LOWINFOOD

Multi-actor design of low-waste food value chains through the demonstration of innovative solutions to reduce food loss and waste

GA No. 101000439

D1.3 FLW data collection protocol

WP1 - Type of deliverable: Report - Dissemination level: Public - Due date: Oct 31, 2021

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LOWINFOOD Consortium

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20	Cogzum Bulgaria OOD	COZ	Bulgaria
21	Uppsala Kommun	UPP	Sweden
22	Recuperiamo srl	REG	Italy
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24	Confederazione Nazionale dell'Artigianato e della piccola e media impresa Associazione di Viterbo e Civitavecchia	CNA	Italy
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Summary

The LOWINFOOD Protocol for the collection of Food Loss and Waste data during demonstrations outlines the indicators, methods, and strategy to be implemented during the project for the evaluation of the efficacy of innovations. The objective of the deliverable is to present the replicable process that has led to the assessment of indicators and the guidelines for the collection of data on FLW across selected innovations.

The deliverable complements the methodological framework presented in D1.1, as it provides the final list of indicators set up to define minimum reduction standards and impact, the replicability, user-friendliness and utility of the innovations, an accurate methodology, including duration of measurement, unit of reference and method.

The protocol is the result of an ongoing process of consultation and application; therefore, indicators and methodology for data collection might undergo minor and major modifications during the actual implementation of the protocol.

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Introduction to the deliverable

LOWINFOOD is a project committed to co-design, together with actors of the food chain, low-waste value chains by supporting the demonstration of a portfolio of innovations in a set of value chains particularly concerned by food loss and waste (fruits & vegetables, bakery products and fish), as well as in at-home and out-of-home consumption. Each of these value chains corresponds to a single Work Package (WP) of the project.

The innovations are selected among promising solutions that have already been developed and tested by some partners of the consortium, with the aim to provide the necessary demonstration and upscale to allow market replication.

The LOWINFOOD consortium comprises 27 entities, located in 12 different countries, and ranging from universities and research institutes to start-ups, foundations, associations, and companies working in the food sector. During the 52 months of the project, the partners are committed to complete 30 tasks and to deliver 60 outputs (deliverables).

This deliverable presents the evaluation protocol of the efficacy of selected innovations in reducing food loss and waste. The result of the process conducted in Task 1.2 is presented, together with a stepwise, feasible and systematic protocol for the quantification and evaluation of selected indicators and validate the achievement of the project's objective to impact on the reduction of food waste at all stages of the supply chain.

This deliverable is a pillar of the methodology and evaluation approach of innovations which is part of WP1 of the project. WP1 is dedicated to evaluating the efficacy of LOWINFOOD's innovations and the socio-economic and environmental benefits and efforts when implementing the innovations. The tasks in the first year of the project were applied to design a common methodology for the evaluation including the selection of indicators, the identification of data needs and data sources as well as the creation of questionnaires and data collection protocols in a multi-actor approach. The results of the methodological discussions but also how the multi-actor approach was put into practice are reported in D1.1. For further information on the methodology and the evaluation approach for each innovation (in total 15), it is referred to complementing deliverables within WP1, which are dedicated to the specific dimensions of the evaluation: efficacy (D1.3), socio-economic (D1.4) and environmental evaluation (D1.2). Figure 1 illustrates all the WP1 deliverables.

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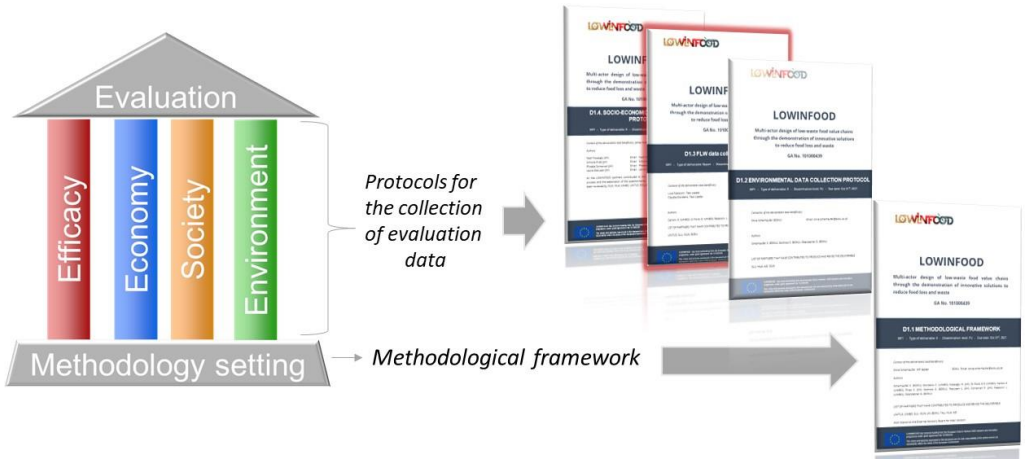

Figure 1 - Dimensions of the evaluation of LOWINFOOD's innovations and dedicated deliverables within the first year of the project

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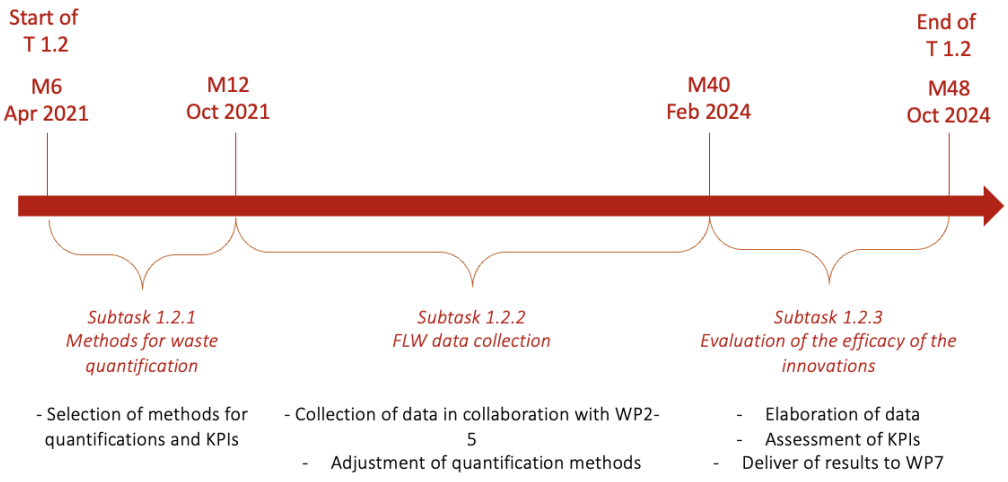
1. Introduction to the efficacy evaluation

One of the main objectives of the LOWINFOOD project is to evaluate the efficacy of the selected innovation, that is the innovation's actual capacity to reduce food loss and waste in different food value chains. To do so, within WP1, Task 1.2 (as per Grant Agreement) is aimed to provide data resulting from the implementation of innovations in the food value chains, quantification and evaluation of selected performance indicators, estimation of the potential impact on food waste reduction at a larger scale.

The aim of this deliverable is to present the protocol for data collection of FLW during the demonstration of innovation. To reach this aim a deep involvement of stakeholders has been sought throughout the process, in order to develop a scientifically sound, feasible and replicable protocol.

Figure 2 depicts the schedule for the efficacy evaluation task (T 1.2) in LOWINFOOD.

Figure 2 - Schedule for data collection



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2. Data Management

The activities concerning the efficacy evaluation envisage the collection of different typologies of data, including:

- Quantity, type and value of food waste generated in different settings, at different times, including households, restaurants, hotels, school canteens, wholesale and retail, food industry and farms.
- Information on the food consumption habits of consumers (individual consumers or families), including, preference for different types of foods, channels of food provision, expenditure for food, waste management habits and food management at home.
- Sales, inputs, structure of revenues and costs of firms involved in the activity.
- Opinions and attitudes of stakeholders of the value chains where the innovations are implemented.
- Information on individuals to support the gender equality analysis conducted throughout the project.

Data will be collected in anonymous aggregate form for the purpose of efficacy evaluation. Where this is not possible, as in the case of tasks 3.2, 3.3, 4.1, 4.2, 5.2, 5.3, 5.4, 5.5, 5.6 and 7.4, which foresee research on humans, the data returns will be minimized, stored and processed in compliance with the procedure stated in D8.2, chapter 4 and in compliance with the principles for protection of Personal Data as stated in D8.2 chapter 2.

A detailed description on how the data is collected, processed and/or generated by LOWINFOOD is available in D7.3 “Data Management Plan”.

2.1. Informed consent procedure

Whenever Personal Data needs to be collected to perform activities connected with the evaluation of efficacy the concerned individuals will be provided a form of informed consent, and they will be required to read and sign it, to provide proof of agreement to participate in a study. The document is in English and will be translated, if necessary, in a language that the potential participants can understand.

A template of informed consent is provided in D8.1 and reported as Annex 1 to this deliverable. The template includes the following sections:

- LOWINFOOD project description
- Purpose of the activity
- Data protection and privacy
- Data processing and dissemination
- Benefits and potential risks

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- Compensation for participation
- Contacts
- Rights of the participant

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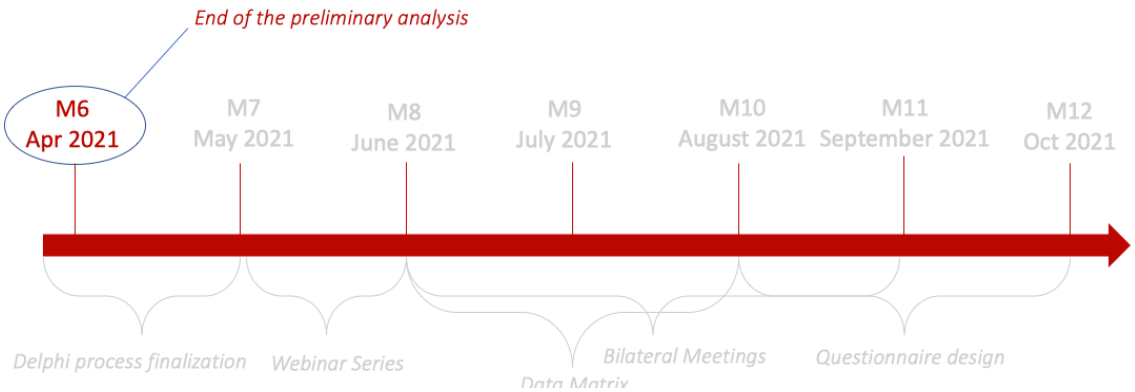
3. Towards the development of efficacy indicators

3.1. Preliminary analysis of the selected innovations

Figure 3 - Preliminary analysis timeline



In the first phase of the projects, innovations are analyzed in terms of:

A. Type of innovation:
- Institutional
- Social
- Organizational
- Technological
- Managerial

B. Value Chain (VC):
- Fruit & Vegetables
- Bakery products
- Fishery products

C. The stage of FSC in which they operate (aligned to REFRESH[1]):
- Primary Production
- Food Processing
- Retail & Distribution
- Food Service
- Household consumption

[1] Resource Efficient Food and drink for the Entire Supply chain (REFRESH) was an EU research project (2015-2019) taking action against food waste. 26 partners from 12 European countries and China work towards the project's goal to contribute towards Sustainable Development Goal 12.3.
REFRESH has been considered in the methodological framework, as LOWINFOOD is built upon already established synergies with projects in which the LOWINFOOD partners have been involved in the field of FLW quantification, assessment and prevention.
More information about REFRESH can be found here: https://www.eu-refresh.org/

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D. The way in which they operate

The results of this preliminary phase are illustrated in Table 1, which reports the innovations' characteristics in terms of the type of innovation, VC, steps of the FSC in which they operate and how the innovation operates.

This analysis proved to be essential for the subsequent phases of the protocol, due to the diversity of the innovations. Indeed, the collection of data on Food Loss and Waste required specific strategies and at the same time, it had to guarantee a certain degree of comparability between innovations.

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Table 1 - Preliminary analysis of the selected innovations

Innovation	Type of innovation	VC	FSC stage	Innovation operation
2.1 Emilia-Romagna Region platform	Institutional Organizational	Fruit & Vegetables	Primary production	Online Software Innovation 2.1 Is an institutional innovation that, through a software, facilitates the market withdrawals of surplus products from Producers Organization and supports free redistribution for charities.
2.2 UNV cooperation agreement	Organizational	Fruit & Vegetables	Primary production and Food service	Agreement. The innovation consists of agreements between farmers and other actors in the value chain that can valorize the surplus food and by-products.
2.3 LEROMA digital market platform	Technological Organizational	Fruit & vegetables	Primary production, Food processing and Retail & distribution	Digital Platform. Leroma offers a digital platform where producers can access a large database of food companies (retailers or manufacturers) searching for vegetable products and vice versa.
2.4 FORESIGHTEE	Organizational	Fruit & Vegetable	Retail & distribution	Machine learning forecasting technology. Foresightee software uses historical data from the store and trains an algorithm in order to find trends of product sales and improve the forecast ability in order to reduce the Fruits & Vegetables waste.

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Table 1 (continues) - Preliminary analysis of the selected innovations

Innovation	Type of innovation	VC	FSC stage	Innovation operation
3.1 SLU innovative supplier-retailer agreement	Managerial	Bakery products	Food processing and retail	Agreement The objective of this innovation is to demonstrate the efficiency of new business models in the bread supply chain. The innovation is doing so by focusing the attention on new forms of agreements without the take-back agreement between bakeries and supermarkets.
3.2 CNA Stakeholder Dialogue	Social Organizational	Bakery products	Food production	Agreement The stakeholder dialogue is aimed to develop guidelines against FLW in bakeries and their branches
3.3 Food Tracks Software	Technological	Bakery products	Food production Retail & distribution	Forecasting software Software for optimization of production planning in bakeries. It offers bakeries (production sites and their subsidiaries) a forecasting software that provides exclusive insights for their purchase orders, sales, and HR management, in real-time and for each of the subsidiaries individually.

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Table 1 (continues) - Preliminary analysis of the selected innovations

Innovation	Type of innovation	VC	FSC stage	Innovation operation
4.1 JHI stakeholder dialogue	Social Managerial	Fish	All stages	Stakeholder dialogue The JHI stakeholder dialogue aims to organize workshops and focus groups involving different actors involved in the fish supply chain with the aim of assessing FLW hotspots along the FSC and possible solutions.
4.2 LEROMA	Technological Organizational	Fish	Primary production, Food processing and Retail & distribution	B2B platform LEROMA offers an online platform, which is a B2B marketplace for food commodities. It builds the digital bridge between raw material suppliers and raw material purchasers. The Leroma platform can be used to easily find the raw materials and resources needed.
5.1 KITRO	Technological	All foods	Food service (restaurants, canteens and hotels)	Food Waste monitoring software Kitro provides actors in food service with a deep learning technology that collects information on the food being wasted through a hardware solution. The user receives detailed information on their food waste via an on-line dashboard.

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Table 1 (continues) - Preliminary analysis of the selected innovations

Innovation	Type of innovation	VC	FSC stage	Innovation operation
5.2 MITAKUS	Technological	All foods	Food service (Restaurants, canteens and hotels)	Forecasting software Mitakus analytics provides a web-based software that generates precise forecasts and menu recommendations with the help of AI algorithms based on internal and external factors. With the help of these predictions and recommendations, Mitakus helps food service operators and restaurants to reduce overproduction and underproduction and to find the perfect menu to meet guest demand and needs.
5.3 MATOMATIC	Technological	All foods	Food service (School canteens)	Plate waste tracker Matomatic provides technology to track the plate waste and gives feedback to pupils in primary schools on how much plate waste they generate. It also allows children to provide feedback to the canteen staff on why they waste food.
5.4. SLU/AIE holistic educational approach	Social	All foods	Food service (School canteens)	Educational approach It provides a holistic educational approach against food waste at schools, targeting pupils, teachers and kitchen staff.

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Table 1 (continues) - Preliminary analysis of the selected innovations

Innovation	Type of innovation	VC	FSC stage	Innovation operation
5.5. CozZo	Technological	All foods	Household consumption	Mobile phone app CozZo is a home groceries management system. It helps reduce household food waste by keeping track of the customers' purchasing and cooking habits. The aim is to lead the consumer to a more accurate purchasing habit in order to reduce his/her household food waste.
5.6 REGUSTO	Technological	All foods	Household consumption	B2C mobile phone App Regusto is a mobile App selling restaurants' surplus food and tracking the product up to the bin. The product is delivered in an original eco-friendly foodie bag.

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3.2. Analysis of background documents to set up the methodology

The methodology for the quantification of FLW reduction is assessed using the official methodologies adopted by the EU legislation on measurement and reporting data on FLW, to be integrated with the measurement of materials not covered by the legislation (i.e., farm losses).

Currently discussed quantification methods such as outlined in the Delegated Decision of May 3, 2019, of the European Commission on a common methodology and minimum quality requirements for the uniform measurement of levels of food waste (e.g., waste composition analysis, surveys, records) and indexes (e.g., UNEP's food waste index of 2019) are considered for innovation demonstrations with the focus on the practicality of implementation, comparability of results and their adequacy for the fulfilment of reduction targets.

Other background documents on which the data collection methodology relies are the following:

1. Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste
2. Hanson, C., Lipinski, B., Robertson, K., Dias, D., Gavilan, I., Gréverath, P., Fonseca, J., van Otterdijk, R., Lomax, T., Lomax, J., O' Connor, C., Dawe, A., Swannel, R., Berger, V., Reddy, M., & Somogyi, S. (2016). Guidance on FLW Quantification Methods. Food Loss + Waste protocol
3. WRI Measurement case studies available at: https://www.flwprotocol.org/
4. Flanagan, K., Robertson, K., & Hanson, C. (2019). Reducing food loss and waste: Setting a global action agenda. World Resources Institute (WRI).
5. Caldeira, C., Corrado, S., & Sala,. S. (2017). Food waste accounting: Methodologies, challenges and opportunities. JRC technical Reports.

3.3. Construction of Efficacy Indicators

The construction of indicators for the evaluation of efficacy is aimed to guide the stepwise and systematic implementation of the innovation and validate the overall project success. The indicators are also used to confirm the project's overall impact on the reduction of food waste at all stages of the supply chain and on the development and implementation of more sustainable and profitable business models.

Efficacy is one of the three pillars of the methodology for evaluation, which is part of the WP1 of the project. The indicators for the evaluation of efficacy have been identified through a multi-actor approach. The approach adopted is described in D1.1 "Report on methodological framework for the evaluation". The report about the methodological framework (D1.1) and the dedicated protocols for the data collection (D1.2 for environmental data, D1.3 for data to evaluate the efficacy and D1.4 for socio-economic data) has been compiled with the support of the whole consortium, since all were involved

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in the discussion and development processes. The multi-actor approach was fully adopted. Its strength to define a feasible but robust methodology out-weighed its weakness of being a long and complex approach involving a lot of efforts by each partner.

The efficacy indicators were constructed to define minimum reduction standards and impact. The definition of FLW adopted in LOWINFOOD is the following:

LOWINFOOD uses the term 'food loss and waste' (FLW) by covering "any food, and inedible parts of food, removed from the food supply chain (primary production to consumers) to be recovered or disposed (including composted, crops ploughed in/not harvested, anaerobic digestion, bio-energy production, co-generation, incineration, disposal to sewer, landfill or discarded to sea)" (Östergren et al., 2014).
It reflects the EU definition on 'food waste' but also the definitions by the FAO on 'food losses' and 'food waste' (FAO, 2020)'. LOWINFOOD also considers food losses at primary production which are not harvested, because they are not marketable.

To measure the efficacy of innovations, that is the innovations' actual capacity to reduce FLW, a set of indicators, divided into absolute and relative indicators has been set up.

Absolute indicators: Indicators showing the magnitude of the improvement achieved through the innovation. Calculated using the same reference unit, that is t*ons of food saved from being wasted*. Mainly used to communicate the project's overall impact. The absolute indicator is reached by measuring the levels of FLW before the implementation of the innovation (No1a=baseline) and after the implementation of the innovation (No1b=monitoring) and then calculating the difference (No1=No1a – No1b).

Relative indicators: Indicators showing the improvements in the specific settings in which the innovation is implemented (i.e., when considering the food handled/cooked/managed/served).

Apart from the reduction in the quantity of food waste achieved through the implementation of the innovations, these indicators also cover other aspects, such as the innovations' replicability potential, user-friendliness and utility. The indicators for replicability, user-friendliness and utility have been set up according to the following definitions:

Replicability: also defined as transferability and scalability, described as the potential of the innovation or pilot test to be replicated, scaled up, expanded, or adapted. It aims to understand the innovations' features that enable or constrain replicability.

Questions identified that the indicator should be able to address:

- Is it easy to assess the results (monitoring, evaluating processes)

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- Does it generate direct or indirect economic resources and benefits itself or is it sustainable only through external funding? If yes, how long after the adoption of the innovation to see the results?
- Is it easy to access and start the innovation?
- Does the innovation require many resources in order to be adopted?

(Partly adapted from Chapter 3.2. Guidance on assessing the replicability of IFES, FAO 2014 Link)

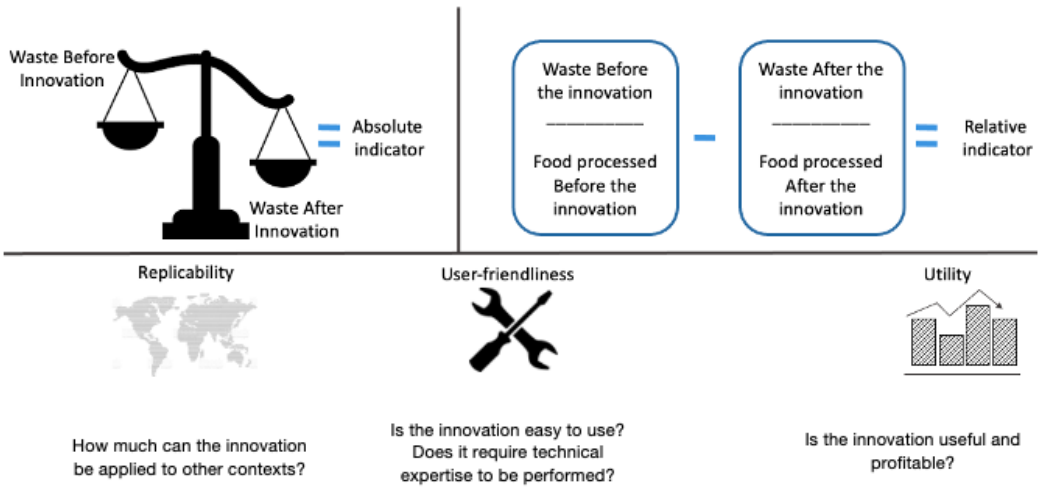
User-friendliness: consists of usability + satisfaction, both from the innovator and final user perspective (innovators and final user to be defined for each innovation).

The indicator should address the following questions:

- Is the application of the innovation easy to perform?
- Can all relevant staff members operate the innovation easily?
- Are innovations easy to maintain (i.e., check-ups) or does it require the help of the innovation providers?
- Does the innovation require specific training or know-how to be implemented?
- Does the innovation require many resources in order to keep performing it?

Utility: identified as usefulness, the state of being useful, profitable, or beneficial.

Figure 4 – The rationale behind the construction of indicators



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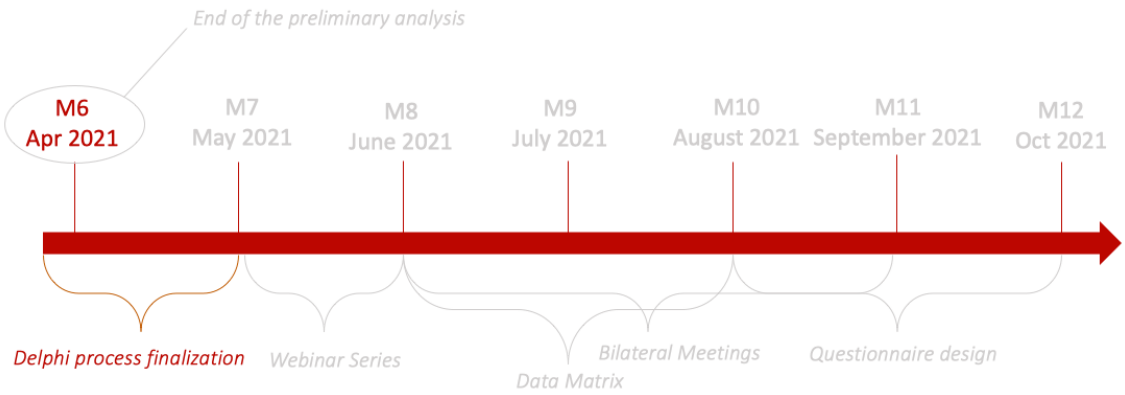
This framework has been used as a base to derive the Efficacy indicators via a 5-steps process:

1) Delphi approach
2) Webinar series
3) Bilateral meetings
4) Data matrix
5) Questionnaire design

3.3.1. The Delphi approach

Figure 5 – The Delphi approach timeline



In order to address specific indicators for each of the innovations, a Delphi investigation has been conducted involving the research partners responsible for the tasks. For a thorough description of how the Delphi process has been implemented, please refer to D1.1.

Box 1 provides a summary of the process.

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Box 1 - Summary of the Delphi process

The selection of the most appropriate methods and indicators is based on exchange among the academic partners, using a Delphi approach. The Delphi approach took place in two rounds, as reported in D1.1. The first round involved the research partners of the WP1. The first round was aimed to assess for each innovation:

1. indicators and unit of measure
2. Indicators and final target
3. Actors involved
4. Scope (boundaries)
5. Method (Baseline and monitoring)
6. Indicators on replicability, user-friendliness, utility

The second round included some additional information to be discussed:

1. FSC and scope (based on REFRESH to assure continuity)
2. Indicators of efficacy
3. Data provider
4. Duration of measurement
5. Open questions to innovators
6. Actors directly and indirectly involved

After the two rounds, some contrasting issues were still unsolved. Therefore, Task 1.2 leaders decided to organize a Task meeting (22/03/2021) to be able to discuss each of the open issues more in-depth. During this meeting, attention was focused on the absolute and relative indicators, method, duration of measurement, actors involved. From the meeting, most of the issues that were still open reached a consensus. On the other hand, further and more specific unsolved issues emerged. Thus, a final round became necessary after the two Task meetings to find a common solution to the open issues and consolidate the final draft of the efficacy part. In order to make the process faster the third Delphi round was organized as a questionnaire where experts have to express their agreement about specific aspects as it is shown in D1.1.

The final Delphi round was also submitted in a different way compared to the first two rounds, indeed a shared folder on Google Drive was sent out to all task partners on 09/04/2021. Finally, the results of the Delphi were at the basis of the set of Efficacy indicators reported in Annex 2.

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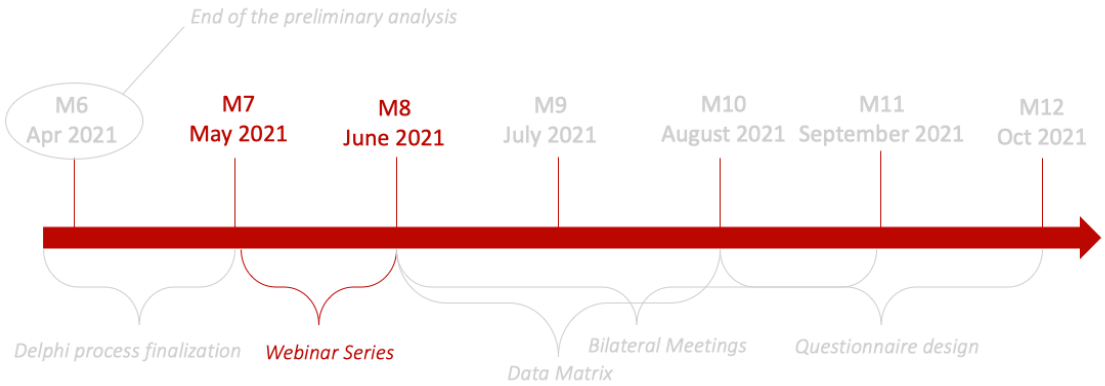
3.3.2. Webinar series

Figure 6 – Webinar series timeline



Once a consensus among the partners was reached the indicators needed to be presented and discussed with innovators implementers. The objectives of these meetings were:

- Discuss the value chain of the innovation in order to better understand at which level of the value chain the innovation was acting
- Give a quick introduction and description of the efficacy, socio-economic and environmental indicators.
- Receive feedback from the innovators about the feasibility of the data collection of the indicators

A webinar per each group of innovation (F&V, bakery products, fish products, food service and households) was conducted during the month of May 2021. The webinar series allowed the partners to meet each other and define the next step for setting the data collection protocols.

In particular, concerning the efficacy evaluation, the webinars offered the possibility to introduce to innovators the framework set up to assess the efficacy of innovations and the preliminary methodology for the collection of data.

3.3.3. Bilateral meetings

Figure 7 – Bilateral meetings timeline

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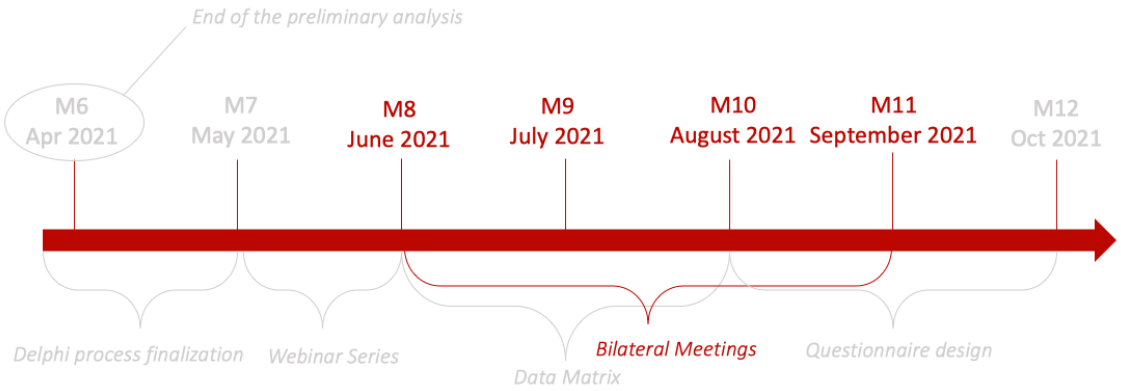

During the WP1 of 16/06/2021, data collection facilitators were identified. Data collection facilitators will collect primary data at the level of participating organizations. Data facilitators in the first steps of the methodology were also in charge of organizing bilateral meetings with innovators to discuss more in-depth the FLW measurement indicators, among others. Table 2 presents the data facilitator for each task, the date of the bilateral meeting(s) and the main results.

