
**MEASURING, PREVENTING AND REDUCING
FOOD WASTE GENERATED IN A CAFÉ**

*PRESENTATION OF A PROJECT
IMPLEMENTED IN CITY LAB IN 2023-2024*



Vilnius, December 2024

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WHO WE ARE AND WHY WE CARE ABOUT FOOD WASTE?

[City Lab](#) is a sustainable and environmentally friendly educational community centre located in Vilnius. The main objectives of City Lab are to bring together and activate the surrounding community and to contribute to the dissemination of ideas for a more sustainable and environmentally friendly lifestyle.

The main source of income for City Lab is a community café. The café is open six days a week, employs 12 staff members, including one cook and one kitchen manager working directly in the kitchen (as of November 2024), and has an annual turnover of €339, 418 (the 2023 data). The kitchen concept is comfort food (cosy, seasonal, home-like, large portions). The kitchen is subject to the same requirements as the centre's entire activity: to operate in an environmentally friendly mode and follow eco-friendly ideas.

The main factors that prompted us to measure food waste and find solutions to prevent and reduce it were the following:

- the need to reduce café costs - food, energy, labour, waste management and other costs, which are rising annually due to inflation;
- the desire to fulfil the organisation's sustainability objectives, as social, environmental and economic sustainability is a priority for the organisation.

As part of our environmental mission as of a laboratory, we aimed to implement a demonstration-educational project, an experiment open to the public.



We have already implemented a number of sustainable initiatives in our organisation, more details on which you can find here: [Secondary interior design, solar modules, grey water reuse, waste sorting, composting; educational garden, outdoor beds, DIY playground; hydroponic garden.](#)

WHAT WERE THE OBJECTIVES OF INTRODUCING A NEW ORGANISATIONAL PROCESS – MEASURING, PREVENTING AND REDUCING FOOD WASTE?

We have been interested in the management of unconsumed food and food waste in catering establishments for a long time, and have implemented innovative solutions that have had a significant qualitative impact, such as food donation and food waste composting. We had extensive experience in the organisation of café operations, the micro-enterprise situation was a natural incentive to save money, and the chefs in charge intuitively avoided wasting food in their daily work. It was, therefore, not entirely clear – is there really anything else we can save on in our café operations? The random manual measurement of food waste and its incomplete data did not give us any insight into where and how to save.

When we decided to introduce a new organisational process in our café - food waste measurement, prevention and reduction - with the encouragement of the European Union investment, we drew on publicly available information on the results of catering establishments that had implemented this process, and set ourselves the following objectives:

1. reducing food waste by 50% (food waste must be 10% of food purchased);
2. reducing the value of food waste by 8 percentage points (the value of food waste must be 7 % of the value of food purchased).

HOW DID WE MEASURE FOOD WASTE IN OUR CAFÉ?

To prepare for the measurement, prevention and reduction of food waste, the following key activities were first implemented in 2023:

- we planned, tested and implemented smart [technical solutions](#);
- we designed, tested and implemented innovative [organisational solutions](#).

In preparation, we clearly saw that measuring food waste would be an essential part of the new organisational process, part of our regular daily activity that would provide detailed and accurate information on which to base future decisions.

Here are the key details of our café's food waste measurement in 2023-2024:

Measurement and data monitoring equipment: smart scales with software



Measurement period:

01-01-2023 – 30-04-2023: Manual measurement to prepare for automated measurement

01-05-2023 – 29-10-2023: Automated measurement with smart scales for testing, improvement, and training of staff

30-10-2023 – 30-11-2024: Automated measurement, the data for which are presented in this report

Data collection:

Data on food waste were collected in the following sections:

1. All food waste was recorded according to its place of generation (kitchen food waste and customer plate leftovers).
2. Kitchen food waste was recorded according to four other criteria:
 - *nature (food produced and raw materials)*
 - *the reason for throwing away the food (seven reasons identified)*
 - *place of generation (kitchen or bar)*
 - *where the leftover food will go (donation, compost, trash)*
3. Customer plate leftovers were only recorded by total weight
4. Food waste data was expressed in monetary value (€), weight units (kg) and transactions¹
5. The application recorded data on food purchased (monetary value, €) and the number of food orders (pcs).

Measurement method and periodicity:

Food waste generated in the kitchen was collected by kitchen staff in designated containers on a daily basis.

At the end of the day, food waste was weighed using a smart scale.

