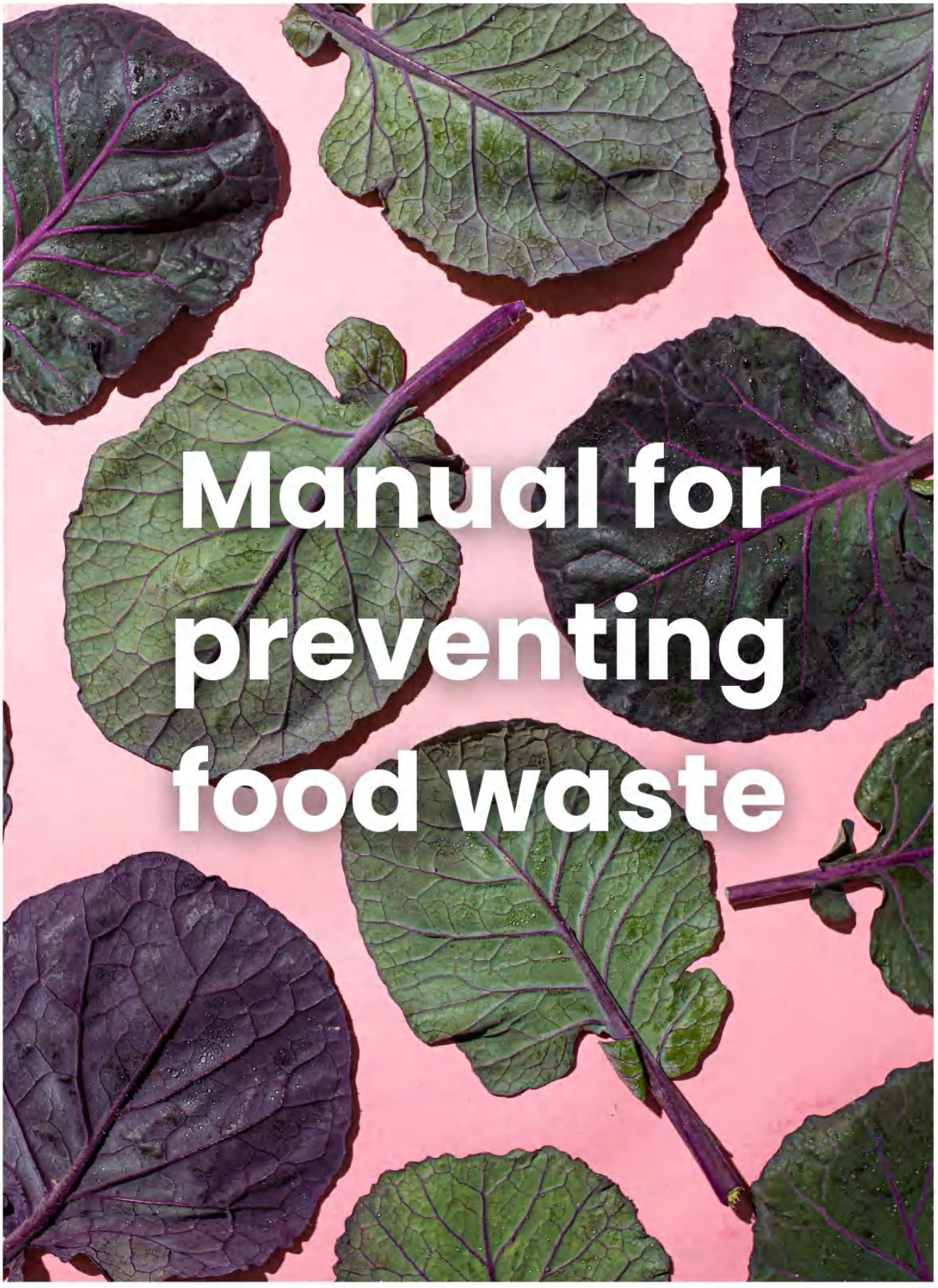


Manual for preventing food waste

VET LOVES FOOD, project funded by the European Commission through the Erasmus+ programme, Call 2021, Round 1 KA2 (2021-1-ES01-KA220-VET-000025377).

VET LOVES FOOD

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them

INDEX

Introduction to food waste prevention

According to the United States Environmental Protection Agency, waste prevention, also known as source reduction, means using less material to get a job done. Waste prevention methods help create less waste in the first place—before recycling. If organizations take a good look at their recycling collection data, they are likely to see ways to reduce waste first through waste prevention, thereby decreasing purchasing costs and the amount of material that must be managed for recycling (EPA, 2016).

The world is facing a food waste crisis. An estimated 931 million metric tons of food were wasted in households, retailers, restaurants, and other food services in 2019 ("UN: 17% of all food available at consumer levels is wasted"). About 61% of that waste occurs in households.

Reducing food waste offers multiple benefits for people and the planet, helping to improve food security, reduce pollution, save money, reduce pressures on nature and the climate, and create opportunities for the economy and society. For this reason, the United Nations Sustainable Development Goal (SDG) 12.3 sets the clear goal of halving global per capita food waste at the retail and consumer level by 2030 (European Commission, n.d.).

The 2021 United Nations Food Systems Summit highlighted innovation as the key to transforming the way food is produced and disposed of. Green and digital technologies play an increasingly important role in reducing consumer food waste and driving the transition to more sustainable food consumption patterns. Cities in both developed and developing countries are well-positioned to take advantage of the new opportunities offered by green and digital technologies (UNEP DTU Partnership and United Nations Environment Programme, 2021).

This manual for preventing food waste and valorizing traditional recipes and local products has been developed within the framework of the actions established in the work of the VET LOVES FOOD program. The objectives established to reduce this waste will be shown, and will be accompanied by good practices and recipes where the practical application of possible ways to reduce waste can be seen. In addition, there will be an introduction to the concept of "Sustainable Restaurant" and the VET LOVES FOOD project.

To prepare this document, a mapping of practices and initiatives related to food waste at a global level has been carried out by all consortium partners within the VET LOVES FOOD project. The project partnership has proposed different traditional recipes that can serve as an example of reducing food waste. In addition, the manual also includes the recipes received in the contest developed by VET LOVES FOOD, where the tastiest and most original recipes with a low carbon footprint were awarded.

This work is the result of broader and previously developed research where green skills applied to the educational framework were defined.

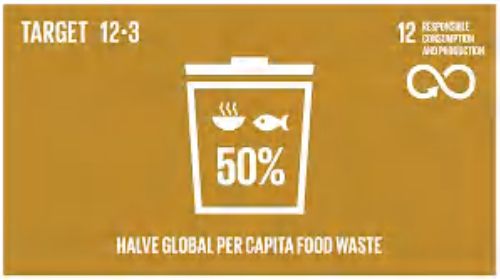
VET LOVES FOOD project

VET LOVES FOOD is a new European Project mainly addressed to VET teachers, trainers, students, and schools. It intends to develop green skills in the agro-food curricula of VET educational pathways and to raise awareness in this sector on food-wasting prevention. It is a KA2 project co-funded by the Erasmus+ Programme and led by the Spanish Confederation of Education Centres (CECE). Implemented in four partner countries: Italy, Portugal, Spain, and Belgium.

The objectives of this project are:

- To develop green skills in agro-food curricula within VET paths to contribute to the development of a sustainable approach focused on the prevention of food waste at all levels.
- To create a performance model to contribute to the transfer of successful methodologies and tools for monitoring food waste in VET.
- To engage local stakeholders in the challenge of attaining the SDGs, in particular SDG 12.3
- To support VET providers and stakeholders in the agri-food sector to pursue food prevention and food management habits by creating an EU Hub for Food Waste Prevention and Management.

IMAGE 1: Target 3 of the 12 SDG



Source: FAO (FAO, 2023)

How are we going to ensure key priorities of VET LOVES FOOD?

- Developing skills to prevent food waste in the agro-food sector.
- Generating new methodologies and tools to be easily capitalized on and adopted in the agro-food sector across countries.
- Enhancing dialogue and collaboration between VET providers and food professionals.

- Engaging local stakeholders in the challenge of attaining the SDGs, in particular SGD indicator 12.3.
- Guiding VET in the challenge of engaging in European strategies, specifically those directed to environmental targets.

The importance of food in education

It is widely understood that current food environments are not making sustainable food choices easy (SAPEA, Science Advice for Policy by European Academies, 2020).

Food education is needed. Food education in schools and as part of professional educational curricula, including in the field of healthcare, Education in itself will not deliver change at the required scale, but it can be a powerful amplifier and enabler of other food environment policies.

For instance, education must be followed by policies that change societal conditions to help make the lessons learned in schools a social norm.

Rationales for providing school feeding programs in the European Union (EU) remain diverse. They include combating food poverty and childhood obesity, as well as social and sustainability concerns. The role of school feeding in tackling malnutrition and food insecurity, even within EU Member States (MSs), remains important (Aschemann-Witzel et al., 2017).

The most effective and equitable way to change food behaviors is to change the structural factors that drive food choices.

For example, some chefs and some educational programs propose bringing food and cooking to school:

- Jamie Oliver's Kitchen Garden Project: an online community hosting over 400 simple and beautiful teaching resources ranging from Jamie Oliver children's recipes to lesson plans, tips, fact sheets, nutrition information, posters, and more (jamieskitchengarden.org, n.d.).

- Juan Lorca proposes advice for healthy eating in schools (Llorca, n.d.).

- Between 2015 and 2017, an educational program was launched for around 5,000 children spread across 18 schools in European countries. From the International Coalition against Food Waste, this pilot project was designed to disseminate educational materials prepared together with the UN Food and Agriculture Organization.

- In 2014, in Spain, the Ministry for Ecological Transition published the Practical Guide to Reduce Food Waste in Educational Centers with the aim of disseminating the problem and raising awareness in classrooms about the need to prevent and reduce the amount of food that is wasted (Ministerio de Agricultura, Alimentación y Medio Ambiente - Gobierno de España, 2014).

The food and the sustainable development goals

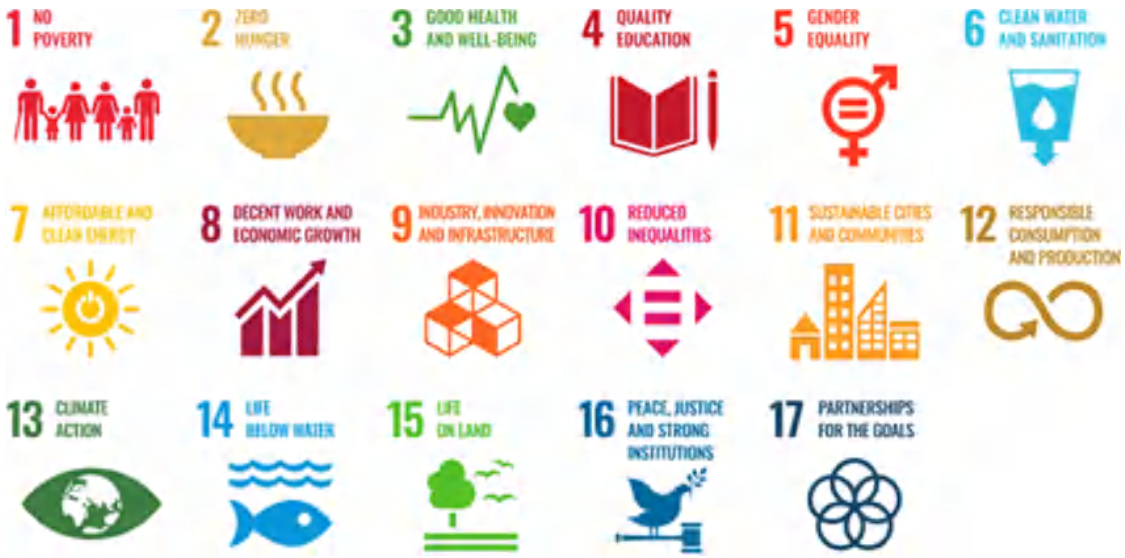
Target 12.3 says that "By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses."

Reducing this food loss and waste is a "triple win." Reductions can save money for farmers, companies, and households. Wasting less means feeding more. And reductions alleviate pressure on climate, water, and land resources.

Although the VET LOVES FOOD Project Proposal only addresses SDG 12.3. All the SDGs are transversally related to food (Champions 12.3, n.d.).

Sustainable food systems don't just help to end hunger. They can help the world achieve critical progress on all 17 Sustainable Development Goals.

IMAGE 2 : 17 SDGs



Source: UNITED NATIONS (UNITED NATIONS DEPARTMENT OF GLOBAL COMMUNICATIONS, 2020)

Goal 1 No poverty

Sustainable food systems can contribute to the fight against poverty by creating good jobs, improving access to food, and supporting healthy communities.

Goal 2 Zero Hunger

Rebuilding our food systems to make them more sustainable, productive, and resilient is essential for solving long-term hunger challenges and managing acute shocks like disease outbreaks and climate extremes.

Goal 3 Good Health and Well-being

Sustainable food systems will support adequate nutrition, which helps people of all ages achieve good health.

Goal 4 Quality education

Recovery from the negative effects of the pandemic requires sustainable food systems that enable students to have a healthy and balanced diet, which is critical to success at school.

Goal 5 Gender equality

Women are up to 11 percentage points (Unwomen.org, 2018) more likely than men to face food insecurity. Sustainable food systems can empower and support women and bolster their livelihoods worldwide.

Goal 6 Clean water and Sanitation

Sustainable food systems can ensure the sustainable use of this precious resource and increase access for those who do not have drinking water while also reducing the amount of pollution in our natural water systems.

Goal 7 Affordable and clean energy

Investing in sustainable food systems that maximize the use of clean and renewable sources of energy will reduce the food sector's environmental impact and improve people's access to clean and affordable energy.

Goal 8: Decent work and economic growth.

Sustainable food systems can create decent jobs and support the incomes of billions of people around the world.

Goal 9 Industry, innovation, and infrastructure

By scaling up innovations and investing in infrastructure, sustainable food systems can deliver widespread benefits to people and the planet.

Goal 10 Reduced inequalities

From 2017 to 2020, products exported by the least developed countries and developing countries that receive duty-free treatment remain at 66 and 52 percent (Economic and Social Council - United Nations, 2021). Sustainable food systems can reduce poverty and provide decent work and a good income.

Goal 11 Sustainable cities and communities

The urban poor are particularly vulnerable to financial crises or food price hikes. Sustainable food systems can help ensure that city dwellers everywhere have purchasing power and are adequately nourished.

Goal 12 Responsible consumption and production

Sustainable food systems reduce waste and spoilage and empower consumers to make smart choices in their food shopping.

Goal 13 Climate action

Greenhouse gas concentrations reached new highs in 2020, with globally averaged mole fractions of CO2 exceeding 410 parts per million (United Nations, n.d.). Sustainable food systems can reduce this impact by lowering emissions of critical climate-warming gasses, including methane and carbon dioxide.

Goal 14 Life below water

Sustainable food systems can ensure the long-term viability of the world's fisheries while also protecting the health of the ecosystems that host them.

Goal 15 Life on land

Sustainable agriculture can reduce deforestation and support healthy terrestrial ecosystems while also providing critical sustenance to people around the world.

Goal 16: Peace, justice, and strong institutions

Sustainable food systems can reduce critical stresses facing families, communities, and nations around the globe, preparing the ground for peace and strong institutions to take hold.

Goal 17 Partnership for the goals

Agriculture, a particular concern for developing countries, accounted for the highest tariff imposed by developed countries in 2019 at 7.9 percent (United Nations, n.d.). Sustainable food systems can deliver tangible benefits to communities around the world.

Waste as a Resource

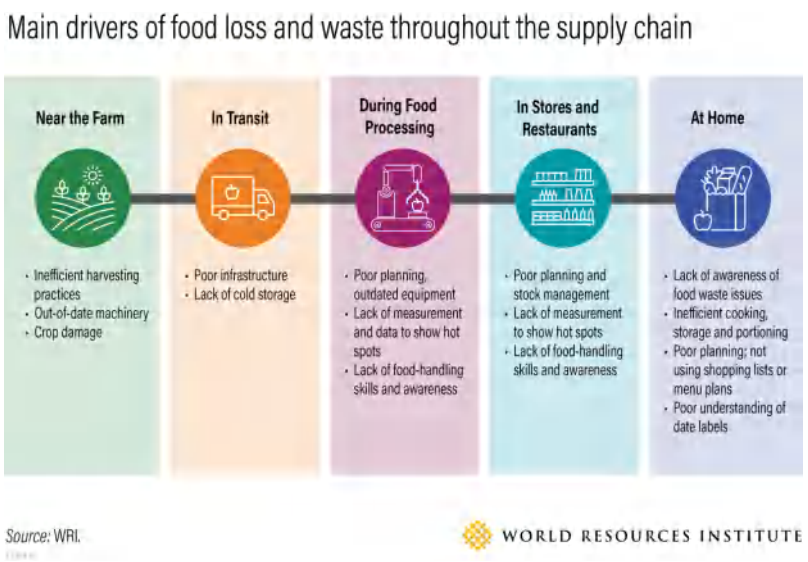
Introduction

According to the Definitional Framework for Food Waste report (Clément Tostivint et al., 2016), Food waste is simply edible food that is not eaten. "Food waste" is uneaten food and inedible parts that go to the following eight destinations: composting, anaerobic digestion, landfill, combustion, sewerage, dumping, spreading on land, or unharvested.

Food waste is all food that is not sold or used by a company or not eaten at home, including food and inedible parts that are donated, fed to animals, reused to produce other products, and all destinations represented in food waste.

1. Agriculture. Farmers and agribusinesses regularly discard foods that are misshapen, unusually colored, or too small to sell.
2. Postharvest. Poor storage facilities allow edible food to rot before it can be eaten or transported to market.
3. Treatment. Foods lost in processing include bread cut to make a sandwich without crust or discarded broccoli stalks as florets used in salads.
4. Distribution. Poor infrastructure (including roads and vehicles) can limit efficient food distribution.
5. Consumption. Consumers regularly throw food out of "forgotten takeaway bins in the back of cluttered refrigerators, and on counters and cabinets when schedules get in the way of ambitious kitchen plans."

IMAGE 3: Main drivers of food loss



Source: WRL

Existing practices and initiatives in Europe and beyond

For a scientific approach and in order to obtain a sampling of existing practices and initiatives in Europe and beyond, we have collected all types of digital resources, reports, and studies related to food waste, its prevention, and its reduction.

