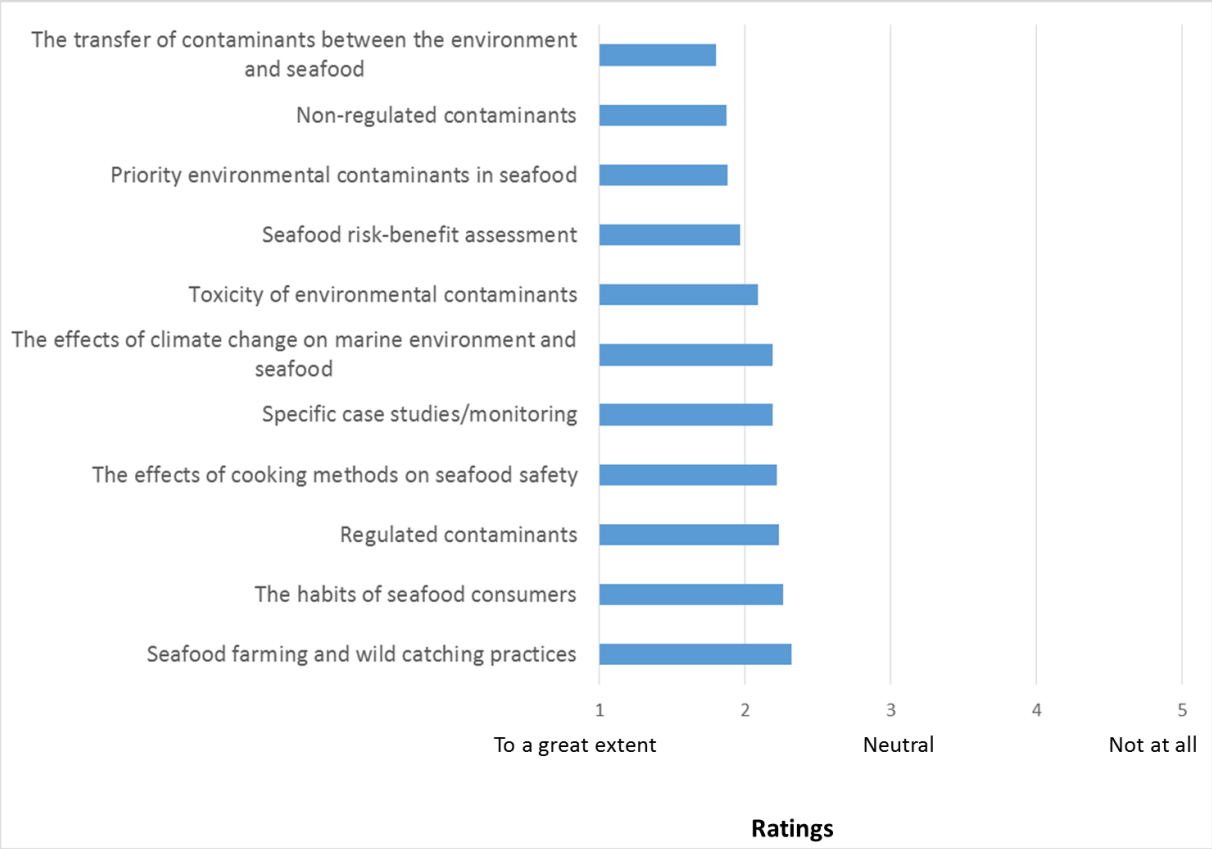
The second-round questionnaire only addresses some of the topics included in the first round and includes fewer, more focused questions.

1) Please indicate which category you belong to:
   - policy and decision maker
   - food producer and/or processor
   - agency and consumer organisation
   - other (please specify) ……..
2) In which country are you located?

Italy
Portugal
Spain
Brazil
France
Belgium
USA
The Netherlands
Bulgaria
Denmark
Finland
Greece
Mexico
Kenya

Ireland
Poland
UK
Germany
Morocco
India
Russian Fed
Seychelles
Singapore
Slovenia
Switzerland
United Arab Emirates
Uruguay
Philippines
Nigeria
Iraq
Other, please specify

