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HORIZON-CL6-2023-FARM2FORK-01

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CATALYSE

Catalysing scientific innovation into food safety action

D6.1 – First Set of Evaluated Educational Materials Link Library to feed the database of CATALYSE Community of Practice platform

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Executive Summary

As part of the CATALYSE project's objective to promote knowledge exchange and capacity building in food safety, a curated link library of educational and training resources has been developed under Work Package 6 (WP6). Informed by stakeholder consultations conducted in WP2, five thematic priority areas were identified: Detection methods, Digitalization and AI, Control measures, Hygiene by design, and Packaging innovations.

A governance model was established to guide the selection, evaluation, and endorsement of relevant materials by WP6 partners. The evaluation process was carried out by a team of six searchers/reviewers, who assessed educational and training materials against pre-defined content and technical quality criteria. Although the initial Key Performance Indicators (KPIs) targeted the evaluation of 210 materials, over 7,000 food safety-related resources were screened. These were identified through searches on platforms such as Google, YouTube, Zenodo, webinar platforms, and university websites, using food safety-related keywords. To improve search effectiveness and relevance, Boolean operators (AND, OR), quotation marks for exact phrases, and wildcards were applied. Of these, 376 materials were found to meet the established requirements based on a single-searcher evaluation. Upon consultation with the company responsible for the Community of Practice (CoP) platform development, it was decided to deliver an initial set of 50 to 100 links. Therefore, a subset of 140 materials was selected for peer evaluation, and each material was independently reviewed by two searchers/reviewers, ensuring thematic diversity and balanced representation across the five focus areas. In cases of discrepancies between the two searchers/reviewers, a third searcher/reviewer was invited to evaluate the material and make a final decision. The peer-review process confirmed that 91 materials fulfilled the quality criteria. From these, 69 were selected for the first release of the link library, as they could be clearly mapped to one of the five thematic topic areas. Materials categorized under "Others" were excluded from this initial release, with plans to further refine and sub-categorize them to improve future accessibility and navigation. Each entry in the link library includes a direct link, title, producing organization, and a range of descriptors such as audience level, material type, addressed food safety risk, relevant food sector, duration for viewing (where applicable), and a short description. A two-level keyword system was also introduced to enhance searchability. The link library comprises a diverse set of formats, including webinars, short videos (knowledge clips), e-books, fact sheets, online courses, and tutorials. An additional 240 single-reviewed materials are pending peer review and will be considered for future updates of the library, thereby supporting the ongoing development of the CATALYSE CoP platform.

INDEX

1. Introduction 5

2. Methodology 5

3. Results 9

4. Conclusion 15

ANNEXS 16

Two-levels keyword system 16

Link library 19

1.Introduction

The CATALYSE project seeks to identify and address the key barriers and enablers faced by stakeholders in the implementation of innovative food safety applications, knowledge exchange mechanisms, and education and training initiatives. Through targeted stakeholder engagements conducted under Work Package 2 (WP2), priority areas were identified and refined based on stakeholder needs and expectations. As a result, the project has focused on five focus areas: Control measures, Detection methods, Digitalization (including artificial intelligence and big data in food safety), Hygiene by design, and Packaging innovations. These areas are intended to inform the development of modular components for the CATALYSE Community of Practice (CoP) platform.

To support this initiative, the criteria and scope for educational materials were defined based on WP2 outcomes. A governance model was subsequently established under Task WP6.1 to facilitate the selection, adaptation, and endorsement of existing educational and training resources by WP6 partners. Using this model, a comprehensive link library of educational and training materials is being compiled. The aim is to meet the KPI by evaluating the relevance and quality of: 100 clips, videos, and webinars from at least 10 different organizations; 10 online food safety education material packages (such as massive online open courses (MOOCs) or other open-access training); and 100 educational materials identified through snowballing and internet searches. These links are intended to serve as curated resources accessible via the online collaborative platform developed under WP3.

2. Methodology

To identify relevant educational and training resources, online search engines (e.g. YouTube, Google, Zenodo, webinar plaforms) and online food safety educational material packages were systematically employed. As previously mentioned, five thematic topics were prioritized for the evaluation of educational materials: Detection methods, Digitalization and AI, Control measures, Hygiene by design and Packaging innovations. Additionally, a sixth category labeled “Others” was included to cover materials that, while not clearly falling within the five primary topics, are nonetheless considered particularly relevant for food safety.

Moreover, stakeholders identified five specific content areas as high priorities, expressing a clear preference for educational materials that address these areas within each of above thematic topic: (1) emerging risks, (2) food microbial analysis and techniques, (3) new tools for monitoring and detecting hazards, (4) food safety culture, and (5) food safety regulations and compliance. In response to this prioritization, particular attention was paid to evaluating educational materials not only by their relevance to thematic topics but also by their ability to

meaningfully cover one or more of these high-priority content areas. To support the search process, a set of targeted keywords was developed based on the themes and critical focus areas identified by stakeholders. A representative selection of these keywords is presented in Table 1. To improve search effectiveness and relevance, Boolean operators (AND, OR), quotation marks for exact phrases, and wildcards were applied.

Table 1: Representative keywords used for food safety educational and training material search

Microbial hazards	Machine learning
Chemical hazards	Artificial intelligence
Allergen hazards	Predictive modelling
Foodborne pathogens	Smart packaging
Food contaminants	Active packaging
Cross-contamination	Edible packaging
Mycotoxins	Time-temperature indicators
Allergen control	Emerging pathogens
Pathogen detection	Cloud monitoring
Biosensor technology	Remote inspection
Rapid testing	Risk communication
Next-generation sequencing	Training programs
Digital food safety	Safety training
Big data	Organizational behavior
Sanitary design	Regulation
Hygienic zoning	Legal requirements
Preventive controls	Risk management
Risk assessment	Disinfection protocols

Each project partner was authorized to contribute to the identification of relevant educational and training materials. Potential sources of educational content were identified across various platforms, and the corresponding links were compiled into an Excel file, making an initial pool of educational materials. Notably, each link generally directed to a webpage or platform hosting multiple educational materials. For each entry, a brief description was provided, including the name and affiliation of the person who located the material, the name of the organization that produced or published it, and a general comment indicating the type of resource (e.g. videos, online courses, webinar, etc.). This method enabled a comprehensive and well-documented collection process, laying a solid foundation for subsequent evaluation and selection of the most appropriate educational and training material.

Before initiating the evaluation phase, it was necessary to establish clear criteria for assessing the educational materials. To guide this process, we followed the evaluation approach of the European Food Safety Authority (EFSA)-guided European Excellence Label (EEL), originally

developed for evaluation of courses in food safety risk assessment. Drawing from this framework and adapting it to the scope of the CATALYSE project, two distinct sets of criteria were defined: content requirements and technical requirements. Under the content requirements, materials were expected to align with the objectives of the CATALYSE initiative and fall within its thematic and educational scope. The overarching aim is to support the development of long-lasting educational resources for all stakeholders in the food supply chain, with a focus on key aspects of food safety. As part of the evaluation, materials were reviewed for their relevance to the six previously identified thematic topics. In addition, particular attention was given to those that addressed any of the five priority content areas defined by stakeholders. Materials developed for commercial purposes were excluded, as the CATALYSE project does not seek to promote or endorse specific companies. However, content produced by commercial entities was considered if it provided scientifically sound, high-quality information without advertising products or services. Another important criterion was the target audience, with all materials needing to be intended for adult learners. Moreover, preference was given to resources developed within Europe, as materials produced outside of Europe may not be relevant or find implementation in the European region such as regulation, hygienic standards, protocols. However, materials from non-European sources that provide relevant and applicable content for the European context will be reviewed at a later stage, ensuring inclusivity while avoiding unintentional bias and maintaining alignment with the specific needs of the European food safety landscape.

With respect to the technical requirements, priority was given to resources available in the English language. Materials in other widely spoken languages (e.g., Spanish, French) will be assessed during a subsequent review phase. In all cases, the material must demonstrate scientific integrity and objectivity, ensuring that the content can be scientifically evaluated and presented without bias. It should clearly state its aim and objectives and allow for the identification and understanding of key terms necessary for effective categorization. The quality of the resource's audio and visual components was also assessed, with clear sound and sufficiently video resolution being mandatory to ensure the content was understandable and effectively delivered. Additionally, each resource should be accompanied by relevant metadata, including information on the topic, format, and associated keywords.

Subsequently, an evaluation group consisting of six searchers/reviewers (Fig. 1) was established to review and assess each resource. The links from the initial website pool were randomly distributed among the searchers, each of whom was responsible for reviewing their assigned content according to the thematic and content priorities, as well as the established content and technical requirements.