Background materials and studies

The reference materials collected by VET LOVES FOOD in the field of food waste reduction and prevention are listed below:

Background materials and studies - INDEX

- "Food waste prevention: reduction, reuse and recycling" study
- "HoReCa Food Waste and Sustainable Development Goals—A Systemic View" study
- "Food waste prevention in the hospitality sector: perspectives and challenges" study
- "Evaluation of food waste prevention actions" report
- "FUSIONS Evaluation Report – Reducing Food Waste through Social Innovation" report
- "HORECA Food Waste and Sustainable Development Goals—A Systemic View" article
- "A study report on global food loss and waste by the United Nations Agriculture Organization" document
- Report on the results of an international survey about food habits
- National Commission Against Food Waste
- "Food Waste Index Report 2021" document
- Bending The Curve: The Restorative Power Of Planet-Based Diets, A WWF Report
- Reducing food loss and waste: setting a global action agenda
- Measuring consumer awareness of food waste: developing constructs with confirmatory factor analysis
- Life cycle analysis of an innovative food waste management system
- EU Platform on Food Losses and Waste
- Initiative of the Ministry of Agriculture and Fisheries, Food and Environment 3 of Spain (MAPAMA), to limit food losses and waste and its impact on the environment. Report on Food Consumption and Food Waste in Spain in 2022
- Basque Environment Framework Programme
- "Desperdicio alimentario y cambio climático" report

- Donating surplus food: effectiveness, carbon footprint and rebound effect
- Restaurant management and food waste reduction: factors affecting attitudes and intentions in restaurants in Spain
- From food waste to surplus value-added products (VASP): consumer acceptance of a new food product category

"Food waste prevention: reduction, reuse and recycling" study

This study starts with the idea that food waste is a particular concern for companies in the hospitality and food service sectors. The premise of the paper is that although, individually, these companies do not generate huge amounts of food waste, collectively, they cause substantial impacts on the environment.

The document emphasizes different strategies as a roadmap for the hospitality sector to start preventing food waste.

The most important strategies, according to the document, are the following:

1. The EU Waste Framework Directive (Directive 2008/98/EU): provides a legislative framework for the collection, transport, recovery, and disposal of waste and includes a common definition of waste.

2. The UK's WRAP (Waste and Resources Action Programme) publishes statistics related to the hospitality sector in the UK and provides food waste management aids and tools for the hospitality sector.

Four conclusions can be drawn from the information in this document:

1. Government food waste prevention focuses much more on raising awareness than on providing tools to manage food waste.

2. Food waste is primarily approached from a holistic perspective. However, due to the diverse nature of the HORECA sector, a more targeted and goal-focused

approach is needed to create tailor-made tools to avoid or reduce food waste in each different situation.

3. There are still legal barriers to the implementation of efficient food waste management and prevention techniques, such as the issue of food labeling and the problem of understanding the expiration date and best-before date. The development of more efficient techniques for the management and prevention of food waste must go through the revision of health legislation at any level.

4. The involvement and awareness of customers in the Ho.Re.Ca sector in terms of prevention and management of food waste is key for hospitality companies to generate less food waste. It has been shown that most of the food waste generated in hospitality businesses is the result of customer actions. (Lasaridi et al., 2017).

"HoReCa Food Waste and Sustainable Development Goals—A Systemic View" study

This document evaluates the problem of food waste in the HoReCa sector from the perspective of achieving the objectives of the SDGs. In parallel, the study proposes, according to a systematic review of the literature on the subject, two dimensions of action to address and reduce food waste:

1. Micro-actions: dedicated to reducing food waste in the HoReCa sector in support of the SDGs.
2. Macro policies and their impact on the SDGs.

The document addresses the urgent need to consider new approaches in food waste prevention and management, focusing on the following actions as the main sources of food waste: oversized portions, inflexibility in chain store management, extensive menu options, and meals served by mistake or delayed.

At the same time, within the document, the following practices have been collected as the most important to address food waste, in accordance with the achievement of the SDGs:

1. Lean management practices, such as:
    a. 5S (a technique for the organization of stations).
    b. TWI (training with industry).
    c. Work instructions, standardization, visual management, staff motivation system, competency matrix, and a suggestion system.
2. Companies that account for the impact of supplier and consumer behavior.
3. Food waste reduction activities focused on innovation in menu planning, purchasing, and food preparation process.
4. Better understanding of customer needs.

Regarding the conclusions that can be inferred from this study, they would be the following:

1. By implementing measures such as reprocessing leftover donations to charities or media of the same kind, this type of food waste is not eliminated, only eliminated. reduced. Therefore, for the Horeca sector, it is much more important to analyze the breeding ground for the creation of edible leftovers.
2. In order to implement effective food waste reduction and prevention measures, the implementation of executive acts, policies, and strategies to achieve individual objectives should be adopted at the international level.
3. Guidelines are needed for consumers to encourage them to make more climate-smart food choices.
4. Activities at the macro level (those mentioned above as macro-policies) should be divided into:

a. Soft activities: focused on raising awareness among societies.

b. Hard activities: understood as legal regulations to be carried out by government administrations.

5. At the micro level (focused on practices related to the Horeca sector), the means against food waste and losses must be analyzed from three different phases: pre-cook, in-kitchen, and post-kitchen, always taking into account the fact that food waste generated in the post-kitchen phase depends mainly on consumer behavior (Buczacki et al., 2021).

"Food waste prevention in the hospitality sector: perspectives and challenges" study

Unlike the other two studies, this study focuses on the valorization of food waste. That is, the focus of this paper is not edible food losses but inedible food losses, valuing the value-added resources that can be found in that food waste that can no longer or cannot be used for human consumption. Through the manuscript, macro-level policies have been compiled to address food waste by turning it into non-edible resources. The macro-level policies listed in this document (in the case study format) are as follows:

1. According to the paper, six forms of phosphorus were determined using a sequential compost extraction method made from fish waste, sewage sludge, green waste, and horse manure. Therefore, the experiment determined that these composts could be used as a source of phosphorus in agriculture.

2. In the case of Taiwan, food waste has been officially designated as one of the mandatory recyclable wastes. The result of this measure is that 2000 metric tons of food waste are recycled daily in Taiwan. This circumstance mitigates the pressure on incineration and waste disposal systems and fits into the circular bioeconomy.

3. A study conducted on the polyphenolic profile of grapes showed that wine grapes have excellent antioxidant properties. Therefore, he concludes that those significant amounts of high-quality wine grapes that are not picked in

wine each year could be used to create food supplements with potential applications in the pharmaceutical industry rather than being food losses.

4. On the island of Crete, food waste is valued as a resource by transforming it into animal feed. On the island, they transform food waste into animal feed through a solar food waste drying unit. Thus, they alleviate the problems caused by food waste in a double way: 1) they give another life to food waste so that it is not a loss, and 2) they reduce the carbon footprint of the process of transforming food waste into feed by demanding renewable energy sources.

Therefore, the conclusions that can be inferred from this study are that:

1. Food losses and waste can have another life beyond human consumption. A holistic, multilateral perspective on how to address this problem is therefore essential.

2. With regard to the HoReCa sector, it appears that coordination between HoReCa stakeholders, policymakers, researchers, scientists, engineering, and the education community is necessary to address the problem of food waste. The HoReCa sector must be up-to-date with all measures that can be considered to address food waste and have them available for more efficient food waste reduction and management (Abeliotis & Lasardi, 2023).

"Evaluation of food waste prevention actions" report

The European Commission's technical report aimed to present a framework for the evaluation of food waste prevention actions and their use in evaluating the effectiveness and efficiency of such actions (Caldeira et al. 2019).

"FUSIONS Evaluation Report – Reducing Food Waste through Social Innovation" report

Report published by the FUSIONS (Food Use for Social Innovation by Optimising Waste Prevention Strategies) project, a project on how to work towards a more resource-efficient Europe by significantly reducing waste (Sarah Bromley et al., 2016).

"HORECA Food Waste and Sustainable Development Goals—A Systemic View" article

Article published by the journal Sustainability focused on reviewing the case of the HORECA sector as one of the main generators of food waste and concluding solutions to prevent food waste in the sector, leading it towards a more sustainable approach (Buczacki et al., 2021).

"A study report on global food loss and waste by the United Nations Agriculture Organization" document

The United Nations Agriculture Organization highlights losses throughout the food chain and assesses their magnitude. Therefore, the study quantifies food waste and loss, identifies the causes of food losses, and suggests possible ways to prevent them.

The document also presents definitions of food waste and loss and lists different types of food loss and waste (FAO, 2011).

Report on the results of an international survey about food habits

To support the project funded by the European Commission, EAT4CHANGE, the World Wide Fund for Nature (WWF) conducted international research through a

survey in nine European countries (Austria, Belgium, Estonia, Finland, France, Greece, Portugal, Sweden, and the United Kingdom (WWF et al., 2021).

The main objective of this project is to involve European citizens in the issue of sustainable food and raise awareness about the impact that individual diets can have on the planet and people's well-being.

The study results reflect the survey's awareness, knowledge, concerns, and opinion on:

1. Environmental and ethical concerns around food.
2. Impact of food production and consumption.
3. Knowledge, confidence, and concern.
4. Barriers to sustainable food.
5. Options:
    a. Sustainability.
    b. Governance.
    c. Behavior changes.

National Commission Against Food Waste

A National Committee against Food Waste was created by the Portuguese Government in 2016 with the aim of promoting the reduction of food waste (CNDA, n.d.).

"Food Waste Index Report 2021" document

This report supports the targets of SDG 12.3 by presenting a comprehensive collection of data, analysis, and modeling of food waste. It, therefore, presents an estimate of global food waste and proposes a methodology for countries to measure food waste in private households, retail, and food service sectors and to track their national progress towards 2030 and the SDGs. 12.3 (United Nations Environment Programme, 2021).

Bending The Curve: The Restorative Power Of Planet-Based Diets, A WWF Report

The report makes a clear connection between diets, eating habits, and the environment. It also shows the health and environmental impacts of current consumption patterns and the potential for dietary shifts towards a plant-based diet. In addition, the paper proposes some policy recommendations for national and multilateral decision-makers (WWF, 2020).

Reducing food loss and waste: setting a global action agenda

This report provides a comprehensive overview of the problem of food loss and waste, its causes and impacts, and the actions that need to be taken to address it. It presents a global action agenda with ten priority areas for action, including improving measurement and data, strengthening governance and policies, and engaging stakeholders (Flanagan et al., 2019).

Measuring consumer awareness of food waste: developing constructs with confirmatory factor analysis

This study aims to examine the role of hunger, the environment, the economy, landfills, and water scarcity concerns as significant dimensions of consumer social awareness marketing in socially responsible consumption of food on plates (Rasool et al., 2021).

Life cycle analysis of an innovative food waste management system

The aim of this study was to investigate the environmental impacts of an innovative food waste management system and compare it with landfilling as a conventional waste management option (Elginoz et al., 2020).

EU Platform on Food Losses and Waste

Food loss and waste exacerbate the risk of food insecurity, malnutrition, and excessive water use at a time when world hunger is on the rise.

EU countries have committed to meeting the UN Sustainable Development Goal of halving per capita food waste at the retail and consumer levels by 2030. (EU Platform on Food Losses and Food Waste, n.d.)

Initiative of the Ministry of Agriculture and Fisheries, Food and Environment 3 of Spain (MAPAMA) to limit food losses and waste and its impact on the environment. Report on Food Consumption and Food Waste in Spain in 2022

The "More Food, Less Waste" strategy is a program for the reduction of food losses and waste and the recovery of discarded food (Ministerio de Agricultura, Pesca y Alimentación - Gobierno de España, 2020). The search for more sustainable agri-food systems, with the minimization of impacts on the environment and a commitment to the circular economy, involves both professionals in the sector and society as a whole.

The Ministry of Agriculture, Fisheries, and Food of the Government of Spain has published the “Spanish Food Consumption and Food Waste Report in 2022” (Ministry of Agriculture, Fisheries, and Food of the Government of Spain, 2022).

Basque Environment Framework Programme

Programme related to Circular Food, whose objective is the use of the complete cycle of the food value chain, from production to processing and sale of food, including the reuse and recovery of by-products and waste (Gobierno Vasco, 2022).

“Desperdicio alimentario y cambio climático” report

Document that seeks to develop a measurement protocol that allows the reduction of food waste and, therefore, the emission of associated greenhouse gases. (Ecodes, n.d.)

Donating surplus food: effectiveness, carbon footprint, and rebound effect

A study conducted in Sweden investigated the effectiveness, carbon footprint, and rebound effect of a food donation system run by a charity and compared the results with those of anaerobic digestion.

The study found that 78% of the redistributed food was eaten, and the net result of food donation was almost double the climate benefit of anaerobic digestion.

However, there was also a substantial rebound effect, offsetting 51% of the potential carbon emissions savings from food donations.

The study supports the food waste hierarchy, which ranks donations of surplus food for human consumption as the next best strategy when food waste cannot be prevented (Sundin et al., 2022).

Restaurant management and food waste reduction: factors affecting attitudes and intentions in restaurants in Spain.

This study aims to understand why restaurant managers are not always involved in reducing food waste. The study analyzes the influence of market orientation and environmental apathy, as well as three techniques that suppress the intention to reduce food waste: appealing to higher loyalties, denying harm, and denying responsibility. The study finds that market orientation affects intention to reduce food waste but not attitudes, while environmental apathy affects attitudes but not intent.

Appeal to higher loyalties and denial of injury suppress managerial intent to reduce food waste, but denial of responsibility has no significant effect (Filimonau et al., 2022).

From food waste to surplus value-added products (VASP): consumer acceptance of a new food product category.

Researchers are focusing on creating food from surplus or waste ingredients, called "value-added surplus products," to reduce food waste. However, it is unclear whether consumers will accept such products made from ingredients intended for garbage.

Three studies have been conducted to test consumer acceptance and preference for such foods, using different signals to evaluate them.

Studies suggest a strong potential for consumer acceptance and preference for surplus value-added products, which could become a distinct new category of food.

Methods and methodologies

This chapter intends to gather the necessary resources in terms of methods and methodologies regarding the issue of food waste prevention and reduction, providing different aspects of how the issue of prevention and reduction of food waste is addressed from a practical-methodological point of view.

The methods and methodologies collected by VET LOVES FOOD in the field of food waste reduction and prevention are listed below:

Methods and methodologies - INDEX

European Hospitality Industry Guidelines to Reduce Food Waste and Recommendations to Manage Food Donations

Since the European Union included the issue of food waste in its action plan for the Circular economy (European Commission Communication, 2015), this document has been aimed at tackling food waste following the food waste hierarchy. That is to say, addressing the problem of food waste by starting with the most preferable waste and ending with the least preferable. To do that, the document has been divided in three key sections: HOTREC guidelines for hospitality establishments to reduce food waste; HOTREC-FEBA recommendations to manage food donations; and best practices and initiatives developed by HOTREC members.

- HOTREC guidelines for hospitality establishments to reduce food waste:

    - The preparation of the menu: for the preparation of the menu, HOTREC recommends to assess regularly the fitness of the menus; favor menus/dishes of the day when possible; have fewer dishes in the menus; use the same product for different recipes; pay attention to the season; provide different portion sizes; and have children's menus with adequate portions.

    - Choice/purchase of the products: favor seasonal products and local distribution channels; adjust the quantities ordered to the expected number of customers; check the products delivered; and ensure that the shelf life is appropriate.

    - Storing of products: limit the stocks; favor smaller packaging and avoid pre-production; avoid damaging packaging; favor under-vacuum storage to extend shelf life; strictly respect the cold chain and strictly respect locally applicable hygiene norms and standards; label everything in the cold storage room.

    - Cooking and kitchen tips: favor flavors over quantities; calculate precise quantities and adjust portions to customers' demands; handle/cook the whole gross product to have fewer losses; use different

cooking techniques for the same vegetable in order to include it in different forms in different dishes; use the right equipment.

- Engage a dialogue with your clients: encourage them to act responsibly and sustainably; dialogue with the customers to check what their expectations in terms of portion size are; offer different portion sizes; be flexible on customers' requests concerning some ingredients; offer doggy bags.

- After the service, for staff's meals, use products that are close to expiration or unsold; reuse leftovers to make new products.

- Reuse and recycle: donate the still edible products to food banks and charitable organizations; find a partner to collect non-edible waste that can be used as animal feed; separate and recycle some other waste for composting.

- Buffet/beverage: do not put bread at the very start of the buffet; do not re-fill the buffet in the last quarter; check on the customers to know about their appetite; be conscious of drink's packaging and purchase those that allow a longer shelf life; for meetings, favor coffee machines and water dispensers.

- Overall management: respect applicable food safety legislation; favor advance bookings to better predict the quantity of the products to be ordered and stored.

- HOTREC-FEBA recommendations to manage food donations: among the recommendations to manage food donations, the following can be highlighted: (1) having a responsible person, (2) selecting a reliable partner, (3) concluding a formal partnership with the partner organization to which the products are going to be donated, (4) identifying which food can be donated, (5) storing the food to be donated, (6) planning how to transfer the food to the partner organization, (7) keeping a record of the donated food, (8) investigating national legislation on tax benefits about donating food, (9) promoting the

donating actions among the customers, and (10) establishing a quality assurance plan between the business and the partner organization.

- The best practices and initiatives developed by HOTREC members are the following:
    - Launch of the "No Food To Waste" campaign by HORECA Vlaanderen.
    - Cross-sectoral partnerships to reduce food waste in Danish hospitality:
        - "Partnership on Less Food Waste."
        - "Stop Wasting Food Movement Denmark".
    - Publication of a guide to help French hotels and restaurants reduce food waste.
    - A pioneer project in France for the secondary use of food waste in restaurants.
    - A cross-sectorial cooperation in Germany with guidelines for restaurants and caterers as a result.
    - Spanish Hospitality Federation - FEHR "Abre los ojos ante el desperdicio" guidelines (HOTREC Hospitality Europe., 2017).

"Hotel waste measurement methodology v 1.0" report

This document introduces a set of methodologies focused on measuring food waste in the hotel sector. Although the focus of these methodologies is oriented to the measurement of hotel waste, it has been selected for its applicability in the HORECA sector in general terms. This guide developed by Greenview and WWF describes within the document a set of methodologies for measuring food waste with the aim of better understanding and, therefore, managing the volume of food waste. The recommendations offered by these guidelines are:

- *Establish limits and definitions:* identify the time, organizational, and residue definition limits that apply to data collection to ensure that the data are

consistent and comparable. This task would be divided into five different subtasks: setting the time limit, setting the organizational limit, setting the residue limit by type or common grouping of waste types, setting the waste destination limit, and setting the floor area for the limit for intensity metrics.

