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Online training courses on Expert Knowledge Elicitation (EKE)

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Abstract

This report summarises the training courses delivered under the contract OC/EFSA/AMU/2021/02 EKE: "Develop and conduct online training courses on Expert Knowledge Elicitation (EKE)". The objective of the courses was to develop and conduct online training courses on applying the methodology described in the EFSA Guidance on Expert Knowledge Elicitation in Food and Feed Safety Risk Assessment" for EFSA staff and experts, as well as corresponding experts from EU member states. In addition to the three standard EKE methods (Sheffield, Delphi and Cooke), the training included a semi-formal method of EKE. All these methods may be used when EKE is performed within an existing EFSA working group to support uncertainty analysis as outlined in "The principles and methods behind EFSA's Guidance on Uncertainty Analysis in Scientific Assessment". In total, 12 courses were organised: two on "Steering an Expert Knowledge Elicitation", two on "Conduct of the Sheffield protocol for an EKE", one on "Conduct of the Cooke protocol for an EKE", one on "Conduct of the Delphi protocol for an EKE", two on "Conduct of a Semi-formal EKE", two on "Reporting an Expert Knowledge Elicitation" and two on "Writing an Evidence Dossier for an Expert Knowledge Elicitation". The courses had in total 149 participants and received very good feedback from the participants with a mean value of 4.2 of 5 possible, considering all numerical questions in the feedback questionnaire. Recommendations for future activities on training EKE methodologies are provided.

Key words: Expert Knowledge Elicitation, Delphi, Cooke, Sheffield, semi-formal EKE, judgements

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Summary

In 2014, EFSA published a Guidance document on Expert Knowledge Elicitation (EKE) in Food and Feed Safety Risk Assessment. In this context EKE is defined as a systematic, documented and reviewable process to retrieve expert judgments from groups of experts in the form of probability distributions. EKE methods are formal, probabilistic judgement techniques designed to encourage careful, thoughtful judgments and reduce psychological biases. EFSA Guidance implements EKE in an efficient, rigorous and transparent manner, targeted on most important parameters, subject to critical review at key decision points, and fully documented.

The Guidance describes three main methods for eliciting a judgement from a group of experts: the Sheffield method, using behavioural aggregation, the Cooke method, using mathematical aggregation with performance weights, and the Delphi method, using individual expert elicitation with feedback loops (mixed behavioural and mathematical aggregation with equal weights). In 2018 EFSA published its Guidance on Uncertainty Analysis in Scientific Assessments.

To meet the recommendation that the experts should at least try to express their uncertainty in conclusion quantitatively, using subjective probability, the principles and methods behind EFSA Guidance on Uncertainty Analysis introduces minimal requirements for a less formal method for EKE. This, "Semi-formal" EKE, is described as a modification of the Sheffield method to an EFSA context where experts are the members of a Working Group or Panel, where their uncertainty can, but does not have to, be expressed using approximate probability. Although not a defined EKE method per se, semi-formal versions EKE are frequently used by working groups preparing EFSA opinions.

This report summarises the training courses delivered under the contract OC/EFSA/AMU/2021/02 EKE: Develop and conduct online training courses on Expert Knowledge Elicitation (EKE). The objective of the courses was to develop and conduct online training courses on applying the methodology described in the EFSA Guidance on Expert Knowledge Elicitation in Food and Feed Safety Risk Assessment for EFSA staff and experts, as well as corresponding experts at EU member states. The training included courses on the three standard EKE methods: Sheffield, Delphi and Cooke and semi-formal versions of EKE.

In total, 12 courses were organised. Steering an Expert Knowledge Elicitation (two rounds), Conduct of the Sheffield protocol for an EKE (two rounds), Conduct of the Cooke protocol for an EKE (one round), Conduct of the Delphi protocol for an EKE (one round) and Conduct of a Semi-formal EKE (two rounds) were modified and longer versions of courses delivered in a previous contract NP/EFSA/AMU/2018/02. The courses Reporting an Expert Knowledge Elicitation and two on Writing an Evidence Dossier for an Expert Knowledge Elicitation were created and delivered twice as part of this contract.

The training had in total 149 participants and received very good feedback from the participants with a mean value of 4.2 of 5 possible seen over all numerical questions in the feedback questionnaire.

Based on participants feedback and experience from delivering the courses, the tutors provide general recommendations for future training EKE methodologies. They also recommend a

modified course set: EKE for experts, Steering an EKE. Writing an Evidence Dossier for an EKE, Reporting an EKE, Conduct of the Sheffield protocol for EKE, Conduct the Delphi protocol for EKE, Conduct of the Cooke and IDEA protocols for EKE, EKE for parameters and EKE for categorical questions.

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1 Introduction

In June 2014, EFSA published a Guidance document on Expert Knowledge Elicitation (EKE) in Food and Feed Safety Risk Assessment. In this context EKE is defined as a systematic, documented and reviewable process to retrieve expert judgments from groups of experts in the form of probability distributions. EKE methods are formal, probabilistic judgement techniques designed to encourage careful, thoughtful judgments and reduce psychological biases. EFSA Guidance (2014) implements EKE in an efficient, rigorous and transparent manner, targeted on most important parameters, subject to critical review at key decision points, and fully documented.

The Guidance:

- describes the phases of the process beginning with defining the risk assessment problem, moving through preparation for elicitation (e.g., framing the elicitation questions, selecting the experts and the method to be used) and the elicitation itself, culminating in documentation;
- identifies the responsible actors for managing each of these phases;
- explicates three protocols for expert knowledge elicitation, that can be applied to real-life questions in food and feed safety. The Sheffield protocol with group interaction of experts (behavioural aggregation); the Cooke protocol with use of seed questions for the calibration of experts (mathematical aggregation); and the Delphi protocol on written individual expert elicitation with feedback loops (mixed behavioural and mathematical aggregation);
- ends with recommendations on the implementation of the methodology in EFSA.

The Sheffield method employs behavioural aggregation, in which the experts meet face to face in an elicitation workshop and are allowed to interact and discuss under the management of the elicitor. There are potential problems in such interaction which may distort the final elicited distribution and lead to a poor result, but the advocates of behavioural aggregation argue that with good facilitation by the elicitor these risks are minimised and are outweighed by the potential advantages of the interaction. Finally, within a face-to-face workshop it is easier to ensure that the experts understand clearly what is being asked of them.

Cooke's method does not allow the experts to discuss their judgements; interaction is limited to initial training and briefing. Instead of behavioural aggregation, Cooke's method employs a form of mathematical aggregation. The potential problems with mathematical aggregation are that the choice of an aggregation rule is somewhat arbitrary, that every choice can be shown to have some undesirable implications and that it is not clear whose judgements the aggregated distribution represents. Nevertheless, the advantage of having an aggregation rule makes the aggregation explicit, auditable and, in a sense, objective.

The Delphi method lies between these two positions. Interaction between experts is allowed but is controlled. Judgements from each round are fed back to the experts in the subsequent round, but in an anonymised form. Although the interaction is very limited, advocates of the Delphi approach argue that it allows some benefits from the sharing of information without the risks of personal factors influencing judgements inappropriately. After all rounds of the Delphi method are completed, the final distribution is obtained by a simple equal-weighting mathematical aggregation rule.

The Semi-formal expert knowledge elicitation is a reduced and simplified version of the formal protocols (e.g. Sheffield). It is intended for use when EKE should be performed within an existing EFSA working group. It provides probabilistic judgements about individual sources of uncertainty and may also be applied to suitable combinations of uncertainties. "The principles

and methods behind EFSA's Guidance on Uncertainty Analysis in Scientific Assessment" chapter 11.3 and its Annex B.8 describe the semi-formal EKE for quantitative expressions of uncertainty, but many of the principles are also applicable to qualitative expressions in general.

1.1 Background and terms of reference as provided by the requestor

This contract/grant was awarded by EFSA to: Lund University

Contractor: EFSA

Contract title: Develop and conduct online training courses on Expert Knowledge Elicitation (EKE)

Contract number: OC/EFSA/AMU/2021/02 EKE

The general objective of the contract resulting from this procurement was to develop and conduct online training courses on Expert Knowledge Elicitation (EKE).

The courses should be based mainly on the EKE Guidance document (EFSA 2014) and the Guidance on Uncertainty Analysis (EFSA 2019a) and have to be accompanied by homework to consolidate the ideas.

The contractor should be able to develop and conduct online training courses for EFSA staff, members of EFSA panels and the EFSA Scientific committee, members of EFSA working groups and networks, and corresponding experts from the member states in applying the methodology described in the EFSA Guidance on Expert Knowledge Elicitation in Food and Feed Safety Risk Assessment. The training will be synchronous online courses delivered through a platform e.g. MS Teams.

1.1.1 Objectives

Objective 1:

Adaptation/development of one curriculum and execution of one synchronous online course (28h) through a platform with minimum 2 trainers of: "Steering an Expert Knowledge Elicitation", adaptation of existing training material according to the on-site curriculum (available at EFSA from previous training sessions) plus 1 repetition of the course.

Objective 2:

Adaptation/development of one curriculum and execution of one (16 h) synchronous online course through a platform with minimum of 2 trainers of: "Conduct of the Cooke protocol for an EKE", adaptation of existing training material according to the on-site curriculum (available at EFSA from previous training sessions).

Objective 3:

Adaptation/development of one curriculum and execution of one (16 h) synchronous online course through a platform with minimum of 2 trainers of: "Conduct of the Delphi protocol

for an EKE", adaptation of existing training material according to the on-site curriculum (available at EFSA from previous training sessions).

Objective 4:

Adaptation/development of one curriculum and execution of one (16 h) synchronous online course through a platform with minimum of 2 trainers of: "Conduct of a Semi-formal EKE", adaptation of existing training material according to the on-site curriculum (available at EFSA from previous training sessions) plus 1 repetition of the course.

Objective 5:

Adaptation/development of one curriculum and execution of one (16 h) synchronous online course through a platform with minimum of 2 trainers of: "Conduct of the Sheffield protocol for an EKE", adaptation of existing training material according to the on-site curriculum (available at EFSA from previous training sessions) plus 1 repetition of the course.

Objective 6:

Development of one curriculum and conduction of one (16h) synchronous online course through a platform with minimum 2 trainers of: "Writing an evidence dossier for an Expert Knowledge Elicitation", plus 1 repetition of the course.

Objective 7:

Development of one curriculum and conduction of one (16h) synchronous online course through a platform with minimum 2 trainers of: "Reporting an Expert Knowledge Elicitation", plus 1 repetition of the course.

1.1.2 General content of all training courses

To enhance the motivation and learning success the on-line training courses have to use:

• a wide range of didactical elements, like presentations, individual exercises (homework), short tests, quizzes, group interactions, feedback elements, suitable for online courses.