Table 2 - Data facilitators and outputs of bilateral meetings

Task	Data facilitator	Bilateral meeting(s)	Outputs and feedback
T2.1	**UNIBO (IT)**	Task meeting 01.07.2021	First meeting with the Emilia Romana region → First draft of 5 questionnaire for all stakeholders, some open issues (transport, refunding)
		Meeting 02.09.2021	Meeting with ARE and Catalan Authorities to find suitable contexts for replication
		Meeting 21.10.2021	Meeting with ARE and Catalan Authorities to discuss the possible application of the software
T2.2	**BOKU (AT)**	Task meeting 16.07.2021	Feedback on indicators collected
		Task meeting 8.09.2021	1 set of questionnaires prepared by BOKU and reviewed by UNV
		Task meeting 27.10.2021	Data management discussed

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Table 2 (continues) - Data facilitators and outputs of bilateral meetings

Task	Data facilitator	Bilateral meeting(s)	Outputs and feedback
T2.3	**ISUN (DE)**	Meetings arranged by ISUN with LER (DE) via Zoom: 30.7.2021 10.9.2021 16.9.2021	Similar set of questions used as in task 4.2. Questionnaire finalized in 30.9.2021
T2.4	**UNITUS (IT)**	Task meeting online 07.07.2021 with UNITUS, FOR, PICO	First plan for the demonstration of the innovation, collection of historical data to be started in October 2021
		Task meeting 25.08.2021 (Physical meeting in Terni, Italy) with UNITUS, FOR and PICO	Discussion on indicators and finalization of data matrix
T3.1	**SLU (SE), TAU (FI), UNITUS (IT)**	No update	No update
T3.2	**TAU (FI), SLU (SE), UNITUS (IT)**	Task meeting 07.08.2021 (physical meeting in Viterbo, Italy) with CNA	First plan for the organisation of the stakeholder discussion and discussion on indicators
		Task meeting 31.08.2021 (physical meeting in Viterbo, Italy) with UNITUS and CNA	Finalization of data matrix proposal
		Task meeting 01.09.2021 (online meeting) with UNITUS, SLU, TAU, CNA	Finalisation of data matrix for 3.2, discussion on items of the questionnaires, first stakeholder discussion to start in Italy in November 2021 Bakeries in Finland and Sweden will be recruited in Oct-Nov 2021.
T3.3	**ISUN (DE)**	Discussion in meeting with Food Tracks 15.07.2021 Discussion round 2 18.8.2021 Discussion round 3 06.9.2021	Feedback collected, 1 set planned. e-mail feedback 23.9.2021 collected from ADB and Food Tracks → questionnaire finalized on 24.9.2021
T4.1	**JHI (Scotl.), ISUN (DE)**	13.07.2021 meeting with ISUN (questionnaire will be developed EN/DE)	4 sets drafted
		10.09.2021 meeting with ISUN (final revision of the questionnaires)	Feedback from evaluation task leaders integrated in the questionnaires and discussed

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Table 2 (continues)- **Data facilitators and outputs of bilateral meetings**

Task	Data facilitator	Bilateral meeting(s)	Outputs and feedback
T4.2	**ISUN (DE), JHI (Scotl.)**	Meetings arranged by ISUN with LER (DE) via Zoom: 30.7.2021 10.9.2021 16.9.2021	Similar set of questions used as in task 2.3. Questionnaire finalised in 30.9.2021
T5.1	**ISUN (DE and CH), HUA (GR)**	First discussion with Kitro (before revised version) 1. Meeting ISUN-Kitro to discuss indicators: 22.07.2021	1. Feedback collected on set of indicators as input for WP1 task leaders
		2. Feedback on further questions: 15.9.2021	2. Feedback on methodology of measurement
		3. Feedback of Kitro on questionnaire: 30.9.2021	3. Feedback on remaining questions (e.g. who delivers data, Kitro or restaurant, etc.)
T5.2	**ISUN (DE), SLU (SE)**	Meeting with Mitakus and ISUN to discuss indicators: 17.8.2021 part1 and 19.8.2021 part2	1. Agreement on indicators to keep, to delete or to adapt
		Meeting with Mitakus, demonstration partner and ISUN to discuss implementation and required indicators: 02.09.2021 Feedback on list of indicators from Miltakus: 8.9.2021	2. Agreement who can provide data, what needs to be done at demonstration partners site to capture data
		Feedback on questionnaire: 28.9.2021	3. Revised list of indicators
		Meeting to discuss current version of questionnaire with Mitakus and demonstration partner: 01.10.2021	4. Reformulated and enhanced draft of questionnaire

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Table 2 (continues) - Data facilitators and outputs of bilateral meetings

Task	Data facilitator	Bilateral meeting(s)	Outputs and feedback
T5.3	**SLU (SE), ISUN (DE), AIE (AT)**	Bilateral meeting, 13.06.2021, working on guiding questions start with T5.3, then translation, indicators will be adapted, 17.09.2021: first meeting with school, test with one school and then the others	1 Questionnaire is currently under development
T5.4	**SLU (SE), AIE (AT)**	See T5.3	1 Questionnaire is currently under development
T5.5	**TAU (FI), BOKU (AT), HUA (GR)**	Task meeting 11.06.2021with CozZo Task meeting 15.07.2021 with CozZo	Task is delayed due to COVID. Data matrix, indicators and open questions about the functionalities of the app were clarified.
		Task meeting 14.09.2021 with all involved research partners to discuss possible quantification method and start of demonstration	First set of questionnaires prepared by TAU, reviewed by JHI, UNIBO, BOKU. Research partners (TAU, BOKU, HUA) decided on collecting baseline FW data by waste audits (separate bins) Demonstration phase will not start before Jan/Feb 2022.
T5.6	**UNITUS (IT)**	Task meeting (online) 07.07.2021 with REGUSTO	First plan for the demonstration of the innovation, collection of historical data
		Task meeting (online) 28.07.2021 with REGUSTO	Internal call to discuss the new list of indicators and the food waste measurement methods
		Task meeting (online) 29.07.2021 with ISUN	Indicators T5.6
		Task meeting (online) 01.09.2021 with REGUSTO	Discussion on indicators, first discussion on questionnaires and structure of the data matrix
		Task meeting (online) 15.09.2021 with REGUSTO	Finalization of the questionnaires for data collection on households and restaurants

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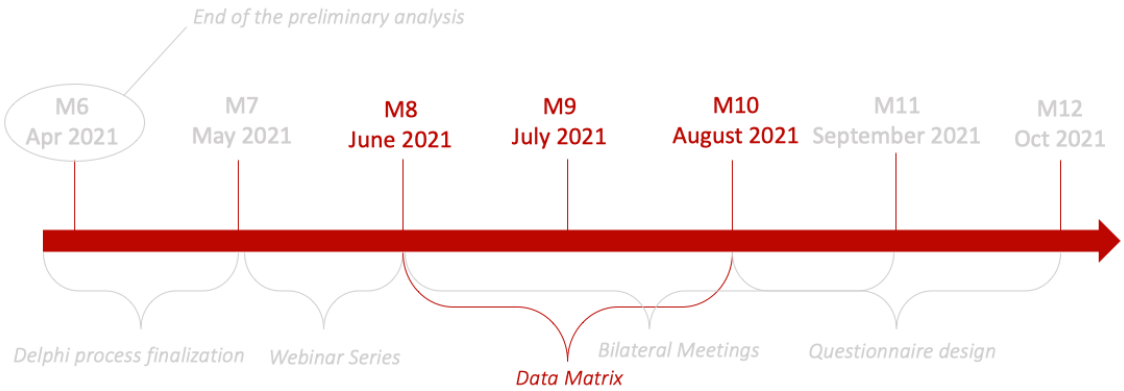
3.3.4. Data matrix

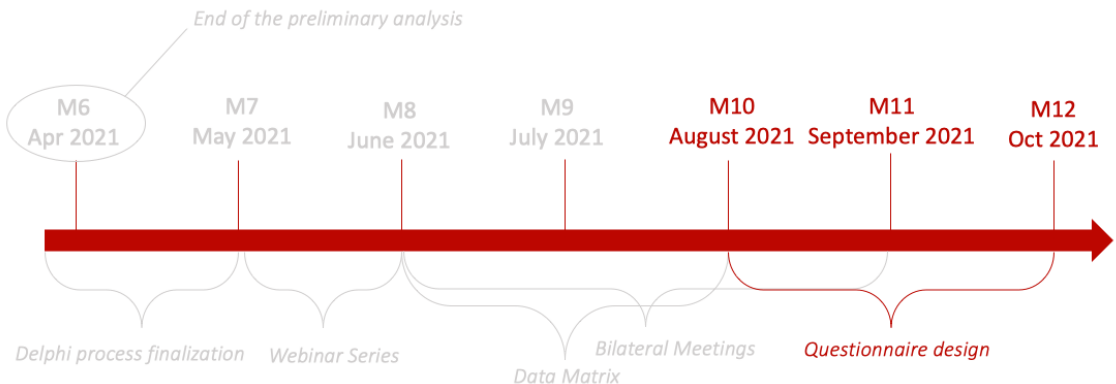
Figure 8 – Data matrix timeline



The results of the ongoing bilateral meetings led to the definition and fine-tuning of the FLW indicators, which represented the input data of a data matrix that would have then helped the formulation of the questionnaires for the data collection. The data matrix defines the quantification method, the frequency of data collection, the unit of measurement and the provider of the information for each of the indicators for the evaluation of the absolute and relative efficacy in FLW prevention. Data facilitators were expected to provide feedback after bilateral meetings with the innovators.

3.3.5. Questionnaire design

Figure 9 – Questionnaire design timeline



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The aim of the above-mentioned stages (Delphi approach, webinar series, data matrix creation, and bilateral meeting between data facilitators and innovators) was to fine-tune the selected indicators in order to create the questionnaire to be submitted to the actors directly involved in the innovation and be then used for the collection of data on the socio-economic, environmental and efficacy dimensions of the innovation. The data facilitators have been addressed as the responsible for developing the questionnaire of the single innovations. Once the data collection facilitator defined a first draft of the questionnaire, they shared the file with task leaders of the WP1 (UNIBO for the efficacy part, BOKU for the environmental part and JHI for the Socio-Economic indicators).

After a round of feedback, questionnaires were sent back to the data facilitator in order to reach a consensus regarding the questionnaire formulation.

Annex 3 reports the questionnaires set up for the efficacy, socio-economic and environmental evaluations.

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4. Data collection

This section illustrates how the LOWINFOOD consortium intends to implement the process of data collection for FLW reduction and prevention, by assessing and measuring the selected indicators to evaluate the innovation's feasibility, but also to guide the stepwise and systematic implementation, and validate the overall project success.
In particular, the methodology for the data collection, including duration of measurement and the unit of reference, is derived from the background documents on FLW quantification methods mentioned in paragraph 3.2.
Annex 2 presents a summary for each innovation of how data will be collected in order to calculate the quantity of FLW that has been prevented thanks to the innovation.

4.1. Data collection methodology

4.1.1. Selected methods for collection of data on FLW quantification

The methodology for the collection of data on FLW quantification depends on the state of progress of each pilot, on the VC in focus and on the type of innovation covered.

Therefore, data will be collected in different ways concerning the absolute and relative indicators. In particular, scanning, recording and statistics will be used for fruits & vegetables and bakery products. Data on transaction volumes and qualitative and quantitative data collected in surveys will be the main methods used for data collection in the fish value chain. When feasible, also waste weighting/volumetric assessment will be used in the fish value chain. Food waste at the consumer level will mainly be assessed through food waste diaries and, where relevant, through qualitative compositional analysis of waste, quantitative waste analysis (gravimetric or visual estimation).

The collection of data for the indicators on replicability, user-friendliness and utility is collected by administering questionnaires to the actors directly involved in the innovation and/or, in some cases, they can be retrieved automatically from the innovation (especially in the case of technological innovations).

4.1.2. The duration of measurement

The data collection methodology is implemented using a diachronic approach (assessment pre and post innovation) as follows:

1. **Baseline**: before the demonstration of the innovation
2. **Mid-term**: during the demonstration of the innovation
3. **Monitoring**: at the end of the demonstration period

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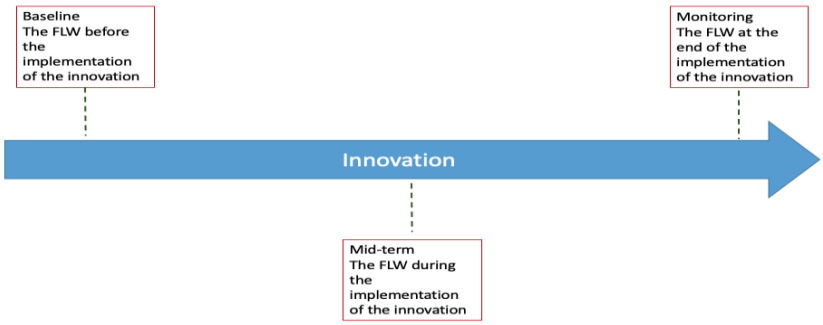
Some indicators might be collected in all three moments, while others are only suitable for baseline and monitoring or only for one out of the three identified intervals.

Figure 10 illustrates the three data collection intervals along the demonstration period.

Figure 10 – Duration of measurement



4.1.3. The unit of reference

The unit of references varies according to the typology of innovation and based on the indicators. The absolute indicator is calculated in mass units (grams/kg/tons) of food loss and waste. The relative indicators are always referring to kg or tons over the total amount of products treated/purchased by the user of the innovation. In the innovations dealing with food services (5.1 - 5.2 - 5.3 - 5.4), the relative indicator is calculated as the FLW over the number of guests/pupils that received the meal. In the case of innovation involving household food waste (5.5 - 5.6), the relative indicator is estimated as the food saved from being wasted over the total amount of food purchased (5.5) or, when possible, through direct weighing by consumers (5.6). Finally, it is worth mentioning that the work of data collection has been adjusted in close collaboration with task leaders of WP2-5. Underway adjustments of quantification methods and units of reference are foreseen based on the task leader feedback, to assure the feasibility of the evaluation for all innovations concerned by the project.

4.1.4. Scope and boundaries of the data collection

As reported in the WRI guidelines (https://www.flwprotocol.org/) on the FLW quantification methods, the FLW measurement needs to consider the boundaries, since it is one of the elements that could influence the approach taken to assess volumes. In the case of LOWINFOOD, these boundaries are determined by the innovation limit of action; the food

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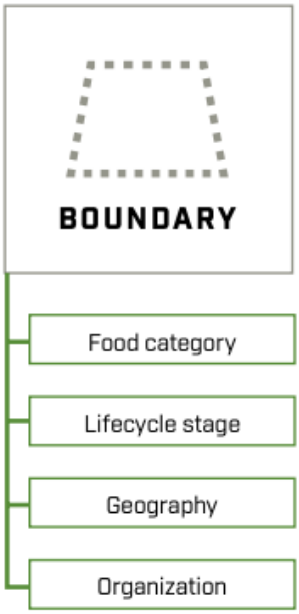
category in which it operates; the Lifecycle Stage; the Geophysical location; and the type of organization and stakeholders that are involved.

Figure 11 – FLW boundaries dimension (Source: WRI)



Food category is the first boundary dimension and refers to the typology of food that is included when measuring FLW. In the case of LOWINFOOD innovations, they are divided according to their food categories in 4 groups: (i) Fruits & Vegetables; (ii) Bakery products; (iii) Fish and (iv) all food categories.

The Lifecycle stage refers to the stage(s) in the food supply chain or food lifecycle within which reported FLW occurs. Regarding the innovation involved in LOWINFOOD, the FLW is measured at different stages depending on the single innovation. In particular, the supply chain steps involved are the ones summarized in Table 1 and include waste at Primary production, Food transformation, Food distribution, Food Service and final consumer.

The geography dimension refers to the geographic borders within which the FLW occurs. In the LOWINFOOD innovations, the geographical context is Europe and the countries represented and in which the innovations are implemented and/or planned to be replicated are: Germany, Austria, Sweden, Finland, Italy, Belgium, Bulgaria, Scotland, Switzerland and Greece.

The Organization dimension refers to the Organizational units (stores, companies, households, all sectors) within the FLW. In the LOWINFOOD innovations, several organizations are involved including farmers, food retailers, restaurants and households.

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5. Data analysis

Starting from February 2020 [M40 of the project], the data collected in subtask 1.2.2 will be elaborated. In particular, the indicators are assessed for all the innovations concerned by WP2-5.

Data collected will be organized into a dataset. The dataset will be analyzed by means of descriptive statistics to understand (i) the change in FLW levels before and after the innovation; (ii) the potential for replicability of each innovation; (iii) the user-friendliness of the innovation; (iv) the level of utility. Further qualitative data analysis will be needed in order to integrate the questionnaire measurements. The resulting evidence will be then delivered to the partners responsible for dissemination and communication (WP7) to allow the maximum possible spread of the evidence provided by the project, and to push the replication of the successful innovations on the market.

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6. Evaluation

The resulting evidence will be delivered to the partners responsible for dissemination and communication (WP7) to allow the maximum possible spread of the evidence provided by the project, and to push the replication of the successful innovations on the market.

Through the Efficacy indicators of FLW, we expect to evaluate to what extent innovations are able to reduce absolute and relative quantities of FLW. This evaluation will be implemented together with other actors and will follow specific strategies for each innovation as shown in Annex 2. The analysis of the findings will be performed following different approaches on the basis of the type of data that are collected. Quantitative measurements are required for the evaluation of the absolute and relative indicators, while qualitative analysis will better fit the information emerging from the surveys. Statistical tools can also be relevant for analysing data from innovation with a higher number of actors involved. This Evaluation should also consider the potential impact of exogenous factors such as political decisions, market fluctuations, environmental crisis and societal trends. To this end, the integration between the different task leaders of Socio-Economic, Environmental and Efficacy analysis, is implemented.

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WRI Measurement case studies available at: https://www.flwprotocol.org/

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Annex 1: Template of the informed consent form

INFORMED CONSENT FORM

Dear Participant,

you are invited to take part in a research and innovation activity in the context of the project "LOWINFOOD- Multi-actor design of low-waste food value chains through the demonstration of innovative solutions to reduce food loss and waste", funded under the H2020 framework by the European Commission. This document seeks to provide you all the necessary information to decide whether to participate in this research activity in a responsible manner.

LOWINFOOD project description

The core activity of LOWINFOOD is the demonstration of a portfolio of innovations in a series of value chains particularly concerned by food loss and waste problem: fruits & vegetables, bakery products and fish value chains, as well as in at-home and out-of-home consumption.

Purpose of the activity

[Option 1 – Events]
The purpose this activity is to organise a set of events promoting the dialogue among stakeholders in the [BREAD OR FISH] value chain. Stakeholder dialogue seeks to analyse, together with the actors of the value chain, the measures that can be taken to reduce the quantity of food waste throughout all the stages of the chain.

[Option 2 – User survey or focus groups]
The purpose of this activity is to collect information about the quantity and type of food waste produced [AT THE COMPANY, AT HOME, AT RESTAURANT], along with data about the behaviour of the people involved in the generation of such waste. This data will help studying and identifying effective measures to prevent and reduce the amount of food waste.

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Data protection and privacy

The data gathered during this activity will be stored securely by [NAME OF THE LOWINFOOD PARTNER RESPONSIBLE FOR DATA COLLECTION], [COUNTRY], [FULL ADDRESS]. Personal data collected as part of this activity shall be retained up to 24 months after the end of the LOWINFOOD project, and shall be destroyed after this period. Personal data will be encrypted by assigning each individual a unique identifier made of 11 characters, that will make the data unintelligible to people who do not have access to personal data. Only the staff involved in the encryption process will know the association of your personal data with the unique identifier, and only the encrypted dataset shall be used for statistical elaboration and to produce results to be communicated and disseminated.

Data processing and dissemination

The materials and data collected will be encrypted and then elaborated to generate the results of the LOWINFOOD project. These results may be presented at scientific or professional meetings or published as deliverables of the project as well as in scientific or professional journals for communication and dissemination purposes. Personal data shall be processed only for those administrative, operational, accounting, research and monitoring purposes that are necessary for the safe and reliable implementation of LOWINFOOD, without prejudice to the individual rights under the relevant laws.

Benefits and potential risks

There are no direct risks or benefits to you that we know of. Your decision whether to participate in this study or not will not be reported to nor will it affect your participation in other LOWINFOOD events and activities.

Compensation for participation

[Option 1 – for free]
Participation is voluntary and you will not receive any reimbursement, in cash or in kind, as payment for your participation.

[Option 2 - rewarded]
Participation is voluntary and rewarded with [ADD DETAILS ABOUT THE REWARD: TYPE, AMOUNT, FORM OF PAYMENT].

Contacts

This research is organised by [NAME OF THE LOWINFOOD PARTNER], [COUNTRY], [FULL ADDRESS]. If you need any further information or clarification on this research you may contact [NAME OF THE RESPONSIBLE PERSON], [EMAIL CONTACT].

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Rights of the participant

Your participation is voluntary, and you have the right to refuse to participate and to withdraw your participation, samples and/or data at any time without any consequences. You have the right to refuse to answer specific questions. Your name and contact data will be always retained confidential, will never be public, findable or accessible, and, unless you specifically request otherwise, you will never be identified. You will be always the owner of data and samples collected.

Informed consent statement

I have read and understood the information about the LOWINFOOD project, as provided above. I have been given the opportunity to ask questions about the project and my participation.

I voluntarily agree to participate in the research activity described in this document. I understand I can withdraw at any time without giving reasons and that I will not be penalised for withdrawing nor I will be questioned on why I have withdrawn.

I understand that the researchers in the LOWINFOOD consortium will have access to this data only if they agree to preserve the confidentiality of the data and if they agree to the terms I have specified in this form.

Therefore, I CONSENT DO NOT CONSENT

to participate in the research, knowing that such consent is freely expressed and can be revoked at any time.

_____, _____

(place and date)

_____

(signature of the participant)

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Annex 2: Data collection protocol

Task 2.1 - Regione Emilia-Romagna S.I.R. Software

Brief description: Software to manage withdraws of fruits & vegetables by producer organizations (PO and APO) within the system of CAP payments, managing donation of these products to charities. The software has been implemented by the Emilia-Romagna Region in Italy since 2012.

FLW prevention and reduction: Absolute indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
ABS 1	Baseline and Monitoring	Food loss and waste quantification	Tons or Kilos	Emilia Romagna Region and/or Regional Institution	Records reporting: quantity of food surplus destined to disruption	Yearly
ABS 2	Monitoring	Food loss and waste quantification	Tons or Kilos	Emilia Romagna Region and/or Regional Institution	Records reporting: quantity of food surplus destined to disruption	Yearly

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FLW prevention and reduction: Relative indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REL1	Baseline, Mid-Term and Monitoring	Amount withdrawn over the total of food handled	Tons or Kilos	Emilia Romagna Region and/or Regional Institution	Records Reporting: the amount of food withdrawals - Total amount of food surplus	Yearly
REL2	Baseline, Mid-Term and Monitoring	Food donated out of the food recovered in one year	Tons or Kilos	Emilia Romagna Region and/or Regional Institution	Records Reporting: Total amounts of food surplus recovered from withdrawals - Total amount of food surplus donated to charities	Yearly
REL3	Baseline, Mid-Term and Monitoring	Food sent to ethanol production over the total of food recovered in one year	Tons or Kilos	Emilia Romagna Region and/or Regional Institution	Records Reporting: Total amounts of food surplus recovered from withdrawals - Total amount of food surplus Sent to Ethanol Production	Yearly
REL4	Baseline, Mid-Term and Monitoring	Farmers' surplus recovered out of the total farmers' surplus in one year	% of farmers surplus recovered over the total food surplus produced	Producers' Organization & Regional Authorities	To be estimated from the Records Reporting: a) Total amounts of food surplus produced in one year by the farmers in the Producers	Yearly

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					Organizations b) Total amounts of food surplus recovered from withdrawals (it can also be disaggregated by type of destination e.g. Charities, Ethanol Production)	

Indicators: replicability, utility, user-friendliness

REPLICABILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REP 1	Baseline & Monitoring	agencies, charities, POs adopting/willing to adopt the platform during the pilot	Number	Regional Authority (in our case Emilia-Romagna Region who is also managing the software)	Questionnaire	Once, at the baseline

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REP 2	Baseline & Monitoring	Charities entering the platform per country	Number	Regional Authorities, Emilia Romagna Region	Questionnaire	Once at Baseline and Once at monitoring
REP 3	Baseline & Monitoring	Agencies and charities expressing interest to the innovation, per country	Number	Regional Authorities	Questionnaire	Once, at Baseline and Monitoring
REP 4	Monitoring	Partners willing to promote the innovation	Qualitative information	POs, Charities and Agencies, Emilia Romagna Region	Questionnaire	Once, at Monitoring

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UTILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
UTI1	Monitoring	Successfully completed Recoveries	Number	POs	Questionnaire	Once, at the monitoring
UTI2	Monitoring	People who have developed new skills thanks to the implementation of the software	Qualitative data	Charities, POs, Agencies and Regional Authorities, Emilia Romagna Region	Questionnaire	Once, at monitoring.
UTI3	Monitoring	Satisfaction rating of the innovation	Qualitative data	Charities and POs	Questionnaire	Once, at monitoring.
UTI4	Monitoring	Assessment of non-monetary benefits over non-monetary costs	Qualitative data	POs	Questionnaire	Once, at monitoring.

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USER-FRIENDLINESS

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
USF1	Monitoring	Phone call/email to RER due to issues with the platform/donations	Number	Emilia Romagna Region	Questionnaire	Once, at the Monitoring
USF2	Baseline	Difficulty to start using the innovation	Qualitative data	POs and Charities	Questionnaire	Once, at Baseline
USF3	Monitoring	People needed to work on the platform/per agency;	Number	Regional Authorities, POs, Charities, Ethanol producing plants	Questionnaire	Once, at the Monitoring
USF4	Monitoring	Willingness to keep participating to the innovation	Qualitative data	Regional Authorities, POs and Charities	Questionnaire	Once, at the Monitoring
USF5	Monitoring	Hours needed to learn how to use the platform	Qualitative data	Emilia Romagna Region, Regional Authorities, POs and APOs, Charities, Ethanol producing plants	Questionnaire	Once, at the Monitoring

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Task 2.2 - UNV Cooperation System

Brief description: UNV Cooperation system between farmers and restaurants to reuse unharvested agricultural products Austria

FLW prevention and reduction: Absolute indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
ABS1	Baseline	Food loss and waste Redistribution before the innovation	Tons per year	UNV (the company implementing the innovation)	Records from database	Yearly
ABS2	Monitoring	Food loss and waste quantification	Tons per year	UNV	Records from database	Per action

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FLW prevention and reduction: Relative indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REL1	Monitoring	Food redistributed (or reused) in one year per products sold	Kg waste per kg products sold	only farmers	Records from database and interviews In particular, the following calculations will be used: **REL1 (actual amount)** = ABS2/REL1a * 100 **REL1 (target amount)** = (ABS2/REL1b * 100)/REL1 *100	Year
REL1a	Monitoring	Total products sold	Tons or kg of food	Farmers	Interviews with single farmers to ask their total products sold.	Year
REL1 b	Monitoring	Farmers' surplus recovered out of the total farmers' surplus in one year	% of food recovered over the farmers' food surplus	Farmers	Interviews with single farmers, estimation of farmers only	Year

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Indicators: replicability, utility, user-friendliness

REPLICABILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REP1	Baseline and Monitoring	Number of farmers enrolled in the innovation	Number	UNV	Records from the innovation	Once at Baseline and once at monitoring
REP2	Baseline and Monitoring	Food surplus receivers enrolled in the collaboration system	Number	UNV	Records from the innovation	Once at Baseline and once at monitoring
REP3	Monitoring	Partners willing to promote the innovation	Qualitative data	Farmers	Questionnaire	Once at monitoring

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UTILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
UTI1	Monitoring	Difficulty to start using the innovation	Qualitative data	Farmers	Questionnaire	Once, at monitoring
UTI2	Monitoring	% of crop production restored by the farmers thanks to the innovation	Percentage of food restored	Farmers	Questionnaire	Once, at monitoring
UTI3	Monitoring	People who have developed new skills thanks to the implementation of the UNV innovation	Qualitative data	Farmers & Restaurants/food receiver	Questionnaire	Once, at monitoring
UTI4	Monitoring	Companies saying that the innovation met their expectations, and average rating	% based on a qualitative data and number	Farmers & Restaurants/food receiver	Questionnaire	Once, at monitoring

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USER-FRIENDLINESS

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
USF1	Monitoring	Difficulties in starting using the innovation	Qualitative data	Farmers & Restaurants/food receiver	Questionnaire	Once, at monitoring
USF2	Monitoring	Hours needed to learn how to implement the agreement	Number	Farmers & Restaurants/food receiver	Questionnaires	Once, at monitoring
USF3	Monitoring	Non-monetary benefits over non-monetary costs	Qualitative data	Farmers & Restaurants/food receiver	Questionnaire	Once, at monitoring

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Task 2.3 - Leroma B2B digital market place

Brief description: digital market place for food commodities, bridging producers and food industry and allowing to sell products that are no longer suitable for their initial purpose or surplus products

FLW prevention and reduction: Absolute indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
ABS1	Baseline	FLW Quantification at baseline	Tons	Selected Leroma users	Record and interviews	Once
ABS2	Monitoring	FLW Quantification after innovation	Tons	Selected Leroma users	Questionnaire on the object, amount and unit of transaction	Once
ABS3	Monitoring	FLW Quantification during innovation	Tons	All Leroma users	Single question on the transaction website	Every transaction

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FLW prevention and reduction: Relative indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REL1	Baseline and Monitoring	Amount of products offered per year	Tons	Selected Leroma users	Record and interviews	Once, at baseline
REL2	Baseline and Monitoring	Amount of food surplus traded out of the products offered per year	% of food that has been sold through Leroma out of the products traded	Selected Leroma users	Record and interviews	once, at monitoring

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Indicators: replicability, utility, user-friendliness

REPLICABILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REP1	Monitoring	Companies involved	Number	Leroma	Questionnaire	Once, at monitoring
REP2	Monitoring	Searches made in the app/portal	Number	Leroma	Questionnaire	Once, at monitoring
REP3	Monitoring	Partners willing to promote the innovation	Qualitative data	Selected Companies using Leroma	Questionnaire	Once, at monitoring

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UTILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
UTI1	Monitoring	B2B agreements	Number	Leroma	Questionnaire	Once, at baseline
UTI2	Monitoring	Offers uploaded through the digital marketplace	Number	Leroma	Questionnaire	Once, at baseline
UTI3	Monitoring	Number of matches reached by each company	Number	Leroma	Questionnaire	Once, at baseline
UTI4	Monitoring	Increase in products reintroduction to market	Number	Research partners	Derived from UTI1; UTI2; UTI3	Once, at baseline
UTI5	Monitoring	People who have developed new skills thanks to the implementation of the Leroma platform	Qualitative data	Selected Leroma users	Questionnaire	Once, at monitoring.
UTI6	Monitoring	Companies saying that the innovation met their expectations, and average rating	% derived from qualitative data	Selected Leroma Users	Questionnaire	Once, at monitoring.

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USER-FRIENDLINESS						
No	**Period**	**Indicator**	**Unit**	**Provider of the information**	**Method for data collection**	**Frequency**
USF1	Monitoring	Resource needed to implement the innovation	Qualitative data	Selected Leroma users	Questionnaire	Once, at monitoring
USF2	Monitoring	Difficulty to start using the innovation	Qualitative data	Leroma users	Questionnaire	Once, at monitoring
USF3	Monitoring	Drop/out rate	Number	Leroma	Questionnaire	Once, at monitoring
USF4	Monitoring	Number of inquiries made to Leroma	Number	Leroma	Questionnaire	Once, at monitoring
USF5	Monitoring	Willingness to keep the innovation after the project	Qualitative data	Selected Leroma users	Questionnaire	Once, at monitoring

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Task 2.4 - FORESIGHTEE

Brief description: Sales forecasting software for supermarkets, based on machine learning; it will be implemented on fruits & vegetables products, allowing a better management of orders

FLW prevention and reduction: Absolute indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
ABS1	Baseline	FLW Quantification at baseline	tons	Supermarket	Records from supermarkets on waste	Monthly data for 3 years
ABS2	Monitoring	FLW Quantification after innovation	Tons	Foresightee data platform	Estimation based on the Record from supermarkets on Sales, stocks, orders + Foresightee sales forecasts [Theoretical data derived from the difference between Supermarket forecasting and Foresightee forecasting]	Monthly data for 5 months

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FLW prevention and reduction: Relative indicators						
No	**Period**	**Indicator**	**Unit**	**Provider of the information**	**Method for data collection**	**Frequency**
REL1	Baseline and Monitoring	Product unsold/product purchased before implantation, disaggregated by product group, per year and unit of sales area	% in terms of tons	Supermarket	Records from supermarket on waste and sales [Theoretical data in the monitoring phase]	Monthly
REL2	Baseline and Monitoring	Product purchased after implementation, disaggregated by product group, per year and unit of sales area	% in terms on tons	Foresightee data platform	[Theoretical data] Records from the platform related to Sales, stocks, orders + Foresightee sales forecasts [Theoretical data in the monitoring phase]	Monthly
REL3	Baseline and Monitoring	Products sold/products purchased	% in terms on tons	Foresightee data platform	Records from the platform related to sales, stocks, orders + Foresightee sales forecasts [Theoretical data in the monitoring phase]	Monthly

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Indicators: replicability, utility, user-friendliness

REPLICABILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REP1	Monitoring	Agreements subscribed by retailers	Number	Foresightee	Questionnaire	Once, at monitoring
REP2	Monitoring	Supermarket adopting the software	Number	Foresightee	Questionnaire	Once, at monitoring
REP3	Monitoring	Partners willing to promote the innovation	Number from qualitative data	Foresightee	Questionnaire	Once, at monitoring

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UTILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
UTI1	Monitoring	Value of products ordered following software indication	Qualitative data	supermarkets	Questionnaire	Monthly data during implementation
UTI2	Monitoring	People who have developed new skills thanks to the implementation of Foresightee	Qualitative data	Supermarkets	Questionnaire	Once, at monitoring
UTI3	Monitoring	Companies saying that the innovation met their expectations, and average rating	% derived from qualitative data	Supermarkets	Questionnaire	Once, at monitoring
UTI4	Monitoring	Increase in revenue from buying raw material through the platform	% and qualitative data	Supermarkets	Questionnaire	Once, at monitoring
UTI5	Monitoring	Non-monetary benefits over non-monetary costs	Qualitative data	Supermarkets	Questionnaire	Once, at monitoring

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USER-FRIENDLINESS						
No	**Period**	**Indicator**	**Unit**	**Provider of the information**	**Method for data collection**	**Frequency**
USF1	Baseline	Difficulty to start using the innovation	Qualitative data	Supermarkets	Questionnaire	Once, at baseline
USF2	Monitoring	Contacts made with the support due to difficulties in using the software	number	Foresightee	Questionnaire	Once, at monitoring
USF3	Monitoring	People in the supermarket that need to be trained	number	Supermarket	Questionnaire	Once, at monitoring
USF4	Monitoring	System's suggestions followed by consistent operator action/number suggestions given by the system	%	Supermarkets	Questionnaire	Once, at monitoring
USF5	Monitoring	Resources needed to implement the innovation	Qualitative data	Supermarkets	Questionnaire	Once, at monitoring
USF6	Monitoring	Hours needed to learn how to use the platform	number	Supermarkets	Questionnaire	Once, at monitoring
USF7	Monitoring	Willingness to keep the innovation after the project	Qualitative Data	Supermarkets	Questionnaire	Once, at monitoring

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Task 3.1 - SVERIGES LANTBRUKSUNIVERSITET New supplier/retailer agreements

Brief description: New supplier/retailer agreements for bakery products, avoiding take-back that is a risk factor for waste in this sector

FLW prevention and reduction: Absolute indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
ABS1	Baseline	FLW Quantification at baseline	tons	Country's Research Partners	Questionnaires and records	Once, at baseline
ABS2	Monitoring	FLW Quantification after innovation	Tons	Country's Research Partners	Questionnaires and records	Once, at monitoring

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FLW prevention and reduction: Relative indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REL1	Baseline	surplus bread / purchased bread at retailer and supplier before innovation (baseline) per year and kg delivered	Tons	Suppliers and Retailer	Questionnaire	Before the implementation of the innovation
REL2	Monitoring	Surplus bread / purchased bread at retailer and supplier after innovation per year and kg delivered.	Tons	Suppliers and Retailer	Questionnaire	Yearly, during the task
REL3	Baseline and Monitoring	Surplus bread on total daily or weekly/monthly orders	%	Suppliers and Retailer	Records	Monthly & Weekly

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Indicators: replicability, utility, user-friendliness

REPLICABILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REP1	Baseline & Monitoring	Suppliers involved in the agreements	Number	SLU & other research partners	Records from innovator	Baseline & Monitoring
REP2	Baseline & Monitoring	Retailers involved in the agreements	Number	SLU & other research partners	Records from innovator	Baseline & Monitoring
REP3	Monitoring	Partners willing to promote the innovation	Number from qualitative data	Suppliers and Retailers	Questionnaire	Once, at monitoring

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UTILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
UTI1	Monitoring	Take-backs avoided thanks to the agreement	number and %	Suppliers and retailers	Questionnaire	Once, at monitoring
UTI2	Monitoring	People who have developed new skills thanks to the implementation of SLU	Qualitative data	Suppliers and retailers	Questionnaire	Once, at monitoring.
UTI3	Monitoring	Companies saying that the innovation met their expectations, and average rating	% derived from qualitative data	Suppliers and retailers	Questionnaire	Once, at monitoring.