- *Identify metrics:* identify appropriate measurement metrics and ensure that *data requirements are incorporated into the progress of data collection.*
- *Data collection and extrapolation:* collecting data between properties, identifying and filling gaps, and extrapolating data when necessary. This phase would be divided into three steps: (1) primary data collection (the data to be collected is property information, waste data, and destination data); (2) identifying and filling data gaps, which would require the following process: record each company's total waste mix (which is relevant for food chains and catering), fill the gap of partial data and data scenario with the tools provided by the guidelines (p. 15), and document assumptions and calculations for each property; and, finally, (3) extrapolate the results to a portfolio.
- *Audit and verification:* It is very important to carry out routine data verification to ensure the accuracy of the actual and estimated data that is communicated to stakeholders.

In addition to these methodologies, these guidelines provide a list of appendices for better measurement of food waste:

- *Volume-to-weight conversion and guidelines:* The purpose of this appendix is to list ways to transfer the volume of food waste in measurable proportions (weight).
- *Data Scenario Action Tool:* The goal of this tool is to provide appropriate data actions and guidance depending on the type of data available for each property for total waste, diverted waste, total food waste, and diverted food waste.
- *Property Waste Scenarios and Data Collection Challenges:* This appendix lists common challenges when collecting waste data and the proposed solution for each.
- *Estimation coefficients of single-ownership food waste and total waste:* the coefficients can be found on page 37 of the guidelines.

- *Definition of default coefficients:* The default coefficients would be as follows: 1) residue intensity (kg/square meter); (2) food waste intensity (kg/square meter); (3) deviation rate of waste (%), and food waste as a proportion of total waste (%).
- *Limitations and improvement of methodology:* aiming to provide an accurate list of constraints for proper measurement of food waste (Greenview & WWF, 2021).

"Recommendations for action in preventing food waste" document

This document, drafted by the EU Platform on Food Losses and Waste, aims to meet the food loss and waste reduction targets adopted by the United Nations General Assembly as part of the 2030 SDG Agenda. With a holistic approach, the recommendations of the EU platform address the necessary measures at each stage of the food supply chain and involve all key actors from the public and private sectors. These recommendations focus on preventing food waste at the source and limiting the generation of food surpluses.

Based on a multi-stakeholder approach, the main recommendations for the HORECA sector present in this document are:

Who?	**What? / How?**
European and national public authorities, professional research associations	Provide support to small businesses to increase their knowledge and capacity-building
Trade associations	Motivate and engage companies to take action against food waste in their operations
European and national public authorities, trade associations, food service companies and redistribution organizations	Identify solutions to the logistical challenge related to collecting small amounts of food at multiple locations
Food service companies, trade associations and third parties designing food waste reduction actions	Monitor the efficiency and effectiveness of actions by setting SMART goals and KPIs

Food service companies, national public authorities, consumer and environmental NGOs, consumer organizations	Help influence consumer expectations/behavior to reduce and prevent plate waste

In addition, since outcome c) of this current task: background materials and studies, has underpinned the need to address customer behaviors in phases. post-cooking, the recommendations of these methodologies in that regard will be listed below.

Who?	**What? / How?**
Consumer organizations and citizens	Changing individual and community behavior by taking action to reduce food waste at home, shopping, and in restaurants
Funding of program managers, researchers, and academic institutions	Develop and use a broader range of methods to better understand consumer behavior regarding food waste and design effective solutions
Researchers and practitioners supported by funders and policymakers	Increase the use and development of audience segmentation

In addition, the document has two annexes dedicated to a booklet of advice for the consumer on "How to reduce food waste in your daily life" and a list of possible additional actions against food waste that did not qualify as key recommendations of the EU Platform on Food Losses and Waste due to the lack of consensus among members (EU Platform on Food Losses and Food Waste, 2019).

"Reducing food waste at the local level: guidance for municipalities to reduce food waste within local food systems" report

Report by the organizations Slow Food and ZERO WASTE EUROPE, aimed at addressing how to reduce food waste at the European level within local food systems (Coste et al., 2021).

Food Waste Reduction Roadmap

Set of methodologies developed by the English organization WRAP. These methodologies are addressed as the target, measure, and action approach for the UK industry to help achieve UN Sustainable Development Goal 12.3 (WRAP, n.d.).

National Strategy for Food Waste Reduction (Germany)

REFOWAS – reduces food waste, a German project that includes a software-based system to provide demand forecasts for small and medium-sized bakeries, allowing production levels to be adapted to requirements and the volume of returned goods to be reduced. The details of the project can be found in the strategy published by the German Federal Ministry of Food and Agriculture (p. 15) which sets out measures to prevent food waste at the national level from an ethical and economic point of view (Federal Ministry of Food and Agriculture - Germany, 2019).

Draft Irish National Food Waste Prevention Roadmap for public consultation

Ireland's draft national food waste prevention roadmap for public consultation is included in Ireland's Waste Action Plan for a Circular Economy—Ireland's National Waste Policy 2020–2025, published in September 2020, which commits to developing a food waste prevention roadmap listing a number of actions aimed at achieving the reductions needed to reduce half our food waste by 2030. meet any other related objectives and promote our transition to a circular economy. This roadmap provides the pathway to help achieve Ireland's target of reducing food waste by 50% by 2030 (Government of Ireland, 2022).

Guidelines on the prevention of food waste in hotels, restaurants, and other points of public consumption

Document published by the Food and Agriculture Organization of the United Nations (FAO). These guidelines were developed based on the guidelines "Combating food waste in hotels", which were developed by WWF, AHLA (American Hotel & Lodging Association), and the Rockefeller Foundation in order to support the efforts made by the hospitality industry, catering, and other public consumer industries for food waste

prevention, providing guidance regarding the challenges of preventing food waste in the industry, donating food waste that cannot be prevented, and directing the remaining part. In addition, the document contains the results revealed by the Food Waste Measurement Project conducted by Metro Turkey in hotels and restaurants (Metro Turkey, T.C. et al., 2020).

Food and Agriculture eLearning Course United Nations (FAO) eLearning Academy: Food Loss Analysis Case Study Methodology

An eLearning course that introduces the Food and Case Study Methodology of the United Nations Agriculture Organization (FAO) for the analysis of critical food loss, which focuses on pinpointing and analyzing the multidimensional causes of food loss (FAO, 2018).

From Farm to Table Strategy: For a fair, healthy, and environmentally friendly life-Food friendly system

The document presents the strategy at the heart of the European Green Deal, an initiative comprising a set of proposals aimed at making the European continent the first climate-neutral continent by 2050 (European Commission, 2021).

11 Methods for Retailers and Distributors to Reduce Food Waste by ONE THIRD Food Waste Prevention.

A list of methods for retailers and distributors to reduce food waste is based on the 6-level food recovery hierarchy of the U.S. Environmental Protection Agency (Onethird, 2023).

How to go to zero waste

Article addressing the topic of the single-use of plastic and the danger caused by microplastics to oceans and marine fauna. Moreover, the article lists five key principles to help people integrate the necessary changes in their daily lives. The added value this article can bring is to be applied to the food sector, where the use of plastic is often preferred compared to other materials (Revolve, 2020).

SUDEGO - Sustainable Development Goals in schools.

SUDEGO is a project funded by Erasmus+ with the aim of developing two didactic modules for teaching the SDGs to Junior and Baccalaureate students: good health and well-being, responsible consumption and production, and life on earth (Sudego, 2022).

Moving towards a zero-waste lifestyle.

This article provides insightful advice on how to start approaching a zero-waste lifestyle from kitchen items, e.g. reusing glass jars, opting for tote bags for shopping, etc (Revolve, 2021).

Analysis of food waste in the Basque agri-food chain

Platform against food waste to advise and support Basque administrations (No despilfarro alimentario. Elika., n.d.).

Food loss and waste prevention plan

All actors in the food chain should have a plan outlining how they will apply the hierarchy of priorities (Ministerio de Agricultura, Pesca y Alimentación, 2022).

Household food waste quantification panel

Methodology to know in depth the usefulness of the food waste panel outside the home (Ministerio de Agricultura, Pesca y Alimentación - Gobierno de España, 2020) (Ministerio de Agricultura, Pesca y Alimentación - Gobierno de España, 2021).

Food Donation and Food Banks

Food donation and food banks are effective methods of preventing food waste by redirecting surplus food to people in need. Instead of throwing away excess food, it is donated to food banks and other charitable organizations that distribute the food to individuals and families struggling with food insecurity.

Food donations and food banks not only prevent food waste but also help fight hunger and malnutrition. In many cases, food that is donated remains edible and safe for consumption but may be considered unsaleable due to reasons such as overproduction, cosmetic imperfections, or the proximity of their expiration dates.

Food banks and other charitable organizations often have processes in place to ensure that donated food is safe, nutritious, and distributed equitably to those who need it most. They may have partnerships with local food retailers, manufacturers, and distributors to collect and distribute surplus food.

What to donate to a food bank and what to avoid:

Food banks accept donations of dry and canned foods. Why does that matter? In general, non-perishable or "stable" foods can be stored in a cupboard without spoiling. In addition, only food that has not yet passed its expiration date should be donated. Food banks often need items like peanut butter, canned soup, canned fruits, canned vegetables, canned stew, canned fish, canned beans, pasta (most prefer whole grain), and rice (most prefer brown rice)... That's not an exhaustive list, but it includes most of what food banks frequently require.

It's also good to know what not to donate to a food bank. Food categories that cannot be donated: items that need refrigeration, expired food, leftovers, food with packaging problems, baked goods.

Under the slogan "At our table, there is always room for one more", the campaign called Food Bank against Hunger aimed to sensitize the Portuguese population to contribute "in support of families who experience situations of food scarcity every day". The food collection campaign was carried out in 2021, between May 27 and June 6, through coupons available in supermarkets and online donations, the institution announced (Morello, 2020) (Morrisons Blog, 2018) (TPN, 2021) (Finney, 2022).

Composting

Composting is a food waste prevention method that involves breaking down organic materials such as food scraps, garden waste, and other biodegradable materials into a nutrient-rich soil amendment that can be used to enrich soil in gardens, farms, and other landscapes. Composting reduces food waste by diverting organic waste from landfills and incinerators, where it contributes to greenhouse gas emissions and other environmental problems (United States Environmental Protection Agency, 2023).

Composting can be done on a small scale, such as in a backyard compost bin, or on a larger scale, such as in a commercial composting facility. The process involves creating a pile of organic materials, adding water and oxygen, and allowing the materials to decompose over time. As organic materials decompose, they release nutrients that enrich the soil and support plant growth (Food and Agriculture Organization of the United Nations (FAO), 2015).

Some communities have composting programs that collect food waste from residents and businesses and transport it to composting facilities. These programs can be administered by local governments or private companies and can be a convenient and effective way to divert organic waste from landfills and promote sustainable waste management (Clarck, 2011).

Composting is an effective food waste prevention method that supports sustainable agriculture and promotes a healthy environment (Open Access Government, 2022).

What can be composted? Vegetable peels, fruit garbage, tea bags, coffee grounds, plant pruning, dry goods (crackers, flour, spices), old dried herbs and spices that have lost their flavor, eggshells, nutshells, pasta (cooked or uncooked), baked goods, expired foods, grass cuttings, dead leaves, crushed paper/newspaper and a few more.

What should not be composted? Inorganic materials (rock, glass, metal, plastic, etc.), animal products (bones, shellfish, meat scraps, fat), dog or cat waste, etc.

Recycling of surplus food

The conversion of surplus food into processed food products for human and animal consumption is a food waste prevention method that involves the processing of food that would otherwise be wasted into new food products that can be used for human or animal consumption. This method is also sometimes referred to as "upcycling" or "value-added processing".

The process of turning surplus food into processed food products involves taking foods that may be considered "ugly" or imperfect, but still edible, and processing them

into new food products. For example, surplus products that may be too small or misshapen for retail sale may be processed into jams, sauces and other value-added products. Similarly, surplus meat or dairy products can be converted into pet food, animal feed, or other products.

This method of food waste prevention has several benefits. By converting surplus food into new products, you help reduce food waste by using food that would otherwise go to waste. It also creates new sources of food products that can be sold or donated, which can provide economic and social benefits to communities. In addition, by processing surplus food into new products, you can help reduce the environmental impact of food waste by diverting food from landfills and reducing greenhouse gas emissions.

Some challenges associated with converting surplus food into processed food products include the need for specialized processing equipment, the need for food safety regulations to ensure the safety of processed food products, and the need for a market for processed products. However, many organizations and companies are working to address these challenges and promote the use of this method of food waste prevention (Sundin et al., 2022) (Friederike & Schmidt, 2023) (Muneera & Lateef, 2022) (Aschemann-Witzel et al., 2023).

Tools for food prevention and waste monitoring

This chapter intends to bring together the useful resources in terms of tools and toolkits regarding the issue of food waste prevention and reduction, providing different examples of how the issue of food waste prevention and reduction is addressed in practice through different case studies and tools already implemented.

The tools and tools in the field of food waste reduction and prevention have been listed below:

Tools for food prevention and waste monitoring - INDEX

- Food without waste
- App: Encantado de comerte
- App: Phenix
- App: OLIO
- Karma
- NoWaste
- Lidl: Feed it back (partner Neighbourly
- Guidelines for home composting
- Waste nothing
- Use leftover food
- Zero waste trend
- Take advantage of perishable supplies that are in inventory
- The seasonality of the menu contributes to sustainability
- Take care of the water
- Save electricity
- Green constructions
- Involve the restaurant in a cause for the common good
- Sustainable sourcing
- Waste management
- Food protection
- Efficiency in the use of natural resources – water and energy
- Sustainable construction and building
- Sustainable materials and other inputs
- People management
- Social responsibility and communication

A set of tools to communicate food waste to guests

Open resource developed by the NGO WWF developed mainly for Hotels but applicable to the HORECA sector in general that addresses communication with guests / clients as a key resource to avoid food waste. This toolkit includes an introduction on how to use it, guest information; communication strategies for companies on how to raise awareness among their customers about the prevention and

management of food waste; turnkey campaigns; how to develop an awareness campaign on food waste prevention; and two appendices: food waste and its brand, and additional food waste statistics (WWF, 2021).

Best Practices and Emerging Solutions TOOLKIT: A Joint Project of the Food Marketing Institute, the Grocery Manufacturers Association, and the National Restaurant Association

Toolkit written by the Alliance for Food Waste Reduction (Garlich et al., 2014). With primary goals to reduce food waste in landfills and increase food donations, the toolkit aims to achieve the following goals: (1) reduce the amount of food waste generated; (2) increase the amount of safe and nutritious food donated to those in need; (3) recycle unavoidable food waste by diverting it from landfills. To meet these goals, the toolkit features the following Solutions, divided into four different groups:

- Best practices and emerging solutions;
- Development and quantification metrics related to food waste within the manufacturing, retail, and restaurant sectors;
- Communication established between the four solutions task forces to create a holistic vision and solutions to the food waste problem;
- Work to understand institutional and public policies that may affect the ability to achieve proposed objectives and how to positively influence changes where necessary.

More responsible food consumption: proposals to prevent and avoid food waste

This document is a set of tools developed by the Generalitat de Catalunya, together with the Agència de Residus de Catalunya. The toolkit features the following content: an introduction to the topic of food waste; a section devoted to understanding the problem of food waste; preventive actions grouped between challenges, actions of producers and manufacturers, distribution and marketing actions; restoration and

restoration actions: actions of the public and other actions; and examples to learn, divided between international experiences and experiences in Catalonia and Spain (Generalitat de Catalunya; Agència de Residus de Catalunya., 2013).

Tools to prevent and divert food waste

Toolkit compiled from the U.S. Environmental Protection Agency (EPA) for more sustainable food management. These tools include a guide to conducting food waste audits by students, a set of tools for reducing food waste and packaging, tips and examples for food waste reduction and examples for businesses and organizations, a waste reduction model, training webinars, and peer-to-peer exchange webinars (United States Environmental Protection Agency (EPA), 2015).

The Roadmap for Food Waste Reduction Toolkit

Toolkit developed by the English organization WRAP. These methodologies are addressed as a roadmap for the UK industry to help achieve UN Sustainable Development Goal 12.3 (WRAP, 2022).

Office Food Waste Toolkit

This document, published by the Rockefeller Foundation, brings together a set of objectives to be achieved in the offices in terms of food waste prevention and possible activities to achieve the aforementioned objectives (The Rockefeller Foundation, n.d.).

Food Waste Prevention for Food Service Part 1: Toolkit Report for Restaurants, Drinking Places, and Specialty Food Service Operators

Food Waste Prevention for Food Service Part 1: Toolkit Report for Restaurants, Drinking Places, and Specialty Food Service Operators The HORECA sector starts from the understanding of performance to the management of unavoidable waste, going through all the intermediate steps of food waste (British Columbia Ministry of Environment and Climate Change Strategy, n.d.).

A guide: Changing behavior to help more people waste less food, by champions 12.3

This document is a guide focused on household food waste. Its main objective is to help key actors in the food system contribute to the reduction of food waste by consumers through behavior change. Champions 12.3 is a coalition of executives from governments, businesses, international organizations, research institutions, farmers' groups, and civil society dedicated to accelerating progress toward achieving Sustainable Development (Goodwin et al., 2022).

Food Waste Reduction Guide

A guide for the reduction of food waste by the city of Leiria within the scope of URBAN WINS, a project HORIZON2020 (Câmara Municipal de Leiria, 2019).

Mudatuga

Mudatuga is a Portuguese startup that aims to replace landfills for composting. The company raises awareness about composting and recycling through workshops, talks, team-building activities, and consulting. It also sells composters (Mudatuga, n.d.).

App: Too Good to Go

It is an app/service that individuals and food businesses (e.g. restaurants, supermarkets, bakeries, distributors, etc.) can subscribe to avoid waste. Companies can sell products with a short expiration date or that were not sold but are still in edible condition at a reduced price (Too Good to Go, n.d.).

Projeto Orgânico

An initiative of the Porto City Council that aims to promote the separation of organic waste in local households. The project provides subscribers with a set of tools to separate their organic waste (Organico, n.d.).

Nãm Mushroom

A circular economy business model that uses coffee waste to grow organic mushrooms. It collects coffee waste, produces mushrooms, and sells them to restaurants (NÃM mushroom, n.d.).

Planet-Based Diets Impact & Action

Calculator by WWF is a calculator that shows the impact of diets on the environment and helps users realize what changes can be made to their diet to reduce the environmental impact in their country. The quantities per week of food products such as grains, fruit and vegetables, roots and tubers, red meat, fish, etc. are measured, and the calculator tells us the damage that this type of weekly diet causes to the planet in terms of biodiversity loss, GHG emissions, cropland use, grazing land use, water use, and eutrophication (WWF, n.d.).

