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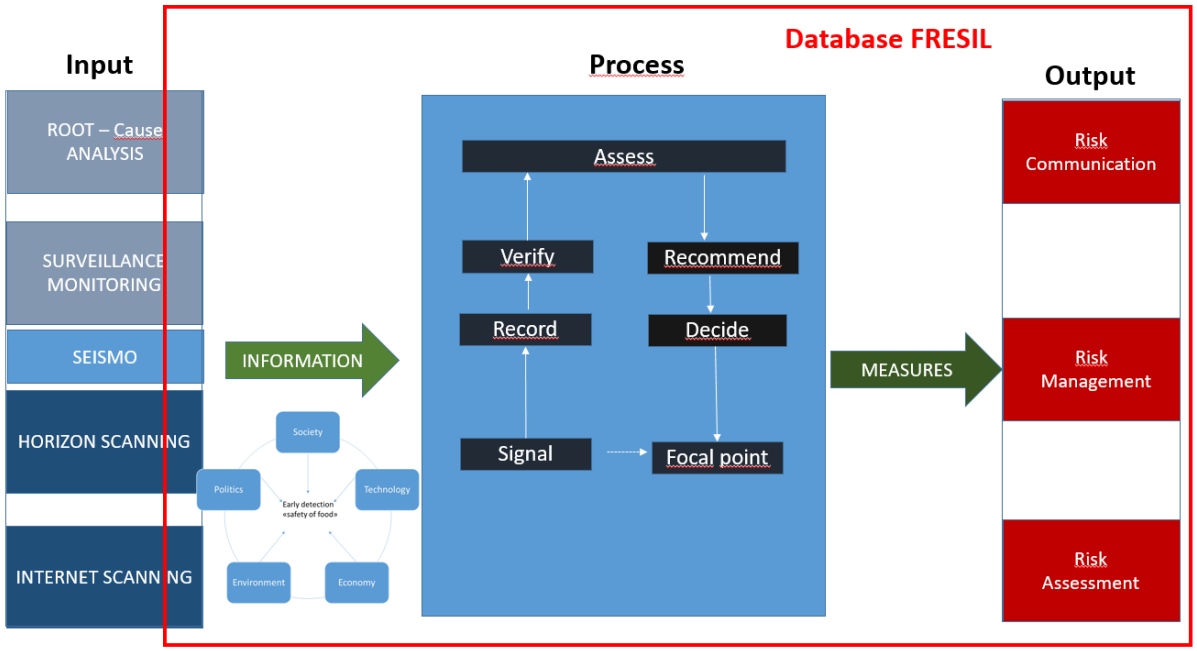
Federal Department of Home Affairs FDHA
Federal Food Safety and Veterinary Office FSVO
Risk Assessment

Early Detection / Food Safety ("FRESIL") Concept



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1 Summary

The strategy of the Federal Food Safety and Veterinary Office (FSVO) states that the FSVO will actively promote the health of humans and animals and be prepared for new tasks and threats. To achieve this goal, the FSVO attaches great importance to crisis management, risk assessment, prevention and early detection.

The FSVO Early Detection / Food Safety scheme («FRESIL», from ***Fr****üherkennung* ***Si****cherheit der* ***L****ebensmittel*) aims to promptly identify and assess potential risks posed to consumer health by foodstuffs and food contact materials, and to derive appropriate measures.

In implementing FRESIL, the FSVO takes account of fraud and deception, as well as microbiological, chemical and nutrition-related hazards and risks.

Early detection is impossible without information. Early Detection / Food Safety considers both retrospective and prospective information. Retrospective means the analysis of existing data and time series, but also the targeted analysis of specific incidents. On the other hand, the analysis of prospective information aims to identify possible future developments and assess their impact on health and fraud risks. Both analyses can be carried out by persons inside (or outside) the FSVO. These persons act as the seismographs of early detection; they are referred to in this concept as «*Seismos*».

All of the *Seismos* together form the *Seismo* panel. The latter can consult an advisory board, consisting of external experts, for an assessment of the information submitted. The Seismo panel discusses and evaluates the information described as “signals”. It then proposes measures to the joint committee (“GEFA”, from ***ge****meinsamer* ***Fa****chausschuss)*, which consists of decision-makers responsible for FSVO risk assessment and risk management.

This committee assesses the proposals received from the *Seismo* panel and decides on further action to be taken. Two levels are distinguished in this respect: a) strategic early detection with a long-term perspective, and b) operational early detection for direct prevention of crises and incidents. According to the GEFA’s instructions, Risk Assessment, Risk Management and/or Risk Communication then process these identified focal points.