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USER-FRIENDLINESS

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
USF1	Monitoring	Suppliers and retailers who decided to continue with the agreements after one year	Number from qualitative data	Suppliers and retailers	Questionnaire	Yearly
USF2	Monitoring	Procedures needed to implement the innovation	number	Suppliers and retailers	Questionnaire)	Once, at monitoring
USF3	Monitoring	Assessment of non-monetary benefits over non-monetary costs	Qualitative data	Suppliers and retailers	Questionnaire	Once, at monitoring

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Task 3.2 - Stakeholder dialogue in the bakery sector

Brief description: Stakeholder dialogue to promote coordination in the bread value chain for the adoption of innovative solutions against FLW

FLW prevention and reduction: Absolute indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
ABS1	Baseline	FLW Quantification at baseline	Tons	Bakeries and retailers	Questionnaires and records from bakeries and retailers	Once, at baseline
ABS2	Monitoring	FLW Quantification after innovation	Tons	Bakeries and retailers	Questionnaires and records from bakeries and retailers	Once, at Monitoring

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FLW prevention and reduction: Relative indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REL1	Baseline	Surplus bread produced/ total monthly bread production (3 main bread types) before the innovation	Tons	Bakeries	Company records	Before the implementation of the innovation
REL2	Monitoring	Surplus bread produced / total monthly bread production (3 main bread types) after the innovation	Tons	Bakeries	Company records	Monthly after the implementation of the innovation

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Key Performance Indicators

REPLICABILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REP1	Baseline & Monitoring	Decrease in actors and subjects involved (drop-out rate)	number and %	Researchers	Direct information listing all the actors who are taking part in stakeholder dialogue is reported.	Once at Baseline & once at Monitoring
REP2	Monitoring	Partners willing to promote the innovation	Number from qualitative data	Bakeries	Questionnaire	Once at Monitoring

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UTILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
UTI1	Monitoring	Increase in information flow	Qualitative data	Bakeries and Retailers	Questionnaire	Once, at monitoring
UTI2	Monitoring	Companies saying that the innovation met their expectations,	Qualitative data	Bakeries and Retailers	Questionnaire	Once, at monitoring.
UTI3	Monitoring	People who have developed new skills thanks to the implementation of the stakeholder dialogue	Qualitative data	Bakeries and Retailers	Questionnaire	Once, at monitoring.

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USER-FRIENDLINESS

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
USF1	Monitoring	Suppliers and retailers who decided to continue with roadmap actions	Number from qualitative data	Bakeries and retailers	Questionnaire	Once at monitoring
USF2	Monitoring	Complexity of the roadmap	Qualitative data	Bakeries and retailers	Questionnaire	Once, at monitoring
USF3	Monitoring	Hours needed to implement the actions of the roadmap and how many staff were involved	number	Suppliers and retailers	Questionnaire	Once, at monitoring
USF4	Monitoring	Non-monetary benefits over non-monetary costs	Qualitative data	Suppliers and retailers	Questionnaire	Once, at monitoring

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Task 3.3 - Food Tracks Software

Brief description: Food Trackers Software for optimization of bakeries' production

FLW prevention and reduction: Absolute indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
ABS1	Baseline	FLW Quantification at baseline	kg	Bakeries	Records from bakery producers reporting the number of products produced (delivered) to a bakery shop; the number of products wasted; and by using standard weights per products, the amount in kg is deduced	Once, at baseline
ABS2	Monitoring	FLW Quantification after innovation	kg	Bakeries	Records from bakery producers reporting the number of products produced (delivered) to a bakery shop; the number of products wasted; and by using standard weights per products, the amount in kg is deduced	Yearly and at Monitoring

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FLW prevention and reduction: Relative indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REL1	Baseline & Monitoring	surplus bread / produced bread per year and unit of sales (baseline)	% (or kg waste per kg produced)	Bakeries	Records from bakery producers reporting the number of products produced (delivered) to a bakery shop; the number of products wasted	Continuously monitor the amounts produced and overproduced for 12 months

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Indicators: replicability, utility, user-friendliness

REPLICABILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REP1	Mid-term & Monitoring	Times the app has been integrated into the user systems	Number	FT	FT records	Once at mid-term & once at Monitoring
REP2	Mid-term & Monitoring	Resources needed to implement the innovation	Qualitative information	Bakery	Questionnaire	Once at mid-term & once at Monitoring
REP3	Mid-term & Monitoring	Partners willing to promote the innovation	Number from qualitative data	Bakeries	Questionnaire	Once at mid-term & once at Monitoring

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UTILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
UTI1	Mid-term & Monitoring	Decisions suggested by the app	Number	FT	Questionnaire	Once at mid-term & once at Monitoring
UTI2	Monitoring	Decisions made using the data provided by the software	Number and %	FT / Bakeries	Questionnaire	Once at mid-term & once at Monitoring
UTI3	Monitoring	Companies saying that the innovation met their expectations, and average rating	qualitative data	Bakeries	Questionnaire	Once, at Monitoring
UTI4	Mid-term & Monitoring	People who have developed new skills thanks to the implementation of FT	Qualitative data	Bakeries	Questionnaire	Once at mid-term & once at Monitoring

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USER-FRIENDLINESS						
No	**Period**	**Indicator**	**Unit**	**Provider of the information**	**Method for data collection**	**Frequency**
USF1	Monitoring	Adopting bakeries willing to continue using FT	Number from qualitative data	Bakeries	Questionnaire	Once, at Monitoring
USF2	Baseline	Difficulty to start using the innovation	Qualitative	Bakeries	Questionnaire	Once, at baseline
USF3	Baseline, Mid-term & Monitoring	People involved in the innovation that required specific training to implement it	Qualitative data	Bakery	Questionnaire	Once, at baseline, once at midterm and once at monitoring
USF4	Monitoring	Level of ease of use in terms of feature	Qualitative data	Bakeries	Questionnaire	Once, at monitoring
USF5	Monitoring	Changes in companies' processes.	Qualitative description	Bakeries	Questionnaire	Once, at monitoring
USF6	Monitoring	Non-monetary benefits over non-monetary costs	Qualitative data	Bakeries	Questionnaire	Once, at monitoring

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Task 4.1 - JHI Stakeholder dialogue

Brief description: Stakeholder dialogue to promote coordination between actors at different stages of the value chain for the adoption of innovative solutions against FLW or the identification of alternative uses of food which is not fit for its initial purpose though direct contact between stakeholders

FLW prevention and reduction: Absolute indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
ABS1	Baseline	Tons of fish saved from being wasted before	tons per year	Companies joining the dialogue	Questionnaire	Once, at the baseline
ABS2	Final/overall assessment	Tons of fish saved from being wasted after	tons per year	Companies joining the dialogue	Questionnaire	Once, at the monitoring and at each food transaction, if there are food transactions triggered by the dialogue.

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FLW prevention and reduction: Relative indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REL1	Baseline	Rate of fish wasted, out of the total fish traded by a single company along a year (to get a magnitude of the phenomenon)	%	Companies joining the dialogue	This indicator will be calculated based on the information and questionnaire used for indicator ABS2	Once at Baseline
REL2	Final/overall assessment	Rate of fish waste avoided (after implementation) out of the total fish wasted by a single company along a year.	%	Companies joining the dialogue	This indicator will be calculated based on the information and questionnaire used for indicator ABS2	Once at the end of the task, if changed
REL3	Baseline and Final/overall assessment	Tons of fish wasted / total fish traded by the company before the innovation	tons	Companies joining the dialogue	This indicator will be calculated based on the information and questionnaire used for indicators ABS1 and ABS2	Once at baseline and once at the end of the task, if changed
REL4	Final/overall assessment	Rate of fish wasted on total daily or weekly/monthly fish traded	kg	Companies joining the dialogue	This indicator will be calculated based on the information and questionnaire used for indicators ABS1 and ABS2	Once at the end of the task, if changed

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Indicators: replicability, utility, user-friendliness

REPLICABILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REP1	Baseline, mid-term monitoring & Final/overall assessment	Number of actors involved	Number from qualitative data	JHI	Records	Once at baseline, for each food transaction, & once at the end of the task
REP2	Mid-term monitoring & Final/overall assessment	Partners willing to keep using the innovation	Number from qualitative data	JHI (for mid-term assessment) & Companies joining the dialogue (for final assessment)	Questionnaire	For each food transaction & once at the end of the task
REP3	Final/overall assessment	Partners willing to promote the innovation	Number from qualitative data	Companies joining the dialogue	Questionnaire	Once at the end of the task

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UTILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
UTI1	Final/overall assessment	People who have developed new skills thanks to the implementation of JHI	Qualitative data	Companies joining the dialogue	Questionnaire	Once at the end of the task
UTI2	Final/overall assessment	Companies saying that the innovation met their expectations, and average rating	% derived from qualitative data	Companies joining the dialogue	Questionnaire	Once at the end of the task.

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USER-FRIENDLINESS						
No	**Period**	**Indicator**	**Unit**	**Provider of the information**	**Method for data collection**	**Frequency**
USF1	Mid-term monitoring & Final/overall assessment	Number of hours spent in participatory activities and/or in dialoguing with partners bilaterally (calculated by gender)	Number from qualitative data	Companies joining the dialogue	Questionnaire	For each food transaction & once at the end of the task
USF2	Final/overall assessment	Willingness to keep contacts with other stakeholders acquired through the dialogue after the project. detected through a survey	Qualitative data	Companies joining the dialogue	Questionnaire	Once at the end of the task
USF3	Final/overall assessment	Non-monetary benefits over non-monetary costs	Qualitative data	Companies joining the dialogue	Questionnaire	Once at the end of the task

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Task 5.1 - KITRO Innovative bin

Brief description: Innovative bin for restaurants, canteens and hotels' kitchen, with visual image recognition to monitor quantity and type of food waste

FLW prevention and reduction: Absolute indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
ABS1	Baseline	FLW Quantification at baseline	kg	KITRO	weighing (Kitchen staff puts food waste in bin, which is weighted by Kitro scale)	Data are automatically inserted into the system every time food waste is weighed
ABS2	Monitoring	FLW Quantification at baseline	kg	KITRO	weighing (Kitchen staff puts food waste in bin, which is weighted by Kitro scale)	Data are automatically inserted into the system every time food waste is weighed

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FLW prevention and reduction: Relative indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REL1	Baseline and monitoring	Amount of food waste per guest/meal	g/guest or g/meal	KITRO and Restaurant	Weighing system from KITRO + the number of guests as documented by kitchen staff	Daily at the beginning and at the end of the task
REL2	Baseline and monitoring	Quantity of food wasted/food produced or distributed	%	KITRO and Restaurant	Weighing system from KITRO + quantity of food distributed as documented by kitchen staff	Daily at the beginning and at the end of the task
REL3	Baseline and monitoring	Number of meals served	number	KITRO and/or Restaurant	ERP system from KITRO and/or kitchen staff reports	Daily at the beginning and at the end of the task

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Indicators: replicability, utility, user-friendliness

REPLICABILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REP1	Monitoring	Share of adopting companies willing to continue applying the innovation	Number	restaurant	Questionnaire	Once, at the monitoring
REP2	Monitoring	Number of partners willing to promote the innovation	Number	restaurants	Questionnaire	Once, at the monitoring

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UTILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
UTI1	Baseline & monitoring	Reduction in the type of food wasted connected to decisions made thanks to the images taken by the bin	Qualitative data	Restaurants and/or KITRO	Questionnaire	Once at baseline and once at monitoring
UTI2	Baseline & monitoring	Reduction in the quantity of food wasted connected to decisions made thanks to the images taken by the bin	Kg	KITRO	KITRO weighing system	Once at baseline and once at monitoring
UTI3	Monitoring	Companies saying to what extend the innovation met their expectations, and average ratings.	Qualitative data	Restaurants	Questionnaire	Once, at monitoring
UTI4	Monitoring	Number of people who have developed new skills thanks to the implementation of the innovation.	Qualitative data	Restaurants	Questionnaire	Once, at monitoring

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USER-FRIENDLINESS						
No	**Period**	**Indicator**	**Unit**	**Provider of the information**	**Method for data collection**	**Frequency**
USF1	Monitoring	KITRO app ease of use and interface user-friendliness	Qualitative data	Restaurants	Questionnaire	Once, at monitoring
USF2	Monitoring	Resources needed to implement the innovation	Qualitative data	Restaurants	Questionnaire	Once, at monitoring
USF3	Monitoring	How difficult was it to start using the innovation?	Qualitative data	Restaurants	Questionnaire	Once, at monitoring
USF4	Monitoring	Assessment of the level of involvement in the innovation (calculated by gender)	Qualitative data	Restaurants	Questionnaire	Once, at monitoring
USF5	Monitoring	Non-monetary benefits over non-monetary costs	Qualitative data	Restaurants	Questionnaire	Once, at monitoring

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Task 5.2 - MITAKUS Forecasting software for restaurants

Brief description: Forecasting software for restaurants providing accurate demand forecasts, allowing to reduce preparation of surplus food

FLW prevention and reduction: Absolute indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
ABS1	Baseline	FLW Quantification at baseline	kg	Restaurants and MITAKUS	Analysis of data from ERP system: Overproduction = number of meals planned - number of meals sold Additional Tracking needed: manually tracking to what happens to overproduction (indirect kitchen waste)	Once at baseline, but it might change because diversity in the typology of waste needs to be considered
ABS2	Monitoring	FLW Quantification at baseline	kg	Restaurants and MITAKUS	Analysis of data from ERP system: Overproduction = number of meals planned - number of meals produced	Once at baseline, but it might change because diversity in the typology of waste needs to be considered

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FLW prevention and reduction: Relative indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REL1	Baseline, Mid-term and monitoring	Amount of food waste per guest/meal	g/ guest	Restaurant	Direct weighing from restaurants and direct measurement of guests by the restaurants	To be defined with restaurants, probably together with absolute indicators measurement
REL2	Baseline, Mid-term and monitoring	Quantity of food wasted/food produced or distributed	%	Restaurant	Direct weighing from restaurants and direct report of the different products over purchased	To be defined with restaurants, probably together with absolute indicators measurement
REL3	TBD	Number of meals cooked	Number of meals	Mitakus / Restaurant	either from ERP system or documentation of Kitchen staff	To be defined with restaurants, probably together with absolute indicators measurement
REL4	TBD	Number of meals served	Number of meals	Mitakus / Restaurant	either from ERP system or documentation of Kitchen staff	To be defined with restaurants, probably together with absolute indicators measurement

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Indicators: replicability, utility, user-friendliness

REPLICABILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REP1	Monitoring	Number of times that the app has been integrated into the user (restaurant, etc) systems	Number	Mitakus	Records from Mitakus	Once, at the monitoring
REP2	Baseline	Share of companies starting to use the innovation	Number	Mitakus	Records from Mitakus	Once, at baseline
REP3	Mid-term and Monitoring	Number of partners willing to promote the innovation	Number	restaurants	Questionnaire	Once, at mid-term and once, the monitoring

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UTILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
UTI1	Monitoring	Share of adopting companies willing to continue using Mitakus	Qualitative data	Restaurants	Questionnaire	Once, at monitoring
UTI3	Monitoring	Changes in companies' processes.	~~number~~ Qualitative description	Restaurants	Questionnaire	Once, at monitoring
UTI4	Monitoring	Companies saying that the innovation met their expectations, and average rating	Qualitative data	Restaurants	Questionnaire	Once, at Monitoring
UTI5	Monitoring	Number of people who have developed new skills thanks to the implementation of the innovation.	Qualitative data	Restaurants	Questionnaire	Once, at monitoring

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USER-FRIENDLINESS						
No	**Period**	**Indicator**	**Unit**	**Provider of the information**	**Method for data collection**	**Frequency**
USF1	Monitoring	Mitakus app ease of use and interface user-friendliness	Qualitative data	Restaurants	Questionnaire	Once, at monitoring
USF2	Monitoring	Resources needed to implement the innovation	Qualitative data	Restaurants	Questionnaire	Once, at monitoring
USF3	Monitoring	Difficulty in starting using Mitakus	Qualitative data	Restaurants	Questionnaire	Once at monitoring
USF4	Monitoring	Non-monetary benefits over non-monetary costs	Qualitative data	Restaurants	Questionnaire	Once, at monitoring

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Task 5.3 – MATOMATIC Plate waste tracker

Brief description: Plate waste tracker for school canteens

FLW prevention and reduction: Absolute indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
ABS 1	Baseline	FLW Quantification at baseline	tons per year	Kitchen staff quantify the mass and Research partners elaborate the result	plate waste, serving waste and number of served pupils are recorded by kitchen staff, plate waste is tracked by pupils (self-reporting of kitchen staff can be verified), in other schools in same community, waste is also tracked (without Matomatic plate waste tracker) to be able to detect other factors affecting quantities of FW (e.g. pandemic)	daily for at least 20 days as baseline measurement
ABS 2	Monitoring	FLW Quantification at monitoring	tons per year	Kitchen staff quantify the mass and Research partners elaborate the result	plate waste, serving waste and number of served pupils are recorded by kitchen staff, plate waste is tracked by pupils (self-reporting of kitchen staff can be verified), in other schools in same community, waste is also tracked (without Matomatic plate waste tracker) to be able to detect other factors affecting quantities of FW (e.g. pandemic)	100-300 daily observations for the monitoring

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FLW prevention and reduction: Relative indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REL1	Monitoring	Quantity of food waste avoided at the schools with respect to food served per pupil	Grams	School Canteen	Direct weighting per type of products	During the monitoring period
REL2	Baseline	Grams of food wasted (plate waste) per guest (and the numbers of guests are estimated by the number of used plates) before the innovation	Grams/guests	School Canteen	Documenting number of meals/plates served/sold from ERP system or from documentation of the chef	During the Baseline period
REL3	Monitoring	Grams of food wasted (plate waste) per guest (and the numbers of guests are estimated by the number of used plates) after the innovation	Grams/guests	School Canteen	documenting number of meals/plates served/sold from ERP system or from documentation of chef	During the monitoring period
REL4	Monitoring	Total food saved = grams of plate waste saved per guest * number of guests	Grams/guests	School Canteen	documenting number of meals/plates served/sold from ERP system or from documentation of chef	During the monitoring period

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Indicators: replicability, utility, user-friendliness

REPLICABILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REP1	Monitoring	Share of adopting organisations/schools that are willing to continue applying the innovation	Qualitative	School Canteens	Questionnaire	Once, at monitoring
REP2	Monitoring	Share of pupils, teachers and kitchen staff participating	Number	School Canteens manager	Questionnaire	Once, monitoring
REP3	Mid-term and monitoring	Number of partners willing to promote the innovation	Number	restaurants	Questionnaire	Once, at mid-term and once, the monitoring

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UTILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
UTI1	Monitoring	Share of adopting companies willing to continue using Matomatic	Qualitative data	School Canteens	Questionnaire	Once, at monitoring
UTI2	Monitoring	Reduction in the quantity of food wasted connected to the information provided by the innovation	Qualitative data	Schoool canteens	Questionnaire	
UTI3	Monitoring	Share of companies saying that the innovation met their expectations, and average ratings.	Qualitative data	School canteens	Questionnaire	Once at monitoring
UTI4	Monitoring	Number of people who have developed new skills thanks to the implementation of the innovation.	Qualitative data	Restaurants	Questionnaire	Once, at monitoring

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USER-FRIENDLINESS

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
USF 1	Monitoring	Matomatic app ease of use and interface user-friendliness	Qualitative data	School canteens	Questionnaire	Once, at monitoring
USF 2	Mid-term and Monitoring	How difficult was it to start using the innovation?	Qualitative data	School canteens	Questionnaire	Once, at mid-term and once at monitoring
USF 3	Mid-term and Monitoring	Frequency of uses (do users apply the innovation in the intended intervals or less?)	Number	Matomatic	Records from Matomatic	Once, at mid-term and once at monitoring
USF	Mid-term and	Number of hours spent (or effort) in participatory	Qualitative	School Canteens	Questionnaire	Once, at mid-term and

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4	Monitoring	activities and/or in dialoguing with partners bilaterally (calculated by gender)	data			once at monitoring
USF 5	Monitoring	Non-monetary benefits over non-monetary costs	Qualitative data	Restaurants	Questionnaire	Once, at monitoring
USF 6	Monitoring	Contacts made to innovator for issues with the software	Qualitative data	Restaurants	Questionnaire	Once, at monitoring

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Task 5.4 – SLU/AIE Holistic educational approach

Brief description: Holistic educational approach against food waste at schools, targeting pupils, teachers who accompany the pupils during the meals and kitchen staff (through smart kitchen workshops)

FLW prevention and reduction: Absolute indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
ABS1	Baseline	FLW Quantification at baseline	Weight	Kitchen staff quantify the mass, possibly with assistance from Research partners	depends on situation on site (likely overproduction and plate waste)	Baseline
ABS2	Monitoring	FLW Quantification after innovation	Weight	Kitchen staff quantify the mass, possibly with assistance from Research partners	depends on situation on site (likely overproduction and plate waste)	Monitoring

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FLW prevention and reduction: Relative indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REL1	Baseline	Grams of food wasted (plate waste) per guest (and the numbers of guests are estimated by the number of used plates) before the innovation (baseline)	grams	School	Direct weighting of wasted products	Baseline
REL2	Monitoring	Grams of food wasted (plate waste) per guest (and the numbers of guests are estimated by the number of used plates) after the innovation	grams	School	Direct weighting per type of products	Monitoring
REL3	Monitoring	quantity of food waste avoided at the schools with respect to food served per pupils	grams	School	Direct weighting per type of products	Monitoring
REL4	Monitoring	Total food saved = grams of plate waste saved per guest * number of guests	grams	School	Direct weighting per type of products	Monitoring

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Indicators: replicability, utility, user-friendliness

REPLICABILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REP1	Monitoring	Share of adopting organisations/schools that are willing to continue applying the innovation	Qualitative data	School	Questionnaire	Once, at monitoring
REP2	Monitoring	Share of pupils, teachers and kitchen staff participating	Qualitative data	School	Questionnaire	Once, monitoring
REP3	Monitoring	Number of partners willing to promote the innovation	Qualitative data	School	Questionnaire	Once, monitoring
REP4	Monitoring	Level of receptivity from schools' students	Qualitative data	School	Questionnaire	Once, at monitoring

UTILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
The utility of the innovation will be addressed in the socio-economic indicators since it is an innovation that involves a wider social impact. These indicators can be found in D1.4.						

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USER-FRIENDLINESS						
No	**Period**	**Indicator**	**Unit**	**Provider of the information**	**Method for data collection**	**Frequency**
USF1	Mid-term and Monitoring	Resources needed to implement the innovation (i.e., Hours/time needed to train the kitchen staff, teachers) (I)	Quantitative	Schools	Questionnaire	Once, at mid-term and once at monitoring
USF2	Mid-term and Monitoring	Number of enquiries made for issues with the innovation	Qualitative data	Schools	Questionnaire	Once, at mid-term and once at monitoring
USF3	Mid-term and Monitoring	How difficult was it to start using the innovation?	Qualitative data	Schools	Questionnaire	Once, at mid-term and once at monitoring
USF4	Mid-term and Monitoring	Number of hours spent in participatory activities and/or in dialoguing with partners bilaterally (calculated by gender)	Qualitative data	Schools	Questionnaire	Once, at mid-term and once at monitoring
USF5	Mid-term and monitoring	Non-monetary benefits over non-monetary costs	Qualitative data	Schools	Questionnaire	Once at mid-term and once at monitoring.

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Task 5.5 – CozZo Mobile App

Brief description: Mobile application to manage food provisions at home and avoid kitchen waste. Household (all food)

FLW prevention and reduction: Absolute indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
ABS1 [For communication purposes]	Baseline	Food saved from being wasted	kg	Researcher	Researchers calculate the data from the indicator ABS4	Once at baseline
ABS2 [For communication purposes]	Monitoring	Food saved from being wasted	kg	Researcher	Researchers calculate the data from the indicator ABS4	Once at monitoring
ABS3 Evaluation of efficacy	Baseline	FLW	kg	Researcher	Data from waste audits using separate bins made by researchers at baseline	Once at baseline
ABS4 Evaluation of efficacy	Monitoring	FLW	Kg	Researcher	Data from waste audits using separate bins made by researchers after the innovation	Once at monitoring

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FLW prevention and reduction: Relative indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REL1	Baseline	Household food wasted/ Household food purchased	kg	Researcher Households	A waste audit is made by researchers at the baseline (using a separate bin) Baseline questionnaire asking the household weekly food purchased	Once at baseline
REL2	Monitoring	Household food wasted/ Household food purchased	kg	Researcher CozZo	The system calculates automatically this information combining the food purchased and not consumed This information is complemented with a waste audit (using a separate bin) made by researchers after the innovation	Once at monitoring
REL3	Baseline	Cost of weekly household food purchasing	Euro	Households	Baseline questionnaire asking the cost of weekly household purchasing	Once at baseline
REL4	Monitoring	Cost of weekly household food purchasing	Euro	Households	Monitoring questionnaire asking the cost of weekly household purchasing	Once at monitoring

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Key Performance Indicators

REPLICABILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REP1	Baseline & Monitoring	Number of downloads	Number	CozZo	Innovator is directly asked to report the number the App has been downloaded from users	Once at baseline & once at Monitoring
REP2	Baseline	App compatibility with Android and iOS	Qualitative	CozZo	Innovator is directly asked to report the compatibility of the App with Android and iOS software	Once at baseline
REP3	Baseline	Number of subscriptions after download	Number	CozZo	Innovator is directly asked to report the number of subscription/signs into the app after the download	Once at baseline
REP4	Monitoring	Number of final users willing to promote the app	Qualitative	Household	Questionnaire	Once at monitoring
REP5	Monitoring	Share of adopting final users that are willing to continue applying the innovation	Qualitative	Household	Questionnaire	Once at Monitoring

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UTILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
UT1	Monitoring	Monthly/Weekly savings on consumers' food purchase	Euro	Household	Questionnaire	Once at monitoring
UT2	Monitoring	Number of shopping lists created in the app	Number	Household	Questionnaire	Once at monitoring
UTI3	Monitoring	Number of recipes created in the app	Number	Household	Questionnaire	Once at monitoring
UTI4	Monitoring	Time spent in supermarket	Qualitative	Household	Questionnaire	Once at monitoring
UTI5	Monitoring	Share of HH saying that the innovation met their expectations, and average rating	Qualitative	Household	Questionnaire	Once at monitoring
UTI6	Monitoring	Number of people who have developed new skills thanks to the implementation of the innovation by gender. e.g.: Please evaluate how much (from 1 to 5) the following skills have been improved thanks the use of COZZO	Qualitative	Household	Questionnaire	Once at monitoring

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USER-FRIENDLINESS						
No	**Period**	**Indicator**	**Unit**	**Provider of the information**	**Method for data collection**	**Frequency**
USF1	Monitoring	App rating in Google play/App Store	Number	CozZo	Secondary data	Once at monitoring
USF2	Monitoring	Number of enquiries made for issues with the innovation	Qualitative	Household	Questionnaire	Once at monitoring
USF3	Monitoring	Difficulty in starting using the innovation	Qualitative	Households	Questionnaire	Once at monitoring
USF4	Monitoring	Use of the App by gender	Qualitative	Households	Questionnaire	Once at monitoring
USF5	Monitoring	Willingness to keep using the app after the end of the demonstration phase	Number	CozZo	Number of COZZO users keeping interacting with the app after the end of demonstration	Yearly, starting at 6 months after the monitoring questionnaire

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Task 5.6 – REGUSTO Mobile App

Brief description: Mobile application selling restaurants' surplus food and tracking the delivered products up to the bin. Household (all food)

FLW prevention and reduction: Absolute indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
ABS1 Evaluation of efficacy	Baseline	Food saved (and sold via Regusto App) from being wasted	kg	Restaurants & REGUSTO	Initial weight of filled Regusto bag is determined by weighing in restaurants + photo in order to document filling level of bag, consumers take photos after consumption	
ABS2 Evaluation of efficacy	Monitoring	Food saved (and sold via Regusto App) from being wasted	Kg	Restaurant & REGUSTO	Initial weight of filled Regusto bag is determined by weighing in restaurants + photo in order to document filling level of bag, consumers take photos after consumption	
ABS4	Monitoring	FLW quantification at households	kg	Households	The consumer weight and take a photo to the opened bag inside the restaurant before takeaway. Then replicate the same activity at home after food consumption.	

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FLW prevention and reduction: Relative indicators

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REL1	Monitoring	Food saved by Regusto but wasted at consumer	grams	Researcher	Direct weighting	
REL2	Monitoring	Food saved through doggy bags per user, per month	grams	REGUSTO	Direct weighting	
REL3	Monitoring	Rate of saved food ending non-consumed and disposed	grams	Households	Direct weighting	

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Key Performance Indicators

REPLICABILITY

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
REP1	Monitoring	Share of adopting restaurants and households that are willing to continue applying the innovation	%	Regusto and Households	Questionnaire	Monitoring
REP2	Baseline	App compatibility with Android and iOS	Qualitative	Regusto	Questionnaire	Once at baseline
REP3	Baseline & Monitoring	Number of downloads	Number	Regusto	Questionnaire	Once at baseline & once at monitoring
REP4	Baseline	Number of restaurants that subscribed to the service after downloading the app	Number	Regusto	Questionnaire	Once at baseline
REP5	Monitoring	Share of adopting final users that are willing to promote the innovation	Qualitative	Household & restaurants	Questionnaire	Once at monitoring

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UTILITY						
No	**Period**	**Indicator**	**Unit**	**Provider of the information**	**Method for data collection**	**Frequency**
UT1	Monitoring	Number of food items uploaded	Quantitative	REGUSTO	Collected automatically by the App	Once at monitoring
UT2	Monitoring	Number of food items shipped/delivered	Quantitative	REGUSTO	Collected automatically by the App	Once at monitoring
UT3	Monitoring	Number of connections between suppliers and buyer made	Quantitative	REGUSTO	Collected automatically by the App	Once at monitoring
UT4	Baseline & Monitoring	Food stocking period reduction	Quantitative	Restaurants	Questionnaire	Once at baseline & once at monitoring
UT5	Monitoring	Monthly/Weekly savings on consumers' food purchase	Qualitative	Households	Questionnaire	Once at monitoring
UT6	Monitoring	Share of users saying that the innovation met their expectations and average rating	Qualitative	Restaurants & Households	Questionnaire	Once at monitoring
UT7	Monitoring	Number of products to take-way and for delivery	Quantitative	Restaurants	Questionnaire	Once at monitoring

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UT8	Monitoring	Number of people who have developed new skills thanks to the implementation of the innovation by gender	Qualitative	Restaurants	Questionnaire	Once at monitoring

USER-FRIENDLINESS

No	Period	Indicator	Unit	Provider of the information	Method for data collection	Frequency
USF1	Monitoring	App rating in Google play/App Store	Number	Regusto	Secondary data	Once at monitoring
USF2	Monitoring	Number of enquiries made for issues with the innovation	Qualitative	Restaurants	Questionnaire	Once at monitoring
USF3	Baseline	Difficulty in starting using the innovation	Qualitative	Restaurants & Households	Questionnaire	Once at baseline
USF4	Baseline & Monitoring	Use of the App by gender	Qualitative	Restaurants & Households	Questionnaire	Once at baseline and once at monitoring
USF5	Monitoring	Satisfaction	Qualitative	Restaurants & Households	Questionnaire	Once at monitoring
USF6	Monitoring	App ease of use and interface user-friendliness	Qualitative	School canteens	Questionnaire	Once at monitoring

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Annex 3: Preliminary questionnaires – Status: October 31st, 2021

Please note that questionnaires below represent only a preliminary version. The discourse between partners conducting the evaluation and partners supporting the demonstration tasks has started, but has not been completed, yet ("multi-actor approach", see also D1.1). A final set of questionnaires reaching a consensus need to be produced upon distribution or upon conducting the first interviews.

Consistency and completeness check

A consistency and completeness check was conducted by evaluation partners:

- UNIBO for efficacy related questions
- JHI for socio-economic related questions
- BOKU for environmental related questions
- ELH for gender related questions
- UNIBO; JHI; BOKU for questions related to the complete questionnaire

Feedback loops

After the consistency and completeness check, data facilitators were asked to accept or decline proposed changes and also include remarks for open discussions. This discussion process is still ongoing. So, several feedback loops will still be necessary before a consolidated version of questionnaires can be finalized.

Parts of the questionnaires which still need to be discussed or consolidated are therefore marked in grey and bold letters.

Clarifications on 'gender equality'

We will include a gender perspective and ensure **gender equality** throughout the evaluation, disaggregating data by sex, accounting for multiple inequalities and for women's needs.

Data will be collected disaggregated by sex using the categories *female, male, other* and *prefer not to say*. In this way different gender identities will have visibility.

The age of the participants will be another indicator to be taken into account. Both vertical and horizontal segregation will also be analysed by asking participants about the position and sector to which they belong to, and the satisfaction of each person with the questionnaire will be taken into account.

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In the case of the innovation to be carried out at household level, the types of families will be analysed according to the age and sex of each member and an attempt will be made to ensure the participation of different types of families.