The food waste information was recorded [in seven standardised steps](#) on a tablet screen.

The customer plate leftovers (total amount) were weighed by the customers, if they wished, or by the service staff.

Data processing and presentation of results:

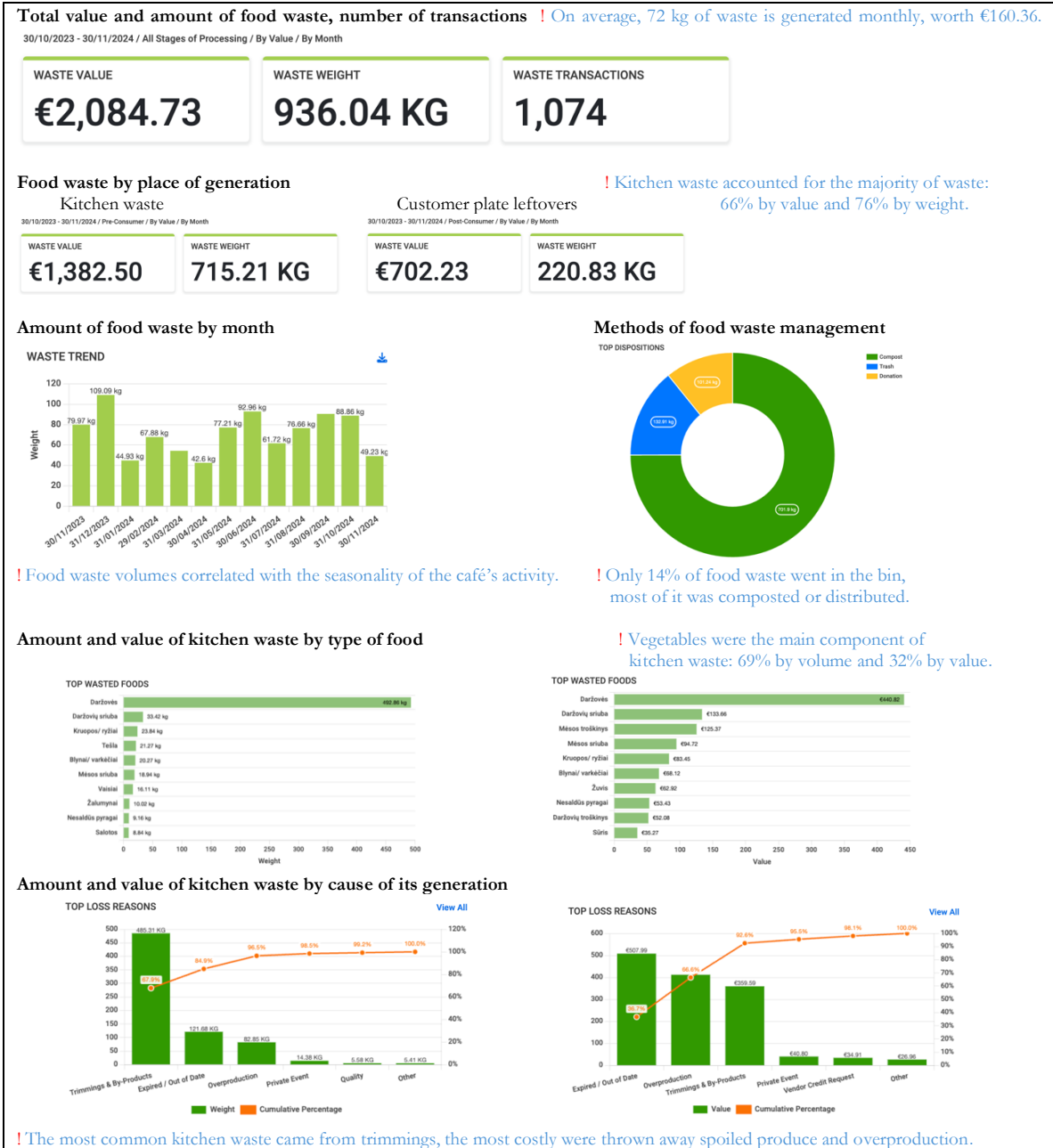
The data were processed and systematised and the results were presented in a smart scale computer application.

¹Transaction means the number of weigh-ins of food waste. The indicator allows us to monitor whether food waste is regularly weighed.

WHAT DOES LONG-TERM FOOD WASTE MEASUREMENT TELL US?