• a set of practical examples and experiences from applications in the remit of EFSA. The contractor includes at least 3 examples from different areas of EFSA, selected from the following: chemical risk assessment; microbial risk assessment; environmental risk assessment; human nutrition; animal health and welfare risk assessment; plant health risk assessment.

• a clear structure of presuppositions, preparations and learning objectives

• virtual outbreak groups to use problem-based learning in the specific field of expertise of the participants

• supporting electronic material, e.g. presentations, lists of useful links, additional references for further study, and any other documentation considered relevant, handouts, a syllabus (i.e. an outline and summary of the topics to be covered by the training).

• an evaluation of the training success

The contractor provides clear instructions on how to perform expert knowledge elicitation in food and feed safety scientific assessments, based on the specific protocol; instructs on careful planning an EKE; guides on eliciting judgements and uncertainties.

1.1.3 Specific objectives for the training course: Steering an EKE

The target audience are EFSA staff, members of EFSA panels and the EFSA Scientific committee, members of EFSA working groups and networks, and corresponding experts from the member states all over EFSA's remit (via the Focal Points). The courses will be included in the EFSA Learning Offer.

1.2 Needs and expectations

1.2.1 Prerequisite knowledge, educational background

Due to the heterogeneous scientific background of experts working in the remit of EFSA and the still not common use of systematic, quantitative expert knowledge elicitation, it can be expected that the majority have limited pre-requisite theoretical knowledge, and no practical experience in specific elicitation methods. However, all participants will have a higher academic education in natural sciences or medicine. It is likely that the participants know quantitative risk assessment methods, and have basic knowledge in statistics, which are related to their field of application.

1.2.2 Language requirements

The training course has to be designed for participants with good knowledge of English. Nevertheless, as the target audience is international, the curriculum has to respect different cultural background and the language has to be easily understood by a non-native English speaker.

1.2.3 Scientific courses offered to staff and experts

Considering that the training will be required to be completed by experts, as condition to be involved in EFSA's work, a more extrinsic motivation can be assumed. Nevertheless, didactical elements to support intrinsic motivation and joy of learning have to be included during the whole training.

1.2.4 Other

In addition to the above:

- The training content was planned to be consistent with the EFSA Guidance on EKE (EFSA 2014), the EFSA Guidance on Uncertainty Analysis (2019a) and the EFSA Guidance on Communication of Uncertainty (EFSA 2019b).
- Participants were given clear information on what preparatory work is essential and what preparation is 'nice to have'.
- Participants were asked to ensure they were available for the entire duration of the training (e.g. arrange childcare, avoid other commitments).
- Participants were informed of the web environment to be used for the training and given clear instructions on how to connect and work in that environment. When applicable, a

pre-training exercise was used to check the software for the course, so that any problems can be addressed before the training.

2 Organisation of training

2.1 Overview

The 12 courses were given during the period 28 February 2022 to 4 July 2023 (Table 1). The training had in total 149 participants and it received very good feedback from the participants with a mean value of 4.2 of 5 possible seen over all numerical questions in the feedback questionnaire.

Table 1: Overview of 12 trainings, with duration, dates, tutors, number of participants and overall feedback.

Objective	Course	Version	Duration (half days)	Dates	Tutors	Number of participants	Feedback: number of responders	Feedback: Overall
2	Conduct of the Cooke protocol for an EKE	1	4	12, 13, 14, 15 September 2022	Abigail Colson, Tina Nane, Anca Hanea, Ullrika Sahlin and Maarten Nauta	5	3	4.1/5
3	Conduct of the Delphi protocol for an EKE	1	4	12, 20, 21, 22 July 2022	Lynn Frewer, Fergus Bolger, Anca Hanea, Julio Álvarez Sánchez, Kevin Wilson, Martine Barons and Ullrika Sahlin	5	4	4.3/5
7	Reporting an EKE	1	4	14, 15, 17, 18 November 2022	Tina Nane, Maarten Nauta, Lynn Frewer, Fergus Bolger and Ullrika Sahlin	10	1	4.5/5
7	Reporting an EKE	2	4	29, 30 June, 3, 4 July 2023	Tina Nane, Maarten Nauta, Lynn Frewer, Fergus Bolger and Ullrika Sahlin	6	2	4.1/5
4	Conduct of a Semi-formal EKE	1	4	30 May, 1, 7, 8 June 2022	Ullrika Sahlin, Kevin Wilson, Martine Barons, Maarten Nauta, Julio Álvarez Sánchez, Anca Hanea and Fergus Bolger	4	1	3.7/5
4	Conduct of a Semi-formal EKE	2	4	9, 10, 23, 28 March 2023	Ullrika Sahlin, Kevin Wilson, Martine Barons, Maarten Nauta, Julio Álvarez Sánchez, Anca Hanea and Fergus Bolger	10	4	4.5/5

5	Conduct of the Sheffield protocol for an EKE	1	4	26, 27, 30 September, 3 October 2022	Kevin Wilson, Ullrika Sahlin, Abigail Colson and Maarten Nauta	3	3	4.6/5
5	Conduct of the Sheffield protocol for an EKE	2	4	19, 31 January, 2, 3 February 2023	Kevin Wilson, Ullrika Sahlin, Abigail Colson and Maarten Nauta	21	13	4.3/5
1	Steering an EKE	1	7	28 February, 1, 2, 3, 4, 7, 8 March 2022	Julio Álvarez Sánchez, Andy Hart, Anca Hanea, Fergus Bolger, Kevin Wilson, Martine Barons and Ullrika Sahlin	23	17	3.6/5
1	Steering an EKE	2	7	25, 26, 27, 28, 29 April, 2, 3 May 2022	Julio Álvarez Sánchez, Andy Hart, Anca Hanea, Fergus Bolger, Kevin Wilson, Martine Barons and Ullrika Sahlin	17	1	4.4/5
6	Writing an Evidence Dossier for an EKE	1	4	10, 11, 12, 13 October 2022	Anca Hanea, Ullrika Sahlin, Julio Álvarez Sánchez and Tina Nane	9	5	3.8/5
6	Writing an Evidence Dossier for an EKE	2	4	9, 10 February, 2, 6 March 2023	Anca Hanea, Ullrika Sahlin and Julio Álvarez Sánchez	30	6	4.8/5

2.2 Announcement of trainings and participant registrations

The trainings were announced internally by EFSA, and registrations were collected by EFSA. EFSA made the final selection of participants for all trainings.

2.3 Training material and course certificates

Training material was shared with course participants in electronic format before the training via the course platform. Material for preparatory activities were shared via email to the participants. The material included e.g., presentations, recordings of asynchronous lectures (Appendix I), and examples of EKE (Appendix J) and other material used for practical exercises and independent learning. A list of examples of EKE. The EFSA logo changed during the time of the courses, and therefore the material consists of a mixture of the old and new logo. Participants received a certificate of attendance after the training.

2.4 Participant feedback

Participants were invited to complete a feedback form after the training that included questions on course content, time allocation, practical organisation, teaching and professional competence of the tutors, satisfaction and usefulness of training. The results for all trainings are summarised in Table 1 and Table H1 in Appendix H. Free text answers were analysed and summarised by the tutors.

Questions asked to the participants:

- 1.1. Did the course fully meet your expectations and requirements?
- 1.2. Have you reached the intended learning outcomes of the course?
- 1.3. Has the course facilitated your future work for EFSA?
- 2.1. Did the content of the course meet your training needs?
- 2.2. Was the course material at the correct level for your training needs?
- 2.3. Did the balance of practical sessions versus lectures meet your training needs?
- 2.4. Did the balance of synchronous versus asynchronous sessions meet your training needs?
- 2.5. Did the sessions for independent learning meet your training needs?
- 2.6. Did the time allocated for discussions with fellow participants and tutors meet your needs?
- 2.7. Did the teaching ability of the tutors meet your training needs?
- 2.8. If requested additional information, was this provided?
- 2.9. Which part/s of the course did you find MOST useful/instructive and why?
- 2.10. Which part/s of the course did you find LEAST useful/instructive and why?
- 3.1. Did the overall organisation and administration associated with the course, prior to and during the training, meet your requirements?
- 3.2. Did the course platform combined with an online meeting room in zoom meet your requirements?
- 3.3. How relevant and user friendly were the training materials?
- 3.4. How suitable was the scheduling, including duration of different tasks, of the training?

- 4. Please add any other comments that you have or suggestions on how the course and/or administration/organisation can be improved.

2.5 Trainings

2.5.1 Steering an Expert Knowledge Elicitation

Tutors were Julio Álvarez Sánchez, Andy Hart, Anca Hanea, Fergus Bolger, Kevin Wilson, Martine Barons and Ullrika Sahlin

The objectives of the course were that the participants on completing the course shall be able to:

1. Recall the characteristics of Expert Knowledge Elicitation (EKE)
2. Explain the role and purpose of EKE in risk assessment
3. Explain probabilistic expert judgements
4. Identify and prioritise tasks in risk assessment suitable for EKE
5. Frame a problem for EKE
6. Identify, select, and motivate experts for an elicitation
7. Decide on training needs for the experts
8. Produce background information for an elicitation
9. Recall typical protocols using the Cooke, Delphi and Sheffield methods
10. Discuss and select the appropriate elicitation method
11. Define the elicitation protocol, incl. adaptations, resources and selection of elicitors
12. Document and interpret results; discuss and handle risks of elicitations
13. Produce a complete documentation of an EKE
14. Discuss handling of confidentiality during an EKE
15. Discuss issues of repeatability of an EKE

The first version of the course was 7 half days developed from a 2 day (afternoon, full day, morning) physical course. The course consisted of lectures, practicals, quizzes, independent learning, reporting back and discussions (Annex A). The course was provided in the learning management system Canvas at Lund University and synchronous sessions were held in LU Zoom. The second version (Schedule in Appendix A) was a slight modification of the first version, considering feedback from participants and experiences from the tutors.

There were first 23 and then 17 registered participants from EFSA Panels, working groups, networks and member state authorities.

The feedback from the participants on both rounds of the course was negative relating to the scheduling and issues with time management, but mostly positive regarding content and tutors. A major part of respondents providing feedback found that the course material was just right for their training needs (Table H1). The average feedback rates were 3.6 (first round, 17 respondents) and 4.4 (second round, 1 respondent) out of 5 (Table 1). This indicates that the course improved between the rounds and provided an opportunity to gain theoretical and practical understanding of how to steer an Expert Knowledge Elicitation.