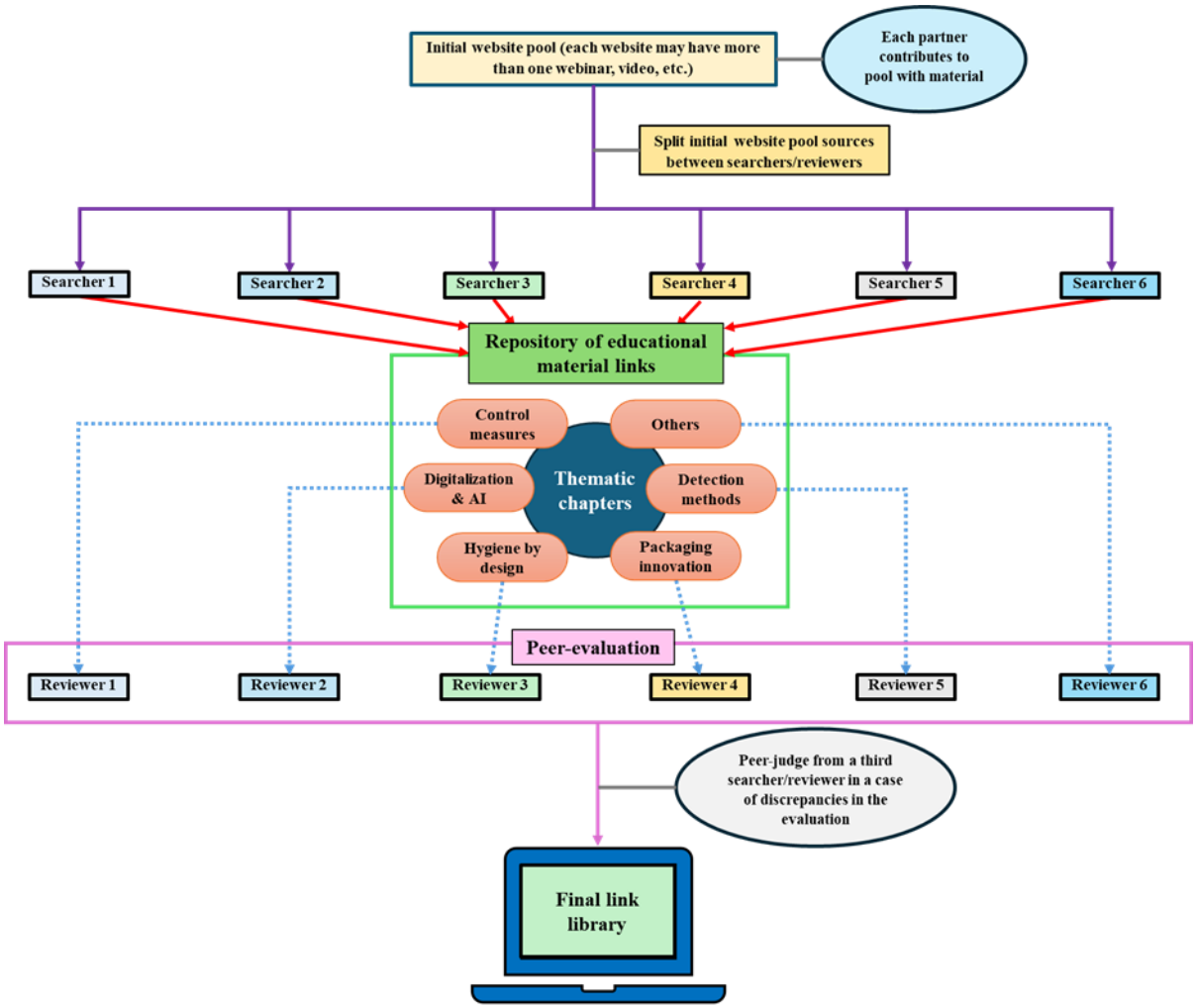

Figure 1: Evaluation process of educational and training material.

When a resource was found to meet the evaluation criteria, the searcher was required to document it in a secondary Excel file, serving as a repository of eligible educational material links. For traceability and transparency, this file included the name of the searcher who evaluated and selected the material, the name of the organization that produced it, the original link from the initial pool, and the direct link to the specific educational resource. The title of the material was also recorded to provide a clear indication of its content and subject focus. Additional columns detailed the sector of application (e.g meat industry, agriculture), the six thematic, and the five specific content areas covered. The type of material (e.g., webinar, online course) and its duration in minutes (where applicable) were also recorded. Additionally, the searcher determined up to five keywords that best described the material's content, and an extra comments column was included to highlight any noteworthy aspects or relevant information not addressed by the predefined categories.

To ensure consistency and accuracy in the selection process, each identified material underwent a peer-evaluation, with the group of six searchers serving as reviewers. Each searcher was assigned materials categorized under one of the six thematic topics and tasked

with re-evaluating the material to confirm that it met all content-related criteria and requirements. In cases where there was a discrepancy between the two searchers/reviewers' assessments, the material was forwarded to a third searcher/reviewer for final evaluation and decision.

3. Results

The original collection included 173 websites, each developed by a different organization, comprising a total of approximately 80,000 online resources such as videos, clips, webinars, open-access educational materials, and training courses. By applying targeted keywords related specifically to food safety such as those included in Table 1, this collection was narrowed down to approximately 7,000 materials (Fig. 2) that were thematically relevant. These materials represent a diverse range of formats.

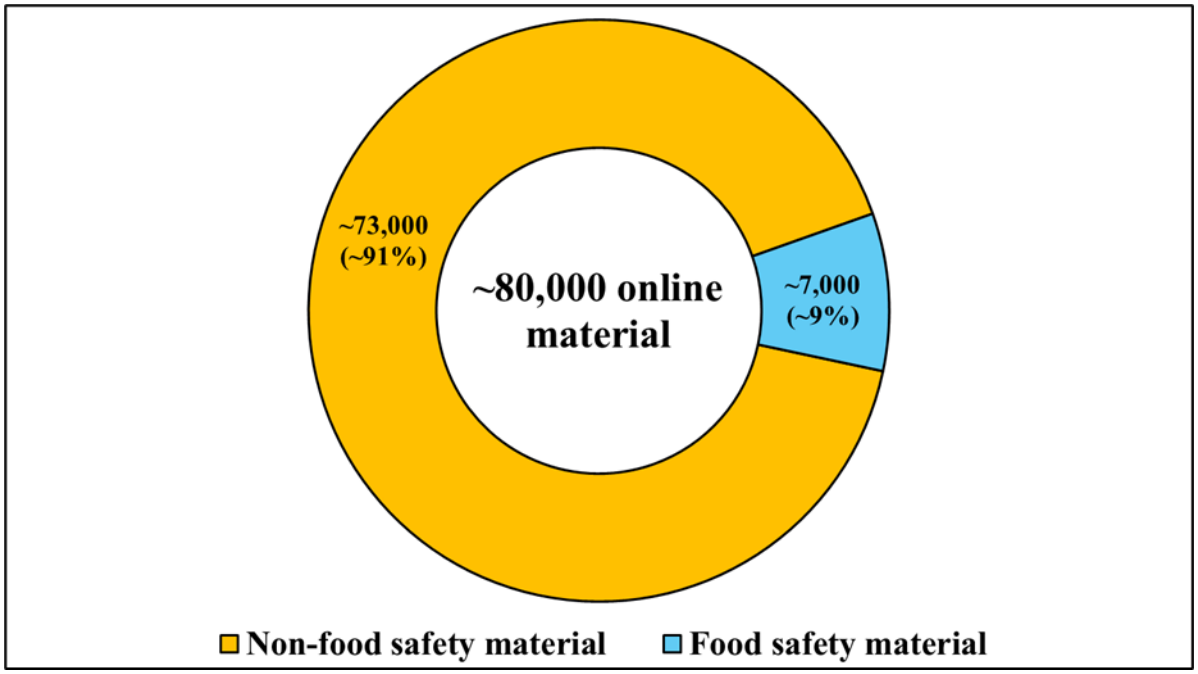

Figure 2: Screening of online educational and training materials for Food safety relevance.

Based on the predefined evaluation criteria, a single-searcher screening process led to the selection of 376 links (approximately 5% of the total food safety-related content) that met all quality and relevance requirements (Fig. 3A). These materials originated from 43 different organizations. Among the selected materials, 84 were related to Control measures, 32 to Digitalization and AI, 19 to Hygiene by design, 28 to Packaging innovations, 29 to Detection methods, and 184 to other thematic topics (Fig. 3B). In terms of format, the majority were

webinars (181), followed by short videos (94), e-books (35), fact sheets (27), online courses (23), tutorials (12), podcasts (2), online tools (1), and workshops (1) (Fig. 3C).

