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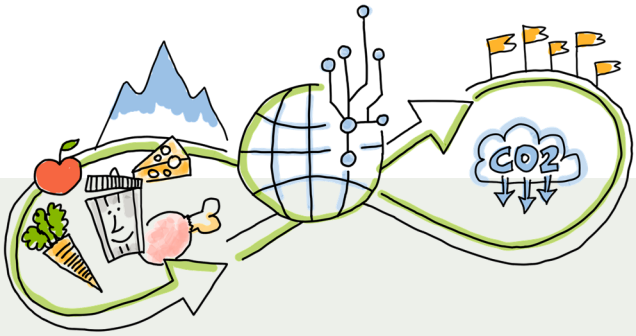

User-Centered Evaluation of FoodCycle.ai: Insights from a Cross-Industry Testing Webinar

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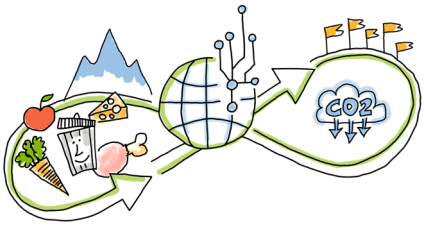

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User-Centered Evaluation of FoodCycle.ai: Insights from a Cross-Industry Testing Webinar

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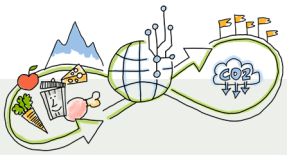
Index



1. Introduction

As part of the Interreg Alpine Space project CEFoodCycle, the digital tool FOODCycle.ai was developed to support the transition towards a circular economy in the food sector. The tool provides innovative, data-driven solutions designed to help reduce food waste, improve resource efficiency, and foster sustainable value chains. It brings together complex datasets and digital functionalities in a user-friendly interface, making it easier for stakeholders across the food system to make informed, sustainability-oriented decisions.

FoodCycle.ai specifically addresses common challenges along the food value chain—such as the lack of transparency in surplus flows, difficulties in identifying suitable redistribution or processing partners, and barriers to efficient communication between stakeholders. The tool helps to bridge these gaps by enabling users to map food surpluses, identify appropriate circular strategies (e.g., redistribution, upcycling, composting), and connect directly with relevant actors. A built-in chatbot, multilingual support, and automatic calculations (e.g., for product quantities) further enhance its usability.

To ensure the tool meets practical needs, the development team employed a multi-step evaluation process with constant feedback loops. An initial mockup testing phase allowed for early user engagement and feedback on the concept and design. Building on this, a live online testing webinar was organized to assess the tool's usability and real-world relevance in a dynamic setting. The session brought together a diverse mix of stakeholders—including food producers, NGOs, policy-makers, IT specialists, and researchers—reflecting the interdisciplinary nature of circular economy initiatives.

During the testing webinars participants were given access to the tool and invited to test the tool freely. Structured feedback was collected through a digital questionnaire focusing on usability, content, and functionality. Additionally, final “lightning rounds” allowed for spontaneous verbal reflections. Observations from the live testing sessions further enriched the evaluation, offering insights into user behavior and potential areas for improvement.

The initial feedback confirmed the practical relevance of core the core features. However, several areas for improvement were also identified. This report presents a detailed account of the evaluation methodology of an online AI-Decision-Making-Tool, summarizes key findings from the testing phase, and explores how tools like FoodCycle.ai can play a pivotal role in the digital transformation of circular food systems. By providing a platform that supports real-time decision-making, stakeholder networking, and strategic planning, FoodCycle.ai demonstrates how digital innovation can contribute meaningfully to sustainable resource management and the prevention of food waste—both within the Alpine region and beyond.

2. Methodology

The overall testing methodology of FoodCycle.ai followed a sequential and iterative development process, starting with initial mock-up testing and concluding with the final evaluation of the near-complete tool. Throughout these stages, continuous coordination and feedback exchange between developers, regional hub coordinators, and testing teams ensured that insights were rapidly integrated and aligned across all hubs.

2.1 Preparatory Mock-Up Testing

Before conducting the final testing of the functional foodcycle.ai tool, an initial mock-up testing phase was implemented to validate the conceptual design and identify user requirements. This phase served as an essential methodological foundation for the later development and testing of the operational prototype.