From the free text feedback from both courses we learnt that some participants found the course nicely structured and tutors of high quality, whereas others experienced it as a marathon of too much material. The practical sessions and independent learning with real examples gave the opportunity to understand concepts better, and it was useful to compare different EKE protocols.

There is a lot in this course, and the online version was too much of a time commitment for the participants. Recorded lectures were too long and should have been adjusted to a different format than live lectures. The asynchronous format worked well and offered the possibility to revisit parts.

The quizzes were intended to be used as revision and reinforcement of lectures in synchronous sessions, but this role of quizzes during the first course was not appreciated and therefore they were changed to be self-support in training. Feedback from tutors during practical sessions could have been more structured, and more time allowed for interaction even under asynchronous sessions.

Examples for the courses (Appendix I) were taken to represent different areas and EKE methods and were compiled into EKE summaries (Annex H). The participants were diverse from different areas of EFSA, which resulted in a challenge in finding suitable examples and reporting back to all participants. There were few EFSA examples of EKE applying the Cooke and Delphi methods.

Some participants were more interested in learning how to perform an elicitation session than learning about the whole EKE process. A participant asked for a course targeting experts taking part in an EKE. To accommodate this need, the tutors recommend creating a course for experts doing an EKE, introducing EKE and providing probabilistic training. Material developed as part of this contract, can be used for this purpose.

Tutors recommend shortening the course to 3-5 half days targeting persons that will steer or facilitate an EKE. Alternatively, to break up the course into two several courses, one focusing on steering with an introductory overview of EKE methods and other courses providing general knowledge about EKE methods with focus on application in and EFSA context. They recommend separating the lecture for Sheffield and Semi-formal EKE, to avoid confusion about Sheffield and Semi-formal, and allow for more time to explain the role of Semi-formal EKE protocols at EFSA. They also recommend giving a separate lecture or practical for the IDEA protocol (Hanea et al. 2016), to illustrate a modification combining Delphi and Cooke methods with the possibility for experts to interact.

2.5.2 Conduct of the Cooke protocol for an EKE

Tutors were Abigail Colson, Tina Nane, Anca Hanea, Ullrika Sahlin and Maarten Nauta.

The objectives of the course were that the participants on completion of the course shall be able to:

1. Describe the key features and structure of an EKE using the Cooke protocol
2. Identify suitable uses of the Cooke protocol for EFSA assessments
3. Design target and seed questions

4. Plan and prepare an elicitation by the Cooke protocol
5. Analyse experts' assessments using Excalibur and interpret the results
6. Document an elicitation using the Cooke protocol
7. Be aware of the differences between Cooke method and other EKE methods

The course was 4 half days developed from a one-day physical course. The course consisted of lectures, practicals, quizzes, independent learning, reporting back and discussions. The course was provided in the learning management system Canvas at Lund University and synchronous sessions were held in LU Zoom.

There were 5 registered participants from EFSA Panels, working groups, networks and member state authorities.

The feedback from the participants was negative related to independent learning and practicals but positive related to lectures and discussions (Table H1). The average feedback rate was 4.1 out of 5 (Table 1). This indicates that the course provided an accessible introduction to the topic.

From the free text feedback we learnt that lectures and discussions were comprehensive. The independent learning and reporting could have been better and the practical on Excalibur is better led by a tutor. The recorded lectures would benefit from being shortened.

Tutors recommend shortening the course to 3 half days targeting persons that will steer or facilitate an EKE.

A future course would benefit from including both the Cooke and IDEA protocols, the latter being a combination of all the three main EKE methods (Hanea et al. 2016). This would be possible when the appropriateness and usefulness of the IDEA protocol has been evaluated by EFSA.

The lack of examples applying the Cooke protocol on EFSA assessments is potentially stopping it from being used. The Cooke method requires seed questions, and there are few or no examples demonstrating reasonable seed questions for different uses of EKE in EFSA assessments. The possibility to apply performance-based weighting of experts in EFSA assessments is constrained by the working principles of Working Groups and Panels. To give more guidance on using mathematical aggregation instead of behavioural aggregation, the tutors recommend EFSA to apply the Cooke and/or IDEA methods for aggregating expert judgements and evaluate how well they work in an EFSA context.

2.5.3 Conduct of the Delphi protocol for an EKE

Tutors were Lynn Frewer, Fergus Bolger, Anca Hanea, Julio Álvarez Sánchez, Kevin Wilson, Martine Barons and Ullrika Sahlin.

The objectives of the course were that the participants after completing the course, shall be able to:

1. Describe the key features and structure of an EKE using the Delphi protocol

2. Identify suitable uses of the Delphi protocol for EFSA assessments
3. Prepare an elicitation by the EFSA Delphi method
4. Recruit experts for an EFSA Delphi workshop
5. Be aware of suitable tools for an EFSA Delphi elicitation
6. Facilitate a remote session using the EFSA Delphi protocol
7. Analyse and report results from an EFSA Delphi elicitation
8. Document a Delphi protocol

The course was 4 half days developed from a one-day physical course. The course consisted of lectures, practicals, quizzes, independent learning, reporting back and discussions. The course was provided in the learning management system Canvas at Lund University and synchronous sessions were held in LU Zoom.

The preparatory lecture and practical were added to support the participants learning about the Delphi protocol, by reminding about the use of EKE and quantitative judgements in an EFSA context. This was considered as preparatory material that could be accessed by the participants prior or during the course, (partly to accommodate varying availability) and therefore they were not included as a lecture or practical in the course as such.

There were 5 registered participants from EFSA Panels, working groups, networks and member state authorities. Due to availability of participants, the course was given a restructured schedule, where the asynchronous preparatory lecture and practical was moved to the first day and lecture 2, 3 and 4 moved to the second day.

The feedback from the participants was very positive (Average 4.3 out of 5, Table 1) indicating that the course provided an accessible introduction to the topic (Table H1).

From the free text feedback from both courses we learnt that discussions and practicals were helpful to digest theory, identify potential challenges and applications of the method. Interactions between participants and teachers were particularly useful. Due to the low number of participants, the examples chosen did not fall into everyone's area, which created a problem in the practicals. It is important that tutors are well prepared and can explain the context and assessments in the examples,

The tutors found that the course provides a good introduction to EKE in general. The format linking all practicals to consider different steps of a Delphi process on the same example could be adopted in the other courses.

Tutors recommend shortening the course to 3 half days targeting persons that will steer or facilitate an EKE. The tutors recommend letting material from the lecture about summarising qualitative judgments (the experts' reasonings behind their judgements) be expanded further and go into other courses on EKE. They also recommend that a future course include the IDEA protocol (Hanea et al. 2016), the latter being a combination of elements from all three main methods. The limited number of examples applying the Delphi protocol on EFSA assessments is a factor that can hinder it from being used more often. Behavioural aggregation is currently closest to the existing interactions in Working Groups and Panels. More guidance is needed for which situations the Delphi method is preferable

over behavioural aggregation in EFSA assessments. The tutors therefore recommend EFSA to apply Delphi and/or IDEA methods for aggregating expert judgements and evaluate how well they work in an EFSA context.

2.5.4 Conduct of a Semi-formal EKE

Tutors were Ullrika Sahlin, Kevin Wilson, Martine Barons, Maarten Nauta, Julio Álvarez Sánchez, Anca Hanea and Fergus Bolger.

The principles and methods behind EFSA's Guidance on Uncertainty Analysis in Scientific Assessment (2018) defines minimal requirements for Semi-formal EKE:

- Predefined, unambiguous question
- Appropriate group of experts
- Basic training in probability judgements
- Available evidence provided in convenient form
- Appropriate & documented elicitation method
- Neutral facilitator, not contributing to judgements
- Clearly expressed result & summary of reasoning

A protocol is a set of choices that defines a complete method for conducting an elicitation (EFSA 2014). When developing the course, the tutors addressed needs to accommodate the distinction made by EFSA between formal and semi-formal protocols for EKE. Semi-formal EKE was introduced in the development of the Uncertainty Analysis Guidance (EFSA 2019a) to adapt applications of EKE to be fit for purpose in some particular EFSA contexts. A Semi-formal EKE protocol is a modification of a formal EKE protocol, that is ensured to be rigorous if it fulfils a set of minimum requirements. The most common use is a semi-formal protocol for the application of the Sheffield method. Efforts were made to clarify in the course material that Semi-formal EKE is a protocol and not a method to elicit group judgements. The course Semi-formal EKE was designed to identify situations (e.g. urgent assessment, for the characterisation of overall uncertainty, and less formal EKE on less important parameters) when Semi-formal EKE is justified and help the participants to critically evaluate EKEs with respect to the minimum requirements.

From the examples of EKE, it was common to express expert judgements by Approximate Probabilities (APs) as part of uncertainty analysis in EFSA assessments. An AP is a range or bound for a subjective probability (EFSA 2018). It is worth noting that the three main EKE methods in the EFSA Guidance for EKE are not intended for judgements expressed by AP. In Table B.17 in Annex B of the Principles and Methods behind the Guidance on Uncertainty Analysis in Scientific assessments (EFSA 2018), formal EKE is described as resulting in uncertainty expressed in the form of subjective probabilities or subjective probability distributions, whereas the Semi-formal EKE in addition to these expressions also can result in probability bounds (an AP). As a result, an EKE when experts make their judgements with an AP is being referred to as a Semi-formal EKE. The use of AP can be justified if it is easier or enough for experts to provide a range than a precise probability. There are several alternative interpretations for the range of an AP, and therefore care must be taken to clarify this when making judgements. The tutors identified that expert elicitation of a

categorical question expressed quantitatively by an AP is a new EKE method that is open for review by experts in the field. To support training of EKE in an EFSA context, the tutors therefore recommend EFSA improve the description and strengthen the justification of this new method.

EFSA's AP Scale has been developed to create harmonised use of verbal expressions when communicating uncertainty for a categorical question (EFSA 2018, EFSA 2019b). According to Section 12.3 of the Guidance for Uncertainty Analysis (EFSA 2019a), "assessors may find it helpful to refer to a standard scale of probability ranges when making judgements in semi-formal procedures or by less formal methods". EFSA's Approximate Probability Scale (APS) is recommended for this purpose, but only as an aid, not a guide, and experts should be encouraged to use their own range and precise probability if these better express their judgement (EFSA 2018). The Guidance for Uncertainty Analysis is firm that "judgements should be based on the probability ranges, not on the verbal terms" (Section 12.3 EFSA 2019a). When using the APS to facilitate elicitation, there is a risk that assessors do not follow this recommendation, or follow it but the experts become inappropriately influenced by the verbal phrases. From the EKE examples and in discussions with experts and staff participating in the course, questions were raised on the use of the APS to facilitate judgements. The tutors have chosen to raise these concerns in the training, an put emphasis on the importance of following the guidance and guarding against the potential for bias.