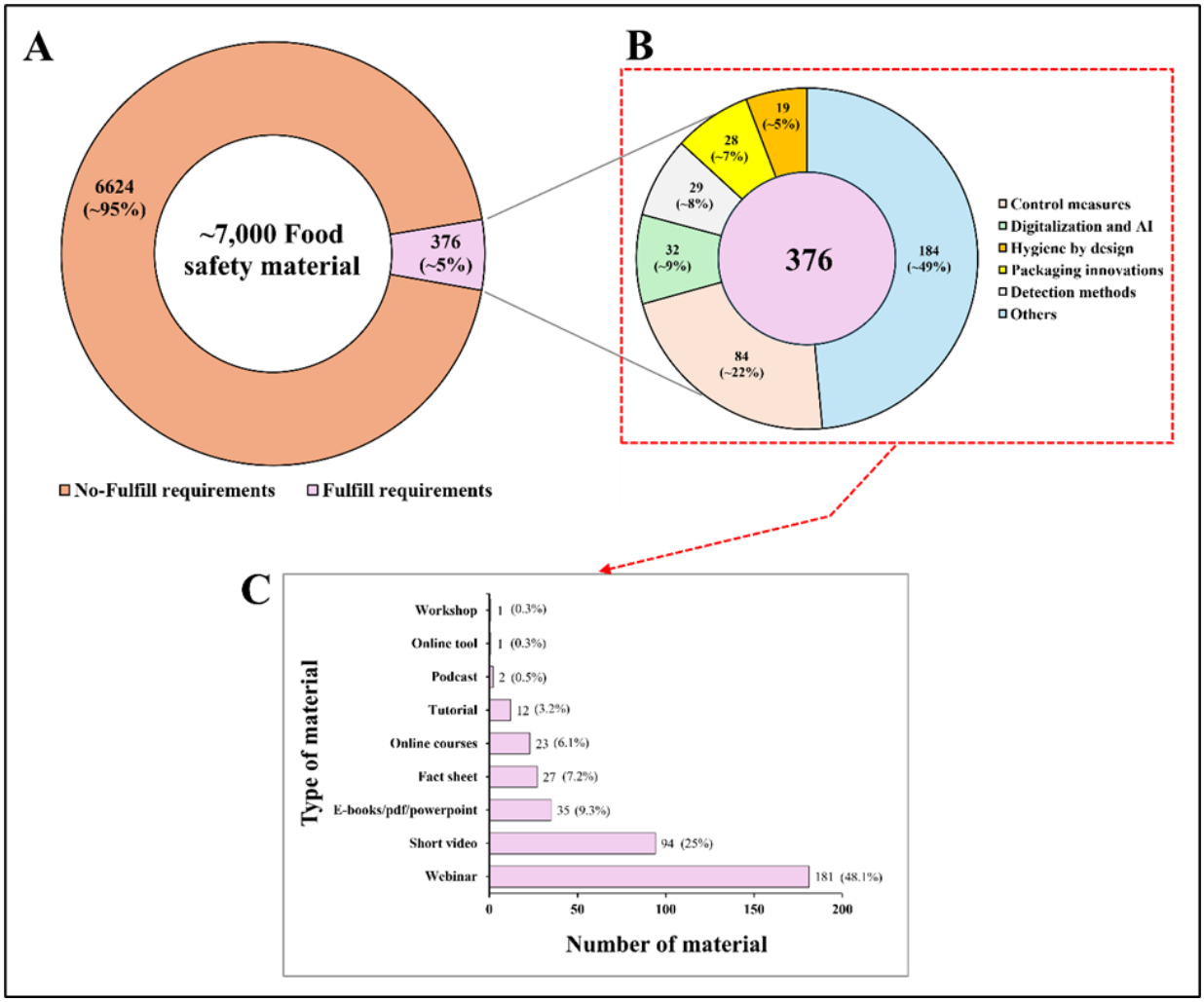

Figure 3: Overview of educational materials evaluated through single-searcher screening based on the predefined criteria. Number of the material met all quality and relevance requirements (A), Distribution by thematic topic (B), and Distribution by content format (C).

Although the 376 resources identified through the single-searcher screening met the initial quality and relevance criteria, all of them still require peer-evaluation to ensure accuracy, consistency, and alignment with the established criteria. In light of constraints highlighted by the website development team–particularly the significant time and effort required to integrate and manage a large volume of content–it was agreed that only a limited number of links (ideally between 50 and 100) would be included in the initial launch of the CoP website and the online link library, scheduled for the 5th of June 2025. This approach supports platform stability, enables proper testing, and allows for easier updates in the future. Once the foundational web framework and content structure are established, the link library will be progressively expanded

with additional peer-evaluated resources, ensuring the platform remains dynamic and up to date.

To support a balanced and representative initial launch, a total of 134 links from the pool of 376 single-searcher evaluated resources were selected for peer-evaluation. This subset was composed of links from all thematic categories to ensure comprehensive topic coverage (Fig. 4). The selection process also considered the inclusion of materials spanning a variety of priority content areas and formats, where possible, and originating from a diverse range of organizations. This approach was intended to ensure that the initial release of the link library demonstrates both thematic breadth and content quality, while providing a foundation for systematic expansion in future development phases.

Among the 134 resources peer-reviewed, 96 were confirmed to meet the predefined evaluation criteria through consensus among searchers/reviewers (Fig. 4). The remaining materials are pending further assessment and will be re-evaluated by a third searcher/reviewer at a later stage to resolve discrepancies. Specifically, the 96 approved resources include 23 related to Control measures, 12 to Digitalization and AI, 14 to Hygiene by design, 3 to Detection methods, 17 to Packaging innovations, and 27 covering other thematic topics.

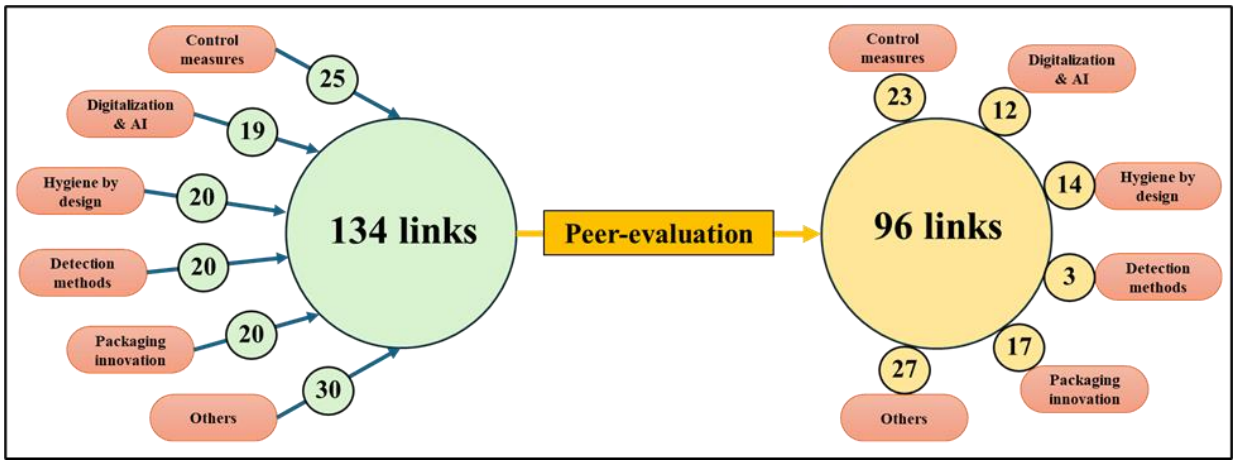

Figure 4: Distribution of links per thematic topic before and after peer-evaluation. The left side shows the number of single-reviewed links selected for peer-evaluation, while the right side displays the results of the peer-evaluation process.

Following discussions between the searchers/reviewers' group and the partners consortium, it was decided that the “Others” thematic category would not be included in the first release of the link library. This decision was based on the recognition that the broad and diverse nature of this category could benefit from further refinement. In particular, it was agreed that creating subcategories within this group would improve user navigation by allowing easier access to materials aligned with specific interests. However, it was also concluded that this categorization

effort would be more effective once peer evaluation of all links across the “Others” thematic category has been completed, ensuring the development of more comprehensive and representative subcategories. Therefore, by excluding the 27 peer-approved resources classified under the "Others" thematic topic, the initial release of the link library will consist of 69 links corresponding to the five defined thematic topics, with their distribution across each category already illustrated in Fig. 4.