The mock-up testing took place in two stages in June / July 2024. First, project partners tested a clickable prototype and provided feedback through Google Forms, written comments, and discussions in joint meetings. The focus was on evaluating the clarity of the concept, the structure of the user journey, and the general usability of the proposed interface.

In a second step, stakeholders from the regional Food Hubs participated in interactive webinars to review the mock-up. Sessions were held in four regions (Salzburg/Bavaria, South Tyrol, Piedmont, Nice), with a total of more than 40 participants representing SMEs, producers, processors, waste-management actors and NGOs. The webinars allowed users to walk through the tool step-by-step and give direct input.

The mock-up testing provided valuable insights into user needs, confirming that the core concept of connecting surplus providers with solution providers was clear and relevant. At the same time, it highlighted areas requiring refinement, such as clearer onboarding, more specific product categories, improved visual consistency, and expectations for additional functions (e.g., matching, geolocation, data export).

2.2. Tool Testing

Following the initial mock-up testing carried out in 2024, the development of foodcycle.ai progressed substantially. By mid-2025, the tool had evolved from a conceptual prototype into a functional, responsive online application capable of generating real environmental impact data and providing end-to-end user guidance. Although still in development and requiring further data enrichment and minor refinements, the tool was fully operational and ready for structured pilot testing with real users.

Purpose and Testing Approach

The final testing phase followed the piloting strategy paper developed in Periods 4 and 5. The purpose of this testing was to evaluate the performance of the functional tool under real-world conditions, verify whether user requirements were met, and generate evidence for final improvements before the public launch.

Testing Objectives

The testing approach focused on four main objectives:

- Validation – Confirm that the implemented core functions (input forms, matching logic, environmental indicators, navigation) work reliably and meet user expectations.
- Feedback Collection – Gather structured and open user feedback to assess usability, clarity, and overall usefulness.
- Risk Mitigation – Identify potential technical, conceptual, or user-interface issues before further scaling and dissemination.
- Performance Evaluation – Observe how stakeholders use the tool in practice, including data entry behavior, interaction with LCA-outputs, and understanding of recommendations.

Testing Webinars

The pilot phase took place in three selected Food Hubs—Salzburg–Bavaria, South Tyrol, and Piedmont—reflecting both geographical diversity and the varying structures of regional food systems. In each region, at least one to two stakeholders were invited to participate in interactive online webinars.

During the webinars, participants accessed the tool directly on their own devices and were guided step-by-step through the main functionalities, including registration, input of surplus data, interpretation of solution suggestions, and review of environmental outputs. Regional project partners moderated the sessions, answered questions, and facilitated real-time discussions on usability and functionality.

Data collection

Evaluation was carried out through three complementary channels:

- Observational insights gathered during live walkthroughs
- Verbal feedback provided in open discussion rounds
- Structured Google Forms questionnaire, capturing user impressions regarding the clarity of the concept, intuitive interface, usefulness of LCA results, and perceived relevance of proposed solutions

The combination of guided interaction and structured evaluation provided a nuanced understanding of how different user groups—from SMEs and NGOs to researchers and public public institutions—engaged with the tool.

Webinar Dates

The final testing sessions took place on:

- 29 April 2025 Piedmont Food Hub
- 20 May 2025 Salzburg–Bavaria Food Hub
- 30 May 2025 South Tyrol Food Hub

Participants

Across all three regions, the testing involved a diverse group of stakeholders, including:

- Food producers
- Retailers
- NGOs
- Academic institutions
- Business support organizations
- Public authorities

This broad participation ensured that the evaluation reflected a wide spectrum of practical needs and expectations within the food sector.

Key Insights

The insights gained from this piloting phase served as an important contribution to the refinement of foodcycle.ai. They helped identify both strengths—such as the intuitive interface, multilingual functionality, and effective chatbot support—and areas requiring further development, particularly regarding data completeness, regional relevance, and enhanced user guidance. The final testing thus represented a crucial step in ensuring that foodcycle.ai evolves into a robust and user-centred tool capable of supporting circular food systems in the Alpine region and beyond.

