D7.5 – Report on trainings

WP7- Dissemination, communication, exploitation and training

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1 Executive Summary

FAIRCHAIN project "Innovative technological, organisational and social solutions for fairer dairy and fruit and vegetable value chains" addresses the need for a food system transformation by developing innovations to be implemented for development of competitive intermediate food chains for small and mid-sized actors with a focus on postharvest steps in the fruit, vegetable, and dairy sectors. The objective is to enable scale up and expanded production at the local and regional level.

The FAIRCHAIN trainings aim at forming a pool of trained professionals at EU level able to understand the concept of intermediate value chains, get insights of several innovations to scale up their business, learn about the co-creation process and its application and more. Different types of training methods have been developed from an e-learning programme blended with face-to-face sessions to student competitions and Food Hack. The real situations of the Cases Studies (CS) including practical demonstrations and workshop are also included. The trainings are targeted at an assortment of audiences: from professionals with years of experience, both academic and industry through current students and interested consumers covering both general and specific aspects of the agri-food value chain.

Deliverable (D) 7.5 is the final report of the trainings developed in the frame of the FAIRCHAIN project. The document presents in detail the structure, target groups and achievements of the i) e-learning programme, ii) face to face learning sessions, iii) Food Factory 4 US student competition, iv) Food Hack, and the highlights of the v) CS demonstrations and workshops (D 7.8).

In total, the e-learning programme was completed by 208 people worldwide, the three FF4Us student competitions attracted 133 applicants on 34 teams, from 14 countries around the world and 58 students completed a competition, the Food Hack competition received 28 interested students from Swedish Universities including three students from the FF4Us winning teams and the CS trainings reached more than 180 people from six European countries. Overall, the feedback of the different trainings was very positive, recognizing the usefulness information and knowledge gathered. Also, the networking, when possible, was greatly valued by participants.

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List of Acronyms

Abbreviation / acronym	Description
IFA	ISEKI-Food Association
FF4Us	Food Factory 4 Us
IFVC	Intermediate Food Value Chains
SFVC	Short Food Value Chains
SFS Innovation Platform	Sustainable Food System Innovation Platform
IUFoST	International Union of Food Science and Technology

2 The FAIRCHAIN e-learning programme

Three on-demand e-learning courses (2.2) were linked to two face-to-face sessions (2.3) to create a blended learning programme. The first e-learning course became available on the IFA Moodle site in April 2023, the second course was launched in October 2023 and the third course in March 2024. The courses have remained accessible here through the end of the project and beyond. The courses are found in the category of 'Innovative Food Supply Chains', which also contains on-demand e-learning courses developed in the SMARTCHAIN project. The two complimentary face-to-face sessions took place at large conferences: the ISEKI-Food International Conference in July 2023 and the International Union of Food Scientists and Technologists (IUFoST) Conference in September 2024.

2.1 Target groups and dissemination

The e-learning programme of FAIRCHAIN is targeted first to actors in the intermediate food value chain, that is those typically less involved in research and innovation programs, such as: farmers and farmer organizations, food industry (particularly SMEs), traders, and distributors, but also to all interested in IFVCs. The first e-learning course introduces the benefits of IFVCs, including a comparison with the more common Short Food Value Chains, SFVC in which most small producers work. The second and third courses are more practical, covering concrete ways to move a short Food Value Chains, FVC to an intermediate one including how to get funding, find practical and innovative ideas, use common networking channels, and follow best practice examples in many food categories.

The first course was tested by CS leaders to incorporate country- and culture-specific suggestions on reaching local producers. These included the use of short videos as the primary tool for knowledge exchange, and the adaptation of the e-learning platform to accommodate access on a mobile phone. Later courses incorporated a suggestion from the first project review meeting and added the option of videos with subtitles in any language (Figure. 2.1).

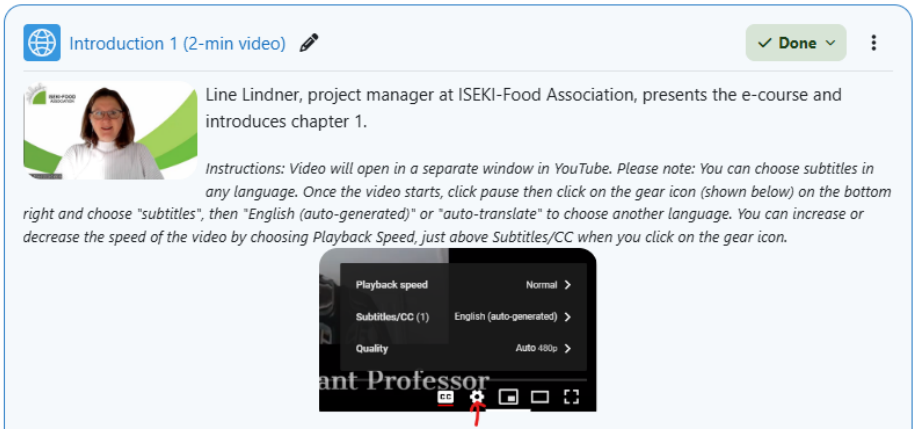

Figure 2. 1: Example of the video instruction in the course 2 introduction.

To decrease the English language dependence, materials originally in other languages were also used (Figure 2.2).

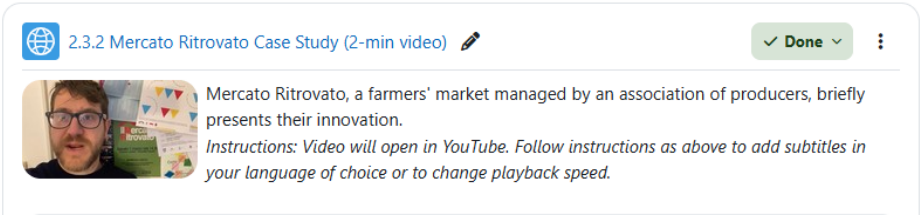

Figure 2. 2 Example of an activity presentation in Italian language.

The two blended learning sessions were designed as face-to-face workshops aimed at reaching professionals and researchers in the food sector, in a proximity setting, to increase interaction and discussion of the main achievements and challenges related to IFVC.

The first session was held at the ISEKI international Food Conference (Paris, 4 July 2023) as a pre-conference event, under the theme: "Intermediate Food Value Chains in Practice". The second session was held as an interactive oral presentation, at the IUFoST conference (Rimini, 10 September 2024) under the title: "Digital microlearning in intermediate food value chains".

Organized dissemination campaigns were carried out to launch the three e-courses and the blended learning sessions. Several visual resources were designed to support the dissemination via email and social media posts. The three e-learning courses were publicized to the six FAIRCHAIN CSs to reach a variety of small producers. They were also publicized to food science faculty at universities, and through IFA and FAIRCHAIN project social media channels (Fig.2.3).

Emails were also sent to the IFA mailing list (+8000), to the already registered students and to other FAIRCHAIN students like the FF4Us participants and mentors. The e-courses and blended sessions were also announced in the IFA newsletter, which is released four times a year.

Throughout the duration of the courses, several emails were sent motivating students to continue attending.

