

# DELIVERABLE D.T2.3.7: PA7-PA13: THEMATIC REPORT ON OPTIMISED FOOD WASTE PREVENTION IN FOOD PREPARATION AND CONSUMPTION

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**Version 1**  
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# 1. Food Waste Prevention in Food Preparation and Consumption: PA7 (Rimini)

## 1.1. Feasibility Study overview

This chapter will summarize the Feasibility Study presented in December 2017 (D.T2.3.1, PA7). The potential food waste flows in food service sector can be split up in four categories:

- products removed from the inventory including food damaged during transportation and food thrown away from storage (e.g. food exceeding a use-by date or loss of quality);
- product waste during food preparation at the food service location;
- products prepared front and back office (and possibly exposed or transported) for ready-to-eat human consumption but not consumed;
- plate leftovers.

(Fusions- Food waste quantification manual to monitor food waste amounts and progression)

According to a study conducted by WRAP, hotels often say they waste very little food as the plates generally come back clean. However, food waste comes from a variety of sources:

- Spoiled or out of date food
- Peelings & trimmings
- Inedible by-products, e.g. bones, coffee grounds, tea leaves
- Kitchen error
- Plate waste

## 1.2. Implementation of pilot actions

In this chapter we will present how the experimentation of best practices to reduce waste in hotel restaurants was carried out. The experimentation was conducted through two main activities:

**Survey.** Research carried out on a sample of 150 hoteliers and restaurateurs to identify a list of best practices to be tested with accommodation facilities managers.

**Practical experimentation.** Operations to test the best practices identified with the survey to prevent food waste.

The research involved 150 Italian restaurateurs and hoteliers, including 50 from the Province of Rimini. The survey has been carried out through direct interviews with managers of catering for tourism. The managers were asked to answer to a questionnaire which included the following questions:

- Food waste is a topic discussed in your hotel/restaurant?
- Have you taken actions to prevent or reduce food waste?



- How much is the waste indicatively in your structure?
- What are the main wasted food categories in your facility?
- What actions do you think could help your hotel/restaurant to reduce waste?
- Are you aware of the negative consequences of food waste in the environment, in economy and in society?
- Where do you think the food waste comes from?
- In your opinion, which is the most effective way to reduce food waste in hotel/restaurant?
- What are the obstacles to reducing food waste in your hotel/restaurant?

It can therefore be concluded that in Rimini, like in the rest of the country, there are two main initiatives taken by restaurant owners:

- > changing menu
- > recycling everything that is possible

The difference that emerges is on the activation of a donation system. The definition of an action plan, the assistance given to the client and the proposal of adequate portions seem to be less effective.

Overall, the waste is considered negligible by almost half of the restaurants in Rimini, and by 2/3 of those in the rest of the country; the Rimini reality, therefore, signals a problem a little more incident.

In this sector, the factors to be kept under control to reduce waste are many, and may have an unpredictable trend; the number of hypotheses that can be pursued, however, shows that the commitment can be carried out in several directions and lead to a positive outcome. What emerges, is a hierarchy that does not clearly favour a single choice, but a series of initiatives to be adopted is outlined:

- organize donations: a first way to avoid the dispersion of what is left along the whole process;
- monitoring waste: means verifying what happens and at what moments in the supply chain;
- changing menus: think of an offer to minimize surpluses;
- recycling: attention can be given to how to reuse what has not been used.

The double reality to be faced is highlighted: customer behaviour and the restaurateur's control of the process.

According to Rimini restaurateurs and hoteliers, the five best practices to be implemented to prevent food waste are:

- > differentiating portions: offering diversified dimensions is seen as the first means of combating waste;



- > train hall staff and kitchen staff on the topic: pay attention to what is offered and to the use of the raw material;
- > guarantee adequate storage to avoid deterioration;
- > plan the menu, reducing those preparations that generate waste;
- > try to predict the demand.

Finally, it can be useful to identify the obstacles that occur in reducing waste. All Italian restaurateurs, including those in Rimini, agree that it is the customer's behavior that is the greatest difficulty to overcome. Moreover, we must mention lack of time and insufficient staff preparation, so, external obstacles and internal ones are mixed. The general awareness-raising work that is taking place at national level is worth, and on this activity is necessary to continue working. Furthermore, it is important to increase staff preparation to act against food waste.

Analysis of the restaurateurs' responses shows that the problem is well known and it is considered as important; there are also all the indications to address the issue of reducing food waste. Following the survey described above, best practices have been tested, in order to verify the impact and the real applicability on food waste reduction.

Summary of the activities carried out:

Identification of the sample

- I° inspection at the facilities
- Performance of experimentation activities
- II° inspection at the facilities
- Review of collected data
- Drafting of the Deliverable D.T 2.3.4

In order to find a sample of hotels to carry out best practices testing, the Province of Rimini has organized an official presentation inviting the hoteliers of the territory. The meeting took place at the headquarters of the Province on April 16th, 2018. As a result of the presentation of the project, 3 hoteliers gave the position to test the planned activities.

The three managers, who decided to join the experimentation of the best practice, completely shared the ultimate goal of waste reduction. Each hotel has proved to have different characteristics, considering both "meals preparation practices" and "waste prevention activities". In particular:

**Table 1: Sample characteristics from 3 different hotels in Rimini**

Sample characteristics	Hotel Tritone	Hotel Sovrana	Hotel Vela d'Oro
<b>Opening period</b>	Summer season	All year	Summer season
<b>N° of rooms</b>	37	51	50
<b>Breakfast service</b>	YES	YES	YES
<b>Lunch service</b>	YES	NO	YES
<b>Dinner service</b>	YES	NO	YES



The experimentation in each structure was developed in 3 phases:

**First phase - I° inspection: interview and identification of best practices to be integrated or enhanced.**

The aim of the first meeting was to define which best practices have to be tested. The best practices to test were chosen by comparing those that emerged from the survey with those already activated by hotels.

**Second phase - Experimentation / improvement of the identified best practices.**

At this stage the hotels, with the support of Last Minute Market, tested the best practices selected in the previous phase with the aim of evaluating their impact on the reduction of food waste. Last Minute Market has supported hotels by producing support material for applying best practices, such as designing communication material.

**Third phase - II° inspection: evaluation of the best practices tested.**

During a second survey, Last Minute Market verified the implementation and impact of best practices implemented, trying to obtain, when possible, an assessment by the manager on what was found in relation to the single good practice tested.

Monitoraggio delle buone pratiche attuate e da sperimentare presso le strutture ricettive di Rimini – Progetto STREFOWA					
STRUTTURA .....		REFERENTE/RESPONSABILE .....			
BUONE PRATICHE	ATTUATA	NON ATTUATA	ATTUABILE	VALUTAZIONE (voto da 1 a 10)	RIDUZIONE % DEGLI SPRECHI
<b>MENU</b> Modificare il menù per prevenire o ridurre al minimo le eccedenze					
<b>RICICLO</b> Riciclare tutto ciò che può essere riciclato					
<b>DONAZIONE</b> Attivare un sistema di donazione delle eccedenze non somministrate					
<b>DOGGY-BAG</b> Prevedere la possibilità di asporto degli avanzi (es. doggy-bag)					
<b>MISURAZIONE</b> Misurare lo spreco alimentare attraverso il monitoraggio degli scarti					
<b>PREVEDERE DIVERSE PORZIONI</b> Prevedere la possibilità di scelta delle porzioni (es. mezza porzione/intera/abbondante)					
<b>PROPORRE PORZIONI ADEGUATE</b> Proporre al cliente porzioni adeguate					
<b>RESPONSABILE</b> Individuare un responsabile dell'attività di prevenzione degli sprechi tra personale cucina					
<b>ASSISTENZA ALLA CLIENTELA</b> Assistere il cliente in sala durante l'ordinazione dando maggior informazione al cliente					
<b>PIANO D'AZIONE</b> Sviluppare un piano d'azione per ridurre gli sprechi alimentari					
<b>CONDIVISIONE RISULTATI</b> Condividere i risultati delle attività di prevenzione degli sprechi con personale e clienti					
ALTRO .....					

Altri suggerimenti, proposte e attività:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Figure 1: Card used for the interview with hoteliers for the evaluation of best practices**

### 1.3. Problems and other important issues occurred during the PA implementation

During the D.T2.3.4 - Reports on Food Waste prevention from Food Preparation, the problem encountered was to be able to involve a large number of hoteliers in the testing phases. The period useful to the performance of the activities coincided with the high tourist season which prevented hoteliers from engaging in experimentation activities.



## 1.4. Results and target groups reached

TARGET GROUPS	QUANTIFICATION
Local public authority	-
Regional public authority	-
Interest groups including NGOs	-
Education/training centre and school	-
Large enterprises	-
SME	<p><i>D.T2.3.1- Feasibility Study from Food Waste prevention from Food Preparation, 150 Italian restaurateurs were involved for the Survey</i></p> <p><i>D.T2.3.4-Reports on Food Waste prevention from Food Preparation, 4 hoteliers were involved, 3 of which participated to the testing phase</i></p>
General public	-

<i>Pilot Action</i>	<i>Amount of waste avoided per PA</i>
<b>PA7</b>	<p><i>D.T2.3.4-Reports on Food Waste prevention from Food Preparation: given the method of the proposed experimentation it is not possible to indicate a single datum on the reduction of waste. The only two information in this sense derive from the hoteliers' estimates. In the specific: Hotel Sovrana, in relation to the good practice CUSTOMER SERVICE, estimate a 30% waste reduction - Hotel Vela D'Oro, in relation to the good practice PROPOSE ADJUSTED PORTIONS, estimates a 50% waste reduction</i></p>



## 1.5. Sustainability and transferability of pilot actions on optimal solutions on Food Waste Prevention in Food Preparation and Consumption

The goal of this deliverable is to identify a list of good practices aimed at reducing waste in the tourism sector. A first list of good practices was obtained from a survey addressed to an Italian sample of 300 operators in the hotel sector, the survey was carried out both on a national scale and on a local scale, the Province of Rimini.

The survey, in addition to giving us a first list of good practices, has confirmed that there is a strong focus on food waste by the tourism sector, in fact, 50% of respondents confirmed that often addressed the topic of waste with their staff, of issues related to food waste, and 30% occasionally, but they did.