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1 Regional authorities (before implementation)

1a. Questionnaire to be filled by regional authorities at the beginning of the task

A. Regional authority identification

1. Region
2. Nation
3. Department
4. Number of employees in the Department, by gender
5. Number of POs and APOs in the Region
6. Number of charities in the Region
7. Number of ethanol producing plants in the Region

B. Use of S.I.R.: participating actors, type of products, software information

1. How many charities, ethanol producing plants, POs and APOs are participating/willing to participate in the S.I.R. software? [number]
2. Please list the range of products involved in the innovation? [qualitative information]

C. Gender and survey satisfaction

3. Age and gender of the respondent.
4. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

2 Regional authorities (after implementation)

1b. Questionnaire to be filled by regional authorities at the end of the task

A. Use of S.I.R.: costs, employment, skills, contacts

1. *What has been the total cost of implementing the innovation (e.g. additional/new capital investment, labour, training etc.)? [qualitative information + number]*
2. Have you developed any new streams of income or financial gains (i.e., new products or avoid costs) as a result of participating in the innovation? [yes/no]
    - If yes, please specify their amount and typology [amount in Euro of each new stream]

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3. Please list all employees who have been involved in the use of S.I.R. software, by gender, age and role. [department, level of responsibility, if it is a decision-making position or not]
    - Did your company need to hire new personnel (including casual workers) in order to use S.I.R. software? [yes/no]
    - If yes, how many (by gender)? [numeric information and qualitative information]
    - Is there any increase/decrease of hours worked due to the innovation? Please, if possible, disaggregated by gender [multiple choice: increase/decrease]
4. What is the number and type of FTE jobs created for (or lost due to) the implementation of the innovation (if this is only a share of time of one or more employees, indicate the cumulated share in FTE)? In doing this, male female and non-binary employees' hours should be recorded separately. [number and qualitative information]
5. Have you made any new contacts ?What is the type of new contacts you have made in and out of your own sector as a result of your involvement in the S.I.R. Software? [qualitative information]
6. Are you willing to continue the relationships with these new contacts? [Likert scale: from 1 "very unlikely" to 5 "very likely"]
7. Have you suggested or are you willing to suggest the use of S.I.R. Software to other actors? [yes, I did / yes, I will / no]
    - Number and type of actors to which you suggested to use S.I.R. software, if any. [number and qualitative information]
    - Number of those who declared to be interested in it, if possible [number]
    - Number of those who have adopted it after you informed them, if possible [number]
8. How would you assess the time needed to learn how to properly use S.I.R Software? [Likert scale from 1 "very little" to 5 "too much"]
9. How many employees have developed new skills thanks to the use of S.I.R software, by gender?
    - Technological (use of pc software) [number and qualitative information]
    - Technical (better understanding of how to manage food transactions) [number and qualitative information]
    - Social/relational (with other users of the software, if relevant) [number and qualitative information]

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B. Use of S.I.R.: participating actors, type of products, software information

1. How many charities, ethanol producing plants, POs and APOs have participated in the S.I.R. software? [Number for each type of actor]
2. Could you list the range of products involved in the innovation? [qualitative information]
3. Is the type of product registered in the software? [yes/no]
4. Is the region of the POs/APOs listed in the software? [yes/no]
5. Is the region of the surplus food receiver listed in the software? [yes/no]
6. Has the software provider information about the server capacity? [yes/no]
7. *If you had to acquire a new computer to use S.I.R., please specify:*
    - *The location of the server [qualitative information]*
    - *Server capacity [quantitative information]*
    - *Amount of server capacity used for the S.I.R. software [% of total capacity];*
    - *Type of CPU]Intel Skylake/others (please specify)]*
    - *Type of device [tablet or iPad/computer/notebook/smartphone/other (please specify)]*
    - *Computer time used for operations related to S.I.R. [quantitative information]*
    - *Please specify the purposes for which you use the device other than the software, if any [qualitative information].*

C. Use of S.I.R.: software satisfaction

1. How much do you think that the participation in S.I.R. Software has improved the following aspects?
    - Trust with other stakeholders [Likert scale: from 1 “not at all” to 5 “a lot”]
    - Communication with other stakeholders [Likert scale: from “a lot” to “not at all”]
2. Has participation in the innovation met your expectations? [Likert scale from 1 “At all” to 5 “more than expected”]
3. How would you rate the S.I.R. software? [Likert scale from 1 “poorly” to 5 “very well”]
4. Are you willing to keep participating in the use of the S.I.R. software? [yes/no]

D. Gender and survey satisfaction

1. Age and gender of the respondent.

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2. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

3 RER Regione Emilia Romagna (once)

2. Questionnaire to be filled by REGIONE EMILIA ROMAGNA [only one time]

A. Regional authority identification

1. Region
2. Nation
3. Department
4. Number of employees in the Department, by gender
5. Number of POs and APOs in the Region
6. Number of charities in the Region
7. Number of ethanol producing plants in the Region

B. Use of S.I.R.: costs, employment, skills, contacts

1. Have you developed any new streams of income (i.e., new products or avoid costs) as a result of participating in the innovation of each new stream? [Qualitative information]
    - If yes, please specify their amount [quantitative information]
2. How much has been the total cost of implementing the innovation (e.g. additional/new capital investment, labor, training, etc.)? [qualitative information + number]
3. Please list all employees who have been involved in the use of S.I.R. software, by gender, age and role. [department, level of responsibility, if it is a decision-making position or not]
4. Did your company need to hire new personnel (including casual workers) in order to use S.I.R. software? [yes/no]
    - If yes, how many (by gender)? [numeric information + qualitative information]
    - Is there any increase/decrease of hours worked due to the innovation? Please, if possible, disaggregated by gender [multiple choice: increase/decrease]
5. What is the number and type of FTE jobs created for (or lost due to) the implementation of the innovation (if this is only a share of time of one or more employees, indicate the cumulated share in FTE)? In doing this, male, fe-

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male and non-binary employees' hours should be recorded separately. [number and qualitative information]

6. What is the type of new contacts you have made in and out of your own sector as a result of your involvement in the S.I.R. Software? [qualitative information]
7. With how many of these new contacts are you willing to continue the relationship? ? [Likert scale: from 1 "none of them" unlikely" to 5 "all of them"]

   - Can you specify particular reasons why you are willing or not to continue the relationship? [open question]
8. How would you assess the time needed to learn how to properly use S.I.R Software? [Likert scale from 1 "very little" to 5 "too much"]
9. How many employees have developed new skills thanks to the use of S.I.R software, by gender?
   - Technological (use of pc software) [number]
   - Technical (better understanding of how to manage food transactions) [number]
   - Social/relational (with other users of the software, if relevant) [number]
10. How many phone calls or emails has RER received due to issues and difficulties related to the use of the software and or with the redistribution of surplus food? [number]

    - Please list the typologies of issue agencies, charities, ethanol producing plants reported? (i.e. issues with the platform, issues with donations) [qualitative information]

C. Gender and survey satisfaction

1. Age and gender of the respondent
2. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

4 POs and APOs (before implementation)

3a. Questionnaire to be filled by POs and APOs at the beginning of the task

A. Producer organization/Association of producers organization identification

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1. Region
2. Nation
3. Number of producers enrolled in the PO/APO in the Department, by gender
4. Number of employees, by gender

B. Food waste: awareness, attitudes and commitment

1. *What is the staff's self-assessment of awareness of food waste levels in the organization? Please disaggregate by gender [Likert scale: from 1 "fully aware" to 5 "not aware at all"]*
2. *Attitude towards food waste: (1) how concerned/worried the respondent is about the problem of food waste in the organization. Please disaggregate by gender [Likert scale: from 1 "very concerned" to 5 "not at all concerned"]; and (2) commitment to reduce/limit food waste in their company. Please disaggregate by gender [Likert scale: from 1 "the main priority" to 5 "not at all a priority"]*

C. Use of S.I.R.: surplus food, costs, employment and waste disposal before the innovation

When answering these questions, please provide data for your organization and disaggregate as much as possible the same data at farmers level

1. What are the fixed costs associated with withdrawals disposal, sales to ethanol producers, and donation to charities in the absence of innovation? Fixed costs are defined as costs that do not change with the amount transferred [qualitative information]
   - How much do these costs amount to? [quantitative information]
2. What are the variable costs with withdrawals, payments, deliveries of disposal, sales to ethanol producers, and food donation to charities in the absence of innovation)? Variable fixed costs are defined as costs that change with the amount of food transferred [qualitative information]
   - How much do these costs amount to? [quantitative information]
3. What happened to the surplus food before? [multiple choice: A) Left on the field B) spread onto land C) animal feed D) recycling (composting, ethanol production, biogas production, etc.) E) Municipal solid waste collection F) Other: please specify]

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4. How much of the surplus food has to be disposed of through waste processors? [quantitative information]
5. What is the unit or total cost of organic waste disposal (depending on the charging scheme of the disposal service provider)? [quantitative information + multiple choice: flat rate/fixed rate]
6. Are you making profits from your organic waste? [yes/no]
    - If yes, how much? [quantitative information]

D. Gender and survey satisfaction

1. Age and gender of the respondent.
2. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

5 POs and APOs (after implementation)

3b. Questionnaire to be filled by POs and APOs at the end of the task

A. Food waste: awareness, attitudes and commitment

When answering these questions, please provide data for your organization and disaggregate as much as possible the same data at farmers level

1. *What is the staff's self-assessment of awareness of food waste levels in the organization? Please disaggregate by gender [Likert scale: from 1 "fully aware" to 5 "not aware at all"]*
2. *Attitude towards food waste: (1) how concerned/worried the respondent is about the problem of food waste in the organization. Please disaggregate by gender [Likert scale: from 1 "very concerned" to 5 "not at all concerned"]; and (2) commitment to reduce/limit food waste in their company. Please disaggregate by gender [Likert scale: from 1 "the main priority" to 5 "not at all a priority"]*

To which extent do you agree to the following statements? (to be answered individually by the staff members also indicating gender, position and age)

	Completely agree	*Somewhat agree*	*Neutral*	*Somewhat disagree*	*Completely disagree*

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Food loss and waste are major issues for the sustainability of food systems					
Food loss and waste are major issues in the food production sector					
Food loss and waste are major issues on this organization (or farm)					
I am concerned about the costs of food loss and waste on this farm					
I am concerned about the environmental impact of the food loss and waste					
I am committed to reduce the food loss on this farm					

B. Participation in the S.I.R. software: difficulty, resources, satisfaction

When answering these questions, please provide data for your organization and disaggregate as much as possible the same data at farmers level

1. Please list all employees who have been involved in the use of S.I.R. software, by gender, age and role. [department, level of responsibility, if it is a decision-making position or not]
    - Did your company need to hire new personnel (including casual workers) in order to use S.I.R. software? [yes/no]
    - If yes, how many (by gender)? [numeric information + qualitative information]
    - Is there any increase/decrease of hours worked due to the innovation? Please, if possible, disaggregated by gender [multiple choice: increase/decrease]

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2. What is the number and type of FTE jobs created for (or lost due to) the implementation of the innovation (if this is only a share of time of one or more employees, indicate the cumulated share in FTE)? In doing this, male and female employees' hours should be recorded separately. [quantitative and qualitative information]
3. How many hours per day per person were needed to participate in the platform? Please, if possible, disaggregated by gender [quantitative information]
4. How would you assess the time needed to learn how to properly use S.I.R Software? [Likert scale from 1 "very little" to 5 "too much"]
5. How difficult was it to start using the innovation? [Likert scale: from 1 "not at all" to 5 "more than expected"]
6. How many employees have developed new skills thanks to the use of S.I.R software, by gender? [quantitative information]
    - Technological (use of pc software) [number]
    - Technical (better understanding of how to manage food transactions) [number]
    - Social/relational (with other users of the software, if relevant) [number]
7. What is the type of new contacts you have made in and out of your own sector as a result of your involvement in the S.I.R. Software, if any? [qualitative information]
8. With how many of these new contacts are you willing to continue the relationship? ? [Likert scale: from 1 "none of them"very unlikely" to 5 "all of them "very likely"]
    - Can you specify particular reasons why you are willing or not to continue the relationship? [open question]
9. Have you suggested or are you willing to suggest the use of S.I.R. Software to other actors? [yes, I did / yes, I will / no]
    - Number and type of actors to which you suggested to use S.I.R. software, if any. [number]
    - Number of those which declared to be interested in, if possible [number]
    - Number of those who have joined it after you informed them, if possible [number]
10. How much do you think that the participation in S.I.R. Software has improved the following aspects?

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- Trust with other stakeholders [Likert scale: from 1 “not at all” to 5 “a lot”]
- Communication with other stakeholders [Likert scale: from “a lot” to “not at all”]

11. Has participation in the innovation met your expectations? [Likert scale from 1 “At all” to 5 “more than expected”]
12. How would you rate the S.I.R. software? [Likert scale from 1 “poorly” to 5 “very well”]
13. Are you willing to keep participating in the use of the S.I.R. software? [yes/no]

C. Use of S.I.R.: costs, economic benefits, waste, transport and satisfaction

When answering questions number 1, 2, 6, 8, 9, 11, 12, please provide data for your organization and disaggregate as much as possible the same data at farmers level

1. What are the fixed costs associated with withdrawals disposal, sales to ethanol producers, and donation to charities in the absence of innovation? Fixed costs are defined as costs that do not change with the amount transferred [qualitative information]
   - How much do these costs amount to? [quantitative information]
2. What are the variable costs with withdrawals, payments, deliveries of disposal, sales to ethanol producers, and food donation to charities in the absence of innovation)? Variable fixed costs are defined as costs that change with the amount of food transferred [qualitative information]
   - How much do these costs amount to? Variable fixed costs are defined as costs that change with the amount of food transferred. [quantitative information]
3. What is the change in the annual balance (due to additional income or avoided cost) resulting from the innovation? [quantitative information]
4. What has been the total cost of implementing the innovation? (e.g. additional/new capital investment, labour, training, etc.) [quantitative information]
5. Have you developed any new streams of income (i.e., new products or avoid costs) as a result of participating in the innovation? [Qualitative information]
   - If yes, please specify their amount [quantitative information]

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6. How many recoveries have you successfully completed? [number]
7. How many farmers were able to restore 100% of their production costs thanks to the platform?
    - Please disaggregate the number of farmers by gender and the total number of farmers who will participate in the innovation.
8. How many farmers were able to restore 50% of their production costs thanks to the platform?
    - Please disaggregate the number of farmers by gender and the total number of farmers who will participate in the innovation.
9. How much of the surplus food has to be disposed of through *ethanol producers/or more general waste processors*? [quantitative information]
10. What is the unit or total cost of organic waste disposal (depending on the charging scheme of the disposal service provider)? [quantitative information]
11. Are you making profits from your organic waste? [yes/no]
    - If yes, how much [quantitative information]

D. Use of S.I.R.: Transportation

1. Who organizes the transport of surplus food to charities/ethanol producing plants, i.e., seller (food surplus supplier)? [qualitative information]
2. Which type of transport is used for surplus food? A) Tractor with single trailer B) tractor with double trailer C) Truck with semi-trailer 28-34t D) Rigid truck 20-26t E) Rigid truck 20-26t with cooling unit F) Other: please specify
    - In the case of a forwarder, which forwarding agency is used? [qualitative information]
3. Which type of fuel is used to transport products to ethanol production? [multiple choice: diesel/vegetable oil/electricity/others, please specify]
4. Is the food distributed to charities packed? [yes/no]
    - If yes, do you use reusable packaging [yes/no]
    - If yes, which type of packaging is used? [reusable/single use]
    - If yes, what is the weight of the packaging in kg per kg distributed food? [quantitative information]
5. Is the food distributed to ethanol producing plants packed?
    - If yes, do you use reusable packaging [yes/no]
    - If yes, which type of packaging is used? [reusable/single use]
    - If yes, what is the weight of the packaging in kg per kg distributed food?

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6. Were there any empty returns? [yes/no]
7. Was the same vehicle used for additional orders other than charities/ethanol production plants? [yes/no]
    - If yes, please specify for which additional purposes the same transportation was used [qualitative information
8. Can you indicate the fill rate of the vehicle? [%]
9. Was the surplus food stored before transferring to charities [Yes/No]
10. If yes, please specify: (1) the typology of storage; (2) the time of storage; (3) whether a cooling unit was required; (4) an estimate of the storage cost (electricity, etc.); (5) whether it is a cost you would have incurred regardless of this transaction

E. Gender and survey satisfaction

1. Age and gender of the respondent.
2. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

6 Charitable organizations (before implementation)

4a. Questionnaire to be filled by charitable organizations at the beginning of the task

A. Charitable organization identification

1. Region
2. Nation
3. Number of employees, by gender
4. Number of meals distributed per year
5. How do you provide food to indigent people? [Multiple choice: A) fresh food B) finished or semi-finished products C) prepare food at charity and provide meals D) others]
6. How many meals do you provide per week ?

B. Food waste: awareness, attitudes and commitment

1. What is the staff's self-assessment of awareness of food waste levels in the charitable organization? Please disaggregate by gender [Likert scale: from 1 "fully aware" to 5 "not aware at all"]
2. Attitude towards food waste: (1) how concerned/worried the respondent is of the problem of food waste in the organization. Please disaggregate by gender [Likert scale: from 1 "very concerned" to 5 "not at all concerned"]; and (2) commitment to reduce/limit food waste in their company. Please

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disaggregate by gender [Likert scale: from 1 “the main priority” to 5 “not at all a priority”]

C. Gender and survey satisfaction

1. Age and gender of the respondent.
2. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

7 Charitable organizations (after implementation)

4b. Questionnaire to be filled by charitable organizations at the end of the task

A. Food waste: awareness, attitudes and commitment

1. What is the staff’s self-assessment of awareness of food waste levels in the charitable organization? Please disaggregate by gender [Likert scale: from 1 “fully aware” to 5 “not aware at all”]
1. Attitude towards food waste: (1) how concerned/worried the respondent is about the problem of food waste in the organization. Please disaggregate by gender [Likert scale: from 1 “very concerned” to 5 “not at all concerned”]; and (2) commitment to reduce/limit food waste in their company. Please disaggregate by gender [Likert scale: from 1 “the main priority” to 5 “not at all a priority”]

B. Use of S.I.R.: meals and storage

1. *As a result of the innovation, were you able to provide more fruits & vegetables in the meals you distribute? [Likert scale from 1 “no, we provide way less fruits and vegetables in the meals than before” to 5 “yes, we provide more fruits and vegetables in the meals than before”]Is the surplus food stored? [yes/no]*
2. If yes, where is the surplus food stored (i.e., cooling units)? [qualitative information]

C. Use of S.I.R.: costs, employment, skills, contacts, satisfaction

1. What has been the total cost of implementing the innovation (e.g. additional/new capital investment, labor, training, etc.)? [qualitative information + number]
2. Have you developed any new streams of income (i.e., new products or avoid costs) as a result of participating in the innovation? [yes/no + qualitative information]

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- If yes, please specify their amount [quantitative information]

3. Please list all the people who have been involved in the use of S.I.R. software, by gender, job grade (if he/she is volunteering), and role, level of responsibility, if it is a decision-making position or not [list with qualitative information]
4. How many hours per day per person were needed to participate in the platform? Please, if possible, disaggregated by gender [quantitative information]
5. Is there any increase/decrease of hours worked due to the innovation? Please, if possible, disaggregated by gender [multiple choice: increase/decrease]
6. How would you assess the time needed to learn how to properly use S.I.R Software? [Likert scale from 1 “very little” to 5 “too much”]
7. How difficult was it for the charitable organization to start using the platform? [Likert scale: from 1 ”not all” to 5 “more than expected”]
8. How many employees have developed new skills thanks to the use of S.I.R software (disaggregated by gender: women, men, non-binary)? [quantitative + qualitative information]
   - Technological (use of pc software) [number]
   - Technical (better understanding of how to manage food transactions) [number]
   - Social/relational (with other users of the software, if relevant) [number]
9. Has the innovation met your expectations? [Likert scale from 1 “At all” to 5 “more than expected”]
10. How would you rate the innovation? [Likert scale from 1 “poorly” to 5 “very well”]
11. Are you willing to keep participating in the use of the S.I.R. software? [yes/no]
12. What is the type of new contacts you have made in and out of your own sector as a result of your involvement in the S.I.R. Software? [qualitative information]
13. With how many of these new contacts are you willing to continue the relationship? ? [Likert scale: from 1 “none of them”very unlikely” to 5 “all of them “very likely”]
    - Can you specify particular reasons why you are willing or not to continue the relationship? [open question]

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14. Have you suggested or are you willing to suggest the use of S.I.R. Software to other actors? [yes, I did / yes, I will / no]
    - Number and type of actors to which you suggested to use S.I.R. software, if any. [quantitative and qualitative information]

D. Gender and survey satisfaction

1. Age and gender of the respondent.
2. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

8 Ethanol producing plants (before implementation)

5a. Questionnaire to be filled by ethanol producing plants at the beginning of the task

A. Ethanol producing plant identification

3. Region
4. Nation
5. Number of employees, by gender
6. Maximum capacity of the plant and its utilization per year

B. Activities and costs in the absence of the innovation

7. What would be the theoretical cost (unitary cost) of food waste materials you receive through RER if you had purchased these food inputs at their full market price? [quantitative and qualitative information]
8. Did you pay (and if so, how much did you pay) for this input (withdrawals) through RER? (unitary cost of surplus food * unitary amount of the surplus food). [quantitative information]
9. What are the fixed costs of arranging product withdrawals or other sources of food waste for your waste processing plant in the absence of innovation? [qualitative and quantitative information]
10. What and how much are fixed costs of input for ethanol production at your plant in the absence of innovation? Fixed costs are defined as costs that do not change with the amount of food waste transferred [quantitative and qualitative information]
11. What are variable costs of arranging product withdrawals or other sources of food waste for your waste processing plant in the absence of the RER innovation? Variable costs are defined as costs that change with the amount transferred [quantitative and qualitative information]

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12. How much are the variable costs of receiving produce withdrawals and disposal e.g. if they also occur in the absence of innovation?

C. Gender and survey satisfaction

13. Age and gender of the respondent.
14. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

9 Ethanol producing plants (after implementation)

5b. Questionnaire to be filled by ethanol producing plants at the end of the task

A. Food waste: awareness, attitudes and commitment

15. What is the staff's self-assessment of awareness of food waste levels in the ethanol producing plant? Please disaggregate by gender [Likert scale: from 1 "fully aware" to 5 "not aware at all"]
16. Attitude towards food waste: (1) how concerned/worried the respondent is about the problem of food waste in the ethanol producing plant. Please disaggregate by gender [Likert scale: from 1 "very concerned" to 5 "not at all concerned"]; and (2) commitment to reduce/limit food waste in their company. Please disaggregate by gender [Likert scale: from 1 "the main priority" to 5 "not at all a priority"]

B. Use of S.I.R. Software: activities, employment, contacts, satisfaction

17. Do you sell the ethanol to other end users? [yes/no]
    - If yes, how much does the innovation change the value of your sales, or if they charge for processing, how did it change fees? [quantitative information]
18. Does the food received via the S.I.R. software require specific processing steps before using it in the plant (e.g. unpacking)? [yes/no]
19. What is the number of FTE jobs created for (or lost due to) the implementation of the innovation (if this is only a share of time of one or more employees, indicate the cumulated share in FTE)? [quantitative information]
    - For each worker please indicate gender.
    - For each worker please indicate job grade and if he/she is a decision-making position
20. How many hours per day per person were needed to participate in the platform? Please, if possible, disaggregated by gender [quantitative information]

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- Is there any increase/decrease of hours worked due to the innovation? Please, if possible, disaggregated by gender [multiple choice: increase/decrease]

21. How would you assess the time needed to learn how to properly use S.I.R Software? [Likert scale from 1 "very little" to 5 "too much"]
22. Are there any new end users of ethanol and/or surplus suppliers with which you came into contact as a result of your involvement in the innovation? [yes/no]
    - If yes, how many? [number]
    - If yes, which typology of actors? [qualitative information[
23. With how many of these new contacts are you willing to continue the relationship? ? [Likert scale: from 1 "none of them"very unlikely" to 5 "all of them "very likely"]
    - Can you specify particular reasons why you are willing or not to continue the relationship? [open question]
24. What is the change in the content and the amount of waste processed? [quantitative information]
25. Please list other activities related to the innovation [qualitative information[
    - If you answered yes to question B2: is the unpacking done manually or automatically? [multiple choice: manually/automatically]
26. Are you willing to suggest the use of S.I.R. Software to other actors? [yes, I did / yes, I will / no]

C. Gender and survey satisfaction

1. Age and gender of the respondent.
2. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

10 Researchers

Information to be retrieved both by the researchers and through the software

IN GENERAL FOR ALL ACTORS

1. What happened to the surplus food before? (if possible)
2. Where did you dispose of it? (if possible)
3. Number of Charities/POs/agencies adopting the S.I.R. software in Emilia-Romagna

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4. Location of surplus food ready for redistribution [postcodes]
5. Location of charities [postcodes]

FOR CHARITIES

6. What would be the theoretical cost (unitary cost) of food provision if you had purchased these food inputs at their full market price?
7. Did you pay (and if so, how much did you pay) for the food input (withdrawals) through the software? (unitary cost * unitary amount of the food processed or donated).
8. What are the fixed costs of withdrawals and donations in the absence of innovation? (Fixed costs are defined as costs that do not change with the amount of surplus food transferred.)How much do they amount to?
9. What are the variable costs of arranging produce withdrawals and then donating to charities or delivery to waste processors if they also occur in the absence of innovation? Variable fixed costs are defined as costs that change with the amount of surplus food transferred. How much are the variable costs amount to?
10. What are the types of fruit and vegetable that have to be withdrawn?
11. What are the unit amounts of fruit and vegetable that have to be withdrawn?
12. What is the unit or total cost of organic waste disposal (i.e. fixed rate, flat rate etc. depending on the charging scheme of the disposal service provider)?

FOR FARMERS, POs and APOs

13. What are the original market prices of fruit and vegetables the producers produce?
14. How many withdrawals occur for each type (baseline)?
15. What is the price of fruit and vegetables withdrawn for waste processors or any income is created or cost avoided through donations?

We already know answers for questions:
Have you been able to access any subsidies/other monetary benefits as a result of the innovation and resulting transaction? [yes/no]

- How much? Are these one-time, periodical, fixed, or proportional to the amount of waste avoided? [multiple choice question: one-time/ periodical/ fixed/ proportional to the amount of waste avoided]

T2.2 UNV cooperation system for F&V

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Data provided per food transaction:

1. Food waste amounts:
   - Food redistributed per action: amount in kg and type of food (or per pot, in case of herbs or per portion in case of radisch)
   - Have you been able to take over all the surplus food of the farmer? (yes/no)
   - If no, what have been the reasons, why not everything was taken over.
2. Packaging:
   - Is the food which is distributed packed? (Yes/No)
   - Do you also use reusable packaging (Yes/No)
   - What is the weight of the packaging in kg per kg distributed food
   - Which type of packaging is used: (plastic/bio-plastic/paper/cardboard/metal/composite)
3. Transport:
   - What is the postcode of the location, where the surplus food is picked up?
   - What is the postcode of the locations, where the surplus food is distributed to? (provided by delivery note)
   - Which means of transport is used for the food transaction?
     a. tractor with single trailer
     b. tractor with double trailer
     c. truck with semi-trailer 28-34t
     d. rigid truck 20-26t
     e. rigid truck 20-26t with cooling unit
     f. other
   - Does the transport have an empty return? (will be covered by sensitivity analysis, if information is not available)
   - What is the fill rate of the transports? (will be covered by sensitivity analysis, if information is not available)

Questions to Unverschwendet *(each quarter?):*

1. Number of actors enrolled in the collaboration system:
   - Number of food surplus providers (sellers):
   - Number of food surplus receivers (buyers):
   - Number of food surplus receivers (charities):
   - Other:

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2. Number of companies who have been informed of the innovation (e.g. dialogue, platform, software etc.)
    - number of these who declared to be interested in it
    - number who have joined it
3. How many hours per day per person are needed to maintain the collaboration system?
    - Number of female persons (in FTE): __ Estimated hours per day: __
    - Number of male persons (in FTE): __ Estimated hours per day: __
4. List of people who have contributed at different tasks related to the innovation
    - transferring the product, gender and position
    - from making contacts to the delivery of the product, gender and position

Questions to Unverschwendet (once):

5. Computer use:
    - Has the software provider information to the server capacity? Where is the server located?
    - How much of the total server capacity is used for the software (in vCPU/CPU in use)?
    - Which type of CPU is used (e.g. Intel Skylake)
    - Do you need to buy new devices to run this software? Or do you use existing devices?
    - Which device do you use (tablet/Ipad; computer; notebook; smartphone)
6. Do you use the device solely for the software or do you also use it for other purposes?
7. How long do you use the device per case?

12 Food surplus supplier (after a food transaction)

1. Gender and position of the respondent
2. Area of cultivation: per food product if possible.
3. How often do you produce surplus food
    - Likert-Scale: very often, often, regularly, only occasionally, very seldom)
4. Can you estimate how much of your surplus food can be restored thanks to the collaboration system?
    - 0-10%
    - 10-50%
    - >50%
5. How difficult was it for your company to start using the collaboration system?

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- On a scale from 1 = at all to 5= more than expected,

6. How satisfied is your company with the collaboration system?
   - On a scale from 1 = at all to 5= more than expected,
7. *How many hours per day per person are needed to use the collaboration system (registration)?*
   - *Number of female persons (in FTE): __ Estimated hours per day: __*
   - *Number of male persons (in FTE): __ Estimated hours per day: __*
   - *Number of non-binary persons (in FTE): __ Estimated hours per day: __*

   Or alternative question:

   How do you rate the efforts of applying the collaboration system?
   - *On a scale from 1 = very easy to 5= very complicated,*
8. *Has the staff developed new skills thanks to the participation in the collaboration system? Which typology of new skill has been acquired thanks to the participation in the collaboration system? Please disaggregate by gender*
   - *communication skills: number of females/males/non-binary*
   - *relational skills: number of females/males/non-binary*
   - *technological skills: number of females/males/non-binary*
   - *technical skills: number of females/males/non-binary*
9. Are there new products new income streams resulting from the innovation?
   - Yes/No
10. Are the variable costs covered?
    - Yes/No
11. Have additional costs been occurred as a result of the collaboration system?
    - *Yes/No; If yes, why type of costs and how much*
12. How much do you pay for your organic waste disposal? OR Do you pay for your organic waste disposal?
13. *What has been the total cost of implementing the innovation (e.g. additional/new capital investment, labour, training etc.)*

14. Please list all employees who have been involved in the use of the collaboration system, by gender, age and role. [level of responsibility, if it is a decision-making position or not]
15. Did your farm need to hire new personnel (including casual workers) as a result of the innovation
    - If yes, how many (by gender)? [numeric information + qualitative information]

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- Is there any increase/decrease of hours worked due to the innovation? Please, if possible, disaggregated by gender [multiple choice: increase/decrease]
- *Have you qualified for an additional funding or subsidy as a result of taking part in the innovation ?*
- *Have you established new business contacts as a result of taking part in this innovation ? If yes, what kind of (upstream, e.g. sellers; downstream e.g., buyers) contacts have you made?*
- *Do you plan to continue working with these new business relationships established through the UNV innovation ?*

16. In the absence of UNV innovation, in what ways do you dispose of your surplus food (e.g. livestock feed, ethanol producers, waste collection)?

17. Are you aware of the problem that we waste too much food?

- *Likert scale from "very aware" to "not aware at all"*

18. Are you committed to reduce food waste?

- *Likert scale, from "a lot" to "not at all"*

19. Has the collaboration system met your expectation?
    - On a scale from 1 = at all to 5= more than expected
20. How willing are you to keep using the collaboration system?
21. On a scale from 1=at all to 5=Definitely yes,
22. How satisfied are you with the survey
    - Likert scale from "very satisfied" to "unsatisfied"

Staff survey:

To which extent do you agree to the following statements? (to be answered individually by the staff members also indicating gender, position and age)

	Completely agree	*Somewhat agree*	*Neutral*	*Somewhat disagree*	*Completely disagree*
Food loss and waste are major issues for the sustainability of the food					

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systems in general					
Food loss and waste are major issues in the food production sector					
Food loss and waste are major issues on this farm					
I am concerned about the economic costs of food loss and waste on this farm					
I am concerned about the environmental impact of the food loss and waste on this farm					
I am committed to reduce the food loss on this farm					

13 Food surplus receiver (after a food transaction)

To be elaborated.

T2.3 Leroma B2B digital market place for F&V

Leroma platform – questionnaire for T2.3

The reference population for the assessment will be represented by the companies who conduct transactions on the Leroma platform. All companies that sell something will fill questionnaire 5 with the single question. The other questionnaires are intended for use in case studies with selected companies. For non-cross-border transactions, all questionnaires are filled in as part of the case studies. The companies based in different countries which are involved in a transaction with the former would only fill a specific questionnaire after the transaction: the purchaser would fill questionnaire 4 and the seller would fill questionnaire 3.

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14 Platform users (upon registration)

1. Questionnaire to be filled upon registration on the Leroma platform

B. Company identification

1. Name of the company.
2. Stage of the supply chain where the company operates.
   - Primary production
   - Processing
   - Wholesale
   - Retail
   - Distribution
3. Geographical area where the company operates. [postcode]
4. Number of years of operation.
5. Average age of the employees of the company.
6. Number of employees of the company, by gender.

C. Food waste: awareness, attitudes and management

7. Awareness of food waste levels in the company. [Likert scale: from 1 "fully aware" to 5 "not aware at all"]
8. To which extent do you agree with the following statements?

Statement	Completely agree	Somewhat agree	Neutral	Somewhat disagree	Completely disagree
Food loss and waste are a major issue for the sustainability of the food systems in general.					
Food loss and waste are a major issue in our sector.					
Food loss and waste are a major issue for our company.					

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I am concerned about the economic costs of food loss and waste in our company.					
I am concerned about the environmental impact of food loss and waste in our company.					
We are committed to reducing food loss and waste in our company.					