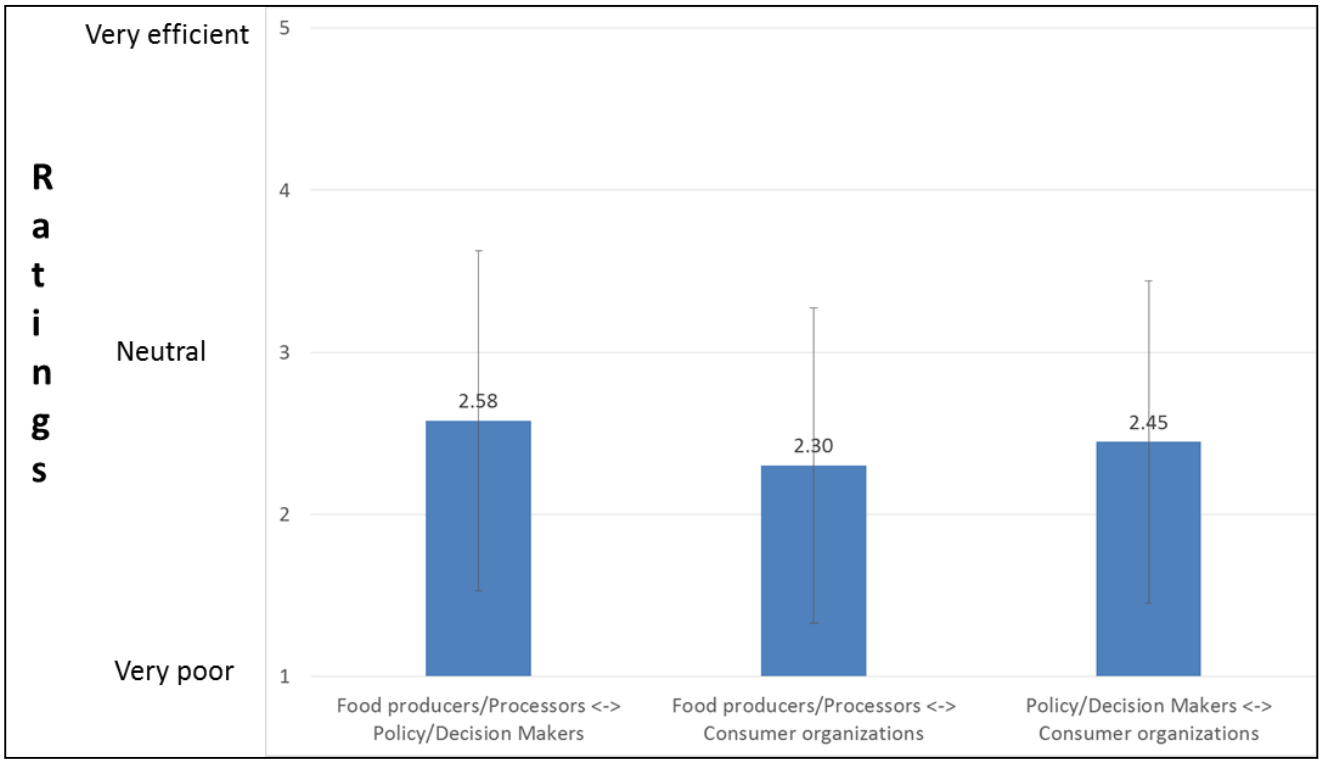
In the first questionnaire, stakeholders were asked to indicate where more data are required in the field of seafood and seafood safety. Since response mean values showed that more data are required for all the areas included in the question (see figure below), we would like you to refine your answer now.



3)Where are data lacking most? (maximum 3 answers allowed)