The objectives of the course were that after completing the course, participants shall be able to:

1. Describe the key features and structure of a Semi-formal EKE using the Sheffield protocol
2. Account for the differences and tradeoffs between Semi-formal and formal EKE
3. Identify suitable uses of Semi-formal EKE in EFSA assessments
4. Organise the elicitation workshop, facilities and material on existing evidence
5. Frame a question for an elicitation using Semi-formal EKE
6. Train experts in doing probabilistic judgements of quantities and yes/no questions for Semi-formal EKE
7. Use software supporting judgements in a Semi-formal EKE using the Sheffield protocol
8. Summarise the existing evidence, identify limitations, and list uncertainties
9. Report a Semi-formal EKE
10. Define the work plan and resources (time, staff and budget) needed for a Semi-formal EKE
11. Review the existing expertise within the working group and select the expert panel for a Semi-formal EKE
12. Handle confidentiality issues

The first version of the course was 4 half days developed from a one-day physical course. The course consisted of lectures, practicals, quizzes, independent learning, reporting back and discussions. The course was provided in the learning management system Canvas at

Lund University and synchronous sessions were held in LU Zoom. The second version was a slight modification of the first version, considering feedback from participants and experiences from the tutors.

There were first 4 and then 10 registered participants from EFSA Panels, working groups, networks and member state authorities.

The feedback from the participants on both rounds of the course was negative relating to the format but mostly positive regarding content and tutors (Table H1). A major part of respondents providing feedback found that the course material was just right for their training needs. The average feedback rates were 3.7 (first round, one respondent) and 4.5 (second round, 4 respondents) out of 5 (Table 1). This indicates that the course improved between the rounds and provided an opportunity to gain theoretical and practical understanding of how to conduct a Semi-formal EKE and the context when this is suitable.

From the free text feedback from both courses we learned that the appreciation of the course depended on whether the participants were interested in facilitating or not. In any case, the course material was appreciated as it provided a theoretical background to EKE and a discussion on usefulness, advantages and disadvantages of different types of EKE. One participant wrote "As a person with little experience in EKE procedure, I found the theoretical background provided by this course very useful. The knowledge acquired during this course will help me to better understand the formulation/structure of the EKE needed for ongoing mandates I'm involved in." Practicals were a good recap of lessons and provide good examples of the topic. It was appreciated to be able to do practicals in advance. The recorded material allowed for pausing and taking time to process. On the negative side, some of the discussions were unstructured and could have been more efficient.

The tutors recommend that future course target persons that will steer or facilitate an EKE. To further tailor the training, the course can be split into one course for judgements on parameters, focusing on semi-formal protocols using behavioural aggregation resulting in probability distributions, and judgements for categorical questions, focusing on semi-formal protocols for overall uncertainty resulting in probability or probability bounds.

2.5.5 Conduct of the Sheffield protocol for an EKE

Tutors were Kevin Wilson, Ullrika Sahlin, Abigail Colson and Maarten Nauta.

The objectives of the course were that the participants on completing the course shall be able to:

1. Explain probabilistic expert judgements
2. Recall the key features and structure of the Sheffield protocol
3. Review and finalize the elicitation protocol for the Sheffield method
4. Define the work plan and resources (time, staff and budget) needed for the Sheffield method
5. Establish an expert panel for an EKE using the Sheffield method
6. Invite and prepare experts for the elicitation workshop
7. Organize the elicitation workshop, facilities and material

8. Understand the need for training on probabilistic judgements and Sheffield protocol for the experts
9. Use the Sheffield tools in a basic manner (SHELF software and forms)
10. Actively support a conduct of the Sheffield protocol
11. Analyse, interpret, and discuss the results of an EKE using the Sheffield method
12. Help to prepare the necessary reports
13. Handle confidentiality issues with regards to Chatham House rules

The first version of the course was 4 half days developed from a one-day (afternoon, morning) physical course. The course consisted of lectures, practicals, quizzes, independent learning, reporting back and discussions. The course was provided in the learning management system Canvas at Lund University and synchronous sessions were held in LU Zoom.

There were first 3 and then 21 registered participants from EFSA Panels, working groups, networks and member state authorities.

The feedback from the participants on both rounds of the course was very positive (Table H1). A major part of respondents providing feedback found that the course material was just right for their training needs. The average feedback rates were 4.6 (first round, 3 respondents) and 4.3 (second round, 13 respondents) out of 5 (Table 1). This indicates that the course provided an opportunity to gain theoretical and practical understanding of how to perform an Expert Knowledge Elicitation using the Sheffield protocol.

This course was useful even for someone not so familiar in EKE. From the free text feedback from both courses one could find positive statements "I think anyone who does EKE training should start from this one" and "This course is useful not only for beginners like me, but for professionals already dealing with EKE". Some participants appreciated the work with the SHELF software. Lectures were very informative providing an overview of the method that were helpful when designing an EKE. Practicals following background through lectures and followed by discussions were appreciated, and "helped one think about the concepts more concretely". The role playing was instructive and helped a lot to understand the expression of other opinions and the challenges of the elicitator. More could be provided in the role play, in particular with regard to probability estimates. Overall, discussion with the tutors was very helpful.

Based on the feedback from participants, there is a need for a course for facilitators and a course for experts. The format with all lectures live in synchronous sessions, and some practicals asynchronous worked well.

The tutors found that too much time was spent on installation of R on participants' computers. This can be avoided by using the R-studio cloud. Some participants wanted to fit distributions using other software used at EFSA, e.g. @risk.

Tutors recommend shortening the course to 3 half days targeting persons that will steer or facilitate an EKE.

2.5.6 Writing an Evidence Dossier for an Expert Knowledge Elicitation

Tutors were Anca Hanea, Ullrika Sahlin, Julio Álvarez Sánchez and Tina Nane (first round only).

The first version of the course was 4 half days developed as part of this tender. The course consisted of lectures, practicals, quizzes, independent learning, reporting back and discussions. The course was provided in the learning management system Canvas at Lund University and synchronous sessions were held in LU Zoom. The second version was a slight modification of the first version, considering feedback from participants and experiences from the tutors.

The objectives of the course were that after completing the course, participants shall be able to:

1. Describe the main components of an ED prepared specifically for an EKE
2. Identify key features of an ED to support EKE in EFSA's scientific assessments
3. Evaluate an ED to support EKE according to good practice
4. Be familiar with using tables and graphical tools to summarise quantitative information in an ED
5. Be able to draft the structure of an ED supporting EKE in an EFSA context

There were first 9 and then 30 registered participants from EFSA Panels, working groups, networks and member state authorities.

The feedback from the participants improved from the first to the second round of the course (Table H1). Participants were in general satisfied with the balance of synchronous and asynchronous sessions. For the first round, 2 of the respondents found that the course material was just right for their training needs, whereas 2 found it to be too advanced and one too basic. For the second round, all respondents found the course material to be just right for their training needs, demonstrating that the revision of the course was successful in that respect. The average feedback rates were 3.8 (first round, 5 respondents) and 4.8 (second round, 6 respondents) out of 5 (Table 1). This indicates that the course provided an accessible introduction to the topic.

The course could be significantly shortened. From the free text feedback from both courses the tutors learned that participants appreciated the work on practical examples and a lot of group discussions. They found that the independent learning for one half day allowed them to put gained knowledge into practice, and there was enough time to evaluate the work done together with the tutors.

The lecture on writing an Evidence Dossier for an EKE with many questions was useful, but a bit complex and somewhat outside the EFSA context, and could be replaced by a range of applications on EFSAs work.

They found it helpful to see the range of applications and to experience learning by doing, although it was desirable to focus more on best practice. There is no guidance on what is best practice in Writing an Evidence dossier for an EKE in an EFSA context, and the course

was designed to provide participants a basis to reflect on best practices. The independent learning and presentations during the last day of the course resulted in a list of suggested criteria for good practice in an EFSA context:

An Evidence Dossier supporting an Expert Knowledge Elicitation should

- contain information on relevant evidence, data and modelling
  - link this information with information on uncertainties
- contain information on uncertainties
  - list sources of uncertainty that might influence the judgement on the EKE question
  - add support on how to reason when taking these sources into account
  - provide any quantitative information of uncertainty or ranges in data and estimates
- be focused on supporting the EKE question
  - clarify the context for the EKE (including type, prioritisations and method for EKE)
  - contain a well-defined and targeted EKE question
  - avoid too much information
- be easy to follow
  - adapted and balanced layout and structure
  - accessible references and links, when available, to other material
  - summaries of information in tables to make it easier for experts to digest and compare multiple sources of evidence/data
  - visualise evidence/data using e.g. forest plots from meta-analyses or, if no meta-analysis has been done, modifications of forest plots with the data only
- provide guidance to help experts make their judgements
  - guidance on how to interpret information
  - guidance on making probabilistic judgements
  - guidance to synthesise pluralistic evidence
    - e.g. when comparing conflicting evidence, list the conditioning factors & conditions from each study for contrast
    - support to consider sources of uncertainty, e.g. sensitivity analysis reports
  - Interactive tools to explore tables, maps or do sensitivity analysis on a model

  - Information about previously made judgments (e.g. previous rounds of an iterative EKE process or qualitative judgements on source of evidence
- be reviewed by the elicitation group
  - and if helpful by additional experts before sending to the experts
  - and the experts
  - new evidence revealed during the session should be reviewed as well

Tutors recommend shortening the course to 3 half days targeting persons that will steer or facilitate an EKE and/or staff or experts preparing evidence dossiers for EKE. Future versions of the course need additional good examples of evidence dossiers for EKE in an EFSA context.

2.5.7 Reporting an Expert Knowledge Elicitation

Tutors were Tina Nane, Maarten Nauta, Lynn Frewer, Fergus Bolger and Ullrika Sahlin.

The objectives of the course were that the participants after completing the course shall be able to:

1. Describe the key requirements of reporting an EKE
2. Understand why these requirements of reporting an EKE are there
3. Select type of reporting and appropriate content depending on the aim of reporting
4. Identify reporting content required for each EKE method
5. Plan and prepare three types of reporting that are in the EFSA EKE Guidance
6. Review reportings of EKE
7. Be aware of requirements on reporting in EFSA Guidance, and recommendations to communicate risk and uncertainty in EFSA guidance's
8. Be aware of reporting styles that are not following EFSA’s reporting protocol

The first version of the course was 4 half days developed as part of this tender and had 10 registered participants from EFSA Panels and working groups. The course consisted of lectures, practicals, quizzes, independent learning, reporting back and discussions. The course was provided in the learning management system Canvas at Lund University and synchronous sessions were held in LU Zoom. The second version was a slight modification of the first version, considering feedback from participants and experiences from the tutors. There were 6 registered participants from EFSA Panels, working groups, networks and member state authorities on the second round of the course.