Furthermore, around 75% of respondents said they had taken actions to reduce waste in their business.

What experienced shows that attention to the issues of sustainability and the fight against waste are present in the planning of the hotel catering business.

The implementation of good practices for the reduction of food waste is however always possible. The experimentation carried out in the context of Rimini shows that with organizational and communicative measures, the results already obtained with practices ranging from the modification of the menus to the doggy-bag can be improved.

More complex, but necessary, to be able to activate projects for accurate monitoring of the waste generated both during preparation and from the customer at the end of the meal.

## 2. Food Waste Prevention in Food Preparation and Consumption: PA8 (BOKU)

### 2.1. Feasibility Study overview

This pilot action attempts to fill part of the research gap, by focusing on the extent, composition and origin of food waste in the event catering business (deferred system) and hotel industry in the functional urban area Vienna. By knowing the reasons and the scale of food waste generation in each case, effective prevention measures shall be implemented. In addition to determining at which stage food waste occur with various reasons behind each stage, it is important to ascertain what kind of waste is produced. The output of this pilot action has been used in the guideline on food waste prevention activities in the food service sector and will be accessible for the broad public and interested stakeholder groups

The aim of the pilot action is to reduce the amount of food waste in the selected hotels and catering business and subsequently to provide guidelines for food waste prevention in this business sector.

### 2.2. Implementation of pilot actions

The pilot action (PA 8) analysed the extent, composition and origin of food waste in 4 event catering businesses (in each case 1 - 3 events using the deferred system) and 6 hotels in the



functional urban area Vienna and Innsbruck. By knowing the reasons and the scale of food waste generation in each case, effective prevention measures were implemented aiming at a reduction of food waste in the respective food service outlets. With the consulting initiative of United Against Waste (UAW) - called Küchenprofi[t] - each hotel or caterer was, therefore, professionally coached by independent consultants (e.g. professional chefs) to identify individual avoidance measures. Sorting analyses of food waste were conducted before and after the implementation of avoidance strategies in order to evaluate the impact of certain measures.

In event catering 25 % of food waste arises from food preparation (unavoidable), 45% from unissued meals (overproduction), 18 % from buffet leftovers and 13 % from consumer plates (status quo analyses of 7 individual events). It could be revealed that in catering businesses the quantities of food prepared for an event may tend towards over-provision in response to pressure to offer enough portions and variety of menu choices to satisfy consumers. However, it could be shown that the amount of avoidable food waste in relation to consumed meals (level of efficiency) was effectively reduced. The level of efficiency ranged between 14.5 % and 78.6 % prior to the implementation of avoidance measures in catering at events, while the efficiency values showed a variation of 17.6 - 36.5 % after the implementation. The best practice example (reduction of standard portion size by 20 - 25%, sous-vide cooking for demand-based preparation and cooking ) even achieved a reduction of 61 % of the efficiency level when comparing the same event. However, the remaining individual events revealed a limited comparability due to diverse catering types (self-service buffet, flying buffet or full table service), difficult predictability of actual consumer numbers and organisational challenges such as time pressure or short-term deviations from the event schedule leading to knock-on effects on the catering schedule.

In hotels 26 % of food waste arises from food preparation (unavoidable), 10 % from unissued meals (overproduction), 43 % from buffet leftovers and 20 % from consumer plates (status quo analyses of 6 hotels). Since all hotels serve breakfast (and in some hotels) lunch and dinner as a self-service buffet, a high share of leftovers from the buffet table could be determined. For each hotel, the level of efficiency varied between 6.8 % and 54.9 % prior to the implementation of avoidance measures, while the efficiency values could be reduced to 5.0 - 34.4 % after the implementation. Best practice example?!

Since technologies and approaches used in the catering sector are similar, they could be applicable to other food-service providers in planning more sustainable catering activities. In addition, international acting hotel groups could easily implement avoidance activities in other functional urban areas of Central Europe. A guideline including the success stories of the pilot action is accessible to the broad public and all interested stakeholder groups in order to support the implementation of prevention activities in other regions.

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• By using sorting analysis in the food service sector and providing concrete figures on the efficiency level the size of losses (also in terms of unused money) can be explained very easily to the stakeholder</li> <li>• The diversion into stage of loss and</li> </ul>	<ul style="list-style-type: none"> <li>• It is difficult to integrate the sorting process into ongoing cooking business</li> <li>• Especially for big catering business it is difficult to get all relevant figures for one event as there are often different events in parallel or even different locations for the food</li> </ul>





<p>composition of food waste gives the possibility to find the main reasons of food waste generation as well as best possibilities for future food waste prevention</p> <ul style="list-style-type: none"> <li>• Since technologies and approaches used in the catering sector and hotel business are similar, they could be applicable to other food-service providers in planning more sustainable activities.</li> <li>• International acting hotel groups could easily implement avoidance activities in other functional urban areas of Central Europe</li> </ul>	<p>preparation. To get all data for all stages of loss (not only for the event itself)</p>
<p><b>Opportunities</b></p>	<p><b>Threats</b></p>
<ul style="list-style-type: none"> <li>• As food service and tourism is already big and an even growing sector huge amounts of food waste can be prevented</li> <li>• The effect of food waste prevention measures is very directly visible also in terms of money, therefore stakeholders can be convinced easily to be active</li> <li>• Bringing the topic of food waste prevention into food service sector gives the chance to contribute to SDG12.3</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Because of limited time resources of cooking personal and staff in the tourism sector in general it is difficult to acquire participants.</li> <li>• Cooks and responsible persons might not know about the materials and guidelines that are already developed</li> <li>•</li> </ul>

### 2.3. Problems and other important issues occurred during the PA implementation

As main problem the lack of time in the Hotel and catering business could be identified. Although people are interested and want to cooperate, it is difficult to fix dates and appointments. Sorting analyses disturb the normal kitchen work and have therefore to be prepared very carefully. It is important not only to involve the management but especially for hotels also to speak to the kitchen chef and kitchen team in advance. It is necessary to get an overview on the normal menu to avoid sorting analysis on special untypical days (with special food offered e.g. Schnitzel or knuckle of pork)

### 2.4. Results and target groups reached



TARGET GROUPS	QUANTIFICATION
Local public authority	-
Regional public authority	-
Interest groups including NGOs	-
Education/training centre and school	-
Large enterprises	-
SME	<i>6 hotels and 4 catering businesses</i>
General public	-

<i>Pilot Action</i>	<i>Amount of waste avoided per PA</i>
<b>PA8</b>	345 kg <i>food waste in hotels restaurants was reduced by around 20 %.</i> <i>61% in the best practice example for caterer</i>

It could be shown that huge food waste prevention potential exists in the hotel and event catering sector. Especially for catering it is difficult to get comparable figures between two events as each event is very specific in terms of number of persons, type of food or type of consumers.

## 2.5. Sustainability and transferability of pilot actions on optimal solutions on Food Waste Prevention in Food Preparation and Consumption

The findings of the pilot case entered in the STREFOWA guidelines on food waste prevention in the food service sector which can be downloaded at the STREFOWA Tool <http://www.reducefoodwaste.eu/guideline-food-service.html> and can be used independently from the region in all different food service sectors. Future activities will be ongoing in cooperation in cooperation with the initiative United Against Waste in Austria.



## 3. Food Waste Prevention in Food Preparation and Consumption: PA9 (BOKU)

### 3.1. Feasibility Study overview

The aim of this pilot action is to make pupils more aware of the problem of food waste, to show them specific options for actions that are within their sphere of influence and to teach them new skills (e.g. related to the evaluation of food quality and understanding of durability labels, proper storage and food preservation options or purchase planning). The focus of this pilot action therefore lays on how to bring this topic into the classroom. Both the development of different teaching materials as well as establishing offers/materials for teacher training seem useful to meet those objectives.

To consider on a very early stage of the pilot action the different feasibility aspects on future implementation expert interviews have been carried out with responsible persons from the Vienna Municipal Education Authority. In a first discussion the development of teaching materials and/or training materials for teachers in general was considered suitable by Mr. Tschaikner and Mr. Simpson (both from the Vienna Municipal Education Authority "Stadtschulrat für Wien, Europabüro") to introduce this topic in the actual teaching at schools. The Austrian curricula are only framework curricula containing - amongst others - topic areas and general contents that have to be addressed in class. The actual design of the lessons including the decision on which topic is only addressed superficially and which topic is covered in more detail, however, is left to the schools and teachers themselves. Therefore, STREFOWA will focus on the development of teaching materials and/or training materials for teachers.

The focus of this pilot action primarily was on the age group of 10 to 14-year-olds and, thus, mainly comprises school types belonging to lower secondary education (secondary level I). This age group is also considered as the appropriate target group for this pilot action by all contacted experts from the Vienna Municipal Education Authority.

### 3.2. Implementation of pilot actions

The development of teaching materials covered both design and content. In order to develop teaching materials giving a comprehensive overview of the topic of food waste (prevention), a wide range of aspects is addressed by these materials:

- Type and quantity of food waste generated in private households)
- Impacts of food waste
- Reasons for food waste
- Options for preventing food waste
  - Correct food storage
  - Conservation of food



- Meaning of “best before” and “use by” dates
- Using leftovers

The teaching materials consist of the following items:

- Worksheets with different tasks and exercises for the pupils
- PowerPoint presentations for the teachers to support discussing food waste in class
- Information materials for teachers giving a comprehensive summary of background knowledge on different aspects of food waste
- Workshop Concept: Crime Scene Organic Waste Bin: Tracking food waste

In addition to the teaching materials intended to be used by teachers in class in a “usual” lesson, a concept for a workshop about food waste (prevention) was developed. Having an interactive design similar to a detective’s work, this workshop is covering the same topics as the teaching materials: General basics (type, quantity and impacts of food waste), reasons for food waste; options for avoiding food waste (e.g. correct food storage, food conservation, use of leftovers etc.) and correct disposal of food waste.

All teaching materials have been tested, evaluated and revised within several meeting with teachers as well as meetings with the Viennese Education Authority. Find examples for developed working sheets within the next pages as well as pictures from the first test of the workshop.