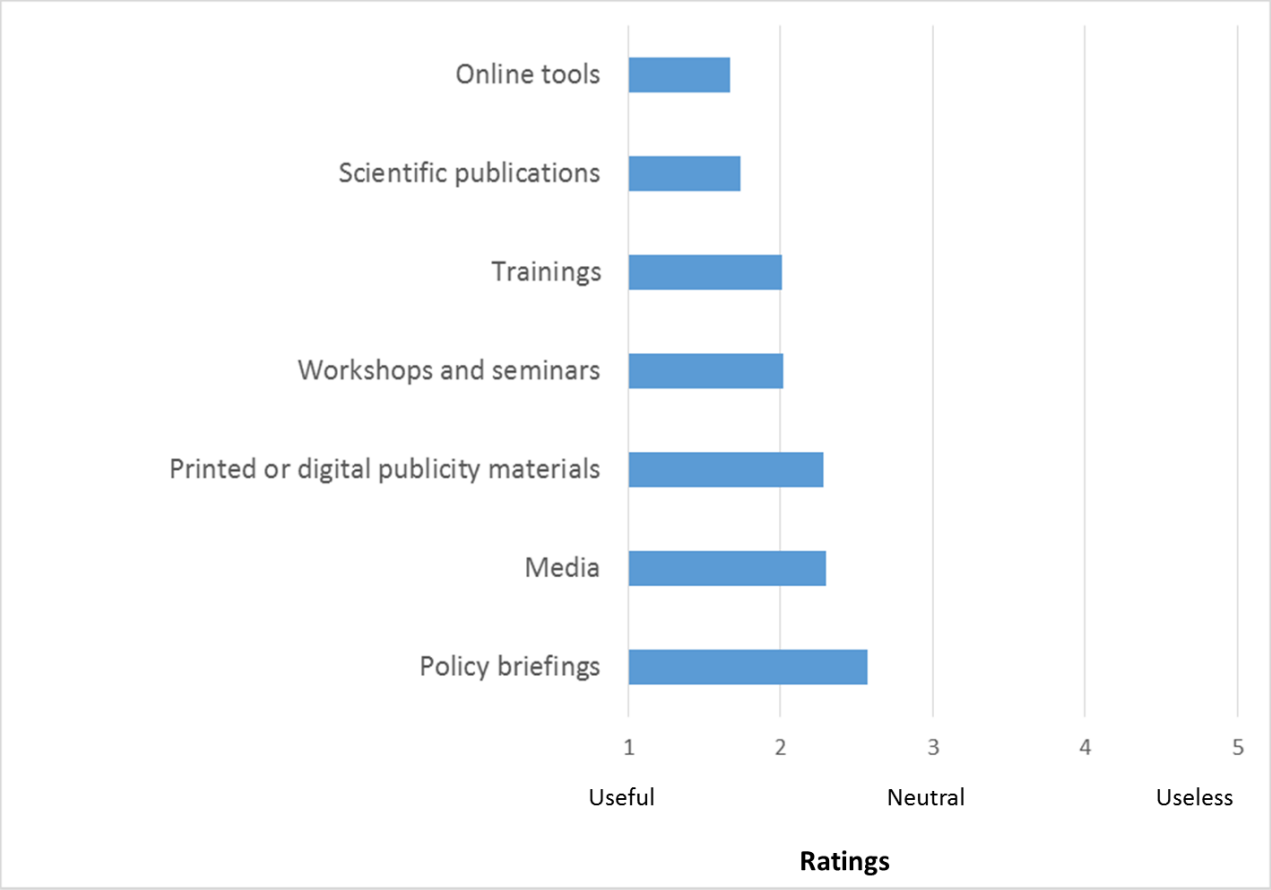
The transfer of contaminants between the environment and seafood
Non-regulated contaminants
Priority environmental contaminants in seafood
Seafood risk-benefit assessment
Toxicity of environmental contaminants
Specific case studies/monitoring
The effects of climate change on marine environment and seafood
The effects of cooking methods on seafood safety
Regulated contaminants
The habits of seafood consumers
Seafood farming and wild catching practices

Communication between the different groups of stakeholders is generally considered to be poor by the sample of respondents (mean values between 1 and 3). Results show that communication between food producers/processors and consumer organisations is the poorest (2.30) (see figure below).



4) Can you confirm that communication between the different groups of stakeholders is generally poor? Y/N
5) If yes, please state at least one reason why communication is poor:
   - ……
   - ……
   - ……

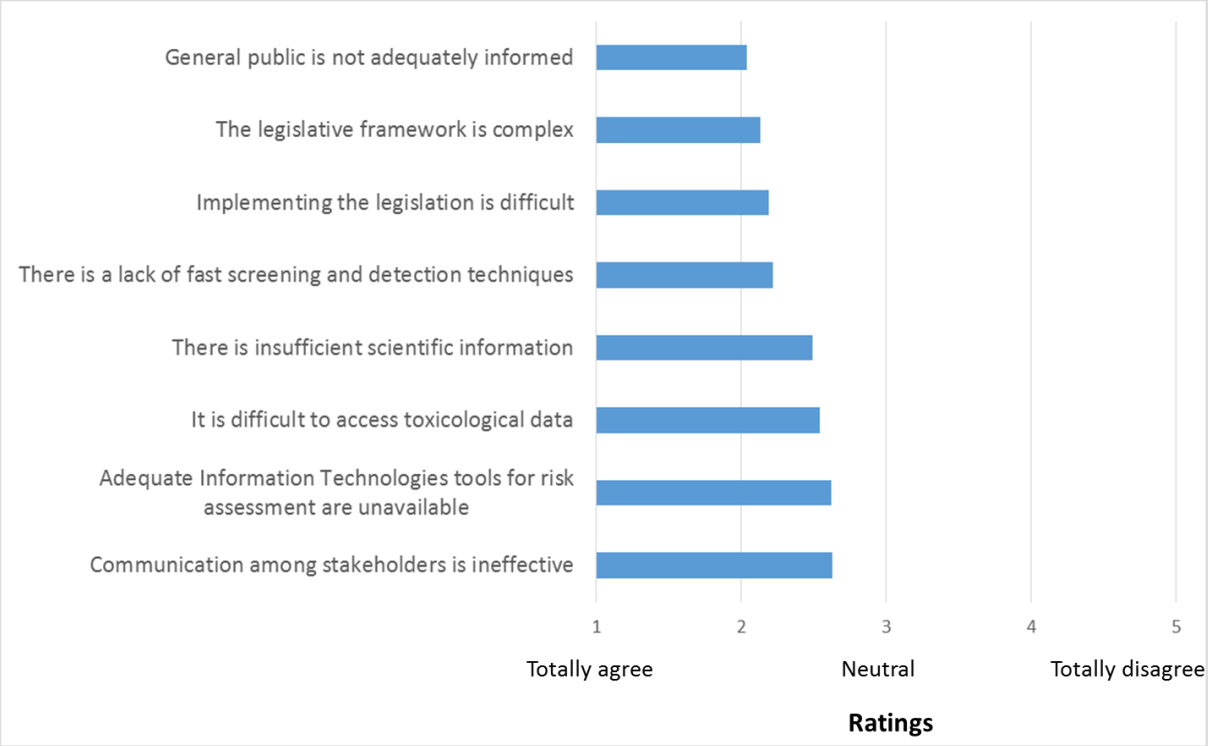
Another question investigated the usefulness of a list of communication channels to be used for obtaining information on seafood safety. The results indicated that all of the proposed communication channels were perceived as being useful (see figure below).