Accurate and continuous measurement of food waste has broadened our horizons and our understanding of exactly how much food waste our café generates and where we need to focus our efforts.

Here are the statistics recorded in our café for the period from 30-10-2023 to 30-11-2024 (13 months in total):



Compared to the value (€62,337) and volume (10.2 t) of food purchased between 30-10-2023 and 30-11-2024, food waste in our café accounted for 3.3% of the value of food purchased and 9.2% of the volume of food purchased. In terms of the average catering establishments, the value and volumes of food waste in our café were very low.

HOW HAS OUR CAFÉ'S DAILY ROUTINE CHANGED?

Referring to the data on the volume and causes of food waste, and in consultation with food technologists and kitchen staff, we introduced the following simple changes to prevent and reduce food waste in our café, which have led to significant results:

Customer plate leftovers prevention and reduction strategy

1. Management of portion sizes:
 - several portion sizes are offered to customers, and the smart cash register system allows them to choose the desired extras (sauces, salads, bread, etc.) for an additional fee;
 - a discussion between the waiter and the customer is encouraged to assess the customer's expectations (how much and what kind of food they would like);
 - the customer is encouraged to take any uneaten food with them in a reusable deposit box.
2. Optimisation/adaptation of the menu:
 - the café's menu is regularly reviewed against the customer's plate leftover data and inadequate portion sizes or unpopular dishes are identified;
 - customer needs are assessed through a smart cash register report, i.e. which add-ons are not preferred by customers and are therefore not worth further cooking and serving;
 - a discussion between the waiter and the customer is encouraged to find out the reasons for leftovers on the plate;
 - daily brief discussion with waiters, and dishwashers to identify where most of the leftovers have occurred and, if possible, why (too large portions, unpopular, unhealthy, unpalatable, etc.).
3. Publicising of the results:
 - weekly update of the amount of food waste generated in the cafeteria is displayed in the customer lounge;
 - customers can weigh their uneaten food themselves using a smart scale and find out the financial and environmental value of these leftovers;
 - information on food waste problems and solutions is made available on the spot via information boards on the tables;
 - we share information on food waste and solutions on our social networks and other media.

Kitchen food waste prevention and reduction strategy

1. Monitoring of kitchen waste from cutting and peeling of food (not everything is waste):
 - waste is sorted in separate containers, separating those the content of which can still be used (e.g., for broth, vegetable powder, etc.);
 - encouragement to continuously improve cutting skills;
 - in certain situations, buying already cut, partially prepared foodstuffs if this is more cost-effective and avoids large quantities of waste.
2. Proactive actions to prevent expired products and spoiled food:
 - communication with suppliers to ensure proper supply management and quality of food products;
 - daily inventory of food products;
 - small daily menu (five dishes);
 - flexibility in menu planning to allow quick adaptation of available foods;
 - the use of a 'use first' shelf in the kitchen, where food is arranged in such an order that it is clear which food is to be used first (based on its shelf life);
 - foods are properly packaged, labelled, dated and frozen.

The smart scales computer application facilitated the planning and use of measures to prevent and reduce food waste by (1) capturing prevention targets and assessing indicators of achievement; (2) providing a realistic and comprehensive daily monitoring of the food waste situation; and (3) visualising structured data (e.g. through a priority matrix), which facilitated the identification of prevention opportunities.

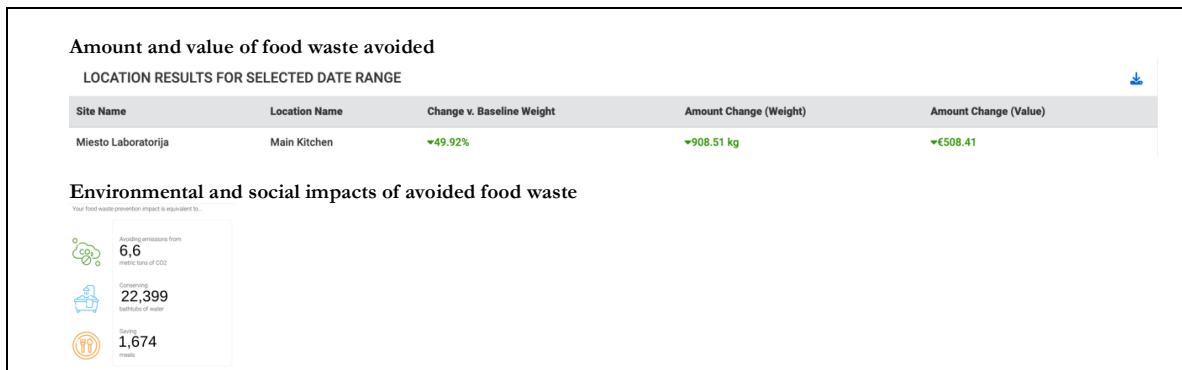
WHAT RESULTS HAVE WE ARCHIEVED?