The feedback from the participants on both rounds of the course was very positive (Table H1). The average feedback rates were 4.5 (first round, 1 respondent) and 4.1 (second round, 2 respondents) out of 5 (Table 1). For the first round, the only respondent found that the course material was just right for her training needs, whereas 1 person found it too basic in the second round. Due to a low number of respondents it is not clear if the quality

of the course changed between the revisions. Our conclusion is that the course provided an accessible introduction to the topic.

EFSAs practices on reporting an EKE was not entirely clear during the development of the course, and there the course would improve from identifying what they are. The course requires experience in EKE. Reporting challenges are part of the whole EKE process, but it is too much to explain an EKE process at the course. Participants found it difficult to use a concrete case of their own for which they were to plan reporting. There is guidance on what is best practice for reporting an EKE in an EFSA context in the EKE Guidance document, but the course aimed to identify explicit recommendations allowing the participants to reflect on best practices. The independent learning and presentations during the last day of the course resulted in a list of suggested criteria for good practice in an EFSA context.

Tutors recommend shortening the course to 3 half days targeting persons that will steer an EKE.

3 Conclusions

All objectives have been delivered upon and the general and specific requirements for each course were fulfilled. Two new courses have been created and new course material has been added to existing courses. Compared to the previous set of courses (Colson et al. 2020), there was more material available demonstrating the use of EKE in EFSA assessments. Collected examples of EKE in practice, especially in the EFSA context (Appendix J), were perceived as valuable. In some cases, it was unclear to what extent certain aspects of the EKE process aligned with guidance.

The number of participants on all courses was 149. Some courses had more than 20 participants (Steering and EKE, Conduct of the Sheffield method, Writing an Evidence Dossier), which was difficult to manage in interactive sessions online with reporting back. Other courses had too few participants (five or less), which reduced the possibility of benefiting from participants' experiences in an efficient way.

Overall, the participants were satisfied with the courses. The tutors were satisfied with the course participants for providing opportunities for interesting discussions and a deeper understanding of EFSAs work.

4 Recommendations

4.1 General recommendations for future training

The tutors recommend for future training activities on EKE to

- Tailor courses for two target audiences: i) persons that will steer or facilitate an EKE and ii) scientific experts taking part in an EKE. This will allow courses to be more effective and provide general and necessary training for experts.
- Shorten the courses to three (max 5) half days. The days do not have to be consecutive. This is to accommodate for the EFSA staff and experts' busy schedules. Although shortened, asynchronous sessions are useful for hosting recorded material,

quizzes and other material to prepare for the synchronous sessions and to allow for flexibility in the schedule.

- Plan for physical or online formats (or mixture of these) to make the best use of their benefits. For example, an online format does not require travelling, is more accessible for more people, and the course can be spread out in time. Courses for people already based at EFSA could be physical, so only the tutors would need to travel, whereas online courses are favorable for experts more geographically dispersed. A physical format enables the participants to better engage with the course material. Courses targeting facilitators might benefit from having at least one physical session.
- When using recorded lectures, use sets of shorter videos and accompanying text.
- Include role play, e.g. on when defining EKE questions or facilitating an elicitation session, as a pedagogical method in more courses.
- Ensure that participants have the required expertise in EFSA assessments to be able to take part in and compare real applications of EKE.
- Tailor training on EKE on parameters and categorical questions separately. The first focusing on elicitation methods resulting in a probability distribution. The second is relevant for the characterisation of overall uncertainty in the answer to a categorical assessment question and should also cover elicitation resulting in approximative probabilities.
- Consider additional guidance on elicitation on approximate probability, including how to set a suitable operational definition for the range.
- Consider approaches to elicit and summarise qualitative judgement to justify the quantitative judgement in more courses.
- Consider additional guidance or experience on using performance-weighted mathematical aggregation in an EFSA context.
- After a review, consider including the IDEA protocol (with equal weighting or performance-based weighting) as a possible EFSA method for EKE. The IDEA protocol combines elements from all three methods and was developed after the EKE Guidance.

4.2 Suggested modified course set

Based on the general recommendations and identified needs, the tutors propose a modified course set.

4.2.1 EKE for experts

A new two half-day course for scientific experts taking part of EKEs as expert. The course should explain basic concepts, the EKE process and provide basic probabilistic training. This can be an online self-study course with recorded lectures, quizzes and practical exercises. The course could be designed as a resource for experts to come back to in their work for EFSA.

4.2.2 Steering an EKE

Reduce the existing course to three half days targeting persons that will steer or facilitate. Consider material related to steering from the course on Semi-formal EKE, in particular the

minimal requirements and situations justifying a less formal EKE. Provide an overview of different EKE methods, and direct participants to take complementary courses to learn more about the different EKE protocols. Provide training in facilitation of a method with behavioural aggregation using a role play (preferably in a physical session). Include condensed material, e.g. a lecture and a practical, from the courses Reporting an EKE and Writing an Evidence Dossier for an EKE.

4.2.3 Writing an Evidence Dossier for an EKE

Reduce the existing course to three half days. Tailor for a specific topic to allow for focused examples. Preferably, spread it out in time to allow for independent individual work.

4.2.4 Reporting an EKE

Reduce the existing course to three half days, targeting staff and experts that are to be involved in steering an EKE. One option is to tailor a specific topic to allow for focused examples. Another option is to present a broad range of reporting practices across EFSA areas to allow cross-fertilisation.

4.2.5 Conduct of the Sheffield protocol for EKE

Reduce the existing course to three half days targeting persons that will steer or facilitate an EKE. Aim for in-person course to practice facilitation when there are interactions between experts.

4.2.6 Conduct of the Delphi protocol for EKE

Reduce the existing Delphi course to three half days targeting persons that will steer or facilitate an EKE. Aim for online course to reduce the need for travelling.

4.2.7 Conduct of the Cooke and IDEA protocols for EKE

Reduce the existing course in the Cooke protocol to three half days targeting persons that will steer or facilitate an EKE. Include the IDEA protocol with performance-based weighting. Aim for an online or a hybrid course on non-consecutive days.

4.2.8 EKE for parameters

A new three half day course targeting persons that will steer or facilitate an EKE. Introduce the three main EKE protocols and the IDEA protocol. Provide advanced training on methods allowing for interaction between experts, e.g. the Sheffield and the IDEA protocol (with equal weighting).

4.2.9 EKE for categorical questions

A new three half day course targeting persons that will steer or facilitate an EKE that align with the Guidance on Uncertainty Analysis (EFSA 2019a) and Communication of Uncertainty (EFSA 2019b). Introduce methods to elicit categorical questions allowing for interaction or behavioural aggregation between experts. Use material from the course Semi-formal EKE on methods to characterise uncertainty in conclusions (overall uncertainty) and elicitation resulting in approximate probabilities.

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Abbreviations

AHAW	Animal Health and Welfare
APS	Approximate Probability Scale
BIOHAZ	Biological Hazards
BPA	Bisphenol A
CEP	Food Contact Materials, Enzymes and Processing Aids
CONTAM	Contaminants in the food chain
EKE	Expert Knowledge Elicitation
FAF	Food Additives and Flavourings
FEEDAP	Additives and Products or Substances used in Animal Feed
GMO	Genetically Modified Organisms
IDEA	Investigate, Discuss, Estimate, Aggregate
NDA	Nutrition, Novel Foods and Food Allergens
PLH	Plant Protection Products and their Residues

Appendix A – Course programme for Steering an EKE

The schedule for the 7 half days of training

PART 1. Principles and problem definition: role of the Working Group

DAY 1.

09:00: Synchronous INTRODUCTION: Course objectives and agenda

9:20 Synchronous LECTURE 1. Introduction – reasons and roles for the use of EKE in EFSA risk assessments

9:35 Synchronous PRACTICAL 1a. Examples of expert judgement in EFSA's work from participants

10:15 Synchronous BREAK

10:40 Synchronous PRACTICAL 1b. Examples of expert judgement in EFSA's work to work with during practicals of the course

11:10 Synchronous Introduction to the course platform and groups and introduction to independent learning

11:30 Synchronous SESSION ENDS

11:30 Asynchronous *LECTURE 2. Key principles for EKE

11:55 Asynchronous Lecture 2 quiz

12:00 Asynchronous LECTURE 3. Probabilistic expert judgements

12:25 Asynchronous Lecture 3 quiz

12:30 Asynchronous LECTURE 4. Identifying priority parameters for EKE

12:55 Asynchronous Lecture 4 quiz

13:00 END OF DAY

DAY 2:

9:00 Synchronous Feedback on quiz on material from Lect 2,3,4. Time for questions

9:20 Synchronous PRACTICAL 2. Plenary. Discussion of key principles

9:50 BREAK

10:00 Synchronous PRACTICAL 3. Probabilistic expert judgements - work individually

10:30 Synchronous Feedback on Practical 3

10:50 Synchronous PRACTICAL 4 - breakout groups. Identifying priority parameters for EKE: sensitivity analysis

PART 2. The pre-elicitation phase: role of the Steering Group

11:40 Asynchronous LECTURE 5. Specifying questions for EKE

12:10 Asynchronous Lecture 5 quiz

12:20 Asynchronous LECTURE 6. Identifying, selecting, motivating and training experts for an elicitation

12:50 Asynchronous Lecture 6 quiz

13:00 END OF DAY

DAY 3

09:00 Independent learningIL1: Each participant selects an EKE case study close to their unit /panel and reads the opinion in detail and identifies how priority parameters for EKE were identified. IL2: Continue with the same EKE case study and identify how the experts were identified, selected, motivated & trained. Prepare a 4-minute summary.