To enhance the descriptive quality and usability of the link library, seven descriptors were introduced. Firstly, a direct link to the material is provided. Secondly, the material’s title is included. Thirdly, the producing organization is identified. Notably, the release of the first set of link library includes educational and training material produced by 28 different organizations. Fourthly, a thematic topic descriptor was added to further support classification and navigation of materials. Fifthly, each listing features a brief summary (2–3 sentences) describing the content. Sixthly, information about the type of material (e.g., webinar, online course) is specified. The first set of link library includes a variety of educational material formats, such as 27 webinars, 26 short videos (knowledge clips), 17 fact sheets, 1 e-book/PDF, interactive modules and simulation tools like 1 online course and 2 tutorials (Fig. 5). Additional resources, including databases and assignments, will be incorporated in a future phase. Seventhly, the duration of viewing (when applicable) is provided to help users estimate the required engagement time, with video- or webinar-based materials ranging from 1 to 100 minutes.

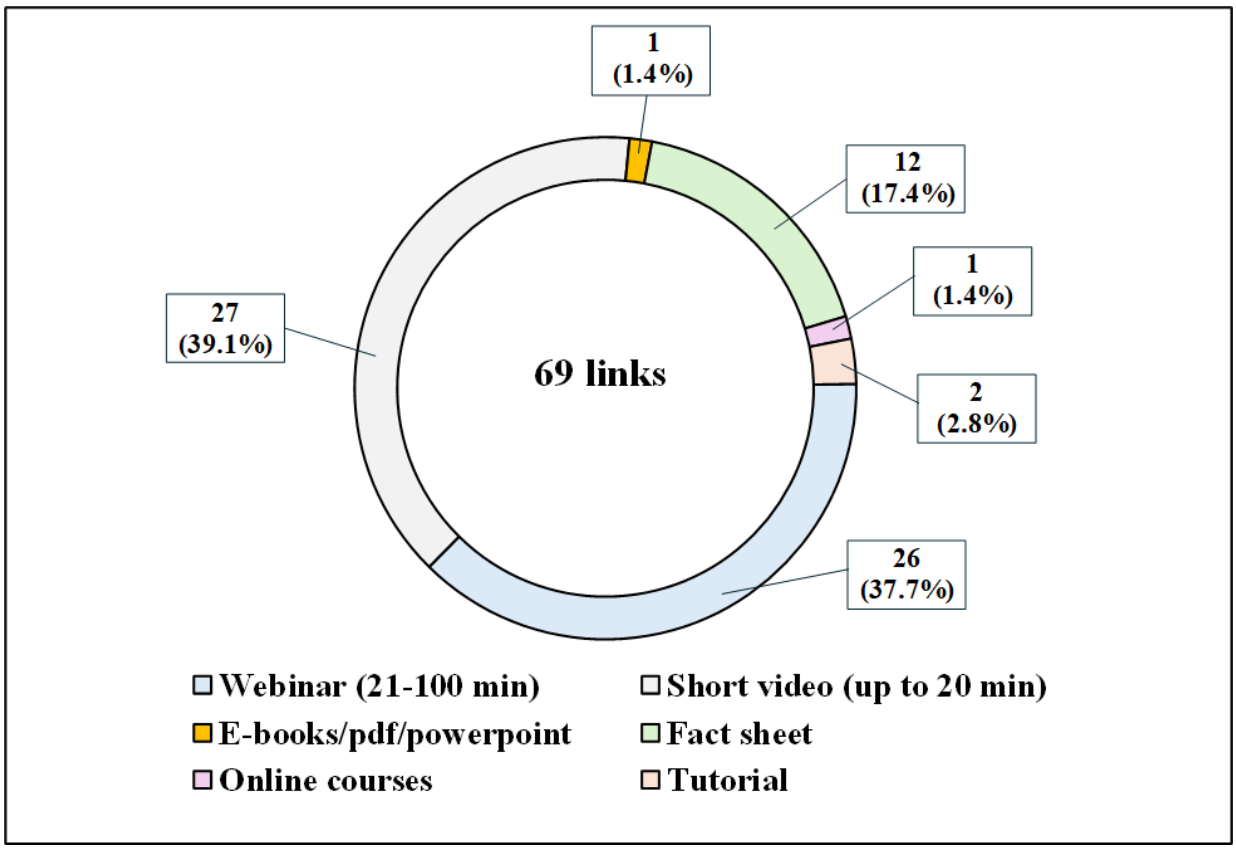

Figure 5: Distribution of educational material formats released in the first set of link library.

In addition to seven core descriptors, four additional descriptors were introduced to further improve clarity and usability. Firstly, audience level was included to help users quickly identify materials suited to their background knowledge. The audience level is categorized into three groups: beginners (high school graduates), intermediate (those with a BSc-level understanding in life science), and experts (individuals with advanced or specialized knowledge). This classification ensures that users can select materials that match their learning needs and expertise. As shown in Fig. 6A, most materials are classified as intermediate level (34), followed by beginner (29) and expert (6).

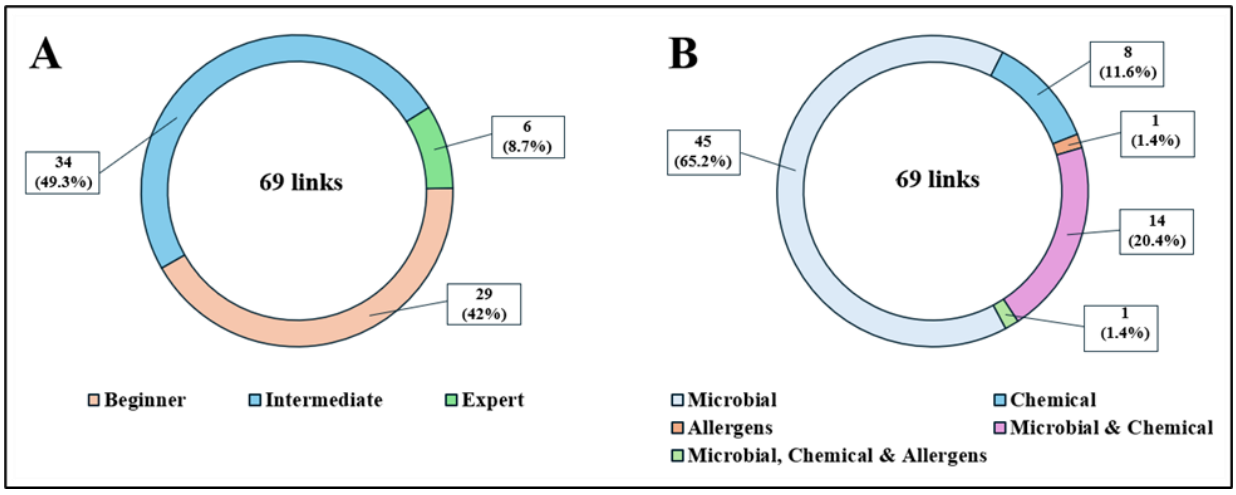

Figure 6: Distribution of educational material by relevant audience level (A) and type of food safety risks addressed (B) in the release of the first set of link library.

Secondly, the type of food safety risk addressed by each material is indicated. This classification was added to help users quickly identify resources relevant to their specific areas of interest or concern within the broad domain of food safety. By distinguishing between different types of risks, users can better target materials that align with their professional focus or learning objectives. The materials primarily focus on microbial risks (45 entries), followed by chemical risks (8) and allergens (1). However, several materials cover multiple types of risks, with 14 entries addressing both microbial and chemical risks, and 1 entry encompassing microbial, chemical, and allergen risks (Fig. 6B).

Thirdly, a sector descriptor was introduced to align the link library with the structure of the CoP, which is organized by sector and then by thematic topic. Based on input from the CoP, ten sectors were defined: Meat & Poultry, Fish & Seafood, Dairy & Cheese, Grain & Cereals, Fresh Fruit & Vegetables, Plant-based & Alternative Protein, Processed & Packaged Food, Beverages, General (applicable to all sectors), and Others. As shown in Fig. 7, the majority of materials (60 entries) fall under the General category, indicating their relevance across all food sectors. In addition, there is 1 entry for Fish & Seafood, 1 for Fresh Fruit & Vegetables, 3 for Meat & Poultry,

and 4 under Others, representing materials that do not clearly fit into any of the predefined sectors.