9. Waste management costs of the company during the last year.

D. Gender and survey satisfaction

10. Age and gender of the respondent.
11. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

15 Subset of platform users (at the beginning)

2. Questionnaire to be filled by selected companies as part of a case study at the beginning

A. Production: inputs, outputs and waste

1. Main Fruit & Vegetables (F&V) input used by the company (or mix of products, qualitatively described).
2. Quantity of the main F&V input purchased during the last year.
3. Average price at which you purchased your main F&V input during the last year.
4. Quantity of F&V input wasted and not recovered during the last year (avoidable, not avoidable, by-products).
5. Ways in which the above waste was used (animal feed, composting, anaerobic digestion, incineration, discards on land/at sea, Others: please specify). [multiple answer]
6. Main F&] product(s) produced by the company.

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7. Quantity of the main F&V product(s) produced and sold during the last year.
8. Average price(s) at which the main F&] product(s) was/were sold during the last year.
9. Quantity of F&V product which was wasted and not recovered during the last year (avoidable, not avoidable, by-products).

B. Gender and survey satisfaction

10. Age and gender of the respondent.
11. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]2

16 Seller (after a food transaction)

3. Questionnaire to be filled by the seller (selected companies as part of a case study) after a food transaction

A. Product sold

1. Which product was the object of the transaction?
2. Which amount of product was the object of the transaction, and which was the unit of transaction?
3. Price at which the product was sold.
4. Price at which the product would have been sold on the market for its original use.
5. If the product sold needed to be disposed of, how much would you have spent in terms of waste management costs?

B. Procedure to sell the product

6. Where was the product located before being transferred [postcode] and where was it moved [postcode]?
7. Did/Will you (or a company hired by you) take care of the transport of the product? [yes/no]
   - If yes, please specify:
   - (1) if this was carried out by you, or you had to involve another company;
   - (2) the means of transport used;

[2] Besides this questionnaire, the staff of the companies involved in the case study who are expected to be using Leroma should fill the staff questionnaire in Appendix 2.

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- Truck with semi-trailer, 28-34 t
- Rigid truck, 20-26 t
- Rigid truck, 20-26 t, cooling
- Tractor, single trailer
- Tractor, double trailer
- Other: please specify

- (3) if it had a cooling unit;
- (4) the type of fuel used
  - diesel
  - vegetable oil
  - electricity;
- (5) if there was an empty return (Yes/No);
- (6) the fill rate of the vehicle (%).

8. Did/Will you (or a company hired by you) take care of the packaging of the product? [yes/no]
   - If yes, please specify:
   - (1) if this was carried out by you, or you had to involve another company;
   - (2) the mass of packaging material for distribution (kg per kg of product);
   - (3) if the packaging ist reusable (yes/no).
   - (4) the type of packaging (material)
     - Plastic
     - Bio-plastic
     - Cardboard
     - Metal
     - Paper
     - Composite
     - Others: please specify
9. How many working hours (if possible by gender) did/will your employees dedicate to this transaction?
10. Could you estimate the aggregated costs in which you incurred / will incur for making this transaction with Leroma (excluding the Leroma fee)?

C. Preparation of the product traded

11. If the product had to undergo any ad hoc treatments before being sold, please specify:
    (1) type of treatment;

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Possible response options (multiple answers):

- Unpacking
- Shredding
- Heating
- Hygienisation
- Other: please specify

(2) cost (in EUR or GBP/ton).

D. Gender and survey satisfaction

12. Age and gender of the respondent.
13. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

17 Buyer (after a food transaction)

4. Questionnaire to be filled by the purchaser (selected companies as part of a case study) after a food transaction

A. Product purchased

1. Which product was the object of the transaction?
2. Which amount of the product was the object of the transaction, and which was the unit of transaction?
3. Price at which the product was purchased.

B. Procedure to acquire the product

4. Where was the product located before being transferred [postcode] and where was it moved [postcode]?
5. Did/Will you (or a company hired by you) take care of the transport of the product? [yes/no]
   - If yes, please specify:

   (1) if this was carried out by you, or you had to involve another company;

   (2) the means of transport used;

   - Truck with semi-trailer, 28-34 t
   - Rigid truck, 20-26 t
   - Rigid truck, 20-26 t, cooling
   - Tractor, single trailer
   - Tractor, double trailer
   - Other: please specify

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(3) if it had a cooling unit;
(4) the type of fuel used
- diesel
- vegetable oil
- electricity;

(5) if there was an empty return (Yes/No);
(6) the fill rate of the vehicle (%).

6. Did/Will you (or a company hired by you) take care of the packaging of the product? [yes/no]
   - If yes, please specify:
   - (1) if this was carried out by you, or you had to involve another company;
   - (2) the mass of packaging material for distribution (kg per kg of product);
   - (3) if the packaging is reusable (yes/no).
   - (4) the type of packaging (material)
     - Plastic
     - Bio-plastic
     - Cardboard
     - Metal
     - Paper
     - Composite
     - Others: please specify
7. How many working hours (if possible by gender) did/will your employees dedicate to the transaction?
8. Could you estimate the aggregated costs in which you incurred / will incur for making this transaction with Leroma (excluding the Leroma fee)?

C. Subsequent use of the product traded

9. If the product had to undergo any ad hoc treatment before being used, please specify:
   (1) type of treatment;
   (2) cost for you.
10. Which product did/will you obtain using the food traded, which quantity, and at which price did/will you sell it?

D. Gender and survey satisfaction

11. Age and gender of the respondent.

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12. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

18 Seller (during a food transaction)

5. Question to be answered by the seller in the course of every food transaction

What would you have done with the goods if you hadn't been able to sell them on the platform?

- We would have sold them through the usual sales channels
- We would have sold them through other sales channels (please specify)
- We would have disposed of them
- Other (please specify)

19 Subset of platform users (at the end of the demonstration)

6. Questionnaire to be filled at the end of the task by selected companies as part of a case study

A. Food waste: awareness, attitudes and management

1. Awareness of food waste levels in their company. [Likert scale: from 1 “totally aware” to 5 “not aware at all”]
2. To which extent do you agree with the following statements?[3]

Statement	Completely agree	Somewhat agree	Neutral	Somewhat disagree	Completely disagree
Food loss and waste are a major issue for the sustainability of the food systems in general.					

[3] All the employees who have been using Leroma should fill the staff questionnaire in Appendix 2.

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Food loss and waste are a major issue in our sector.					
Food loss and waste are a major issue for our company.					
I am concerned about the economic costs of food loss and waste in our company.					
I am concerned about the environmental impact of food loss and waste in our company.					
We are committed to reducing food loss and waste in our company.					

3. Waste management costs of the company during the last year.

B. Use of Leroma: employment, costs, contacts, outcomes, satisfaction

4. Please list all employees who have been involved in the use of Leroma, by gender, age and role. [department, level of responsibility]
   - Did your company need to hire new personnel (including casual workers) in order to use Leroma, and how many (by gender)?
5. How would you assess the time needed to learn how to properly use Leroma? [Likert scale from 1 “very little” to 5 “too much”]
6. Are the procedures to use Leroma too many / too complex? [Likert scale: from 1 “not at all” to 7 “yes, a lot”]
7. How many employees have developed new skills thanks to the use of Leroma by gender? Technological (use of mobile app, pc software); Technical (better understanding of how to manage food transactions); Social/relational (with other users of Leroma, if relevant).
8. If you had to acquire a new computer to use Leroma, please specify:
   (1) type of device;

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(2) computer time used for operations related to Leroma.

9. Have you suggested or are you willing to suggest the use of Leroma to other companies? [yes, I did / yes, I will / no]
   - Number of companies to which you suggested to use Leroma, if any.
   - Number of those who declared to be interested in it; number of those who have used it after you informed them.
10. Did you discover new alternative use of your products and/or by-products thanks to Leroma? [yes/no]
    - Did you develop any new streams of income (e.g., new products) as a result of using Leroma? [qualitative information]
11. Were you able to access any subsidies/other monetary benefits as a result of using Leroma? How much? Are these one-time, periodical, fixed, or proportional to the amount of waste avoided?
12. To what extent did Leroma meet your expectations? [Likert scale: from 1 "completely" to 5 "not at all"]
13. Is your company willing to continue using Leroma after the project has come to an end? [yes/no]

C. Management of the products traded

14. Did some or all of the products traded on Leroma ended up as waste anyway? How often and in which proportion?
15. Concerning the storage of the products traded, please specify:
    (1) the typology of storage;
    (2) the time of storage;
    (3) whether a cooling unit is required;
    (4) whether this is a cost you would have incurred regardless of using Leroma.

D. Gender and survey satisfaction

16. Age and gender of the respondent.
17. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

20 LER Leroma (after implementation)

7. Information to be retrieved by Leroma at the end of the task

1. Number of searches made by each company on the Leroma platform.

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2. Number of agreements activated and finalized through the Leroma platform by each company.
3. Number of offers uploaded on the Leroma platform by each company.
4. Number of matches reached by each company.
5. Number of inquiries made to Leroma by potential buyers and sellers from Germany and Scotland (regardless of their registration).
6. Number of companies that registered to Leroma and then dropped out / did not finalise any transaction.

T2.4 FORESIGHTEE software for packed F&V

21 Supermarket (before and after the implementation)

Data collected via sharing of store (supermarket) records

Description	Unit of measure	Period	Timeframe	Frequency
Quantity and value of F&V products wasted (by item)	kg	Baseline	3 years (2019-2021)	Monthly
Quantity and value of F&V products wasted (by item)	kg	Evaluation	5 months (2022)	Monthly
Sales of F&V products (by item)	€	Baseline	3 years (2019-2021)	Monthly
Sales of F&V products (by item)	€	Evaluation	5 months (2022)	Monthly
Stocks of F&V products (by item)	kg	Baseline	3 years (2019-2021)	Monthly
Stocks of F&V products (by item)	kg	Evaluation	5 months (2022)	Monthly
Orders of F&V products (by item)	kg	Evaluation	5 months (2022)	Monthly
Rate of unsold products out of total products purchased	% on quantity	Baseline	3 years (2019-2021)	Monthly

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Rate of unsold products out of total products purchased	% on quantity	Evaluation	5 months (2022)	Monthly
Input costs (purchase price of products)	€ / unit	Baseline	3 years (2019-2021)	Monthly
Input costs (purchase price of products)	€ / unit	Evaluation	5 months (2022)	Monthly
Margins on F&V products sold	%	Baseline	3 years (2019-2021)	Monthly
Margins on F&V products sold	%	Evaluation	5 months (2022)	Monthly

Questionnaires to supermarkets

Before and after the implementation of the innovation

1. Name and location of the supermarket store
*Name and location:*_____

2. How many stores does the company have?
*Number:*_____

3. Total number of employees in this store
*Men:*_____
*Women:*_____
*Other (as noted in question 14):*_____

4. How many fruits & vegetables products are marketed in this store?
Total number of references: _____
Among which sold by unit: _____
Among which sold by weight: _____

5. Please list the factors that are currently considered in forecasting the sales in the fruits & vegetables department? (For example: the sales volume of last week, you then check the weather,.. to end up with a final sales forecast)
_____

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6. Please list the factors that are currently considered in ordering fruits & vegetables? For example: the sales forecast, the stock,.. to end up with a final order.

_____

7. What are the average margins (difference between selling price and purchase cost) of the store? And in the fruits & vegetables department?
Store average margin %: _____
F&V average margin %: _____

8. Out of the total quantity of fruits & vegetables disposed, how much is due to each of the following reasons? (The total must add up to 100%)
Approaching expiration date %: _____
Spoiled %: _____
Broken packaging %: _____
Other causes (specify) %: _____

9. In what ways are the wasted fruits & vegetables disposed of before (please tick, multiple answers allowed):
donated to charities
animal feed
composting
anaerobic digestion
incineration
Others: please specify_____

Are fruits & vegetables products sold at a reduced price before discarding them? If so, what is the yearly turnover of these promotions?

_____

In any of these ways do you sell your organic waste? If so, how much turnover can be made in each way (unit value x amount)?

_____

10. What is the average cost of organic waste disposal for your organisation per month? Is it a fixed cost independent of the amount or does it vary with the quantity of waste disposed?

_____

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The below questions should be asked before the implementation and after the implementation

11. What is the frequency of out-of-stock? What are types of financial losses associated with out-of-stock and how much do they cost each?

12. To which extent do you agree to the following statements? (to be answered individually by each staff members also indicating their gender, position and age)

	Completely agree	Somewhat agree	Neutral	Somewhat disagree	Completely disagree
Food loss and waste are major issues for the sustainability of food systems					
Food loss and waste are major issues in the retail sector					
Food loss and waste are major issues in this store					
I am concerned about the costs of food waste in this store					
I am concerned about the environmental impact of the food wasted in this store					
I am committed to reduce the food wasted in this store					
The staff (if possible by gender) of the supermarket are concerned about the					

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costs of the food wasted at this store					
The staff (if possible by gender) of the supermarket are concerned about the environmental impact of the food wasted at this store					
The staff (if possible by gender) of the supermarket are committed to reduce the food wasted at this store					

13. In a scale from 1 (not at all) to 5 (yes, a lot), can you rate your satisfaction for this survey?

□ *1* □ *2* □ *3* □ *4* □ *5*

14. Gender of the respondent

□ *Female* □ *Male* □ *Other* □ *Prefer not to say*

Additional questions to evaluate the implementation of innovation

1. Considering the implementation of the Foresightee software, to which extent do you agree with the following statements?

	Completely agree	*Somewhat agree*	*Neutral*	*Somewhat disagree*	*Completely disagree*
The Foresightee platform met our expectations					
Starting to use the Foresightee platform was difficult					
The staff (if possible by gender) has developed new communication skills					

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The staff (if possible by gender) has developed new technical skills					
The staff (if possible by gender) has developed new relational skills					
The staff (if possible by gender) has developed new technological skills					
This company will continue using Foresightee platform after the demonstration					
Trust with other actors of the chain (suppliers/customers) has increased					
Communication with other actors of the chain (suppliers/customers) has improved					

2. How many members of the staff were involved in the implementation of the innovation?

Men (specify job grade and hours per week): _____

Women (specify job grade and hours per week): _____

Other (specify job grade and hours per week): _____

3. How many employees will need to be trained if the innovation was fully implemented in practice?

Men (specify job grade): _____

Women (specify job grade): _____

Other (specify job grade): _____

4. Will you need to hire new personnel to support the full implementation of the innovation in practice? [yes/no]

5. Will you need to buy new devices to support the full implementation of the innovation? Which device(s)?

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6. To which extent do you expect that the Foresightee forecasts can actually be used to decide the quantity of F&V products to be ordered ? Please estimate a % of the orders-related decision that might be based on Foresightee forecasts

_____

7. Have you followed the indications of Foresightee ? How would you rate your adherence to the recommendations of Foresightee? Has your use Foresightee led to an increase in revenue? If yes, how much in %?

_____

8. Did you establish new contacts or agreements with other actors of the chain as a result of your involvement in the innovation? What type of contacts (e.g. downstream actors like suppliers; other retailers, others) are these?

9. If yes, how likely is that you continue these relationships, assessed on a 1 (very unlikely) to 5 (very likely) scale?

	New agreements (YES/NO)	*Very unlikely*	*Somewhat likely*	*Neither likely or unlikely*	*Somewhat likely*	*Very likely*
With suppliers						
With other retail companies						
With other actors (specify)						

10. Do you expect a change in the frequency of out-of-stock due to the implementation of the innovation? How much in %?

Management survey to be administered at the end of the demonstration

11. What is your return on investment from participating in this innovation ?

12. Has participating in the innovation led to creation of new income streams ? Please indicate each with the amount.

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13. *Did you establish new contacts or agreements with other actors of the chain as a result of your involvement in the innovation? What type of contacts (e.g. downstream actors like suppliers; other retailers, others) are these ?*

If yes, how likely is it that you continue these relationships on a 1 (very unlikely) to 5 (very likely) scale? Please use the table below to indicate and use as many lines as necessary to indicate a new contact.

Type of new contact/ relationship established	*Number of resulting agreements*	*Likelihood of continuing relationships*				
		Very unlikely	*Somewhat likely*	*Neither likely or unlikely*	*Somewhat likely*	*Very likely*
Another company from the sector (a competitor)						
A supplier						
A buyer						
Other type of actor (specify)						

Questionnaire to innovator

To be administered at the end of the demonstration

1. Total number of staff in the company

*Men:*_____

*Women:*_____

Other: _____

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2. How many actors (retailers/stores) were involved in the demonstration of the Foresightee software?
Number of retailers: _____
Number of stores: _____

3. How many actors (retailers/stores) were willing to continue the implementation of the roadmap after the project?
Number of retailers: _____
Number of stores: _____

4. How many agreements did you subscribe with new retailers/stores as a result of the implementation of the software?
Number: _____

5. How many contacts (i.e., emails, phone calls) has Foresightee received due to difficulties in implementing the innovation? Which type of issue did the companies experience?
_____

6. How many staff were involved in the implementation of the innovation during LOWINFOOD activities?
Men (specify job grade): _____
Women (specify job grade): _____
Non-binary or other (specify job grade): _____

7. Did the company hire new staff to support the implementation of the innovation? How many?
Men (specify job grade): _____
Women (specify job grade): _____
Non-binary or other (specify job grade): _____

8. How many companies external to the LOWINFOOD consortium have been informed of the innovation? How many of them declared to be interested in it?
_____

9. Location of the server used by Foresightee
_____

10. What is the server capacity? How much of it is in currently in use?
_____

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11. Which type of CPU is used to support the software?

_____

12. Did you need to buy new devices to support the implementation of the innovation? Which device(s) were used?

_____

13. In a scale from 1 (not at all) to 5 (yes, a lot), can you rate your satisfaction for this survey?

□ *1* □ *2* □ *3* □ *4* □ *5*

14. Gender of the respondent

□ Female □ Male □ Other □ Prefer not to say

T3.1 Supplier-retailer agreements

23 Stakeholders

General information:

Name of company:

Type of company (retailer, baker, single store/branch, multiple stores/branches)?

Name of contact person (s):

Number of staff (to be broken down by Male, Female, Other, specify job position)

FLW prevention and reduction (collected through company records and environmental reports)

Amount of food waste before the innovation

Amount of food waste after the innovation food product/food product mix

Type of food waste management operations

Efficacy

Replicability

- Will you promote the supplier/retailer agreements for bakery products without take back agreement to other partners and companies? (yes/no)

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Utility

- Has the innovation met your expectations? (At all, to a certain extent, fully, more than I expected)
- On a scale from 1 = at all to 5= more than expected, how would you rate the innovation?
- Has the staff developed new skills thanks to the participation in the implementation of the innovation? If yes, how many people? Which typology of new skill has been acquired thanks to the implementation of the innovation? (i.e. communication skills, relational skills, technological skills, technical skills) If possible disaggregated by gender: woman, man, non-binary (or other).

User-friendliness

- Are you willing to keep participating in the agreement after the project has ended?
- Which procedures are required for your company to implement the supplier/retailer agreements for bakery products without take back agreement?
- Considering the procedures required by the supplier/retailer agreements for bakery products without take back agreement. On a scale from 1 to 5, do you think there are too many steps?
- Has your trust to other partner increased due to this innovation?
- Has your communication with other actors increased due to this innovation?
- In the absence of the innovation, in what ways do you dispose of the returned bakery products?
- Do you make a profit from this disposal route? If yes, how much per tonne in each alternative?

Socio-economy

Profitability

- "For each transfer of bakery products which could have ended as waste, please answer the following:

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- Buyer (retailers- bakery store or supermarket): theoretical cost (unitary price) at which the product purchased would have been purchased at its full retail price on the market.
- Seller (baker): theoretical cost at which the product would have been sold on the market if it could be sold before becoming surplus/waste.
- Buyer and seller: price at which the product was purchased/sold, if any."

- "For each transfer of bakery products which could have ended as waste, please answer the following:
  - Buyer (retailers- bakery store or supermarket): theoretical cost (per day + total) of storing, transporting and handling the product purchased if this was purchased on the retail market (cumulated cost, including electricity, etc.).
  - Buyer (retailers- bakery store or supermarket): cost (per day + total) of storing, transporting and handling the product from its purchase until its final use (cumulated cost, including electricity, etc.).
  - Seller (baker): theoretical cost (per day + total) of storing the product if this was sold normally on the market (cumulated cost, including electricity, etc.)."
- "Buyer (retailers- bakery store or supermarket): theoretical cost of obtaining one unit of the bakery product purchased if it was purchased on the market (cumulated cost, including electricity, labour, etc.).
  - Buyer (retailers- bakery store or supermarket): cost of managing the bakery product from its acquisition until its sale (cumulated cost, including electricity, labour, transport, planning etc.).
  - Seller (baker): theoretical cost of one unit of the bakery product transferred if it was sold through the usual channels (cumulated cost, including electricity, labour, etc.). Seller (baker): cost of producing the product transferred (cumulated cost, including electricity, labour, etc.)."

- "For each transfer of bakery products which could have ended as waste, please answer the following:
  - Seller (baker): theoretical fixed costs incurred to dispose of the products transferred in case it ended up as waste and needed to be disposed.
  - Seller (baker): theoretical variable costs incurred to dispose of the products transferred in case it ended up as waste and needed to be disposed.

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  - Buyer (retailers- bakery store or supermarket): fixed costs incurred to dispose of the products purchased in case it ended up as waste anyway and needed to be disposed."
  - Buyer (retailers- bakery store or supermarket): variable costs incurred to disposed of the products purchased in case it ended up as waste anyway and needed to be disposed."

- The same as Change in total value of sales of the product(s) involved (the number of units sold x unit price)

- Are there new products or income streams resulting from the innovation? If yes, what and how much are each new streams of income created or costs avoided as a result of participating in the innovation?

- What is the change in the annual balance (due to additional income or avoided cost) resulting from the innovation? What has been the total cost of implementing the innovation (e.g. additional/new capital investment, labour, training etc.)

- Are there any subsidies/other monetary benefits received as a result of waste reduction> If yes, please list each (in Euros) specify if these are one-time, periodical, fixed or proportional to the amount of waste).

- What are the overall expenses (e.g. labour, new equipment purchase etc.) that resulted from participating in this innovation?

Scale

- "For each transfer of bakery products which could have ended as waste, please answer the following:
  - Buyer (retailers- bakery store or supermarket): Value (unitary price + quantity) at which the product received was sold on the market after transformation.
  - Buyer (retailers- bakery store or supermarket): Theoretical value (unitary price + quantity) at which the same quantity of the same product could have been sold on the market if it was normally sourced on the market"

- "For each transfer of food products which could have ended as waste, please answer the following:

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- Seller (baker): hours of work (for male, female and non-binery employees separately) for managing the product transferred, from making the contact to its delivery to the buyer etc.
- Seller (baker): theoretical hours of work (for male, female and non-binery employees separately) for managing the product transferred in case it was ending up as waste.
- Buyer (retailers- bakery store or supermarket): hours of work (for male, female and non-binery separately) for managing the product received from making the contact until its withdrawal and inputting in the production process.
- Buyer (retailers- bakery store or supermarket): theoretical hours of work (for male, female and non-binery separately) for managing the same product in case it was purchased normally on the market."

- Number and type of new buyers with which they came into contact as a result of their involvement in the innovation + willingness to continue the relationship (assessed on a Likert scale from “very likely” to “very unlikely”).

- Number and type of new buyers and sellers (i.e., downstream, upstream, horizontal; from the sector, out of the sector) with which they came into contact as a result of their involvement in the innovation + willingness to continue the relationship (assessed on a Likert scale from “very likely” to “very unlikely”).

Competitiveness

- "For each transfer of bakery products which could have ended as waste, please answer the following:
  - Buyer (retailers- bakery store or supermarket): quantity (piece) of product to be sold on the market derived from the product transferred.
  - Buyer (retailers- bakery store or supermarket): theoretical quantity (piece) of product to be sold on the market derived from a unit of product similar to the one transferred but sourced from the standard source.
  - Seller (baker): quantity (piece) of food inputs used to derive the product transferred.
  - Seller (baker): theoretical quantity (piece) of food inputs used to derive a unit of the product transferred (assuming that this was still in condition to be used for its original goal)."

Behavior

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- Self-assessment of awareness of the food waste problem (Likert scale from "very aware" to "not aware at all") by the respondent and by each of the employees involved in managing the food product transferred.

- Self-assessment of concerns for, and commitment to, food waste reduction (Likert scale, from "a lot" to "not at all") by the respondent and by each of the employees involved in managing the food product transferred.

- To which extent do you agree to the following statements? (to be answered individually by the staff members also indicating gender, position and age)

	Completely agree	*Somewhat agree*	*Neutral*	*Somewhat disagree*	*Completely disagree*
Food loss and waste are major issues for the sustainability of the food systems in general					
Food loss and waste are major issues in the [insert the name of your sector here]					
Food loss and waste are major issues [insert here the type of your organisation]					
I am concerned about the economic costs of food loss and waste in [insert here the type of your organisation]					
I am concerned about the environmental impact of the food loss and waste in this [insert here the type of your organisation]					

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I am committed to reduce the food loss in this [insert here the type of your organisation]					

Creation of local jobs?

- All participants: number and type of full time equivalent (FTE) jobs created to manage the food products transferred (if this is only a share of time of one or more employees, indicate the cumulated share in FTE). In doing this, male, female and non-binery employees' hours should be recorded separately.

Spill-over effects

- Number of companies who have been informed of the innovation (e.g. dialogue, platform, software etc.) + number of these who declared to be interested in it + number who have joined it.

Environment:

- How are the surplus bakery products managed? Please estimate the share of used valorisation/disposal pathways.
  donation to charities, food bank (%)___
  reworking (e.g. manufacturing process) (%)__
  valorisation to other food products (e.g. bread crumbs) (%) ___
  animal feed (%)___
  composting (%)___
  anaerobic digestion (%)___
  incineration (%) ___
  discards on land/at sea (%) ___
  Others: please specify (%) ____

T3.2 Innovating supplier-retailer interactions through stakeholder dialogue

24 Data collection (company records from bakeries)

Data collected via sharing of company records

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Description	Unit of measure	Period	Timeframe	Frequency
Bread losses and waste (3 main bakery products)	Kg	Baseline	6 months	Monthly
Bread losses and waste (3 main bakery products)	Kg	Evaluation	6 months	Monthly
Surplus bread produced (3 main bakery products)	Kg	Baseline	one year	Monthly
Surplus bread produced (3 main bakery products)	Kg	Evaluation	one year	Monthly
% surplus bread on total monthly bread production (3 main bakery products)	%	Baseline	one year	Monthly
% surplus bread on total monthly bread production (3 main bakery products)	%	Evaluation	one year	Monthly

25 Bakeries (before and after implementation)

Questionnaires to bakeries

Before and after the implementation of measures against food waste

1. Name and location of the company
*Name and location:*_____

2. How many production branches does the company have?
*Number:*_____

3. How many own stores does the company have?

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*Number:*_____

4. Total number of employees
Male (specify job grade): _____
Female (specify job grade): _____
Other (specify job grade): _____

5. How many types of bakery products does the company produce? Can you list the 3 main (in terms of quantity produced)? And what percentage each has in the overall quantity produced?
*Number:*_____
*Name of main bread types (%):*_____

6. How much of each bakery product does the company typically produce in one day?
*Product 1: kg*_____
*Product 2: kg*_____
*Product 3: kg*_____

7. Through which channels are sold these products (please add % of quantities, considering the average over 1 year)?

Product	*% own store*	*% supermarkets*	*% other retailers*	*% other channels (specify)*
1)				
2)				
3)				

8. How many vehicles does this company use for the distribution of the products?
Number: _____

9. For each vehicle, can you list the type, fuel, capacity, average km per year?

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Vehicle	*Type*	*Fuel*	*Capacity (kg)*	*km/year*
1)				
2)				
3)				
…				

10. Can you estimate the average fill rate of your vehicles during their trips?
*Delivery: % fill rate*_____
*Return: % fill rate*_____
*Empty return: % on total trips*_____

11. What is the unitary amount of **input costs** for producing the main bakery products (possibly broken down by cost categories)?
*Product 1: Euro per unit (or kg)*_____
*Product 2: Euro per unit (or kg)*_____
*Product 3: Euro per unit (or kg)*_____

12. What is the unitary amount of **other variable costs** (such as labour, electricity etc. that change with the amount of production) for producing the main bakery products (possibly broken down by cost categories)?
*Product 1: Euro per unit (or kg)*_____
*Product 2: Euro per unit (or kg)*_____
*Product 3: Euro per unit (or kg)*_____

13. What is the unitary amount of **fixed costs** (such as equipment rent etc. that do not change with the amount of production) for producing the main bakery products (possibly broken down by cost categories)?
*Product 1: Euro per day*_____
*Product 2: Euro per day*_____
*Product 3: Euro per day*_____

14. What is the average selling price of the main bakery products (Euro)?

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Product	*own store*	*supermarkets*	*other retailers*	*other channels (specify)*
1)				
2)				
3)				

15. What is the rate of return on investment of the company during the year?
Rate %: _____

16. What is the quantity of material inputs used to derive 1 kg of each product?
*Product 1: kg of inputs per 1 kg of product*_____
*Product 2: kg of inputs per 1 kg of product*_____
*Product 3: kg of inputs per 1 kg of product*_____

17. What is the weight of the packaging for the main bread products?
*Product 1: kg of packaging per 1 kg of product*_____
*Product 2: kg of packaging per 1 kg of product*_____
*Product 3: kg of packaging per 1 kg of product*_____

18. What material is used to pack each product?
Product 1: _____
Product 2: _____
Product 3: _____

19. To which extent do you agree with the following statements? (to be asked from each staff member involved in the innovation disintegrated by their age, gender, position and department in the company, education)

	Completely agree	*Somewhat agree*	*Neutral*	*Somewhat disagree*	*Completely disagree*
Food loss and waste are major challenges for the sustainability of					

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food systems					
Food loss and waste are major issues in the bakery sector					
Food loss and waste are major issues in this company					
I am concerned about the costs of the food wasted during the company's operations					
I am concerned about the environmental impact of the food wasted during the company's operations					
I am committed to reduce the food wasted during the company's operations					
The employees (if possible by gender) are concerned about the costs of the food wasted during the company's operations					
The employees (if possible by gender) are concerned about the environmental impact of the food wasted during the company's operations					
The employees (if possible by gender) are committed to reduce the food wasted during the company's operations					

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20. How are the wasted / surplus bakery products managed/ disposed of? Please estimate the share of used valorisation/disposal pathways.

donation to charities, food bank (%)___
reworking (e.g. manufacturing process) (%)__
valorisation to other food products (e.g. bread crumbs) (%) ___
animal feed (%)___
composting (%)___
anaerobic digestion (%)___
incineration (%) ___
discards on land/at sea (%) ___
municipal waste management/private waste management company (%) _____
Others: please specify (%) ____

Do you make a profit from this disposal route ? If yes, how much per tonne in each alternative?

_____

21. What is the cost of disposal? Is it fixed or does it vary with the quantity of waste disposed (per tonne)?

_____

22. On a scale from 1 (not at all) to 5 (yes, a lot), can you rate your satisfaction for this survey?

□ *1* □ *2* □ *3* □ *4* □ *5*

23. Gender of the respondent

□ *Female* □ *Male* □ *Other* □ *Prefer not to say*

Additional questions to evaluate the implementation of the roadmap against food waste (2023)

1. Considering the roadmap against food waste that has been elaborated as part of the LOWINFOOD project for the bakery sector, to which extent do you agree with the following statements? (to be asked from each staff member involved in the innovation disintegrated by their age, gender, position and department in the company, education)

	Completely	*Somewhat*	*Neutral*	*Somewhat*	*Completely*

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	agree	*agree*		*disagree*	*disagree*
The roadmap against food waste met my expectations					
The roadmap is too complex (e.g. there are too many actions)					
The staff (if possible by gender) has developed new communication skills					
The staff (if possible by gender) has developed new technical/operational skills					
The staff (if possible by gender) has developed new relational skills					
The staff (if possible by gender) has developed new technological/digitalization skills					
This company will continue using the roadmap after the project					
Trust with other actors of the chain has increased					
Communication with other actors of the chain has improved					
I will promote the Roadmap to other partners/companies					

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2. How many hours per day did the implementation of the roadmap require? How many staff were involved?
Male (specify job grade): _____
Female (specify job grade): _____
Other (specify job grade): _____

3. Are there new products or income streams resulting from the innovation? Which ones and how much gain is achieved in each stream?

_____

4. What is the change in the annual balance (due to additional income or avoided cost) resulting from the innovation?

_____

5. What has been the total cost of implementing the innovation (e.g. additional/new capital investment, labour, training etc.)

_____

6. Did you get subsidies or other monetary benefits (in Euro) to implement the roadmap? If yes, please specify the amount and type (one-time, periodical, fixed or proportional to the amount of waste)

_____

7. Did you establish new agreements with other actors of the chain as a result of your involvement in the innovation? If yes, how likely is it that you continue the relationship, assessed on a 1 (very unlikely) to 5 (very likely) scale?

	New agreements *(YES/NO)*	*Very unlikely*	*Somewhat likely*	*Neither likely or unlikely*	*Somewhat likely*	*Very likely*
With suppliers						
With buyers						
With other bakeries						

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26 CNA and research partners (questionnaire)

Questionnaire to innovator

To be administered after the end of the stakeholder discussion (2022)

1. How many actors (bakeries/retailers) were involved in the stakeholder dialogue?
Number: _____

2. How many actors (bakeries/retailers) were willing to continue the implementation of the roadmap after the project?
Number: _____

3. Which actions are required by companies in order to implement the shared roadmap?

_____

4. How many bakeries decided to quit the innovation due to the difficulty in implementing the actions defined in the shared roadmap?
Number: _____

5. How many staff were involved in the stakeholder discussion?
Male (specify job grade): _____
Female (specify job grade): _____
Other (specify job grade): _____

6. On a scale from 1 (not at all) to 5 (yes, a lot), can you rate your satisfaction for this survey?
□ *1* □ *2* □ *3* □ *4* □ *5*

7. Gender of the respondent
□ *Female* □ *Male* □ *Other* □ *Prefer not to say*

T3.3 FT Software for bakeries

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Questionnaire for the data collection for the sustainability assessment of the innovation FoodTracks

Date of interview:	Carried out by (ISUN):

Explanations to the survey

The survey is conducted in the form of a personal interview with the persons responsible for the project as the users and as the project partners. Some of the questions will be presented to the interview partners in written form so that they can gather the necessary information in a flexible manner.