6) Please refine your answer, by marking the 3 most useful communication channels：

Online tools
Printed or digital publicity materials
Workshops and seminars
Policy briefings
Trainings
Media
Scientific publications

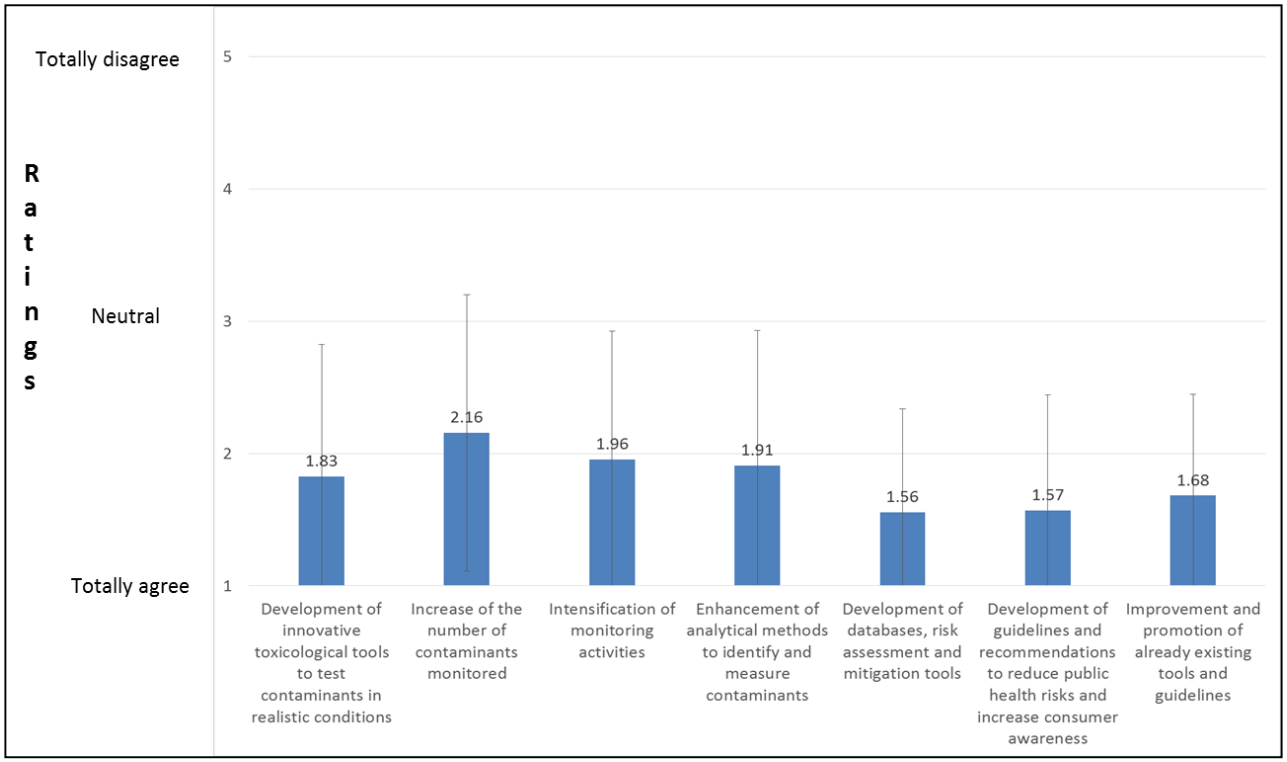
In the first-round questionnaire, the following question was included: “Please indicate to what extent you agree or disagree with the following statements related to seafood safety”. Respondents tended to agree with all of the statements reported in the question, as shown in the figure below.