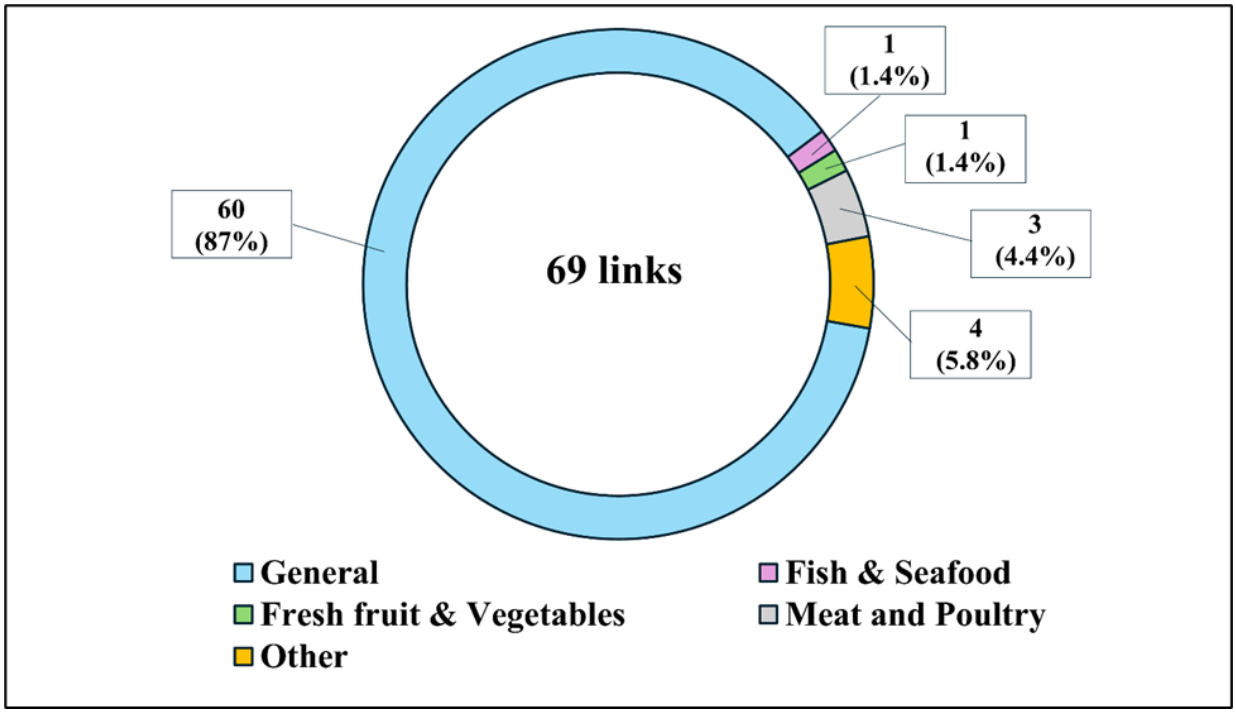

Figure 7: Distribution of educational material by in the release of the first set of link library.

Fourthly, to enhance the searchability of educational content, a two-level keyword system was implemented. First-level keywords serve as broad descriptors, while second-level keywords offer more detailed and specific classifications (Annex table 1). This keyword system is designed to evolve over time; as the peer evaluation of materials progresses and new resources are added to the link library, the list of both first- and second-level keywords will be expanded accordingly.

Annex table 3 includes the first set of educational and training materials from the link library. It is organized by thematic topic category and audience level, giving a structured overview of the full range of available resources. This library shall feature a range of audiovisual content, including webinars, short videos (knowledge clips), fact sheets, e-books/PDFs, interactive modules, and simulation tools such as online courses and tutorials. Although not all formats have been achieved in the shortlisted link library below, this being the first phase of materials gathered reflecting the keywords. More databases and assignments will be added in the future phase. For each entry, the table presents the target sector, a concise 2–3 sentence description of the material's, the title, and a direct link for quick access.

4. Conclusion

The evaluation of existing educational and training materials conducted to date has significantly exceeded the initial KPI targets. While the KPIs aimed to evaluate the relevance and quality of 100 short-format resources (such as clips, videos, and webinars) from at least 10 different organizations, 10 comprehensive online training packages (e.g., MOOCs), and 100 additional educational materials identified through targeted online searches and snowballing, over 7,000 food safety-related resources were screened following the established governance model, resulting in a curated selection of 69 links fulfilling all the predefined content and technical requirements. The selected materials encompass various formats, addressing a wide range of thematic topics and levels of expertise. Ongoing peer evaluation continues to enhance the thematic and structural diversity of the library. Preliminary findings from this process indicate content gaps in areas such as digitalization, detection methods, and AI applications in food safety. These gaps are being addressed through targeted efforts—both by identifying additional existing materials through focused search and planning for the development of new content. Additional gaps may emerge as the evaluation progresses, and these will be similarly addressed to ensure broad and balanced thematic coverage. By continuously identifying gaps and refining the content, this process contributes to CATALYSE's mission to enhance the accessibility and relevance of educational resources, thereby catalysing innovation and translating knowledge into food safety action.

ANNEXS

Two-levels keyword system

Annex table 1: First- and second-level keywords for educational material description

1st level	2nd level				
Foodborne	Foodborne illness	Foodborne pathogens	Foodborne outbreak	*Listeria*	*Salmonella*
	Clostridium	*Aspergillus*	*Candida*	*E. coli*	*Listeria*
	Campylobacter	Food poisoning	Virulence		
Virus	Hepatitis A	Norovirus			
Parasites	Toxoplasma	Worms			
Pests	Rodents	Insects			
Toxins	Natural toxins	Mycotoxins			
Handling practices	Consumer handling	Handing raw material	Cooking guidelines	Transportation	Preparation
	Food handling	Stock rotation	Food delivery		
Temperature control	Danger zone	Temperature	Temperature management	Thawing	Reheat food
	Temperature abuse	Cooling	Hot & cold holding	Cooking temperature	
Storage conditions	Storage	Safe storage	Fridge	Freezer	
Contamination sources	Cross-contamination	Transmission pathways	Food contamination	Contamination	Contaminants
Processing & preservation technologies	Preservation	Food process	Food conserve	Active packaging	Intelligent packaging
	Dry store	Cold plasma	Non-thermal	Food printing	3D printing
	New production technologies	Thermal process	Heat treatment	Packaging	Antimicrobial coating
Regulation	Compliance	Requirements	Legislation	Food law	Guidelines

Prevention practices	Prevention	Good agricultural practices	Good hygiene practices	Good manufacturing practices	HACCP
	Practice	Critical limits	Cleaning	Sanitation	Protective clothing
	Techniques	Disinfecting			
Hygiene	Hand washing	Dishwash	Hand care	Personal hygiene	Warewash
Labelling	Labelling requirements	User by	Best before	Date marking	Color coding
Hazard assessment/ analysis	Hazard identification	Incidence investigation	Detection	Outbreak incidence	Outbreak investigation
	Inspection	Surveillance	Epidemiology	Critical control point	Risk management
	Root cause analysis	Risk analysis	Risk	Risk assessment	Emerging risks
Monitoring & control	Nonconformance	Corrective actions	Heat process validation	Testing strategy	Testing methods
	Limits	Sampling plan	Measurement uncertainty	Enumeration	Control
	Analysis				
Novel analysis & technology	Whole genome sequencing	Metagenomic	Genotyping	Bioinformatic analysis	PCR
	Microbiological testing	AI	Big data	IoT	Digitalization
	Text mining				
Hazard management	Management system	Management	Emergency	Crisis	
Infrastructure	Equipment	Facilities	Utensils		
Leadership & vision	Vision	Purpose	Expectations	Goals	Drivers
	Challenges	Commitment	Leadership		
	Behavior	Cooperation	Communication	Education	Training

Behavioral change & communication	Awareness	Cross-functionality	Transparency	Routine	Cross-function
	Storytelling	Response	Behavioral change	Food safety culture	
Monitoring and performance improvement	Credibility	Accountability	Learning	Resilience	Traceability
	Performance	Measurement tools	Monitoring	Auditing	Digital traceability

Link library

Annex table 2: Link library of educational and training material

Audience level	Title of the material and direct link	Sector	Material description
TOPIC: Detection methods			
Beginner	Rapid diagnostic technologies for Foodborne Pathogens, Material Link: https://www.youtube.com/watch?v=iGrnixlLrFk&ab_channel=FoodStandardsAgency	General	The video discusses portable diagnostic technologies for detecting pathogens and foodborne contaminants. It explores their effectiveness, applications in different environments, and potential impact on food safety and public health.
Intermediate	Microbiological testing: what food businesses need to know Material Link: https://www.youtube.com/watch?v=AlaGrS0rf9Q	General	The video provides essential information on microbiological testing for food businesses, including its importance in ensuring food safety, interpreting test results, and complying with regulatory standards. It covers key microbiological hazards, testing methods, and best practices for maintaining hygiene and quality control.
	Making Sense of Presumptive Positives: Understanding rapid methods and confirmations Material Link: https://www.youtube.com/watch?v=qVLgOxhWKs&ab_channel=EurofinsUSFoodGroup	General	This video explores the concept of presumptive positive results in testing, covering its historical background, current testing methods, and the need for confirmation of rapid tests. It also discusses how to address non-confirming presumptives and provides practical recommendations for the food industry.
TOPIC: Hygiene by design			
Beginner	Health and Hygiene Material Link: https://www.youtube.com/watch?v=1oZl4FmEeHo	General	This video explains the importance of personal hygiene in preventing biological contamination in food handling. Proper practices are highlighted to maintain health and hygiene standards in food service environments.
	Proper Hygiene for Food Handlers Material Link: https://www.youtube.com/watch?v=toT5NBLrfJ4	Others	The video emphasizes the critical role of personal hygiene in ensuring food safety. It outlines necessary measures food handlers should adopt to prevent contamination and protect public health.