11:40 Asynchronous LECTURE 7. The evidence dossier

12:10 Asynchronous Lecture 7 quiz

12:15 Asynchronous LECTURE 8. Sheffield Method (and an introduction to Semi-formal EKE)

12:55 Asynchronous Lecture 8 Quiz

13:00 END OF DAY

DAY 4

9:00 Synchronous Feedback on quiz on material from Lect 5,6,7. Time for questions

9:20 Synchronous Report back on independent learning

10:05 Synchronous PRACTICAL 5 - breakout groups. Specifying questions for EKE

10:30 Synchronous PRACTICAL 6 - breakout groups. Identifying, selecting, motivating and training experts for an elicitation

10:55 Synchronous PLENARY DISCUSSION - report back from breakout groups P5 and P6

11:35 Synchronous SESSION ENDS

PART 3. The elicitation phase: role of the Elicitation Group

11:35 Asynchronous LECTURE 9. Delphi Method

12:05 Asynchronous Lecture 9 quiz

12:10 Asynchronous LECTURE 10. Cooke Method

12:25 Asynchronous Lecture 10a IDEA Protocol

12:50 Asynchronous Lectures 10 &10a quiz

13:00 Asynchronous SESSION ENDS

DAY 5

9:00 Synchronous Feedback on quiz on material from Lect 8-10a Time for questions

9:20 Synchronous PRACTICAL 10 - breakout groups. Key aspects of steering the Cooke & IDEA methods

10:10 Synchronous PLENARY DISCUSSION - report back from breakout groups P10

10:30 Synchronous PRACTICAL 9 - breakout groups. Key aspects of steering the Delphi method

11:20 Synchronous PLENARY DISCUSSION - report back from breakout groups P9

11:40 Synchronous PRACTICAL 8 - breakout groups. Key aspects of steering the Sheffield method

12:30 Synchronous PLENARY DISCUSSION - report back from breakout groups P8

12:50 Synchronous Instruction independent learning 2nd session

13:00 END OF DAY

PART 4. The post-elicitation phase

DAY 6:

9:00 Asynchronous LECTURE 11. Selecting the appropriate elicitation method

9:30 Asynchronous Lecture 11 quiz

9:35 Asynchronous LECTURE 12. Steering and documenting the elicitation process: review of main points

9:55 Asynchronous Lecture 12 quiz

10:00 Independent learningIL3: Continue with same example as IL1 and and identify the protocol used and how it was applied. Suggest others that might be suitable. IL4: Continue with the same example and identify how the EKE questions were specified. Can you suggest improvements? Prepare 4-minute summary for IL3 and IL4. IL5: Opportunities and challenges for uptake in participants' own work areas. Prepare 2-minute presentation for the final discussion on the last day of the course.

13:00 END OF DAY

DAY 7

9:00 Synchronous Feedback on quiz on material from Lect 11 & 12. Time for questions

9:15 Synchronous Report back on independent learning (IL3 and IL4)

PART 5. Lessons learned and future implementation

9:55 Synchronous PRACTICAL 11 - breakout groups. Selecting the appropriate elicitation method

10:25 Synchronous PRACTICAL 12 - breakout groups. Challenges and solutions in implementing EKE in scientific assessment

10:45 Synchronous PLENARY DISCUSSION - report back from breakout groups (P11 and P12)

11:15 Synchronous Opportunities and challenges for uptake in participants' own work areas - breakout groups for the independent learning. Meet and discuss and possibly revise the reporting back on IL5.

11:35 BREAK

11:50 Synchronous Reporting back from independent learning (IL5): Opportunities and challenges for uptake in participants' own work areas

12:20 Synchronous PLENARY DISCUSSION - Opportunities and challenges for uptake in participants' own work areas

12:55 Synchronous Course wrap up

13:00 END OF DAY

Appendix B – Course programme for Conduct of the Cooke protocol for an EKE

The schedule for the 4 half days of training was

DAY 1: Introduction to the method

9:00 Synchronous INTRODUCTION: Welcome and course objectives

9:10 Synchronous Overview of course platform

9:20 Synchronous LECTURE 1. EKE and judgement of uncertain quantities

9:50 Synchronous QUIZ: Lecture 1

10:00 Synchronous LECTURE 2. Overview of the Cooke method

10:40 Synchronous BREAK

11:10 Synchronous LECTURE 3. Identifying seed questions for Cooke method

11:40 Synchronous QUIZ: Lectures 2 & 3

11:50 Synchronous Day 1 Introduction to independent learning

12:00 Asynchronous INDEPENDENT LEARNING 1: Think about relevant questions from own area of work & post to forum

12:50 Asynchronous DISCUSSION: Post independent learning questions in the discussion forum

13:00 END OF DAY

DAY 2: Performance and performance-based Aggregation

9:00 Synchronous DISCUSSION: Welcome, recap of forum discussion, feedback on example questions

9:20 Synchronous PRACTICAL 1. Identifying seed questions for Cooke method

10:20 Synchronous BREAK

10:40 Synchronous DISCUSSION: Identifying seed questions; day 2 wrap up

11:10 Asynchronous LECTURE 4. Expert performance in the Cooke method

11:30 Asynchronous QUIZ: Lecture 4

11:40 Asynchronous LECTURE 5. Performance-based aggregation in the Cooke method

12:00 Asynchronous QUIZ: Lecture 5

12:10 Asynchronous LECTURE 6. Introduction to EXCALIBUR

12:30 Asynchronous INDEPENDENT LEARNING 2: Introduction to EXCALIBUR

12:50 Asynchronous DISCUSSION: post independent learning questions in the discussion forum

13:00 END OF DAY

DAY 3: Practical matters

9:00 Synchronous DISCUSSION: Welcome, recap of forum discussion, discussion of performance concepts

9:20 Synchronous LECTURE 7. Interpreting and reporting Cooke results

9:50 Synchronous PRACTICAL 2. Interpreting Cooke results

10:50 Synchronous BREAK

11:20 Synchronous LECTURE 8. Facilitating a Cooke EKE

12:00 Synchronous Day 3 Wrap up

12:10 Asynchronous QUIZ: Lecture 7

12:20 Asynchronous QUIZ: Lecture 8

12:30 Asynchronous INDEPENDENT LEARNING 3: Reflecting on applying Cooke method to their questions

12:50 Asynchronous DISCUSSION: post independent learning questions in the discussion forum

13:00 END OF DAY

DAY 4: Applications, practice, and looking forward

9:00 Synchronous LECTURE 9. IDEA

9:20 Synchronous PRACTICAL 3. IDEA

9:40 Synchronous DISCUSSION: Welcome, recap of forum discussion, discussion of performance concepts

10:20 Synchronous LECTURE 10. Example Cooke applications

10:50 Synchronous BREAK

11:20 Synchronous LECTURE 11. Comparison with other protocols

11:50 Synchronous DISCUSSION: Challenges and opportunities for Cooke method in EFSA

12:50 Synchronous Course wrap up

13:00 END OF DAY

Appendix C – Course programme for Conduct of the Delphi protocol for an EKE

The schedule for the 4 half days of training was

DAY 1. Problem definition: role of the Working Group

09:00: Synchronous LECTURE 1. Introduction - Course objectives, agenda and EKE

9:15 Synchronous LECTURE 2. Overview of the Delphi method

9:50 Synchronous Q&A

10:00 Synchronous LECTURE 3. Recruiting experts

10:35 Synchronous Q&A

10:45 Synchronous BREAK

11:15 Synchronous LECTURE 4. Preparing and running Round 1 of an EFSA Delphi

11:50 Synchronous Q&A

12:00 Synchronous INDEPENDENT LEARNING. Introduction to independent work

12:15 Asynchronous PRACTICAL 1. Recruiting expert for an EFSA Delphi

13:00 Asynchronous END OF DAY

DAY 2:

9:00 Asynchronous PREPARATORY LECTURE. EKE and judgement of uncertain quantities

9:30 Asynchronous PREPARATORY PRACTICAL. Probabilistic judgements

11:30 Asynchronous INDEPENDENT LEARNING

13:00 Synchronous END OF DAY

DAY 3:

9:00 Synchronous DISCUSSION. Feedback from independent work

09:45 Synchronous PRACTICAL 2. Preparing Round 1 of an EFSA Delphi

10:30 Synchronous Practical 2 feedback

10:45 Synchronous PRACTICAL 3. Running Round 1 of an EFSA Delphi

11:30 Synchronous Practical 3 feedback

11:45 Synchronous PRACTICAL 4. Between EFSA Delphi rounds

12:30 Asynchronous BREAK

12:35 Asynchronous LECTURE 5. Between EFSA Delphi rounds and Round 2

13:00 Asynchronous END OF DAY

DAY 4:

9:00 Synchronous Practical 4 feedback

9:15 Synchronous PRACTICAL 5. Running EFSA Delphi Round 2

10:15 Synchronous Practical 5 feedback

10:45 Synchronous BREAK

11:05 Synchronous LECTURE 6. Final analysis and reporting

11:35 Synchronous Q&A

12:05 Synchronous PLENARY DISCUSSION: Lessons for future implementation

12:35 Synchronous Course wrap up

13:00 Synchronous END OF DAY

Appendix D – Course programme for Conduct of a Semi-formal EKE

The schedule for the 4 half days of training for the final version of the course was

DAY 1:

9:00 Synchronous INTRODUCTION: Course objectives and agenda

9:05 Synchronous LECTURE 1. Key concepts for EKE

9:40 Synchronous PRACTICAL 1. Review of formal EKE methods

10:15 Synchronous BREAK

10:25 Synchronous LECTURE 2. Introduction to Semi-formal EKE

10:50 Synchronous PRACTICAL 2. Identifying uses of Semi-formal EKE

11:30 Asynchronous BREAK

12:00 Asynchronous LECTURE 3. Key features of probabilistic judgements

12:40 Asynchronous Quiz Day 1

13:00 Asynchronous END OF DAY

DAY 2:

9:00 Asynchronous INDEPENDENT WORK: Find examples of Semi-formal EKE

10:00 Asynchronous LECTURE 4. Writing an evidence dossier

10:40 Asynchronous LECTURE 5. Identifying experts in formal EKE

11:10 Asynchronous BREAK

11:30 Asynchronous LECTURE 6. Planning a Semi-formal EKE

12:00 Asynchronous LECTURE 7. Methods for assessing uncertainty

12:30 Asynchronous BREAK

12:40 Asynchronous LECTURE 8. Reporting a Semi-formal EKE

13:00 Asynchronous END OF DAY

DAY 3:

9:00 Synchronous PRACTICAL 3. Tools for probabilistic judgements

10:00 Synchronous BREAK

10:20 Synchronous PRACTICAL 4. Assessment of overall uncertainty

11:20 Synchronous BREAK

11:40 Asynchronous LECTURE 9. Conducting training in probabilistic judgement

12:20 Asynchronous PRACTICAL 5: Review a Semi-formal EKE

13:00 Asynchronous END OF DAY

DAY 4:

9:00 Synchronous PRACTICAL 5: Review a Semi-formal EKE

9:40 Synchronous REPORTING BACK P5

10:15 Synchronous PRACTICAL 6. Challenges in facilitating a Semi-formal EKE

10:45 Synchronous BREAK

11:15 Synchronous REPORTING BACK P6

11:45 Synchronous LECTURE 10. Semi-formal and formal EKE and other modifications of EKE protocols

12:10 Synchronous PLENARY DISCUSSION: Challenges and opportunities with Semi-formal EKE