Fruta Feia

This project creates an alternative market for "ugly" fruits and vegetables (foods that do not meet market standards in size or appearance) by buying from local and national producers food that they cannot sell to distributors and selling for a reduced price to their subscribers (Fruta Feia, n.d.).

EAT4CHANGE sustainable recipes

EAT4CHANGE is an international project that aims to promote sustainable diets. On its website, the project offers some sustainable recipes (ANP - Associaçao Naturaleza Portugal & WWF, n.d.).

WINNOW

A technological solution for food waste. WINNOW technology provides restaurants and the catering industry with artificial intelligence and clothing software to help manage, track, measure, and control food waste (Winnow, n.d.).

Food Waste Management Cost Calculator

A food waste management cost calculator was conducted by the United States Environmental Protection Agency to help estimate the cost competitiveness of alternatives to food waste disposal (United States Environmental Protection Agency, 2022).

FoodKeeper App

Developed by the USDA, this app helps users understand how to store food properly and provides information on expiration dates, expiration dates, and safe handling guidelines. It also offers reminders about when to use or dispose of items in your refrigerator, freezer, and pantry (FoodKeeper App, 2019).

Restaurant project: LETERN No waste

In Ricard Camarena's restaurants, they reuse parts of food that the vast majority would throw away. A comprehensive use of the product that defines this restaurant is included in the list of the one hundred best restaurants in the world since June 2023 by The World's Best 50 Restaurants (Ricard Camarena Restaurant, n.d.) (Pons, 2023).

Guide to good practices against food waste

The Guide to Good Practices against food waste (Gobierno de Aragón & ECODES, 2018), intended for consumers, gives us keys to stop the high percentage of food that we do not consume. And it provides us with data and changes in habits that will help us make better use of the food we buy. Purchase planning, advice on how to store and preserve, ways of cooking, training, and activism proposals are the lines on which the proposals are articulated.

The chapters of this guide are:

- Feeding an overpopulated world
- Food paradoxes
- Wasting food has its cost
- Who wastes food, and how much do we throw away?
- Why do we waste food at home?
- Tips: and what can I do?

Food without waste

A blog about food losses and waste, the generation of food waste, and its use, written by Iñigo Arozarena, Professor of the Department of Agronomy, Biotechnology and Food (Food Technology Area) of the Public University of Navarra (UPNA). (Arozarena, n.d.).

App: Encantado de comerte

Encantado de Comerte puts food at your disposal at reduced prices through the app (Encantado de comerte, n.d.).

App: Phenix

By activating the location, you will find the anti-waste offers of the trade that you have near you. They can be restaurants, supermarkets, bakeries, or prepared food stores (Phenix, n.d.).

App: OLIO

Olio is a community-based app that connects people with surplus food with other people in their local area who can use it. It enables individuals, retailers and other businesses to share food that would otherwise be wasted, reducing food waste and supporting access to food for those in need. (Olio, n.d.).

Karma

This app is designed to reduce food waste by connecting consumers with surplus food from restaurants, cafes, and grocery stores. Users can browse nearby food vendors that offer food products with discounted prices, all while buying produces or ingredients directly through the application (Sustainability Guide, n.d.).

NoWaste

This app helps users track their food inventory and plan meals to use the ingredients before they expire. It also includes a shopping list feature that suggests recipes based on items already in the user's pantry (NoWaste, n.d.).

Lidl: Feed it back (partner Neighbourly)

Lidl, the European supermarket chain, has partnered with social platform Neighbourly to launch its "Feed It Back" initiative. The initiative aims to prevent food waste and support local communities by donating surplus food to charities across the UK. Through the initiative, Lidl stores across the UK will donate surplus food to local charities and community groups. Neighborly helps coordinate donations, ensuring food is distributed to those in need (LIDL, n.d.).

Guidelines for home composting

Learning to compost is the most environmentally friendly way to deal with kitchen and garden waste. It can be used as a soil improver and more, simply by removing unwanted food and garden waste (Boeckmann, 2023) (Homebiogas, n.d.) (Simon, 2022) (Vinje, 2023).

Step-by-step guidelines for composting at home:

1. Choose a location: Find a suitable location for your compost bin or pile. Ideally, it should be in a dry, shaded, and well-drained area.

2. Select a container: You can use a compost bin, or a cup, or simply create a pile in the ground. If you use a container, make sure it has enough ventilation and is large enough to hold your compost.

3. Add materials: Start by adding a layer of "browns," such as dried leaves, straw, or crushed newspaper. Then, add a layer of "vegetables," such as fruit and vegetable scraps, coffee grounds, and grass clippings. Be sure to mix the materials together.

1. Keep it moist: Your compost should be moist but not too wet. Add water if necessary, but be careful not to choke the compost.

2. Turn it over: To speed up the composting process, rotate your compost regularly using a fork or shovel. This helps to aerate the compost and distribute the materials evenly.

3. Wait and add more: Wait for the compost to decompose and become nutrient-rich soil. This can take anywhere from a few weeks to several months, depending on the materials used and the size of your compost pile. In the meantime, continue to add more "browns" and "greens" to the compost.

4. Use your compost: Once your compost is ready, you can use it to fertilize your garden, flower beds, or potted plants. Simply spread the compost on the ground and mix it.

Conclusions

The HoReCa sector is at the heart of food waste prevention and management. This sector is key to avoiding most of the food waste caused globally. However, due to both the lack of efficient legislation and communication between stakeholders, food waste is not tackled as skillfully as it could be.

Throughout this document, a list of useful resources has been provided to address food waste in the sector. At the same time, in line with the previous question, a list of needs has emerged to improve food waste management in the HoReCa sector:

1. Innovation: There is a tangible need for more efficient resources to address food waste.

2. Lean management: the implementation of these techniques in the HoReCa sector has proven to be an efficient resource to reduce food waste through the implementation of a new corporate mentality oriented to the HoReCa business circular economy.

3. Global macro-policies: Standardized and business-oriented policies at local, national, and international levels on food waste prevention and management have proven to be a common need, just as the lack of it has proven to be a barrier for the HoReCa sector in attempting to reduce food waste and losses.

4. Customer-facing business strategies: The customer has been shown to be a key source of food waste in the post-kitchen phase. Therefore, catering to customer needs and making menus geared towards them can be a useful measure to reduce food waste.

5. Awareness of customers and societies: it is not only important to create customer-oriented strategies by the HoReCa sector. For more efficient prevention and reduction of food waste, raising awareness among future customers is important to prevent food waste in the post-kitchen phase, as they have a key role in avoiding food waste and losses when interacting with the Horeca sector.

Sustainable Restaurant

Introduction

“There is an inseparable relationship between cultural and biological diversity. Missing species, varieties of crops, and agricultural techniques not only impoverish our culinary tradition but also diminish our knowledge and heritage. We have always supported local products, taken care of their quality, and bet on the producers who produce them. For us, it is a way to preserve both our environment, like our memory, and our flavors. Ultimately, the kitchen is a vehicle key to sustainability, development, innovation, and social inclusion.” (BBVA, 2021)

Gastronomy can be interpreted from a broad perspective: from food production and distribution to the different patterns of consumption and, finally, the management of food waste, and from a public to a private perspective. The “actors” in gastronomy (producers, chefs, restaurants, the public sector, but also customers, NGOs, and many others from all parts of society) play a key role in spreading any message across the whole food system and food value chain. There is a contemporary need to develop awareness of sustainability so that, with well-informed actions and involvement in the inevitable changes, sustainable gastronomy and Sustainable Development Goal 12.3 can be achieved.

The present scenario underscores the threats of the days to come. The consequences of climate change or armed conflicts, such as the one in Ukraine, impact both economies and agricultural production chains. A part of the population is beginning to realize that natural resources and cultural resources cannot be taken as goods for their own consumption and that there is a duty to preserve them for those who will come after them.

The waste problem of food exists on a part of the planet. Between 720 and 811 million people will face situations of food shortages in 2020, according to data from the World Food Program. 10% of the world's population suffers from food insecurity. 811 million people stood up every day in 2020 without knowing what they would eat. 161 million people more than in 2019. Almost 2.370 million people did not have adequate food in 2020, an increase of 320 million people in just one year.

The data from the FAO suggests that, globally, between a quarter and a third of food produced annually for human consumption is lost or wasted. This equals about 1,300 million tons of food, which includes 30% of cereals, between 40% and 50% of roots, fruits, vegetables, seeds, oilseeds, 20% of meat and dairy products, and 35% of fish. The FAO estimates that such food would be enough to feed 2,000 million people. Of the total food produced in the world, 14% is lost and 17% is wasted.

These reflections have been included in the discussions on the role that gastronomy and its actors should play in pursuing sustainable models of being in the world. The food chain affects the environment, the social and territorial balance, and has an impact on our most local and immediate environment as well as globally. It is therefore not surprising that gastronomy and the gastronomic industry have undertaken processes of transformation toward environmentally friendly practices, including investment in renewable energy sources and the use of sustainable materials in facilities, and especially the control of the supply of raw materials and the management of food losses and waste.

A "Sustainable Restaurant" is an establishment that demonstrates the implementation of initiatives, actions, and good practices that contribute in some way to one or more of the Sustainable Development Goals (SDGs) promoted by the United Nations.

To evaluate the sustainable performance of establishments that want to qualify as "Sustainable Restaurants", certain criteria must be met.

Next, the work carried out in the Basque Country (Spain) to create an official quality standard that allows evaluating the level of awareness and good practices regarding sustainability by hospitality establishments will be presented. This project was born from the concerns of hoteliers and public institutions in Bilbao, driven by the knowledge collected over the years by the Basque Know-How Fundazioa, whose technical development is being carried out by Azti (Member of Basque Research & Technology Alliance) together with stakeholders. It is currently in the phase of measuring the viability of the standard in a real environment and has the participation of different organizations linked to the hotel and restaurant industry. To arrive at this first proposal for a standard, extensive research in the sector has been carried out in recent years, thanks to the knowledge of stakeholders and experts in quality and sustainability. With the information collected, the “criteria of a sustainable restaurant” and the evaluation method presented below were established.

Criteria for sustainable Catering/Food and Beverage business

In this section, we are explaining the concepts that characterize a sustainable restaurant, as established in the project "Towards sustainable gastronomy, an alliance with its value chain - Criteria for sustainable restoration" mentioned before:

Waste nothing

Resources must be taken care of; therefore, we must make the most of them. An interesting aspect of actions for sustainability is what to do with food leftovers. They are no longer waste to be thrown away and are conceptualized as materials to be recycled.

Use leftover food

- Those that remain on the plates served to customers can be donated to animal breeders, compost producers, or biodiesel producers, for example.
- The leftover food in the kitchen is sent to underprivileged people, nursing homes, children's homes, and people who need it.

You must organize the logistics of deliveries, which must be done daily. Some restaurants simply place containers on a table in the street. People in need come to get food.

Zero waste trend

In addition to food, multiple types of waste are generated in the restaurant. Organizing their management is key to sustainability. Some venues have begun serving wine and beer straight from the barrel to avoid packaging. Sorting waste and locating recycling points is an action to consider.

Take advantage of perishable supplies that are in inventory

The expiration of perishable raw materials is another source of resource misuse. If inventory can't be moved well, products will sit on a shelf so long that their shelf life expires.

It is very important to organize the flow of raw materials, products, and food. In this way, we will try to ensure that the most perishable foods and the oldest ones in storage are the ones

that are used first; it is a way to prevent waste. What comes in first, comes out first. That should be the watchword.

The seasonality of the menu contributes to sustainability

It is important for a sustainable restaurant to propose menus where seasonal products predominate. Choosing organic raw materials is a sign of concern for people's health. Where possible, purchases will be made from local producers as a way of supporting the local economy.

Offering vegetarian and healthy alternatives, as well as natural and very fresh vegetables, is a feature that your customers will highly value. Creativity in the preparation and presentation of the dishes will allow a simple combination to become an excellent proposal.

More and more restaurants are basing their image on preserving the environment and interacting with their immediate environment. And those notes highlight his interest in humanity and his social responsibility.

Take care of the water

The issue of the scarcity of potable water, one of the biggest concerns around the world, must be addressed in a sustainable restaurant. It is essential to implement measures that tend to make the most of every drop of water.

The use of washing machines when they are full so that the water performs to the maximum is a good deed. Faucets with movement sensors and controlled water emissions prevent waste. These and other measures are easily installed without large investments.

Save electricity

Turning off lights, stoves, machinery, and appliances when they are not necessary saves energy. The use of energy-saving light bulbs also reduces consumption; there are automatic systems for turning on lights in spaces with little traffic. Motion or darkness sensors are low cost and highly effective mechanisms for this purpose.

Green constructions

Green or ecological architecture is spreading around the world. These are designs and construction techniques that tend to preserve ecology.

Buildings made of mud or adobe have begun to emerge, with water purification systems, solar panels to generate energy, and the maximum use of sunlight for lighting. It is possible to achieve comfort and excellence in services with construction systems for the use of resources.

Involve the restaurant in a cause for the common good

You don't need to spend money for this; it's just a matter of organizing. Donations of leftover food in the kitchen or residual products for cooperatives, for example, do not require special expenditures. Organizing an event annually in which part of the profits are donated to a cause is also a useful strategy.

Therefore, a sustainable restaurant is one that strives to minimize the impact generated by its business. Being respectful of the environment is how it differs from the competition.

They care about generating the minimum possible impact in terms of the production and distribution of the raw materials they use.

During their day-to-day and in all areas of the business, they try to reduce their ecological footprint to a minimum.

In the principles of a restaurant with these characteristics, it is striving to serve a meal made with zero-kilometer products. This consists of: preparing the menus to be served with local products; and, as far as possible, using organic products.

In this way, sustainable restaurants not only try to reduce their emissions but are also based on an economic and social nature, taking their community into account and satisfying not only their own economy but also that of their environment.

As an example of initiatives that promote sustainable gastronomy, we find the project "Sustainable Gastronomy" in the Basque country. Gastronomy is one of the internationally recognized hallmarks of the Basque Country and a key sector for tourism and the economic fabric of Bizkaia. Currently, this sector faces a series of global challenges, both environmental and socioeconomic, of great impact, such as climate change or new consumer trends or business models, which require the implementation of sustainable development strategies in this key sector.

The "Sustainable Gastronomy" initiative, coordinated by AZTI in collaboration with Basque Know-How Fundazioa and the Gorka Izagirre Winery, and financed by BBK-KUNA, has developed and agreed with 28 representatives of the agents of the value chain, 9 aspects and the most relevant environmental and social criteria to take into account to evaluate the degree of sustainability of a gastronomic service. The focus of the standard is on sustainable procurement, waste management, food waste, efficiency in the use of natural resources, sustainable construction and building, sustainable materials and other inputs, people management, transparency towards the consumer, and social responsibility and communication.

Throughout the project, the capacity of the model to improve not only the sustainability of the sector itself but its entire value chain has also been verified. On the one hand, it promotes the acquisition of sustainable raw materials, which will drive the entire value chain towards one with less environmental impact. On the other hand, The incorporation of the Sustainability Certificate can contribute to sustainable development and expand and raise awareness about the importance of incorporating these principles into our consumption habits, beyond the sector itself. That is, the standard invites and encourages the consumer to be especially proactive, not only in the restaurant but in their way of life.

Identifying and describing traditional recipes, from a sustainability perspective

Food is related to many other aspects of life, including culture, politics, agriculture, and the environment. Through our choices related to food consumption, we can exert a collective influence on the way in which these are grown, produced, and distributed, generating, consequently, a great change. This global approach is present in movements such as Slow Food, which works in projects such as Km 0, Ark of taste, where products are claimed, Good, Clean and Fair or Terra Madre, and the declaration of Puebla, which serve as inspiration as a model of sustainable cuisine through traditional and local cuisine recipes (Slow Food Foundation for Biodiversity, n.d.) (Slow Food Foundation for Biodiversity, 2007).

In traditional recipes, key elements such as ingredients, presentation, and preparation, among others, are shown. In this case, not only technical aspects are taken into account but also aspects related to the context and the environment of the recipe, as well as those elements that introduce them in the field of sustainability through sustainability tips.