7) You can review your first-round answers now: these statements identify problems related to seafood safety that could be addressed. If you had to choose only one of them (the most important and urgent), which one would you choose? (only **one** answer allowed)

It is difficult to access toxicological data
Adequate Information Technologies tools for risk assessment are unavailable
There is a lack of fast screening and detection techniques
Communication among stakeholders is ineffective
General public is not adequately informed
The legislative framework is complex
Implementing the legislation is difficult
There is insufficient scientific information

According to the first-round responses, the best strategy to increase seafood safety is the development of databases, risk assessment and mitigation tools (1.56). This was closely followed by the development of guidelines and recommendations to reduce public health risks and increase consumer awareness (1.57). However, responses indicated that mitigating all of the problems listed in the question may help to improve seafood safety (see figure below).



Since the ECsafeSEAFOOD project will develop guidelines and recommendations for stakeholders, with the aim to reduce public health risks and increase consumer awareness, we are focusing on this aspect.

8) In your opinion, which of the following options is the best way to communicate/disseminate guidelines and recommendations? (please mark only **one** answer)
   - Conferences / face-to-face meetings
   - Websites
   - Handbooks / best practices manuals
   - Brochures

Appendix III. First stakeholder workshop agenda

ECsafeSEAFOOD Stakeholder Workshop I

Risk and benefit perception of seafood consumption on human health (including vulnerable groups) to consumer organisations and producers/processors: information needs and communication strategies

Context

Although seafood is recognised as a high quality, healthy and safe food, some can accumulate environmental contaminants with potential impact on human health. Seafood is currently controlled by efficient monitoring programmes for certain environmental contaminants (e.g. Pb, Hg, Cd, toxins) that provide crucial information for management and risk assessment purposes. However, little information is available for contaminants without maximum limits set by authorities, such as toxins from harmful algal blooms, marine litter, endocrine disruptors, pharmaceutical and personal care products, inorganic As, organic Hg, and brominated flame retardants. In this context, the ECsafeSEAFOOD project (http://www.ecsafeseafood.eu/) aims to assess safety issues mainly related to non-regulated contaminants present in seafood as a result of environmental contamination and evaluate their impact on public health.

Aims of the workshop

Investigate what information is needed about seafood benefits and risk assessment and how it should be communicated to the general public and to vulnerable groups of consumers in order to reduce public health risks from seafood consumption. In particular:

- Evaluate the information availability about seafood benefits (minerals, fatty acids, etc.) and risks (as far as non-regulated and regulated contaminants are concerned)
- Present project results on consumer risk and benefit perception in different European regions
- Understand risk and benefit perceptions of consumer organisations and producers/processors associated with seafood consumption
- Identify the appropriate strategies to effectively communicate to consumers, whilst maintaining a strong seafood sector and promoting consumer confidence in seafood industry
- Inform on the achievements of the ECsafeSEAFOOD project regarding emerging contaminants in seafood

Topics to be discussed

- Achievements of the ECsafeSEAFOOD project regarding the monitoring of non-regulated contaminants in seafood
- Risk and benefit assessment related to seafood consumption
- Consumer and producers'/processors' needs and risk perception of seafood consumption on human health – Identification of the knowledge gaps in seafood safety

Target audience

Consumer organisations (also NGOs) and seafood producers/processors from Europe.

Expected output of the workshop

Identify the information needs of consumers and seafood producers/processors about seafood safety issues in order to better implement strategies to increase consumer awareness and confidence in seafood safety, and promote safe seafood consumption in Europe.

The results of the first workshop will be included in an ECsafeSEAFOOD deliverable and communicated to risk managers/communicators and policy makers in a second workshop.

Agenda

The workshop will be managed with the aim of encouraging participants to express their views and discuss. A voting system will be used in order to gather participants' opinions for brief discussion.