The smart scales application estimated the volume of food waste avoided (kg) and its economic value (€), as well as its environmental value (in terms of CO2 emissions, fuel and water) and its social value (in terms of food portions) in equivalent terms.

The amount and value of food waste avoided were calculated based on the ratio of food waste generated to the baseline. The baseline is the average amount and value of food waste recorded before starting food waste prevention targets. The baseline for our café is 14 kg of customer plate waste per week with a value of €15 and 21 kg of kitchen food waste per week with a value of €33.

The food waste measurement data showed that there is potential for savings even in our micro-enterprise café. In the period from 30-10-2023 to 30-11-2024, we avoided more than 0.9 t of food waste. In 13 months, we managed to reduce waste by almost 50%! This saving, in terms of the environmental and social value created, meant that 6.6 metric tonnes of CO2 emissions were avoided, water equivalent to over 22,000 baths was not used, and 1,674 portions of food were not thrown away². For our café, these are impressive figures! Meanwhile, the financial savings (more than €500) have allowed us to partially absorb the price rises due to inflation.

The following are the quantities, value and impact of avoided food waste recorded in our café for the period from 30-10-2023 to 30-11-2024 (13 months in total):



How did we manage to achieve the goals we set at the beginning of the project? In the period between 30-10-2023 and 30-11-2024:

1. we reduced food waste by 50% (food waste accounted for 9.2% of food purchased);
2. we reduced the value of food waste by 1 percentage point (the value of food waste represented 3.3% of the value of food purchased).

WHAT WERE THE MAIN CHALLENGES WE FACED?

The biggest challenges for our organisation have been in the following areas:

1. **The length of time it took to implement a process to measure, prevent and reduce food waste.** It took more than half a year to select, purchase and install the equipment, including planning, testing, and improving of the organisational processes and training of staff. The customisation of the software for the smart cash register system and the smart scales to the specifics of the café was labour- and time-intensive (we had to enter a large amount of information about the café's activities, and programming work had to be done). It also took time to build up the new skills for the team. The chefs and staff were new to measuring food waste and did not always weigh accurately and correctly, or forgot to weigh the waste, which resulted in inaccurate data for quite some time. As a result, we had the baseline later than expected.
2. **Continuous motivation of the team.** As cooks, waiters or managers changed, it was necessary to re-train staff on how to use the smart cash register and smart scales. The training process was facilitated by short and clear instructions we created. Meanwhile, motivating staff to engage in the new process of measuring, preventing and reducing food waste, and creating a sense of purpose, was a much harder

² In this way, we have contributed to the United Nations Sustainable Development Goal 12.3 to halve global food waste and food loss by 2030.

task. To increase motivation, we used proven tools such as giving team members access to the software with data, routine discussion of the café's results with the team, as well as active media communication by the managers to publicise the new process and results (employees were more eager to accept new things that received a high level of positive public interest).

3. **Not all the preventive solutions introduced were financially beneficial.** The implementation of one of the solutions to prevent customer plate leftovers, the possibility to choose the portion size of a very popular dish or to buy a single portion to share, resulted in almost no leftovers of this dish but a significant decrease in its overall sales. This situation showed that preventive menu decisions need to assess their impact in the long term and correctly determine the pricing of the dishes and the necessary actions to compensate for the expected drop in sales.
4. **What shall be done next?** The decision on the further investment needed to ensure that the process is in place at the end of the project will be taken by the owners of the organisation after they assess the results of the financial year, the suppliers' financial proposals for the coming year and the availability of financial support.

WHAT NEW OPPORTUNITIES HAVE WE DISCOVERED?