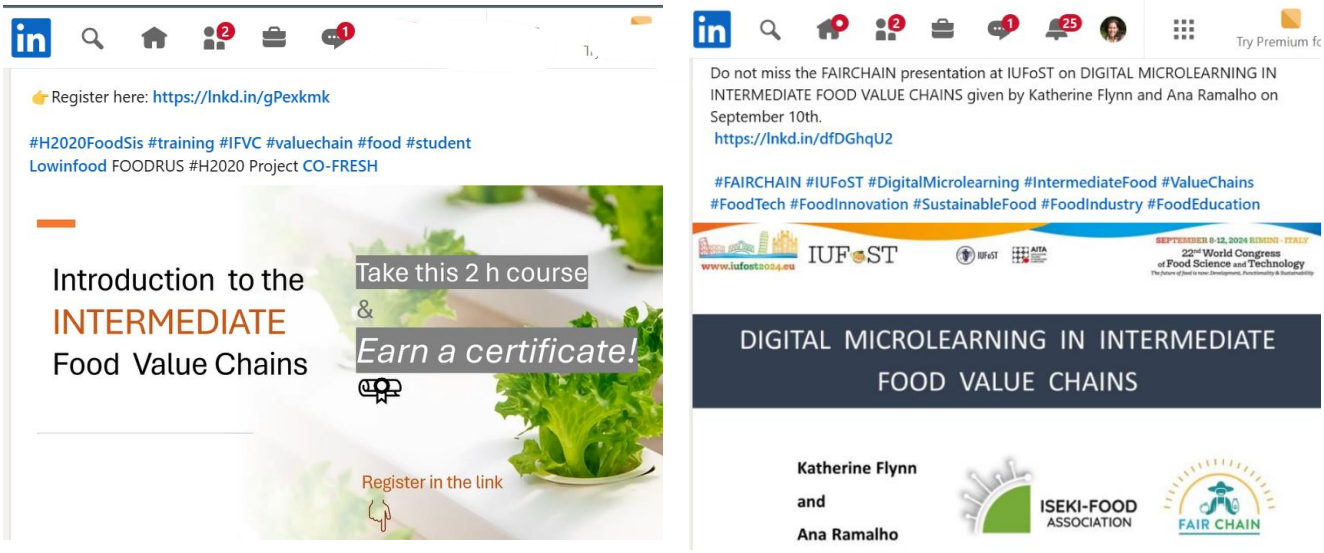

Figure 2. 3 : Example of two dissemination posts on Linked In about the a) second e-course and b) the second blended session.

2.2 Online courses

The e-learning programme of the FAIRCHAIN project is developed as microlearning. Microlearning involves short, focused learning sessions, typically lasting three to ten minutes, offering concise, interconnected, yet independent learning opportunities. This learning model offers an effective solution for today's fast-paced, multitasking learning and working environments. It enables learning in small, manageable steps with concise content delivered through social interaction, and potentially can effectively support continuous professional development. The microlearning developed in the e-courses had to be completed in chapter order but may be carried out on their own schedule during the courses availability.

FAIRCHAIN e-learning courses are organized on the IFA Moodle Platform (Fig. 2.4) and available there via a direct link from the SFS Innovation Platform (Fig 2.5), ISEKI-Food website and FAIRCHAIN website (Fig 2.6).

Figure 2. 4 : ISEKI-Food Moodle with the FAIRCHAIN e-learning courses.

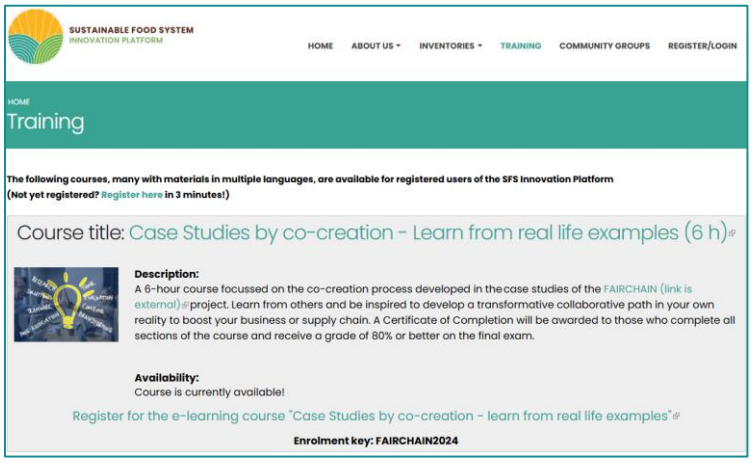

Figure 2. 5 : FAIRCHAIN e-learning course available on the training tab of the SFS Innovation Platform.

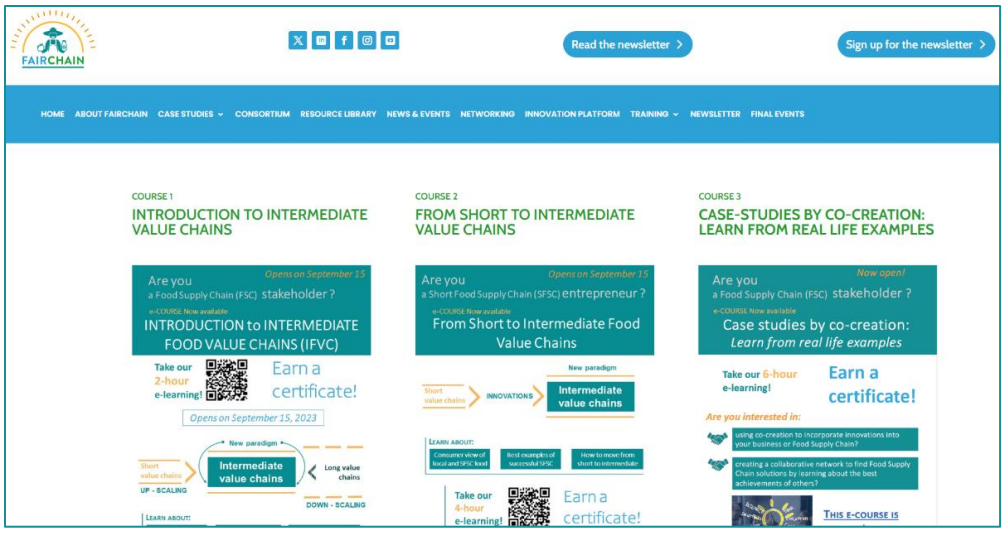

Figure 2. 6 : FAIRCHAIN e-learning course disseminated on the FAIRCHAIN website.

With an easily accessible and free FAIRCHAIN e-learning programme, we aim to bring assorted actors into the FAIRCHAIN community, both through their participation in the course and through course links to other FAIRCHAIN activities e.g., face-to-face sessions at FAIRCHAIN events, FAIRCHAIN website, SFS Innovation Platform, and FAIRCHAIN social media.

The three courses were developed and structured as chapters to be taken sequentially at each one's availability.

There is an introductory chapter, which defines the e-course guidelines and promotes communication between organizers and participants. It has the following topics:

- Announcements
- Course guide
- Demographic questions
- Quick self-assessment (T/F)

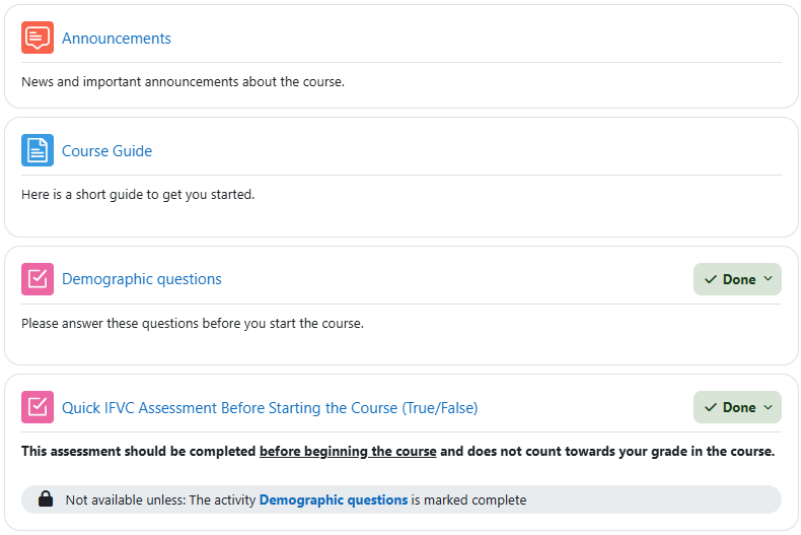

Figure 2. 7: Introductory chapter of the e-courses

Before beginning the course, participants view the course instructions and learn how to progress along the chapters (Fig 2.7). An announcement section was used as needed. The five demographic

questions provided information about the participants in the courses. A quick assessment quiz about IFVC was available before and after the completion of all the activities to evaluate the participants level of knowledge and measure performance and knowledge improvement on the theme.

Project partners were successfully involved in the three e-courses as many materials available were produced by the project partners according to their different areas of expertise. The materials available included power point presentations, videos, website visits, infographics, interviews and more. The activities are subsequent, students must complete one to be able to unlock assess to the following activity. After each chapter, there is a "check your understanding" self-assessment quiz, as training for the final quiz. Also, after most chapters suggested activities and further readings are listed as an opportunity to widen knowledge.

