



SISTERS one year towards systemically lowered food loss & waste and towards a more sustainable food system



The SISTERS consortium meets in Naples (Italy) to celebrate the first anniversary General Assembly of the project.

SISTERS is an EU H2020 funded project that aims to design, implement, and promote the uptake of five innovative strategies, one at each stage of the food value chain, to systemically reduce food loss & waste.

GLANCE AT THE FIRST YEAR OF SISTERS WORK TOWARDS FOOD LOSS & WASTE REDUCTION

SISTERS started with a kick-off meeting organised in Zaragoza in November 2021, where all the 18 partners gathered to strategically plan to reach the **project's aim – to reduce food loss & waste along the food value chain, and thus to ensure that the food system is more sustainable.**

In the first year, the partners progressed in the development of innovations, which are foreseen to systemically reduce food loss and waste (by 27.4% as per the case studies). The partners advanced the work towards:

- preventing discarding of produce at production stage which does not comply with the market standards, e.g., due to lower aesthetics,
- preventing food loss at logistics stage which happens due to suboptimal transportation conditions, e.g., humidity and temperature,
- improving the sustainability of the packaging used to preserve food while reducing their potential negative impacts,
- providing consumers more information about the food product for informed choices and behaviour.

Specifically, the advancements in the innovation development were as follow:

At production stage – SISTERS is developing a Short Chain Platform – an open user-friendly platform for European primary producers to directly sell to consumers their fruits & vegetables that do not meet the market standards.

For the development of the Short Chain Platform, firstly the partners conducted a feasibility study to understand the existing technological solutions for produce otherwise discarded and identify the core functionalities to incorporate in the Platform. Subsequently, the partners worked on the specifications and development of the Platform.



Furthermore, work started on building an open-source fruit and vegetable database to help primary producers quickly launch their e-commerce app.

Key outcomes so far: the feasibility study showed that there is a need for a Short Chain Platform on the existing market to allow food producers to easily sell their otherwise discarded produce.

At logistics stage – SISTERS is developing smart containers for improved transportation of bulk and packaged fresh food produce in most optimal conditions.

Work on the development of smart containers started with analysis of sensors which would be a key element of the solution to assure food safety and optimise shelf-life. The analysis focused on sensors that measure key parameters of container conditions, such as temperature, humidity, oxygen, and carbon dioxide. The housing unit for the sensor kit was designed. Also, the communication protocol to connect to the cloud was developed, and different IoT platforms were investigated.

Key outcomes so far: the prototype design of the elements of smart containers was done, namely the sensor kit box, the container size and characteristics, modifications of the lid (considering the sensor kits on the lids) and gas outlets.

At processing stage – SISTERS is developing bio-based packaging materials with optimised recyclable, and compostable properties.

Development of the SISTERS bio-based packaging started with preparation of formulations of flexible and rigid packaging as well as the enzymatic masterbatches (additives) to make the polylactic acid packaging compostable. The relevant partners provided materials as well as prepared compounds and flexible films, trays, and injected jars. Trials with the produced materials started and first material characterisations were done.

Key outcomes so far: all formulations of the bio-based packaging were successfully processed by standard pilot equipment. The enzymatic masterbatch was successfully added to polylactic acid- based materials.

At consumption stage - SISTERS is developing a new QR-based labelling codification that contains vital product information for consumers e.g., its origin and the economic and environmental cost of wasting the product.

Work related to the QR labelling started in month 7 of the project implementation, with the partners investigating the state-of-the-art of consumer perceptions towards bio-based, biodegradable, and compostable packaging and sustainable labelling systems. This allowed for preliminary design of a questionnaire for the consumer online survey on packaging and labelling.

Key outcomes so far: main barriers for bio-based and compostable packaging in Europe were identified (e.g., low consumer knowledge, limited recognition of these packaging) as well as the main recognition aids (logos and claims). The conclusion was that consumers have positive attitudes towards environmentally friendly packaging, yet real behaviour may differ due to other factors.

ENSURING IMPACT OF THE PROJECT DEVELOPMENTS

Along with technological developments, the partners worked on designing strategies and plans for the project's maximised impact. The [SISTERS](#) exploitation plan was developed, outlining the paths for deployment of the project's results. In parallel, the IPR Protection Plan was elaborated, describing the Intellectual Property Rights management procedures and strategies. For systemic action plan, synergies were created with other European projects aiming at innovation in the food system. This was done in the form of established Working Groups where the participants shared their experiences and lessons learnt. The Policy brief and policy report on food loss and waste situation in Europe were prepared. For ensuring effective project visibility, plans were designed for dissemination & communication of the project, and targeted actions began (e.g., [SISTERS EU Green Week's online webinar](#) and the [first annual SISTERS webinar](#) organised by SAFE).

Key outcomes so far: analysis of market conditions for each Key Exploitable Result showed great market potential, while the Freedom to Operate proved that that SISTERS has almost total operational capacity. Connecting with other EU projects has initiated exchanges of lessons learnt. Dissemination and communication campaigns launched proved first interest of the target audiences.



NEXT STEPS FOR THE SISTERS PROJECT

In the coming year, the work on the mentioned [SISTERS](#) innovations will advance in parallel. The first version of the Short Chain Platform is expected to be finished and validated with 100 primary producers testing it, allowing for optimisations. In terms of smart containers, sensor kit for smart containers for bulk produce will be completed, while for packed produce, a prototype will be achieved. Validations of the smart containers will start. For the bio-based packaging, the most promising formulations will be upscaled and tested by the industrial partners. The consumer online survey on packaging and labelling will be launched in six European countries, targeting at least 1,000 respondents. Work on guaranteeing impact and maximised exploitability of the results will continue, with focus on preparation of a preliminary impact plan and a replicability plan, as well as effectively reaching high level stakeholders and policy makers. Targeted dissemination and communication campaigns will be implemented so that the project is widely visible to all parties of interest.

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