The project has given us new ideas and stimulated new activities, such as:

1. We have implemented changes related to healthier diets, shorter food supply chains, reducing packaging waste (e.g. reducing sugar in meals, expanding our cooperation with local suppliers, replacing a significant part of the food imported from abroad with local produce).
2. We implemented a social project on food donation. In cooperation with the local authorities and nearby restaurants, we set up a [Community Fridge](#) for donated food. The food comes from nearby catering establishments or residents and can be taken from the fridge by anyone who wants to.
3. We have shown leadership, openly sharing our experience with businesses, government agencies, cookery schools, international partners and the media. Food waste measurement and prevention solutions were presented on our social networks, on Lithuanian National Radio and Television, at events organised by associate business structures, and in working meetings with stakeholders. These activities have strengthened our reputation as a sustainable and socially responsible organisation.
4. We have directly educated our clients. To involve as much of the public as possible in the experiment, we took the unconventional decision to place the smart scales in the customer lounge. Customers were able to weigh their uneaten food themselves using smart scales and find out the financial and environmental value of these leftovers. Children were particularly interested in this activity.

OUR CONCLUSIONS AND SUGGESTIONS

For catering establishments

The statistics we received proved that the new organisational process we have put in place - the measurement, prevention and reduction of food waste - is beneficial for our café in every sense: economic, social, environmental and even reputational. The process has changed the way our team thinks and behaves, as well as the culture of our kitchen. Food waste prevention has become a priority for our organisation, and food waste data is one of the most important indicators of kitchen efficiency. Food waste prevention has partly absorbed the increase in the cost of food, electricity and waste management services. Our smart technology-based food waste management process gave us timely, accurate, structured and easy-to-understand data that enabled us to

set targets, monitor our progress, and respond proactively and quickly to problems. And most importantly, thanks to this technology, we were able to ensure the long-term viability of the new process.

The results of the cost-benefit analysis showed that the financial savings did not compensate for the investment required for smart technologies (e.g. in our case, the investment for smart scales averages €5,300 per year). This situation is largely due to the relatively small size of our café (in terms of the value of food purchases, which is around €60,000 per year). Although we have reduced food waste by almost 50% in 13 months, the financial value of these savings is relatively small compared to the investment required. Environmental and social incentives are therefore the main motivators for us to continue this activity.

For politicians and decision-makers

The project has shown that even micro-enterprises have the potential to achieve significant food savings in their operations, but that an automated, smart-technology-based process for measuring, preventing and reducing food waste may be too costly for them to implement, and that environmental and social incentives alone may not be enough.

We believe that financial support could be the first incentive for small and micro-sized catering establishments to implement similar food waste measurement, prevention and reduction processes. It should be noted that introduction of such a process requires financial support not only for smart equipment, but also for specialist advice and staff training. Such financial support would also encourage digital and green transformation of companies.

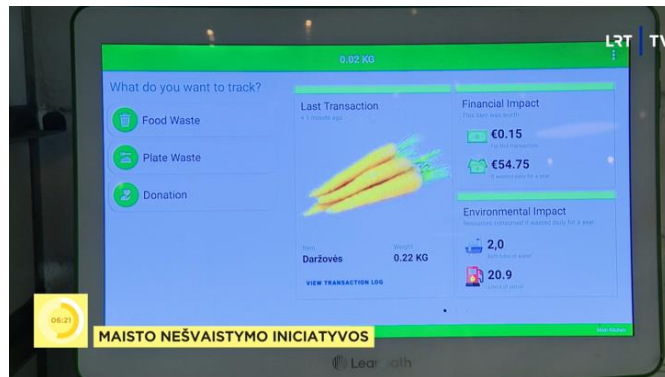
Other important complementary incentives for enterprises are the publicity given to companies' "best practices" and the implementation of public education campaigns. During the project, we have seen a great interest in new solutions for food waste prevention from both businesses and the media.

For every member of society

We don't need a handful of people doing zero waste perfectly. We need millions of people doing it imperfectly.
[Anne Marie Bonneau, Zero Waste Chef](#)



The table we put on the tables for our customers



The calculations the customers see when they weigh their plate leftovers

Ordered today and didn't finish your portion? What if you do this all year round? Have you thought about how much money, water and fuel will be wasted? For example, just 220 grams of vegetables left on a customer's plate and thrown in the trash is worth only 15 cents. However, if this goes on for a whole year, the monetary value of the waste is already €54.75, while the environmental value is two (2) baths of water and 20.9 litres of petrol.

We call on you to be responsible both in your kitchen and when visiting your favourite cafés and restaurants, and to demand the same of these caterers.