At the end of each course, there was a final quiz with 20 random questions chosen from the Check Your Understanding quizzes included throughout the courses. This quiz was graded and a grade of 80% or above was required for success. Participants who successfully completed the quiz and all other course activities received a FAIRCHAIN certificate (Fig. 2.8).

Figure 2. 8: FAIRCHAIN courses certificate.

After the completion of all activities, participants were requested to fill in the course evaluation form about the course length, their favorite part, the usefulness of the course or what would they change to improve it (Fig 2.9). In the second and third courses a feedback form (Fig 2.10) was implemented after each chapter because it was found to be easier to rate the interest and relevance of topics along the course and not only at the end.

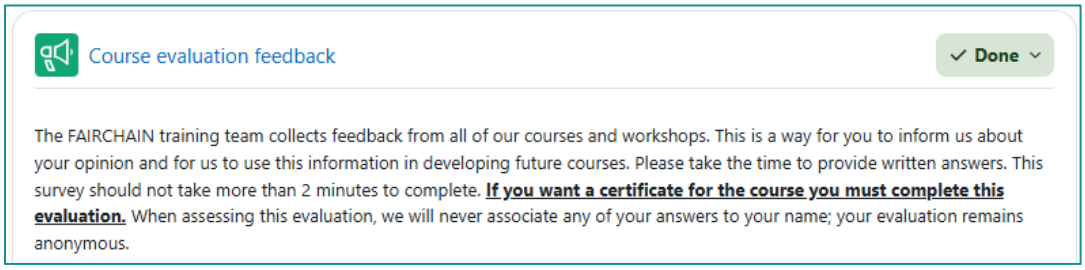

Figure 2. 9: Course evaluation feedback.

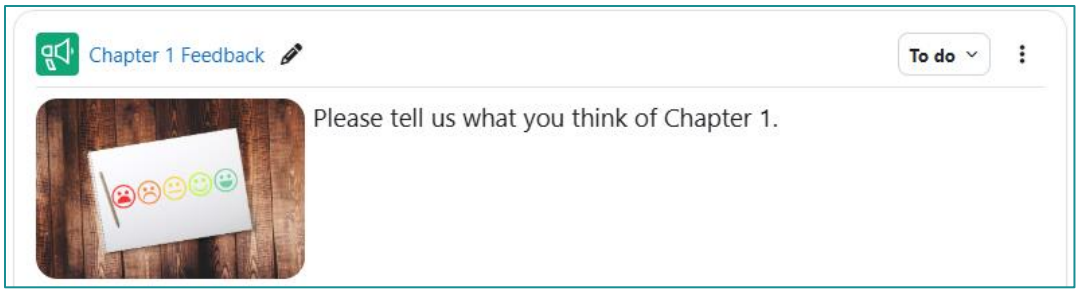

Figure 2. 10: Feedback form after chapters in courses 2 and 3.

2.2.1 'Introduction to Intermediate Food Value Chains' course

This 2h e-course with five chapters aimed to pave the way to introduce and establish the concept of Intermediate Food Value Chains. Having a food supply chain as starting point, the term Food Value Chain was also introduced and used interchangeable. From there, different types of supply chains models are explored with their advantages and disadvantages. After, a highlight to the concept of IFVC, its characteristics and examples, also identifying the differences and similarities between the supply chains models is included and followed by the challenges faced in the transition to an IFVC and the e-course conclusions. The e-course is structured in five sections called "chapters". Each chapter has an introductory presentation, by one of the e-course organisers, about the topics and learning materials to come.

Each activity is only unlocked after completion of the previous. After each chapter, there is a "check your understanding" self-assessment quiz, as training for the final quiz, and a section with further material as extra information on the topic.

The course was made available in April 2023 and will be open after the project lifetime.

The e- course chapters were structured as follows:

Chapter 1: What is a food value chain?

1.1 Introduction to chapter 1
1.2 "Food Value Chain Basic Intro"
1.3 Supply chain example: bakery
1.4 Life of a strawberry

Chapter 2: Types of common food value chains: advantages and drawbacks

2.1 Introduction to chapter 2
2.2 What is a long food value chain?
2.3 What is a short food value chain?
2.4 Global value chains and agriculture
2.5 Inside America's Food Supply Chain Under COVID-19
2.6 SMARTCHAIN Smart Solutions in Short Food Supply Chains
2.7 Short Food Chain EU community

Chapter 3: The concept of intermediate food value chains

3.1 Introduction to chapter 3
3.2 What is an intermediate food value chain?
3.3 Comparison of food value chains

3.4 Examples of Intermediate value chains

3.5a An intermediate food value chain in Germany

3.5b An intermediate food value chain in the USA

3.6 Characteristics of intermediate food value chain

Chapter 4: Challenges and issues in the transition towards intermediate food value chains

4.1 Introduction to chapter 4

4.2 Intermediate Value Chain Issues

4.3 Issues for Small and Mid-Sized Actors in the Food Chain

4.4 Examples of the Five Major Issues

4.5 Pathways for Transitioning to IFVC

Chapter 5: Conclusions

5.1 Introduction to chapter 5

5.2 Intermediate Food Value Chains Summary

5.3 What is the FAIRCHAIN Project?

5.4.a Visit FAIRCHAIN website

5.4.b Visit FAIRCHAIN Innovation Platform

2.2.2 'From Short to Intermediate Food Value Chains' course

This 4h e-course with five chapters aimed to provide concrete support and knowledge transfer to Short Food Value Chain (SFVC) actors to add innovative solutions to optimise performance and further development in the intermediate food supply domain. It begins with a context on consumer perceptions and behaviour regarding local food, going through the GAIN transition model (developed in the SMARTCHAIN Project – GA 773785) and the gamification and how they can benefit the SFVCs. Some best and innovative examples of SFVCs were presented including local markets and social solutions followed by best examples of enterprises working at the intermediate supply chain level. Their collaborative strategies to improve networking and grow local supply chains were presented. The business solutions were tackled with practical examples, such as networking and blockchain. Lastly, it is shown how Food Value Chains are changing, some smart solutions for FVCs and examples of international cooperation.

Each activity is only unlocked after completion of the previous. After each chapter, there is a "check your understanding" self-assessment quiz, as training for the final quiz, and a section with further material as extra information on the topic.

The course was made available in October 2023 and will be open after the project lifetime.

The e- course chapters were structured as follows:

Chapter 1: What is a food value chain (FVC)?

1.1 Welcome to the e-course and introduction to chapter 1

1.2 Consumer behavior and food supply chains

1.3 The GAIN Transition Model

1.4 Innovation and design of smart specializations

Chapter 2: Short FVCs – Some best examples

2.1 Welcome to chapter 2

2.2 Vending machines for fresh and local products

2.3 Farmer's markets and cooperatives

2.4 Social Innovation and Community-Supported Agriculture (CSA): Contribute to producing your food

Chapter 3: Intermediate FVCs – Some best examples

3.1 Welcome to chapter 3

3.2 Regional valorization of damaged fruits and vegetables

3.3 A Spanish digital market for selling regional food

3.4 Collaboration to grow SFVCs: European examples

3.5 Certification system for innovative food value chains

Chapter 4: Getting from short to intermediate: Innovations and communities

4.1 Welcome to chapter 4

4.2 What makes a food innovation successful?

4.3 Blockchain solutions for food

4.4 Food inventories in an online platform

4.5 SFSC LinkedIn community interactions

Chapter 5: Conclusion: Changing food supply chains

5.1 Welcome to chapter 5

5.2 Changing food supply chains

5.3 SMARTCHAIN Smart Solutions in Short Food Value Chains

5.4 Europe is changing its food value chains

5.5 The FAIRCHAIN project

2.2.3 'Case-studies by co-creation: learn from real life examples' course

This 6h course with nine chapters was designed for SFVC entrepreneurs, primarily producers and processors, interested in using the co-creation process to incorporate innovations into their business and grow it to (part of) an IFVC. The course begins with the FAIRCHAIN project context and objectives, introducing the concept of IFVCs. Then it is presented the concept of co-creation process, how to initiate the process, how to develop a network with trusted relationships and common values, aiming win-win situations for all actors involved. This includes examples of the Goal defining workshops and the Implementation workshops. Using the CS of the FAIRCHAIN project as supporting examples, the course explores the co-creation concept and shows how it can be applied in practice.