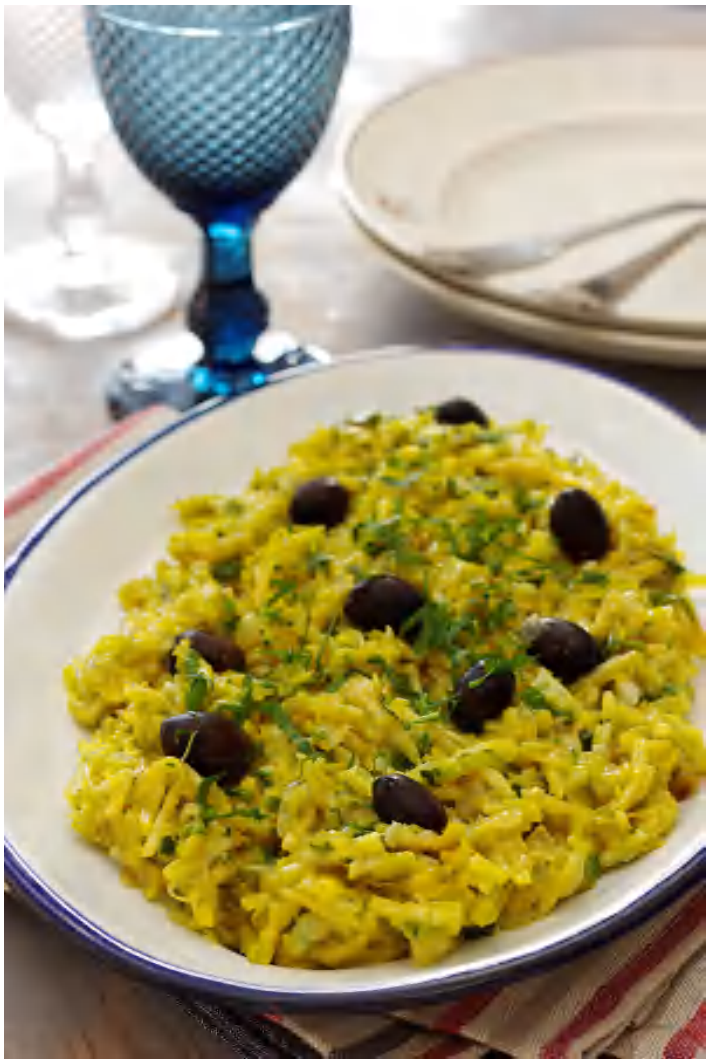


Image Source:

Cinco Quartos de Laranja

(https://www.cincoquartosdelaranja.com/2018/02/alho-frances-a-bras.html)

Alho francés à Brás

This is a vegetarian version of a famous traditional Portuguese dish made of shreds of salted codfish. Instead of codfish, the key element of this recipe is leek

PORTUGUESE TRADITIONAL RECIPE

Portions: 10	**Preparation time:** **30 minutes.**	**Alergens/ Intolerances/ Food Restrictions: Eggs**

Elaboration: Peel the potatoes, cut them into thin stick shapes, and put them in water for about 10 minutes. In the meantime, peel the onion and the garlic and slice them thinly. Thoroughly wash the leek and slice it. Put the eggs into a bowl and whisk them. Drain the potatoes and fry them in preheated oil. While the potatoes fry, pre-heat a frying pan with the olive oil, braise the onion, garlic, and leek, and add the bay leaves. Let it cook on low heat until the onion and the leek become soft and golden. Next, add the chips to the frying pan with the leek and the onion, remove the bay leaves, and mix. Add the eggs to the mix and stir it slowly for about 2 minutes until all the ingredients become a homogenous prep. Be careful not to overcook it, as the eggs might become dry. It is ready! Before serving, add salt and pepper to taste and decorate it with the sliced black olives and parsley.	**Sustainability tips:** This recipe is an adaptation of a traditional recipe that usually has codfish as the main ingredient. We replaced it with leeks in order to make it more sustainable. In case you have some chicken leftovers, shred them and replace the leek with the chicken. It is a great recipe to turn leftovers into a brand new meal. The waste produced by this recipe is the peel of the potatoes, onions, and garlic. The CO2 emission of this recipe per portion is approximately 151,965 against 839,165, which is the CO2 emission of the same recipe but with codfish instead of leek

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
leek	1600 gr	x		x		x	
eggs	10	x			x	x	
potatoes	8	x			x	x	
bay leaves	2 or 3	x			x	x	
onions	3	x			x	x	
garlic	6	x			x	x	
parsley	a handful	x			x	x	
salt	just enough	x			x	x	
pepper	just enough	x			x	x	
sliced black olives	12	x			x	x	
frying oil	1 L	x			x	x	
olive oil	2 spoons	x			x	x	

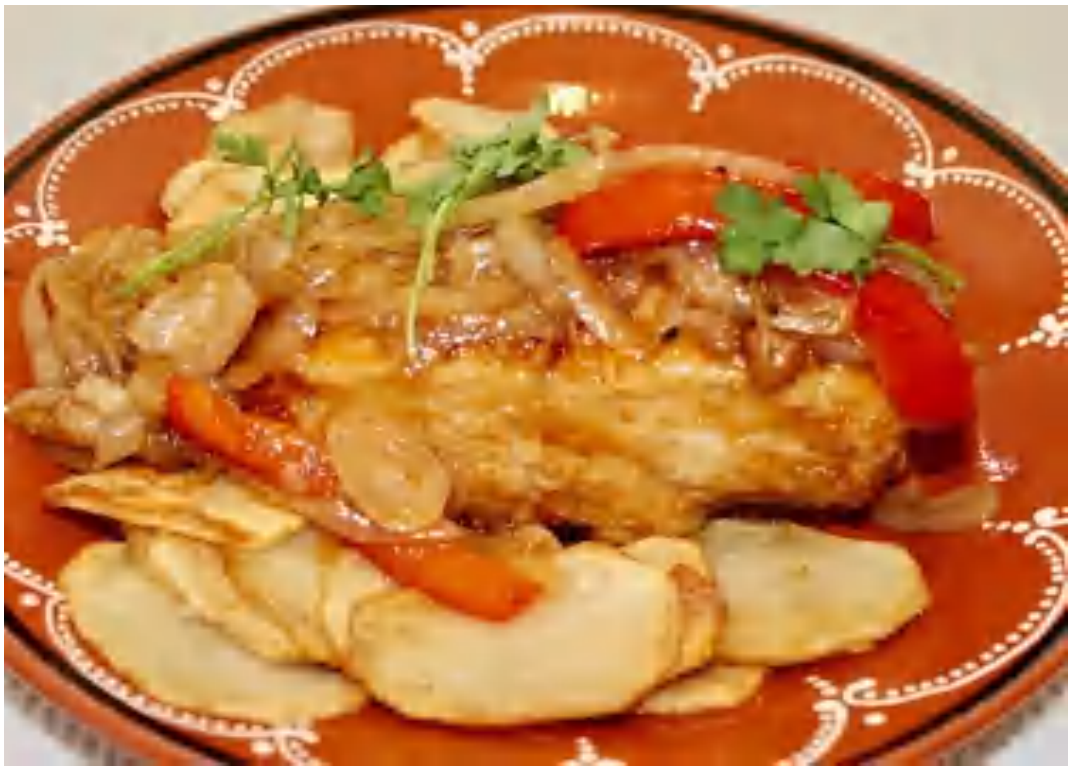


Image Source: https://www.receitasdeculinaria.tv/receita-de-bacalhau-a-moda-de-braga/

Braga-style codfish

Braga-style codfish is a very typical dish from the north of Portugal (Minho region). It was first cooked by a restaurant in Braga, Narcisa Restaurant, and due to its success, it was cooked by several restaurants in the region. Some people still call it "Narcisa-style codfish". Although not local, codfish is a very typical ingredient used in Portuguese gastronomy.

PORTUGUESE TRADITIONAL RECIPE

Portions: 4	**Preparation time: 40 min.**	**Alergens/ Intolerances/ Food Restrictions: None, vegetarian**

Elaboration:	**Sustainability tips:**

"Bring the cod to a boil in a pot of water. When the water starts boiling, turn off the heat and let the cod stay in the water for 5 minutes. After that, remove it from the water and dry it with a kitchen towel. Put a frying pan on the heat with olive oil, 2 bay leaves, and 1 clove of garlic. Place the codfish in it and fry it. Remove it from the pan and place it on a serving dish. Remove the bay leaves and the garlic cloves from the frying pan and start preparing the onion mixture. Cut the onions and 1 garlic clove into slices and place them in the frying pan where you fried the codfish. Cut the peppers into strips and the tomato into pieces, and add them to the frying pan. Season with salt and pepper, and add a little vinegar. Let it cook until the onion is cooked. Cut the potatoes into thick slices and fry them. When ready, place them around the cod. Cover the whole thing with the onion and serve."	Waste: Selective waste collection and measurement have been carried out for each type of waste, complying with current regulations. To dry the codfish, use a kitchen towel instead of kitchen paper. Losses: non-existent; Reuse: the content of the frying pan is reused for the onion mixture; the potatoes' skin can be reused; Energy saving: the pot of water is turned off when it starts boiling; To reduce CO2 emissions, the volume of waste was reduced, and energy use was saved. Extra tip: as codfish is not a local product, this recipe can be adapted with another ingredient to reduce CO2 emissions."

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Codfish cutlets/loins	4	x			x		x
Onions	2	x		x		x	
Garlic	3	x		x		x	
Green bell pepper	0.5	x		x		x	
Red bell pepper	0.5	x		x		x	
Bay leaves	2	x		x		x	
Vinegar	1 tablespoon	x			x	x	
Tomato	1	x		x		x	
Salt	5	x		x		x	
Olive oil	80	x		x		x	
Ground pepper	1	x			x		x
Potatoes	8	x		x		x	

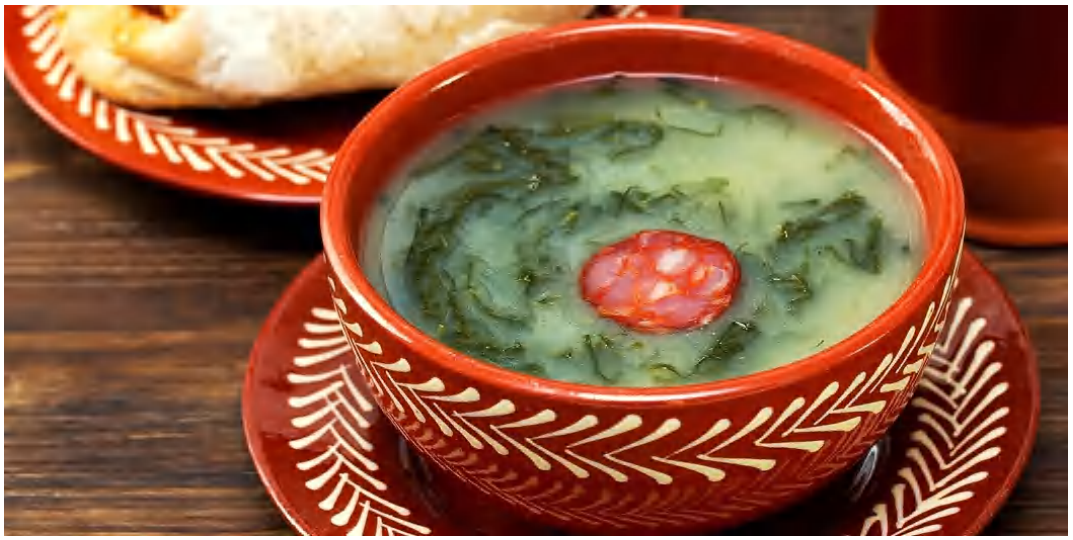


Image Source:
Sapo Lifestyle
https://lifestyle.sapo.pt/sabores/receitas/caldo-verde-2

Caldo verde à moda do Minho

This is a classic of Portuguese traditional cuisine. Caldo verde à moda do Minho is a kale soup with chorizo that originated in Minho, the northern region of Portugal. This mouthwatering green soup is usually served with a slice of traditional Portuguese corn bread
PORTUGUESE TRADITIONAL RECIPE

Portions: 4	**Preparation time: 1h.**	**Alergens/ Intolerances/ Food Restrictions: Meat**

Elaboration:	**Sustainability tips:**

Peel the potatoes, the onions, and the garlic. Wash them and dice them into small pieces. Next, wash the kale and cut it into thin strips. Next, add the potatoes, the onion, the garlic, the water, and a bit of olive oil to a pot to boil, and season it with salt. When it starts boiling, add the chorizo and let it boil for a couple of minutes. Once boiled, remove the chorizo and save it for later. Once the potatoes are well boiled, shred the prep with a hand blender. Put it on low heat and add the kale. Once the kale is boiled, season it to taste and add some more olive oil. Slice the chorizo, and when serving, add one slice to each bowl. Serve with a slice of traditional Portuguese corn bread.	This recipe's CO_2 emissions are extremely low, at approximately 74 per portion. It is a great dish for the winter season. The waste it produces is minimal; the potato scraps and the garlic and onion skins are the only waste generated. Consider disposing these into a composter, as they can become fertilizer for your vegetable garden

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Onion	1	x			x	x	
Olive oil	150 ml	x			x	x	
Water	1,5 l	x			x	x	
Garlic	100 gr	x			x	x	
Portuguese kale	200 gr	x		x		x	
Chorizo	at taste	x			x	x	
Potatoes	600 gr	x		x		x	
Salt	1 ts	x			x	x	
Corn bread	at taste	x			x	x	

Image Source: https://made-portugal.blogspot.com/2018/02/pastel-de-nata.html

Cream Pastry

A very traditional Portuguese sweet recipe, whose original recipe was created by the monks of the Jeronimos Monastery in Lisbon, It is believed that during the liberal revolution, the monks cooked the cream pastries to sell them and, thus, survived in a very difficult time. They started selling it in an establishment near the Jerónimos Monastery in Belém. The most known cream pastries are the "belém pastries", which are part of Portuguese history and whose recipe is kept secret.

PORTUGUESE TRADITIONAL RECIPE

Portions: 20	**Preparation time: 75 min.**	**Alergens/ Intolerances/ Food Restrictions: Dairy, Gluten**

Elaboration:	**Sustainability tips:**

Preheat the oven to 240 ºC. Put the milk, lemon peels, and cinnamon sticks into a pan. Bring to a boil and turn off the heat. In a bowl, mix the sugar and the flour and add them to the hot milk, stirring well. Remove the lemon peel and cinnamon sticks and let them cool for 10 minutes. Add the eggs and the yolks and stir until it forms a homogeneous cream. Bring to the boil again, stirring constantly until thickened. Put the puff pastry into molds. Be careful to use the whole puff pastry. Pour the cream into the molds and bake in the oven for about 15 minutes	Waste: Selective waste collection and measurement have been carried out for each type of waste, complying with current regulations. Losses: non-existent. The non-used egg whites can be reused. Reuse: this recipe uses lemon peels that can be reused from another recipe; the egg whites can be reused to another recipe; To reduce CO2 emissions, the volume of waste was reduced, and energy use was reduced. The quantity of the non-local products was adjusted to reduce CO2 emissions.

		ORIGIN KNOWN		**SEASONAL PRODUCT**		**LOCAL PRODUCT**	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Milk	1 l	x			x	x	
Lemon peels	2	x		x		x	
Cinnamon stick	2	x		x			x
Sugar	400g	x		x			x
Flour	80g	x			x		x
Eggs	4	x			x	x	
Yolks	6	x			x	x	
Puff pastry	500 g	x			x		x

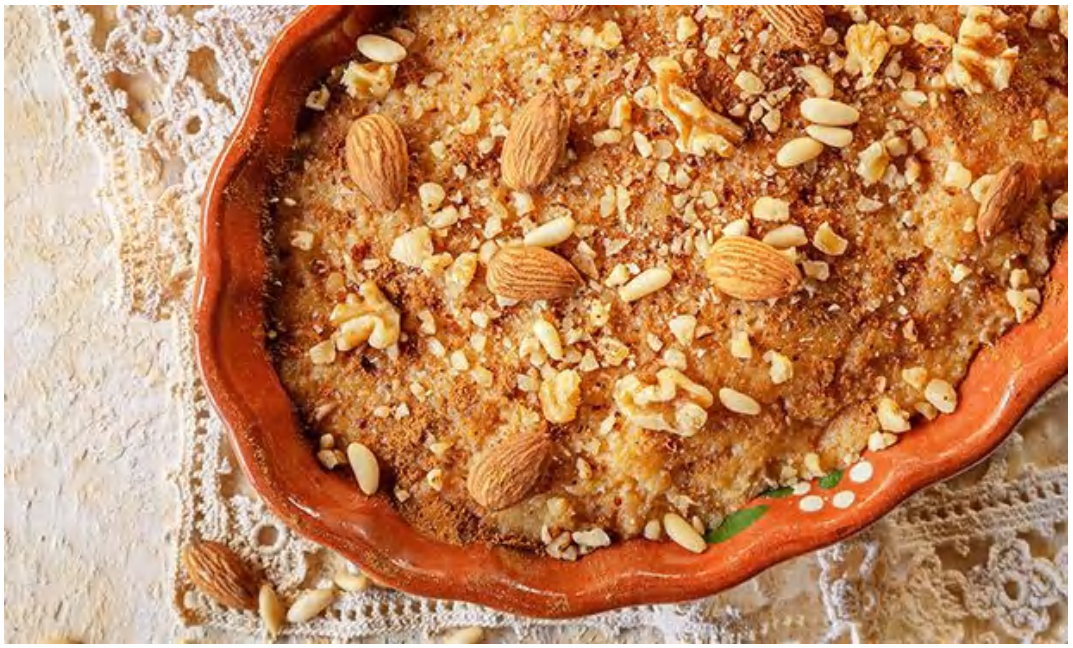


Image Source:
Receitas Pingo Doce
https://www.pingodoce.pt/receitas/formigos/

Formigos

This is a typical dessert from the north of Portugal and is traditionally served during the Christmas season. It can either be served hot or cold.
PORTUGUESE TRADITIONAL RECIPE

Portions: 6	**Preparation time: 30 min.**	**Alergens/ Intolerances/ Food Restrictions: Dairy, eggs, nuts, gluten**

Elaboration:

In a pan, add the water, the sugar, the milk, the lemon peel, and the cinnamon stick. Take it to the

Sustainability tips:

This is a seasonal dessert traditionally served at Christmas in the north of Portugal, which is also when pine nuts and other nuts are in season,

stove and let it boil for about 5 minutes. Shred the bread into small pieces and add it together with the Port wine and the butter to the pan with the previous mix. Stir it and keep it on low heat until it thickens. Turn off the stove, remove the lemon peel and the cinnamon stick from the pan, and add the pine nuts, walnuts, hazelnuts, and raisins. Mix everything. Pour the prep into a platter or individual bowls. and decorate it with some more nuts and powdered cinnamon.	making good use of seasonal products. Usually, the bread used in this recipe is not fresh, making this a good example of how to make use of products that are no longer fresh or leftovers, avoiding food waste. This recipe produces no waste; the lemon peel is only a small part of the lemon, and it can be removed without damaging what remains of the fruit, so it can easily be preserved for other recipes. This recipe's CO2 emissions are approximately 217,025 per portion.

