



FOOD WASTE FLOW BALANCE

Web application users' guide
<http://95.110.171.18:9335/life-foster/>
(at the moment for the in itinere monitoring)

www.foodwasteflowbalance.eu/life-foster/



FOOD WASTE FLOW BALANCE (FWFB)

Is the web application developed through the **LIFE FOSTER** project by the **University of Gastronomic Sciences** with the technical support of **DGS** for the digital development.

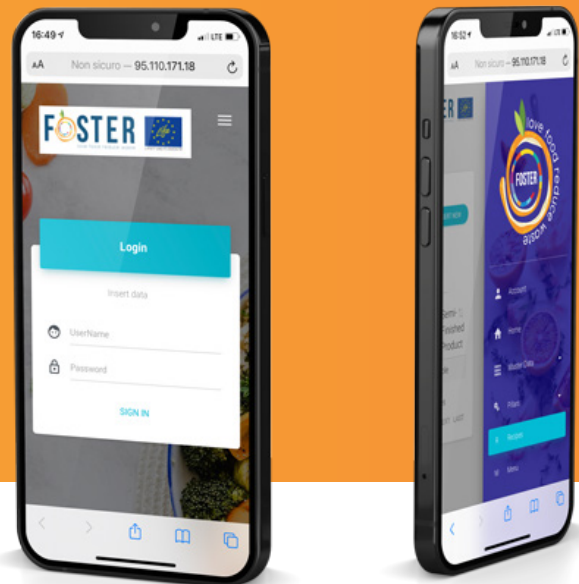
WHAT IS THE PURPOSE OF FOOD WASTE FLOW BALANCE?

This innovative tool allows restaurant owners and VET trainers to quantify the food waste that is generated from their work, both for catering activities and restaurants. Thanks to the application, it is possible to create a personalized profile for tracking the entire work process, including preparation, from the storage of raw materials to the execution of the recipe and the final dish. The app also allows you to monitors its trend over time.

HERE ARE SOME OF THE MAIN FUNCTIONS OF THE WEB APPLICATION:

- Quantifying food waste and its value during all phases (receipt and storage of goods, food preparation, cooking and service);
- Classifying and quantifying food waste according to the category of the product;
- Measuring the proportions of edible and non-edible waste;
- Measuring energy and water consumption associated with the preparation;
- Comparing different menus/meals in terms of waste production;

Let's get hold of useful elements to design effective solutions and create awareness on the food value and strengthen the engagement within the staff!



Login

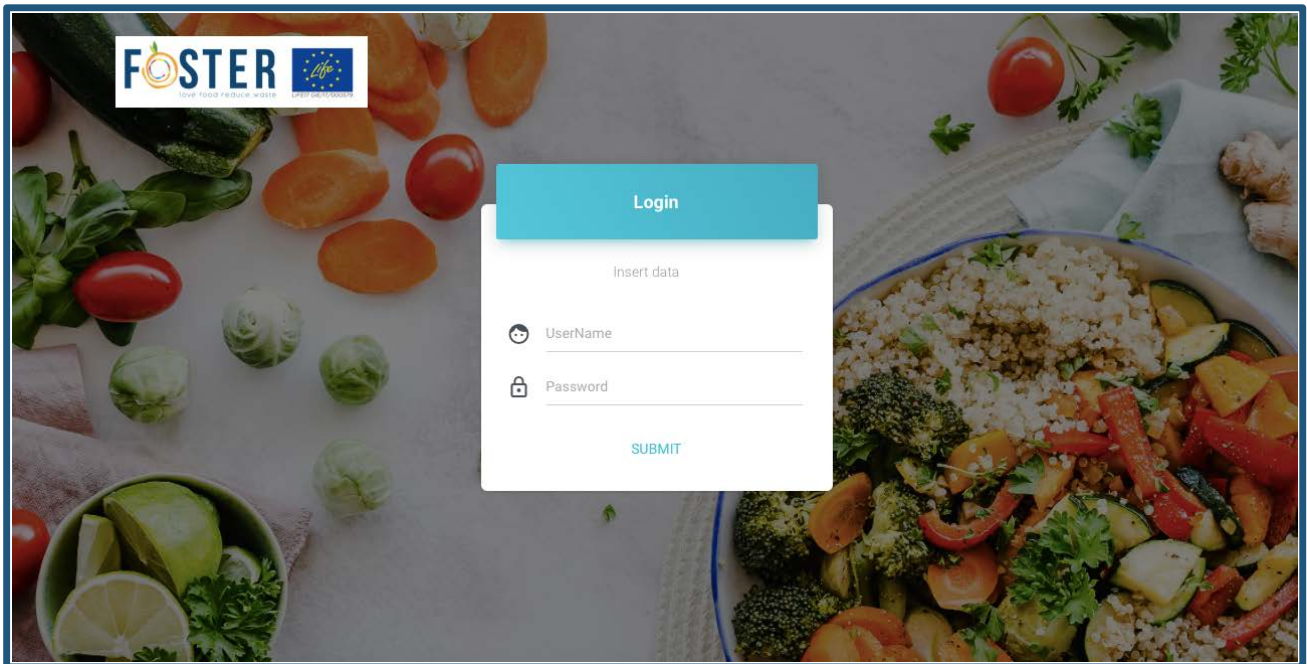


Fig.1 Login screen

Each training center/restaurant can access to the Food Waste Flow Balance web application by inserting the assigned username and password. It would be possible to change the assigned password.

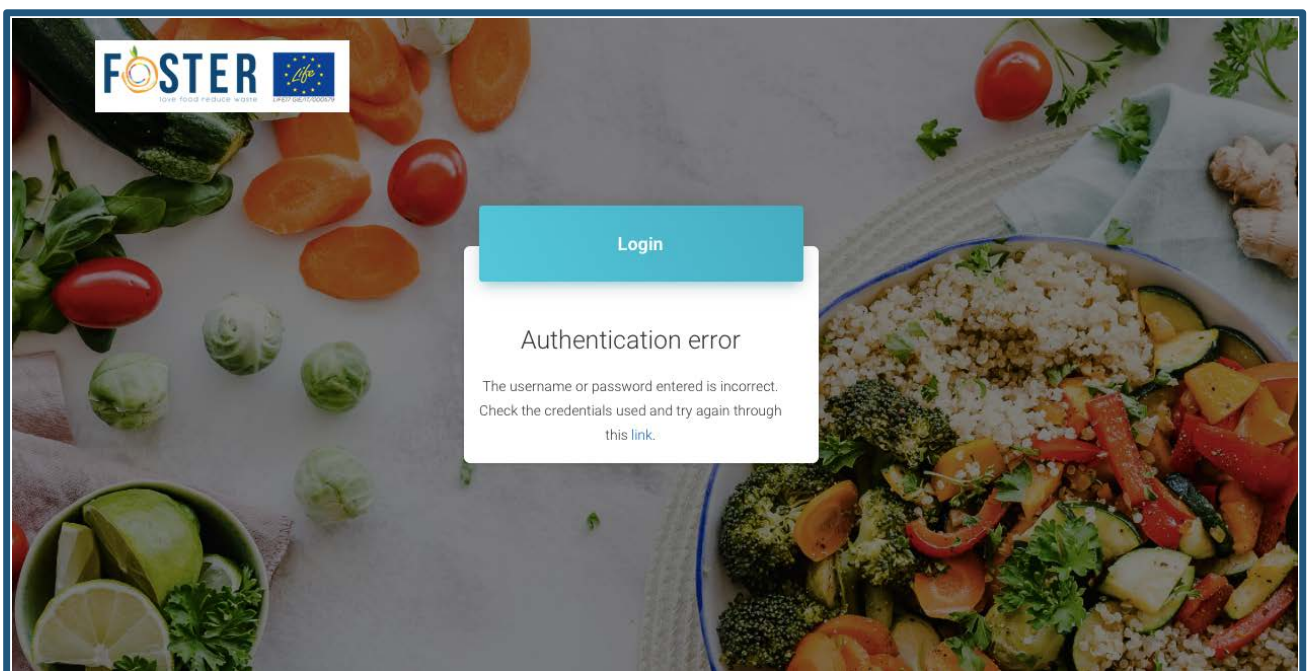


Fig.2 Authentication error screen

If the username or password entered is incorrect, please check the credentials used and try again by clicking on the link.

Homepage

At the Homepage there's a description of the FWFB application and its main purposes. On the left you can access the main menu of the application (Fig.3). The items in the menu (Master Data, Usage Data, Dashboard, User Data) will open in cascade (Fig.4). It is possible to enlarge the view by clicking on the three dots in the white circle at the top left (Fig. 5). On the right side, by clicking on the men-icon you can see the username and its structure of reference (Fig.3).