The course was made available in March 2024 and will be open after the project lifetime.

The e- course chapters were structured as follows:

Chapter 1: Chapter 1 Introduction to FAIRCHAIN project

1.1 Welcome to the e-course and introduction to chapter 1

1.2 What is FAIRCHAIN

1.3 Visit the FAIRCHAIN website

1.4 Visit the Sustainable Food Systems Innovation Platform

1.5 What are Intermediate Food Value Chains

2.3 Blended learning sessions

The blended learning sessions were carried out face to face at two different conferences. The objective of the blended learning was to bring into practice the training materials produced, the concepts developed, the research and innovations from the FAIRCHAIN project.

2.3.1 Intermediate Food Value Chains in Practice

This session was held as pre-conference event of the ISEKI Food Conference 2023 "Next-Generation of Food Research, Education and Industry" on the 4 July, AgroParisTech in Paris, France (Fig. 2.11). This blended learning workshop focused on practical aspects of the two first FAIRCHAIN e-learning

courses: 'Introduction to Intermediate Food Value Chains (FVC)' and 'From Short to Intermediate FVC'.

The workshop was interactive and practical, with participants working in groups and individually and discussing the several materials and features presented. They used Short and Intermediate FVC websites and platforms, joined online groups moving from short to intermediate FVCs and explored funding possibilities for FVC entrepreneurs. The feed-back of the session was collected via google form at the end. Seven questions were asked to evaluate the workshop, the favourite part, the knowledge before and after, the suitable duration and possible improvements.

Agenda

- Introductions (15 min)
- What is available? Some Short and Intermediate FVC websites and platforms (45 min)
- Getting involved. Exploring online groups involved in Short and intermediate FVCs (45 min)
- Moving ahead. Opportunities to advance Short and Intermediate FVC entrepreneurship. (45 min)
- Conclusions (15 min)

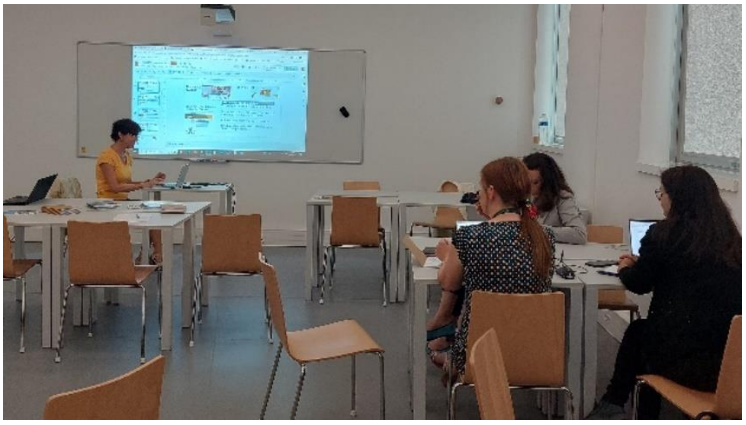

Figure 2. 11: Blended session in July 2023.

2.3.2 Digital microlearning in intermediate food value chains

This session was part of the IUFoST 2024 conference "The future of food is now: development, functionality & sustainability" as an oral presentation included in a session dedicated to Politics and Education (10 September) (Fig. 2.12). The aim of the activity was to complement digital microlearning with an interactive live session and assess the improvement of knowledge.

In the beginning, participants were asked three questions, using slido.com application, about the IFVC and the co-creation process, focusing on the third e-course "Case-studies by co-creation: learn from real life examples" (Fig 2.13). Then, insights into the FAICHAIN project, the concepts of FVCs, advantages and disadvantages, and about the co-creation concept and process were presented. At the end, the same quiz was shown, and the answers were recorded to assess and evaluate the microlearning session.

Figure 2. 12: Blended session in September 2024.

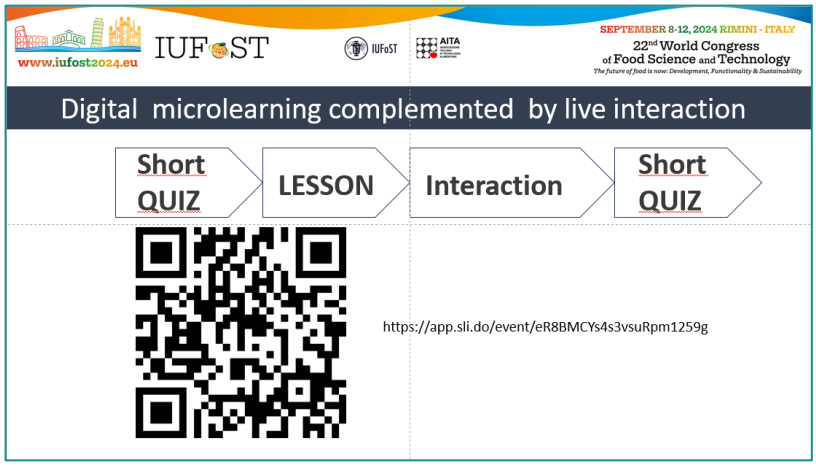

Figure 2. 13: Slide from PPT presentation explaining the interactive oral session.

2.4 Achievements and sustainability

2.4.1 Online courses

2.4.1.1 Demographic data

Overall, 120 people registered for one of the three FAIRCHAIN e-courses. The demographic characterization of the participants by course are shown. Sixty percent of participants were female (Fig. 2.14) with 72% of age between 21 and 40 years old (Fig.1.15), corresponding to 1 to 10 years of experience (Fig.2.16). Participants from different types of stakeholders were represented in the courses, though seventy-seven percent had a technology provider/ researcher/ academic profile (Fig. 2.17).