There are three survey periods:

- **Before** using FoodTracks (**project beginning**)
- While using FoodTracks (**mid-term**)
- At the ending of the project (**project ending**)

The questions (blocks) marked in yellow must be answered at the middle and end of the project, all other questions must also be answered before using FoodTracks.

Privacy statement (will be added if required)

Part 1: General data on the organisation

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• Name of the organisation:			
• Contact:			
• Number and gender of employees - total: thereof: - Administration: - Production: - Logistics: - Management: - Cleaning: - Sales staff:	female	male	diverse
Description of the bakery in which FoodTracks will be implemented (number of sales stores, integration of cafés/bistros, production site, etc.)			

Part 2: Questionnaire for users

Waste disposal

1. *Do returned goods go to other distribution channels ~~or are they disposed of~~? If yes, can you estimate the share of used pathways ?*
   Food donation to charities/food banks (%)
   Reworking (%)
   Valorisation to other products (e.g bread crumbs) (%)
   Animal feeding (%)
   Composting (%)
   Anaerobic digestion (%)
   Incineration (%)
   Other (%): please specifiy

2. If so, what product groups are involved and in what quantities? Where are they sold?

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Product Group of returned goods	Quantity (in units)	Distribution channel

3. Do you make a profit from any of the utilized distribution channels? If yes, how much € per unit in each product group?

Prerequisites for implementing FoodTracks

4. What resources were necessary to use FoodTracks?
   a. technical infrastructure (new PC, tablet, etc.) - type of computer device
   b. Qualification of employees
   c. Staff deployment (in hours and EUR) necessary for implementation *(by gender and position)*
   d. Staff deployment (in hours and EUR) necessary for daily usage *(by gender and position)*
5. Did you have to train staff to use FoodTracks in your bakery? If yes, how extensive was the training (staff involved, duration)

Impact of FoodTracks on the business and the employees

6. How has the production planning process changed since you started using FoodTracks?

7. Do you buy less raw materials since you started using FoodTracks? *If yes, how much less in amount? and how much did you save in costs financially as a result ?*

8. Has the production process changed as a result of using FoodTracks (e.g. more baking in the shop or starting work later)?
   Are there any other processes in your company that have changed due to the application of FoodTracks?

9. *Are there new subsidies and/or other monetary benefits received as results of food waste reduction after the innovation? If you answered yes to the previous question, please indicate their value .*

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10. *Have there been changes in the selling price of your productss since the introduction of FoodTracks, has the use of FoodTracks had an impact on this? If so, please indicate which product and how much per unit.*

11. *Have there been changes in the number of different products produced since the introduction of FoodTracks, has the use of FoodTracks had an impact on this? If so, please indicate which product and how many units.*

12. *Did the use of FoodTracks lead to the creation of additional jobs or the loss of jobs/shares (if yes, share in FTE by gender)?*

13. Are there employees who have acquired new competences through the use of FoodTracks? Please disaggregate by gender
    - *Technological (use of pc software) [number and qualitative information]*
    - *Technical (better understanding of how to manage food transactions) [number and qualitative information]*
    - *Social/relational (with other users of the software, if relevant) [number and qualitative information*

14. Are there non-financial improvements and advantages through the use of FoodTracks (e.g. better agreements between sales and production staff, higher motivation, PR effects, increased trust with raw material supplier, improved communication with internal or external partners e.g. supplier)? On a scale of 1-5, how do you rate these benefits (1-low, 5-high)

15. Have other sources of income arisen for you through the use of FoodTracks? If yes, which ones?

16. Have new business contacts resulted for you through the use of FoodTracks (other bakeries, sales outlets, new distribution channels, etc.), if yes, which ones?

17. Has your clientele changed through the use of FoodTracks (are there new / different customer groups)?

18. How has your awareness of food waste changed through the use of FoodTracks? *(open question + scale 1-5: 1-no change, 5-strong change)*?

    To which extent do you agree with the following statements? (to be answered individually by the staff members also indicating gender, position and department, education and age)

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	Completely agree	*Somewhat agree*	*Neutral*	*Somewhat disagree*	*Completely disagree*
Food loss and waste are major issues for the sustainability of the food systems in general					
Food loss and waste are major issues in [insert the name of your sector here]					
Food loss and waste are major issues in [insert here the type of your organisation]					
I am concerned about the economic costs of food loss and waste in [insert here the type of your organisation]					
I am concerned about the environmental impact of the food loss and waste in [insert here the type of your organisation]					
I am committed to reduce the food loss in [insert here the type of your organisation]					

19. How has your behaviour changed? Has FoodTracks helped you to waste less food (open question + scale 1-5: 1-no change, 5-strong change)?

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20. How has the behaviour of your production and sales staff changed? Has FoodTracks contributed to them wasting less food (open question + scale 1-5: 1-not a change, 5-significant change (less wastage)?

21. Have you saved costs by using FoodTracks? How high are the savings and to which cost types can they be attributed (e.g. use of goods, energy, personnel, cleaning, disposal of food waste, storage costs, other fixed costs, other variable costs, etc.)?

User-friendliness of FoodTracks

22. How satisfied are you with the following features of FoodTracks (scale 1-5: 1-barely, 5-very satisfied)?
    a. Answering questions
    b. Functions of the application
    c. Ease of use of the application

23. What features or design elements would you change or add to FoodTracks? (Free text)

Evaluation of FoodTracks

24. Will you continue to use FoodTracks after the end of the project?

25. What were your expectations regarding the use of FoodTracks (e.g. cost savings, food waste reduction)? Were these fulfilled?

26. Have you talked to other institutions about FoodTracks? Have they expressed interest in implementing FoodTracks?

27. Would you recommend FoodTracks to other companies?

28. Please rate the level of difficulty for implementing FoodTracks (scale 1-5, 1-easy, 5-very difficult).

Other questions

29. What is your motivation for using FoodTracks? Please sort the possible reasons in order of decreasing importance (first mentioned most important - last mentioned least important). *(ask only at project beginning)*

    ☐ Other bakeries also participate.

    ☐ We can reduce the workload of the sales staff.

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- ☐ We can optimise our ordering process.
- ☐ We are interested in participating in a scientific project.
- ☐ The costs for FoodTracks are partly covered by the project.
- ☐ We can reduce costs in the business.
- ☐ We can reduce food waste.
- ☐ We can act in an environmentally friendly way.
- ☐ Other:

30. Did you get access to further funding through participation in the project (e.g. food waste reduction funding)?

31. Please list job title, gender, task of the persons (without names) who were involved in the project (from the first meeting, background activity, implementation, PR, etc.).

32. How satisfied are you with this survey *(by gender, scale 1-5, 1-very satisfied, 5 not at all satisfied).*

Part 3: Questions to the partners FoodTracks, ADB Nord and iSuN

Specific questions for FoodTracks related to the bakery _____

Production volume (Data collection period tbd)

1. Which articles were produced in the bakery during the survey period (baseline, mid-term, monitoring) and in what quantities?

Quantity of food wasted (Data collection period tbd)

2. What number of units per item was not sold during the survey period (returns / overproduction)?
   overproduction = (units produced – units sold)*weight per unit

Socio-economic impact

3. What are the prices of the items produced and sold (for the calculation of sales)?

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Application of FoodTracks in the bakery

4. How many decisions were made through FoodTracks?
5. How many of the suggestions were used as a decision-making basis for production planning?
6. How much time did the bakery spend working with FoodTracks during the data collection period?

General questions for FoodTracks

7. What are the regular costs of implementing FoodTracks?
8. Location of the servers
9. Server capacity
10. Type of CPU in use (e.g. Intel Skylake)
11. In how many bakeries has FoodTracks been implemented so far?
12. List of persons (without names), job title, gender, task, who were involved in testing FoodTracks in LOWINFOOD (acquisition, implementation, support, evaluation, etc.).

General questions for ADB Nord

Calculation the costs in the bakeries

13. What are the costs of the items produced? What are the proportions (a-h) in relation to the total costs per item?
    a. *Cost of raw material*
    b. *Energy*
    c. *Personnel*
    d. *Cleaning*
    e. *Waste disposal (does this refer to food waste only or waste in total?)*
    f. *Storage*
    g. *Other fixed costs*
    h. *Other variable costs*
14. List of persons (without names), job title, gender, task, who were involved in testing FoodTracks in LOWINFOOD (acquisition, implementation, supervision, evaluation, etc.).

Calculation of the quantities produced and wasted in the bakeries

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15. What are the standard weights of the different bakery products produced?

General questions for iSuN

16. Gender of the interviewee(s) ISUN

17. List of persons (without names), job title, gender, task, who were involved in testing FoodTracks in LOWINFOOD (acquisition, implementation, supervision, evaluation, etc.).

T4.1 Stakeholder dialogue

The questionnaires were reviewed by the partners in charge of evaluating the efficacy, the socio-economic impact, and the environmental impact of the innovations in Lowinfood WP1, to ensure that all the relevant indicators identified are covered. They will be used both in Scotland by JHI, and in Germany by ISUN. To ensure comparability, the same questionnaires will be used in the two countries; however, they might undergo slight revisions after the initial tests (e.g. removal of problematic questions) to optimise data collection given specific country and supply chain conditions.

Questions in *italics* can be removed with priority. Questions in red can be asked only to the buyer or to the seller of food products, or only to the part who bore the costs (in the case of transport and packaging).

29 Stakeholder dialogue participants (upon registration)

Initial questionnaire

To be filled when the company joins the dialogue

A. Company identification and expectations

1. Name of the company.

2. Stage of the supply chain where the company operates (primary production, primary processing, processing (for human consumption), processing (by-products, not for human consumption), wholesale, retail, distribution, food service, other(s): please specify). [multiple answers]

3. Geographical area where you operate (postcode).

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4. Number of years of operation (or years of activity of the respondent)
5. Age and gender of the respondent.
6. What do you expect from the dialogue? (qualitative description)
7. Which type of stakeholders would you like to get in touch with?
8. List the people who will attend activities of the dialogue (if known), by gender, age, and role in the company (department, level of responsibility).

B. General economic characteristics of the company

9. Turnover of the company during the last year. [ranges to be provided]
10. Fixed costs of the company during the last year. [ranges to be provided]
11. Variable costs of the company during the last year (excluding waste management costs). [ranges to be provided]
12. Waste management costs of the company during the last year.

C. Production: inputs, outputs and waste

13. Main fish input used by the company (or mix of products, qualitatively described). [not for fishing companies]
14. Quantity of the main fish input purchased during the last year. [not for fishing companies]
15. Average price at which you purchased your main fish input during the last year. [not for fishing companies]
16. Do you know the quantity of fish input which was wasted and not recovered during the last year (avoidable, not avoidable, by-products)? If not, could you provide an approximate estimate? [not for fishing companies]
17. Ways in which the above waste was used (animal feed, composting, anaerobic digestion, incineration, discards on land/at sea, other(s): please specify). [multiple answers]
18. Main fish product(s) produced by the company.

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19. Quantity of the main fish product(s) produced and sold during the last year.

20. Average price(s) at which the main product(s) was/were sold during the last year.

21. Do you know the quantity of fish product which was wasted and not recovered during the last year (avoidable, not avoidable, by-products)? If not, could you provide an approximate estimate?

22. Ways in which the above waste was used (animal feed, composting, anaerobic digestion, incineration, discards on land/at sea, other(s): please specify). [multiple answers]

D. Employment in the company

23. Number of employees of the company, by gender.

24. Number of hours worked in an average week by the company's employees, by gender.

25. Number of full time equivalent jobs in the company, by gender.

26. Number of local households that are supported by jobs in the company.

E. Food waste: awareness, attitudes and management

27. Awareness of food waste levels in their company. [Likert scale: from 1 "totally aware" to 5 "not aware at all"]

28. To which extent do you agree with the following statements?4

Statement	Completely agree	Somewhat agree	Neutral	Somewhat disagree	Completely disagree
Food loss and waste are a major issue for the sustainability of the food systems in general.					

[4] If the company has more than 10 employees, all the employees who are expected to be involved in the stakeholder dialogue should fill the staff questionnaire in Appendix 2.

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Food loss and waste are a major issue in our sector.					
Food loss and waste are a major issue for our company.					
I am concerned about the economic costs of food loss and waste in our company.					
I am concerned about the environmental impact of food loss and waste in our company.					
We are committed to reducing food loss and waste in our company.					

29. Are you already implementing any measures to reduce food waste on a regular basis, namely the trading of fish product(s) removed from the supply chain for human consumption? [yes/no]

30. If yes, please specify:
    - The type of product. [qualitative]
    - If the product had to undergo any ad hoc treatment before being sent / after being received, please specify: (1) type(s) of treatment (unpacking, shredding, heating, hygienisation, other(s): please specify) [multiple answers]; (2) cost for you (Euro/ton).
    - Location(s) the buyers/sellers. [postcode(s)]
    - Means of transport generally used to transfer the product: (1) type (truck with semi-trailer, 28-34 t; rigid truck, 20-26 t; rigid truck, 20-26 t, with cooling; tractor, single trailer; tractor, double trailer; other(s): please specify); (2) type of fuel (diesel/vegetable oil/electricity); (3) if there are empty returns (yes/no/don't know); (4) fill rate of the vehicles

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(%); (5) if other products are transported apart from the product in focus (yes/no/I don't know); (6) who pays for it (you / the other party).
- Storage conditions before sending / after receiving (with cooling unit/without; time of storage).
- If the transferring of the product required packaging, please specify: (1) the mass of packaging material (kg per kg of product); (2) whether reusable packaging was used (yes/no); (3) the type of packaging (plastic, bio-plastic, cardboard, paper, metal, composite, other(s): please specify) [multiple answers]; (4) who paid for it (you / the other party).

F. Survey satisfaction

31. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

30 Stakeholder dialogue participants (before final event)

Final questionnaire

To be filled before the 'final stakeholder events'

Company identification

A. Name of the company.

B. Age and gender of the respondent.

General economic characteristics of the company

C. Turnover of the company during the last year. [ranges to be provided]

D. Fixed costs of the company during the last year. [ranges to be provided]

E. Variable costs of the company during the last year (excluding waste management costs). [ranges to be provided]

F. Waste management costs of the company during the last year.

Production: inputs, outputs and waste

G. Did you experience any significant changes in the following aspects compared to the initial year of the dialogue? If yes, please specify.

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a. Main fish input used by the company (or mix of products, qualitatively described). [not for fishing companies]
b. Quantity of the main fish input purchased during the last year. [not for fishing companies]
c. Average price at which you purchased your main fish input during the last year. [not for fishing companies]
d. Do you know the quantity of fish input which was wasted and not recovered during the last year (avoidable, not avoidable, by-products)? If not, could you provide an approximate estimate? [not for fishing companies]
e. Ways in which the above waste was used (animal feed, composting, anaerobic digestion, incineration, discards on land/at sea, other(s): please specify). [multiple answers]
f. Main fish product(s) produced by the company.
g. Quantity of the main fish product(s) produced and sold during the last year.
h. Average price(s) at which the main product(s) was/were sold during the last year.
i. Do you know the quantity of fish product which was wasted and not recovered during the last year (avoidable, not avoidable, by-products)? If not, could you provide an approximate estimate?
j. Ways in which the above waste was used (animal feed, composting, anaerobic digestion, incineration, discards on land/at sea, other(s): please specify). [multiple answers]

Employment in the company

H. Number of employees of the company, by gender.

I. Number of hours worked in an average week by the company's employees, by *gender.*

J. Number of full time equivalent jobs in the company, by gender.

K. Number of local households that are supported by jobs in the company.

Food waste: awareness, attitudes and management

L. Awareness of food waste levels in their company. [Likert scale: from 1 "totally aware" to 5 "not aware at all"]

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M. To which extent do you agree with the following statements?[5]

Statement	Completely agree	Somewhat agree	Neutral	Somewhat disagree	Completely disagree
Food loss and waste are a major issue for the sustainability of the food systems in general.					
Food loss and waste are a major issue in our sector.					
Food loss and waste are a major issue for our company.					
I am concerned about the economic costs of food loss and waste in our company.					
I am concerned about the environmental impact of food loss and waste in our company.					
We are committed to reducing food loss and waste in our company.					

Participation in the dialogue: employment, costs, contacts, outcomes, satisfaction

N. Please list all employees who have been involved in activities of the dialogue, by gender, age and role (department, level of responsibility).

[5] All the employees who have been involved in the stakeholder dialogue and/or related food exchanges should fill the staff questionnaire in Appendix 2.

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- Did your company need to hire new personnel in order to deal with the dialogue and deriving activities, and how many (by gender)?
- How many hours did you dedicate yearly/monthly/weekly to the dialogue and deriving activities on average?

O. How many employees have developed new skills thanks to the dialogue (by gender)? Technological (use of mobile app, pc software); Technical (better understanding of how the food supply chain works); Social/relational (with other participants in the dialogues).

P. Could you estimate the costs in which you incurred due to your participation in the dialogue? (Please exclude the costs relative to food transactions if any, which were already measured in ad hoc questionnaires; only include day-to-day costs, e.g. travel for attending events)

Q. How many new contacts were generated by the dialogue, divided into buyers, sellers, and partners at the same level of the chain?
- Willingness of these contacts to continue the relationship. [Likert scale: from 1 “very likely” to 5 “very unlikely”]

R. How much do you think that the dialogue improved the following aspects?
- Trust with other stakeholders. [Likert scale: from 1 “a lot” to 5 “not at all”]
- Communication with other stakeholders. [Likert scale: from 1 “a lot” to 5 “not at all”]
- Interactions and transactions with other stakeholders. [Likert scale: from 1 “a lot” to 5 “not at all”]

S. Did you involve or are you willing to involve other companies in the dialogue (i.e. sharing contacts, joint discussions)? [yes, I did / yes, I will / no]
- Number of companies who have been informed of the dialogue by you.
- Number of companies who declared to be interested in it; number of those who have joined it after you informed them.

T. Did you discover new alternative forms of food use thanks to the dialogue? [yes/no]
- Did you develop any new streams of income (e.g., new products) as a result of participating in the dialogue? [qualitative]

U. Are the procedures to participate in the stakeholder dialogue too many / too complex? [Likert scale: from 1 “not at all” to 7 “yes, a lot”]

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V. In which specific participatory activities of the dialogue did you take part? [list of the activities implemented and multiple answers]

W. Have you been able to access any subsidies/other monetary benefits as a result of the dialogue and resulting transaction? How much? Are these one-time, periodical, fixed, or proportional to the amount of waste avoided?

X. To what extent did the dialogue meet your expectations? [Likert scale: from 1 "much better than expected" to 5 "much worse than expected", plus 6 "I did not have particular expectations"]

Y. Is your company willing to continue "using" the dialogue after the end of the project? [yes/no]

Survey satisfaction

Z. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

31 Seller (at each food transaction)

Questionnaire for sellers

To be filled by the stakeholders who sell or somehow deliver a food product

Company identification

1. Name of your company
2. Age and gender of the respondent
3. Did you purchase/acquire a product that could otherwise become waste (buyer), or did you sell/deliver it (seller)? [filtering question: depending on the answer, the stakeholder will either proceed with this questionnaire or continue with the buyer one below]
4. Could you confirm that this transaction was facilitated by the dialogue (e.g. because you got in touch with the buyer during the dialogue)?

Product exchanged

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5. Which product was the object of the transaction?

6. Which amount of product was the object of the transaction, and which was the unit of transaction?

7. Which amount of fish input is required to derive the amount of product object of the transaction?

8. Theoretical price at which the fish product / the by-product would have been sold on the market before becoming waste (when its original use was still an option); and after becoming waste (when its original use was not an option anymore), if it could be sold.

9. If the product sold/delivered needed to be disposed of, how much would you have spent in terms of waste management costs?

10. If the product had to undergo any ad hoc treatment before being sold/delivered, please specify: (1) type(s) of treatment (unpacking, shredding, heating, hygienisation, other(s): please specify) [multiple answers]; (2) cost for you (Euro/ton).

11. Price at which the product was sold, if any.

Procedure to transfer the product

12. Where was the product located before being transferred (postcode) and where was it moved (postcode)?

13. Concerning the means of transport used to transfer the product, please specify: (1) the means of transport (truck with semi-trailer, 28-34 t; rigid truck, 20-26 t; rigid truck, 20-26 t, with cooling; tractor, single trailer; tractor, double trailer; other(s): please specify); (2) the type of fuel used (diesel/vegetable oil/electricity); (3) if there was an empty return (yes/no/don't know); (4) the fill rate of the vehicle (%); (5) if other products were transported apart from the product in focus (yes/no/I don't know); (6) who paid for it (you / the other party).

14. Concerning the storage of the product before sale/delivery, please specify: (1) the typology of storage; (2) the time of storage; (3) whether a cooling unit was required; (4) an estimate of the storage cost (electricity, etc.); (5) whether it is a cost you would have incurred regardless of this transaction.

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15. If the transferring of the product required packaging, please specify: (1) the mass of packaging material (kg per kg of product); (2) whether reusable packaging was used (yes/no); (3) the type of packaging (plastic, bio-plastic, cardboard, paper, metal, composite, other: please specify) [multiple answers]; (4) who paid for it (you / the other party).

Additional inputs needed

16. How many working hours (by gender) did you require for managing the product sold/delivered from making the contact to its preparation, until its delivery? To how many FTE jobs do these correspond?

17. How many working hours (by gender) would you have required for managing the product if it was ending up as waste?

18. *Did you have to create one or more positions (including casual workers) to carry out this transaction? Was this position taken by a woman? Would you have created this job even in the absence of the dialogue? (yes/not)*

19. Have you received any subsidies/other monetary benefits (not related to market transactions) as a result of this transaction, and how much?

20. Could you estimate the aggregated costs in which you incurred for making this transaction (communication, transport, staff time, etc.)?

Survey satisfaction

21. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

32 Buyer (at each food transaction)

Questionnaire for buyers

To be filled by the stakeholders who purchase or somehow acquire a food product

Company identification

1. Name of the company.

2. Age and gender of the respondent.

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3. Did you purchase/acquire a product that could otherwise become waste (buyer), or did you sell/deliver it (seller)? [filtering question: depending on the answer, the stakeholder will either proceed with this questionnaire or continue with the seller one above]

4. Could you confirm that this transaction was facilitated by the dialogue (e.g. because you got in touch with the seller during the dialogue)? [yes/no]

Product exchanged

5. Which product was the object of the transaction?

6. Which amount of product was the object of the transaction, and which was the unit of transaction?

7. Theoretical price (unitary) at which the fish product transferred would have been purchased on the market.

8. Total price at which the product was purchased, if any.

Procedure to acquire the product

9. Where was the product located before being transferred (postcode) and where was it moved (postcode)?

10. Concerning the means of transport used to transfer the product, please specify: (1) the means of transport (truck with semi-trailer, 28-34 t; rigid truck, 20-26 t; rigid truck, 20-26 t, with cooling; tractor, single trailer; tractor, double trailer; other(s): please specify); (2) the type of fuel used (diesel/vegetable oil/electricity); (3) if there was an empty return (yes/no/don't know); (4) the fill rate of the vehicle (%); (5) if other products were transported apart from the product in focus (yes/no/I don't know); (6) who paid for it (you / the other party).

11. Concerning the storage of the product after purchase/acquisition and before use, please specify: (1) the typology of storage; (2) the time of storage; (3) whether a cooling unit was required; (4) an estimate of the storage cost (electricity, etc.); (5) whether this is a cost you would have incurred regardless of this transaction.

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12. If the transferring of the product required packaging, please specify: (1) the mass of packaging material (kg per kg of product); (2) whether reusable packaging was used (yes/no); (3) the type of packaging (plastic, bio-plastic, cardboard, paper, metal, composite, other: please specify) [multiple answers]; (4) who paid for it (you / the other party).

Additional inputs needed

13. How many working hours (by gender) did you require for managing the transaction (from making the contact until its withdrawal and inputting in the production process)? To how many FTE jobs do these correspond?

14. Did you have to create one or more positions (including casual workers) to carry out this transaction? Was this position taken by a woman? Would you have created this job even in the absence of the dialogue? [yes/no]

15. Have you received any subsidies/other monetary benefits (not related to market transactions) as a result of this transaction and how much?

16. Could you estimate the aggregated costs in which you incurred for making this transaction (communication, transport, staff time, etc.)?

Use of the product

17. If the product had to undergo any ad hoc treatment before being sold/delivered, please specify: (1) type(s) of treatment (unpacking, shredding, heating, hygienisation, other(s): please specify) [multiple answers]; (2) cost for you (Euro/ton).

18. Which final product did you obtain using the product object of the transaction? Did it include other inputs? [qualitative]

19. Which quantity of final product did you obtain using the food object of the transaction? At which price did you sell it?

20. If the product obtained through the transaction replaced a similar product sourced through your standard source, was the rate of transformation into output the same as the standard product?

21. If some or all of the product purchased/acquired ended up as waste anyway, please specify: (1) the amount; (2) related waste management costs.

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Survey satisfaction

22. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

T4.2 Leroma B2B digital marketplace for fish

Leroma platform – questionnaire for T4.2

The reference population for the assessment will be represented by the companies who conduct transactions on the Leroma platform and that are based in either Germany or Scotland (or the UK, if the region cannot be identified). All companies that sell something will fill questionnaire 5 with the single question. The other questionnaires are intended for use in case studies with selected companies. For non-cross-border transactions, all questionnaires are filled in as part of the case studies. The companies based in different countries which are involved in a transaction with the former would only fill a specific questionnaire after the transaction: if a product from Germany or Scotland is sold in other countries, the purchaser would fill questionnaire 4; if a product from other countries is sold in Germany or Scotland, the seller would fill questionnaire 3.

33 Platform users (upon registration)

Questionnaire to be filled upon registration on the Leroma platform

A. Company identification

1. Name of the company.

2. Stage of the supply chain where the company operates.
    - Primary production
    - Primary processing
    - Processing (for human consumption)
    - Processing (by-products, not for human consumption)
    - Wholesale
    - Retail
    - Distribution
    - Food service
    - Other(s) (please specify)

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3. Geographical area where the company operates. [postcode]
4. Number of years of operation.
5. Average age of the employees of the company.
6. Number of employees of the company, by gender.

B. Food waste: awareness, attitudes and management

7. Awareness of food waste levels in the company. [Likert scale: from 1 “fully aware” to 5 “not aware at all”]
8. To which extent do you agree with the following statements?

Statement	Completely agree	Somewhat agree	Neutral	Somewhat disagree	Completely disagree
Food loss and waste are a major issue for the sustainability of the food systems in general.					
Food loss and waste are a major issue in our sector.					
Food loss and waste are a major issue for our company.					
I am concerned about the economic costs of food loss and waste in our company.					
I am concerned about the environmental impact of food loss and waste in our company.					

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We are committed to reducing food loss and waste in our company.					

9. Waste management costs of the company during the last year.

C. Gender and survey satisfaction

10. Age and gender of the respondent.

11. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

34 Subset of platform users (at the beginning)

Questionnaire to be filled by selected companies as part of a case study at the beginning

A. Production: inputs, outputs and waste

1. Main fish input used by the company (or mix of products, qualitatively described). [not for fishing companies]

2. Quantity of the main fish input purchased during the last year. [not for fishing companies]

3. Average price at which you purchased your main fish input during the last year. [not for fishing companies]

4. Quantity of fish input wasted and not recovered during the last year (avoidable, not avoidable, by-products). [not for fishing companies]

5. Ways in which the above waste was used (animal feed, composting, anaerobic digestion, incineration, discards on land/at sea, Others: please specify). [multiple answer]

6. Main fish product(s) produced by the company.

7. Quantity of the main fish product(s) produced and sold during the last year.

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8. Average price(s) at which the main fish product(s) was/were sold during the last year.

9. Quantity of fish product which was wasted and not recovered during the last year (avoidable, not avoidable, by-products).

10. Ways in which the above waste was used (animal feed, composting, anaerobic digestion, incineration, discards on land/at sea). [multiple answer].

B. Gender and survey satisfaction

11. Age and gender of the respondent.

12. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]6

35 Seller (after a food transaction)

Questionnaire to be filled by the seller (selected companies as part of a case study) after a food transaction

A. Product sold

1. Which product was the object of the transaction?

2. Which amount of product was the object of the transaction, and which was the unit of transaction?
3. Price at which the product was sold.

4. Price at which the product would have been sold on the market for its original use.

5. If the product sold needed to be disposed of, how much would you have spent in terms of waste management costs?

B. Procedure to sell the product

6. Where was the product located before being transferred [postcode] and where was it moved [postcode]?

[6] Besides this questionnaire, the staff of the companies involved in the case study who are expected to be using Leroma should fill the staff questionnaire in Appendix 2.

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7. Did/Will you (or a company hired by you) take care of the transport of the product? [yes/no]
    - If yes, please specify:
    - (1) if this was carried out by you, or you had to involve another company;
    - (2) the means of transport used;
        - Truck with semi-trailer, 28-34 t
        - Rigid truck, 20-26 t
        - Rigid truck, 20-26 t, cooling
        - Tractor, single trailer
        - Tractor, double trailer
        - Other: please specify
    - (3) if it had a cooling unit;
    - (4) the type of fuel used
        - diesel
        - vegetable oil
        - electricity;
    - (5) if there was an empty return (Yes/No);
    - (6) the fill rate of the vehicle (%).

8. Did/Will you (or a company hired by you) take care of the packaging of the product? [yes/no]
    - If yes, please specify:
    - (1) if this was carried out by you, or you had to involve another company;
    - (2) the mass of packaging material for distribution (kg per kg of product);
    - (3) if the packaging ist reusable (yes/no).
    - (4) the type of packaging (material)
        - Plastic
        - Bio-plastic
        - Cardboard
        - Metal
        - Paper
        - Composite
        - Others: please specify

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9. How many working hours (if possible by gender) did/will your employees dedicate to this transaction?

10. Could you estimate the aggregated costs in which you incurred / will incur for making this transaction with Leroma (excluding the Leroma fee)?

C. Preparation of the product traded

11. If the product had to undergo any ad hoc treatments before being sold, please specify:
    (1) type of treatment;
        Possible response options (multiple answers):
        - Unpacking
        - Shredding
        - Heating
        - Hygienisation
        - Other: please specify
    (2) cost (in EUR or GBP/ton).

D. Gender and survey satisfaction

12. Age and gender of the respondent.

13. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

36 Buyer (after a food transaction)

Questionnaire to be filled by the purchaser (selected companies as part of a case study) after a food transaction

A. Product purchased

1. Which product was the object of the transaction?

2. Which amount of the product was the object of the transaction, and which was the unit of transaction?

3. Price at which the product was purchased.

B. Procedure to acquire the product

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4. Where was the product located before being transferred [postcode] and where was it moved [postcode]?

5. Did/Will you (or a company hired by you) take care of the transport of the product? [yes/no]
   - If yes, please specify:

   (1) if this was carried out by you, or you had to involve another company;

   (2) the means of transport used;
   - Truck with semi-trailer, 28-34 t
   - Rigid truck, 20-26 t
   - Rigid truck, 20-26 t, cooling
   - Tractor, single trailer
   - Tractor, double trailer
   - Other: please specify

   (3) if it had a cooling unit;

   (4) the type of fuel used
   - diesel
   - vegetable oil
   - electricity;

   (5) if there was an empty return (Yes/No);

   (6) the fill rate of the vehicle (%).

6. Did/Will you (or a company hired by you) take care of the packaging of the product? [yes/no]
   - If yes, please specify:
   - (1) if this was carried out by you, or you had to involve another company;
   - (2) the mass of packaging material for distribution (kg per kg of product);
   - (3) if the packaging is reusable (yes/no).
   - (4) the type of packaging (material)
     - Plastic
     - Bio-plastic
     - Cardboard
     - Metal
     - Paper
     - Composite

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- Others: please specify

7. How many working hours (if possible by gender) did/will your employees dedicate to the transaction?

8. Could you estimate the aggregated costs in which you incurred / will incur for making this transaction with Leroma (excluding the Leroma fee)?

C. Subsequent use of the product traded

9. If the product had to undergo any ad hoc treatment before being used, please specify:
   (1) type of treatment;

   (2) cost for you.

10. Which product did/will you obtain using the food traded, which quantity, and at which price did/will you sell it?

D. Gender and survey satisfaction

11. Age and gender of the respondent.

12. Level of satisfaction with the survey. [Likert scale: from 1 “very satisfied” to 5 “not at all satisfied”]

37 Seller (during a food transaction)

Question to be answered by the seller in the course of every food transaction

What would you have done with the goods if you hadn't been able to sell them on the platform?

- We would have sold them through the usual sales channels
- We would have sold them through other sales channels (please specify)
- We would have disposed of them
- Other (please specify)

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Questionnaire to be filled at the end of the task (selected companies as part of a case study)

A. Food waste: awareness, attitudes and management

1. Awareness of food waste levels in their company. [Likert scale: from 1 "totally aware" to 5 "not aware at all"]

2. To which extent do you agree with the following statements?[7]

Statement	Completely agree	Somewhat agree	Neutral	Somewhat disagree	Completely disagree
Food loss and waste are a major issue for the sustainability of the food systems in general.					
Food loss and waste are a major issue in our sector.					
Food loss and waste are a major issue for our company.					
I am concerned about the economic costs of food loss and waste in our company.					
I am concerned about the environmental impact of food loss and waste in our company.					

[7] All the employees who have been using Leroma should fill the staff questionnaire in Appendix 2.

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We are committed to reducing food loss and waste in our company.					

3. Waste management costs of the company during the last year.

B. Use of Leroma: employment, costs, contacts, outcomes, satisfaction

4. Please list all employees who have been involved in the use of Leroma, by gender, age and role. [department, level of responsibility]
    - Did your company need to hire new personnel (including casual workers) in order to use Leroma, and how many (by gender)?