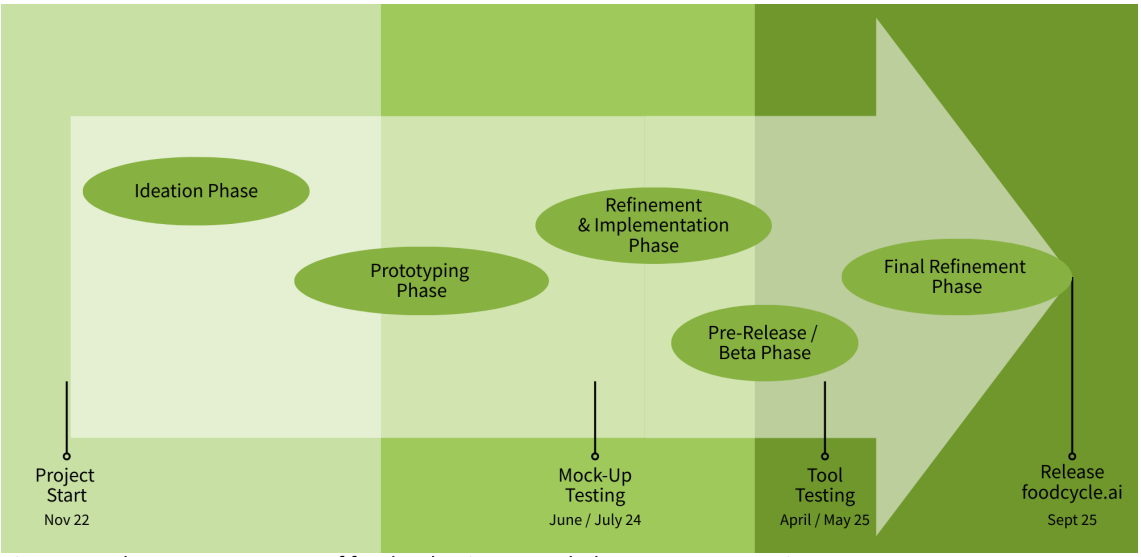


Figure 1: Delevopment process of foodcycle.ai © Umweltcluster Bayern, Manis

3. Results

3.1 Positive Aspects

Participants highlighted several strengths of FoodCycle.ai during the testing sessions. The interface was praised for its intuitive design and marked improvement compared to the earlier mock-up. The multilingual functionality, allowing users to switch seamlessly between German and English, was noted as particularly valuable, while participants suggested that further languages such as Italian or French could increase accessibility for smaller organizations and NGOs in the Alpine region.

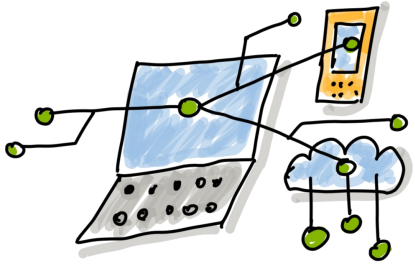
The integrated chatbot was described as helpful and responsive, supporting users during navigation, and the automated calculations, such as quantity adjustments, were seen as accurate and highly practical. Testers also appreciated the inclusion of correct contact information, facilitating direct communication with relevant stakeholders. NGOs in particular valued the tool's ability to provide quick, practical solutions for managing surplus products. Finally, the visual design stood out for its clear layout, user-friendly buttons, and logical page structures, all contributing to a highly practical and pleasant user experience.

3.2 Areas for Improvement

Participants also identified several areas for improvement across content, structure, and user guidance. Regarding content and data, missing product categories such as coffee grounds, wool, and feathers, as well as incomplete product details—such as packaging, freezing requirements, or alcohol content—were noted as limitations. The lack of quality indicators for products was highlighted as a particular challenge for donation-based users who rely on this information for decision-making. Additionally, disposal solutions and relevant partners were missing, and some suggested solutions appeared too generic or not regionally relevant, reducing the tool's practical applicability.

In terms of structure and navigation, participants mentioned the risk of user overload due to the high number of available options. The absence of interactive functions such as PDF exports or clearly defined next steps, the lack of tooltips or info icons, and some non-responsive UI elements were seen as barriers to efficient use. Important content was sometimes positioned too far down the page, increasing the likelihood of being overlooked. With respect to language and internationalization, participants emphasized the importance of robust multilingual support, noting that English-only fields could present barriers for smaller NGOs and businesses.