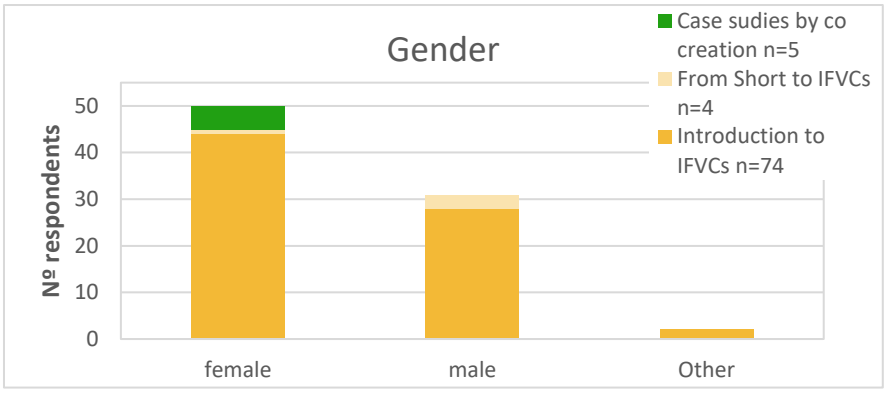

Figure 2. 14: E-course registrants by participants' gender

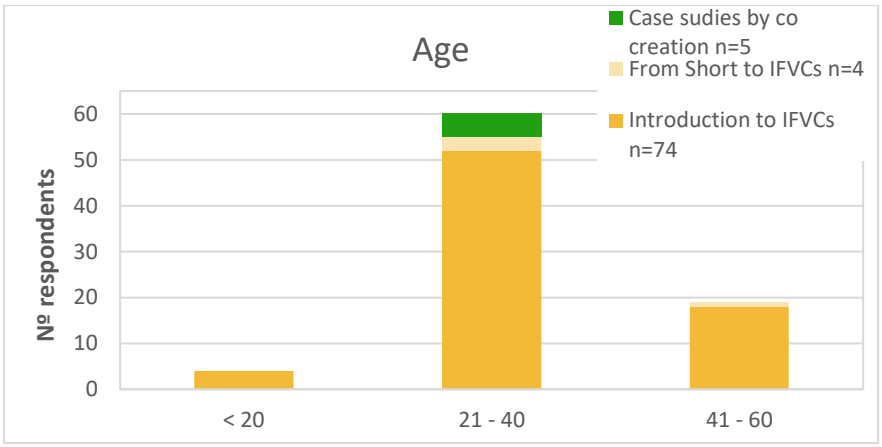

Figure 2. 15: E-course registrants by participants' age

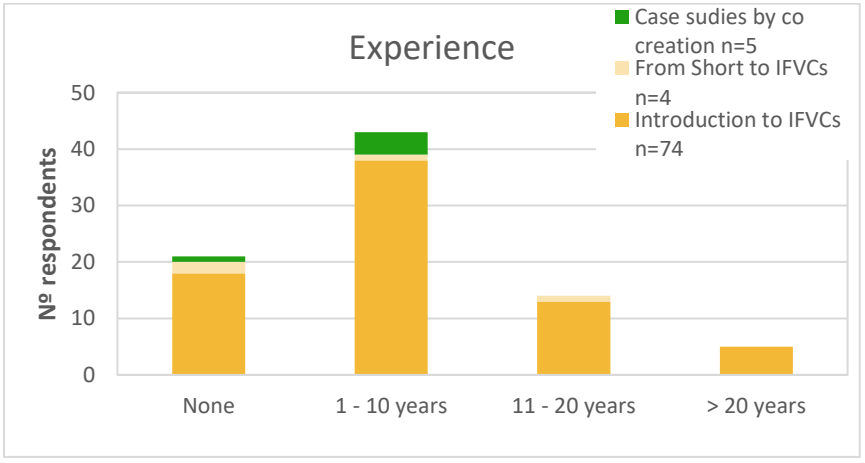

Figure 2. 16: E-course participants' by numbers of experience in the sector.

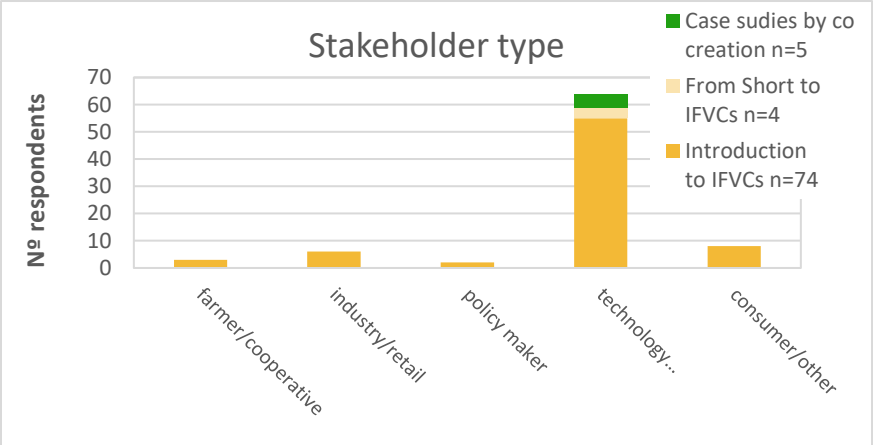

Figure 2. 17: E-course participants' by stakeholders type

From the total of 120 registrants, 85% started the courses by completing the initial assessment, 38 % completed the course and 8% received a certificate (Table 2.1). The highest participation was in the "Introduction to the IFVCs" as being the first launched while for the other 2 courses less participants registered.

Table 2.1: Number of participants along the three e-courses.

Participants	Introduction to IFVCs	From Short to IFVCs	Case studies by co-creation	All	All %
Registered	103	7	10	120	100%
Started	90	7	6	103	85%
Reached the end	40	5	0	45	38%
Completed	7	2	0	9	8%

2.4.1.2 Knowledge improvement

The quick assessment was a list of 10 true or false statements in e-courses "Introduction to IFVC" and "From Short to IFVCs" and six in the e-course "Case studies by co-creation" relating to each chapter of the course. The same quick assessment was given at the beginning and at the end of the course to evaluate if participant knowledge increased with the course.

In the e-course "Introduction to IFVC", 82 participants completed the "quick assessment before" with an average score of 6/10 and 36 participants completed the "quick assessment after" with an average score of 6.5/10. In the e-course "From Short to IFVCs", 7 participants completed the "quick assessment before" with an average score of 8.4/10 and 3 participants completed the "quick assessment after" with an average score of 9.3/10. In the e-course "Case studies by co-creation", 5 participants completed the "quick assessment before" with an average score of 3.2/6 and no participants answered the "quick assessment after" the e-course (Figure 2.18).

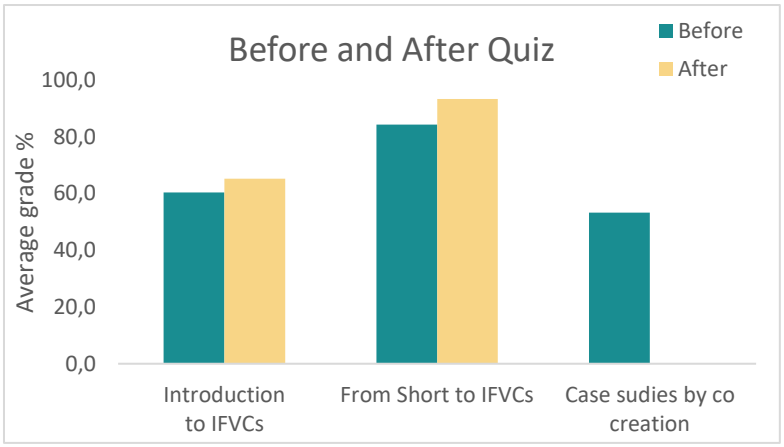

Figure 2. 18: E-course participants' by numbers of experience in the sector.

This assessment showed an overall improvement in the two first course, and no data to compare with in the last course. Some slight variations based on the question occurred, the majority had improvements, some questions had higher improvements than others, some had no change, and some even had a decrease in percent of correct answers. The basis of these differences will be further examined by IFA as the e-courses continues to improve over time.

Another assessment made at the end of the first course was very informative about the perception of knowledge improvement by the participants (Fig. 2.19). Half of participants, considered to have *low* and *very low* and 10% with *high* knowledge on IFVCs before the course. This improved with 67.5 % considering having *high* and *very high* knowledge on IFVCs after the course.

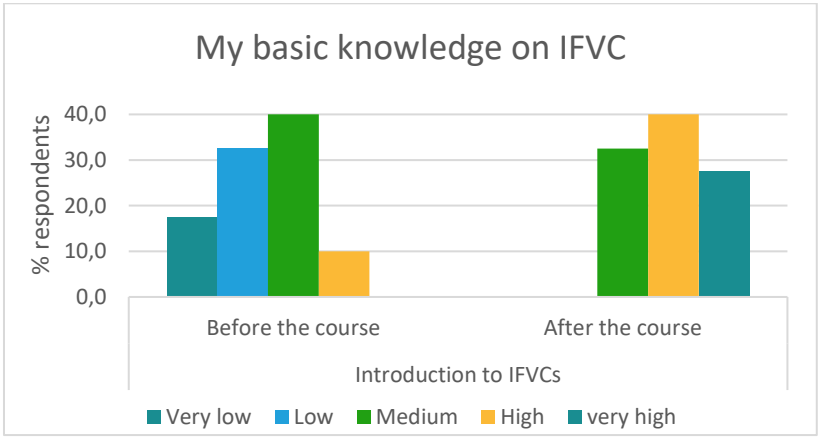

Figure 2. 19: Participants perception of their basic knowledge about the IFVCs before and after the "Introduction to IFVC" course.

2.4.1.3 Feedback form

The e-courses were rated as *very helpful* or *extremely helpful* by more than eighty percent of the participants in the first two courses. No answers were received regarding the third course until this report was finished (Fig.2.20).

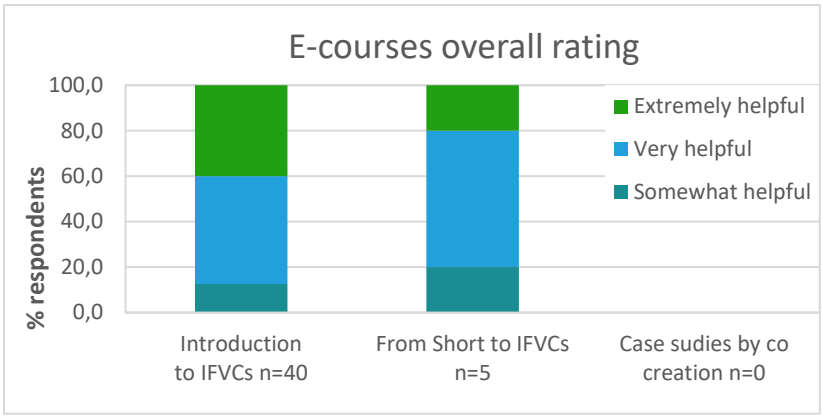

Figure 2. 20: Participants perception of their basic knowledge about the IFVCs before and after the "Introduction to IFVC" course.