	Food Handlers & Their Hands Material Link: https://www.youtube.com/watch?v=bcyxuHNCtT0	General	The video emphasizes the critical role of proper hand hygiene in food safety. It outlines essential practices food handlers should adopt to prevent contamination and protect public health.
	Hand Care Material Link: https://www.youtube.com/watch?v=NXWyOuh2zOU	General	The video discusses the challenges of hand hygiene compliance in food service environments, emphasizing the importance of proper handwashing techniques to prevent foodborne illnesses. It highlights common barriers, while providing practical solutions to improve adherence to hygiene protocols.
	Wash Rinse Sanitize Material Link: https://www.youtube.com/watch?v=IPqLxh5KPWk	General	The video emphasizes the importance of the wash, rinse, and sanitize process, highlighting its significance in maintaining cleanliness and hygiene.
	Effective food safety for small food businesses Material Link: https://www.youtube.com/watch?v=4-MqYBIRMLg	General	The content covers food poisoning bacteria, their control, and essential hygiene practices for food businesses. It highlights proper handling, storage, and cleaning to prevent contamination, with real-life case studies illustrating the importance of food safety.
	Why cleaning is important for your food business Material Link: https://www.youtube.com/watch?v=edBTFMviZYw	General	This video covers the importance of proper cleaning in food businesses, explaining the differences between cleaning, sanitizing, and disinfection, and why are necessary. It also discusses factors like cleaning agents, utensils, effective cleaning routines, and staff training to ensure food safety and hygiene compliance.
	Why personal hygiene is vital in your food business Material Link: https://www.youtube.com/watch?v=ZXtRVzparpo	General	This video highlights the importance of staff hygiene in food facilities, covering topics like cross-contamination, the critical need for hand hygiene, glove use, the role of clothing, the significance of personal protective equipment , and how to maintain visitor logs for safety.

	Types of contamination Material Link: https://www.youtube.com/watch?v=RJCgtyGX6mg	General	This video explores the three main types of food hazards—microbial, chemical, and physical—with special emphasis on allergies. Moreover, it highlights specific sources of contamination that can introduce these hazards and compromise food safety.
	Wet cleaning and disinfecting Material Link: https://www.youtube.com/watch?v=F2SEy0nxKXo	General	This video outlines the procedure and importance of wet cleaning and disinfecting in maintaining a safe food environment.
	Food Safety & Public Health Matters Material Link: https://www.youtube.com/watch?v=O2nj5runuV4	General	The video explains the fundamentals of warewashing, covering the proper cleaning and sanitizing of dishes, utensils, and kitchen equipment to prevent cross-contamination. It highlights the importance of correct water temperature, chemical usage, and procedural best practices to ensure food safety and public health compliance.
Intermediate	Demystifying Sanitation in Foodservice: New Procedures and Approaches Material Link: https://www.youtube.com/watch?v=2WxlxkokErA	General	The video provides an in-depth exploration of effective sanitation practices within the foodservice industry. It covers essential topics such as cleaning protocols, pathogen control, and compliance with health regulations to ensure food safety.
	HACCP: Auditing Approaches Material Link: https://www.youtube.com/watch?v=8-Iv1-VrBI0&list=PLBAPaXJEEiwdUH9ejDghpn4AdzQBIQ-Iv&index=15	General	This video explores the key aspects of HACCP, including prerequisite program management, understanding risks and hazards in hazard analysis, and the terminology of validation and verification. It also covers auditing approaches, process flow diagrams, CCP summary sheets, and essential documentation for supporting a HACCP plan.
Expert	Processing Environment Monitoring in Low Moisture Foods Production: Setting Up a Meaningful Programs Material Link: https://youtu.be/730Ac-P_fJU?si=ytVPQAbHDKQrKtjl	General	The video explored the importance of environmental monitoring in ensuring food safety for low moisture foods, focusing on pathogen

			behavior, hygiene practices, and analytical tools for risk assessment. Key discussions emphasized the persistence of microorganisms, the necessity of effective monitoring strategies, and the need for ongoing research to mitigate food safety risks.
TOPIC: Control measures			
Beginner	Food Safety Fact Sheet - Foodborne Illness: Listeriosis Material Link: https://www.agriculture.ks.gov/home/showpublisheddocument/6624/638469270136530000	General	The fact sheet provides essential information on *Listeria monocytogenes* and highlights prevention practices, such as proper food handling, storage, and cooking, to reduce the risk of contamination and ensure food safety.
	Food Safety Fact Sheet - Foodborne Illness: Campylobacteriosis Material Link: https://www.agriculture.ks.gov/home/showpublisheddocument/6626/638469270142630000	General	The document explains Campylobacteriosis, their caused, symptoms and prevention methods.
	How to wash your hands correctly to avoid food poisoning Material Link: How to wash your hands correctly to avoid food poisoning	General	This video demonstrates the proper technique for washing hands to prevent the spread of harmful bacteria. It emphasizes key steps to ensure hands are thoroughly cleaned and reduce the risk of food poisoning.
	Food Safety Fact Sheet - Foodborne Illness: E. Coli Material Link: https://www.agriculture.ks.gov/home/showpublisheddocument/6628/638469270149200000	General	The document covers the risks and prevention methods related to *E. coli* infection. It highlights how this bacteria can lead to severe illnesses, particularly in vulnerable groups and safe food handling, emphasized to prevent infection.
	Hot & Cold Food Temperatures Material Link: https://www.youtube.com/watch?v=_YPN2-MhICY	General	This video has information that food workers can use to ensure foods are held at safe temperatures.
	Food Safety Fact Sheet - Foodborne Illness: Hepatitis A Material Link: https://www.agriculture.ks.gov/home/showpublisheddocument/6630/638469270155430000	General	The document discusses Hepatitis A, a virus transmitted through the fecal-oral route, often through contaminated food or drink. It outlines symptoms and prevention methods include thorough hand washing and vaccination. The document also provides guidance on treatment, which typically

			involves rest and a balanced diet.
	Time and Temperature Controls during Unrefrigerated Processing: Fish and fish products manipulation/control temperature Material Link: https://www.youtube.com/watch?v=StTn46MG_oA&ab_channel=U.S.FoodandDrugAdministration	Fish and Seafood	This video is intended for seafood operators. It provides guidelines on managing time and temperature during unrefrigerated seafood processing. It discuss about common bacterial pathogens in seafood, their impact on health, and the steps to create and implement a time-temperature profile. This profile helps set critical limits to control the growth of pathogens and the production of toxins in raw, ready-to-eat, and cooked, ready-to-eat seafood.
	Biological Pathogen Control Measures Material Link: https://www.youtube.com/watch?v=84vQ-DJEg5w&ab_channel=SafeFoodAlliance	General	This video explores essential control measures for biological pathogens to ensure food safety. It explains how to prevent, limit, and eliminate pathogens through methods such as pasteurization, freezing, and pickling while highlighting the role of sanitation, packaging integrity, and key controls like pH and temperature. Whether for those new to HACCP or refining their approach, the video provides expert insights and industry best practices to enhance food safety knowledge.
	Biological Pathogen Control Measures Material Link: https://www.youtube.com/watch?v=84vQ-DJEg5w&ab_channel=SafeFoodAlliance	General	This video explores essential control measures for biological pathogens to ensure food safety. It explains how to prevent, limit, and eliminate pathogens through methods such as pasteurization, freezing, and pickling while highlighting the role of sanitation, packaging integrity, and key controls like pH and temperature. Whether for those new to HACCP or refining their approach, the video provides expert insights and industry best practices to