## 1 „Vermeidbar oder nicht vermeidbar“ – das ist hier die Frage!

Arbeitsblatt zu MODUL B1

**INFO-BOX: Vermeidbare und nicht vermeidbare Lebensmittelabfälle**

Nicht immer können wir die Entstehung von Lebensmittelabfällen verhindern. Bestimmte Teile wie Knochen, Fischgräten oder Melonenschalen können wir zum Beispiel nicht essen. Diese sogenannten **nicht vermeidbaren Lebensmittelabfälle** machen jedoch weniger als die Hälfte aller Lebensmittelabfälle aus.

Der größere Teil sind **VERMEIDBARE LEBENSMITTELABFÄLLE**, die wir eigentlich **hätten verhindern können**. Diese Lebensmittel waren vielleicht **noch gar nicht schlecht**, als sie im Müll gelandet sind. Oder aber, sie wären **gar nicht schlecht geworden**, wenn wir sie **rechtzeitig gegessen hätten**.

**AUFGABE** Nicht alle Lebensmittelabfälle können vermieden werden. Mehr als die Hälfte aller Lebensmittelabfälle sind jedoch vermeidbar! Kreise alle vermeidbaren Lebensmittelabfälle rot ein!



Auch im Biomüll landen viele Lebensmittelabfälle! Mehr als die Hälfte davon sind vermeidbar!

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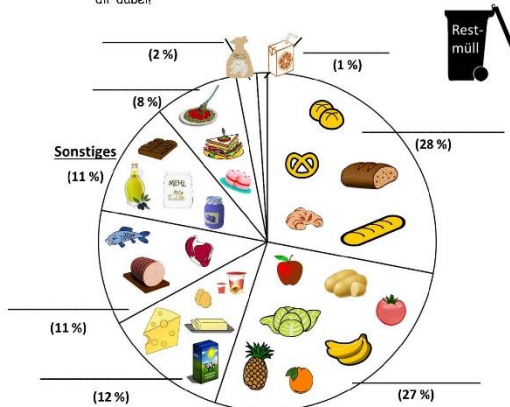
## 1 Die Zusammensetzung von Lebensmittelabfällen in Österreich

Arbeitsblatt zu MODUL B1

**INFO-BOX: Die Zusammensetzung von Lebensmittelabfällen**

Untersuchungen zeigen, dass einige Produktgruppen besonders häufig weggeworfen werden. Mehr als die Hälfte der vermeidbaren Lebensmittelabfälle im Restmüll werden von nur drei Produktgruppen verursacht. Finde in diesem Arbeitsblatt heraus, welche Gruppen zu diesen „Top 3“ gehören!

**AUFGABE** Fülle die Grafik fertig aus! Schreibe dazu die richtigen Produktgruppen auf die vorgegebenen Striche. Die Box unter der Grafik hilft dir dabei!




**Produktgruppen (in alphabetischer Reihenfolge):**  
Brot & Backwaren -- Fleisch, Wurstwaren & Fisch -- Getränke -- Milchprodukte, Eier & Käse -- Nudeln & Reis -- Obst & Gemüse -- Sonstiges -- Speisereste

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## 1 Lebensmittel wegzuwerfen schadet Umwelt und Geldbörse!

Arbeitsblatt zu MODUL B1

**INFO-BOX: Die Auswirkungen von Lebensmittelabfällen**



**AUFGABE:** Fülle den Lückentext aus! Das Bild oben hilft dir dabei!

Herstellung, Verarbeitung und Transport von Lebensmitteln **verbrauchen** Ackerfläche, \_\_\_\_\_ (Wasser), Energie (z.B. in Form von \_\_\_\_\_ (Treibstoff) oder Dünger) und Arbeitskraft. Lebensmittel wegzuwerfen bedeutet, dass diese **Ressourcen** \_\_\_\_\_ (verschwendet) werden.

Bei Herstellung, Lagerung und Transport von Lebensmitteln **entstehen** sogenannte **Treibhausgase**, zum Beispiel Kohlenstoffdioxid (CO<sub>2</sub>). Diese \_\_\_\_\_ (Treibhausgasen) **beeinflussen** unser Klima. Werden \_\_\_\_\_ (Lebensmittelabfälle) falsch entsorgt (z.B. auf der Mülldeponie) entsteht das Treibhausgas Methan (CH<sub>4</sub>). Je \_\_\_\_\_ (mehr) dieser Treibhausgase in die Luft gelangen, desto schlechter ist das für unser \_\_\_\_\_ (Klima).

Lebensmittel **wegwerfen** heißt \_\_\_\_\_ (es) wegwerfen. Ein österreichischer Haushalt wirft pro Jahr etwa 227 Euro in Form von Lebensmitteln in den Restmüll.

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## 1 Mindesthaltbarkeits- & Verbrauchsdatum: Ist doch das gleiche, oder?

Arbeitsblatt zu MODUL B1

**INFO-BOX: Mindesthaltbarkeitsdatum und Verbrauchsdatum**

Das **Mindesthaltbarkeitsdatum (MHD)** findet man auf **fast allen** Produkten. Nach diesem Zeitpunkt verändern sich manchmal Aussehen oder Geschmack. Die Produkte sind deshalb aber noch nicht schlecht! **Viele Produkte sind auch (lange) nach dem MHD noch essbar!** Schauen! Riechen! Schmecken! So kannst du feststellen, ob das Produkt noch essbar ist!

Produkte mit überschrittenem MHD muss man also nicht gleich wegwerfen! Sie dürfen sogar noch verkauft werden!

Obst, Gemüse, Zucker, Salz, Essig oder Kaugummi haben kein MHD!

Das **Verbrauchsdatum (VD)** ist auf Produkten zu finden, die **sehr schnell schlecht werden** (z.B. Fleisch und Fisch). Lebensmittel mit **überschrittenem VD** sollten besser entsorgt und nicht gegessen werden.

**AUFGABE**

Lies dir folgende Aussagen durch und kreuze an, ob sie richtig (R) oder falsch (F) sind! Die Info-Box oben hilft dir dabei!

	R	F
1. Wenn ich ein Joghurt mit überschrittenem Mindesthaltbarkeitsdatum (MHD) im Kühlschrank finde, werfe ich es sofort weg. Sicher ist sicher!		
2. Ich habe gehört, dass Fleisch, bei dem das Verbrauchsdatum (VD) überschritten ist, besser entsorgt werden sollte.		
3. Vor kurzem habe ich im Kühlschrank Salz gefunden, bei dem das MHD bereits zwei Jahre überschritten war. Ich habe es sofort entsorgt!		
4. Ich werfe alle Lebensmittel weg, die das MHD überschritten haben. In den Geschäften dürfen sie schließlich auch nicht mehr verkauft werden.		
5. Gestern habe ich einen Fruchtzwerg im Kühlschrank gefunden, den ich total vergessen hatte. Das MHD war schon vier Tage überschritten! Nach Geruchs- und Geschmackstest konnte ich aber keine Mängel feststellen. Daher habe ich ihn gegessen!		
6. Es ist wichtig daran zu denken, dass viele Produkte auch noch lange Zeit nach dem Mindesthaltbarkeitsdatum essbar sind – denke nur an Nudeln!		
7. Soweit ich weiß, kann man das Verbrauchsdatum z.B. auf Fisch finden.		

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**STREFOWA** European Union  
European Regional  
Development Fund

**Arbeitsblätter zu  
MODUL B2: Lebensmittelabfälle  
vermeiden: Wie geht das?**

**MODUL B2.a.: HANDLUNGSOPTIONEN**

Die vorliegenden Unterrichtsmaterialien zum Thema „Vermeidung von Lebensmittelabfällen“ wurden im Rahmen des Interreg Central Europe Projekts STREFOWA entwickelt.




 **Tipps & Tricks zur Vermeidung von Lebensmittelabfällen** Arbeitsblatt zu MODUL B2

**INFO-BOX: Tipps & Tricks gegen Lebensmittelabfälle** *Wie kann ich Lebensmittelabfälle vermeiden?*

Einfrieren (2) • Marmelade einkochen (1) • trocken werden lassen und reiben (1) • gekühlt lagern (1) • weniger pflücken (1) • Semmelknödel machen (1) • ansehen, riechen, kosten (1) • Einkauf besser planen (2) • einen Teil wegschneiden (1)

*Manche Lebensmittel könnten auch an Haustiere verfüttert werden. Aber Achtung! Nicht jedes Tier darf alles fressen!*

**AUFGABE**

Lies dir durch, was mit den Lebensmitteln bei Familie Müller passiert ist und gib Ihnen Tipps zur Lebensmittelabfallvermeidung! Die Info-Box oben hilft dir dabei die Zahl in () zeigt dir, wie oft diese Lösung vorkommt. Schreibe auch weitere Möglichkeiten auf!

Gestern war Familie Müller am Erdbeerfeld. Weil die Erdbeeren so gut waren, hoben die Kinder viel zu viel gepflückt.

Was könnten sie jetzt damit machen anstatt sie wegzuerwerfen?

Mehrere Semmeln sind übrig geblieben, weil die Familie nicht so viel zum Frühstück essen konnte.

Was könnten sie jetzt damit machen anstatt sie wegzuerwerfen?

Lisa findet im Kühlschrank zwei Becher Joghurt, deren Mindesthaltbarkeitsdatum seit 3 Tagen überschritten ist.

Was kann sie jetzt damit machen anstatt sie wegzuerwerfen?

---

Im Obstkorb findet Mama einen Apfel mit einer braunen Stelle.


Was soll sie damit machen anstatt ihn wegzuerwerfen?

Elias findet im Kühlschrank eine schimmelige Zitrone.

Was soll er tun?

**SCHIMMEL!** Schimmelige Lebensmittel müssen zur Sicherheit weggeworfen werden! (Gesundheitsgefahr!)

*Achtung bei SCHIMMEL!*





**Interreg**   
CENTRAL EUROPE  
**STREFOWA** European Union  
European Regional  
Development Fund

**Arbeitsblätter zu  
MODUL B2: Lebensmittelabfälle  
vermeiden: Wie geht das?**

**MODUL B2.b.: LAGERUNG**

Die vorliegenden Unterrichtsmaterialien zum Thema „Vermeidung von Lebensmittelabfällen“ wurden im Rahmen des Interreg Central Europe Projekts STREFOWA entwickelt.