12:50 Synchronous Course evaluation

13:00 Synchronous END OF DAY

Appendix E – Course programme for Conduct of the Sheffield protocol for an EKE

The schedule for the 4 half days of training was

PART 1 Introduction to the method and set-up

DAY 1:

9:00 Synchronous INTRODUCTION: Course objectives and agenda

9:10 Synchronous LECTURE 1. EKE and judgement

9:45 Synchronous BREAK

10:05 Synchronous LECTURE 2. Overview of the Sheffield method

10:40 Synchronous Introduction to the independent learning

10:50 Asynchronous QUIZ: Lecture 1

11:00 Asynchronous QUIZ: Lecture 2

11:10 Asynchronous INDEPENDENT LEARNING 1: Review EFSA Sheffield elicitation, part (i)

12:40 Asynchronous DISCUSSION: post independent learning questions in the discussion forum

13:00 END OF DAY

DAY 2:

9:00 Synchronous LECTURE 3. Planning the workshop

9:30 Synchronous PRACTICAL 1. Planning challenges

10:15 Synchronous BREAK

10:45 Synchronous LECTURE 4. The experts

11:15 Synchronous PRACTICAL 2. The dream team

12:00 Synchronous Day 2 Wrap up

12:10 Asynchronous QUIZ: Lecture 3

12:20 Asynchronous QUIZ: Lecture 4

12:30 Asynchronous INDEPENDENT LEARNING 2: Introduction to SHELF

13:00 END OF DAY

PART 2. Conducting the elicitation and post-elicitation

DAY 3:

9:00 Synchronous LECTURE 5. Workshop in depth

9:50 Synchronous PRACTICAL 3. Workshop challenges

10:35 Synchronous BREAK

11:05 Synchronous PRACTICAL 4. SHELF software

12:05 Synchronous Day 3 Wrap up

12:15 Asynchronous QUIZ: Lecture 5

12:30 Asynchronous INDEPENDENT LEARNING 3: Review EFSA Sheffield elicitation, part (ii)

13:00 END OF DAY

DAY 4:

9:00 Asynchronous DISCUSSION: post independent learning questions in the discussion forum

9:20 Asynchronous LECTURE 6. Workshop roles

9:50 Asynchronous QUIZ: Lecture 6

10:00 Synchronous PRACTICAL 5. Supporting the elicitor

11:00 Synchronous BREAK

11:20 Synchronous LECTURE 7. After a Sheffield EKE workshop

11:50 Synchronous QUIZ: Lecture 7

12:00 Synchronous DISCUSSION: challenges and opportunities for Sheffield method in EFSA

12:45 Synchronous Course wrap up

13:00 END OF DAY

Appendix F – Course programme for Writing an evidence dossier for an EKE

The schedule for the 4 half days of training was

DAY 1:

9:00 Synchronous INTRODUCTION: Course objectives and agenda

9:05 Synchronous PRACTICAL 1. What is an EKE

9:30 Synchronous LECTURE 1. What is an ED for EKE

09:50 Synchronous PRACTICAL 2. Examples of ED in EFSA work

10:20 Synchronous BREAK

10:30 Synchronous REPORTING BACK PRACTICAL 2

11:30 Asynchronous LECTURE 2: Practices within EFSA for writing an ED for an EKE

11:50 Asynchronous BREAK

12:10 Asynchronous LECTURE 3: Best practice for writing an ED for EKE

12:40 Asynchronous PRACTICAL 3a. Introduction to best practice in an EFSA context

12:50 Asynchronous DISCUSSION: Post questions in discussion forum for Day 1

13:00 END OF DAY

DAY 2:

09:00 Synchronous PRACTICAL 3b. Presentation of prepared examples to be used in practical 3

9:30 Synchronous PRACTICAL 3c. Review the example(s) according to best practice

10:20 Synchronous BREAK

10:35 Synchronous REPORTING BACK PRACTICAL 3

11:15 Synchronous INTRODUCTION TO INDEPENDENT LEARNING. Form groups and book group meetings for the Day 3 session

11:45 Asynchronous BREAK

12:00 Asynchronous LECTURE 4. Writing an ED for an EKE with many questions

12:20 Asynchronous LECTURE 5. Practical tools for building an ED for EKE

12:50 Asynchronous DISCUSSION: Post questions in discussion forum for Day 2

13:00 END OF DAY

DAY 3:

Asynchronous INDEPENDENT LEARNING. Choose your own example of an EKE for which an ED is needed. Draft an outline of an evidence dossier and justify the outline based on best practice in an EFSA context. Include an estimation of the time to prepare each item in the ED. Prepare a presentation of the outline to be presented the last day. Work in groups of 2 to 4. Share your plan for the independent learning (chosen example, what you plan to do) with the tutor at the beginning of the session for feedback.

Asynchronous DISCUSSION: Post questions in discussion forum for Day 3"

DAY 4:

09:00 Synchronous Group presentations & Feedback & Discussion & Course wrap up

13:00 END OF DAY

Appendix G – Course programme for Reporting an EKE

The schedule for the 4 half days of training was

DAY 1: Introduction to reporting. Why and what to report?

9:00 Synchronous INTRODUCTION: Welcome, course objectives and agenda

9:10 Synchronous LECTURE 1a. Introduction to reporting an EKE

9:40 Synchronous BREAK

10:00 Synchronous LECTURE 1b. Requirements on reporting an EKE

10:30 Synchronous BREAK

10:50 Synchronous LECTURE 2. Elements to report from different EKE protocols

11:20 Synchronous PRACTICAL 1. Describe reporting in a published EKE

12:10 Synchronous Reporting back from PRACTICAL 1 and introduction to IL 1

12:30 Asynchronous QUIZ: Lectures 1 & 2

12:50 Asynchronous DISCUSSION: Post questions in the discussion forum

13:00 END OF DAY

DAY 2: How to report? Evaluate reporting of an EKE

9:00 Asynchronous LECTURE 3. Recommendations on reporting quantitative judgements

9:40 Asynchronous QUIZ: Lecture 3

10:00 Asynchronous LECTURE 4. Analysis and reporting of qualitative judgements

10:40 Asynchronous QUIZ: Lecture 4

11:00 Asynchronous BREAK

11:30 Asynchronous INDEPENDENT LEARNING 1: Evaluate reporting of a published EKE, e.g. the one you described in Practical 1

12:40 Asynchronous DISCUSSION: Post independent learning questions and criteria in the discussion forum

13:00 END OF DAY

DAY 3: Plan reporting of an EKE

9:00 Synchronous DISCUSSION: Recap of discussions and feedback on independent learning 1

9:30 Synchronous BREAK

9:40 Synchronous LECTURE 5. Practices of reporting EKE

10:20 Synchronous BREAK

10:30 Synchronous PRACTICAL 2. Identify a reporting challenge and plan a task for independent learning 2

11:30 Asynchronous BREAK

11:40 Asynchronous INDEPENDENT LEARNING 2: Plan reporting of an ongoing EKE (continue from Practical 2)

12:40 Asynchronous DISCUSSION: Post independent learning questions in the discussion forum

13:00 END OF DAY

DAY 4: Refine reporting of an EKE

9:00 Synchronous PRESENTATIONS. Presentations from independent learning and feedback (including breaks)

12:00 Synchronous FINAL DISCUSSION - best practice of reporting an EKE in an EFSA context

12:50 Synchronous Course wrap up

13:00 END OF DAY

Appendix H – Course evaluation

Table H1: Participants feedback on all courses, with version, number of participants and participant feedback on numerical questions ([a] unless stated otherwise).

Course	Version	Number of participants	Number of responders	1.1. Did the course fully meet your expectations and requirements?	1.2. Have you reached the intended learning outcomes of the course?	1.3. Has the course facilitated your future work for EFSA?	2.1. Did the content of the course meet your training needs?	2.2. Was the course material at the correct level for your training needs? % answering "Just	2.3. Did the balance of practical sessions versus lectures meet your training needs?	2.4. Did the balance of synchronous versus asynchronous sessions meet your training needs?	2.5. Did the sessions for independent learning meet your training needs?	2.6. Did the time allocated for discussions with fellow participants and tutors meet your needs?	2.7. Did the teaching ability of the tutors meet your training needs?	2.8. If requested additional information, was this provided?***	3.1. Did the overall organisation and administration associated with the course, prior to and during the training, meet your	3.2. Did the course platform combined with online meeting room in zoom meet your requirements?	3.3. How relevant and user friendly were the training materials?	3.4. How suitable was the scheduling, including duration of different tasks, of the training?
Cooke	1	5	3	4.0	4.0	2.3	3.7	100	4.7	4.7	4.0	4.0	4.7	Yes	4.3	4.7	4.3	4.0
Delphi	1	5	4	4.3	4.0	4.5	4.3	100	4.5	4.0	4.0	4.8	4.5	Yes	4.5	4.8	4.5	4.0
Reporting	1	10	1	5.0	4.0	4.0	4.0	100	5.0	5.0	4.0	5.0	5.0	Yes	4.0	4.0	5.0	5.0
Reporting	2	6	2	3.0	4.0	4.5	3.0	50	4.0	4.0	3.5	4.5	4.5	Yes	5.0	5.0	3.5	4.5

Semi-formal	1	4	1	4.0	4.0	4.0	4.0	100	3.0	3.0	3.0	4.0	4.0	Yes	4.0	4.0	4.0	3.0
Semi-formal	2	10	4	4.5	4.0	4.5	5.0	75 (25)	4.5	4.5	4.3	4.0	5.0	Yes	4.8	4.8	4.8	4.5
Sheffield	1	3	3	4.3	4.3	4.3	4.7	100	4.7	4.7	4.3	4.3	5.0	Yes	5.0	4.7	4.3	4.7
Sheffield	2	27	13	4.2	4.2	3.8	4.2	100	4.2	4.3	4.2	4.1	4.7	Yes	4.6	4.5	4.6	3.9
Steering	1	23	17	3.9	3.8	3.9	3.8	94 (6)	3.4	3.4	3.3	2.8	4.1	Yes	3.6	3.9	4.1	2.5
Steering	2	17	1	4.0	4.0	5.0	5.0	100	4.0	4.0	4.0	4.0	5.0	Yes	5.0	5.0	5.0	3.0
Writing	1	9	5	3.8	3.6	3.6	3.2	40 (40)	3.2	4.4	3.8	4.0	4.2	Yes	3.8	4.8	3.4	3.8
Writing	2	30	6	4.8	4.8	4.8	4.8	100	4.7	4.7	4.7	4.7	5.0	Yes	5.0	4.8	4.8	4.8
Average				**4.2**	**4.1**	**4.1**	**4.1**	**94**	**4.2**	**4.2**	**3.9**	**4.2**	**4.6**		**4.5**	**4.6**	**4.4**	**4.0**