14.30 – 14.40 Welcome, purpose and format of the workshop
(Alexandru Marchis - OPERA)

14.40 – 14.55 "The challenges of the ECsafeSEAFOOD project - Overview of objectives and achievements"
(Antonio Marques – IPMA)

14.55 – 15.10 "Marine toxins and seafood consumption: risk assessment specificities"
(Jorge Diógene – IRTA)

15.10 – 15.25 "Consumers' risk and benefit perception of seafood consumption for human health"
(Silke Jacobs - UGENT)

15.25 – 15.45 Discussion on:

- Perception of the benefits associated to seafood consumption
- Perception of the risks associated to seafood consumption (related to chemicals (pharmaceuticals, antibiotics, heavy metals); toxins, bacteria and viruses; plastic residues

15.45 – 16.00 "Seafood communication strategies: ECsafeSEAFOOD stakeholder online tool"
(Lolita Vilavert - URV)

16.00 – 16.20 Discussion on:

- The most appropriate strategies to communicate seafood safety issues to consumers, possible improvements of seafood labelling
- Exploring different communication strategies, e.g.: on line tools, videos, etc.

16.20 – 16.30 Conclusions

Appendix IV. Second stakeholder workshop agenda

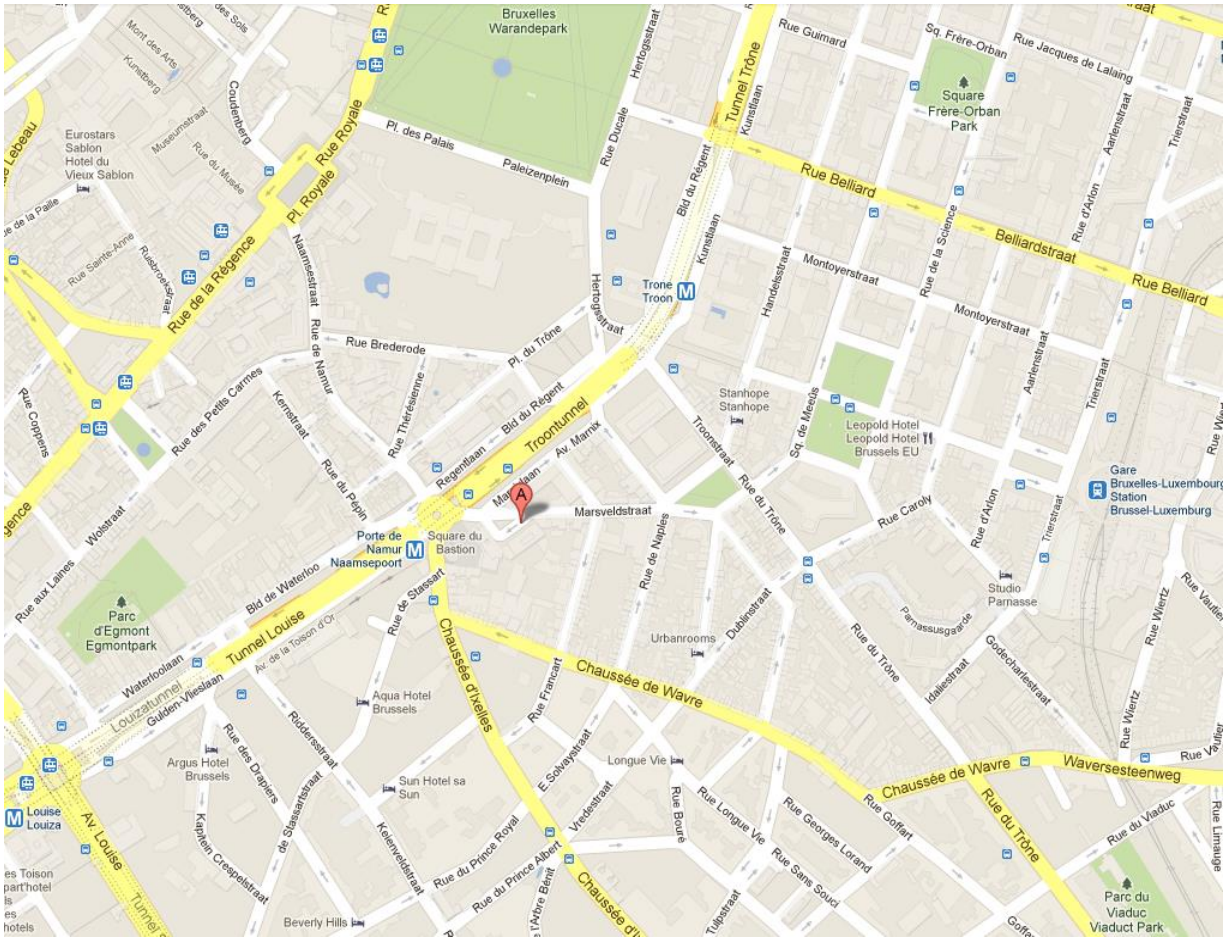
ECsafeSEAFOOD Stakeholder Workshop II

Science supporting policy for the safety of European seafood

Date and Venue

Venue: OPERA Research, Delegation of the Lombardia Region (3rd floor)
Place du Champs de Mars, 2 - 1050 Brussels, Belgium
(Call "Regione Lombardia" on the intercom)