 **Was gehört wohin? - Lebensmittel richtig lagern!** Arbeitsblatt zu MODUL B2


**INFO-BOX: Die richtige Lagerung von Lebensmitteln**

Lebensmittel können bei Raumtemperatur, gekühlt oder tiefgekühlt gelagert werden. Aber Achtung! Nicht jede Lagerungsart ist für jedes Produkt geeignet. Falsch gelagerte Lebensmittel werden schnell schlecht und landen schlussendlich im Müll. Hilf mit, durch Lagerungsfehler verursachte Lebensmittelabfälle zu vermeiden! Denn: Lebensmittel wegzuerwerfen schadet nicht nur deiner Geldbörse, sondern auch der Umwelt.


**AUFGABE**


Lies dir das Infoblatt „Was gehört wohin? - Lebensmittel richtig lagern“ durch. Schreibe unten in die Tabelle bei „zu beachten“ 3 Punkte hinein, auf die du bei der Lagerung im Kühlschrank oder im Vorratsschrank aufpassen musst. Gib für jede Lagerungsart auch ein paar geeignete Produkte als Beispiel an!

LAGERUNGSART	KÜHLSCHRANK	VORRATSSCHRANK (SPEISEKAMMER)
<p>Zu beachten:</p> 		
<p>Was wird hier gelagert?</p> 		






 **Was gehört wohin? – Lebensmittel richtig lagern!** Arbeitsblatt zu MODUL B2

 **Infoblatt „Was gehört wohin? – Lebensmittel richtig lagern!“**

Falsch gelagerte Lebensmittel werden schnell schlecht und müssen weggeworfen werden. Richtige gelagerte Lebensmittel dagegen bleiben lange frisch und essbar. Die richtige Lagerung hilft somit, Lebensmittelabfälle zu vermeiden!

Lebensmittel können an unterschiedlichen Orten gelagert werden: kalt im Kühlschrank oder bei Raumtemperatur in Vorratsschrank, Speisekammer oder Keller. Gemüse, Brot, Fleisch, Fisch oder Käse können sogar einige Monate lang eingefroren und tiefgekühlt gelagert werden. Aber Achtung! Nicht jeder Lagerungsort ist für jedes Lebensmittel geeignet!

Vorratsschrank, Speisekammer, Keller	Kühlschrank
In Vorratsschrank, Speisekammer oder Keller werden <b>trockene Lebensmittel</b> gelagert, zum Beispiel: Reis, Mehl, Müsli, getrocknete Bohnen, Nudeln, Kaffee, Kakaopulver, Tee, Zucker, Honig, Öl, ungeöffnete Marmeladen & Konservendosen, Brot und Gebäck.	In den Kühlschrank gehören <b>Lebensmittel, die schnell schlecht werden</b> , zum Beispiel: Milch, Käse, Joghurt, Fleisch, Fisch, Eier, Margarine und übrig gebliebene Speisen. Auch das meiste Obst und Gemüse sollte gekühlt gelagert werden (am besten in der Obst- & Gemüselade).
Auch <b>kälteempfindliches Obst und Gemüse</b> (z.B. Erdäpfel, Paradeiser, Bananen) sollte hier bei Raumtemperatur gelagert werden. (Im Kühlschrank wäre es ihnen zu kalt.)	Die Temperaturen im Kühlschrank liegen zwischen 0°C und 12°C. Am wärmsten ist es in der Tür und in der Gemüselade. Am kältesten ist es im untersten Fach direkt oberhalb der Glasplatte über der Gemüselade.
<b>Worauf du achten solltest:</b>	<b>Worauf du achten solltest:</b>
<ul style="list-style-type: none"> <li>Die Lebensmittel sollten nicht offen, sondern gut verpackt (z.B. in gut schließenden Dosen) gelagert werden.</li> <li>Neue Vorräte sollten immer hinten ins Regal gestellt werden. Ältere Lebensmittel stehen vorne, damit sie zuerst gegessen werden.</li> <li>Konserven sind eigentlich sehr lange haltbar. Wenn sich bei einer Konservendose Boden oder Deckel nach außen wölben, sollte sie auf keinen Fall mehr gegessen werden.</li> </ul>	<ul style="list-style-type: none"> <li>Nach dem Einkauf sollten die Lebensmittel so schnell wie möglich in den Kühlschrank geräumt werden.</li> <li>Lebensmittel nicht offen lagern! In einer guten Verpackung (z.B. gut schließende Kunststoffdose) bleiben Lebensmittel länger frisch und essbar.</li> <li>Die Kühlschranktür sollte immer nur kurz geöffnet werden, damit die Temperatur im Kühlschrank nicht ansteigt.</li> </ul>



 **Was gehört wohin? – Lebensmittel richtig lagern!** Arbeitsblatt zu MODUL B2

 **INFO-BOX: Die richtige Lagerung von Lebensmitteln**

Lebensmittel können bei Raumtemperatur, gekühlt oder tiefgekühlt gelagert werden. Aber Achtung! Nicht jede Lagerungsart ist für jedes Produkt geeignet. Falsch gelagerte Lebensmittel werden schnell schlecht und landen schlussendlich im Müll.

Leicht verderbliche Lebensmittel wie Milch, Käse, Joghurt, Fleisch, Fisch, Eier, Margarine und übrig gebliebene Speisen gehören in den **Kühlschrank**. Auch das meiste Obst und Gemüse kann gekühlt gelagert werden (am besten in der Obst- & Gemüselade).

Dunkle, trockene Orte wie der **Vorratsschrank** sind geeignet für die Lagerung von **trockenen Lebensmitteln** wie z.B. Reis, Mehl, Müsli, getrockneten Bohnen, Nudeln, Kaffee, Kakaopulver, Tee, Zucker, Honig, Öl, ungeöffneten Marmeladen & Konservendosen, Brot und Gebäck. Kälteempfindliches Obst und Gemüse (z.B. Erdäpfel, Paradeiser, Bananen) mag es lieber warm und sollte daher bei Raumtemperatur gelagert werden!


 **AUFGABE**

Räume die Lebensmittel aus der Einkaufstasche richtig in den Kühlschrank oder in den Vorratsschrank (nächstes Blatt) ein!

Schreibe oder zeichne sie an die richtige Stelle im Kühlschrank, Gefrierschrank oder Vorratsschrank! Die Infobox oben hilft dir dabei.

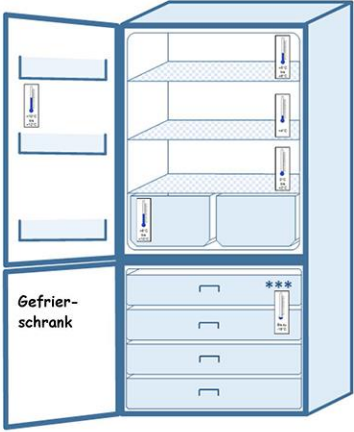




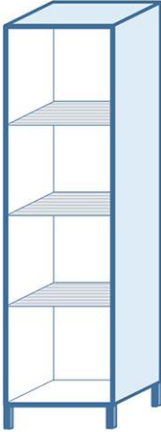
 **Was gehört wohin? – Lebensmittel richtig lagern!** Arbeitsblatt zu MODUL B2

Räume die Lebensmittel richtig ein!

**Kühlschrank**



**Vorratsschrank**



**Gefrierschrank**

**Fülle aus!**

In den Kühlschrank gehören:


\_\_\_\_\_

\_\_\_\_\_

In den Vorratsschrank gehören:

\_\_\_\_\_

\_\_\_\_\_









## PA9 SWOT-Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• Feedback meetings with teachers on draft versions of PA9 teaching materials ensure the development of materials that are ready to use in class. This aspect of practicability facilitates that the materials are widespread used in practice.</li> <li>• Developing worksheets for pupils in two levels of difficulty ensures that the materials can be used in all schools for 10-14-year-olds (“New Secondary School” (Neue Mittelschule” &amp; “Academic Secondary School” (AHS-Unterstufe) and therefore reach all Austrian children of this age group</li> <li>• Cooperation with the Viennese Education Authority (Stadtschulrat für Wien) ensures that PA9 gets support from an official administrative body which made it easier to contact schools and spread the finalized materials</li> </ul>	<ul style="list-style-type: none"> <li>• Materials might not be used often and distribution might be low due to competition from other teaching materials (other subjects)</li> <li>• PA9 is targeted at an age group with limited influence on the handling of food at home (responsibility is with the parents). By the time kids grow up and take over responsibility for food shopping and preparation a lot of knowledge they gained at a young age (10-14 years) might then be lost already.</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• With teaching materials for children age 10 to 14 potentially all Austrian pupils could be reached as children at this age all have to attend school within the framework of the 9-year general compulsory education.</li> <li>• Vague content specifications in the Austrian curricula allow teachers to choose - within borders - quite freely on which topics they focus on in their lessons (food waste prevention could, thus, be discussed in connection to topics such as environmental impact of humans / human consumption, resource use, ...).</li> <li>• A good and practicable concept for teaching materials for 10-14 year-olds can at a later stage be adapted in a way that it will be suitable to for e.g. 16-18 year olds.</li> <li>• Bringing the topic of food waste prevention into schools might facilitate to include this topic into the official Austrian curricula when those legal acts are amended next time.</li> <li>• The finalized teacher trainings will help to spread the materials in future.</li> <li>• The developed workshop concept is ready to be used by waste consultants and is likely to be used in future.</li> </ul>	<ul style="list-style-type: none"> <li>• Because of limited time resources of teachers maybe not all teaching materials (i.e. all topics) will be tested in practice (i.e. in class).</li> <li>• Teachers might not know about the materials and/or be not interested into the topic themselves.</li> <li>• Children may not discuss the contents at home and therefore will not act as multipliers</li> </ul>



### 3.3. Problems and other important issues occurred during the PA implementation

The original idea to anchor the topic "food waste prevention" in various curricula in addition to developing materials for teaching and teacher training had to be rejected already in an early stage of the project. According to Mr. Tschaikner and Mr. Simpson, who were asked about the feasibility of implementing the ideas of the STREFOWA project team for the pilot action at Viennese schools, curricula are under the responsibility of the national government and require a parliamentary legislative process to be changed or amended (Tschaikner and Simpson, 2016). Therefore, embedding "food waste prevention" in Austrian curricula within the scope of STREFOWA is not an option.