5. How would you assess the time needed to learn how to properly use Leroma? [Likert scale from 1 “very little” to 5 “too much”]
    - Are the procedures to use Leroma too many / too complex? [Likert scale: from 1 “not at all” to 7 “yes, a lot”]

6. How many employees have developed new skills thanks to the use of Leroma? Technological (use of mobile app, pc software); Technical (better understanding of how to manage food transactions); Social/relational (with other users of Leroma, if relevant) if possible by gender.

7. If you had to acquire a new computer to use Leroma, please specify:
    (1) the location of your computers;
    (2) server capacity;
    (3) type of CPU;
    (4) type of device;
    (5) computer time used for operations related to Leroma.

8. Have you suggested or are you willing to suggest the use of Leroma to other companies? [yes, I did / yes, I will / no]
    - Number of companies to which you suggested to use Leroma, if any.
    - Number of those who declared to be interested in it; number of those who have used it after you informed them.

9. Did you discover new alternative use of your products and/or by-products thanks to Leroma? [yes/no]

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- Did you develop any new streams of income (e.g., new products) as a result of using Leroma? [qualitative information]

10. Were you able to access any subsidies/other monetary benefits as a result of using Leroma? How much? Are these one-time, periodical, fixed, or proportional to the amount of waste avoided?

11. To what extent did Leroma meet your expectations? [Likert scale: from 1 "completely" to 5 "not at all"]

12. Is your company willing to continue using Leroma after the project has come to an end? [yes/no]

C. Management of the products traded

13. Did some or all of the products traded on Leroma ended up as waste anyway? How often and in which proportion?

14. Concerning the storage of the products traded, please specify:
    (1) the typology of storage;
    (2) the time of storage;
    (3) whether a cooling unit is required;
    (4) whether this is a cost you would have incurred regardless of using Leroma.

D. Gender and survey satisfaction

15. Age and gender of the respondent.

16. Level of satisfaction with the survey. [Likert scale: from 1 "very satisfied" to 5 "not at all satisfied"]

39 LER Leroma (after implementation)

Information to be retrieved by Leroma at the end of the task

1. Number of searches made by each company on the Leroma platform.

2. Number of agreements activated and finalized through the Leroma platform by each company.

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3. Number of offers uploaded on the Leroma platform by each company.
4. Number of matches reached by each company.
5. Number of inquiries made to Leroma by potential buyers and sellers from Germany and Scotland (regardless of their registration).
6. Number of companies that registered to Leroma and then dropped out / did not finalise any transaction.

T5.1 KITRO Innovative bin

40 User (before, mid-term, at the end)

Questionnaire for the data collection for the sustainability assessment of the innovation Kitro

Date of interview:	Carried out by (ISUN):

Explanations to the survey

The survey is conducted in the form of a personal interview with the persons responsible for the project as the users and as the project partners. Some of the questions will be presented to the interview partners in written form so that they can gather the necessary information in a flexible manner.

There are three survey periods:

- **Before** using Kitro (**project beginning**)
- While using Kitro (**mid-term**)
- At the ending of the project (**project ending**)

The questions (blocks) marked in yellow must be answered at the middle and end of the project, all other questions must also be answered before using Kitro.

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Privacy statement (will be added if required)

Part 1: General data on the organisation

• Name of the organisation:			
• Contact:			
• Number and genderof employ-ees - total: thereof: - Administration: - Production:	female	male	diverse

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- Management: - Cleaning: - Service staff:			

Please describe the organisation in which Kitro is used:

- **Catering system** (regeneration kitchen, cook & chill, cook & hold, etc.)

- **Serving system** (free-Flow, Buffet, Portion sizes etc.)

- **Menu** (e.g. number of menu lines, menu cycles, options to choose menu components)

- **Guests** (average number and deviations, target groups)

- **Other characteristics**

Part 2: Questionnaire for users

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Production of food (data collection period tbd)

7. Please send us the menus for the survey periods.
8. Were there any deviations in the dishes actually prepared (e.g. dishes produced at short notice)? *(entered into the ERP system?)*
9. How many guests were served daily during the data collection period?
10. What quantities (in kg) were produced (production quantity)?

    Production figures from ERP system?

    *Production volume (in kg) = Units of dished produced*weight per unit*
11. How many guests did you cater for daily during the survey period?
12. What was your turnover during the survey period? Is this a regular period or was it affected by unusual events?
13. What is the cost of the prepared dishes? *(can there be a breakdown by dishes/components here or is there an average value?)*
14. Can you provide information on the individual cost items?
15. What are the proportions (a-h) in relation to the costs per dish? Which of the costs would you consider as variable, i.e. changing with the number of dishes produced?
    a. *Raw material*
    b. *Energy*
    c. *Staff*
    d. *Cleaning*
    e. *Waste disposal (Do these refer to food waste only or to total waste?)*
    f. *Storage*
    g. *Other fixed cost*
    h. *Other variable cost*

Food waste (data collection period tbd)

16. Are there any bins other than those documented by Kitro through which food waste is disposed of?

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17. If so, how many are the other bins and what is the proportion of the organic waste that goes to these ?

18. Waste disposal costs: What is the amount of waste disposal costs? What proportion of this is due to food waste? How is food waste disposed of (per tonne, per container, etc.)?

19. Which disposal company collects the waste? Can you provide information on what happens to the waste after collection?

Implementing and using Kitro

20. Which resources were required to use Kitro?
    e. technical Infrastructure (new computer, tablet, etc.)
    f. Qualification of staff
    g. Staff deployment (in hours and EUR) required for the implementation *(by gender)*
    h. Staff deployment (in hours and EUR) for the daily usage of Kitro *(by gender)*

21. Did you have to train staff to use Kitro? If yes, how extensive was the training (staff affected and duration of training)?

Kitro's impact on business operations and employees

22. Has your production planning process changed since you started using Kitro? *If so, please explain in which regard.*

23. Do you buy less raw materials since you started using Kitro? *If there is a change in the raw material purchase, how much is it for each ingredient after the innovation*?

    How has your input-output productivity changed as a result of the innovation ? Please indicate these figures for before and after the innovation

    unit of each raw material purchased (the unit could something like kg per week)

    unit of each raw material disposed (the unit could something like kg per week)

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number of each dishes produced

24. Are there certain dishes / menu components for which you plan production quantities more specifically since you started using Kitro / receive suggestions for changes from Kitro?

    Has the production process of your dishes changed since you started using Kitro? If so, please explain this change.

25. Are there any other processes in your company that have changed since you started using Kitro? *If so, please explain which processes are these.*

26. If there have been price changes for your items since Kitro was introduced, has the use of Kitro had an impact on this? Could you list the dishes whose selling price has changed and how much per dish ?

27. Have you always used the values suggested by Kitro during the survey period as a basis for your production planning? If not, how many of the suggestions did you use?

28. How many employees have developed new skills thanks to the use of KITRO, by gender?

- *Technological (use of pc software) [number]*
- *Technical (better understanding of how to manage food transactions) [number]*
- *Social/relational (with other users of the software, if relevant) [number]*

Are there non-financial improvements and benefits through the use of Kitro (e.g. better agreements in the team, higher motivation, PR effects)? On a scale of 1-5, how would you rate these benefits (1 low, 5 high)?
Are there new income streams resulting from the innovation? If you answered yes to the previous question, please indicate the type of new income streams and their value in Euros.

Are there new subsidies and/or other monetary benefits received as results of food waste reduction after the innovation? If you answered yes to the previous question, please indicate their value in Euros.

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If you received any subsidies and/or other monetary benefits as results of waste reduction, please specify whether these are (multiple choices possible): One-off; Periodic; Fixed; Proportional to the quantity of waste; Other (please specify)

29. How has your awareness of food waste changed through the use of Kitro? *(open question + scale 1-5: 1-no change, 5-strong change)*?

How has the awareness of the issue of food waste of the employees (if possible by gender) in production and service changed through the application of Kitro? (To be filled in by each employee; open question + scale 1-5: 1 - no change, 5 - strong change)?

To which extent do you agree with the following statements? (to be answered individually by the staff members also indicating gender, position and department, education and age[SP1])

	Completely agree	*Somewhat agree*	*Neutral*	*Somewhat disagree*	*Completely disagree*
Food loss and waste are major issues for the sustainability of the food systems in general					
Food loss and waste are major issues in [insert the name of your sector here]					
Food loss and waste are major issues in [insert here the type of your organisation]					
I am concerned about the economic costs of food loss and waste in [insert here the type of your organisation]					

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I am concerned about the environmental impact of the food loss and waste in [insert here the type of your organisation]					
I am committed to reduce the food loss in [insert here the type of your organisation]					

30. How has your behaviour changed? Has Kitro helped you to waste less food *(open question + scale 1-5: 1-no change, 5-strong change)?*

31. How has the behaviour of your production and service staff (if possible by gender) changed? Has Kitro contributed to them wasting less food *(open question + scale 1-5: 1-not a change, 5-significant change (less wastage)?*

32. Have you saved costs by using Kitro? How high are the savings and to which cost types can they be attributed (e.g. use of goods, energy, personnel, cleaning, disposal of food waste, storage costs, other fixed costs, other variable costs, etc.)?

33. Have other sources of income arisen for you through the use of Kitro? If yes, which ones?

34. Have new business contacts resulted for you through the use of Kitro (other suppliers, new distribution channels, etc.), if yes, which ones?

<u>User-friendliness of Kitro</u>

35. How satisfied are you with the following features of Kitro *(scale 1-5: 1-hardly satisfied, 5-very satisfied)?*
    a. *Quality of the service*
    b. *The dashboard of the innovation*
    c. *The features of the innovation -*
    d. *Ease of use for managers -*
    e. *Ease of use for kitchen staff -*

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36. What features or design elements would you change or add to Kitro? (*open question*)

Evaluation of Kitro

37. Will you continue to use Kitro after the end of the project?

38. What expectations did you have when using Kitro with regard to reducing food waste? Were they fulfilled?

39. Have you talked to other institutions about Kitro? Have they expressed interest in implementing Kitro? How likely do you think they are to implement Kitro? *(Scale 1-5, 1-very unlikely, 5-very likely)*

40. Would you recommend Kitro to others?

41. Please rate the degree of difficulty for implementing Kitro:
(Scale 1-5, 1-easy, 5-very difficult)

Other questions

42. What is your motivation for using Kitro? Please sort the possible reasons in order of decreasing importance (first mentioned most important - last mentioned least important). *(ask only at project beginning)*

    ☐ Other restaurants also participate.

    ☐ We can reduce the workload of the staff.

    ☐ We can optimise our production planning process.

    ☐ We are interested in participating in a scientific project.

    ☐ The costs for Kitro are covered by the project.

    ☐ We can reduce costs in the business.

    ☐ We can reduce food waste.

    ☐ We can act in an environmentally friendly way.

    ☐ Other:_____

43. Did you get access to further funding through participation in the project (e.g. food waste reduction funding)?

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44. Please list job title, gender, task of the persons (without names) who were involved in the project (from the first meeting, background activity, implementation, PR, etc.).

45. How satisfied are you with this survey *(by gender, scale 1-5, 1-very satisfied, 5 not at all satisfied).*

41 Kitro

Part 3: Questions to the partners Kitro and iSuN

Questions for Kitro

<u>Determining the amount of food waste (Data collection period tbd)</u>

1. At which points in the production and serving process are the Kitro measuring systems placed? What type of waste is collected *(storage, production, serving losses/overproduction, leftover plates)?*
2. How many photos were taken during the data collection period?
3. How did the use of Kitro/the resulting Kitro suggestions change the waste for certain food waste categories? *Please indicate the quantity and type of food waste*
4. How long does it take users to use Kitro on average each day?

<u>Weitere Fragen</u>

5. What are the costs of implementing Kitro?
6. List of persons (without names), job title, gender, task, who were involved in the project.
7. Computer: Location of the server
8. Computer: Server capacity
9. Computer: Type of CPU in use (e.g. Intel Skylake)
10. Technical equipment: Scale (number per user, lifetime)

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11. Technical equipment: Type of bin (lifetime, number per user, size, weight, material)
12. Technical equipment: Camera (lifetime, number per user)
13. Business model: Who is the owner of the Kitro devices? Are the devices only used once per restaurant or are they reused again?

42 ISUN

Questions for ISUN

1. *List of persons (without names), job title, gender, task, who were involved in the project.*
2. *Gender of the interviewee(s)*

T5.2 MITAKUS Forecasting software for restaurants

43 User (before, mid-term, at the end)

Questionnaire for the data collection for the sustainability assessment of the innovation Mitakus

Date of interview:	Carried out by (ISUN):

Explanations to the survey

The survey is conducted in the form of a personal interview with the persons responsible for the project as the user and as the project partners. Some of the questions will be presented to the interview partners in written form so that they can gather the necessary information in a flexible manner.

There are three survey periods:

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- **Before** using Mitakus (**project beginning**)
- While using Mitakus (**mid-term**)
- At the ending of the project (**project ending**)

The questions (blocks) marked in yellow must be answered at the middle and end of the project, all other questions must also be answered before using Mitakus.

Privacy statement (will be added)

Part 1: General information about the organisation (user)

• Name of the organisation:	
• Function of interviewee(s):	

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• Number and gender of employees - total:	female	male	diverse
- thereof: o Administration:			
o Production:			
o Service staff:			
o Management:			
o Cleaning:			
o Other Functions:			

Please describe the organisation in which Mitakus is used:

- **Catering system** (regeneration kitchen, cook & chill, cook & hold, etc.)

- **Serving system** (free-Flow, Buffet, Portion sizes etc.)

- **Menu** (e.g. number of menu lines, menu cycles, options to choose menu components)

- **Guests** (average number and deviations, target groups)

- **Other characteristics**

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Part 2: Questionnaire for users

Production of food (data collection period tbd)

1. Please send us the menus including prices for the survey periods.
2. What are the unit weights for each menu / dish?
3. What quantities (units or kg) were produced (production quantity)?
   Production figures for all main menus and side dishes/ other meal components from ERP System
   Production volume (in kg) = Units produced unit weight*
4. Were there any deviations in the dishes actually prepared (e.g. other quantities or other dishes produced at short notice)? (*entered into the ERP system?)*
5. How large is the deviation between conventional production planning and planning with Mitakus?

Food waste (data collection period tbd)

6. What quantities (number or kg) of dishes produced were not sold (overproduction)? *Sales figures from ERP system*

   *Overproduction (in kg) = (production quantity – units sold) *unit weight*
7. Which quantities of overproduction were reused, which were thrown away (food waste)?

   Food waste = overproduction - food reused
8. Data to determine relative indicators (waste per guest): number of guests *(does the number of transactions documented in the system correspond to the number of guests?)*

Implementing and using Mitakus

9. What resources were necessary to use Mitakus?

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a. Technical infrastructure (new computer, tablet, etc.)
b. Qualification of the MA
c. Staff input (in hours and EUR) necessary for implementation (by gender)
d. Staff input (in hours and EUR) for daily use (by gender)

10. Did you have to train staff to use Mitakus? If yes, how extensive was the training (staff involved, duration)?

Cost of food prepared and waste disposal

11. What is the cost of the dishes prepared? (can a breakdown by dish/component be given here or is there an average value?)

12. Can you give details of the individual cost items? What are the proportions (a-h) in terms of cost per dish?
    a. *Cost of raw materials*
    b. *Energy costs*
    c. *Personnel costs*
    d. *Cleaning costs*
    e. *Waste disposal costs (do these relate to food waste only or waste in total?)*
    f. *Storage costs*
    g. *Other fixed costs*
    h. *Other variable costs*

13. Waste disposal costs: What is the amount of waste disposal costs? What proportion of this is caused by food waste? How is the disposal of food waste accounted for (per tonne, per container, etc.)?

Impact of Mitakus on business operations and employees

14. How has your production planning process changed since you started using Mitakus?

15. Has the amount of raw materials purchased changed since you started using Mitakus (*how has it changed*)?

16. Has the production process of your dishes changed since you started using Mitakus?

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17. Are there any other processes in your company that have changed since you started using Mitakus?

18. If there have been price changes for your meals since the introduction of Mitakus, has the use of Mitakus had an impact on this?

19. Have you always used the values suggested by Mitakus as a basis for your production planning during the data collection period? If not, how many of the suggestions did you use?

20. Are there employees who have acquired new competences through the use of Mitakus (e.g. technological, technical, communication skills)? *By gender*

21. Are there non-financial improvements and benefits through the use of Mitakus (e.g. better agreements in the team, higher motivation, PR effects)?

    Open question + On a scale of 1-5, how would you rate these benefits (1 low, 5 high)?

22. How has your awareness of food waste changed as a result of using Mitakus/participating in the project?

    Open question + scale 1-5: 1 no change, 5 strong change

23. How has the awareness of the issue of food waste of the other employees (if possible by gender) who work with Mitakus changed through the use of Mitakus?

    Open question + filling in per MA; scale 1-5: 1 no change, 5 strong change

24. How has your behaviour changed? Has Mitakus contributed to you wasting less food?

    At work, in private - open question + scale 1-5: 1 no change, 5 strong change

25. How has the behaviour of your employees (if possible by gender) changed? Has Mitakus contributed to them wasting less food?

    Open question + scale 1-5: 1 no change, 5 strong change

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26. Have you saved costs by using Mitakus? How high are the savings and to which items can they be attributed (e.g. waste disposal costs, energy, personnel costs, use of goods)?

User-friendliness of Mitakus

27. How satisfied are you with the following features of Mitakus?
    Scale 1-5: 1 hardly satisfied, 5 very satisfied
    a. The dashboard of the innovation
    b. The features of the innovation -
    c. Ease of use for managers -
    d. Ease of use for kitchen staff -
    e. Quality of service
    f.

28. Which functions or design elements would you change or add to Mitakus? *(Free text)*

Evaluation of Mitakus

29. Will you continue to use Mitakus after the end of the project?

30. What expectations did you have when using Mitakus with regard to reducing food waste? Were they fulfilled?

31. Have you talked to other institutions about Mitakus? Have they expressed interest in implementing Mitakus?

32. Would you recommend Mitakus to others?

33. Please rate the level of difficulty for implementing Mitakus
    Scale 1-5, 1-easy, 5 very difficult

Other questions

34. What is your motivation for using Mitakus? Please sort the possible reasons in order of decreasing importance (first mentioned most important - last mentioned least important). *(ask only at project beginning)*

    ☐ Other restaurants also participate.

    ☐ We can reduce the workload of the staff.

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- ☐ We can optimise our production planning process.
- ☐ We are interested in participating in a scientific project.
- ☐ The costs for Kitro are covered by the project.
- ☐ We can reduce costs in the business.
- ☐ We can reduce food waste.
- ☐ We can act in an environmentally friendly way.
- ☐ Other:_____

35. Did you get access to further funding through participation in the project (e.g. food waste reduction funding)?

36. Please list job title, gender, task of the persons (without names) who were involved in the project (from the first meeting, background activity, implementation, PR, etc.).

37. How satisfied are you with this survey?

    By gender, scale 1-5, 1-very satisfied, 5 not at all satisfied

38. Which disposal company collects the food waste? Can you provide information on what happens to the waste after collection?

44 Mitakus

Part 3: Questions for the partners Mitakus and iSuN

Questions for innovation partner Mitakus

1. What quantities (units or kg) of dishes produced were not sold (overproduction)? *Sales figures from ERP system*
   *Overproduction (in kg) = (production quantity – units sold) *unit weight*

2. What are the costs of implementing Mitakus?

3. List of persons (without names), job title, gender, task, who were involved in the project.

4. *How many times has Mitakus been integrated in the user system?*

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5. *What is the number of companies that started using Mitakus at the piloting test?*
6. Location of the server
7. Server capacity
8. Type of CPU in use (e.g. Intel Skylake)
9. Type of computer device

45 ISUN

Questions ISUN

10. *List of persons (without names), job title, gender, task, who were involved in the project.*
11. *Genders of the person/s interviewed*

T5.3 MATOMATIC

46 User

General information

Name of Kitchen:

Name, position and gender of contact person (s):

Number of staff by gender and position if possible:

Data related to food waste quantities and environmental impact will be collected from company records.

Efficacy

Replicability

- Would you like to continue to use the innovation after the project? (yes/no)
- How many in the staff have been involved in using the innovation? by gender, by role

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- Will you promote the innovation to other kitchens? (yes, will / yes, already have/ no)

Utility

- Are you satisfied with the innovation from matomatic?
- How much do you think matomatic helped your activity in reducing the FW?
- How many employees have developed new skills thanks to the use of Matomatic, by gender?
- Technological (use of pc software) [number]
- Technical (better understanding of how to manage food transactions) [number]
- Social/relational (with other users of the software, if relevant) [number]
- Do you think your purchasing habits have changed since your using matomatic

How useful do you think this innovation is for your kitchen?

User-friendliness

- Which is the investment needed to purchase the innovation?
- Which is the average working hour cost in your company?
- Did you have to hire new personnel in order to use matomatic? Please provide a short demographic: age, gender, position
- Who in your company is in charge of dealing with MATOMATIC innovation? Please provide a short demographic: age, gender, position
- Has your trust in other partners increased due to this innovation?
- Has your communication with other actors increased due to this innovation?
- How often do you contact matomatic for issues with their innovation? eg.: every day; once a week; once per month; once every six months; once a year
- How much do you agree with the following statements?

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- The dashboard of the innovation is good
- I like the features of the innovation
- The innovation is easy to use for managers
- The innovation is easy to use for kitchen staff
- I am satisfied with the service offered by matomatic

- Open question: What are the features of the innovation you would change or add?

- How difficult was it to start using the innovation on a 1= at all to 5= very difficult scale?

- Hours you dedicate weekly to use matomatic innovation/Total weekly hours?

Socio-economy

Profitability

- What is the (daily weekly/monthly?) expenditure of the school canteen for meal ingredients?

- What are the fixed costs of food management other than buying the food itself ? (e.g. buying an operating a larger fridge, staff time)

- What are the variable costs of food management other than buying the food itself ? (e.g. packing, electricity and water for dishes and other purposes)

- What are the cost, charge structure and mode of disposing organic waste for an educational unit?

- What is the change in the annual balance (due to additional income or avoided cost) resulting from the innovation? What has been the total cost of implementing the innovation (e.g. additional/new capital investment, labour, training etc.)?

Behaviour

- Has there been a change in awareness in the staff (if possible by gender) and management? Self-assessment of awareness of the food waste problem (Likert scale from “very aware” to “not aware at all”) by the respondent and by each of the employees involved in managing the food product transferred.

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- Has there been a change in attitude in the staff (if possible by gender) and management? Self-assessment of concerns for, and commitment to, food waste reduction (Likert scale, from “a lot” to “not at all”) by the respondent and by each of the employees involved in managing the food product transferred.

Environment

- How do you manage your food waste? Can you estimate a share of used pathways?

  Food donation to charities/food banks (%)

  Directly to Composting (%)

  Directly to Anaerobic digestion (%)

  Directly to Incineration (%)

  Municipal or commercial solid waste collection system (‘residual waste bin’) (%)

  Separate collection system for organic waste (‘organic waste bin’)(%)

  Other: Please specify (%)

Matomatic

To ask Matomatic once

- Could you provide us with information of the technical equipment used in the innovation? (Type and number of equipments, picture of the equipment, …)
- Who is the owner of the devices? Are the devices only used once or are they re-used?
- Do you use a server for your programme?
- Has the software provider information to the server capacity? Where is the server located?
- How much of the total server capacity is used for the software (in vCPU/CPU in use)?

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- Which type of CPU is used (e.g. Intel Skylake)
- Do you need to buy new devices to run this software? Or do you use existing devices? Which device do you use (tablet/Ipad, computer, notebook, smartphone)

T5.4 SLU/AIE Holistic educational approach

47 User (before and after the implementation)

Questionnaire to evaluate the current situation of food waste at your school

To be able to measure the effectiveness of various innovative approaches to food waste avoidance in schools, the situation before and after the planned activities should be surveyed. The data are not published and are only used to determine whether and to what extent the implementation of the educational concept affects behaviour and the amount of waste generated during lunch.

General Information

Name of the school:

Name, position, and gender of the contact person (s):

Number of students at the school by gender:

Number of students at the buffet by gender:

Number of teachers by gender and position:

Number of administrative staff by gender and position:

Kitchen staff / canteen staff by gender and position:

Type of food preparation:
(Cooked on site, delivered freshly cooked, cook & chill ...)

Contact:

Type of food serving:

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(Serving by kitchen staff, buffet operation, handing out of the ready-made plate, serving of the ready-made plate ...)

Contact:

How does the ordering system work (order time, electronic, rejections, changes ...)?

Date of the survey:

Carrying out the survey:

Notes: *yellow = after application of the innovation*, *gray = still to be clarified*, pink = not to be answered by the schools, *green text = internal and for the interviewer*
Collection of data BEFORE implementation of the educational concept (baseline collection)

Socio-economic considerations

Q1. What is the average expenditure in the school canteen on groceries? (daily / weekly / monthly costs for the purchase of goods; per serving) or

What are the average expenses of the school maintainer for meals? (daily / weekly / monthly cost of meals; average cost per serving)

Q2. What are the fixed costs of managing food apart from the cost of the food itself? (e.g .: procurement, storage, employee costs) -> important for comparing the effort

Q3. What is the variable cost of food management other than the cost of the food itself? (e.g .: packaging, electricity and water for dishes and other purposes) -> important for comparing the effort

Q4. What are the disposal costs for excess food and plate scraps for your educational institution? (Differentiation between lunch and general leftovers possible, e.g., buffet, school snacks?) -> important for the comparison of the effort

Q5. How many meals are sold / served each week? (If possible, please specify the type of food / menu composition: number of starters / soups, number of main dishes including side dishes, number of desserts; total number of menus) -> possible submission of documents

Please select the appropriate option:

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Q6. What is the cost structure for the disposal of kitchen waste, surplus food, and leftover plates? (Costs for certain collection intervals, container volume, weight; bearer of the costs?)

Q7. What are the costs of a meal for the students? (How are the costs made up? Does the school / municipality specify a standard price for meals?) Is there a correlation between the cost and type of certain meals and leftover plates?

Q8. What are the costs of a meal for the school or the school-maintaining organization / municipality? (How are the costs made up? Does the school / municipality specify a standard price for meals?) Is there a correlation between the price and type of certain meals and leftover plates?

Q9. What subsidies / other cash benefits (in euros) do you receive for reducing waste? (Stating whether these are one-off, periodic, fixed, or proportional to the amount of waste) AFTER application of the EDUCATIONAL CONCEPT; Asked about the future: ... can be expected due to the reduction in waste?

Q10. Has the introduction of the educational concept resulted in cost savings? If so, by how much (in EUR) and in what form (less food ordered, less energy used for cooling, ...)? AFTER application of the EDUCATIONAL CONCEPT

Q11. How big is your commitment to reducing food waste? (Likert scale from "very large" to "not available / not yet ...") *(to be answered by the interviewee and all employees (if possible by gender) who are involved in food management.)*

Q12. Has the personnel / hourly workload changed due to the introduction of the educational concept (if possible by gender)? How many jobs (by gender) in full-time equivalents (FTE) were created or cut as a result of the introduction of the educational concept? (If it is only a part of the time of one or more employees, please state the entire proportion of FTEs) AFTER application of the EDUCATIONAL CONCEPT

Q13. Have other organizations / schools been informed of the testing and implementation of the educational concept? If yes, how many? Total of all organizations / schools informed

How many of them said they were interested?

How many of them would like to use the EDUCATIONAL CONCEPT? evaluate at the end of the project? Time of the survey - after the demonstration? Later?

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Efficiency & Effect after application of the EDUCATIONAL CONCEPT

Q14. Who is responsible for the educational concept at your school? If possible, please indicate the number, age, gender, and area of responsibility.

Q15. Would you like to continue using the educational concept at your school?
Yes / No / Maybe

Q16. How did you get starting the educational concept? Were there any difficulties? What did you like and what didn't you like? Open question!

Q17. How often was something unclear during the use of the educational concept? Are you satisfied with the way you have been helped with occurring problems? Will you recommend the educational concept to other schools?

Q18. How many students have been involved in the educational concept in total? If possible, please indicate the number (per day or per week), age, and gender.

Q19. How many teachers were involved in the educational concept? (informed the class, supervised during lunch ...) *If possible, please indicate the number, age and gender.*

Q20. How many kitchen workers were involved in the educational concept? *If possible, please indicate the number, age and gender.*

Q21. How much additional work do you estimate was required (in h, euros, or number of people) for the educational concept?

Q22. Did you have to organize / hire additional staff (if possible by gender) for the educational concept?

Q23. Has your trust to other partner increased due to this innovation?

Q24. Has your communication with other actors increased due to this innovation

Q25. Was the educational concept received well by the students during the period (use interval)? Please explain your answer (why was the educational concept well received or why not?) *Definition of the intended usage intervals!*

Q26. Did you continue to use educational concept at your school after completing the survey? How many students (if possible by gender) were involved at the educational concept after completing the survey?

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Q27. How useful do you think is the educational concept for your school?

Q28. Were additional purchases or procurements necessary for the implementation of the educational concept? *What was necessary to do/get before starting with the application of the EDUCATIONAL CONCEPT?*

Q29. Are you willing to promote the educational concept to other partners? [yes/no]

Environmental Factors

Although our work mainly deals with plate leftovers, it is important for us to record other food waste along the value chain in order to find out whether food waste has been shifted to other stages and to prove overproduction if applicable.

Q30. How aware are you of the food waste issue? (Please answer the question for the whole team if possible, disaggregate by gender if possible)

Q31. Is food waste separately collected from other solid waste fractions (e.g. packaging or other residual waste)? Yes/No

Q32. How is organic waste currently being disposed of? *(Feeding, composting, biogas plant, thermal utilization, sewage treatment plant?) Please select the appropriate option:*

Q33. How and in which area of the kitchen (plate-leftovers, serving-leftovers / buffet-leftovers, other places) have the leftovers changed due to the use of the EDUCATIONAL CONCEPT (in kilograms)? *Asking for the quantities of the reduction as well as looking at waste-accumulation points in the kitchen!* □ AFTER use of the EDUCATIONAL CONCEPT

Q34. Has your ordering / buying behaviour for lunch changed since implementing the educational concept? Yes, …; No, because…□ AFTER use of the EDUCATIONAL CONCEPT

Q35. Has the educational concept resulted in less food being ordered overall? If so, by how much? (In kilograms per month) □ AFTER use of the EDUCATIONAL CONCEPT

Thank you for your help in collecting the data! You have made a valuable contribution to reducing food waste.

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On behalf of the project team of the Austrian Ecology Institute,

Philipp Hietler Daniel Orth

If you have any further questions, please do not hesitate to contact us at the following email addresses:

hietler@ecology.at

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T5.5 CozZo Mobile app

48 Households (before implementation)

I Baseline questionnaire for households (before the innovation)

Background information of the member of the household who is in charge of food management (shopping, cooking etc.) OR who will most likely use the CozZo app the most.

1. Gender:
   Male
   Female
   Other
   I prefer not to say

2. Age: Year of birth _____

3. Household composition:
   One adult
   One adult + one child
   One adult + two children
   One adult + three or more children
   Two persons/adults without children
   Two persons/adults + one child
   Two persons/adults + two children
   Two persons/adults + three or more children
   Three or more persons/adults without children

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Three or more persons/adults + one child
Three or more persons/adults + two children
Three or more persons/adults + three or more children

4. Optional: Please specify gender and age of other household members:
   _____

5. Total household income (gross income per month in total):
   Less than 1.000 €
   1.000 €–1.999 €
   2.000 €–2.999 €
   3.000 €–3.999 €
   4.000 €–4.999 €
   5.000 €–5.999 €
   6.000 €–6.999 €
   7.000 €–7.999 €
   8.000 €–8.999 €
   9.000€ or more
   I prefer not to say

6. Which of the following describes your current work life situation the best?
   Employed full-time
   Employed part-time
   Unemployed or laid off
   Student
   Stay-at-home parent
   On long-term sick leave
   Retired
   Other: please specify_____

Relative indicators:

7. Household food wasted before the innovation: Frequency of disposal and amount of food wasted
   (In addition to self-assessment, waste amounts are collected by researchers by using separate bins.)

   Please indicate the food group and estimate the frequency and amount wasted per each food group in your household:

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Food groups:
fruits and berries
vegetables, legumes and fresh herbs
potatoes and potato products
pasta, rice and corn products
meat
fish
eggs
dairy products
bread and rolls
sweet and savoury bakery products
home-made meals
fresh convenience meals
processed vegetable and fruit products
spices
cooking residues and plate/pot waste.
Other, please specify: _____

Frequency (for each food group):
6–7 times per week
3–5 times per week
1–2 times per week
2–3 times per month
about once per month
less often or never

Amount of waste (one portion = about one handful of food):
more than 3 portions
2–3 portions
about 1 portion
½ portion and less or nothing.

8. Do you collect food waste separately from other solid waste fractions? (Yes/No)
   If yes, together with garden and yard waste (Yes/No)
   Which options do you use for your food waste disposal?
   - Redistributing to other people (e.g. family, friends, neighbours)
   - Feeding to pets (or wild animals)
   - Home-composting

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- Municipal solid waste collection system ('residual waste bin')
- Separate waste collection system ('organic waste bin')
- Other: please specify

9. Cost of weekly household food purchasing before the innovation (€)
   a. Estimate (in euros), how much money does your household spend on food weekly (for a regular week, not including e.g., holidays or parties). Please make the estimation by calculating from your shopping receipts or debit/credit card statements.

_____

Behaviour

10. Reasons for food waste:
    a. In your household, how often does food end up wasted due to the following reasons? (Likert scale 1-5: 1=never due to this, 5=very often due to this)
    The date in the date label has passed.
    The packaging size of the food I bought does not meet my needs and food is left over.
    The food has spoilt (e.g. rotten or become moldy) before I manage to use them.
    I have prepared too much food for one meal.
    I am not sure whether I can still eat the food and I throw it away just to be safe.
    I don't want to eat the same kind of food for several days at a time.
    I/we didn't like the taste of the food.
    Children leave food uneaten.
    I buy ingredients for a recipe and part of them are left unused.
    I buy food that I later do not fancy eating.
    I/we have bought too much food.