Date: 21 January 2016, from 13.30 to 17.30
Registration time: 13.00



Link to the map

Context: the ECsafeSEAFOOD project

Although seafood is recognised as a high quality, healthy and safe food, some can accumulate environmental contaminants with potential impact on human health. Seafood is currently controlled by efficient monitoring programmes for certain environmental contaminants (e.g. Pb, Hg, Cd, toxins) that provide crucial information for management and risk assessment purposes. However, little information is available for contaminants without maximum limits set by authorities, such as toxins from harmful algal blooms, marine litter, endocrine disruptors, pharmaceutical and personal care products, inorganic As, organic Hg, and brominated flame retardants. In this context, ECsafeSEAFOOD aims to assess safety issues mainly related to non-regulated contaminants present in seafood as a result of environmental contamination and evaluate their impact on public health. Results from the project can inform policy makers about the need for and requirements of seafood regulatory and monitoring programmes for these contaminants of emerging concern.

Aims of the workshop

The aim of this workshop is to get better insights into actions and steps that ECsafeSEAFOOD can take considering the project results on non-regulated contaminants of emerging concern for the implementation of the Marine Strategy Framework Directive (MSFD) – Descriptor 9 (Contaminants in fish and seafood for human consumption) and Descriptor 10 (Marine litter)

Target audience

EC and other policy and decision makers involved in MSFD.

Expected output of the workshop

- Get insight into the steps and actions ECsafeSEAFOOD should take to allow ECsafeSEAFOOD's results to be used for the implementation of MSFD and any other relevant policy
- Strengthen the role of science in supporting safe seafood policy and establish robust communication channels between science and relevant policy makers

Agenda

The workshop will be managed with the aim of encouraging participants to express their views and discuss.

13.00-13.30	Registration
13.30-13.35	Welcome and purpose & format of the workshop (Alexandru Marchis – OPERA Research Center)
13.35-13.45	"Introduction to the ECsafeSEAFOOD project" (António Marques – IPMA)
13.45-14.00	"What are the European Commission's research policy priorities in relation to seafood safety?" (Marta Iglesias - DG RTD, Marine Resources Unit)
14.00-14.15	"Status of the implementation of the MSFD - Descriptor 9 and Descriptor 10" (Georg Hanke and Victoria Tornero - JRC)
14.15-14.30	"ECsafeSEAFOOD approach for assessing the risks of non-regulated contaminants in seafood" (Isabelle Sioen/Silke Jacobs - University of Ghent)

14.30-14.45 "The usage of sensors in the field of environmental contaminants"
(Johan Robbens – ILVO)

14.45-15.00 "Results of the ECsafeSEAFOOD stakeholder consultation - invitation to policy makers for suggestions on how to improve communication on seafood safety between policy and other stakeholder groups (consumer organisations, seafood producers/processors)"
(Alice Tediosi - Aeiforia)

15.00-15.15 "The online tool for balancing risks and benefits of seafood consumption – how to optimise its use"
(Lolita Vilavert - URV)

15.15-15.30 Coffee break

15.30-17.15 Discussion on how the project can contribute to policy developments in food safety and the marine environment:

- Insights into the current Science-Policy Interface (Marine Strategy Framework Directive (MSFD) Competence Centre (MCC)) related to seafood safety issues: – how can ECsafeSEAFOOD collaborate/give input?
- Identification of other EC or national policy levels where ECsafeSEAFOOD results can make an impact.
- Identification of best practice communication means from science to policy and vice versa – personal stories and preferences
- Invitation to Policy makers to provide suggestions as to how relevant research project and initiatives could collaborate and link up to provide coherent information on seafood safety issues
- Accessibility for policy makers to scientific and monitoring information in the field of seafood safety
- Online tool: Insights from policy makers
- How to enlarge the usage of the project dissemination tools to fill informational gaps and to improve communication among policy/decision makers, consumer organisations and food producers/processors

17.15-17.30 Conclusions

The event organisers reserve the right to make changes to the program at short notice.

Registration

To *register* for the *workshop*, please email alice.tediosi@aeiforia.eu by **15th January 2016**.

Appendix V. Invitation flyer for the second stakeholder workshop

ECsafe SEAFOOD Priority environmental contamination in seafood: safety assessment, impact and public perception

www.ecsafeseafood.eu

Agenda

The workshop will be managed with the aim of encouraging participants to express their views and discuss.