(a): Scale: 1. No, not at all to 5. Yes, completely
(b): Answers: Too basic, Just right, Too advanced
(c): Answers: Yes, No, I did not request any additional information

Appendix I – List of recorded material

Recorded material	Tutor	Course	Duration	
Lecture 3. Key features of probabilistic judgements	Martine Barons	Conduct of a Semi-formal EKE	23 min	
Lecture 4. Writing an Evidence Dossier	Anca Hanea	Conduct of a Semi-formal EKE	30 min	Lecture 7 from the course Steering an EKE
Lecture 5. Identifying experts in formal EKE	Fergus Bolger	Conduct of a Semi-formal EKE	29 min	Lecture 6 from the course Steering an EKE
Lecture 6. Planning a Semi-formal EKE	Ullrika Sahlin	Conduct of a Semi-formal EKE	18 min	
Lecture 7. Methods for assessing uncertainty.	Ullrika Sahlin	Conduct of a Semi-formal EKE	17 min	
Lecture 8. Reporting a Semi-formal EKE	Ullrika Sahlin	Conduct of a Semi-formal EKE	15 min	
Lecture 9. Conducting training in probabilistic judgement	Kevin Wilson	Conduct of a Semi-formal EKE	35 min	
Lecture 7. The evidence dossier	Anca Hanea	Steering an Expert Knowledge Elicitation	30 min	
Lecture 6. Identifying, selecting, motivating and training experts for an elicitation.	Fergus Bolger	Steering an Expert Knowledge Elicitation	29 min	
Preparation lecture. Key features of probabilistic judgements	Martin Barons	Conduct of the Delphi protocol for an EKE	23 min	Lecture 2 from the course Conduct of a Semi-formal EKE
Practical. Probabilistic judgements (SHELF app demonstration)	Kevin Wilson	Conduct of the Delphi protocol for an EKE	17 min	Practical from the course Conduct of a Semi-formal EKE
Lecture 5. Between Delphi Rounds (and Round 2 and beyond)	Fergus Bolger	Conduct of the Delphi protocol for an EKE	27 min	
Lecture 3. Recommendations on reporting quantitative judgements	Ullrika Sahlin	Reporting an EKE	25 min	
Lecture 4. Analysis and reporting of	Lynn Frewer	Reporting an EKE	24 min	

qualitative judgements				
Lecture 3: Best practice for writing an ED for EKE	Anca Hanea	Writing an ED for an EKE	22 min	
Lecture 4. Writing an Evidence Dossier for an EKE with many questions	Anca Hanea	Writing an ED for an EKE	21 min	
Lecture 5. Practical tools for building an Evidence Dossier for EKE	Ullrika Sahlin	Writing an ED for an EKE	26 min	
Lecture 2. Key principles for EKE	Martine Barons	Steering an Expert Knowledge Elicitation	17 min	
Lecture 3. Probabilistic expert judgements.	Martine Barons	Steering an Expert Knowledge Elicitation	21 min	
Lecture 4. Identifying priority parameters for EKE	Andy Hart	Steering an Expert Knowledge Elicitation	17 min	
Lecture 5. Specifying questions for EKE	Ullrika Sahlin	Steering an Expert Knowledge Elicitation	16 min	
Lecture 6. Identifying, selecting, motivating and training experts for an elicitation.	Fergus Bolger	Steering an Expert Knowledge Elicitation	30 min	
Lecture 8. Sheffield method (and an introduction to Semi-formal EKE)	Kevin Wilson	Steering an Expert Knowledge Elicitation	40 min	
Lecture 9. Delphi method	Fergus Bolger	Steering an Expert Knowledge Elicitation	29 min	
Lecture 10. Cooke method	Anca Hanea	Steering an Expert Knowledge Elicitation	24 min	
Lecture 10a. IDEA protocol	Anca Hanea	Steering an Expert Knowledge Elicitation	12 min	
Lecture 11. Selecting the appropriate elicitation method	Ullrika Sahlin	Steering an Expert Knowledge Elicitation	29 min	
Lecture 12. Steering and documenting the elicitation process:	Martine Barons	Steering an Expert Knowledge Elicitation	17 min	

review of main points				
Lecture 2. Practices for writing an ED for EKE	Anca Hanea	Writing an ED for an EKE	26 min	
Lecture 4. Expert performance in the Cooke method	Tina Nane	Conduct of the Cooke protocol for an EKE	21 min	
Lecture 5. Performance-based aggregation in the Cooke method	Tina Nane	Conduct of the Cooke protocol for an EKE	21 min	
Lecture 6. Introduction to EXCALIBUR	Tina Nane	Conduct of the Cooke protocol for an EKE	24 min	

Appendix J – List of examples with EKE

Assessment/Report	Panel	Year	Steering	Cooke	Delphi	Semi-formal	Sheffield	Writing	Reporting	Link
Animal welfare aspects in respect of the slaughter or killing of pregnant livestock animals (cattle, pigs, sheep, goats, horses)	AHAW	2017	x				x		x	https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2017.4782
Approval of ListexTM P100 for reduction of Listeria monocytogenes in RTE meat and poultry, fish and seafood, and dairy products	BIOHAZ	2016					x		x	https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2016.4565
Assessment of listing and categorisation of animal diseases within the framework of the Animal Health Law (Regulation (EU) No 2016/429): antimicrobial-resistant Staphylococcus aureus in cattle and horses	AHAW	2022						x		https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2022.7312
Assessment of the control measures of category A diseases of the Animal Health Law: Infection with rinderpest virus (Rinderpest)	AHAW	2022						x		https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2022.7071
Assessment of the control measures of the category A diseases of Animal	AHAW	2021							x	https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2021.6707

Health Law: Classical Swine Fever.										
Citrus Canker	PLH	2014		x	x			x		Case-study from the EKE guidance - Plant health. Appendix D in the EKE GD.
Commodity risk assessment of Citrus L. fruits from Israel for Thaumatotibia leucotreta under a systems approach	PLH	2021						x		https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2021.6427
Commodity risk assessment of Robinia pseudoacacia plants from Israel	PLH	2020	x			x				https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2020.6039
Draft Scientific Opinion on Update of the Scientific Opinion on Polybrominated diphenyl ethers (PBDEs) in Food	CONTAM	2023							x	https://connect.efsa.europa.eu/RM/s/publicconsultation2/a0l0900000AIpRD/pc0520
Ebola virus in bushmeat	BIOHAZ	2014		x	x					
Extension of the spatially- and temporally-explicit "briskaR-NTL" model to assess potential adverse effects of Bt-maize pollen on non-target Lepidoptera at landscape level	GMO	2021					x	x	x	https://efsa.onlinelibrary.wiley.com/doi/10.2903/sp.efsa.2021.EN-6443
Health and welfare of rabbits farmed in different production systems	AHAW	2020			x					https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2020.5944
Inactivation of indicator microorganisms and biological hazards by standard and/or alternative processing methods in Category 2 and 3 animal by-products and derived products to be used as organic	BIOHAZ	2021				x		x		https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2021.6932

fertilisers and/or soil improvers.										
Pest categorisation of Icerya aegyptiaca	PLH	2023						x		https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2023.7739
Pest risk assessment of Amyelois transitella for the European Union	PLH	2022							x	https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2022.7523
Retrospective cumulative dietary risk assessment of craniofacial alterations by residues of pesticides	PPR	2022						x		https://efsa.onlinelibrary.wiley.com/doi/full/10.2903/j.efsa.2022.7550
Risks related to a possible reduction of the waiting period for dogs after rabies antibody titration to 30 days compared with 90 days of the current EU legislative regime	AHAW	2022				x		x		https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2022.7350
Scientific Opinion on Rift Valley fever	AHAW	2013						x		https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2013.3180
Scientific Opinion on the efficacy and safety of high-pressure processing of food	BIOHAZ	2022				x		x		https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2022.7128
Scientific opinion on the evaluation of public and animal health risks in case of a delayed post-mortem inspection in ungulates	BIOHAZ	2020				x				https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2020.6307
Scientific Opinion on the re-evaluation of the risks to public health related to the presence of bisphenol A (BPA) in foodstuffs	CEP	2023							x	https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2023.6857
Scientific Opinion on the risk assessment	CONTAM	2023							x	https://efsa.onlinelibrary.wiley.

of N-nitrosamines in food										com/doi/10.2903/j.efsa.2023.7884
Scientific Opinion on the welfare risks related to the farming of sheep for wool meat and milk	AHAW	2014			x					https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2014.3933
Scientific report on the commodity risk assessment of specified species of Lonicera potted plants from Turkey	PLH	2022							x	https://efsa.onlinelibrary.wiley.com/doi/full/10.2903/j.efsa.2022.7014
Scientific report on the cumulative dietary risk assessment of chronic acetylcholinesterase inhibition by residues of pesticides.	PPR	2021	x			x	x		x	https://efsa.onlinelibrary.wiley.com/doi/full/10.2903/j.efsa.2021.6392
The efficacy and safety of high-pressure processing of food	BIOHAZ	2022						x		https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2022.7128
Update and review of control options for Campylobacter in broilers at primary production	BIOHAZ	2020	x				x		x	https://efsa.onlinelibrary.wiley.com/doi/full/10.2903/j.efsa.2020.6090
Update of the Scientific Opinion on the risks to plant health posed by Xylella fastidiosa in the EU territory	PLH	2015	x					x		https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2015.3989

Annex A Training material from the course Steering an Expert Knowledge Elicitation

The material used for the training course Steering an Expert Knowledge Elicitation is made available in a separate document annexed to this report.

Annex B Training material from the course Conduct of the Cooke protocol for an EKE

The material used for the training course Conduct of the Cooke protocol for an EKE is made available in a separate document annexed to this report.

Annex C Training material from the course Conduct of the Delphi protocol for an EKE

The material used for the training course Conduct of the Delphi protocol for an EKE is made available in a separate document annexed to this report.

Annex D Training material from the course Conduct of a Semi-formal EKE

The material used for the training course Conduct of a Semi-formal EKE is made available in a separate document annexed to this report.

Annex E Training material from the course Conduct of the Sheffield protocol for an EKE

The material used for the training course Conduct of the Sheffield protocol for an EKE is made available in a separate document annexed to this report.

Annex F Training material from the course Writing an Evidence Dossier for an Expert Knowledge Elicitation

The material used for the training course Writing an evidence dossier for an Expert Knowledge Elicitation is made available in a separate document annexed to this report.

Annex G Training material from the course Reporting an Expert Knowledge Elicitation

The material used for the training course Reporting an Expert Knowledge Elicitation is made available in a separate document annexed to this report.

Annex H Example summaries

Seven summaries of examples of EKE used in the courses.