Unclear tasks in the school materials with more questions from pupils have been revised immediately after occurring in lessons.

### 3.4. Results and target groups reached

TARGET GROUPS	QUANTIFICATION
Local public authority	<i>Vienna Municipal Education Authority</i>
Regional public authority	-
Interest groups including NGOs	-
Education/training centre and school	<i>6 schools where activities have been performed</i>
Large enterprises	-
SME	-
General public	-

<i>Pilot Action</i>	<i>Amount of waste avoided per PA</i>
<b>PA9</b>	<i>Direct quantification not possible. Future waste prevention through education</i>

More than 60% of the pupils answered after they visited the lecture or the workshop that they throw away less food. 43 % even say that they influenced their family. Therefore in general a high avoidance potential can be assumed but no measurement is possible.



### 3.5. Sustainability and transferability of pilot actions on optimal solutions on Food Waste Prevention in Food Preparation and Consumption

The materials are ready to be used in class. With the help of public authorities the materials have been distributed widely in Austria and can be found on teaching platforms <http://puma.lehrerweb.at/angebote-und-links/> as well as on the STREFOWA tool. Through the translation of some working sheets the materials will also be ready to use in other countries. The finalized workshop concept is ready to use not only by teachers but also waste consultants or other persons working in the environmental education sector. The materials are also a good basis for the development of materials for older pupils.

## 4. Food Waste Prevention in Food Preparation and Consumption: PA10 (Glopolis)

### 4.1. Feasibility Study overview

As mentioned in the feasibility study, In the Czech Republic, catering in public canteens is determined by a consumer basket, especially school canteens. The Consumer Basket is a summary of rules for satisfying the nutritional value of a meal served to children in schools. The consumer basket determines the amount of each nutrient / food and the school menu must be carefully and in detail planned to reach the total amount of nutrients that the child needs within a day, a week and a month. This means that canteens cannot choose which ingredients to give to children, and they have very little variability in what they offer. School canteens also have a low budget, so in the end they have to combine strict rules with unfavourable financial conditions. It follows that, from a project perspective, it is not possible to change this structure into education because the system is legally binding. This was the main information on which Glopolis based the developing and implementation of the planned activities within PA 10 and continued with respect to this till the end.

The main goal was to create program that would be available online for download and anyone who is interested in teaching the “foodwaste” information can take a complete methodology and use it.

### 4.2. Implementation of pilot actions

Glopolis wanted to create a complex picture of the food waste in school canteens and in the school itself. That is why at the beginning 5 in-depth researches were run to understand how the schools work, what is the system of ordering, cooking and offering the food and what happens with the un-eaten or un-used food that was already cooked.



On this information Glopolis could lead next steps on building the educational program that would fit the atmosphere and conditions in the Czech school system.

Glopolis worked with external experts on education, graphic design, animation and child behaviour.

All the work was based on output - feedback - output which means all the materials were co-created together with the teachers and pupils of elementary schools. Glopolis team wanted all the materials, all the tools to be really useful so before everything was moved to the next stage, it had to be approved by testing it at the schools.

Team of Glopolis understood that the new info material needed to be introduced and explained before the final implementation and the topic should be opened by the team who developed all the materials.

For the research Glopolis cooperated with independent research agency which collected and evaluated all the data.

### 4.3. Problems and other important issues occurred during the PA implementation

The main problems Glopolis faced during the implementation were:

- Convincing the schools to participate in the project.  
Solution: Personal meetings or phone calls which were accepted better than just writing an email which was lost often. Cooperation with the local action plans (MAP) - local institutions which filter all the info coming to the schools and offer the relevant emails, schools were more likely to accept the offer to be a part of the project when official email came through MAP system.
- Leaving of the already confirmed schools.  
Solution: finding the new ones
- Delayed feedbacks from the teachers.  
Solution: Being patient and reminding what and when Glopolis team needed the answer or other data.
- Time possibilities of the teachers. It was hard to make an appointment.  
Solution: Being patient and communicate constructively till Glopolis found the compromise.

In general there was a problem of shortage of time from the side of the teachers which is absolutely understandable as they already have full schedule. Fortunately, everyone wanted to cooperate and at the end Glopolis always found a way to receive what was needed.

### 4.4. Results and target groups reached

As a result of the Pilot action 10, Glopolis developed:

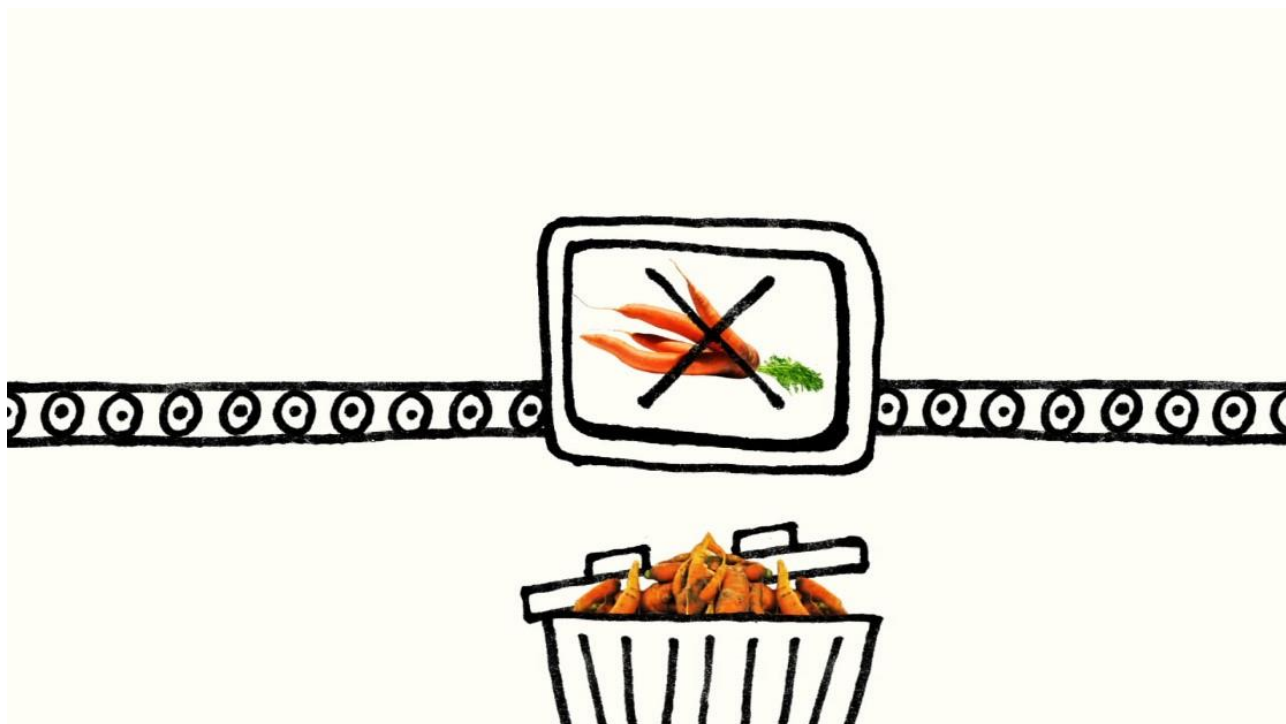


- Complete educational program for elementary schools in the Czech Republic including 3 short animated videos, 1 info brochure for the teachers and 12 lessons with complete methodological process explained, pictures, working sheets and illustrations
- 5 in-depth workshops which resulted in 5 reports of approx. 40 pages each
- Thematic workshops for teachers
- Thematic workshops for pupils
- Final dissemination workshop where all the pupils and teachers from the project schools met and presented their thematic project on food waste at their school

**TENTO PROJEKT VZNIKL ZA PODPORY:**



**V RÁMCI VZDĚLÁVACÍHO PROGRAMU  
NEPLÝTVÁME TÍM, CO JÍME**



**Figure 2: Example printscreen - animated video**



**Figure 3: Workshop for children**





Figure 4: Dissemination workshop - Final event for teachers and children

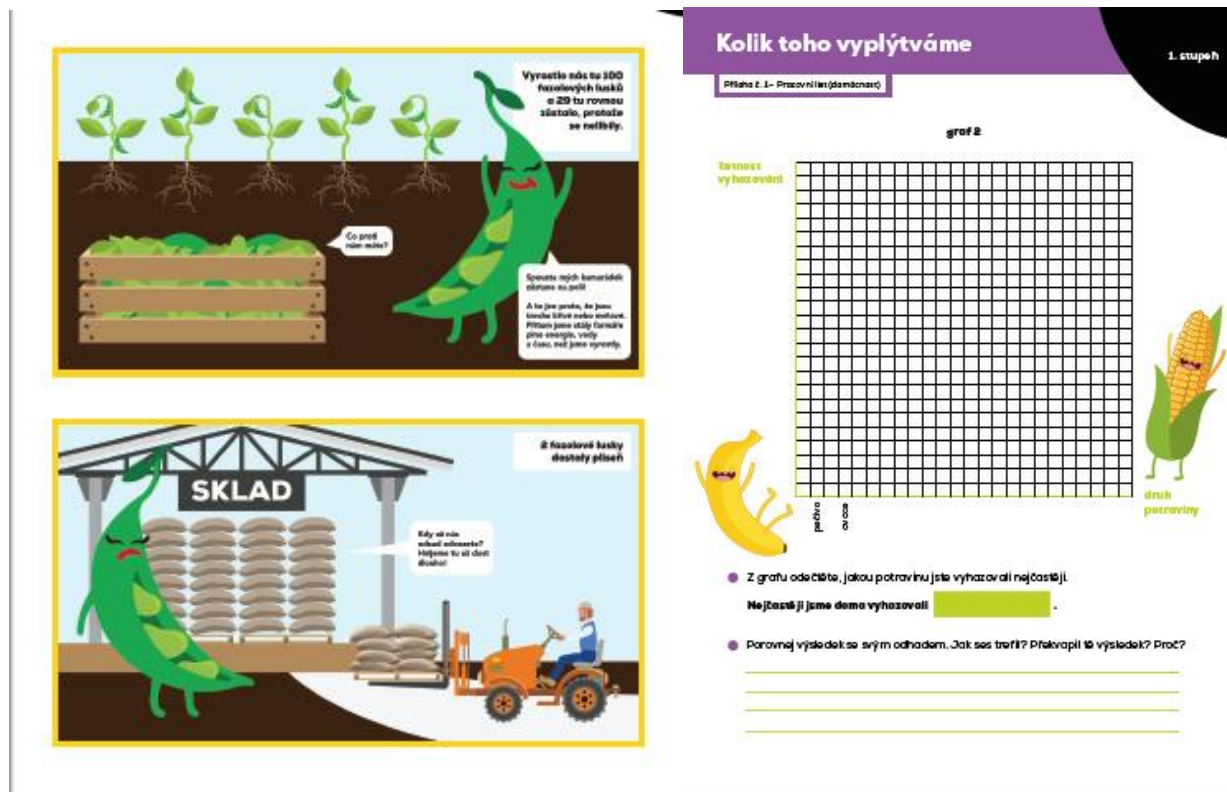


Figure 5: Part of educational lesson material

TARGET GROUPS	QUANTIFICATION
Local public authority	3 local action plans (MAP)
Regional public authority	-
Interest groups including NGOs	-
Education/training centre and school	12 elementary schools, 1 educational center
Large enterprises	-
SME	-
General public	800 followers via Czech Facebook page