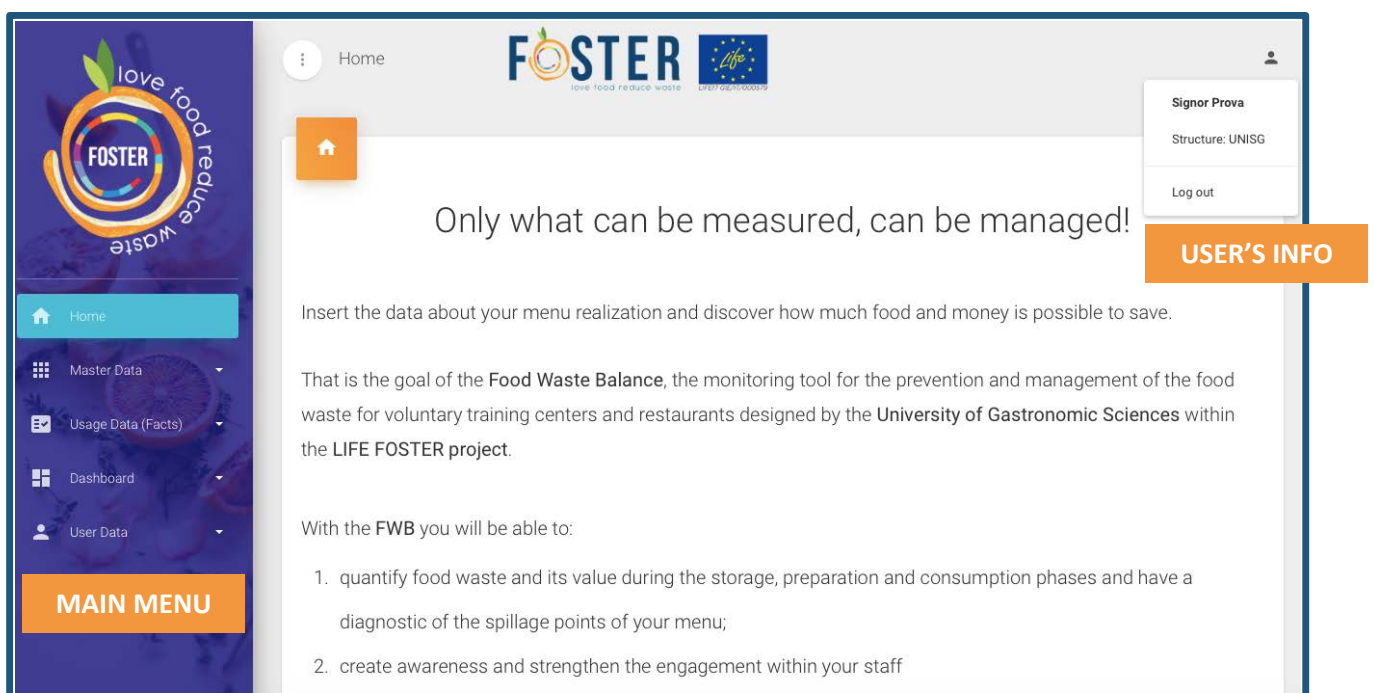


Fig.3 Homepage + menu visualization and user's info

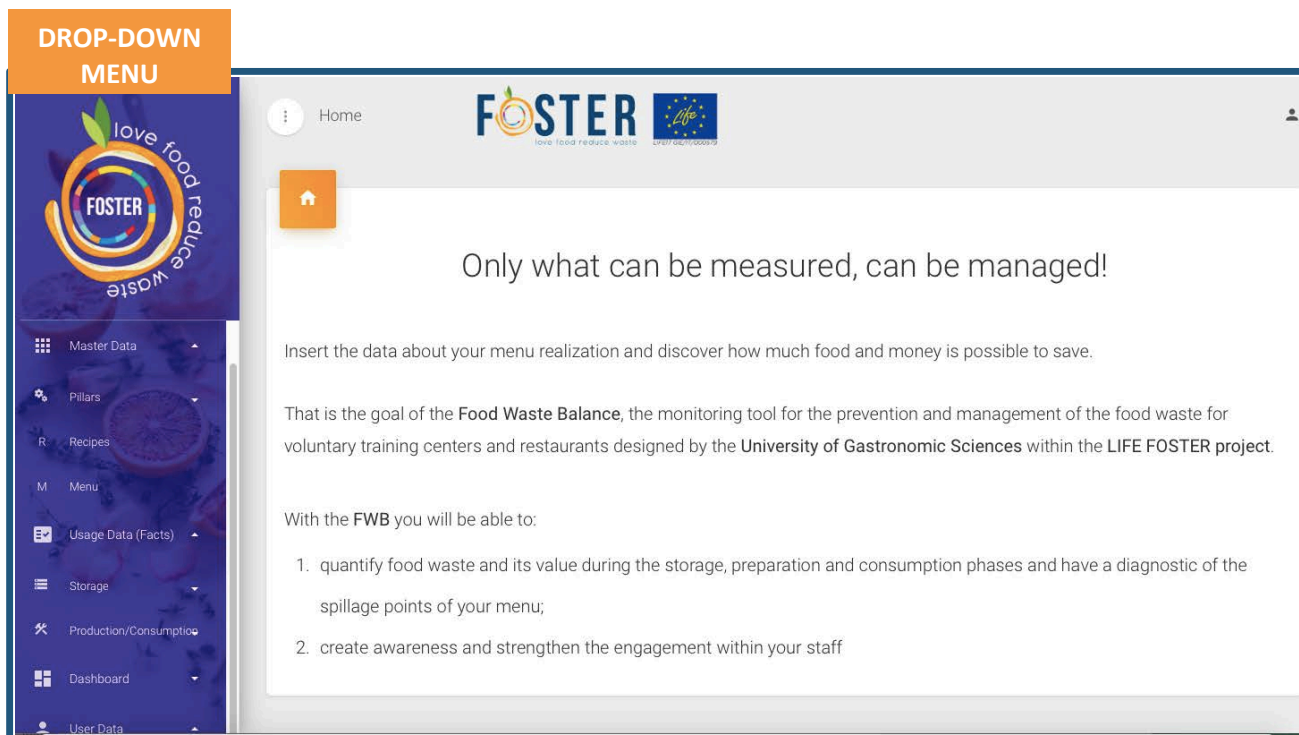


Fig.4 Dropdown menu

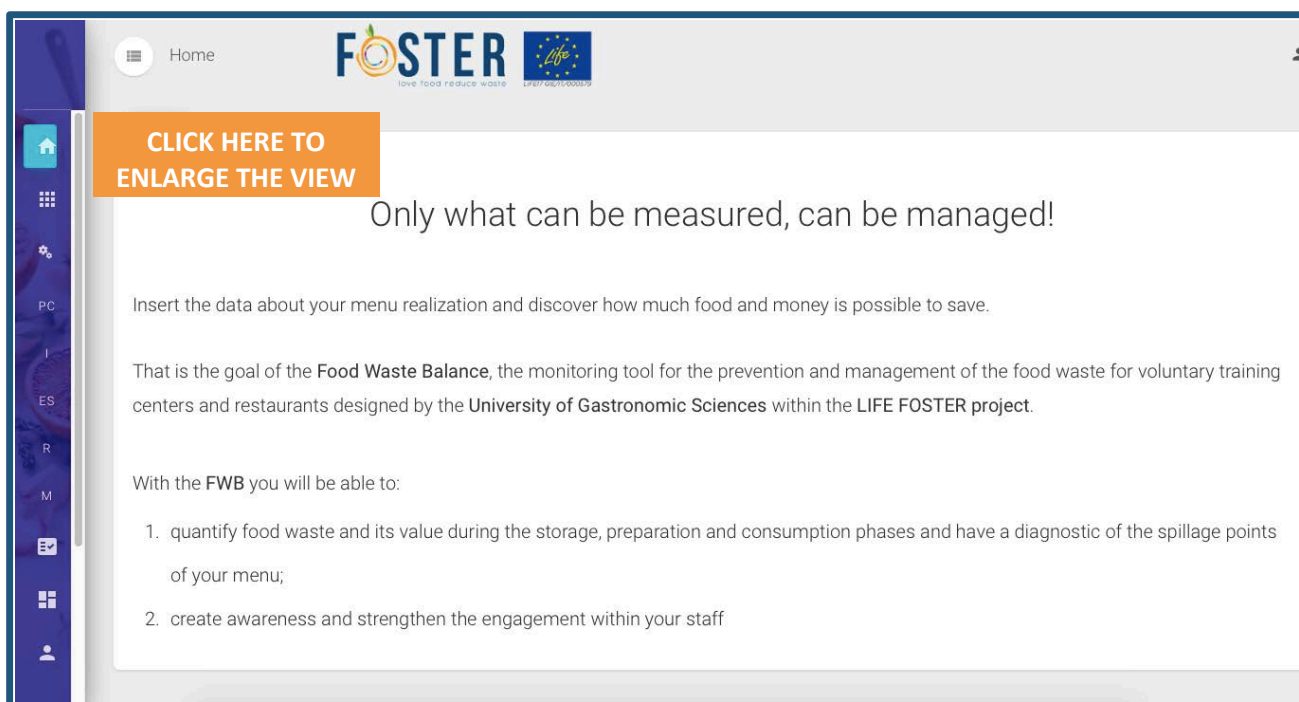


Fig.5 Enlarged view

Dropdown menu/Master data

The master data section of the drop down menu contains the background data. It is divided in Pillars, Recipes and Menu.