Recorded information, signals, focal points and related assessments should be accessible to the various stakeholders. They are entered in a database and the appropriate measures to be taken are recorded. This enables short-, medium- and long-term orientation by federal government and cantons, but also by other stakeholder groups such as industry or the universities.

The FRESIL process owner provides regular updates on the status of the various focal points. A periodical situation assessment on Early Detection / Food Safety is prepared and integrated into the report on the Multi Annual National Control Plan (MANCP report).

Early Detection / Food Safety comprises a wide range of topics and issues. For this reason, cooperation is actively pursued with other authorities and organisations, both inside and outside the FSVO, at both national and international level.

The entire process of Early Detection / Food Safety should be evaluated periodically and any weak points identified should be subjected to a continuous improvement process.

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2 Glossary

Advisory committee	Persons from industry, government and academia entrusted by FSVO with the task of assessing the food safety risks reported by the *Seismos* and issuing recommendations to be submitted to FSVO.
Deception	Article 18 of the Swiss Food Act provides that all information relating to foodstuffs, consumer articles and cosmetics must correspond to the facts. In particular any presentation, labelling, packaging and advertising that is liable to deceive consumers as to the manufacture, composition, condition, method of production, storage life, country of production, origin of the raw materials or components, particular effects or special value of the product is regarded as misleading
Drivers	Influencing factors that can lead to a change in the food chain and thus to a risk. They may be based on social, technological, economic, environmental or political developments (see STEEP).
Focal point	Thematically related signals which are rated as priorities by experts using an assessment matrix.
Food safety	Foods are regarded as safe if they meet the requirements in Article 7 of the Swiss Food Act (SR 817.0). This means that they must be safe for health and suitable for human consumption.
Food fraud	*Qualified food fraud* refers to organised fraud involving all products in the food chain. The perpetrators' intention is to achieve maximum profit in the long term. Qualified food fraud is organised and intentional, in contrast to *deception*. The boundaries between deception (e.g. according to the Food Act SR 817.0) and qualified food fraud (e.g. according to the Swiss Criminal Code SR 311.0) are fluid and to be judged by the judiciary on a case-by-case basis.
FRESIL	Acronym: **Fr**üh**e**rkennung **Si**cherheit der **L**ebensmittel (Early Detection / Food Safety)
Horizon scanning	Defined as the systematic examination of potential hazards, opportunities and likely future developments which are at the margins of current thinking and planning. *Horizon scanning* may explore novel and unexpected issues as well as persistent problems or trends. (According to Defra (UK) in FAO 2013[1]).
Information	All information in the context of early detection. Information is evaluated, checked for redundancy and recorded in the Early Detection / Food Safety database ("DB FRESIL"). Such recorded information is called a *signal*.
Internet scanning	Systematic searching of the Internet and social media for certain keywords. This can be done actively using appropriate software or passively by evaluating media.
Joint committee («GEFA»)	Decides on signals and measures. The GEFA sets priorities, defines responsibilities and determines further action. It consists of the heads of the Food & Nutrition and Risk Assessment divisions.
PO	Process owner, person responsible for Early Detection / Food Safety (FRESIL).
Seismo	Employee internal or external to the FSVO. In accordance with the Early Detection / Food Safety process (FRESIL), the *Seismo* reports information, incidents, observations, etc. which might be relevant to the safety of foodstuffs and food contact materials or which might entail nutritional risks.
Signal	Exceptional reports, incidents, incidents, information, etc. relating to hazards, risks and opportunities which are or may be relevant to food safety or the prevention of food fraud. «Exceptional» refers to changes in quality, quantity, place and time.

[1] Horizon Scanning and Foresight: An overview of approaches and possible applications in Food Safety (FAO 2013)

STEEP	STEEP: **S**ociety, **T**echnology, **E**nvironment, **E**conomy and **P**olitics. **S**ocial, **t**echnological, **e**nvironmental, **e**conomic and **p**olitical risk factors relating to food safety and food fraud are taken into account

3 Starting position

The strategy of the Federal Food Safety and Veterinary Office (FSVO)[2] states that the FSVO will actively promote the health of humans and animals and be prepared for new tasks and threats. To achieve this, the FSVO attaches great importance to crisis management, risk assessment, prevention and early detection. It is about proactively identifying new risks in the field of foodstuffs.

4 Definition

Early detection comprises the identification, collection, verification, analysis and evaluation of data and information. It assesses the relevance of potential hazards and evaluates their risk in accordance with scientific criteria.