11. Self-assessment of awareness of the food waste problem:
    a. How aware do you consider to be of the food wasted (amount, composition) in your household? (Likert scale 1–5: 1 = not aware at all, 5 = very aware)

12. Self-assessment of concerns for, and commitment to food waste reduction:
    a. How committed to food waste reduction do you consider to be? (Likert scale 1–5: 1=not at all, 5=very committed)

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b. How much effort have you taken towards reducing food waste in your household? (Likert scale 1–5: 1=no effort at all, 5=a lot of effort)
c. Please list the kinds of efforts / methods that you have taken towards reducing food waste in your household:

_____

Consumer habits

13. Frequency of purchases in brick-and-mortar stores
    a. How often do your household members go grocery shopping in brick-and-mortar stores?
    several times a day
    6–7 times per week
    3–5 times per week
    1–2 times per week
    2–3 times per month
    once per month or less

14. Consumer travel for purchases
    a. Which mean of transport do your household members primarily use for their grocery shopping trips?
    car
    bike
    bus
    train
    scooter
    by foot
    other, please specify_____

15. Frequency of online purchasing
    a. How often do your household members buy groceries online?
    several times a day
    6–7 times per week
    3–5 times per week
    1–2 times per week
    2–3 times per month
    once per month
    5-6 times a year
    2-3 times a year

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less than 2 times a year
never

16. Frequency of eating out or ordering take-away
    a. How often do your household members eat out (e.g., in restaurants) or order take-away food from restaurants?
    several times a day
    6–7 times per week
    3–5 times per week
    1–2 times per week
    2–3 times per month
    once per month
    5-6 times a year
    2-3 times a year
    less than 2 times a year
    never

Satisfaction with the survey:

17. On a scale from 1 (not at all satisfied) to 5 (very satisfied), can you rate your satisfaction for this survey?

49 Households (after implementation)

II Monitoring questionnaire for households (after the innovation)

Background information of the respondent (preferably the same person who has filled the baseline questionnaire):

1. Gender:
   - ☐ Male
   - ☐ Female
   - ☐ Other
   - ☐ I prefer not to say

2. Age: Year of birth _____

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3. Household composition:
   - ☐ One adult
   - ☐ One adult + one child
   - ☐ One adult + two children
   - ☐ One adult + three or more children
   - ☐ Two persons/adults without children
   - ☐ Two persons/adults + one child
   - ☐ Two persons/adults + two children
   - ☐ Two persons/adults + three or more children
   - ☐ Three or more persons/adults without children
   - ☐ Three or more persons/adults + one child
   - ☐ Three or more persons/adults + two children
   - ☐ Three or more persons/adults + three or more children

4. Optional: Please specify gender and age of other household members:
   _____

5. Total household income (gross income per month in total):
   - ☐ Less than 1.000 €
   - ☐ 1.000 €–1.999 €
   - ☐ 2.000 €–2.999 €
   - ☐ 3.000 €–3.999 €
   - ☐ 4.000 €–4.999 €
   - ☐ 5.000 €–5.999 €
   - ☐ 6.000 €–6.999 €
   - ☐ 7.000 €–7.999 €
   - ☐ 8.000 €–8.999 €
   - ☐ 9.000€ or more
   - ☐ I prefer not to say

6. **Work life situation:** Which of the following describes your current work life situation the best?
   - ☐ Employed full-time
   - ☐ Employed part-time
   - ☐ Unemployed or laid off
   - ☐ Student
   - ☐ Stay-at-home parent
   - ☐ On long-term sick leave
   - ☐ Retired

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☐ Other: please specify_____

Relative indicators:

7. Household food wasted after the innovation: Frequency of disposal and amount of food wasted
(In addition to self-assessment, waste amounts are collected by researchers by using separate bins.)

Please indicate the food group and estimate the frequency and amount wasted per each food group in your household:
Food groups:
fruits and berries
vegetables, legumes and fresh herbs
potatoes and potato products
pasta, rice and corn products
meat
fish
eggs
dairy products
bread and rolls
sweet and savoury bakery products
home-made meals
fresh convenience meals
processed vegetable and fruit products
spices
cooking residues and plate/pot waste.
Other, please specify: _____

Frequency (for each food group):
6–7 times per week
3–5 times per week
1–2 times per week
2–3 times per month
about once per month

less often or never
Amount of waste (one portion = about one handful of food):
more than 3 portions

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2–3 portions
about 1 portion
½ portion and less or nothing.

8. Cost of weekly household food purchasing before the innovation (€). *This amount excludes occasions of eating out or ordering take-away by household members.*
   a. Estimate, how much money does your household spend on food weekly (for a regular week, not including e.g., holidays or parties) (in euros)?
      _____

Behaviour:

9. Reasons for food waste:
   a. In your household, how often does food end up wasted due to the following reasons? (Likert scale 1-5: 1=never due to this, 5=very often due to this)
      The date in the date label has passed.
      The packaging size of the food I bought does not meet my needs and food is left over.
      The food has spoilt (e.g. rotten or become moldy) before I manage to use them.
      I have prepared too much food for one meal.
      I am not sure whether I can still eat the food and I throw it away just to be safe.
      I don't want to eat the same kind of food for several days at a time.
      I/we didn't like the taste of the food.
      Children leave food uneaten.
      I buy ingredients for a recipe and part of them are left unused.
      I buy food that I later do not fancy eating.
      I/we have bought too much food.

10. **Self-assessment of awareness of the food waste problem:**
    a. How aware do you consider to be of the food wasted (amount, composition) in your household? (Likert scale 1–5: 1 = not aware at all, 5 = very aware)

11. **Self-assessment of concerns for, and commitment to food waste reduction**:

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a. How committed to food waste reduction do you consider to be? (Likert scale 1–5: 1=not at all, 5=very committed)
b. How much effort have you taken towards reducing food waste in your household? (Likert scale 1–5: 1=no effort at all, 5=a lot of effort)
c. Please list the kinds of efforts / methods that you have taken towards reducing food waste in your household:

_____

Consumer habits:

12. Frequency of purchases in brick-and-mortar stores
    a. How often do your household members go grocery shopping in brick-and-mortar stores?
    several times a day
    6–7 times per week
    3–5 times per week
    1–2 times per week
    2–3 times per month
    once per month or less

13. Consumer travel for purchases
    a. Which mean of transport do your household members primarily use for their grocery shopping trips?
    car
    bike
    bus
    train
    scooter
    by foot
    other, please specify_____

14. Frequency of online purchasing
    a. How often do your household members buy groceries online?
    several times a day
    6–7 times per week
    3–5 times per week
    1–2 times per week
    2–3 times per month

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once per month
5-6 times a year
2-3 times a year
less than 2 times a year
never

15. Frequency of eating out or ordering take-away
    a. How often do your household members eat out (e.g., in restaurants) or order take-away food from restaurants?
    several times a day
    6–7 times per week
    3–5 times per week
    1–2 times per week
    2–3 times per month
    once per month
    5-6 times a year
    2-3 times a year
    less than 2 times a year
    never

User-friendliness:

(NB! In addition to these questions, qualitative, open ended questions about user-friendliness of the CozZo app will be included in the same survey; those questions will be decided later)

16. Number of enquiries made for issues with the innovation:
    a. Have you contacted either LOWINFOOD researchers or CozZo customer support about issues related to the use of CozZo app? (Yes/No)
    b. How often have you contacted them?
    Every day
    Few times a week
    Once a week
    Few times a month
    Once a month
    Never

17. Perceived difficulty in the start
    a. How difficult was it to start using the CozZo on a scale from 1 to 5? (Likert scale 1–5: 1=Very difficult, 5 = Very easy)

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18. Number of hours spent in using the app:
    a. Please choose all household members who have used the CozZo app and provide background information for all of them (see 12b)
       adult 1
       adult 2
       adult 3
       adult 4
       child 1
       child 2
       child 3
       child 4
       child 5
       other, please specify_____
       other, please specify_____
    b. For each of the household members above, please provide this background information: gender (female, male, other, no prefer not to say), age: birth year, role: mostly in charge of food purchases (yes/no), mostly in charge of cooking (yes/no), participates in food purchasing (yes/no), participates in cooking (yes/no)
    c. Please evaluate, how many minutes a day (on average) each above family member has dedicated to the use of the CozZo app?

Utility:

19. Weekly savings on consumers' food purchase:
    a. Since you started using the CozZo app, has your household's weekly food purchase cost:
       1=diminished
       2=slightly diminished
       3=stayed the same
       4=slightly increased
       5=increased?

20. Number of shopping lists created in the app:
    a. How many shopping lists have your household members created on the app?

21. Number of recipes created in the app:
    a. How many recipes have your household members created on the app?

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22. Time spent in grocery shopping:
    a. Since you started using the CozZo app, has the time your household members spend for grocery shopping:
       1=diminished
       2=slightly diminished
       3=stayed the same
       4=slightly increased
       5=increased?

23. Share of households saying that the innovation met their expectations, and average rating:
    a. How much do you think the CozZo app has helped your household in reducing food waste? (Likert scale 1–5: 1= not at all, 5=a lot)
    b. Do you think your purchasing habits have changed since you started using the CozZo app? (Yes/No)
       □ if Yes: □ open question: Please describe how they have changed:_____
       _____
    c. How useful do you think the CozZo app is for improving your household's purchasing habits (e.g., planning, checking inventory etc.)? (Likert scale 1–5: 1=not at all, 5=very useful)

24. Assessment of new skills thanks to the implementation of the innovation.
    a. Please evaluate how much the following skills you have improved thanks to the use of the CozZo app on a scale from 1 to 5. (Likert scale 1–5: 1=no improvement at all, 5= improved a lot)
       i. Technological skills, such as the use of mobile apps
       ii. Better understanding of food management at home (e.g., planning, buying, cooking, storing)

Profitability:

25. Change in direct input costs (food inputs):
    a. How much you consider your household has saved in their weekly food budget as a result of using the CozZo app? (Likert scale 1–5: 1=no savings at all, 5=saved considerable amount)

26. Change in fixed costs due to the innovation (e.g., storage space):
    a. Have your household members made purchases related to food storage as a result of using the CozZo app (e.g., food containers, freezer or fridge)?

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(Yes/No)

 If Yes: Open question: please describe in more detail.

_____

Replicability:

27. Share of adopting users that are willing to continue applying the innovation:
    a. Do you think you will keep using the app? (Yes/No)

28. Number of users willing to promote the app:
    a. How likely are you to recommend the use of CozZo app to your family, friends, etc. on a scale from 1 to 5? (Likert scale 1–5: 1 = Very unlikely, 5 = Very likely)

Satisfaction with the survey:

29. On a scale from 1 (not at all satisfied) to 5 (very satisfied), can you rate your satisfaction for this survey?

Information to be retrieved from COZZO:

Number of downloads
App compatibility with iOS and Android
Number of subscriptions after downloads
App rating in Google Play/App Store
Number of COZZO users keeping interacting with the app after the end of demonstration.

T5.6 REGUSTO Mobile app

50 Restaurants

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Questionnaire(s) to be used for the survey on Restaurant Survey

1. Information on the restaurant

I.1. Restaurant name: _____

I.2. Location (province and municipality): _____

<u>Please describe your restaurant activity</u>:

I.3. Main type of cuisine in the restaurant (max 2 choices)

- ☐ Meat based
- ☐ Fish
- ☐ Vegetarian
- ☐ Ethnic cuisine
- ☐ Pizzeria
- ☐ Café/Bar
- ☐ Other (please specify): _____

I.4. Year in which the restaurant activity started:

_____

I.5. Number of employees by gender and position:

_____

I.6. Number of seats:

_____

I.7. Annual Turnover (Year 2019):

- ☐ Less than 50,000 Euro
- ☐ Between 50,000 and 150,000 Euro
- ☐ More than 150,000 Euro

Focusing on the <u>respondent to the questionnaire</u>:

I.8. Please indicate your job position within the restaurant for which you are conducting the survey (i.e. restaurant owner, restaurant manager, restaurant director, etc.):

Job position_____

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I.9. Gender

- ☐ Male
- ☐ Female
- ☐ Other
- ☐ Prefer not to say

I.10. Please indicate your age:_____

I.11. Level of Education:

- ☐ Early childhood education ('less than primary') or no education
- ☐ Primary education
- ☐ Lower secondary education
- ☐ Upper secondary education
- ☐ Short-cycle tertiary education
- ☐ Bachelor's or short-cycle degree
- ☐ Master's degree
- ☐ Doctoral/PhD or equivalent level

2. The situation before the introduction of REGUSTO innovation

2.1. How aware are you of food waste related issues? Please consider the following scale with 1= not at all aware and 5: extremely/completely aware.

Not at all aware	Slightly aware	Somewhat aware	Moderately aware	Extremely aware
☐	☐	☐	☐	☐
1	2	3	4	5

2.2. Please indicate your level of agreement with the following statement: *"You and your employees involved in food management are committed to reducing food waste".*

- ☐ Strongly disagree

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- ☐ Disagree
- ☐ Neither agree nor disagree
- ☐ Agree
- ☐ Strongly agree

2.3. Please provide your best estimate on the monthly amount (in kg) of the overall food production in your restaurant

Amount_____ in kg per month

2.4. Please provide your best estimate on the total amount (in kg) of food waste generated monthly in your restaurant's kitchen (kitchen waste)

Amount_____ in kg per month

2.5. Please provide an overall estimate of the percentage of leftovers made by your clients that are thrown into the trash each month compared to the food produced (client waste)

In total _____ %

2.6. Please indicate what is your average food storage period before the introduction of REGUSTO Innovation. Please distinguish your response among the three categories specified in the table.

FRESH/FRIDGE PRODUCTS	FROZEN PRODUCTS	PANTRY PRODUCTS
☐ Less than 1 day	☐ Less than 1 day	☐ Less than 1 day
☐ 1-2 day	☐ 1-2 day	☐ 1-2 day
☐ 2-3 day	☐ 2-3 day	☐ 2-3 day
☐ 4-6 day	☐ 4-6 day	☐ 4-6 day
☐ More than 1 week	☐ More than 1 week	☐ More than 1 week

2.7. Please provide, approximately, the monthly overall amount of the fixed costs before the introduction of the REGUSTO Innovation

Amount_____ in Euro per month

2.8. Please provide, approximately, the <u>monthly</u> overall amount of the variable costs <u>before the introduction of the REGUSTO Innovation</u>

Amount_____ in Euro per month

2.9. Please indicate the modes of disposing organic waste in your restaurants (more than one answer choice is possible)

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- ☐ Sort it as organic waste
- ☐ Undifferentiated garbage
- ☐ Composting
- ☐ Animal feed
- ☐ Anaerobic digestion
- ☐ Incineration
- ☐ Discards on land/at sea
- ☐ Plough-in/not harvested
- ☐ Landfill
- ☐ Sewer
- ☐ Other (please specify): _____

2.10. Taking into consideration the disposal mode(s) indicated in the previous question, please indicate which is, approximately, the total cost (<u>per month</u>) of organic waste disposal in your restaurant

Amount_____ in Euro per month

52 Users (after implementation)

3. The situation after the introduction of REGUSTO innovation

3.1. After the introduction of Regusto APP within your restaurant, how aware are you of food waste related issues? Please consider the following scale with 1= not at all aware and 5: extremely/completely aware.

Not at all aware	Slightly aware	Somewhat aware	Moderately aware	Extremely aware
☐	☐	☐	☐	☐
1	2	3	4	5

3.2. Please indicate your level of agreement with the following statement:
***"You and your employees involved in food management are committed to reducing food waste after REGUSTO Innovation*?"**

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- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neither agree nor disagree
- ☐ Agree
- ☐ Strongly agree

3.3. Please indicate the <u>monthly</u> amount (in kg) of the overall food production in your restaurant

Amount_____ in kg

3.4. Please indicate (in kg) the total amount of food waste generated <u>monthly</u> in your restaurant <u>after the introduction of REGUSTO Innovation</u> (kitchen waste)

Amount_____ in kg

3.5. Please provide an overall estimate of the percentage of uneaten food that <u>each month</u> on average was thrown into the trash compared to the food produced <u>after the introduction of REGUSTO Innovation (client waste)</u>

In total_____ %

Please provide an overall estimate of the percentage of how many transactions were for take-away/for delivery.

_____

3.6. Please indicate what is your average food storage period <u>after the introduction of REGUSTO Innovation?</u> Please distinguish your response among the three categories specified in the table.

FRESH/FRIDGE PRODUCTS	FROZEN PRODUCTS	PANTRY PRODUCTS
☐ Less than 1 day	☐ Less than 1 day	☐ Less than 1 day
☐ 1-2 day	☐ 1-2 day	☐ 1-2 day
☐ 2-3 day	☐ 2-3 day	☐ 2-3 day
☐ 4-6 day	☐ 4-6 day	☐ 4-6 day
☐ More than 1 week	☐ More than 1 week	☐ More than 1 week

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Now, we ask you to provide us with some information on costs incurred or avoided after the introduction of REGUSTO innovation and how these have affected the overall budget of the restaurant

3.7. Please provide, approximately, the monthly overall amount of the fixed costs after the introduction of the REGUSTO Innovation:

Amount_____ in Euro

3.8. Please provide, approximately, the monthly overall amount of the variable costs after the introduction of the REGUSTO Innovation:

Amount_____ in Euro

3.9. Consider your situation after the introduction of REGUSTO Innovation: please specify the mode(s) of disposing organic waste in your restaurants. If necessary, it is possible to indicate more than one choice.

- ☐ Sort it as organic waste
- ☐ Undifferentiated garbage
- ☐ Composting
- ☐ Animal feed
- ☐ Anaerobic digestion
- ☐ Incineration
- ☐ Discards on land/at sea
- ☐ Plough-in/not harvested
- ☐ Landfill
- ☐ Sewer
- ☐ Other (please specify): _____

3.10. Taking into consideration the disposal methods indicated in the previous question, please indicate which is, approximately, the total cost (per month) of organic waste disposal in your restaurant, after the introduction of REGUSTO Innovation?

Amount_____ in Euro per month

3.11. Please indicate what are theoretical costs incurred (divided into fixed costs + variable costs) to dispose of the food sold on REGUSTO in case it ended up as waste and needed to be disposed by customers

Fixed costs: amount _____in Euro per month

Variable costs: amount _____ in Euro per month

3.12. Are there new income streams resulting from the REGUSTO Innovation?

- ☐ Yes
- ☐ No

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3.13. If you answered yes to the previous question, please indicate an approximate amount and the type of new income streams.

New income streams, approximate amount per month: _____ (in Euro)

Type of Income streams: (please specify)_____

3.14. Are there new avoided costs resulting from the REGUSTO Innovation?

- ☐ Yes
- ☐ No

3.15. If you answered yes to the previous question, please indicate an approximate amount and the type of avoided costs.

Avoided costs, approximate amount per month: _____ (in Euro)

Type of avoided costs (please specify): _____

3.16. What is the change in the monthly balance (due to additional income or avoided cost) resulting from the innovation?

In total_____%

3.17. Please indicate what has been, approximately, the total cost of implementing the innovation (e.g. additional/new capital investment, labor, training etc.)

Amount_____ in Euro

3.18. Are there new subsidies and/or other monetary benefits received as results of waste reduction after the REGUSTO innovation?

- ☐ Yes
- ☐ No

3.19. If you answered yes to the previous question, please indicate in Euros the subsidies and/or other monetary benefits received as results of waste reduction (specifying whether these are one-off, periodic, fixed or proportional to the quantity of waste)

Amount_____ in Euro

- ☐ One-off
- ☐ Periodic
- ☐ Fixed
- ☐ Proportional to the quantity of waste
- ☐ Other (please specify)

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Now, we ask you to focus on the use of the application during the training period

3.20. How many discounted meals, on average, are sold daily?

Open answer_____

3.21. How much does the selling price of products involved change compared to selling them without innovation? Please indicate a positive variation with "+" (i.e. +5% if the price has increased by 5%) and a negative variation with "-" (i.e. -5% if the price has decreased by 5%

Change: _____%

Now, we ask you some information about the implementation of the innovation

3.22. Is the person in charge of the Regusto implementation different from the respondent to this questionnaire?

- ☐ Yes
- ☐ No

If you answered YES to the previous question, please answer the question below:

3.23. Who in your Restaurant is in charge of dealing with REGUSTO activity/ innovation?

Please indicate the following information

Gender:

- ☐ Male
- ☐ Female
- ☐ Other
- ☐ Prefer not to say

Age: _____

Job Position: _____

3.24. Did your restaurant need to hire new staff to tackle innovation?

- ☐ Yes
- ☐ No

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3.25. Please indicate, disaggregated by gender, the number of Full-Time Equivalent jobs created for (or lost due to) the implementation of the Regusto innovation (if this is only a share of time of one or more employees, please indicate the change in total hours worked

	Number of FTE jobs created	Number of FTE jobs lost	Change in total hours worked
Female			
Male			
Other			

3.26. Please indicate the list of people who have contributed at different tasks related to the innovation (e.g. transferring the product, from making contacts to the delivery of the product) and for each person please indicate gender, company sector and job grade

Open answer _____

3.27. What is the average number (per month) of new buyers (clients or customers if possible by age and gender) with which you came into contact as a result of your involvement in the Regusto innovation?

- ☐ Numbers: _____
- ☐ Type of buyers (open response) : _____

3.28. Do you think there is a willingness to continue the relationship with these new buyers?

- ☐ Extremely unlikely
- ☐ Unlikely
- ☐ Neither likely nor unlikely
- ☐ likely
- ☐ Extremely likely

3.29. Did you have to buy new technological devices to use the Regusto innovation?

- ☐ Yes
- ☐ No, we used the existing devices

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3.30. Which kind of electronic devices do you use to use REGUSTO? (More than one answer possible)

- ☐ Tablet / iPad
- ☐ Computer
- ☐ Notebook
- ☐ Smartphone
- ☐ Other (please specify): _____

3.31. Did you use these devices solely for REGUSTO innovation?

- ☐ Yes
- ☐ No, I also use it for other purposes (please specify the additional purposes:_____)

3.32. How long did you use these devices for each single order?

- ☐ Less than 5 minutes
- ☐ 5-7 minutes
- ☐ 8-10 minutes
- ☐ More than 10 minutes

3.33. How many hours per week are dedicated to use REGUSTO Innovation?

- ☐ Less than 5 hours
- ☐ 6-10 hours
- ☐ 11-25hours
- ☐ 25-40 hours
- ☐ More than 40 hours
- ☐ Other (please specify): _____

4. Your satisfaction towards the innovation

4.1. How would you rate your level of satisfaction with the Regusto Innovation?

- ☐ Very dissatisfied
- ☐ Dissatisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Satisfied
- ☐ Very satisfied

4.2. Please indicate your likelihood of continuing using the Regusto App:

- ☐ Extremely unlikely

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- ☐ Unlikely
- ☐ Neither likely nor unlikely
- ☐ likely
- ☐ Extremely likely

4.3. How much are you likely to promote the use of this app to your partners/friends, family etc…?

- ☐ Extremely unlikely
- ☐ Unlikely
- ☐ Neither likely nor unlikely
- ☐ likely
- ☐ Extremely likely

4.4. What are the features of the innovation you would change or add?

Please specify here your response:

_____

4.5. For each of the following statements, we kindly ask you to indicate your degree of satisfaction by selecting the modality that best represents your position (1 = strongly disagree; 5 = strongly agree):

	Strongly disagree (1)	**Disagree (2)**	**Neither agree nor disagree (3)**	**Agree (4)**	**Strongly agree (5)**
The dashboard of the innovation is good	☐	☐	☐	☐	☐
I like the features of the innovation	☐	☐	☐	☐	☐
The innovation is easy to use for managers	☐	☐	☐	☐	☐

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The innovation is easy to use for kitchen staff	☐	☐	☐	☐	☐

4.6. How difficult was it to start using the Regusto innovation? Please reply below by considering the scale 1 to 5 where 1= very difficult and 5= very easy

Very difficult	Difficult	Neutral: Neither difficult nor easy	Easy	Very easy
☐	☐	☐	☐	☐
1	2	3	4	5

4.7. Considering one week of using the Regusto APP in your restaurant: how often did you contact the Regusto customer service for the app/platform's issues?

- ☐ Every day
- ☐ Three to four times a week
- ☐ Twice a week
- ☐ Once a week
- ☐ Never
- ☐ Other frequency (please specify_____)

4.8. If you contacted the Regusto customer service, have they been able to help you with your problem?

- ☐ Yes, completely
- ☐ Yes, partially
- ☐ No, not at all

4.9. For each of the following statements, we kindly ask you to indicate your degree of satisfaction by selecting the modality that best represents your position (1 = strongly disagree; 5 = strongly agree)

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	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
The Regusto app was important in my activity for reducing FW	☐	☐	☐	☐	☐
The Regusto app was useful for my company	☐	☐	☐	☐	☐
Technological skills (use of mobile app, pc software) have been improved thanks to the use of Regusto innovation	☐	☐	☐	☐	☐
Technical skills (better understanding of how the FSC works) have been improved thanks to the use of Regusto innovation	☐	☐	☐	☐	☐

4.10. Please indicate your degree of satisfaction with the present survey

- ☐ Very dissatisfied
- ☐ Somewhat dissatisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Somewhat satisfied
- ☐ Very satisfied

4.11. Comments and suggestions:

_____

_____

_____

_____

Households

Questionnaire to be used for the survey on consumers/households

I. Information on the use of REGUSTO bag

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1.1. What is the name and location of the restaurant service (restaurant, bar, café, etc.) that supplied you with the Regusto bag?

Name and location (municipality and province):_____

1.2. Which transport did you use for your visit to the restaurant?

- ☐ Walking
- ☐ Bicycle
- ☐ Car
- ☐ Motorcycle
- ☐ City bus
- ☐ Metro/Tram
- ☐ Other (please specify)

1.3. What kind of food did the Regusto bag contain? (possible multiple responses)

- ☐ Appetizer
- ☐ First course
- ☐ Second course
- ☐ Side dish
- ☐ Sandwich
- ☐ Sweet
- ☐ Pizza
- ☐ Other (please specify):_____

1.4. During which meal did you use the Regusto bag?

- ☐ Breakfast
- ☐ Lunch
- ☐ Snack/aperitif
- ☐ Dinner
- ☐ Other (please specify:_____)

1.5. The use of the Regusto bag comes from a take-away meal or from a leftover of a meal consumed in the restaurant?

- ☐ Take away
- ☐ Leftover from a meal in the restaurant
- ☐ Other (specify):_____

1.6. In case it comes from a leftover, what was the main reason that caused it? (only 1 possible response)

- ☐ The portions were too big

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- ☐ I was not hungry
- ☐ I ordered too much food
- ☐ I did not like the meal
- ☐ Other (please specify):_____

1.7. How much food was in the Regusto bag when it was given to you by the restaurant?

Please take a photo and weigh the amount of food in the Regusto bag, just taken from the restaurant, before being consumed. We kindly ask you to take the photo from the top of the bag Regusto at the time of its withdrawal, in order to frame all the bag and the food contained inside.

In total _____ grams

1.8. For how long the food remained in the Regusto bag before being consumed?

- ☐ 6 hours from the time of purchase
- ☐ 6 to 12 hours from the time of purchase
- ☐ 24 hours from the time of purchase
- ☐ I never consumed it again

Where did you store the food remaining in the Regusto bag?

- ☐ in the fridge
- ☐ in the freezer
- ☐ at room temperature
- ☐ other

1.9. After using the Regusto bag, how much was the uneaten food remained in the bag without being consumed?

- ☐ All
- ☐ About half
- ☐ ¼ of the meal
- ☐ Less than ¼ of the meal
- ☐ All the food was eaten

1.10. How many people ate the food in the Regusto bag?

- ☐ 1 person
- ☐ 2-3 people
- ☐ 4-6 people
- ☐ More than 6 people

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1.11. In case a part of the food has not been consumed, please take a photo and weight the amount of food remained in the Regusto bag before throwing it away
In total _____ grams

1.12. In case a part of the food has not been consumed, what was the reason?

- ☐ I was not sure about the hygienic conditions in which I kept it/food safety reasons
- ☐ I forgot it
- ☐ I preferred to eat something else
- ☐ I tried to eat the food that was taken away, but the taste was no longer the same
- ☐ Other (please specify):_____

1.13. Where did you dispose the food that was uneaten from the Regusto bag?

1.14. Please specify if you (and your family) usually carry out any of the following food waste management practices (multiple answers possible):

- ☐ pet feeding
- ☐ home-composting
- ☐ municipal solid waste collection – residual waste bin
- ☐ municipal solid waste collection - organic waste bin
- ☐ other: please specify_____

II. Customer satisfaction section

2.1. Please indicate your likelihood of continuing using the Regusto App:

- ☐ Extremely unlikely
- ☐ Unlikely
- ☐ Neither likely nor unlikely
- ☐ Likely
- ☐ Extremely likely

2.2. How would you rate your experience with the Regusto Innovation?

- ☐ Very dissatisfied
- ☐ Dissatisfied
- ☐ Neutral: Neither dissatisfied nor satisfied
- ☐ Satisfied
- ☐ Very satisfied

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2.3. Please indicate the degree of likelihood of the following questions by considering the scale with 1= not at all aware and 5: extremely/completely aware

(1) Extremely unlikely
(2) Unlikely
(3) Neither likely nor unlikely
(4) Likely
(5) Extremely likely

How much are you likely to promote the use of this app to your partners/friends, family etc…?

☐ Extremely unlikely
☐ Unlikely
☐ Neither likely nor unlikely
☐ Likely
☐ Extremely likely

How much would you be willing to reuse the app?

☐ Extremely unlikely
☐ Unlikely
☐ Neither likely nor unlikely
☐ Likely
☐ Extremely likely

Do you think you saved money from your food purchasing costs thanks to the Regusto innovation?

☐ Extremely unlikely
☐ Unlikely
☐ Neither likely nor unlikely
☐ Likely
☐ Extremely likely

2.4. If you think you saved money from your food purchase costs thanks to Regusto innovation, please indicate how much, approximately, you think you have saved for each Regusto bag purchased.

Amount_____ in Euro

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Do you think this amount met your expectation on food purchase savings through Regusto?

2.5. How difficult was it to start using the Regusto innovation? Please consider the following scale with 1= very difficult and 5 very easy

- ☐ 1. Very difficult
- ☐ 2 Difficult
- ☐ 3 Neither difficult nor easy
- ☐ 4 Easy
- ☐ 5 Very easy

2.6. Please indicate the degree of satisfaction with the survey

- ☐ Very dissatisfied
- ☐ Somewhat dissatisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Somewhat satisfied
- ☐ Very satisfied

2.7 Comments and suggestions:

_____

_____

_____

_____

III. Socio-demographic information

3.1. Gender

- ☐ Male
- ☐ Female
- ☐ Other
- ☐ Prefer not to say

3.2. Please specify your age: _____

3.3. Please indicate your nationality.

- ☐ Italian
- ☐ Other European country (please specify.....)
- ☐ Non-European country (please specify.....)

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3.4. Please indicate your residence

Province: _____

Municipality: _____

3.5. Employment status

- ☐ Permanent employment
- ☐ Fixed-term employment
- ☐ Looking for a job
- ☐ Retired
- ☐ Student
- ☐ Housewife
- ☐ Other professional condition (please specify……)

3.6. Please indicate your level of education

- ☐ Early childhood education ('less than primary') or no education
- ☐ Primary education
- ☐ Lower secondary education
- ☐ Upper secondary education
- ☐ Short-cycle tertiary education
- ☐ Bachelor's or short-cycle degree
- ☐ Master's degree
- ☐ Doctoral/PhD or equivalent level

3.7. Which of the following categories best describes your monthly and familiar NET income?

PERSONAL MONTHLY NET INCOME	NET HOUSEHOLD MONTHLY INCOME
¨ Less than 500 Euro	¨ Less than 500 Euro
¨ 500-1,000 Euro	¨ 500-1,000 Euro
¨ 1,001-1,500 Euro	¨ 1,001-1,500 Euro
¨ 1,501-2,000 Euro	¨ 1,501-2,000 Euro
¨ 2,001-3,000 Euro	¨ 2,001-3,000 Euro
¨ More than 3,000 Euro	¨ More than 3,000 Euro

3.8. Please indicate the number of members (by gender and age if possible) in your family (household size). Include yourself in the calculation

Open numeric answer_____

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3.9. Please indicate if there are children (under 14 years old) in your family and the corresponding age

- ☐ 1 Age:
- ☐ 2 Age:
- ☐ 3 Age:
- ☐ 4 Age:
- ☐ Other (please specify) Age:

Questions to be retrieved from REGUSTO

App compatibility with Android and iOS
Number of downloads
Number of subscriptions after downloads
Who is paying the bag? (consumer/restaurants/provided by Regusto for free)
Has the software provider information to the server capacity? Where is the server located?
How much of the total server capacity is used for the software (in vCPU/CPU in use)?
Which type of CPU is used (e.g. Intel Skylake)

Questions to Households?

Share of users saying that the innovation met their expectations and average rating
Difficulties in starting using the innovation
Use of the app by gender
Share of users that are willing to continue applying the innovation
Share of users that are willing to promote the use of the innovation
How would you rate your level of satisfaction with the Regusto Innovation?
What are the features of the innovation you would change or add?
Which means of transport do you use for your restaurant visit?

For each of the following statements, we kindly ask you to indicate your degree of satisfaction by selecting the modality that best represents your position (1 = strongly disagree; 5 = strongly agree):

	Strongly	**Disagree**	**Neither agree**	**Agree**	**Strongly**

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	disagree (1)	(2)	nor disagree (3)	(4)	agree (5)
The dashboard of the innovation is good	☐	☐	☐	☐	☐
I like the features of the innovation	☐	☐	☐	☐	☐
The innovation is easy to use for managers	☐	☐	☐	☐	☐
The innovation is easy to use for kitchen staff	☐	☐	☐	☐	☐

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