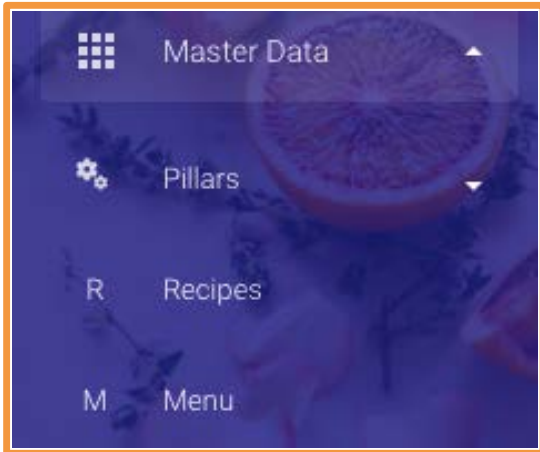


Fig.6 Master data section

Pillars are common for all the users and contains the Product Categories, the Ingredients and the Energy Sources. The user is not required to enter any information in this section.

In this section is possible to visualize and research all the Product Categories, Ingredients and Energy Sources (and their relative unit of measure) already upload by the administrator on the application. In this phase, the insertion of a new ingredient can be done upon request to the administrator (write to n.tecco@unisg.it).

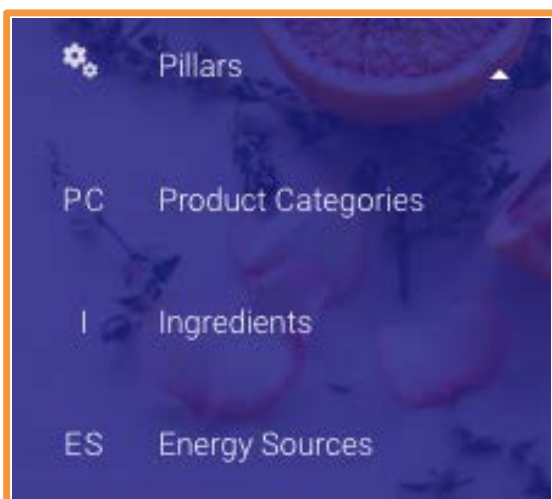


Fig.7. Pillars subcategories

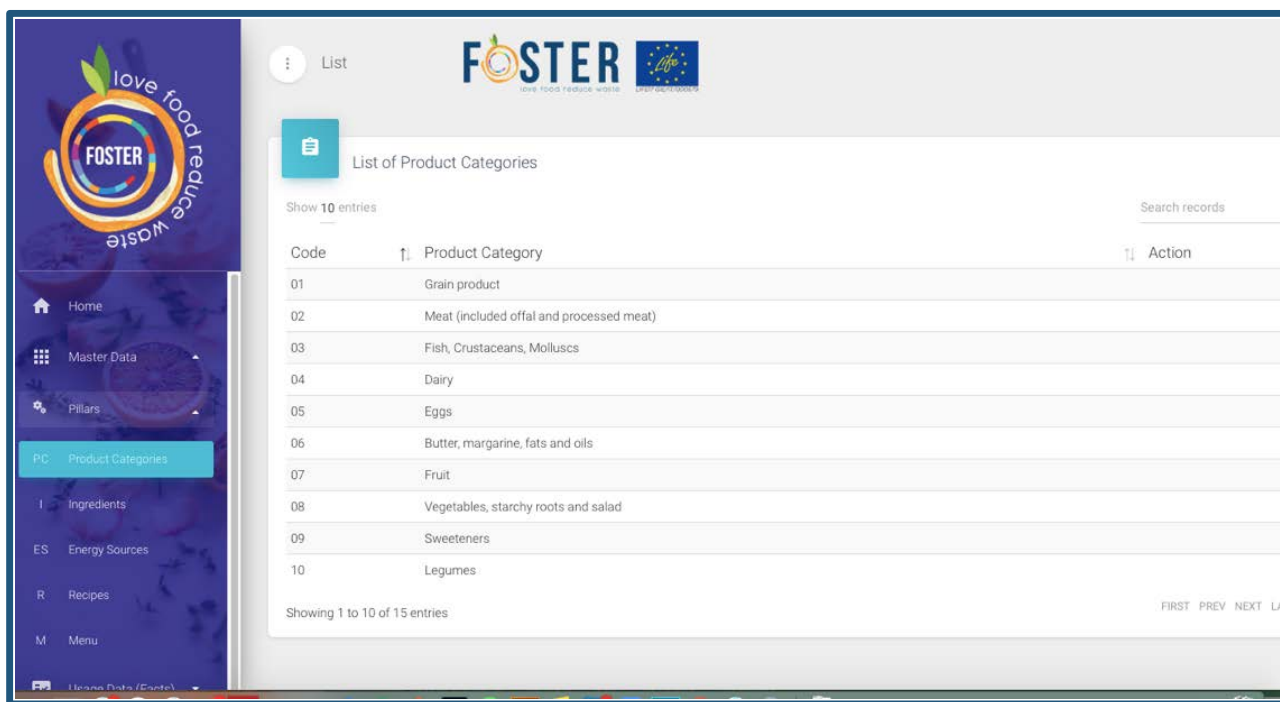


Fig.8 List of product categories

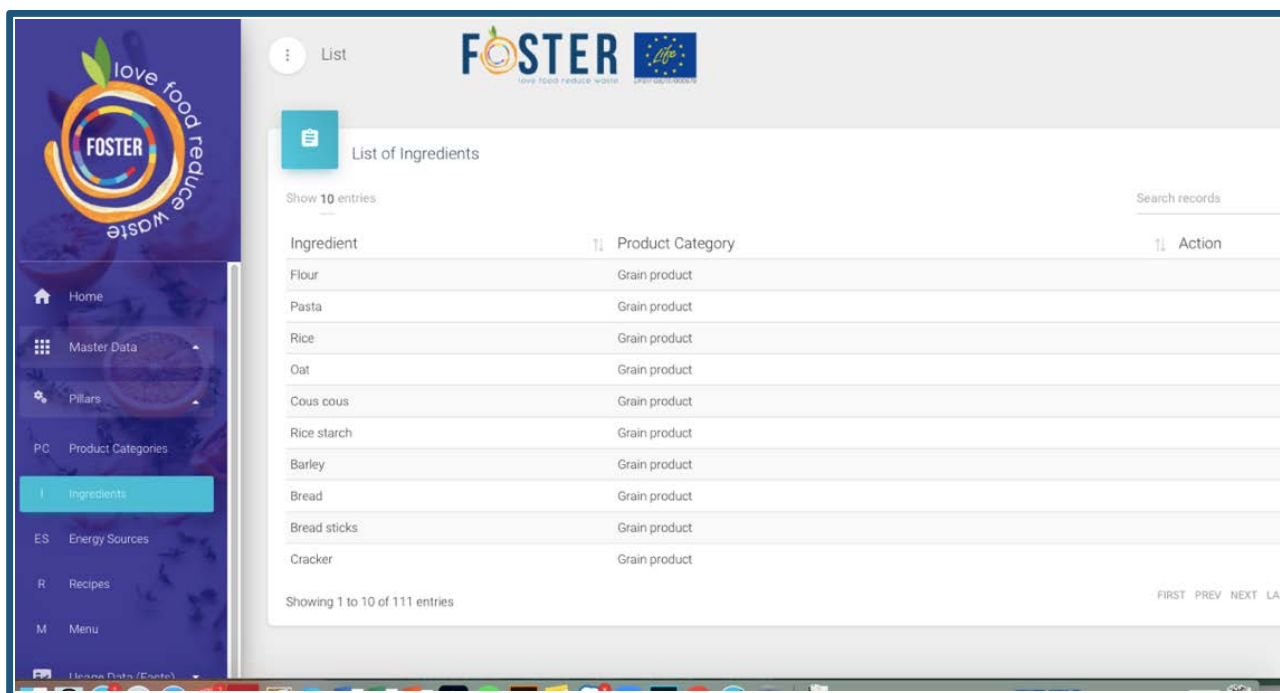


Fig.9 List of ingredients

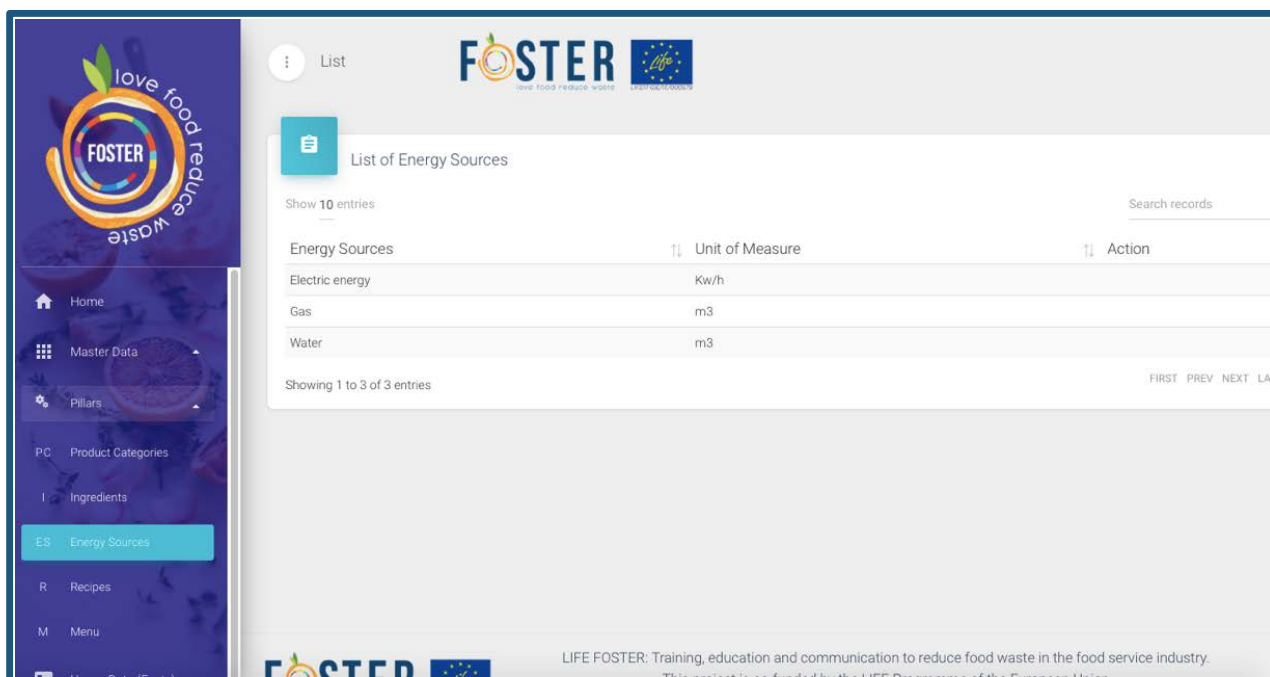


Fig.10 List of energy sources

Recipes and Menu vary users by users.

In the section **Recipes**, the user can insert new recipes (Fig.11) and visualize all the previously uploaded recipes (Fig.12).

The 'Insert new Recipe' form contains the following fields and controls:

- UNISG**: A dropdown menu.
- Recipe's Name (*)**: A text input field.
- N° Persons (*)**: A text input field.
- Semi-finished Product (*)**: Radio buttons for ☒ No and ☐ Yes.
- Ingredients (*)**: A section with a **CHOOSE INGREDIENTS (*)** dropdown, a **Quantity (*)** input, and a unit selector (Kg or L) with '+' and '-' buttons.
- Estimated value (*)**: A section with a **CHOOSE ENERGY SOURCES (*)** dropdown, an **Estimated value (*)** input, and '+' and '-' buttons.