## 4.5. Sustainability and transferability of pilot actions on optimal solutions on Food Waste Prevention in Food Preparation and Consumption

All the data, researches and educational materials are available online in the main output of the project - The Tool website. Other than that, Glopolis also stored all this data on their web page and sent the info link to the database of Czech elementary schools to inform them that these materials are available for downloading and use.

# 5. Food Waste Prevention in Food Preparation and Consumption: PA11 (Lamoro)

## 5.1. Feasibility Study overview

With PA11, LAMORO aimed to raise awareness among young generation and create a new cultural vision. In specific the issue of Food Waste prevention is very important because food is an essential part of everyone life and children should be informed from an early age on how not to waste it and how manage it at the best. And informing children can also have an impact on the adults of the family unit, ensuring a multiplier effect.

LAMORO has focused on primary schools, preparing a booklet with specific activities addressed to children. According to the teachers' advice, the best way to fix an idea in the mind of children is learn by drawing. At the primary schools, drawing is an effective way to teach and train children. The drawing arouses the curiosity and attention of children: through the drawing on the booklet specially prepared by LAMORO, children could "touch" and "explore" the importance of food and the ways in which food is wasted daily.

LAMORO carried out the activity inside schools in May and June 2017, before the end of the school year. The activities started with a specific planning together with the Regional Board of Education (in charge of the school activities) and with the Regional Council and Consumer Protection Board (in charge of the food waste prevention activities at regional level).

Activities with schools were aimed at raising awareness of the importance of food and natural resources that have contributed to the generation of food itself: it is essential to promote more responsible and sustainable behaviours within the younger generations that will inherit the Earth. School pupils were invited to think about the origins of food waste and ways to avoid wasting: small theoretical home cooking exercises were also experimented to cook with the leftovers of the day. The messages transmitted to children to improve their awareness have focused on food: food should not be wasted because otherwise it becomes waste and is bad for the environment; the advanced food can be cooked in another way to be able to consume it and not make it become a waste.



## 5.2. Implementation of pilot actions

After several organizational meetings with the Regional Education Office for Piedmont - IV Territorial Office of Asti, LAMORO contacted some primary schools in the city of Asti and surroundings in order to promote awareness of food waste in qualitative and quantitative terms.

The pilot action took place in two primary schools:

- Primary school “U. Cagni” on 24<sup>th</sup> of May 2017;
- Portacomaro Primary school on 25<sup>th</sup>-29<sup>th</sup> of May 2017 and 5<sup>th</sup>-6<sup>th</sup> of June 2017.

The activities with the schools have been oriented to increase awareness of the importance of food and natural resources that have contributed to the generation of the food itself. Pupils were asked to think about the origins of food waste and any ways not to waste and generate waste: they also did small experiments how to cook with the leftovers of the day. LAMORO realised a booklet with different section and modules: each teacher chooses what is more suitable for the pupils. LAMORO, in fact, used the booklet in different way during each round.

The activities with the schools have been shared with the European partners of the STREFOWA project and go to create a dossier of school experiences for each partner, in order to share experiences, to compare the different realities and find new inputs to be developed in subsequent activities.

The activity was structured as follows:

- first meeting with teachers, choice of activities to be performed based on hourly availability and pupils characteristics;
- preparation of the definitive material;
- pupils activities with support and presence of teachers.

The class meetings are structured as follows:

- > reading a fable for introductory purposes to the theme of food waste, an invitation to draw and represent the more impressive (in terms of waste) passages of the fable;
- > pupils interview about the domestic behaviour how to treat food waste at home: a lot of information sorted out! Introduction to home cooking with leftover food and little practical experiment with the advanced bread in the school cafeteria;
- > presentation of EXPO MILANO 2015 and the Milan Children's Charter, lessons on the waste of natural resources and food.

The messages transmitted to children to improve their awareness have focused on food: food should not be wasted because otherwise it becomes waste and damages the environment; leftover food can be cooked in another way to consume it and not make it waste.



**Figure 6: Activities with pupils**

### 5.3. Problems and other important issues occurred during the PA implementation

The only problematic issue occurred during the implementation of the PA was to find a place for the project’s activities into the dense scholar calendar. But, the interest demonstrated by the teachers and school managers allowed to carry on the project activities with maximum flexibility and with an excellent management of the time.

### 5.4. Results and target groups reached

TARGET GROUPS	QUANTIFICATION
Local public authority	1
Regional public authority	1
Interest groups including NGOs	-



Education/training centre and school  
 Large enterprises  
 SME  
 General public

2
-
-
-

### 5.5. Sustainability and transferability of pilot actions on optimal solutions on Food Waste Prevention in Food Preparation and Consumption

Education for sustainability seems to have become an emerging priority for the Italian schools. So, in addition to the hours dedicated by the teachers training this topic, also the National Environmental Ministry has formally recognized this trend issuing a document (as Guide Lines) for schools where environmental activities will be realised in voluntary form. It is an encouraging document for a new way of teaching and facilitates the transferability of every good practice concerning the education practices about sustainable environmental future.

Italy in the field of environmental education could boast a wide range of good practices based in different regions that could count on a certain continuity that means that a good part of Italian school system facilitates the sustainability of this kind of initiatives.

## 6. Food Waste Prevention in Food Preparation and Consumption: PA12 (BOKU)

### 6.1. Feasibility Study overview

As a first step an extended literature research was performed to learn more about consumer attitudes concerning food waste in general and to define consumer groups on the other hand. The second and main part of the research was to develop a questionnaire for Austrian households to collect as much information as possible on their food waste related behaviours, knowledge and attitude.

In January 2017 an online survey was prepared, after internal pre-test and minor adjustments it was conducted during April and May 2017. It consisted of 28 food waste related questions as well as further questions concerning the socio-demographic background of the participants (the questionnaire can be found in the Appendix of this report). The online-survey tool Lime-Survey was used for this purpose.

2632 participants started this questionnaire, 473 did not finish. The further analysis was continued with 2159 complete data sets. A cluster analysis was carried out to divide the participants into four different groups.

## 6.2. Implementation of pilot actions

Taking into account facts about consumers' preferences, knowledge about different food waste types, consumers' knowledge gaps as well as their behaviours the First Aid Box for food has been developed. A box included 9 different materials (informational materials, instructions as well as sponsored materials for practical use like freezer bags or gelling aid).

The boxes have been handed out to 2000 consumers on six days in March 2018 at three different SPAR retail stores in Vienna. The stores are located in different Viennese districts that include consumers of different social classes and purchase power. Furthermore, the times of distribution varied - boxes have been handed out on weekends as well as weekdays to reach different types of consumers as well as age-groups.

On the front of the box the first aid sign is shown with the inscription: Erste Hilfe für Lebensmittel (First Aid for Food). For the exterior design it was important to catch the consumers' attention - so the following farmers rule (or weather lore) "Landet das Essen im Magen, musst du es zum Müll nicht tragen" (Translation: If the food will end up in the stomach you don't have to carry it to the waste bin) has been placed on the top of the box together with a picture delivering the message. On every other side and the back there are sponsor logos as well as internet addresses and the imprint.



Figure 7: First Aid Box – Exterior Design

- 10 food waste prevention tips



These are mainly important for consumers, who haven't dealt with food waste prevention to this point. The main reason for adding these tips was to help provide an overview on possible and most effective food waste prevention measures in households. Furthermore, their colourful design helps to attract consumers' attention and the format will provide consumers with the possibility to pin it on the fridge or position it on other well visible places.



Figure 8: 10 tips and tricks - an overview on food waste prevention

■ **Express-jam-recipe**

Only 27% of consumers already use jam making as a technique to prevent food waste at home. There is a lot of potential and it seemed to be important that consumers know that making a jam won't take much time and is also a very effective and at the same time creative method to prevent food waste because it is appropriate for all fruit varieties and it is possible to test different mixtures.



**Blitz-Marmelade**

Der Pfirsich bekommt eine schrumpelige Haut? Künstliche Marmelade selbst zu machen geht in Windeseile! Einkochen ist ein einfacher Weg, kleine und große Mengen Obst blitzschnell haltbar zu machen. In unserem Rezept verwenden wir Erdbeeren und Marillen, doch Ihrer Kreativität sind absolut keine Grenzen gesetzt. Mischen Sie Obstsorten, wie es Ihnen beliebt!

