



## **D6.3 - Food Safety Risk Assessment Community-Centred Assessment Plan**



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## ACRONYMS LIST

VRE	Virtual Research Environment
WP	Workpackages
QMRA	Quantitative Microbial Risk Assessment
CV	Controlled Vocabulary
GUI	Graphical User Interface
API	Application Programming Interface
RSS	Rich Site Summary
DOI	Digital Object Identifier
FSK-ML	Food Safety Knowledge Markup Language
FSKX files	Food Safety Knowledge Exchange File
OS	Operating System

## EXECUTIVE SUMMARY

This report outlines the plan for assessing the effectiveness of the developed and deployed AGINFRA+ components in the food safety risk assessment community. Regarding this, the report details when and how pilot execution and dissemination activities will be undertaken and how results will be communicated within the Food Safety Risk Assessment community.

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## 1 INTRODUCTION

For the area of Food Safety Risk Assessment, there are two different use cases outlined in order to deploy and validate AGINFRA+ resources.

In the first use case, WP6 will create solutions aiming at supporting the “Emerging risk identification” (DEMETER) community. In this community, the early identification of emerging risks in the food (and feed) chain is the main objective. Regarding this, the VRE supports a critical element of the strategy to protect European consumers through timely and effective preventive measures. The use of new data mining and data science solutions (digital technologies) are crucial to achieve this. In particular, the identification of emerging food or feed safety issues at an early stage is of high importance. Therefore, this use case will illustrate how a VRE can facilitate the exchange of knowledge on emerging risk identification between risk assessors and how KNIME-based data mining technologies can be applied to identify those risks. Furthermore, it is planned to illustrate the benefits of general VRE-based resources.

The second use case is directed to support data-intensive applications in the area of food safety modelling. This includes the extension of the community capabilities to share mathematical models, to create simulation results and to deploy generated data processing workflows as web-based services. Through the envisaged VRE-based resources, risk assessors and modellers will be able to share their knowledge (data, mathematical model, software code, simulation results) in a harmonized way. Specifically, it will be demonstrated how community-driven food safety model repositories, which contain mathematical models from the area of predictive microbial modelling and quantitative microbial risk assessment (QMRA), can be developed and maintained through AGINFRA+ resources. Finally, the use case will also illustrate the benefits of VRE-based computational resources in computational intensive risk assessment simulations.

An important element for assessing the effectiveness of AGINFRA+ resources is an active promotion of the underlying VRE concept within the different scientific communities. Regarding this, WP6 will actively promote VREs in upcoming national and international research projects, e.g. in order to support the needs for project management and knowledge exchange resources in these research activities.



## 2 ASSESMENT METHODOLOGY

In the context of the Food Safety Risk Assessment area, the usefulness of AGINFRA+ resources and components will be assessed through demonstrating that use-case tailored VREs support efficient knowledge exchange within the corresponding communities. Besides showcasing AGINFRA+’s technical resources, this will also be facilitated through creating and applying new community-specific resources in the following areas:

- Establishment of harmonized standards for representation of models and data (extending PMF-ML) => Food Safety Knowledge Markup Language
- Extending software tools relevant to the Food Safety Risk Assessment community so that the new harmonized information exchange standard (FSK-ML) will be supported. Specifically, the development of import and export functions for tools like PMM-Lab or FSK-Lab will be necessary to achieve desired adoption of standards within the community.
- Extending open source software tools like KNIME to facilitate computational expensive simulation and data visualization tasks

The assessment therefore also includes evaluation of new software features generated during the AGINFRA+ project for tools within the Food Risk-Labs’ suite of tools.

### 2.1 INTERACTION WITH COMMUNITIES

A core aspect in the assessment is the interaction with the targeted communities. The VREs generated within AGINFRA+ project aim at providing support to relevant members in the use case specific research domains. This will be demonstrated to the corresponding researchers through promoting VREs in two ongoing research projects, specifically the RAKIP and DEMETER project. In this way, close interaction and synergies will be generated between all three projects. BfR will communicate research results in upcoming national and international conferences and workshops, like the Global KNIME summits or the Food Micro 2018. The other involved AGINFRA+ project partners will communicate new technical AGINFRA+ resources and results via their specific dissemination channels.

### 2.2 PILOTS TRIALS

The pilot trials will be carried out as described in detail in section 3 and 4. For both trials, a user specific VRE will be established and provided by the AGINFRA+ project to facilitate implementation, demonstration and evaluation of the use case specific solutions.