The length of the first two courses were considered as just about right by sixty percent of the participants. In the "Introduction to IFVC" twenty percent of participants considered the e-course either *too short* as *too long*, and in the e-course "From Short to IFVCs" forty percent (= 2 respondents) found the course *too long*.

The course participants selected their most favourite chapter of the e-course "Introduction to IFVC" as "Chapter 2. Types of common food value chains: advantages and drawbacks" with 13 votes out of 40, followed by "Chapter 3. The concept of intermediate food value chains" with 11 votes out of 40 and Chapter 4. Challenges and issues in the transition towards intermediate food value chains with 10 votes out of 40.

For the second and third e-courses the feedback on favourite and least favourite parts were asked after each section as the courses were longer and could be difficult to make for participants an accurate evaluation of all chapters only at the end.

Regarding the e-course "From Short to IFVCs" the preferred section of each chapter was as follows:

Chapter 1: Consumer behavior and food supply chains (3/5 votes)

Chapter 2: Vending machines for fresh and local products (5/5 votes)

Chapter 3: Regional valorization of damaged fruits and vegetables (4/5 votes)

Chapter 4: Blockchain solutions for food (3/5 votes)

Chapter 5: Europe is changing its food value chains (2/5 votes) and Changing food supply chains (2/5 votes)

In the e-course "Case studies by co-creation", the feedback received was for chapter one, with the preferred section being "What are IFVCs".

Feedback received from participants during the "Introduction to IFVC" course showed that most described the course materials as interesting, very organized and useful. There were also several comments pointing out that the course could have more videos and interactive materials, with interviews and testimonials from IFVC actors. All in all, the feedback was constructive and will be taken into consideration for future updates of the e-learning courses.

The only comment in the second course was a suggestion to reduce the length in about 10-20 percent.

Some selected quotes from participants:

To improve: *"I would replace the articles with the presentation"* and *"I would add real time interviews of farmers and customers as part of this course"*.

To acknowledge: *"I think everything has been prepared in the best possible way to consolidate knowledge"* and *"It was engaging and just right"*.

In the third e-course "Case studies by co-creation", following some suggestions of participants, several videos, interviews and demonstrations were produced under the scope of each CS, and included in the e-course. This effort resulted in more than 35 exclusive videos available in the course.

2.4.1.4 Sustainability

The e-courses will be available on the ISEKI-Food Association Moodle site. The courses are in an area of the Moodle called "Innovative Food Supply Chains" where the e-course "Best Practices in Short Food Supply Chain Innovations (6h)" and materials on Innovation and Solution-based Multi-actor Workshops from the SMARTCHAIN project (grant no.: No. 773785) are also available.

2.4.2 Blended learning sessions

2.4.2.1 Demographic data

The first blended learning session, "IFVCs in practice", held in July 2023 as a pre-conference event, received 22 registrations, 18 from academia, 2 from industry and 2 from non-profit organizations. In the session, 2 moderators and 3 participants were present. All were female and their background was researcher/ academia and non-profit organizations, in the areas of livestock feeding and food industry.

The second session, "Digital microlearning in IFVCs", held in September 2024, was integrated in IUFoST conference as an oral presentation. The session was interactive and between 12 and 15 of the people attended the session and answered the questions.

2.4.2.2 Knowledge improvement

The assessment before and after the session was made via google forms. The three participants rated their knowledge on IFVCs BEFORE/AFTER the workshop using a scale: 1 Very low, 2 Low, 3 Medium, 4 High and 5 very high. An improvement from low knowledge and one high to all high and very high knowledge on IFVCs was registered after the session (Fig. 2.21).

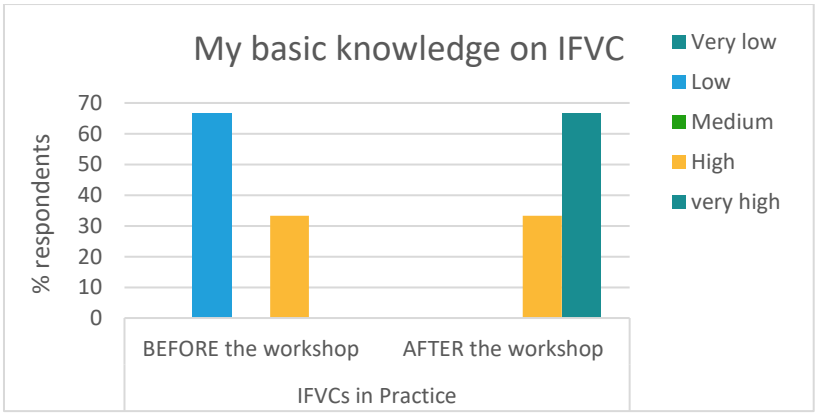

Figure 2. 21: Participants perception of their basic knowledge about the IFVCs before and after the "IFVCs in practice" session.

In the second blended learning, the assessment was made using a quiz with three questions at the beginning and the end of the oral presentation. Between 12 and 15 persons in the room answer to

the quiz. Overall, there was an improvement on the knowledge of IFVCs and the co-creation process (Fig. 2.22). On average, there was an overall improvement on correct answers of forty-three percent.

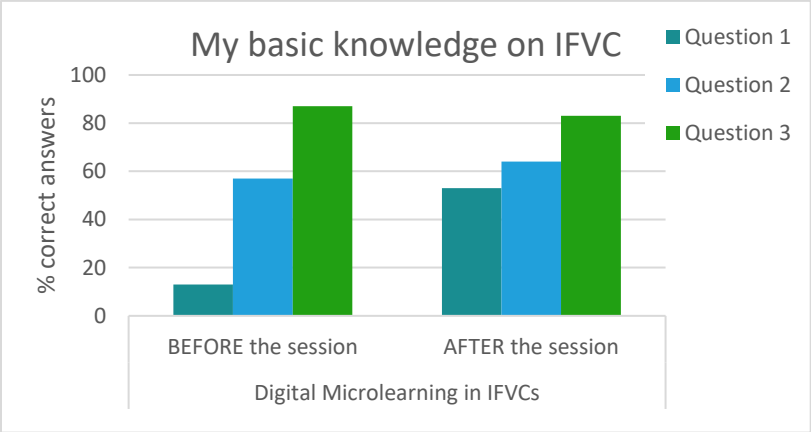

Figure 2. 22: Participants correct answers about the IFVCs and co-creation before and after the presentation on "Digital microlearning in IFVCs".

2.4.2.3 Feedback form

In the IFVCs in practice workshop the participants evaluated the session using a google form and have rated it as very helpful and extremely helpful (Fig. 2.23).

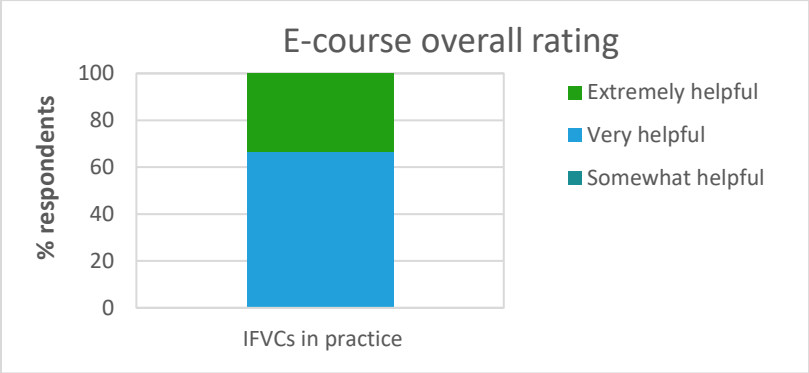

Figure 2. 23: Participants perception of their basic knowledge about the IFVCs before and after the "IFVCs in practice" session".