			enhance food safety knowledge.
	Food Safety Fact Sheet - Hepatitis A and Food Handlers Material Link: https://www.agriculture.ks.gov/home/showpublisheddocument/6632/638469270162470000	General	The document provides essential information on Hepatitis A, emphasizing its transmission through contaminated food or water, particularly by infected food handlers. It discusses symptoms and outlines the importance of handwashing to prevent spread. It also covers treatment options and the role of vaccination.
	Food Safety Fact Sheet - Foodborne Illness: Norovirus Material Link: https://www.agriculture.ks.gov/home/showpublisheddocument/6634/638469270168570000	General	The document discusses Norovirus, a highly contagious virus that causes gastroenteritis or stomach flu, and the symptoms. Norovirus spreads through contaminated food, liquids, surfaces, or direct contact. There is no specific treatment or vaccine, but staying hydrated is essential. Prevention includes frequent handwashing, proper food handling, and disinfecting contaminated surfaces.
	Food Safety Fact Sheet - Foodborne Illness: Salmonella Material Link: https://www.agriculture.ks.gov/home/showpublisheddocument/6636/638469270175300000	General	The document explains about *Salmonella*, their caused, symptoms and prevention methods.
	Food Safety Fact Sheet - Foodborne Illness: Shigellosis Material Link: https://www.agriculture.ks.gov/home/showpublisheddocument/6640/638469270187300000	General	The document discuss about Shigellosis, their caused, symptoms and prevention methods.
	Food Safety Fact Sheet - Norovirus Clean Up Material Link: https://www.agriculture.ks.gov/home/showpublisheddocument/6720/638469273634100000	General	This document offers comprehensive and actionable guidelines for effectively managing and mitigating the risks associated with vomiting or diarrhea accidents, with a specific focus on preventing Norovirus contamination. It details the use of personal protective equipment, proper cleaning protocols, and the preparation of EPA-approved disinfectants or bleach solutions to ensure thorough decontamination. These procedures are essential for maintaining public health and compliance in food facilities and other high-risk environments.

	Food Safety Fact Sheet - Vacuum Packed Fish Safety Material Link: https://www.agriculture.ks.gov/home/showpublisheddocument/6722/638469273640330000	Process and packaged food	This document focuses on *Clostridium*, a foodborne pathogen, providing essential guidelines for its prevention and control in food safety practices. It highlights strategies for managing contamination risks, including proper food handling, sanitation, and temperature control. It ensures compliance with food safety regulations and promotes public health protection.
	Food Safety Fact Sheet - Foodborne Illness: Clostridium perfringens Material Link: https://www.agriculture.ks.gov/home/showpublisheddocument/6736/638469275428030000	General	The document explains *Clostridium perfringens*, their caused, symptoms and prevention methods.
	Food Safety Fact Sheet - Reheat Foods Quickly and Safely Material Link: https://www.agriculture.ks.gov/home/showpublisheddocument/3574/638462855495270000	General	This document is about mitigating food safety risks associated with holding, cooling, and reheating food in food establishments. It emphasizes the dangers of improper temperature control, which can lead to the growth of *Clostridium* perfringens, and highlights the importance of proper reheating practices to eliminate or reduce these risks.
Intermediate	Validation of Ingredient-Based Systems to Control Pathogens Material Link: https://www.youtube.com/watch?v=p1TXeNZwBDc&ab_channel=ILSIGlobal	General	This video focuses on the validation of ingredient-based systems to control pathogens in food safety, with a particular emphasis on non-thermal and novel thermal controls.
	Preventing Salmonella Contamination – Better Testing and Risk Management Material Link: https://www.youtube.com/watch?v=pAlrgy6dEoU&list=PLBAPaXJEEiwdUH9ejDghpn4AdzQBIQ-lv&index=3	Meat	This video focuses on strategies to mitigate *Salmonella* contamination in food production. Emphasizes the importance of implementing robust testing protocols and effective risk management practices to ensure food safety. It highlights the need for continuous monitoring and adopting preventive measures to reduce the incidence of *Salmonella* outbreaks.
	Cold Plasma: A novel Non Thermal Processing technology in the Agri-Food Sector Material Link: https://www.youtube.com/watch?v=GquOg0c3ikc	General	This video explores non-thermal (cold) plasma in medical, food, and agricultural applications, showcasing their role in infection control, cancer

			treatment, and pathogen reduction. It highlights the mechanisms of ionized gases, their applications, and the potential of plasma-activated liquids in contamination control.
	Food Allergy and Intolerance Training Material Link: https://allergytraining.food.gov.uk/	General	This course covers the impact of allergies on the body, regulations for allergen information, and best practices for managing allergens in food production, packaging, and catering. It also explores the importance of accurate labeling, including voluntary allergen labeling.
	Salmonella: Testing & Control measures in the poultry industry Material Link: https://www.youtube.com/watch?v=nJd9TQcW1vQ	Meat and poultry	This video provides an overview of Salmonella concerns in Ireland, highlighting specific cases, outbreaks, and control measures within the food industry.
	Microbiological safety in dried ingredients Material Link: https://youtu.be/NMZFOyGnQ0I?si=jUov3LARP7sHImHN	General	This video explores strategies to reduce microbiological hazards in dried ingredients such as herbs, spices, and fruits. It highlights a risk-based decision tool for contamination control, alternatives to thermal treatments, and the importance of evaluating drying processes. Additionally, it emphasizes early-stage production controls to tackle industry challenges and stay ahead of trends.
	Technical guidance document on sampling the food processing area and equipment for the detection of Listeria monocytogenes Material Link: https://zenodo.org/records/8406616	General	The EURL Lm developed technical guidance on sampling food processing areas for *Listeria monocytogenes* after identifying gaps in the EN ISO 18593:2004 standard. Their 2012 guideline influenced the 2018 revision of this international standard, incorporating improved detection methods. The latest fourth version, approved in October 2023, reflects updates based on revised ISO 18593 (2018) and ISO 11290 (2017) standards, ensuring more precise sampling techniques.

TOPIC: Packaging innovations			
Beginner	Innovation on food packaging and packaging materials Material Link: https://www.youtube.com/watch?v=HJjlwrAQ730&ab_channel=ChemicalHauntBusters	General	The video covers innovations in food packaging, focusing on bioplastic, explaining their properties, applications, and challenges. It highlights ongoing research to enhance bioplastics' performance, affordability, and sustainability, particularly in food packaging, by using agricultural and marine biomass.
Intermediate	Safety assessments of biobased materials Material Link: https://www.youtube.com/watch?v=NWZMPmJR_dw&t=1s&ab_channel=FitNESS-responsiblefoodpackaging	Others	This video covers data on the safety assessment of biobased substances, with a particular focus on the limitations of current regulations, testing procedures and future perspectives. The presenter begins by highlighting why biobased materials have become popular and describe early concerns about plastics that arose in the 1970s. During the presentation, the audience will be informed about the types of biobased materials, such as bioplastics, as well as the presence of different contaminants and their potential health effects. Finally, the speaker discusses the regulatory framework for biobased food contact, the standards applied to ensure the safety of biobased substances and the challenges ahead.
	Innovations in food packaging Material Link: https://www.youtube.com/watch?v=WSjQY6mV5R0&ab_channel=FitNESS-responsiblefoodpackaging	Others	This video explains biobased and biodegradable materials, describing their properties and how they function. It provides a detailed overview of each material and their specific characteristics.
	Safety assessments of bio-based materials Material Link: https://www.youtube.com/watch?v=dT8jP3wrmRg&ab_channel=FitNESS-responsiblefoodpackaging	Others	The video covers the safety assessment of biobased materials, stressing that they must undergo thorough evaluations like any other material. It highlights the potential risks, such as harmful substances, and the need

			for migration testing to ensure safety.
	Latest developments on Food Contact Material regulation Material Link: https://www.youtube.com/watch?v=ygXS4N3_NOE&ab_channel=FitNESS-responsiblefoodpackaging	General	This video covers the latest developments in Food Contact Material regulations, providing an update on new guidelines and standards. It explores key changes, challenges, and the implications of these regulations for food safety and manufacturing practices
	Reusable food packaging in Europe: Regulations, practices, and outlook Material Link: https://www.youtube.com/watch?v=tt3ftbT5JdI&ab_channel=FitNESS-responsiblefoodpackaging	General	The video discusses food packaging reuse systems and their growing importance in reducing waste from single-use packaging. It also covers regulatory developments, industry progress, and key challenges, including chemical migration and the need for better infrastructure.
	How do we optimise the properties of coating materials for application in food packaging Material Link: https://www.youtube.com/watch?v=CEeRU4Uys68&ab_channel=SciFoodHealth	General	The video focuses on developing antimicrobial coatings to improve food safety and extend shelf life. It highlights the use of bacteriophages to target specific pathogens like *Salmonella*, demonstrating their effectiveness in reducing contamination in food products.
	Proteins as biobased coatings for packaging Material Link: https://www.youtube.com/watch?v=wrW2EhGxx94&t=15s&ab_channel=ECOFUNCOBBI	General	The video explores the potential of protein-based coatings as a sustainable solution for packaging. It highlights the protein's ability to provide oxygen barriers and adhesive properties, offering a biodegradable, bio-based alternative to traditional packaging materials.
	Recovery of added value molecules from agro-wastes to apply as coating for the food packaging Material Link: https://www.youtube.com/watch?v=rwYZJd4NFg0&ab_channel=ECOFUNCOBBI	General	The video covers a project focused on recovering valuable molecules from agro-waste to create sustainable coatings for food packaging. It highlights the processes used to extract these substances and their potential applications in improving packaging materials.
	BioNovel packaging films and textiles with tailored EoL Material Link: https://www.youtube.com/watch?v=SjJiiOZNrr8&ab_channel=ECOFUNCOBBI	General	The video focuses on developing biodegradable and recyclable packaging solutions made from bio-