- SAVE** and **CANCEL** buttons at the bottom.

Fig.11 Insert new recipe

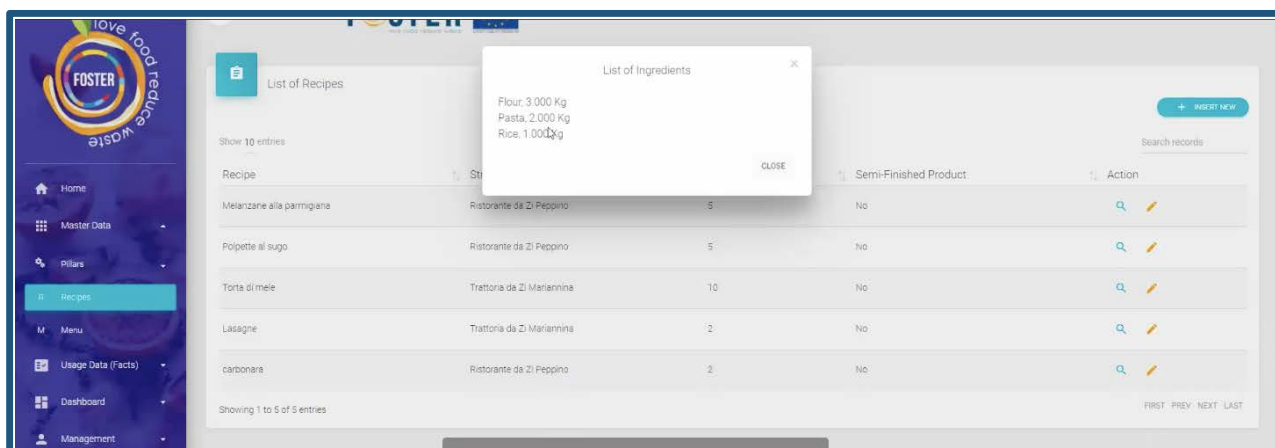


Fig.12 List of recipes with ingredients visualization

The fields to be entered for each new recipe are the following:

- Recipe's name
- Whether is a semi-finished product or not
- Ingredients (to be selected in the list)
- Ingredients quantity (in Kg or L)
- Number of people / portions in reference to the quantities entered
- Percentage estimate (0-100) with respect to the maximum input consumption (100) that a recipe can have for a single energy source.

All the data with * are mandatory. In case of saving without entering all the required fields, the page shows the presence of the number of errors present, which correspond to the fields to be entered

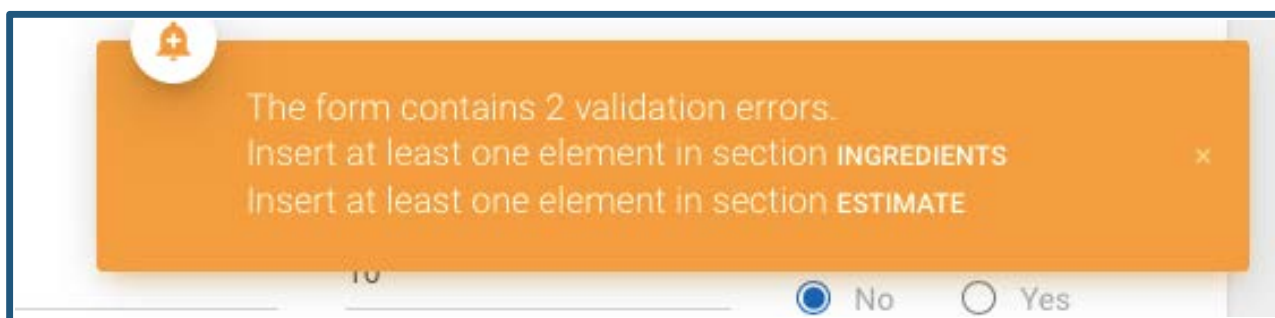


Fig.13 Validation error

In the section **Menu** the user can visualize its menu (and the list of recipes) (Fig. 14) and insert new ones (Fig.15). The user must select how many recipes he wants to associate with the menu he is going to upload. For vocational training centers, the creation of several dishes in a laboratory can be considered as part of a menu.

It is essential to assign the individual recipes to a menu, since the calculation system present within the web application counts the food waste and its value starting from the elaboration of the menus. A menu could consist of only one course. In the case of monitoring, each menu must consist of 4 courses.