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Sugar	250 gr	x			x		x
Milk	350 ml	x			x		x
Water	300 ml	x			x	x	
Cinnamon stick	1	x			x		x
Lemon peel	1	x			x	x	
Butter	60 gr	x			x		x
Port wine	50 ml	x			x	x	
Bread	300 gr	x			x	x	
Honey	2 tea spoons	x		x			x
Pine nut	50 gr	x		x		x	
Walnut	50 gr	x		x			x
Hazelnut	50 gr	x		x			x
Powdered cinnamon	just enough	x			x		x
Raisins	50 gr	x			x		x

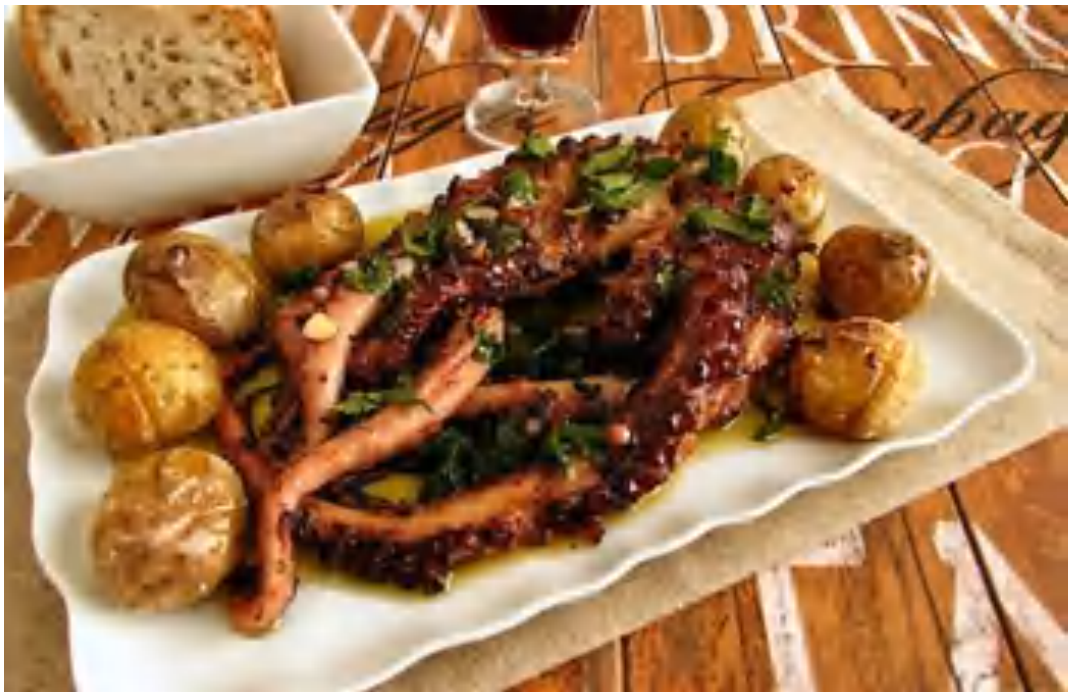


Image Source: https://www.mulherportuguesa.com/receita/polvo-assado-lagareiro-batatas-murro/

"Lagareiro" style octopus

A very traditional Portuguese recipe, whose name is due to the large amount of olive oil that is used to water the octopus. The "lagareiro" is the person who works in the mills: the "lagar". This recipe was adapted from the "Lagareiro" style codfish that originated in the Beiras region, between the south of the Douro River and the north of the Tejo River. When the olive oil matched expectations, the codfish was prepared "lagareiro" style to celebrate the months of hard work. Later, the codfish was replaced by octopus, reaching a greater number of consumers and using a local product, which is one of the most fished species in Portugal.

PORTUGUESE TRADITIONAL RECIPE

Portions: 4	**Preparation time: 75 min.**	**Alergens/ Intolerances/ Food Restrictions: Octopus, Non vegetarian**

Elaboration:

Preheat the oven to 160 ºC.

In a large pot, cook the octopus with 5 l of water, 50 ml of olive oil, a crushed head of garlic, and an onion in its shell. Cook for 40 minutes. Season it with salt and let it cool in its own water. Separate the head from the tentacles, reserving them in an oven dish.

Wash the small potatoes with peels, wrap them in salt, and add them to the tentacles in the oven dish. Increase the oven temperature to 180 ºC.

Drizzle the octopus and potatoes with 200 ml of olive oil, distribute the crushed garlic cloves and bay leaves over the dish, and sprinkle with freshly ground white pepper.

Place it in the oven. When the octopus is golden brown, it is ready.

Sprinkle the dish with chopped parsley and serve it.

Sustainability tips:

Waste: Selective waste collection and measurement have been carried out for each type of waste, complying with current regulations. Losses: non-existent. The onion and potatoes' shells are used in the recipe.

Reuse: the water where the octopus was boiled can be reused to cook octopus rice. To reduce CO2 emissions, the volume of waste was reduced and energy use was reduced.

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Octopus	1	x			x	x	
Olive oil	250 ml	x		x		x	
Garlic	2	x		x		x	
Onion	1	x		x		x	
Salt	2 tablespoons	x		x		x	
Potatoes	900g	x		x		x	
Bay leaves	2	x		x		x	
White pepper	5g	x		x	x		x
Parsley	15g	x		x		x	

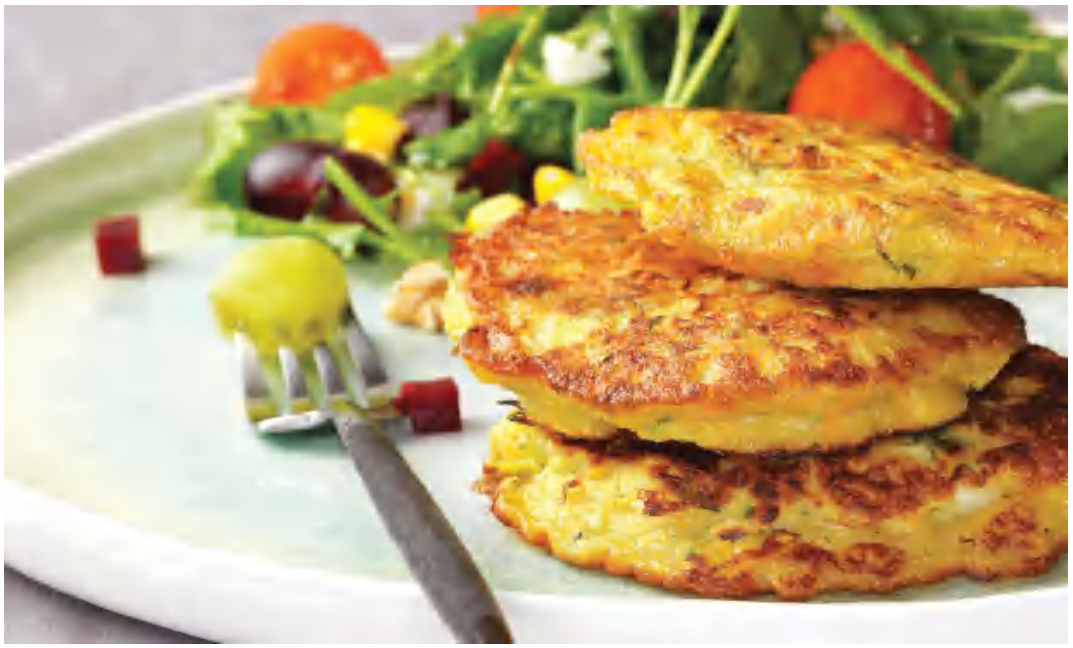


Image Source: https://www.pingodoce.pt/receitas/pataniscas-legumes/

Pataniscas de legumes

Pataniscas is a typical Portuguese delicacy usually made of fried codfish mixed with flour, egg, onion, parsley, salt, and pepper purée. It is usually served as an appetizer. Pataniscas is also commonly served as a main course, therefore, tomato and red bean rice is usually served as a side dish. Even though codfish is a key ingredient in Portuguese traditional gastronomy, it cannot be found in the country's seaside. Therefore, we suggest an alternative recipe that replaces codfish with vegetables.

PORTUGUESE TRADITIONAL RECIPE

Portions: 20	**Preparation time: 30 min.**	**Alergens/ Intolerances/ Food Restrictions: Eggs, gluten, dairy**

Elaboration:	**Sustainability tips:**

Chop the parsley and the vegetables. Then, boil the vegetables. Separately, add the beer, the flour, and the eggs and add some water to a bowl and mix it well until you get a homogeneous batter. Let it rest for 15 minutes. Next, and once the vegetables are ready, add them to the batter and mix it. Finally, add the chopped parsley to the mixture and mix it all again. Prepare the frying oil and once it is warm, pour the mix into it to fry trying to form flat shaped pataniscas. Once fried, they are ready to be served.	As explained, we replaced codfish, the traditional ingredient, with vegetables in order to make it more sustainable. You can also choose to change the recipe and use seasonal vegetables. Selective waste collection and measurement have been carried out for each type of waste, complying with current regulations. With this recipe, food waste is easily avoided. Only onion and garlic skin are not used in the recipe, and this can be saved for a broth to be used in a different recipe. The CO2 emissions of this recipe is approximately 311,925 per portion.

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Mushrooms	1 kg	x		x		x	
Green beans	900 gr	x		x		x	
Carrots	500 gr	x		x		x	
Parsley	100 gr	x			x	x	
Chopped onion	200 gr	x			x	x	
Chopped garlic	100 gr	x			x	x	
Green peas	500 gr	x		x		x	
Egg	5	x			x	x	
Flour	1,4 kg	x			x	x	
Milk	800 ml	x			x	x	
Beer	120 ml	x			x	x	
Frying oil	Just enough	x			x	x	

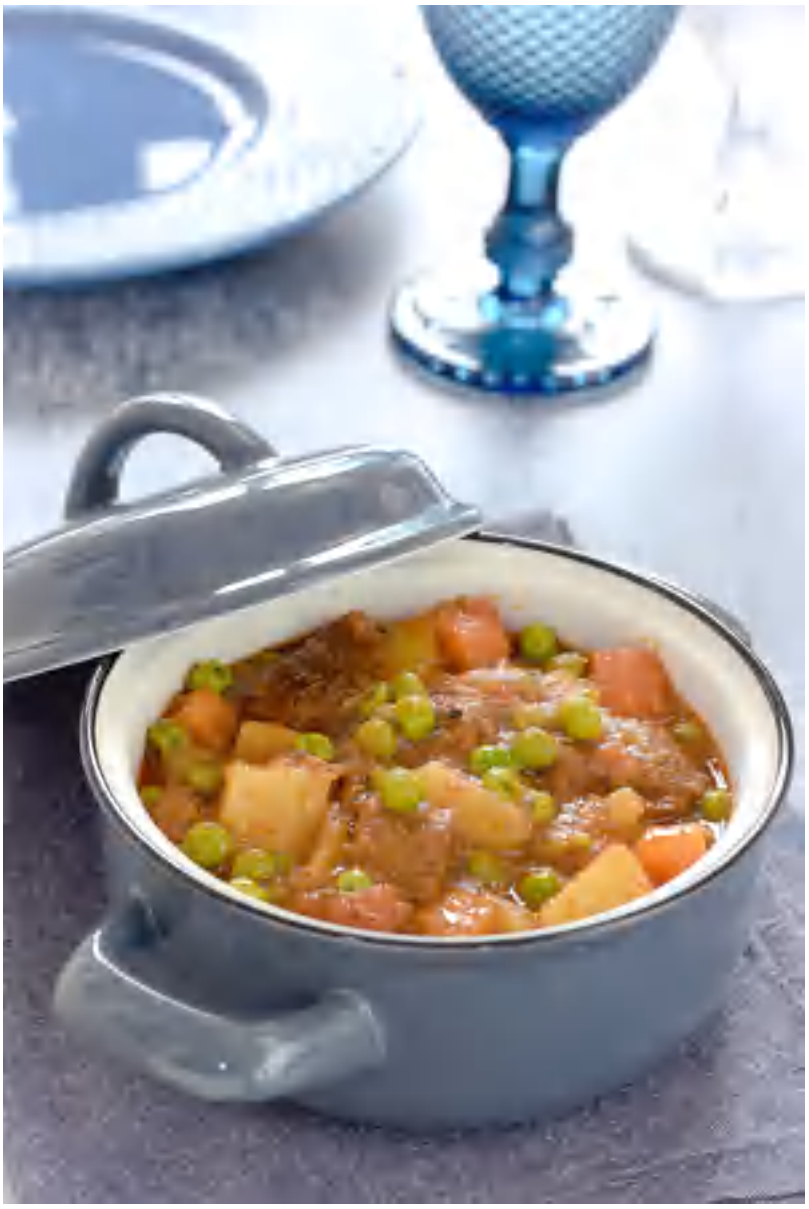


Image Source: https://www.cincoquartosdelaranja.com/2021/03/jardineira-de-carne-de-vaca.html

Portuguese “Jardineira”

Jardineira is a very typical Portuguese dish that includes meat and a great variety of vegetables.
PORTUGUESE TRADITIONAL RECIPE

Portions: 4	**Preparation time: 65 min.**	**Alergens/ Intolerances/ Food Restrictions: Meat, non vegetarian, wine**

Elaboration: Heat the olive oil, the chopped onion, and the bay leaf in a pan and let it braise. Add the chopped garlic and the meat cut into pieces, and let it cook for 10 minutes. Add the wine, the tomato cut into slices, the tomato pulp, the salt and black pepper, and 200 ml of water. Let it cook, and when the water starts boiling, lower the heat and let it cook for about 30 minutes. Add a little more water, and cut the carrots and the potatoes into cubes. Cover and let it cook for about 15 minutes. Add the peas and cook for about 5 minutes more. Serve.	**Sustainability tips:** Waste: Selective waste collection and measurement have been carried out for each type of waste, complying with current regulations. Losses: non-existent; Reuse: the carrots' and potatoes' skin can be reused; To reduce CO2 emissions, the volume of waste was reduced, and energy use was reduced.

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Beef	600g	x			x	x	
Onion	1	x		x		x	
Garlic	2	x		x		x	
Tomatoes	2	x		x		x	
Tomato pulp	2 tablespoons	x		x		x	
Potatoes	2	x		x		x	
Carrots	2	x			x	x	
Peas	150g	x		x		x	
Bay leaf	1	x		x		x	
Olive oil	1 tablespoon	x			x	x	
Red wine	100 ml	x			x	x	
Salt	5 g	x		x		x	
Black pepper	5 g	x			x		x

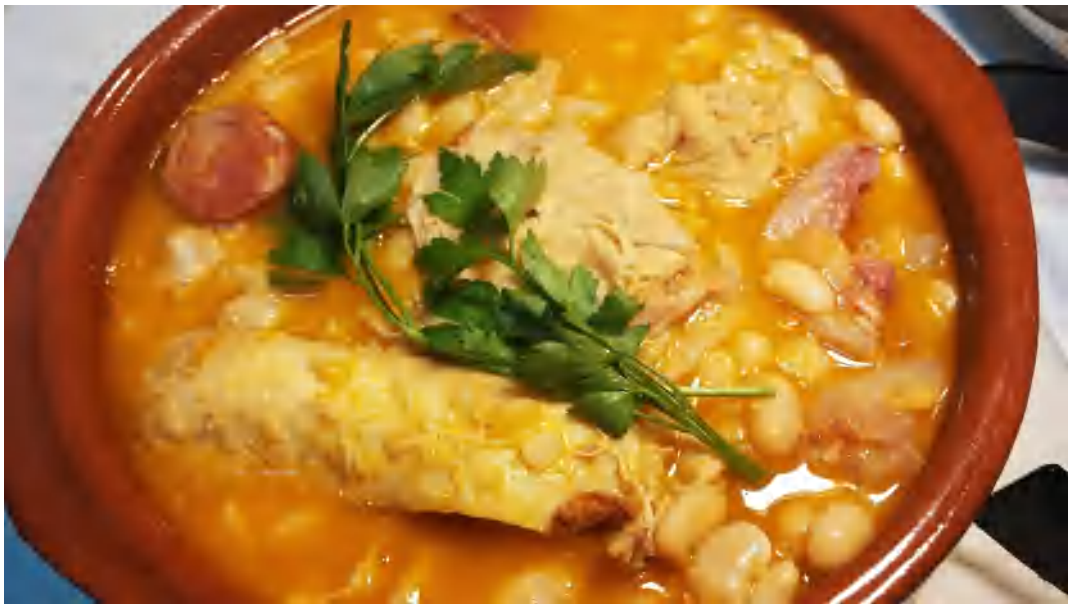


Image Source: Necasdevaladarescanal https://necasdevaladarescanal.blogspot.com/2014/09/receita-de-tripas-moda-do-porto.html

Tripas à moda do Porto

This is a traditional dish that originated in the city of Porto and is strongly linked to the city's history and identity. There are different historical versions of how this plate came to be. The factors all versions have in common are that it was created by the people of Porto (known as 'tripeiros', which means "those who eat tripe") and that the recipe was born out of the necessity of using all ingredients at hand and avoiding waste in times where food was sometimes scarce. The plate is usually served with white rice, and it is a mix of different types of meat, including some unusual animal parts that make the plate a unique delicacy.

PORTUGUESE TRADITIONAL RECIPE

Portions: 8	**Preparation time: 90 min.**	**Alergens/ Intolerances/ Food Restrictions: Meat**

Elaboration:
The first step is one of the most important ones. Wash the tripe thoroughly, rub it with salt and lemon, and boil it in salted water. Then, chop all the meat you are using for this recipe and season it with salt. In a pot with water, boil the calf's hand and pig's ear.

Sustainability tips:
This recipe can be considered a good example of how to get the most out of the ingredients. Even though it uses several types of meat, most of the meat used is

Using a pressure cooker might make this faster. In another pot with water, boil the chicken and the pig's belly and let it cook for about 30 minutes. In the meantime, heat the lard in a pan and braise the onion (sliced or chopped) and the garlic with the bay leaf. Add the carrots (sliced or diced) and let it cook on low heat. Next, add some paprika, the meat already cooked, and the black pudding and chorizo. Water the prep with the white wine. Let the prep cook for about 5 minutes, and then add the white beans. Stir everything and let it cook for about 15 minutes on low heat for flavor. Season the prep to your taste and decorate it with parsley. Serve with white rice.	made out of meat scraps (for example, chorizo) and uses parts of the animal that are not usually eaten and that are wasted. It produces no other waste than the onions and garlic skin; carrots can be cooked with the skin. One tip to make the recipe more sustainable is to reduce the quantity of meat; for example, chicken can be left out. This recipe's CO2 emissions are approximately 800 per portion.

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Garlic	100 gr	x			x	x	
Parsley	1 bunch	x			x	x	
Baked white beans	800 gr	x			x		x
White wine	1 glass	x			x	x	
Black pudding	300 gr	x			x	x	
Chorizo	300 gr	x			x	x	
Paprika	1 tbs	x			x		x
Carrots	150 gr	x		x		x	
Veal tripe (flat, honeycomb and leaf tripe)	1 kg	x			x	x	
Pig's ear	500 gr	x			x	x	
Chicken	600 gr	x			x	x	
Lard	2 tbs	x			x	x	
Pig's belly (bacon)	200 gr	x			x	x	
Calf's hand	450 gr	x			x	x	
Lemon	1	x			x	x	
Salt	2 ts	x			x	x	
Onions	100 gr	x			x	x	
Bay leaf	1	x			x	x	

Image Source: https://www.timeout.pt/lisboa/pt/coisas-para-fazer/classicos-da-cozinha-portuguesa-feijoada-a-transmontana

Transmontana style Feijoada

A very traditional Portuguese recipe, from the Trás-os-Montes region. It is known for the reuse of meat and vegetables from other recipes.
PORTUGUESE TRADITIONAL RECIPE

Portions: 8	**Preparation time: 2h.**	**Alergens/ Intolerances/ Food Restrictions: Meat**

Elaboration:	**Sustainability tips:**
Cook the meat and the sausages in water with 1 teaspoon of salt. When cooked, remove them from the heat and cut them into pieces. Reserve the cooking broth. Separate the cabbage leaves and peel the carrots and cut them into thin slices. Slightly cook the cabbage and carrots in water with 1 teaspoon of salt. In a pan, cook the garlic and onion in olive oil and add the bay leaf. Add the tomatoes peeled and cut in slices and the tomato pulp. Add the meat, the drained beans and part of the cooking broth. Let cook for 10 minutes. Add the sausages and the cabbage and carrots and let cook.	Waste: Selective waste collection and measurement has been carried out for each type of waste, complying with current regulations. Losses: non-existent. Reuse: part of the cooking broth is reused in this recipe; To reduce CO2 emissions, the volume of waste was reduced and energy use was reduced.