In the second blended session, there was no feedback form, as the conference attendees moved quickly from one session to the next. Even though, several participants personally expressed their appreciation of the session and highlighted that the use of interactive methods was a very positive way of communicating and delivering the information.

2.4.3 Conclusion

Three online courses were produced on the main areas of knowledge and work of the FAIRCHAIN project. The project consortium was very innovative in developing and implementing the concept of IFVCs as a middle ground between the most common long chains and the local and less

profitable short chains. As a result, two online training courses were launched on this topic. A second important area of knowledge developed in the projects' six CSs was the co-creation process with stakeholders within each value chain. A third course was produced on this topic to share all the knowledge gathered. This e-course included information on the CS and many videos explaining the concepts, demonstrating the processes, testimonials from the organizers and stakeholders, resulting in a comprehensive e-course on the outputs of the FAIRCHAIN project. The interactive blended learning sessions were considered very positive and engaging, providing a valuable and effective training method to complement the online courses.

Overall, the FAIRCHAIN trainings counted with 266 participants in the diverse training offer, covering a wide range of ages and types of stakeholders.

Despite many efforts to disseminate the e-courses using the ISEKI mailing list, the network of project partners and social media channels, the last two courses had considerably fewer students. In future, the courses will remain open for at least another three years on the ISEKI Moodle and will be regularly publicised in the training section of the ISEKI newsletter, released every three months, and reaches over 8000 members.

3 FoodFactory-4-Us student competition game

The FoodFactory-4US (FF4Us international student competition game is an innovative way of teaching where teams of students work voluntarily to find a solution to a real-life industry-based problem in the food chain. Students attend 'live' online training in soft skills while they prepare a written report and a presentation of their project for evaluation by a board of academic and industry experts. At the final virtual conference open to the public, teams present their projects and a winner is announced. Three online student competitions were organized between October 2022 and April 2024 in the frame of the FAIRCHAIN project by IFA, following this format, which originated in 2017 as part of the European FooD-STA project. Project partners were involved as members of the advisory boards. Sponsorships provided the winning team with cash or other prizes. In the case of FAIRCHAIN, winners of the first two competitions were invited to the FAIRCHAIN Food Hack (see Section 4 below).

3.1 Target groups and dissemination

The target group was students from anywhere in the world, at any university level from undergraduate through post-doctoral, and studying any aspect of food. Students with practical work experience, either currently employed and part-time students or previously employed and then returned to university, were also welcomed.

Dissemination campaigns were carried out via email contacts, IFA website (fig. 3.1), mailing list and newsletter, IFA and FAIRCHAIN social media, and consortium networking contacts. Several dissemination resource, such as flyers and teaser videos, were designed to support the campaigns.

Figure 3. 1 : FF4Us announcement on IFA webpage

3.2 Structure

Each FF4Us competition followed the same structure. Briefly, i) the Advisory Board made up of representatives from academia, industry, and non-profits reviewed previous competitions and FAIRCHAIN goals to decide on a topic for the current competition; ii) a call for teams of applicants was disseminated widely via social media, email, physical postings, etc.; iii) project proposals were reviewed by the competition Advisory Board and a maximum of 10 teams chosen to begin each

competition; iv) team members attended five 'live' online training sessions while preparing a written report and an oral presentation about their unique project; v) a 'Final Virtual Conference' was held where student teams presented their projects to an open audience; and based on the review of the Advisory Board the winning team was announced.

The organization of the FF4Us competitions, including their educational strategy, was largely based on lessons learned in the 6 previous competitions: 3 in the frame of the NextFOOD project(Horizon 2020 grant agreement No. 771738) and before that 3 in the European FooD-STA project (Erasmus+ KA 554312) where the competition originated. FAIRCHAIN built on the lessons from the two projects and their six competitions, including incorporating student feedback and Advisory Board suggestions into competition design, publicity, and team evaluation.

The first competition began in October 2022 with the topic, "*Modernization of a traditional food for contributing to your regional food value chain*". The topic of the second competition was "*Increasing innovation in existing SFVCs to make them stronger and more competitive*" and begin in April 2023. The last competition began in February 2024 under the topic "*Upscale or downscale a food supply chain to a regional or national level*".

The five online training are focused on the following soft skills:

Observation:

Carefully observe a situation

Create a comprehensive overview of a complex situation

Allow for examination of the whole situation before drawing conclusions

Recognize values and goal conflicts of different group members

Participation:

Participate in work with others with commitment and dedication

Empathize with the goals and feelings of group members

Have basic knowledge of factors that stimulate and block creativity in individuals and groups

Understand the processes that enhance a group's ability to identify today's critical challenges and envision a desired future state

Visioning:

Able to inspire change by helping a group develop and align around a shared vision

Awareness of role of reflection in personal learning and development

Connect your group project to theory related to food systems as well as to personal growth

Connect experiences and theory to own personal development

Reflection:

Ability to embrace self-guided learning

Dialogue:

Understand the differences between debate, discussion and dialogue

Can introduce a group to the purpose and guidelines for dialogue

Can identify and formulate questions which stimulate a dialogic approach

Can appreciate and explore a variety of perspectives and identify and challenge the assumptions behind your own and a group's thinking

3.3 FF4Us achievements and sustainability

The three FF4Us student competitions attracted 133 applicants on 34 teams, from 14 countries around the world (Peru, Pakistan, Thailand, UK, Portugal, Rwanda, Italy, etc.). Of these, 85 students began a competition, and 58 students completed a competition, a retention rate of 66%. Most students were female (65%) in all the competitions.

The students self-evaluated their competences at the beginning and end of the competitions in several areas such as technical competencies, soft skills and expectations. Firstly, the participants state their overall and main goal for the competition, the additional personal objectives to be achieved during the competition. Finally, students self-assess their competences related to soft skills using a questionnaire to rate their competences on a scale of 0-9. The questions were grouped by topics.

The results of the before and after self-assessment in the five core competences are shown in Fig 3.2. The data presented are the average values for all the students in the three FAIRCHAIN competitions (although not all of them submitted their answers). An overall improvement (19% on average) was observed in all five competences, as participants perceived an increase in their self-performance in these skills. The most important improvements were in *Observation* (+21%) and *Visioning* (25%) competences.

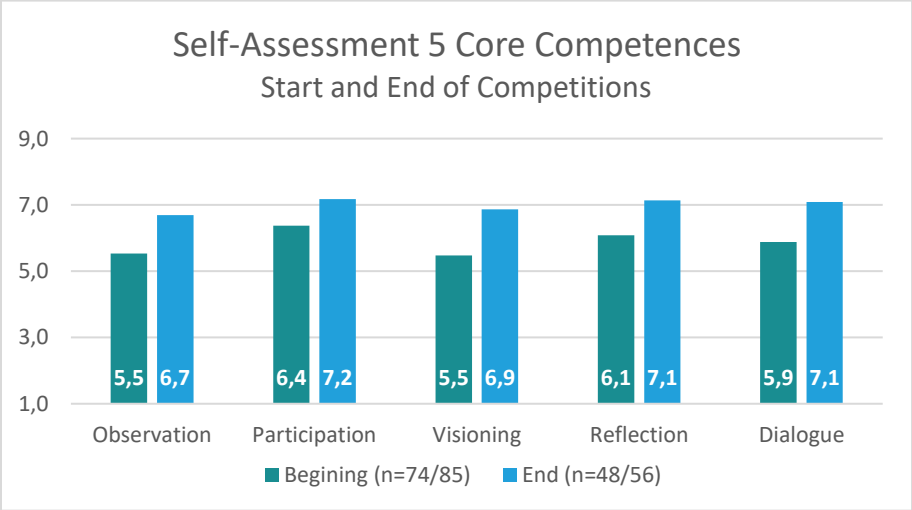

Figure 3. 2 : FF4Us students self-evaluation on the five core competences. They rated their competences on a scale of 0 (no knowledge) to 9 (very competent)

At the end of the three competitions, the students rated their level of competence in different topics (Fig 3.3). The average results of the competitions showed a very positive impact on the lessons and work developed along the sessions. Teamwork, cooperation, and producing a project as a group, scored highest.

Figure 3. 3 FF4Us students self-rating on the technical competences and soft skills after the competition. They rated their competences on a scale of 0 (not at all competent) to 5 (very competent)

The students in the three competitions also evaluated the overall usefulness of the competition, using a five points scale (average values) (Fig. 3.4). The success of the competition can also be perceived by this rating with all parts scoring more than 4/5, with the project review session and the final virtual conference as the most useful (average score 4.5).