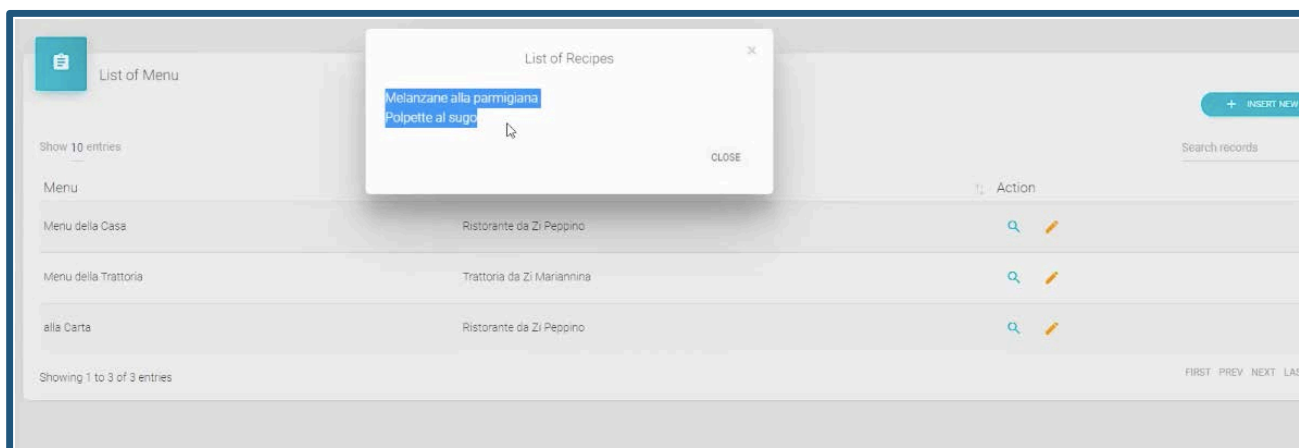


Fig.14 List of Menu

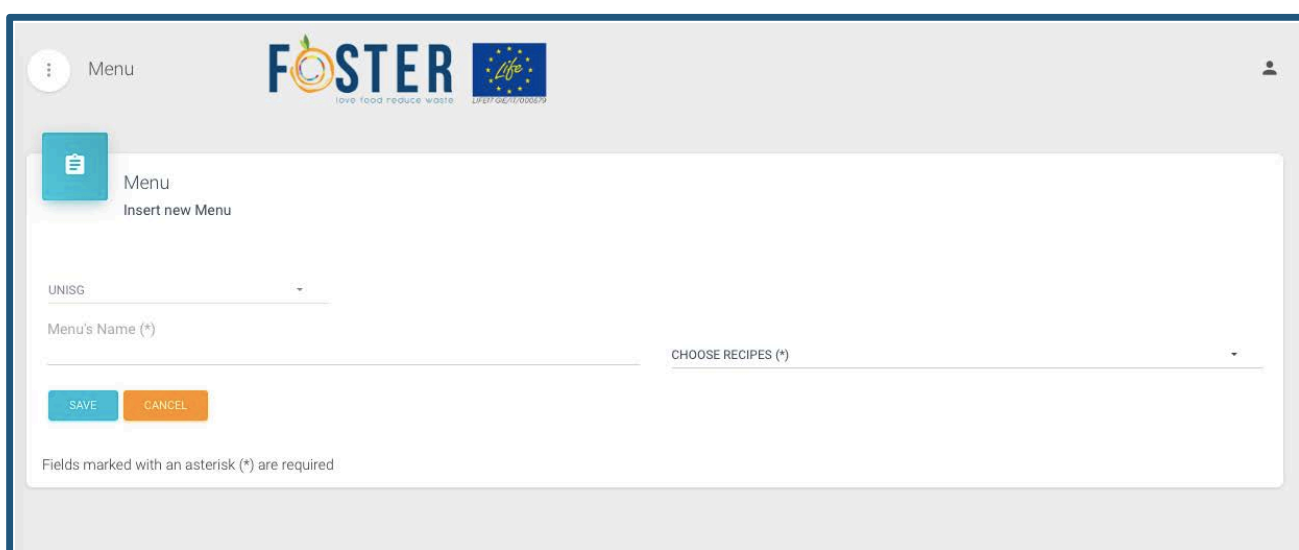


Fig.15 Insert new menu

Dropdown menu/Usage data (Facts)

This section collects the data relating to the actual processing of the recipes for the creation of the menus (Facts). It is divided in Storage (Station1) and Production/Consumption (Station 2 and 3). For storage and production data the user will be able to carry out researches/filter within time intervals that he can select and with variable duration.

Once a fact has been uploaded it is no longer possible to delete it, but it is always possible to modify it. If a fact is mistakenly loaded and you want to delete it, since it is not possible to do so, to delete it from the calculation system, it is necessary to assign a value equal to zero.



Fig.16 Usage data (Facts) section

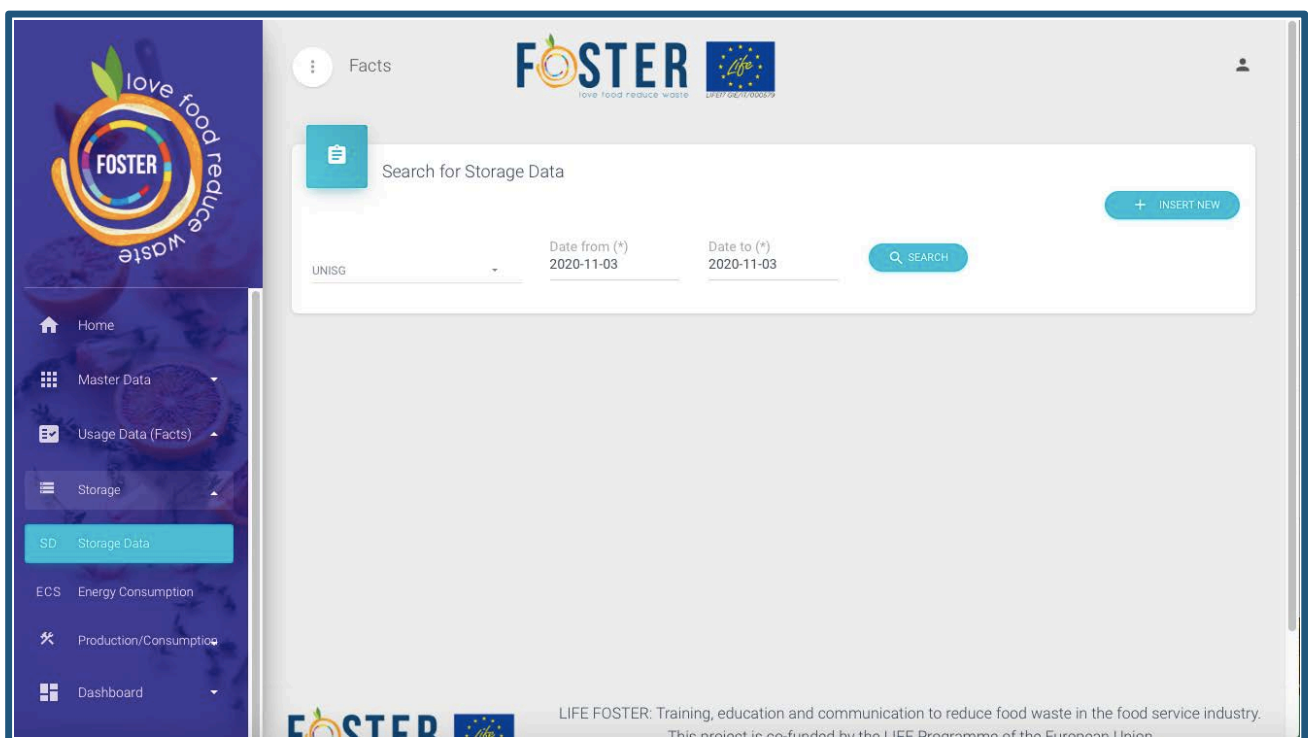


Fig.17 Search for Storage data in a selected time interval

The Storage section is divided into two subsections: Storage Food Data (SFD) and Energy Consumption Storage (ECS) (Fig. 18).

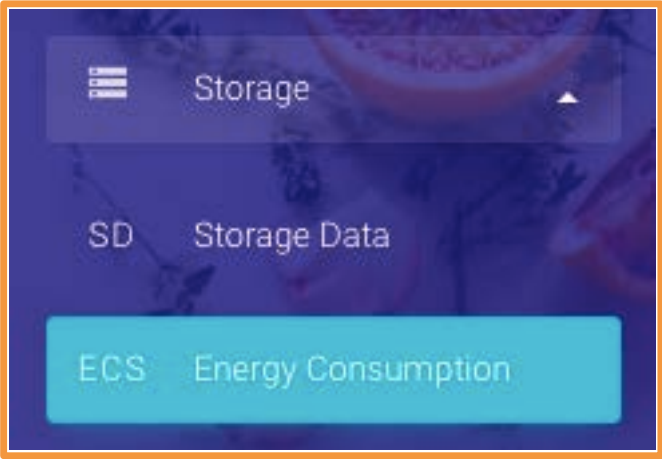


Fig.18 Storage subcategories/sections

In the **Storage Food Data** (Fig. 19) the user has to enter the quantities and economic values of the goods (individual ingredients) stored. In addition, he must enter whether in this phase, relative to the individual ingredients, the amount of waste that was produced indicating the quantity and whether it was attributable to the expiry date of the goods or to its excessive ripeness (in the case of fruit and vegetables).