		ORIGIN KNOWN		**SEASONAL PRODUCT**		**LOCAL PRODUCT**	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Red beans	500g	x		x		x	
Ribs	400g	x			x	x	
Meat sausage	1	x			x	x	
Blood sausage	1	x			x	x	
Pig's ear	100 g	x			x	x	
Pork chispah	100 g	x			x	x	
Bacon	100 g	x			x	x	
Carrots	4	x			x	x	
Cabbage	1	x		x		x	
tomato pulp	5 dl	x		x		x	
Tomatoes	2	x		x		x	
Bay leaf	1	x		x		x	
Onion	1	x		x		x	
Garlic	4	x		x		x	
Olive oil	1 dl	x		x		x	
Salt	2 teaspoons	x		x		x	
Black pepper	1 teaspoon	x			x		x

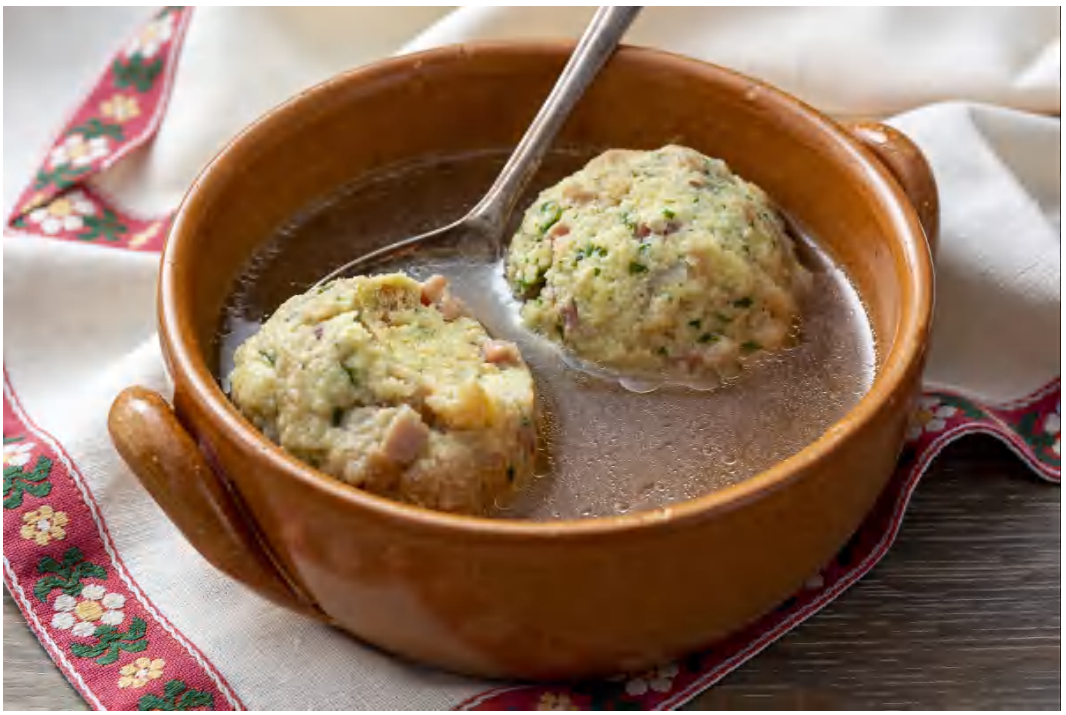


Image Source: https://www.giallozafferano.com/recipes/Knoedel.html

Canederli alla trentina

The name "canederli " generally indicates a sort of dumpling whose main ingredient is stale bread. It is typical of the Trentino-Alto Adige region, in Northern-East Italy, but also of other regions of the Alpine area and of central-east Europe (Austria, Slovenia, Germany, Slovakia, Hungary, and Poland). For this reason, they not only have many different names depending on the area: they are also prepared in a multitude of local varieties, changing ingredients (e.g.: in some cases, pieces of sausage or other cured meats are added), serving modalities (dry or with veggie or meat stock), dimension, and so on.

ITALIAN TRADITIONAL RECIPE

Portions: 4	**Preparation time: 40 min.**	**Alergens/ Intolerances/ Food Restrictions: Meat, dairy, eggs.**

Elaboration:	**Sustainability tips:**
Cut the stale bread into small chunks. Add the milk and massage it into the bread to have it absorbed, then add the beaten eggs along with the chopped parsley and chives. Have the butter melted in a pan and brown half a chopped onion and diced bacon. Then add these ingredients to the bread mixture and, with wet hands, form the canederli, each more or less the size of a golf ball. They should then be dipped in flour and cooked for 10 minutes in boiling broth.	Waste: Selective waste collection and measurement has been carried out for each type of waste, complying with current regulation. This dish has many ingredients, most of them local. Could be improved by using waste from other preparations,

		ORIGIN KNOWN		**SEASONAL PRODUCT**		**LOCAL PRODUCT**	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Stale bread	200 g		x		x	x	
egg	2 medium	x			x	x	
Milk	100 ml	x			x	x	
Speck (dry smoked ham)	100 g	x			x	x	
white onion	30 g	x			x	x	
butter	20 g	x			x	x	
parsley	10 g	x		x		x	
Chives		x		x		x	
Flour 00	20 g		x		x		x

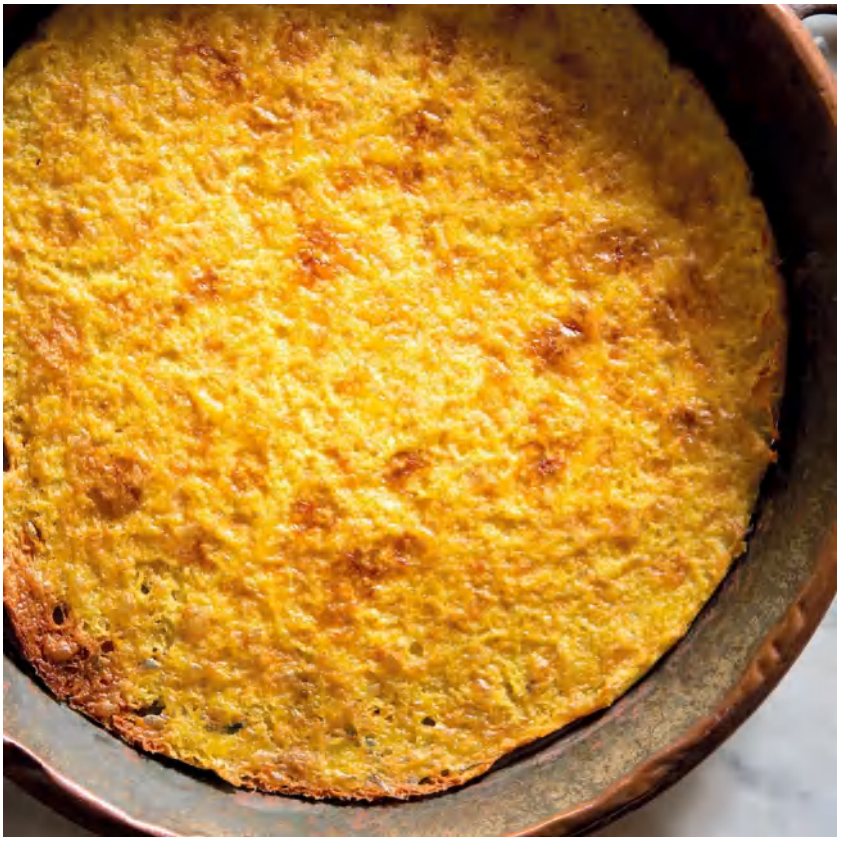


Image Source: https://www.autobahn.com.de/en/2023/02/25/italian-cuisine-top-50-dishes-of-italian-cuisine-recipes-of-italian-cuisine-italian-cuisine-recipes/

Farinata di ceci (chickpea “flatbread”)

"Farinata di ceci" is a sort of savory cake or flatbread typical to the Liguria and Tuscany regions (and of other areas of central Italy). Its origins date back to the medieval times, when merchants of this area had contacts with the arabic world, in which chickpeas are a staple of almost all cuisines. For this reason, similar preparations can also be found in some coastal areas of southern France (e.g. Nice) and Sardinia. As all traditional recipes, it can be found in a great number of local varieties, according to the ingredients available for the filling. However, three ingredients remain consistent: chickpea flour, olive oil, and water.

ITALIAN TRADITIONAL RECIPE

Portions: 8	**Preparation time: 35 min.**	**Alergens/ Intolerances/ Food Restrictions: Chickpeas.**

Elaboration:	Sustainability tips:
Add little by little 900 ml of water to 300 g of chickpea flour, stirring constantly (preferably with a whisk) so as to obtain a homogeneous, lump-free mixture. Cover the bowl with cling film or a clean cloth and let it rest for 4-5 hours at room temperature, stirring from time to time. At the end of this time, the mixture will have formed some foam, which has to be removed. Then add 50 ml of olive oil and 10 g of salt, and mix again carefully. Pour the mixture into a non-stick pan, and cook in the lower part of the oven preheated at 220°C for 7-8 minutes. Transfer to the higher part of the oven for 15 minutes, or until it becomes golden brown. Season with pepper to taste, and serve hot.	Waste: Selective waste collection and measurement have been carried out for each type of waste, complying with current regulation

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
chickpeas	300 g	x			x	x	
water	900 g		x		x	x	
olive oil	50 g	x			x	x	
salt	10 g		x		x	x	
pepper	to taste		x		x		x

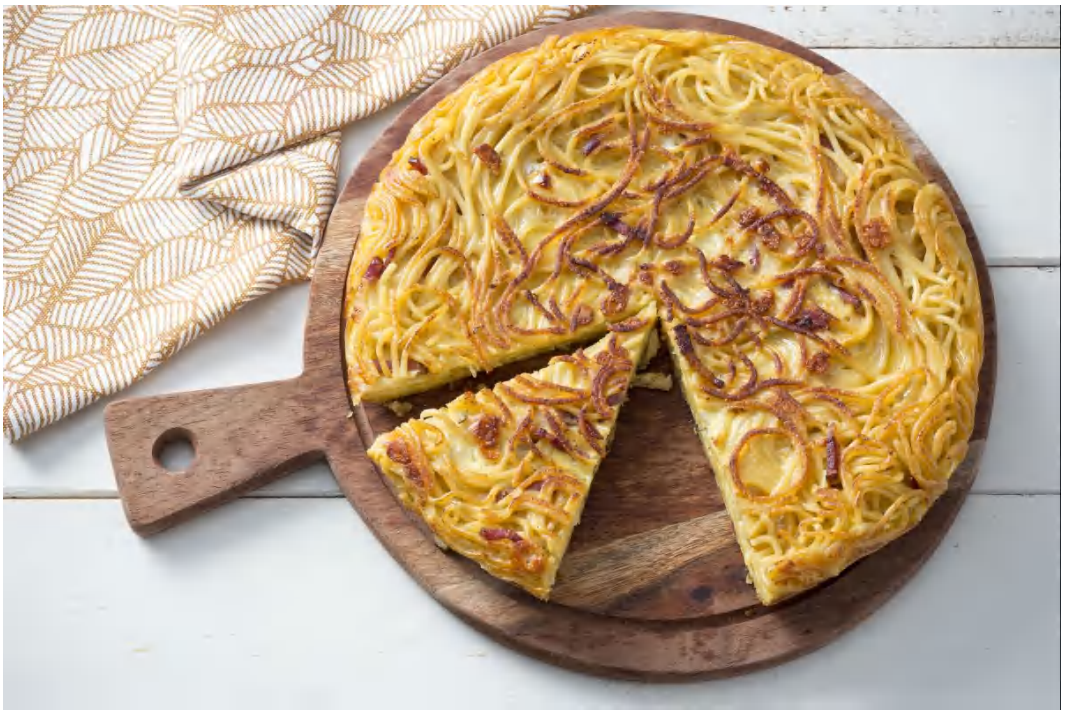


Image Source: https://www.giallozafferano.com/recipes/spaghetti-frittata.html

Pasta omelette (frittata di pasta)

Leftover pasta is a common presence in all Italian households, especially those in the ones of the southern part of the country. The main ingredient of this recipe, typical to the city of Naples and to the Campania region, is leftover pasta: it originated in restrictive times when even this poor ingredient could not be discarded. Overtime, it has been enriched with other ingredients, and it is a common takeaway food for trips to the seaside or to the countryside.
ITALIAN TRADITIONAL RECIPE

Portions: 6	**Preparation time: 30 min.**	**Alergens/ Intolerances/ Food Restrictions: Eggs, meat, dairy.**

Elaboration:	**Sustainability tips:**

These instructions refer to a 22 or 24cm pan. Cook the spaghetti in salted, boiling water, taking them out of water when still slightly undercooked. Once cooled, add the eggs beaten and mix them in. Add grated parmesan cheese, salt, pepper, diced bacon, butter cut into small chunks, and mix well. Heat 1-2 tablespoons of olive oil in a pan and pour the mixture in. Let it simmer 4-5 minutes, until it forms a golden crust, then flip it with the aid of a plate and cook the other side	Waste: Selective waste collection and measurement has been carried out for each type of waste, complying with current regulation. It could be improved by using waste from other preparations,

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Spaghetti	350 g	x			x	x	
Eggs	4	x			x	x	
Grated parmesan	3-4 tablespoons	x			x	x	
Smoked bacon	80 g	x			x		x
Butter (optional)	30 g	x			x		x
olive oil	to taste	x			x	x	
salt	to taste		x		x	x	
pepper	to taste		x		x	x	

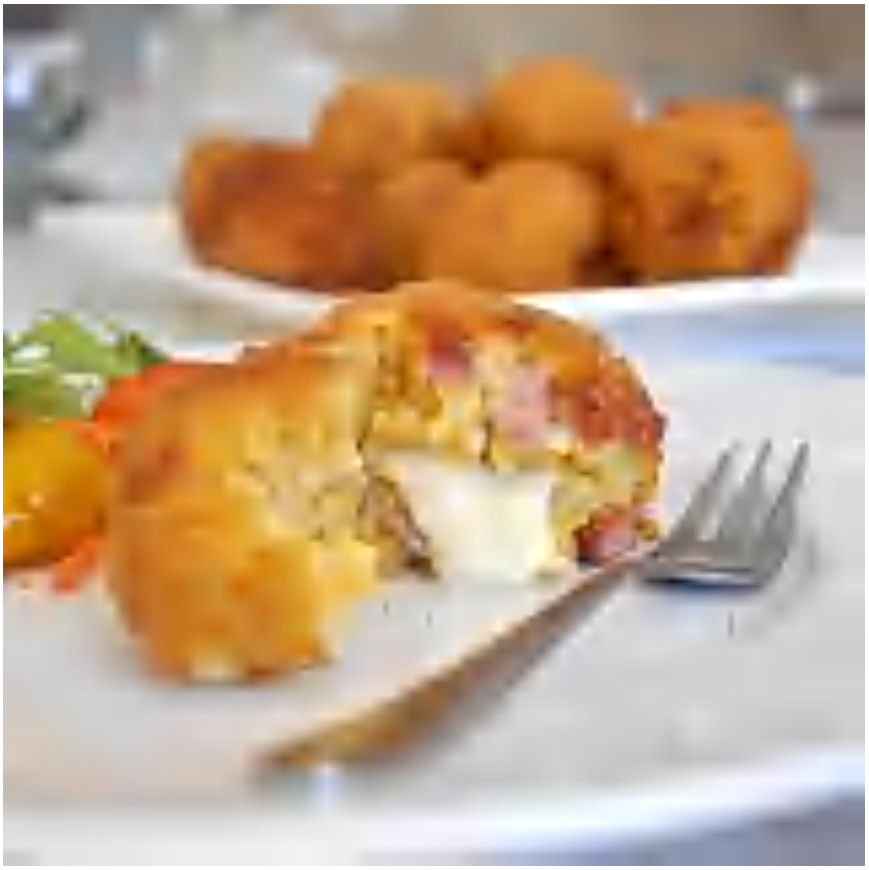


Image Source: https://www.cookingwithmanuela.com/2016/02/arancini-mozzarella-ham.html

Rice arancini (with ham and mozzarella filling)

Arancini, or Arancine (the correct name of this street food is a very sensitive issue for local communities) are a true symbol of Sicilian cuisine, at the same time as being a perfect anti waste traditional preparation. They consist of a fried ball of rice with various fillings (typically cheese and/or minced meat), changing greatly from town to town in dimension, shape and preparation. The common factor is that the core ingredient is leftover risotto (cooked rice).
ITALIAN TRADITIONAL RECIPE

Portions: 12	**Preparation time: 60 min.**	**Alergens/ Intolerances/ Food Restrictions: lactose, meat.**

Elaboration:	**Sustainability tips:**

Cook the rice in salted boiling water (1,2 L) until complete absorption (about 15 mins). Add the saffron diluted in a few drops of water and the butter, and stir accurately. Add 100 grams of grated caciocavallo and mix well, then spread the mixture in a pan in an even layer, cover with film, and leave to cool down. Meanwhile, dice the ham and the rest of the caciocavallo cheese, along with the mozzarella. When the rice has completely cooled down, start from the arancini balls (each should be approximately 130 g of rice), keep a cup of water to moisten the hands. Form half a ball, fill with a few dices of ham, mozzarella, and caciocavallo, and then shape it completely. Prepare a batter by mixing the 00 flour with 300 ml water and a pinch of salt: roll the arancini into it, then dip them in breadcrumbs. Heat the oil at 175°C and fry the arancini one or two at a time, until golden. Best served hot.	Waste: Selective waste collection and measurement has been carried out for each type of waste, complying with current regulation

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Rice (vialone nano variety)	500g	x			x		x
Saffron	1 tsp	x			x		x
butter	30 g	x			x		x
Water	1,6 L						
Salt	1 pinch	x			x	x	
Caciocavallo	160g	x			x	x	
cooked ham	100 g	x			x	x	
seeds oil	enough to fry		x		x		x
Breadcrumbs	to taste		x		x	x	
mozzarella	100g	x		x		x	
00 Flour	200 g		x		x		x