5 Objective

Objective of Early Detection / Food Safety
Early Detection / Food Safety aims to identify and assess potential risks posed to consumer health by foodstuffs and food contact materials. It also includes food fraud and deception. The resulting information and evaluations are quickly passed on and made available to the relevant groups, enabling them to take appropriate measures. Early detection enables the FSVO to focus activities and resources on relevant threats, to address them appropriately and thus to protect human health.

This document serves to explain the concept.

6 Scope

In principle, the scope of the Early Detection / Food safety system encompasses all hazards, risks and opportunities in connection with foodstuffs, nutrition and food contact materials. Implementation is phased:

1. Consideration of microbiological hazards and risks, as well as food fraud (and food deception);
2. Consideration of chemical hazards and risks associated with foodstuffs and food contact materials;
3. Consideration of nutrition-related hazards and risks.

The aspect of food fraud and deception will be integrated into the first phase, as an initial framework for early detection has already been established in line with the planned concept. This will also serve further development in the area of chemical risks.

7 References

- Müller et al. 2016 J. Verbr. Lebensm. (2016) 11 (1): 9–18: *Etablierung eines Frühwarnsystems zur Erkennung lebensmittelbedingter Risiken in Bayern – risikoorientierte Lebensmittelüberwachung weiter gefasst*
- FAO 2015: Enhancing early warning capabilities and capacities for food safety. Training Handbook First Edition
- Marvin et al. Food and Chemical Toxicology 47 (2009) 915-926: https://doi.org/10.1016/j.fct.2007.12.021 *Early identification systems for emerging foodborne hazards*

[2] FSVO strategy 2017 and beyond and Food Chain Strategy

8 Basic concept

The basic concept for an early detection system is based on the preliminary work of FSVO and also considers the observations of the Food and Agriculture Organisation (FAO) and of Müller et al. 2015 (see section 6).

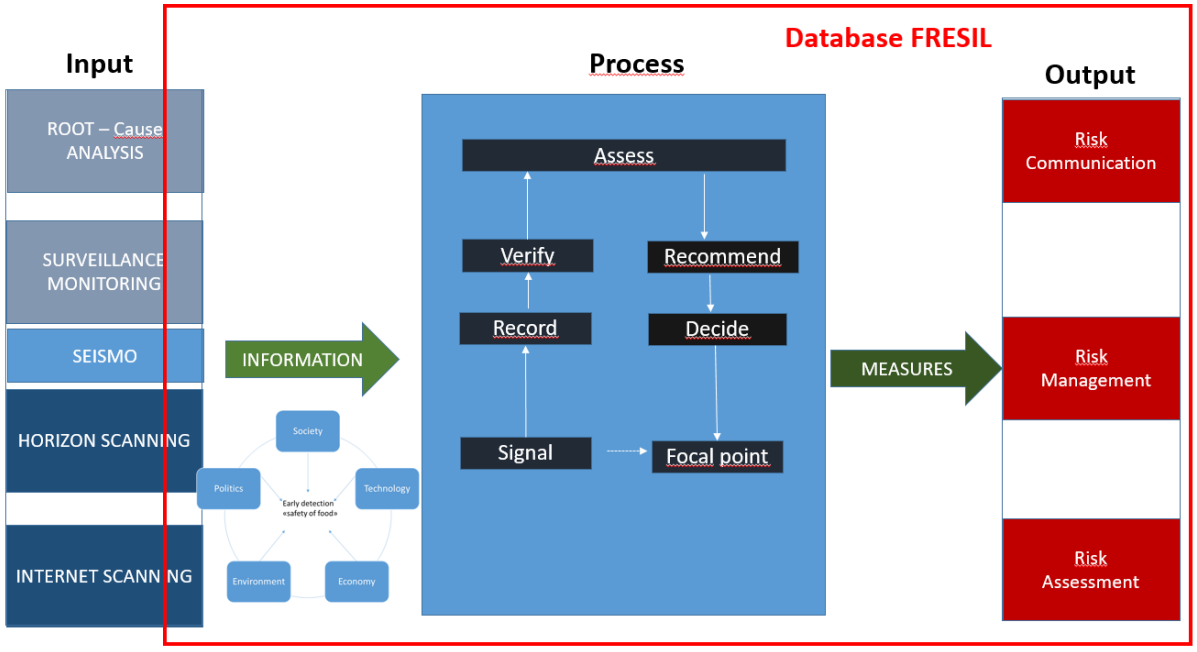

Fig. 1 *Basic concept of the Early Detection / Food Safety system - an overview*

The individual elements of the model are explained below:

8.1 Input

Early detection is impossible without information. This information comes from a wide variety of sources which need to be recorded and evaluated. Two different perspectives are taken into account, one retrospective and one prospective.