21 January 2016		
13.00-13.30	Registration	
13.30-13.35	Welcome and purpose & format of the workshop	Alexandru Marchis – OPERA
13.35-13.45	"Introduction to the ECsafeSEAFOOD project"	António Marques – IPMA
13.45-14.00	"What are the European Commission's research policy priorities in relation to seafood safety?"	Marta Iglesias - DG RTD, Marine Resources Unit
14.00-14.15	"Status of the implementation of the MSFD - Descriptor 9 and Descriptor 10"	Change to: Georg Hanke and Victoria Tornero – JRC
14.15-14.30	"ECsafeSEAFOOD approach for assessing the risks of non-regulated contaminants in seafood"	Isabelle Sioen/Silke Jacobs - UGent
14.30-14.45	"The usage of sensors in the field of environmental contaminants"	Johan Robbens – ILVO
14.45-15.00	"Results of the ECsafeSEAFOOD stakeholder consultation - invitation to policy makers for suggestions on how to improve communication on seafood safety between policy and other stakeholder groups (consumer organisations, seafood producers/processors)"	Alice Tediosi - Aelforia
15.00-15.15	"The online tool for balancing risks and benefits of seafood consumption – how to optimise its use"	Lolita Vilavert - URV
15.15-15.30	Coffee break	
15.30-17.15	Discussion on how the project can contribute to policy developments in food safety and the marine environment: • Insights into the current Science-Policy Interface (Marine Strategy Framework Directive (MSFD) Competence Centre (MCC)) related to seafood safety issues: – how can ECsafeSEAFOOD collaborate/give input? • Identification of other EC or national policy levels where ECsafeSEAFOOD results can make an impact. • Identification of best practice communication means from science to policy and vice versa – personal stories and preferences • Invitation to policy makers to provide suggestions as to how relevant research initiatives could collaborate to provide coherent information on seafood safety issues • Accessibility for policy makers to scientific and monitoring information in the field of seafood safety • Online tool: insights from policy makers • How to strengthen the project dissemination tools to fill informational gaps and to improve communication among policy/decision makers, consumer organisations and food producers/processors	
17.15-17.30	Wrap-up and Conclusions	

The event organisers reserve the right to make changes to the programme at short notice.

The ECsafeSEAFOOD project has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 311820.

Designed by AquaTT

Appendix VI. Participant list of the second stakeholder workshop

ECsafeSEAFOOD Stakeholder Workshop II

Science supporting policy for the safety of European seafood

Participant list

Brussels, 21st January 2016

	Surname	Name	Institution	Signature
1	Brisabois	Anne	ANSES	
2	Capri	Ettore	Università Cattolica del Sacro Cuore	
3	Cassidy	Daniel	Tipik Communication Agency S.A.	
4	De Boosere	Isabel	Food Safety and Nutritional Policy	
5	Eksten	Rickard	Scotland Europa	
6	Garrett	Hannah	SCOTLAND EUROPA	
7	Gerssen	Arjen	Wageningen UR	
8	Hagan	Paul	Welsh Higher Education Brussels (WHEB)	
9	Krys	Sophie	ANSES	
10	Lane	Sam	European Food Information Resource (EuroFIR AISBL)	
11	Maggiore	Angelo	EFSA	
12	Mantur	Angelika	European Food Information Resource (EuroFIR AISBL)	
13	Mortimer	David	Chemical Contaminants & Residues Branch- Food Safety Policy - Food Standards Agency	
14	Paschen	Ole	Konsortium Deutsche Meeresforschung / German Marine Research Consortium	
15	Regairaz	Elise	AlienorEU	

16	Sanmartin	Sandra	European Bureau for Conservation and Development	
17	Sozzo	Sara	University of Turin DISAFA	
18	Sumares	David	Net-Positive Solutions	
19	Trasciani	Giorgia	Moverim consulting	
20	Vanhué	Laura	CRU	
21	Vromman	Valérie	AFSCA / FAVV - Belgian Food Safety Agency	
22	Wesnigk	Johanna	Environmental & Marine Project Management Agency	

ECsafeSEAFOOD partners and speakers attending

Brussels, 21st January 2016

	Surname	Name	Institution	Signature
1	Fait	Gabriella	Aeiforia	
2	Iglesias	Marta	EC, DG RTD, Marine Resources Unit	
3	Jacobs	Silke	Gent University	
4	Marques	António	IPMA	
5	Robbens	Johan	ILVO	
6	Sioen	Isabelle	Gent University	
7	Tediosi	Alice	Aeiforia	
8	Tornero	Victoria	JRC	
9	Vilavert	Lolita	URV	