**Zutaten**

(für ca. 4 Stk. 250 ml Gläser)

1 Pkg Haas Quittin Gelierhilfe (2:1)  
500g Erdbeeren  
500g Marillen  
500g Kristallzucker  
Nach Belieben verfeinern

**... und so wird's gemacht**

- 1) Früchte waschen und - wenn nötig - putzen und entkernen. Größere Früchte halbieren.
- 2) Früchte mit einer Packung Haas Quittin Gelierhilfe in einem großen Topf unter Rühren zum Kochen bringen.
- 3) Zucker dazugeben und weitere 3-4 Minuten kochen lassen bis die Früchte weich sind und sich der Zucker aufgelöst hat. Marmelade evtl. verfeinern (siehe Rückseite).
- 4) Füllen Sie die heiße Marmelade in saubere Gläser ab.

**Tipps für die perfekte Marmelade**

**Alles, außer gewöhnlich**

Um der Marmelade eine besondere Note zu verleihen, kann sie mit unterschiedlichen Zutaten verfeinert werden. Dazu eignen sich beispielsweise das ausgekrazte Mark einer Vanilleschote, Holunderblüten, Amaretto, Rum, Saft oder Zesten (abgeriebene Schalen) von Bio-Zitronen oder Bio-Orangen und geriebener Ingwer. Je nachdem wie fein die Marmelade sein soll, können Sie diese ganz oder teilweise pürieren bzw. durch ein Sieben streichen, um auch kleinste Kerne zu entfernen.

**Sauberkeit ist das A und O**

Sterilisieren Sie alle Gläser indem Sie diese öffnen und sowohl Deckel als auch Gläser in einen Topf mit Wasser geben. Bringen Sie das Wasser zum Kochen. Nach ca. 10 Minuten sind alle Gläser sterilisiert.

**Marmelade richtig abfüllen: Vakuum sorgt für Haltbarkeit**

Achten Sie darauf, dass die Marmelade nicht auf den Verschlussrand tropft und säubern Sie die Ränder gegebenenfalls vor dem Verschließen. Nach dem Befüllen werden die Gläser auf dem Deckel stehend aneinandergereiht und mit einem Küchentuch bedeckt zum Abkühlen aufgestellt. Undichte Gläser sollten im Kühlschrank aufbewahrt und rasch verzehrt werden.



Figure 9: Express Jam - Recipe cards, front and back view

■ **Gelling aid sponsored by Haas**

Step by step instructions can show consumers that making a jam is easier than they thought, but it is even more easier to give it a try when everything they need is already at home. The company Haas therefore sponsored us with gelling aid bags that were added to every box.

■ **Freezing card**

Freezing is already used relatively often as food waste prevention measure in households, nevertheless there exist uncertainties concerning some products e.g. eggs or dairy products as well as how long food stuff can stay in the freezer. The freezing card will help consumers to gain a short overview on all relevant issues and maybe even encourage them to look up whether they can freeze certain products before wasting them.

**Obst und Gemüse**

**Vorfrieren:**  
Obst- oder Gemüsestücke werden lose für kurze Zeit ins Gefrierfach gelegt und erst danach gemeinsam in einem Behältnis eingefroren. So klebt nichts zusammen!

**Gegebenenfalls entkernen**

**Auspressen:**  
Saft kann in Behältern oder Eiswürfelformen eingefroren werden.

**Auftauen:** Im Kühlschrank schonend auftauen oder aber - wenn das Produkt sofort verkocht oder weiterverarbeitet wird - im gefrorenen Zustand verwenden.

**Blanchieren:**  
Einen Topf mit Wasser zum Kochen bringen, etwas Salz hinzufügen und das Gemüse für ca. 2-3 Minuten dazugeben (bereits gewaschen und geschnitten). Danach sofort eiskalt abschrecken und einfrieren.

**Schälen:** Für all jene Sorten, die Sie ohne Schale weiterverarbeiten möchten.

**z.B. Karfiol, Brokkoli, Karotten, Erbsen**

**Ideal zum Portionieren!**

**Für Zitrusfrüchte wie Zitronen oder Orangen**

**z.B. Apfel, Mango, Birne, Pfirsich, Spargel, Kürbis**

**Fleisch und Fisch**

Fleisch und Fisch kann problemlos eingefroren werden. Zum Erhalt der Qualität, am besten vakuumiert oder luftdicht verschlossen einfrieren, damit Gefrierbrand verhindert wird. Über Nacht schonend im Kühlschrank auftauen lassen! Beschriften Sie das Fleisch vor dem Einfrieren (Haltbarkeit: Fisch 2-4 Monate, je nach Fleischart bis zu 12 Monate).

**Eier**

Eier trennen und in beschrifteten Behältern einfrieren. Nach dem Auftauen im Kühlschrank nur mehr für gekochte/gebackene Speisen verwenden (Haltbarkeit: 8-12 Monate).

**Fertige Speisen**

Saucen, Suppen, Eintöpfe, Süßspeisen, Kuchen, Gebäck, Quiches oder fertig zubereitetes Fleisch (z.B. faschierte Laibchen, Saftfleisch, etc.) können problemlos eingefroren werden.

**Beilagen**

Gekochte Kartoffeln, Reis und Nudeln sollten NICHT eingefroren werden, da sich ihre Konsistenz beim Auftauen stark verändert.

**Milchprodukte**

Butter eignet sich gut zum Einfrieren. Buttermilch, Joghurt, Topfen und Kefir eignen sich NICHT zum Einfrieren. Hartkäse darf eingefroren werden, allerdings verändert sich beim Auftauen die Konsistenz. Frischkäse eignet sich gut, Weichkäse sollte nicht eingefroren werden.



Figure 10: Freezing aid - card, front and back view

■ **Freezer bags sponsored by Toppits**







■ Don't forget about me - cards

One of the most important reasons for food waste generation at households is “forgetting” about food that is stored in the fridge. When the first in - first out principle is not applied, food waste will occur. To assist consumers and to help developing a feel for this principle the “Don't forget about me” cards have been developed. They are inspired by already existing cards and stickers that are used for this purpose by other food waste prevention initiatives.

■ Folder from the Viennese Foodbank



Figure 13: Don't forget about me – card

Figure 14: Viennese Foodbank- Folder, front view

Expiration dates as well as food safety is a topic that concerns consumers. Therefore, the Viennese Food Bank developed a folder that provides an overview about the right interpretation of the best before date with a detailed list of food products that can still be enjoyed days or weeks after the expiration date has passed.

Optimisation

The evaluation of the first aid box showed satisfying results - it was very well accepted by consumers.

One of the items most interesting for the participants - the storage circle - was reworked by a graphical designer. The contents of the first aid box have been translated into English and



therefore can be used in different compositions - therefore it is easy adaptable to a special food waste focus or a certain campaign in future.

**Table 2: Final SWOT analysis PA12**

PA12	Positive	Negative
<b>Internal</b>	<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• Consumer are one of the most important target groups when it comes to food waste reduction. It is possible to draw the attention of several thousand people on this topic.</li> <li>• Food waste types that may not have been considered before can be defined.</li> <li>• Possibility to design tailor made awareness campaigns with the fitting information for certain consumer types.</li> <li>• Data can be used for future studies on food waste.</li> </ul>	<p><b>Weakness</b></p> <ul style="list-style-type: none"> <li>• Although it was possible to find different consumer types it turned out that it is better to have one tool that will be interesting for different types</li> </ul>
<b>External</b>	<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• It was possible to get a high reach on social media and so the public awareness about the problem as well as the project increased.</li> <li>• Consumers, who participate in the survey as well as received a first aid box reflected their own food waste behaviours.</li> <li>• Organizations and educational institutions got to know the first aid box and have the chance to access contents in future via the reducefoodwaste tool.</li> <li>• The box is also a good inspiration for further activities in the food waste prevention efforts in different European countries</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• The box might not be used because of missing awareness level that it is accessible.</li> <li>• Consumers, who do not feel bothered by food waste at all will be hard to reach even with tailor made campaigns.</li> <li>• It might not be used in future due to production costs</li> </ul>



### 6.3. Problems and other important issues occurred during the PA implementation

The most important issue to solve was to get feedback of the consumers for the evaluation of the first aid box. The problem was solved by overtaking the return costs for the participants as well as using a lottery game as an incentive to take part.

Furthermore, it turned out that developing one tool that is ready to use for different consumer groups is the best way to get in contact with consumers.

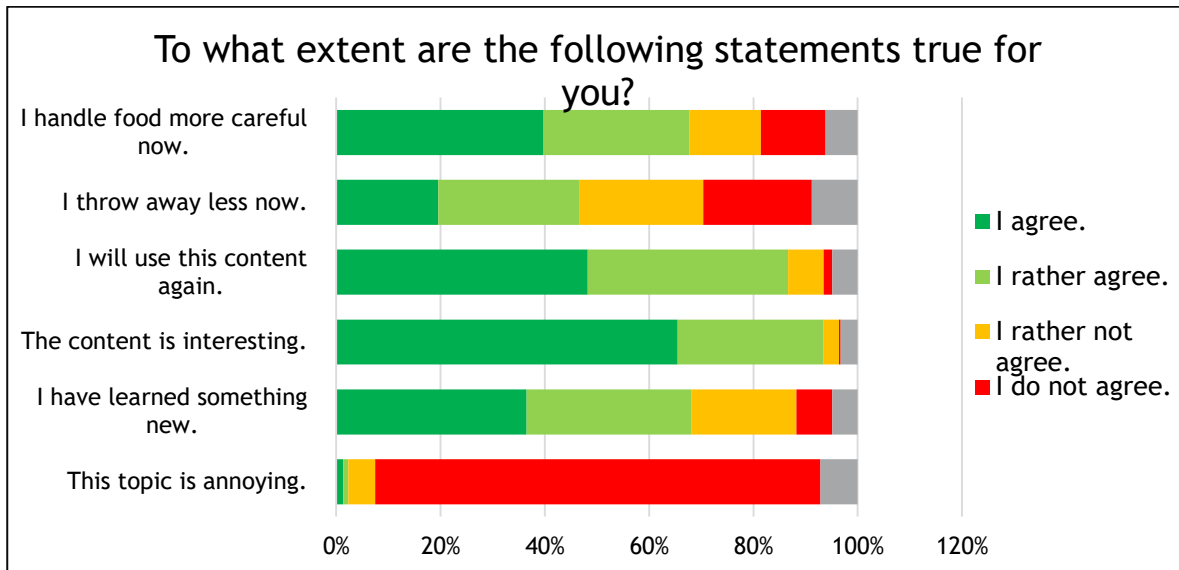
### 6.4. Results and target groups reached

Consumers' habits and attitudes change slowly - but the good news is - they can be changed! Nevertheless, although there are noticeable positive developments the consumer sector will stay the stage of the food value chain with the highest reduction potential in the following years. Therefore, even more efforts, even more creative ideas and education of all age groups are urgently needed to create a solid basis for generations with a higher ecological and social consciousness towards the impacts of food waste and the importance of sustainable consumption.