8.1.1 Retrospective considerations

Retrospective means analysing existing data, but also targeted analysis of incidents with the aim of learning from them.

The *root cause analysis* is therefore about identifying *drivers* which pose a health or fraud risk. Based on this, parallels can be drawn with other commodity chains.

The evaluation of official control results, e.g. from samples, inspections and foodborne disease outbreaks, allows trend analyses and, if necessary, extrapolation of future results. A distinction is drawn between *monitoring* and *surveillance*. The difference is that *surveillance* defines values above which actions are triggered. In *monitoring*, on the other hand, the course of a data series is passively recorded and subsequently analysed. Both elements serve early detection.

8.1.2 Prospective considerations

The prospective perspective aims to identify possible future developments and assess their impact on health and fraud risks. Two methods can be listed here: *horizon scanning* and *Internet scanning*.

Horizon scanning is a systematic examination of potential hazards which could pose a threat to food safety and risk of food fraud in the future. Possible influencing factors are called *drivers*; in this respect, the insurance industry differentiates between social, technological, environmental, economic and political factors. The acronym STEEP is used for this in the literature. The aim of this methodology is to identify emerging risks at an early stage by evaluating plausible future scenarios and, if necessary, to derive measures from them. This grouping is also regarded as useful for Early Detection / Food Safety.

Internet scanning searches the Internet and social media for certain keywords, for example using appropriate software. It is about identifying online conversations on the topic of food safety and food fraud and deriving trends from them. On the other hand, the analysis of media reports and reviews on food safety issues is a more reactive process.

The prospective and retrospective evaluations are brought together by the *Seismos*. In collecting relevant topics, *Seismos* are guided by the *STEEP* influencing factors. *Seismos* are the link between retrospective evaluations and prospective assessments of food safety and food fraud.

Table 1 explains the information procurement concept in detail and gives examples of the different methods.

Table 1 Information procurement methods in the field of food safety. The list is non-exhaustive.

Methodology	**Examples**
Root cause analysis	• Retrospective analysis of a particular safety problem: e.g. *Campylobacter spp*. in the "poultry" commodity chain. Based on this, then transfer to similar themes in other commodity chains.
Surveillance and monitoring	**Food safety:** • Control results (e.g. National Residue Testing Programme) • National Control Plan (MANCP) and its report • Networks of the EU • Data and information from the national reference laboratory • Monitoring data • Product import / export data • Results from surveillance / priority programmes • Results from syndromic surveillance (e.g. antibiotic use, pesticide use) **Public Health data:** • Group outbreaks of food-borne diseases • Laboratory reports of food-borne disease pathogens • Biomonitoring • Syndromic surveillance
Seismo	The *Seismos* collect information from *root cause analysis*, *surveillance*, *monitoring*, *horizon scanning* or *Internet scanning* from their specialist field, from their daily work, but also from other areas which they consider important for early detection, and record this information in a database (DB FRESIL).

Horizon scanning	• Specialist publications • Price trends of agricultural products • Sales trends for agricultural products • Pesticide use • Harvest forecasts • Import data / export data • Weather conditions / climate • Media (media review) • Consumer complaints Exchanges with national / international networks
Internet scanning	• Commercial software • Scientific periodicals, media, newsletters • Big data

8.1.3 Technical aids

To minimise effort, input and output information should be recorded, evaluated and administered in the same database. The concept is described in section 9.

8.2 Early detection process

The process provides for information to be forwarded to the process owners and subjected to an initial review. Additional information to be processed is then referred to as *signals*. These are recorded, verified and structured so that they can be evaluated by a panel of experts. The sources and verification results should be taken into account in particular.

Recording is structured and records are archived centrally. Information from alternative sources is linked to the signal, thus verifying the relevance of the signal.

The individual signal is evaluated by the *Seismo* panel and, if necessary, by an appointed external advisory committee. The latter discuss and evaluate the facts presented and make a recommendation to the FSVO. The joint committee ("GEFA") then decides whether the topic is a focal point and how to proceed. Two processes are distinguished (Fig. 2):

- strategic early detection for incidents with medium- to long-term effects;
- operational early detection for short-term incidents or crises.

Fig. 2 *Overview of the procedure for strategic (in blue) or operational (in red) early detection. PO: Process Owner*

8.2.1 *Seismo* panel

The *Seismos* discuss the signals received in the *Seismo* panel. They verify the signals and decide which ones to submit to the external advisory committee. All signals identified as irrelevant are concluded and the others are submitted to the GEFA for final assessment.