Finally, participants suggested several ideas for further development, including best-practice examples or a blog, short tutorial videos, an expanded "About" section, a standalone user handbook, and enhanced contact options such as a form or live chat to support ongoing guidance and engagement.



4. Discussion

The feedback gathered during the webinar highlighted strong acceptance of FoodCycle.ai's core concept and demonstrated that the application already performs well in practical use. These features proved essential for accessibility and user satisfaction, particularly for NGOs and SMEs. The tool provides quick, practical solutions for managing surplus products, demonstrating its relevance in real-world workflows.

At the same time, the results indicate that further refinements are needed to fully align the tool with user needs. Key development areas include content completeness, product specificity, and the regional accuracy of solution providers. Clear onboarding and practical support—such as tutorials, tooltips, and export options—were highlighted as essential for SMEs and NGOs. Alongside this, ensuring regional relevance of solutions remains a key priority for the next development phase.

Language and internationalization were highlighted as additional considerations: while the tool's current multilingual support facilitates use across German- and English-speaking users, the addition of further languages, such as Italian or French, could enhance accessibility for smaller organizations in other regions.

Overall, the testing confirmed the relevance and potential impact of FoodCycle.ai, while also underscoring the need for continuous iteration. Enhancing content accuracy, regional relevance, and guided user interaction will be key to maximizing practical usefulness, user satisfaction, and the tool's contribution to circular food system solutions. A key success factor was the permanent exchange between developers and testing teams, as well as cross-hub coordination. This collaborative feedback loop allowed for quick adjustments and consistent progress across regions.

5. Conclusion

The final testing phase of FoodCycle.ai marked a significant milestone in the tool's development. By combining structured digital questionnaires, live walkthroughs, and open discussions, the testing provided actionable insights that now guide the next iteration of the platform.

Engaged participation from a diverse range of stakeholders—including NGOs, producers, retailers, public bodies, and sustainability experts—ensured a broad perspective on the tool's potential and relevance. This multidimensional input has helped to shape a roadmap for ongoing improvements and confirms that co-creation and iterative testing are essential to developing user-centered solutions.

Today, FoodCycle.ai is fully operational and accessible online, offering a stable, user-friendly platform that performs smoothly across different contexts and user groups. The development phase is now complete, and the tool is ready for broader use, providing immediate practical value to organizations looking to optimize resource flows and reduce food waste.

Overall, FoodCycle.ai demonstrates strong promise as a digital solution for supporting circular food strategies, and its successful completion underscores the importance of stakeholder engagement, iterative refinement, and practical testing in creating impactful, user-centered tools for sustainable food systems.

6. Acknowledgements

We would like to express our sincere gratitude to all participants of the FoodCycle.ai testing webinar. Your time, thoughtful feedback, and constructive suggestions have played a crucial role in shaping the further development of the tool. The diverse perspectives you brought—from NGOs and food producers to policy-makers and digital experts—enriched the evaluation process and underlined the importance of co-creating digital solutions that are grounded in real-world needs.

A special thanks goes to our partner FHS IT, whose dedicated efforts in organizing, coordinating, and facilitating the webinar made this valuable exchange possible. From the initial planning stages to the smooth technical execution and post-event follow-up, their professionalism and commitment ensured that the webinar could serve as a meaningful milestone within the CEFoodCycle project.

This collaborative effort is a testament to the strength of cross-sectoral and cross-border cooperation in the Alpine region—and a reminder that transformative change in the food system can only be achieved through shared knowledge, mutual learning, and open dialogue.

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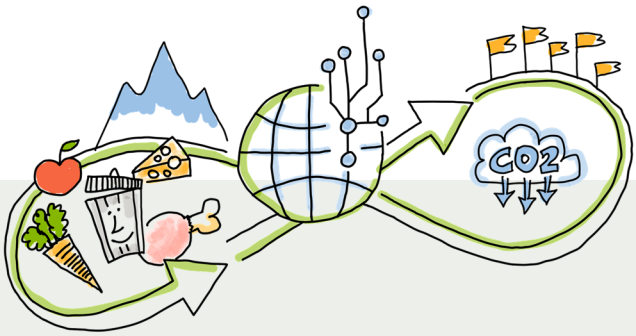

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