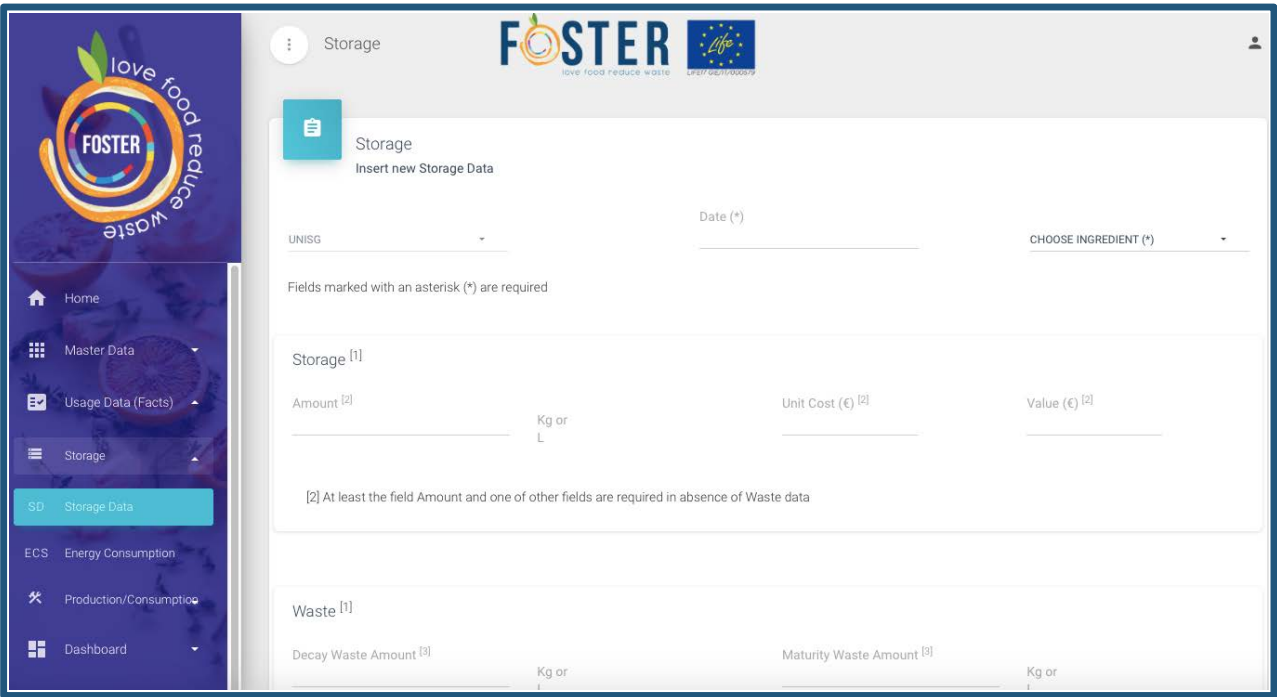


Fig.19 Insert new storage data

In the **Storage Energy Consumption Data** (Fig. 19), the user has to enter the quantities and economic values of the goods of the single energy and water sources used during this phase. For economic cost it can be inserted either the unit (Euro for Kg, Euro for L) cost or the overall value (e.g. eggs where we have a value and not the single unit cost).

The screenshot shows the 'Energy Consumptions of Storage' form in the FOSTER application. The left sidebar contains a menu with 'Home', 'Master Data', 'Usage Data (Facts)', 'Storage', 'SD Storage Data', 'ECS Energy Consumption', and 'Production/Consumption'. The main content area is titled 'Energy Consumptions of Storage' and 'Insert new Energy Consumption Storage Data'. It includes a 'UNISG' dropdown, a 'Date (*)' field, and a table for 'Energy (*)' with columns for 'Consumption (*)', 'Unit Cost (€) [1]', and 'Cost (€) [1]'. A 'CHOOSE ENERGY SOURCES (*)' dropdown is also present. 'SAVE' and 'CANCEL' buttons are at the bottom. A note states: 'Fields marked with an asterisk (*) are required [1] At least one field is required'.

Fig.20 Insert Energy Consumption during of the Storage

Then is possible to move to the Production/Consumption Section and its subsections (Fig.21).



Fig. 21 Production/consumption subcategories/sections

Here is the core of our data collection, where the user can input/insert the production facts by adding/inserting a new production data by filling the fields as in Fig. 22.

Fig. 22. Insert new Production Data

In the **Production Data** (Fig. 22) the user has to enter the quantities and economic values of the goods (single ingredients) used for the realization of a recipe. In addition, he must enter whether in this phase, relative to the individual ingredients, the amount of waste that was produced, indicating the quantity and whether it was attributable to procedural or incidental causes. The user has also to indicate a rate of food edibility of procedural waste ranging from 0 to 100. It has also to check if there is some reuse of the procedural waste.

It is crucial and mandatory to fill this section in order to go on with the data filling of the other three remaining section for Station 2 and 3 (Energy Consumption, Preparation of the recipe, Consumption Data).

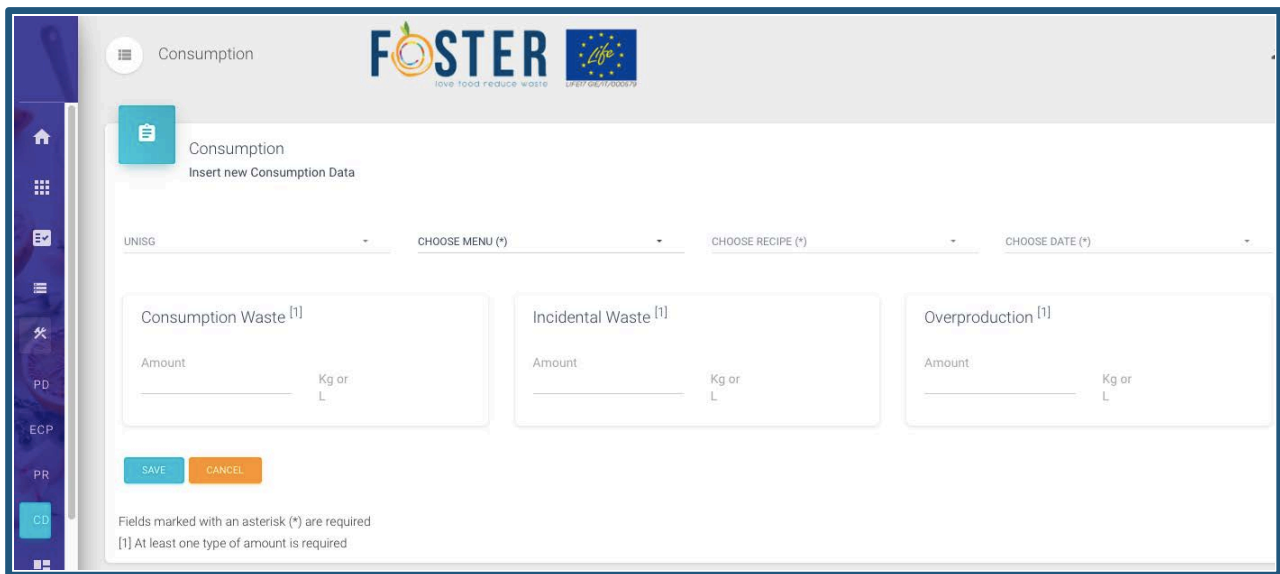
The energy consumption that will be entered will therefore be related to a certain production fact previously loaded and referable to a certain date that will be selected through the drop-down menu (Fig. 23).

Fig. 23. Energy Consumption of Production

The Preparation of Recipe section has the purpose to get the data about the final food amount available for every single recipe, once the process of realization has been concluded. It is mandatory to insert the portions number. It also to possible to insert the number of the portion in surplus.

Fig. 24. Insert a new recipe preparation

The last section is devoted to the Consumption Fact.



The screenshot shows the 'Consumption' section of the FOSTER application. The header includes the FOSTER logo with the tagline 'love food reduce waste' and the European Union flag. The main content area is titled 'Consumption' and 'Insert new Consumption Data'. It features four dropdown menus: 'UNISG', 'CHOOSE MENU (*)', 'CHOOSE RECIPE (*)', and 'CHOOSE DATE (*)'. Below these are three input fields: 'Consumption Waste [1]', 'Incidental Waste [1]', and 'Overproduction [1]'. Each field has an 'Amount' label and a unit selector 'Kg or L'. At the bottom, there are 'SAVE' and 'CANCEL' buttons. A note at the bottom states: 'Fields marked with an asterisk (*) are required' and '[1] At least one type of amount is required'.

Fig. 25. Insert new consumption data

After associating the dish with the reference menu, it is possible to input the quantity of waste attributable to the leftovers of the dish, the incidental waste occurring in this phase and the quantity of surplus generated in relation to the consumption phase.

Dropdown menu/Dashboard

In this section it is possible to view a series of graphs and lists, capable of providing at a glance clear information on trends or performances concerning the production of waste in relation to the Usage data Facts. It is divided in Production, Raw Materials, KPI charts, Production Energy Allocations.