8.2.2 External advisory committee

The composition of the external advisory committee is based solely on the necessary competencies. The persons appointed as advisors are experts with specific knowledge enabling them to contribute to the assessment of food safety and food fraud. The criteria for appointment are the professional expertise and experience of the persons concerned. They may come from cantonal supervisory authorities, federal offices, private laboratories, industry, commerce or academia. Their tasks, responsibilities and financial remuneration are laid down in a job description. The advisors assess and discuss the signals submitted and make recommendations.

8.2.3 Joint committee («GEFA»)

The GEFA decides on the signals and measures to be taken following the recommendations of the *Seismo* panel. It sets priorities, defines responsibilities and determines further action. It also monitors the implementation of the measures triggered.

How quickly the GEFA processes the signals depends on the potential risk. Signals which point to an incident or a crisis are dealt with more quickly and passed on directly to the responsible organisational units. On the other hand, signals for the medium- and long-term assessment of food safety and food fraud go through the more extensive process (Fig. 2).

8.3 Output

Various options are possible with regard to the output. The simplest output is not to follow up, or to defer, a signal.

Signals which need to be followed up are assigned by the GEFA to the Risk Assessment, Risk Management or Risk Communication divisions. Examples of the various options are listed in the following tables. They can be staggered or take place in parallel.

Table 2 Risk Assessment

Timescale	Intervention option
Very short-term measures	• very short-term assessment in the form of a discussion of a focal point, done simultaneously by several persons • Recommendations on measures to Risk Management
Short-term measures	• Assessment and verification of a focal point with the aim of prioritisation
Medium- and long-term measures	• Development of assessments
No measures planned	• Further action determined: Archiving

Table 3 Risk Management

Timescale	Intervention option
Very short-term measures	• Triggering incident or crisis management
Short-term measures	• Initiation of (focused) controls such as sampling, inspections of businesses by the competent cantonal or federal authorities along the food chain
Medium-term measures	• Defining of priority programmes •
Long-term measures	• Strategic orientation of control bodies • Scenario planning
No measures planned	• Language arrangements for risk management and archiving

Table 4 Risk Communication

Timescale	Intervention option
Very short-term measures	• Language arrangements • Website (news) • Withdrawal • Recall • Public warnings • Communication channel such as blog, newsletter, Twitter
Short-term measures	• Information letter and directives
Medium-term measures	• Regularly published bulletin informing the authorities involved about decisions on the focal points. • Exchange with national and international networks
Long-term measures	• Communication of the FSVO's medium- and long-term priorities in the context of annual reporting and situation assessment
No measures planned	• Language arrangements

9 Knowledge management

Once collected, information should be accessible to a wide range of stakeholders over an extended time period, thus facilitating short-, medium- and long-term planning by federal government and cantons, but also by other stakeholders such as industry, academia, etc.

For this purpose, the information is categorised and corresponding measures are recorded. Finally, all information and measures are recorded in the FRESIL database. The reliability of the information should be made transparent.

The intention is that entries in such a database should be made by the *Seismos* themselves. Comments from other interested parties should also be included and recorded. The different access options should be regulated by different access rights. Over time, this information database itself can serve as a source for early detection purposes.

The *Seismos* and interested parties (e.g. cantons, industry, academia) should be informed periodically about the status of the various topics. Important findings, changes to the assessment or changes in priorities should be communicated.

A regular status report on Early Detection / Food Safety should also be drafted. This will then be incorporated into the Multi Annual National Control Plan (MANCP) report. Specialist publications on early detection in suitable journals are an option.

10 Cooperation

The topic of Early Detection / Food Safety comprises a wide range of topics and issues. FSVO early detection is not able to cover all of these on its own. Cooperation with organisations and other institutions which also operate early detection systems should be actively pursued. This will allow the network to be expanded and its quality deepened. These are primarily FSVO-internal bodies and national authorities, but also international partner organisations. The FSVO shares its findings actively with cooperation partners. This ensures that synergies can be exploited, resources saved and assessments exchanged.

11 Process measurement and evaluation

The entire process of Early Detection / Food Safety should be evaluated periodically. To assess the performance and effect of the process and to improve it if necessary, it needs to be monitored on four levels. The following key process indicators should be recorded:

- Input: Number of reported information items and signals;
- Output: Number and type of identified focus points;
- Outcome: Orders created;
- Impact: Measures and activities initiated on the basis of early detection.

The effect of the process should be reflected. The evaluation should monitor and assess whether hazards and risks identified at an early stage had the feared consequences (or if not, why not). This will allow the necessary improvements to be implemented. It should also establish how many hazards and risks remained unaffected by the early detection system, or in which cases the consequences could be mitigated. As far as possible, the performance of this early detection system should be compared with that of similar countries.