A look at the evaluation of the first aid box shows that it was very well accepted by consumers. During this pilot action 2000 first aid boxes have been handed out to consumers. 307 consumers participated in evaluating the contents afterwards, so 15% percent of households that received a First Aid Box returned their questionnaire.

More than 90 percent of the participants stated not to be annoyed at all or rather not annoyed by the topic "food waste". 65% of the participants think that the content is interesting for them and another 28% think that this statement is rather true for them. Furthermore 36% agree and 31% rather agree that they have learned something new.

Food waste behaviours can be changed with the content of the first aid box - 46% of the participants agree or rather agree that they throw away less than before. Measures like the first aid box also help to build up a positive attitude towards food waste prevention - 40% of the participants stated that they handle food more careful now, another 28% think that this is rather true for them. Almost 90% of the participants agreed or rather agreed to the statement "I will use this content again".



**TARGET GROUPS**

**QUANTIFICATION**

Local public authority	1
Regional public authority	-
Interest groups including NGOs	1
Education/training centre and school	4
Large enterprises	-
SME	-
General public	2000

**Pilot Action**

**Amount of waste avoided per PA**

<b>PA12</b>	<i>Not measurable/Evaluation shows that participants state to throw away less now</i>
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### 6.5. Sustainability and transferability of pilot actions on optimal solutions on Food Waste Prevention in Food Preparation and Consumption

It is shown that different stakeholders are interested in the box and ask for more information on the different materials. The materials of the box have been translated into English - therefore it is possible to adapt it also to any other language easily and therefore might be interesting for stakeholders in other countries too. Furthermore, the First Aid Box is a very good tool for the



use in schools as well as other educational institutions and is very interesting for the use at sustainability events to reach and inform as many consumers of different age groups as possible.

## 7. Food Waste Prevention in Food Preparation and Consumption: PA13 (Rimini)

### 7.1. Feasibility Study overview

Food waste in family routine is rather significant, even though always much lower than food waste in food production and distribution chains. The general trends which provoke food waste in families are due to some main practices such as to cook and serve too much food, which causes the production of leftovers, and to leave alimony to expire and overcome the “use by” or “best before” dates. The latter is partly reduced, more and more, thanks to the increasing sensitivity of buyers in choosing alimony with a longer life cycle.

In short, one can say that the main cause of food waste in families is driven by a surplus in buying food compared to the needs and the consumptions. This is due, partly, to the typical consumer approach which push people to impulse buying, partly to the response of the buyers to some market dynamics such as special offers, discounts, promotions which cause people to buy much more than they actually need. It is true that more recent studies demonstrate that this trend is reducing after the economic crisis which has led families to pay more attention to their purchases. However, home food waste is still a problem in Italy and in Rimini too, and it must be tackled even more thinking of the increasing number of people on the threshold of poverty.

The main obstacle to reduce food waste is cultural: people tend not to consider this as a real problem and not to be aware of its consequences on the environment and the society. In particular, for people in a wealthy state food doesn't seem to impinge significantly on their family budget or, in any case, much less that other costs (clothes, travels, facilities, health and care, etc.). Furthermore, buying people have difficulties to calculate which quantities and prices would be able not to produce waste or, at least, to produce less waste. Consequently, they tend to buy alimony following their instinct or habits or responding to a gorgeous offer or taking advantage of a temporary discount. All these mechanisms could be avoided or mitigated by a greater knowledge about the value of food and the importance of our habits to avoid waste in general and food waste specifically. This problem concerns even more young generations that don't have even the example given by older people that experienced very poor life conditions in their past. Nowadays, after decades of economic growth and spread wealth, making culture about these topics has become a need, facing a world population growth which, in a short time, will put the problem of food and water supplies again as a main point in the agenda of global governments. This is why it is necessary to start some massive campaigns of information and sensitisation among people of all ages and all social strata to gradually eliminate as soon as possible barriers about food waste in our population.

### 7.2. Implementation of pilot actions

STREFOWA project works on various activities to demonstrate that it is possible to prevent and manage food waste. On the topic of reducing food waste, with a particular reference to

domestic food waste in the Rimini area, the Province of Rimini has taken a sample of families as a significant reference point. These families were questioned on their eating habits and how they prepare and eat meals, in order to reduce food waste or if it is possible to allow the use of what is not consumed within the family, for reasons of improper use of the food resources, by third parties (disadvantaged people or groups of identified communities). LAST MINUTE MARKET and SWG were commissioned an initial survey through the administration of an online questionnaire. In this way, we obtained macro-data on food waste in families throughout the territory of the Province. At a later stage, a sample of 32 families was chosen, through the network of the Province of Rimini, of #Emporio Rimini (a group of organizations and associations very attentive to the issue of food waste), the Voluntary Associations and officials of the Municipality of Rimini. #EmporioRimini also proposes cultural initiatives about alimentary waste. In this way we chose a sample of different families according to age, composition and income. To this sample of families, the same questionnaire was administered personally (as an interview) in order to create a direct relationship, raise awareness of the issue and understand the wrong habits that generate waste in order to identify good practice that could be as effective as possible.

The following steps:

**Activity 1.** Study of local and supra-local good practices (Italian and European): desk activities (research type);

**Activity 2.** Cognitive survey on food waste referred to the dynamics that were recorded in the families of Rimini. This activity includes the following sub-actions:

A.2.1 drawing up a questionnaire and information collection by administering specific surveys online in the whole Province of Rimini through LAST MINUTE MARKET and SWG;

A.2.2 identification of a sample of families through the existing networks of the proposer and, in particular, in addition to #EmporioRimini, the Voluntary Associations and the Municipality of Rimini and responses collected by administering face to face specific surveys through the reference points of the Province of Rimini.

A.2.3 critical analysis of the results obtained;

**Activity 3.** Definition of an experimental procedure or tailored awareness campaigns to reduce food waste and testing the procedure in the sample of families through the existing networks and in the territory by sending informative emails.



**Figure 15: Cognitive survey - Distribution**



### 7.3. Problems and other important issues occurred during the PA implementation

STREFOWA project works on various activities to demonstrate that it is possible to prevent and manage food waste. On the topic of reducing food waste, with a particular reference to domestic food waste in the Rimini area, the Province of Rimini has taken a sample of families as a significant reference point. These families were questioned on their eating habits and how they prepare and eat meals, in order to reduce food waste or if it is possible to allow the use of what is not consumed within the family, for reasons of improper use of the food resources, by third parties (disadvantaged people or groups of identified communities). The survey allowed us to raise awareness among all respondents to the issue of combating food waste and promoting Strefowa project and its website through the questionnaire and the promotion of rules and good practices. It revealed that respondents are sensitive enough to the topic and do not waste excessive food amounts. After analysing the data, some good practices for waste reduction were promoted to the sample of families and they were asked to test them for two weeks and to quantify how much food waste was reduced. It was found out that the sample of families reduced enough food waste in households.

An important issue: at regulatory level, food that is left at home, unlike what is left in the shops, can't be donated to voluntary associations, because there is no traceability and the risk of incurring food adulterations. We have promoted #EmporioRimini because it organizes food collections inside supermarkets. In the days of food collections it is possible to donate the purchased food by showing the receipt. Here is the opportunity promoted to the sample of families: thanks to the recommended rules and good practices referring to waste reduction, the savings obtained could allow families to make a donation to Emporio Rimini when they go shopping.

### 7.4. Results and target groups reached

TARGET GROUPS	QUANTIFICATION
Local public authority	2
Regional public authority	-
Interest groups including NGOs	4
Education/training centre and school	1
Large enterprises	-
SME	1
General public	<i>Surveys online: 1400 subject</i> <i>Surveys administered personally: 32</i>



<i>Pilot Action</i>	<i>Amount of waste avoided per PA</i>
<b>PA13 Rimini</b>	<i>68% of respondents (sample of 32 families) said they had reduced food waste enough in households, 31% a lot and 6% don't know.</i>

In order to understand which measure or awareness campaign to promote and best fit the chosen family sample, we carried out a search for local, national and European best practices on the issue of food waste prevention. After analysing the collected questionnaires, some good practices were selected and the sample of families was asked to test them for about two weeks. In the end, the sample of families was asked to quantify the reduction of food waste obtained by applying the suggested good practices.

The results show that 28 respondents said they applied the following pieces of advice: - always prepare a shopping list; - use better storage and check the expiry dates; - position food in the fridge and sideboard according to perishability/expiry date; - reuse leftovers to create new meals or a compost for the garden; - freeze surplus food in the fridge. 20 respondents said they applied the following pieces of advice: - prepare a weekly menu and plan the shopping according to it; - use anti-waste recipe links; - consult the food conservation guide of the Ministry of Health. 10 respondents have done the online shopping, selecting only the products that they needed, and 5 have used the Waste notes diary to write down daily the food thrown away, indicating the quantities and the motivations. 5 youngsters have tested a chat on Whatsapp called "Fridge sharing" with a group of acquaintances to share the excess food they have at home. None of the over 65s managed to organize neighbourhood dinners during the testing period but they will try in the future together with the neighbourhood associations.

68% of respondents said they had reduced food waste enough in households, 31% a lot and 6% don't know. 53% of respondents considered the questionnaire and good practices quite useful and 47% very useful.

## 7.5. Sustainability and transferability of pilot actions on optimal solutions on Food Waste Prevention in Food Preparation and Consumption

The objectives of the project were described to the families that were invited to surf the STREFOWA website. In addition, they were informed about the law against food waste and that there are some precautions and good practices to reduce food waste at home. Finally, the search for good practices at national and European level allowed us to select some of them in order to be able to test them in the Province, either through the sample of identified families, or through the promotion within the Province network by sending informative emails to sensitize the territory in favour of food waste reduction.