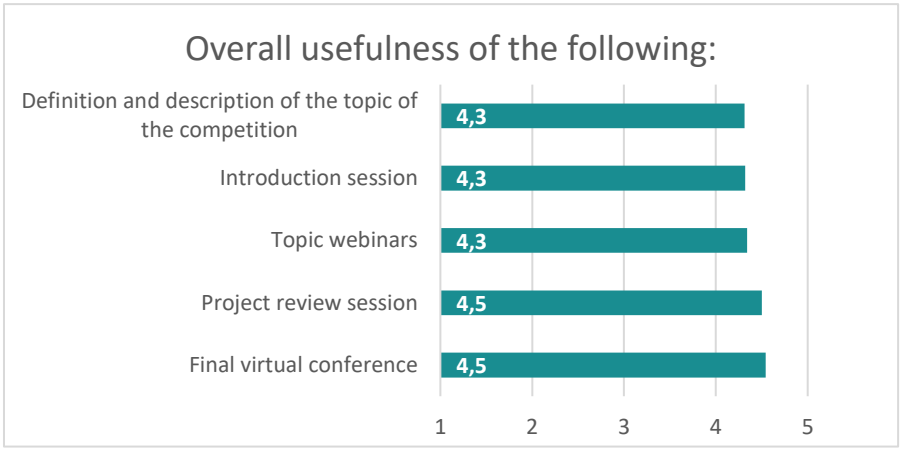

Figure 3. 4 : Students overall evaluation of the usefulness of the different parts of the competition. They used a scale of 0 (not at all usefull) to 5 (very usefull)

The FF4Us international student competition is designed to enhance the practical knowledge and skills of students in the food sector by actively engaging them in solving real-world challenges. Sixteen teams of students had the opportunity to identify, design, and develop innovative and sustainable solutions tailored to the needs of the food industry. Students develop their technical knowledge but also their soft skills and gain competence in communication, problem solving and teamwork. Some examples of testimonials are: "*Mainly, I have improved my visionary thinking and my participation, because I am a person who is afraid to face exposure in front of the public. Thanks*

for this opportunity" and "*I improved my skills in identifying and solving current sustainability issues in the food industry*".

In a way to promote interaction and networking between students in FAIRCHAIN training, three members of the winning teams of the FF4Us first and second editions were awarded to participate at the Swedish Food Hack of autumn 2023, sponsored by RISE. In addition, the winning teams of the three editions were awarded a monetary prize sponsored by IFA.

These competitions can reach food science students all over the world to improve their skill, raise awareness of their different realities and promote networking within and between teams, and can be considered a relevant tool as an addition to university education.

More details about the FF4Us training are available on Milestone 24.

4 Food Hack

A 3-day 'Food Hack' was organised by the FAIRCHAIN partner RISE in collaboration with the annual Nordic Wildberry Conference and in cooperation with IFA in September 2023. This event joined local Swedish students with winners of the first two FF4Us student competitions in a typical hackathon, i.e., a rapid, intensive, and collaborative problem-solving experience. Local stakeholders from the Swedish CS ('Developing wild berry business to boost local economy and social cohesion') presented their business challenges and student teams worked on solutions. At an open session of the Conference, students presented their ideas, and a jury of experts determined the winners.

Figure 4. 1: Wild Berry conference and Food Hack participants.

4.1 Target groups and structure

The food hack was targeted at food science students.

The workshop began with introductory presentations contextualizing the Swedish FAIRCHAIN case study, including an understanding of the value chains and innovations in the food chain. The students were then challenged by how to boost/improve the local business of wild berries. The students could use several approaches to find suitable solutions, like technical, social or business related. On the second day, participants organized into different groups worked together to solve the proposed challenge, supported by mentors. On the third day, all the groups presented their results and solutions to the jury.

The Food Hack programme was as follows:

Day 1 Wednesday. Intro. Umeå University

- Welcome and introduction to the Food hack - Alexander Wahlberg and Karin Östergren, RISE

Inspiration speakers

- "Why eat berries?" – Susanne Bryngelsson, RISE
- "How the value chain works" – John Andersson and Paul Plummer, Uppsala University
- "Innovation in the food chain" – t.b.d., Umeå Institute of Design
- General brainstorming about the challenge with the Audience
- Summary of the day and time for questions

Day 2 Thursday. Working day. Umeå University

- Introduction

- Exercise 1 Brainstorming
- Exercise 2
- Recap + Tool kit
- Free group work
- Working day + feedback/talk to business coaches

Day 3 Friday. Presentations. RISE Office – Umeå

Presentations to the jury.

- Pitches at the Nordic Wild berries conference (Karin Östergren, RISE)
- Winners' ceremony at the research conference
- End

4.2 Achievements and sustainability

The competition received 28 interested students from Swedish Universities. In the Food Hack event 24 students accepted but only 16 participated (eight didn't attend), including three students from the FF4Us winning teams, that were organized into five teams. The coordination team had three attendees from RISE and two from IFA, and lecturers and experts were invited Swedish from Universities, one from Uppsala University, three from Umeå University and one from SLU, Umeå.

The five teams of students presented innovative ideas that had the potential to shape the berry industry of the future. After the two days to develop their ideas, the projects were presented on the closing day of the Nordic Berry Conference. The quality of the presentations, as well as the commitment and professionalism of the students, were considered by the jury to be very impressive.

The winning team designed a project that encourages local individuals, particularly young people, to pick wild berries in their leisure time and rewards them with either cash or supermarket vouchers. The idea was that it benefits both the pickers, who can earn rewards while enjoying nature, and supermarkets, which receive a convenient berry supply. The project aims to boost the harvest of wild berries in Sweden, promote local resources, and enhance customer engagement for supermarkets.

The oral feedback from the students was that the Food Hack session was uplifting and fun, and that it was a good supplement to the regular teaching.

5 Case Study workshops

The CS workshops, also named as the 4th Year events of the FAIRCHAIN CS aimed at training food chain actors in the best practices learned during the project. Six face-to-face workshops were held at the national level, one for each of the six CS. These took place at the end of the project, between April and October 2024, and each was a two-day event consisting of a workshop and a demonstration.

Overall, more than fifty percent of participants in the workshop and demonstration sessions found the events useful or very useful in all the CS. Attendees particularly valued the practical approach and the networking session, the enhanced connection between stakeholders in the food sector was recognized and considered very relevant.

A full report on these CS Events may be found in D 7.8.

6 FAIR FAIRCHAIN Data Management policy

Data produced in this deliverable have not been stored in a dataset.

7 Conclusion

Four different training approaches with innovative methodologies and targeted to various stakeholder types were developed within FAIRCHAIN: i) Three online courses complemented by two blended sessions, to food chains professionals, academics, policy makers, advisors and students, ii) The three FF4Us competitions, iii) the Food Hack targeted to food science students and iv) the CS workshops and demonstration trainings aimed at professionals involved in each specific food chain and some to students.

In total, the e-learning programme was completed by 208 people worldwide. Being released later in the project, the last two online courses do not have high numbers of registrants; however, the courses will stay open for at least more three years on the IFA Moodle and will be regularly publicised in the training section of IFA newsletter, released every three months and reaching + 8000 members.

The three FF4Us student competitions attracted 133 applicants on 34 teams, from 14 countries around the world and 58 students completed a competition and improve their skill. Competitions raise awareness of their different realities and promote networking within and between teams and can be considered a relevant tool as an addition to university education.

The Food Hack competition received 28 interested students from Swedish Universities including also three students from the FF4Us winning teams. The oral feedback from the students was that the Food Hack session was uplifting and fun, and that it was a good supplement to the regular teaching.

The CS trainings reached more than 180 people from six European countries. The events included training and demonstration sessions which were evaluated as relevant or very relevant by the respondents and considered that they were very well and well trained in the best practices included during the event.

Consortium partners were involved by testing the resources developed, producing some of the materials and participating in the live sessions.

Overall, the feedback of the different trainings was very positive, recognizing the usefulness information and knowledge gathered. Also, the networking, when possible, was greatly valued by participants.