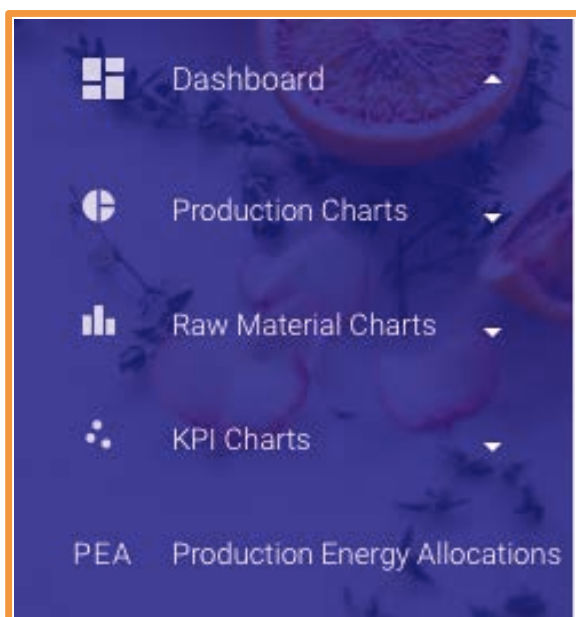


Fig. 26. Dashboard sections

In the Productions Charts section, for each VET centers/restaurants it is possible to view the percentage incidence of the value (Euro) of food waste for each individual menu, by entering the production date or for multiple menus contained within a time interval.

The Production Charts section is divided into three subsections: Edibility, Station and Source Waste (Fig. 27).

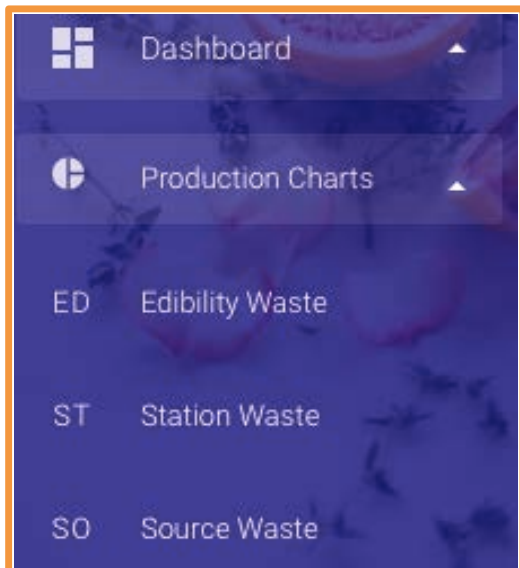


Fig.27 Production Charts subcategories/sections

Next to the aerogram relating to the percentage incidence of the value (Euro) it is possible to view the percentage of edibility/non-edibility of the waste produced (Fig 28), the percentage of production of the waste in relation to the storage phases (station 1), preparation (station 2) and consumption (station 3) (Fig. 29), the percentage breakdown between raw material and energy costs (Fig. 30)



Fig.28 Edibility waste: rate of edibility/non-edibility



Fig.29 Station waste: percentage contribution of the different phases (storage, production and consumption)

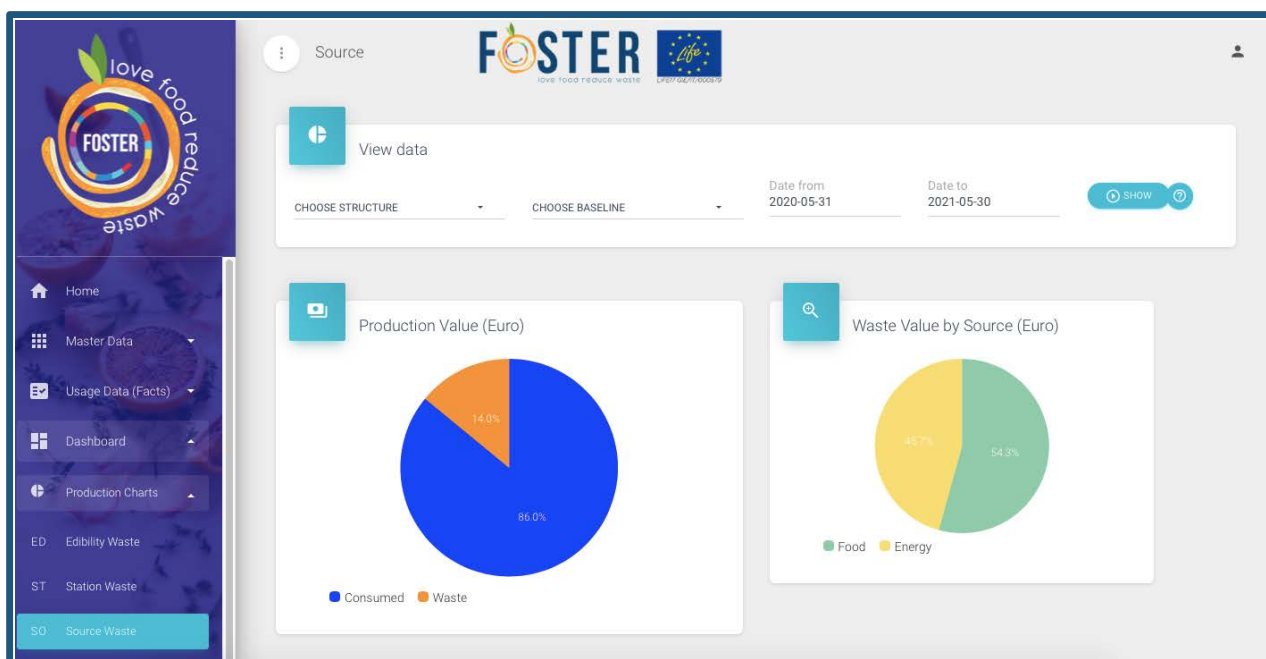


Fig.30 Source waste; percentage breakdown between raw material and energy costs

In the Raw Material Charts section, for each VET centers/restaurants it is possible to go into detail on the waste of individual preparations and the contribution to food waste of the various product categories

The Raw Material Charts section is divided into three subsections: Recipe Waste (Kg), Recipe Waste (Euro) and Product Categories Waste (Fig.31).



Fig.31 Raw Material Charts subcategories/sections

At the menu level, it is possible to view (Fig. 32), the percentage incidence of the quantity (Kg) of food waste of every single course by entering the production menu date. It is also possible to view the amount of waste produced for each recipe in the different phases.



Fig.32 Recipe Waste (Kg): incidence of waste of individual preparations on the quantity of production inputs and by preparation phase

At the menu level, it is possible to view (Fig. 33), the percentage incidence of the value (Euro) of food waste of every single course by entering the production menu date. It is also possible to view the value of waste produced for each recipe in the different phases.



Fig.33 Recipe Waste (Euro): incidence of waste of individual preparations on the value of production inputs and by preparation phase

It is possible to view the incidence of the different product categories to waste for each individual menu, by entering the production date or for multiple menus contained within a time interval (Fig. 34).

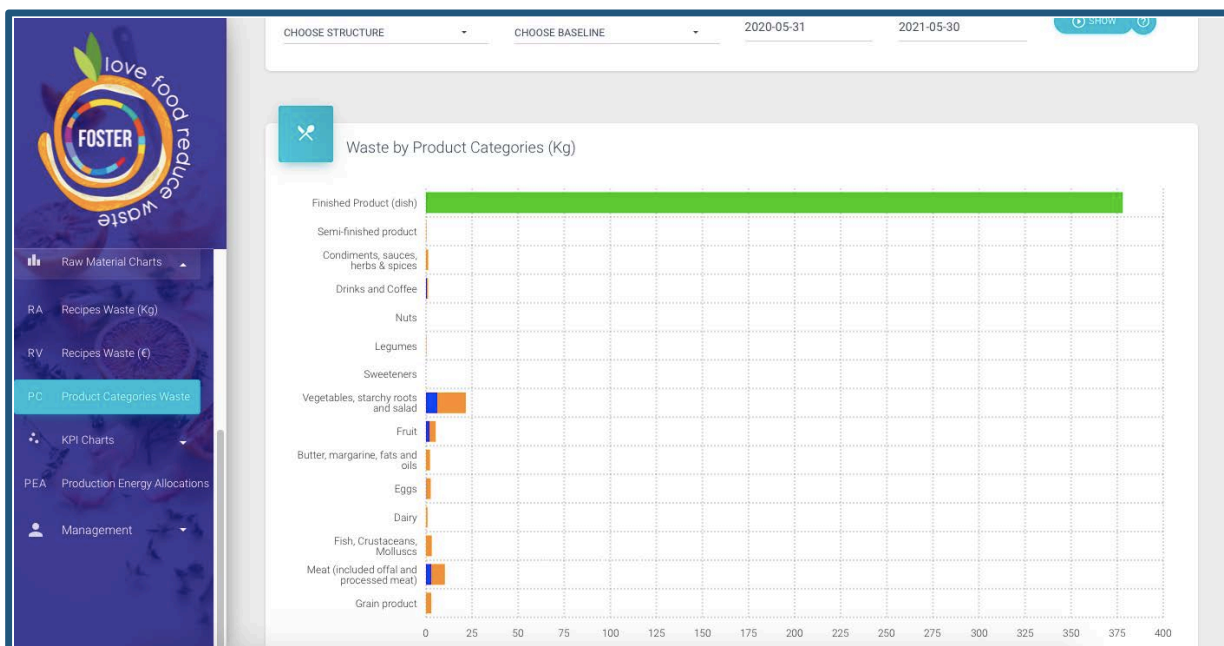


Fig.34 Product Categories Waste: incidence of waste for the different product categories at the single menu level or at menu aggregation level.