			based materials, aiming to address the environmental challenges posed by plastic waste. It includes innovations in packaging formulations, coatings, and end-of-life solutions, ensuring compatibility with various recycling and composting methods.
	The Smart Sustainable Plastic Packaging from Plants Material Link: https://www.youtube.com/watch?v=WPKBnrQrS5o&ab_channel=InnovateUK	General	The video highlights the development of sustainable packaging materials aimed at reducing waste and resource consumption. It discusses their key properties and explores their potential applications in food packaging industries.
	The Compostable plastics: unlocking existing barriers to systems change Material Link: https://www.youtube.com/watch?v=mR9BT6H5bGc&ab_channel=InnovateUK	General	The video highlights the ongoing challenges with compostable plastics, stressing the need for better communication and standardized labeling to reduce confusion. It advocates for more effective waste management solutions that align with real-world composting processes and ensure that materials are properly disposed of to meet environmental goals.
	Intelligent Packaging Material Link: https://www.youtube.com/watch?v=Iya-O11zyL8&ab_channel=SUREFISH	General	The video covers the use of different types of indicators in intelligent packaging. It also discusses various methods for integrating these technologies into packaging, the practical use, challenges, and regulations.
	Flexible Strain Sensor with NFC Tag for Food Packaging Material Link: https://www.youtube.com/watch?v=Kv-4UOJn0n0&ab_channel=IEEESensors	General	The video presents the development of a flexible strain sensor integrated with an NFC tag for food packaging, designed to monitor microbial spoilage. It explains the sensor's materials, working mechanism, and its application in detecting bacterial growth.
	Wearable Sensor-Enabled Meat Packaging for Freshness Monitoring and Assurance Material Link: https://www.youtube.com/watch?v=iK0P_aGKJrk&ab_channel=IEEESensors	Meat and poultry	The video presents the development of a sensor-based packaging system designed to monitor product shelf-life. It discusses the testing and performance of the system,

			as well as future plans to enhance its capabilities for remote monitoring applications
	Innovation on food packaging and packaging materials: from polymers to bioplastics Material Link: https://www.youtube.com/watch?v=oqOy8AWcUA4&ab_channel=ChemicalHauntBusters	General	The video discusses the innovation in food packaging, focusing on biodegradable materials, active, and smart packaging. It highlights the importance of bioplastics and explores the use of active packaging systems to improve food preservation and quality, along with smart packaging that informs consumers about food status through various sensors.
	Where Quality and Safety Meet in Food Packaging Material Link: https://www.youtube.com/watch?v=WKYeFRscyOg&t=250s	General	This video highlights the importance of proper packaging design in ensuring food safety and quality. It also explores future trends in food packaging, including advancements in smart packaging, sustainability, and technologies aimed at extending shelf life, while responding to consumer demands for more effective and reliable solutions.
TOPIC: Digitalization and AI			
Intermediate	Artificial Intelligence (AI) for Food Safety management Material Link: https://www.youtube.com/watch?v=F-c_RSgXzeo	General	The video highlights AI's role in food safety, covering applications in bacterial phenotyping, recall management, outbreak prediction, and antimicrobial resistance, while discussing its benefits, drawbacks, and regulatory considerations.
	Digital for Smallholders: Leveraging IoT and Open Source to drive Smart decisions Material Link: https://www.youtube.com/watch?v=Sp1I3Uo2fQs	Fresh fruit & vegetables	The video explores how the Internet of Things (IoT) and open-source technologies can provide small-scale farmers with low-cost, high-quality smart sensors to monitor crops and environmental conditions. These sensors help improve food safety by detecting risks like contamination or disease, allowing farmers to take proactive measures for better, safer produce.
	Data and Technology in the New Era of Smarter Food Safety Material Link: https://www.youtube.com/watch?v=m7ftR46wSEI	General	The video explores the use of technology to enhance food safety systems,

			focusing on detailed strategies for modernizing food safety frameworks. It stresses the need for a strong food safety culture to tackle emerging challenges and improve public health outcomes using data-driven approaches.
	Artificial Intelligence and ethics within the food sector Material Link: https://www.youtube.com/watch?v=KCRY2AkLAX8	General	The video presents how design fiction methods enabled the researchers to develop a common language and understanding of AI within the food sector, developing a methodology that could be used in other sectors to explore the complex dimensions of data ethics
	AI & Food Safety | AI & Food and Nutrition Material Link: https://www.youtube.com/watch?v=AzLvCriNiWc	General	This video explains how AI, NLP, and text mining help improve food safety by finding risks, tracking outbreaks, and improving regulations. It shows how these technologies analyze data from reports and research.
	Changing Phenomenon of Food Safety practices in the Digital Age Material Link: https://www.youtube.com/watch?v=jfU_T82LLhc	General	The video discusses how digital transformation is changing food safety practices, with industries and regulators using AI, blockchain, and remote technologies to improve safety and efficiency. It also highlights challenges such as data ownership, regulatory frameworks, and the need for digital skills to ensure technology benefits all stakeholders.
	Four steps to successful digitalization of quality management in the food industry Material Link: https://www.youtube.com/watch?v=wPTj8dEjrOc&list=PLBAPaXJEEiwdUH9ejDghpn4AdzQBIQ-lv&index=21	General	The video explores how analyzing existing processes is crucial for a successful digitalization strategy, emphasizing the selection and integration of the right technologies to enhance efficiency and reduce errors. It also highlights the importance of employee training, change management, and continuous system evaluation to ensure long-term success.
Expert	System Design for Identification of Emerging Food Safety Risks Material Link:	General	The video discusses key drivers of change in emerging food safety risks,

	https://www.youtube.com/watch?v=6dy21PZHl0o		affecting the European food system. It presents a structured approach using a driver matrix to assess risks based on volatility, controllability, and health impact, enabling tailored management strategies to enhance resilience and proactive food safety planning.
	Emerging Food Risk Detection Through AI-Enhanced Weak Signal Mining Material Link: https://www.youtube.com/watch?v=Wi9c3j9CuQM	General	The video discusses weak signal mining, a technique for early detection of emerging food and feed risks by identifying subtle, yet rapidly increasing trends in unstructured text data. It highlights the application of AI-enhanced methods to improve the identification and interpretation of these weak signals, aiming to enhance food safety monitoring and response
	AI-Driven Prediction of Emerging Food Safety Risks: A Holistic Approach Material Link: https://www.youtube.com/watch?v=u-3-gHQWo1o	General	The video discusses the development of AI-driven prediction models for identifying emerging food safety risks using both structured data for hazard monitoring and unstructured data for knowledge graph construction. It explores machine learning techniques to improve food safety predictions, leveraging large datasets, feature selection, and synthetic data augmentation, while also incorporating knowledge graphs to enhance understanding of food-hazard relationships.
	Text mining models for emerging risk identification Material Link: https://www.youtube.com/watch?v=ZentcnQoymc	General	The video discusses how data analytical and visualization methods can assist experts in identifying emerging risks by structuring large volumes of unstructured text data, particularly in the food safety domain. It introduced the BarTopIc framework, an open-source machine learning model for topic detection, and demonstrated its application in clustering and

			visualizing food safety news to support decision-making in crisis management and risk assessment.
	FDA New Era of Smarter Food Safety Tech-Enabled Traceability Video Series: Supply Chain Technology Material Link: https://www.youtube.com/watch?v=TZhYL1RdrT8	General	The video emphasizes the critical role of traceability in public health through low or no-cost technology solutions that can modernize food safety for businesses of all sizes. It highlighted the challenges of implementing such systems, including the need for user-friendly interfaces, interoperability, and executive support, while stressing the potential of emerging technologies like blockchain to improve compliance and trust. The discussion concluded with a call for a comprehensive strategy to adopt digital tools that enhance operational efficiency, quality, and sustainability across the food supply chain.

HISTORY OF CHANGES		
Version	**Publication date**	**Change**
1.0	30.06.2025	▪ Final version