### 2.3 PILOTS EVALUATION

The evaluation of pilot trials will be based on two criteria:

- 1) Which VRE features identified and documented (see D6.1) as a need could be provided in the VRE?
- 2) The number of activities (like workshops, talks, presentations) was performed to promote the general AGINFRA+ concept within the Food Safety Risk Assessment community.

After completion of the technical developments the general usefulness and usability of the two VREs will be evaluated during hands-on-training workshops with members of the corresponding research communities.

## 3 USE CASE 1 ASSESSMENT

### USE CASE 1: DETERMINATION AND METRICS OF EMERGING RISK - DEMETER

#### 3.1 TARGET USERS

##### **Risk Assessor / Modeller / Data Scientist:**

The use case will illustrate how the VRE infrastructure can facilitate the work of risk assessors, modellers, risk managers or data scientists in the domain of emerging risk identification.

#### 3.2 ASSESSMENT OBJECTIVES

The objective of this use case is to provide a new web-based resource for the Emerging Risk Identification community that can serve as an “Emerging Risk and Knowledge Exchange Portal” in the future. To accomplish this, the generated resource has to go beyond an infrastructure for sharing text documents (as it is now). Specifically, it will be demonstrated that the generated AGINFRA+ VRE infrastructure can be used in order to share information, data and data-analysis pipelines developed by different stakeholders, e.g. EFSA member states within the EREN network. Furthermore, new opportunities to visualize results of calculations performed by these data mining and data analysis operations will be provided.

#### 3.3 ASSESSMENT INDICATORS

With respect to the assessment criteria 1) the availability of each of the features listed in D6.1 under chapter 2.1.4, 2.1.5, 2.1.6 and 2.1.7 is assessed (available, not available, partly available). With respect to assessment criteria 2) the dissemination activities carried out to promote the use of this VRE are assessed (number of talks, number of workshops).

The general usefulness and usability of the VRE will be evaluated after completion of the technical development phase in hands-on-training workshops with members of the corresponding research communities. The participants of the workshop will be asked to vote on their perception of the usefulness (high, medium, low), usability (high, medium, low) and development needs (free text comment).

## 4 USE CASE 2 - ASSESSMENT

### KNOWLEDGE INTEGRATION PLATFORM - RAKIP

#### 4.1 TARGET USERS

##### **Risk Modeller / Data Scientist:**

The use case will illustrate how the VRE infrastructure can facilitate the work of risk modellers or data scientists in the domain of Quantitative Microbial Risk Assessment (QMRA), as well as risk assessors, risk managers, lab researchers or food microbiologists.

#### 4.2 ASSESSMENT OBJECTIVES

The objective of this use case is to provide a new web-based resource for the QMRA community that can serve as a “Risk Assessment Knowledge Integration” VRE in the future. To accomplish this, the generated resource should go beyond what is currently available, as e.g. the openFSMR (<https://sites.google.com/site/openfsmr/>) or the pure listing of QMRA publications. Specifically, it will be demonstrated that the generated AGINFRA+ VRE infrastructure can be used in order to share models in a harmonized format, share data and data-analysis pipelines and perform user-driven computational-intensive simulations in a cloud-based computational infrastructure. Furthermore, it should be demonstrated that new visualization techniques can be used through the VRE infrastructure. Another important achievement will be the support for the open source data analytics platform KNIME through the VRE.

#### 4.3 ASSESSMENT INDICATORS

With respect to the assessment criteria 1) the availability of each of the features listed in D6.1 under chapter 2.2.4, 2.2.5, 2.2.6 and 2.2.7 is assessed (available, not available and partly available). With respect to assessment criteria 2) the dissemination activities carried out to promote the use of this VRE are assessed (number of talks, number of workshops).

The general usefulness and usability of the VRE will be evaluated after completion of the technical development phase in hands-on-training workshops with members of the corresponding research communities. The participants of the workshop will be asked to vote on their perception of the usefulness (high, medium, low), usability (high, medium, low) and development needs (free text comment).

## 5 TENTATIVE PILOT TRIALS SCHEDULE

The pilot execution and dissemination activities of the pilot trials will be carried out according to the following schedule (which takes into account the necessary technological developments needed in WP2, 3 and 4 to support both pilots):

Planning phase:	start: 07/2017	end: 03/2018
Development phase:	start: 04/2018	end: 12/2018
=> Intermediate pilot execution and evaluation:	start: 04/2018	end: 07/2018
=> Final execution, optimization and evaluation phase:	start: 01/2019	end: 12/2019