The KPI Charts contains the Waste Index section (Fig.35). Here is possible to visualize simultaneously at the single menu level the Waste Amount Ratio and the Waste Cost Ratio.

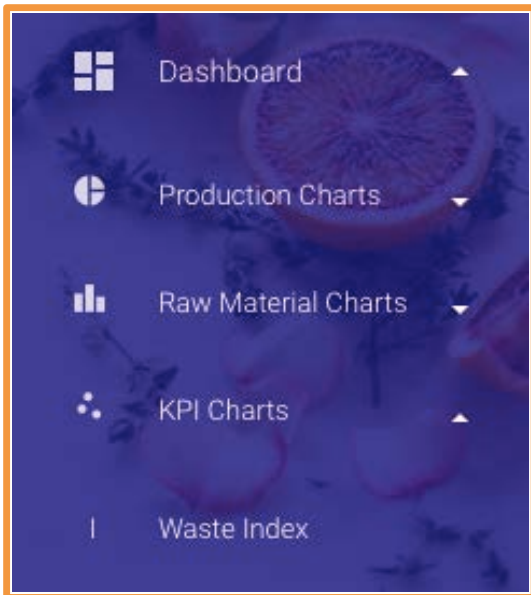


Fig.35 KPI Charts subcategories/sections

The Waste Amount Ratio measures the ratio between the total food waste amount in Kg (output) and the total food amount in Kg (input): the closer it is to 1, the higher the waste rate, as most of the raw material it becomes waste, the closer it gets to 0, the more the share of waste is reduced compared to the quantity of raw material / ingredient used. The graph shows the data aggregated at menu level, where each single sphere corresponds to a preparation / recipe.

The Waste Cost Ratio measures the ratio between the total food waste value in Euro (output) (energy and water included) and the total food value in euro (input) (energy and water included): the closer it is to 1, the higher the waste rate is, as most of the raw material cost it becomes loss, the closer it gets to 0, the more the share of waste is reduced compared to the cost of raw material / ingredient used. The graph shows the data aggregated for the menu, where each single sphere corresponds to a preparation / recipe.

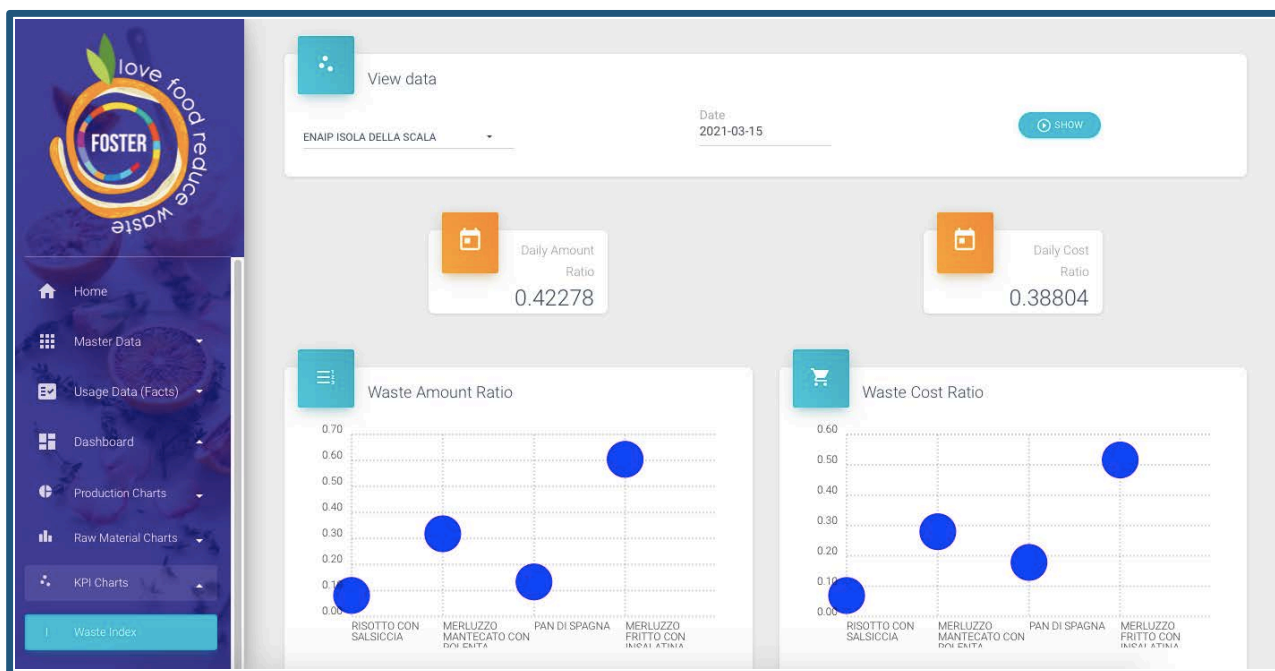


Fig.36 KPI Charts: Waste and Cost Ratio

The section Production Energy Allocations lists the economic value of all the energetic and water consumption voices for all the uploaded preparations. It possible to view these data by single menu (entering the production date) or by multiple menus (entering a time interval).

The screenshot displays the 'Facts' section of the FOSTER dashboard. It features a search bar for 'Energy Allocations' with filters for 'Date from (*)' (2020-05-31) and 'Date to (*)' (2021-05-31), and a 'SEARCH' button. Below the search bar, there is a table titled 'Energy Allocations' showing 10 entries. The table has columns for Recipe, Source, Structure, Menu, Date, % Coefficient, Energy Alloc., Cost Alloc. (€), and Action. The data is as follows:

Recipe	Source	Structure	Menu	Date	% Coefficient	Energy Alloc.	Cost Alloc. (€)	Action
MERLUZZO MANTECATO CON POLENTA	Gas	Enaip Isola della Scala	SINFONIA DI MERLUZZO	2021-02-22	0.50	1.00000	0.03000	
MERLUZZO MANTECATO CON POLENTA	Water	Enaip Isola della Scala	SINFONIA DI MERLUZZO	2021-02-22	0.29	0.00286	0.28571	
RISOTTO CON ZUCCHINE E MERLUZZO	Gas	Enaip Isola della Scala	SINFONIA DI MERLUZZO	2021-02-22	0.50	1.00000	0.03000	
RISOTTO CON ZUCCHINE E MERLUZZO	Water	Enaip Isola della Scala	SINFONIA DI MERLUZZO	2021-02-22	0.29	0.00286	0.28571	

Fig.37 Production Energy Allocation

Dropdown menu/User data

Here the user will be able to see the data of the VET centers/restaurant to which he belongs. In the profile section you will see the card of your profile, being able to change some information, including the password.

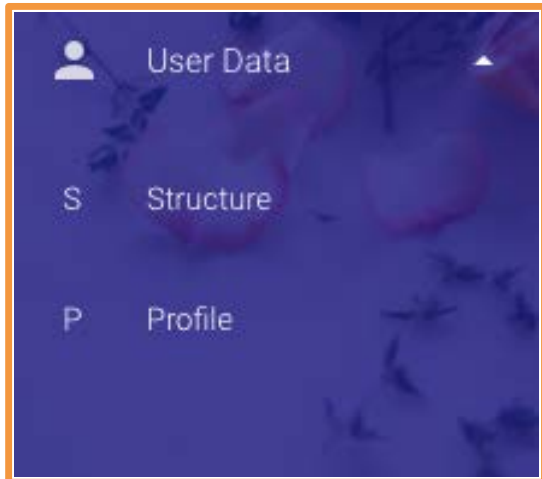





Fig. 38. User Data subcategories/sections

A screenshot of the 'Structure Profile - View Structure's Data' form. The form is white with a light blue header bar. The header bar contains the FOSTER logo (with the tagline 'love food reduce waste') and the European Union flag. The form itself has a title 'Structure Profile - View Structure's Data' and a small icon of a building. Below the title, there are several input fields: 'Structure's Name' with the value 'UNISG', 'Address' with the value 'Piazza Vittorio Emanuele, 9', 'City' with the value 'Pollenzo', and 'Country' with the value 'Bra'. At the bottom, there is a 'Training Center' section with two radio buttons: 'No' (selected) and 'Yes'. To the right of the radio buttons, there is a 'SLOT 5: 51 - 100' label and a small upward arrow icon.

Fig. 39 Structure profile

User's Profile





User's Profile

Edit Profile

Structure

UNISG

Username

signor.prova

First Name (*)

Signor


Last Name (*)

Prova

Email address (*)

n.tecco@gmail.com

Password



Birth's Date (*)

2020-11-02

Sex (*)

☐ Male

☒ Female

SAVE

Fields marked with an asterisk (*) are required

Fig. 40 User's profile



TO HAVE INFORMATION

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LIFE FOSTER: Training, education and communication to reduce food waste in the food service industry.
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