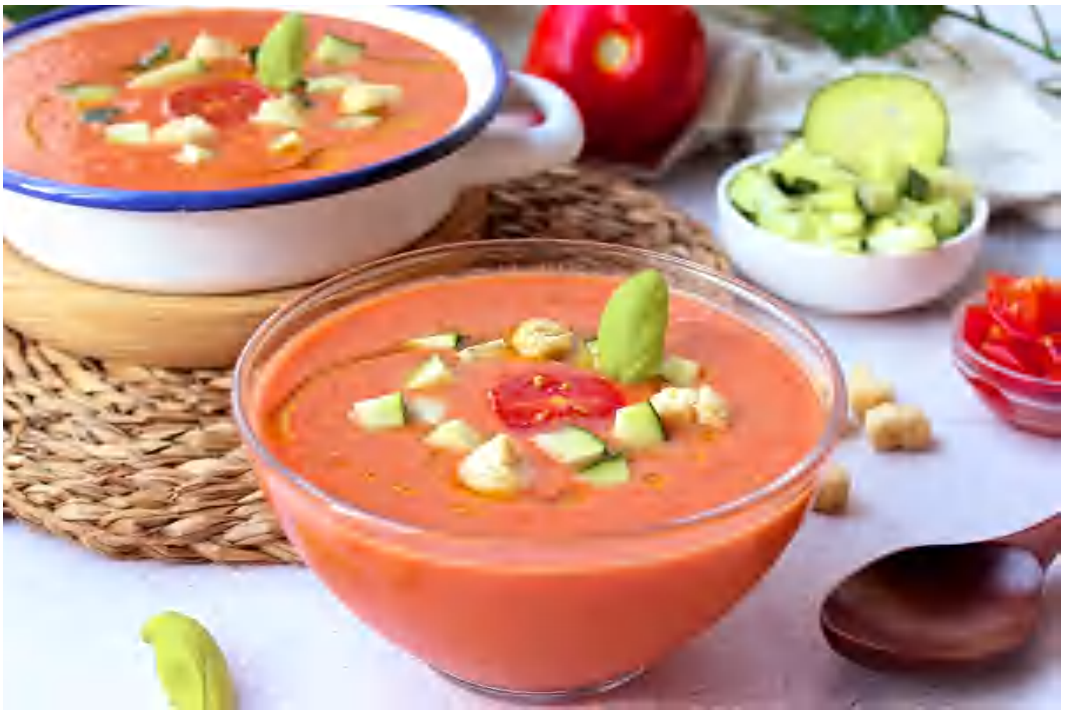


Image Source: https://www.bonviveur.es/recetas/gazpacho-andaluz-casero

Andalusian Gazpacho

Before the famous tomato-based gazpacho, there was already a gazpacho prepared with water, garlic, vinegar, and pepper in Al-Andalus. Gazpacho, as we know it today, originated in Andalusia (16th century), when day laborers and peasants used the dried bread from the previous days to soak it in water, add hand-squeezed tomatoes, and season it all with garlic, oil, and pepper.
Over time, it became fashionable to add other vegetables to the mixture, such as cucumber, red or green pepper, and onion. Today, the dish is also served with chopped vegetables or croutons on the side.

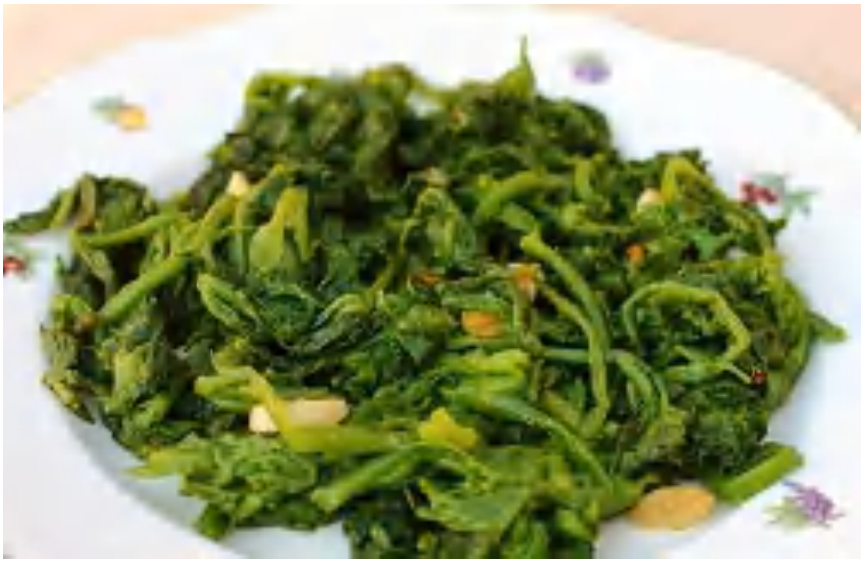
SPANISH TRADITIONAL RECIPE

Portions: 6	**Preparation time: 1 h.**	**Alergens/ Intolerances/ Food Restrictions: Gluten**

Elaboration:	**Sustainability tips:**

Explanation of the cooking process: Peel the garlic and the cucumber. Chop the ingredients and add them together with the liquids in a blender or in the Thermomix. Blend well. Put it in the fridge to cool and enjoy.	Waste: electricity during the cooking process. losses: cucumber and garlic skins. Options for reuse: 1. garlic skins: use them as plants' fertilizer 2. cucumber skins: reuse them to make cucumber skin tempura

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Pear tomato	1 kg	x		x		x	
Italian pepper	1 u	x		x			x
cucumber	1 u	x		x		x	
garlic cloves	2 u	x		x		x	
extra virgin oil	50 ml	x		x		x	
hard bread	50 g	x			x	x	
water	250 ml	x			x	x	
sherry vinegar	30 ml	x			x	x	
salt	5 g	x			x		x



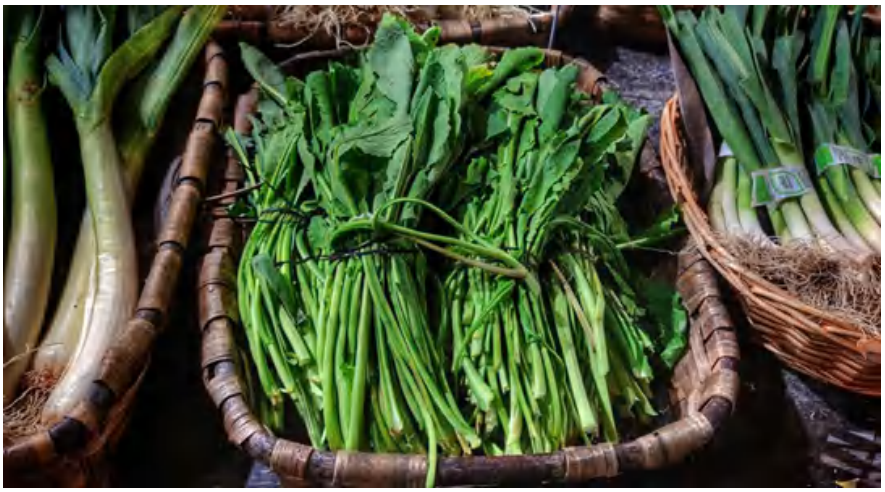


Image Source: https://feeleuskadi.com/arbigaras-gastronomia-vasca-en-mondragon/ https://www.cookingwithrosetta.com/blogposts/tenerumi-2

Sautéed Arbiragas- Rapini

Subsistence recipe- Arbigaras were eaten in December in the Basque Country when the turnip sprouts were tender. They are cut at that moment because later they will be bitter. In Basque "arbi" means turnip. It is a meal from the post civil war during the years of famine in Spain.

SPANISH TRADITIONAL RECIPE

Portions: 1	**Preparation time: 15 min.**	**Alergens/ Intolerances/ Food Restrictions: None**

Elaboration:	**Sustainability tips:**
"Choose, separate into twigs, and wash the turnip sprouts very well. Cook them with the pot uncovered in boiling water seasoned with salt. It drains very well. Crush the garlic cloves and let them brown in a pan with the oil. Add the well-drained turnip tops and sauté over high heat for about 5 minutes."	"The carbon footprint of this dish is very low. Waste: Selective waste collection and measurement have been carried out for each type of waste, complying with current regulations. Losses: Non-existent. Reuse: possible loss of ingredients cannot be used, but sub-processing could be done if there are leftovers, such as an omelet. It is also a variety of leafy vegetables that is being lost due to its low consumption."

		ORIGIN KNOWN		**SEASONAL PRODUCT**		**LOCAL PRODUCT**	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Turnip tops	300	x		x		x	
Garlic	6 cloves	x			x	x	
Olive oil		x			x		x

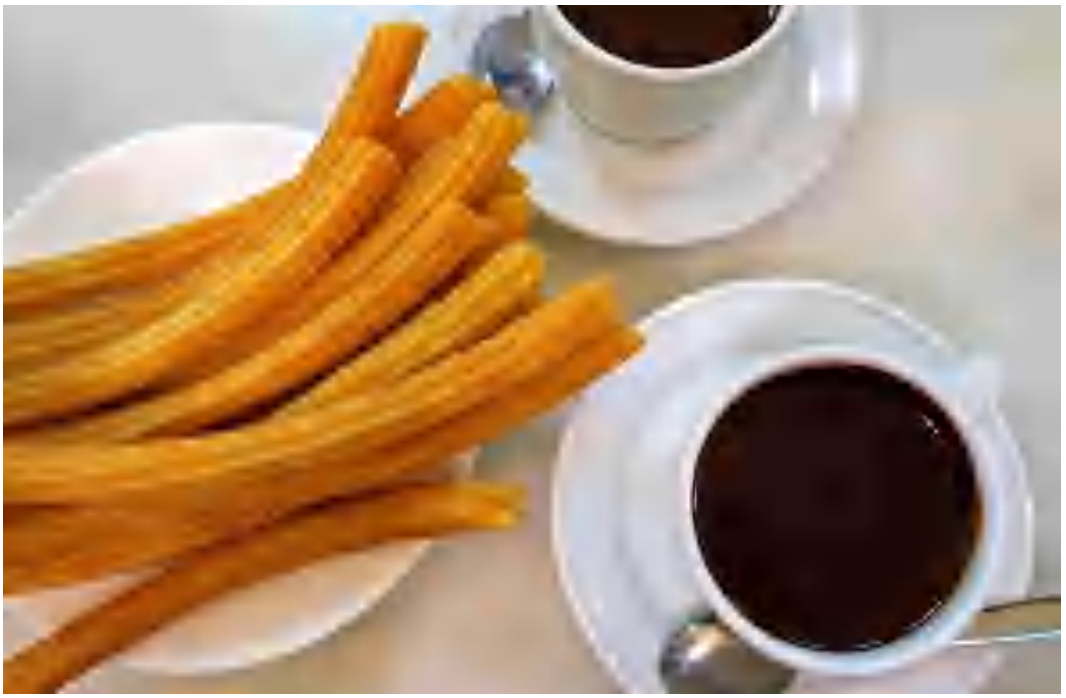


Image Source: https://www.verynatalie.com/madrid-foodie-guide/

Churros

Context of the dish, Associated cultural aspects, origin: there is a lot of controversy around the origin of the Spanish churro. However, this is the most consensual version of its origin: churros are not a Spanish invention; their true origins go back to China, where they were known as "youtiao" (a kind of fried bread with an elongated shape). The main difference is that they were salted, unlike our churros.

With the passing of time and their arrival in Spain, the recipe changed until they became the delicious churros we know today.
SPANISH TRADITIONAL RECIPE

Portions: 8	**Preparation time: 30 min.**	**Alergens/ Intolerances/ Food Restrictions: Gluten**

Elaboration:	**Sustainability tips:**
Explanation of the cooking process: Put the flour in a large bowl. Heat the water and salt in a saucepan. When it starts to boil, pour it	Waste: electricity/gas used during the cooking process.

directly and all at once over the flour. Using a wooden spoon, mix the flour with the water. The dough will be very sticky and quite compact. Now we are going to put this dough into a churrera or piping bag. We make the portions of churros with the raw dough on a kitchen towel on the worktop. This is a way to cool the dough and prevent it from opening or bursting during frying. Heat a frying pan with plenty of very light olive oil or sunflower oil. When it is hot, add the portions of dough to be fried. Cook over a medium heat to prevent the churros from becoming raw inside. Once fried, remove to a tray with kitchen paper to absorb the excess oil. Serve sprinkled with white or icing sugar.	Losses: olive oil. Options for reuse: make soap from used oil, caustic soda, water, and essential oils.

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
flour	250 g	x			x	x	
salt	8 g	x			x		x
water	250 ml	x			x	x	
olive oil	500 ml	x			x		x
sugar (optional)	20 g	x			x	x	

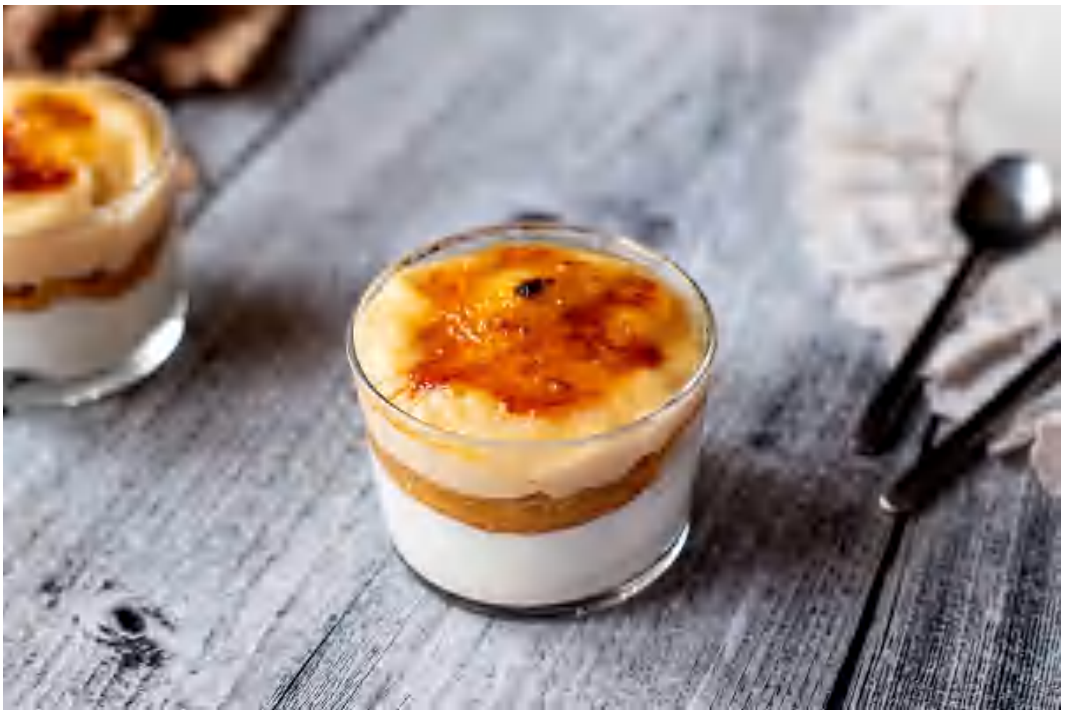


Image Source: https://www.bonviveur.es/recetas/goxua

Goxua

Traditional Basque cuisine dessert, specifically from the Álava area. Goxua means sweet. It comes in three layers: a layer of whipped cream, another of sponge cake, and another of pastry cream. It is a very tasty dessert that is eaten "from the bottom up", to be able to appreciate the set of flavors and different textures.
SPANISH TRADITIONAL RECIPE

Portions: 6	**Preparation time: 60 min.**	**Alergens/ Intolerances/ Food Restrictions: Dairy, eggs, gluten**

Elaboration:	**Sustainability tips:**

Prepare the Genoese sponge beat the eggs with the sugar and vanilla in a bowl and add the sifted flour to the previous preparation Pour the mixture into a baking dish lined with paper and bake at 180ºC for 15-20 minutes. To prepare the pastry cream, beat the egg yolks with the sugar and vanilla until light. Dissolve the cornstarch in part of the milk and add it to the cleared yolks. Heat the rest of the milk in a saucepan. Add the hot milk to the mixture of eggs and sugar; return everything to the saucepan; heat, stirring until thick; and leave to cool. Whip the cream together with the tablespoon of sugar. Cut out a circle of cake and dip it in the syrup. Assemble the "goxua" in a glass, put the whipped cream on the base, and put the biscuit on the whipped cream. Put the pastry cream on the cake, sprinkle it with sugar, and toast it with a blowtorch, or substitute the toasted sugar for caramel.	The carbon footprint is high due to dairy products. You could change them for vegetable drinks. In addition, the use of the vanilla pod increases the kilometers of transport in the desert. The flours can be changed for more local cereal flours to favor biodiversity. The use of energy needed in the technique is also high. It could be improved by using waste from other preparations, such as cake and dairy products.

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Eggs	5	x			x	x	
Sugar	230g		x		x		x
Vanilla bean	01-ene		x		x		x
Milk	500ml	x			x	x	
Wheat flour	60g		x		x		x
Whipping cream	250ml	x			x	x	
Cornmeal	10g	x			x	x	

Image Source: https://thermomix-sansebastian.es/celia-arrieta-abadias/pescados-y-mariscos/marmitako-a-mi-gusto/

Marmitako

The main ingredient of this dish is *thunnus alalunga*, which begins its migration in June from the central Atlantic towards the Bay of Biscay.

For many generations, Basque fishermen have eaten this stew, which is made on the high seas.
SPANISH TRADITIONAL RECIPE

Portions: 6	**Preparation time: 90 min.**	**Alergens/ Intolerances/ Food Restrictions: Fish**

Elaboration:	**Sustainability tips:**

For the fumet: remove the eyes and gills of the bonito. Clean the bones of traces of blood and leave them in ice water to bleed and reserve. Peel the onion, clean the leek, and cut both into mirepoix. Cover with water and cook from cold in a pot together with the parsley and the fish bones. Bring the whole thing to a boil for twenty-five minutes without stopping skimming. Remove from heat, cover, and infuse for approximately 20 minutes. For the marmitako: cut the garlic, onion, and green pepper into cubes. Sauté in olive oil until softened. Add the cascade potato and sauté the whole thing. Add the meat of the chorizo pepper and moisten with the tuna stock. Cook over low heat until the potato softens. Remove from the heat and add the diced tuna. Add a pinch of salt. Emplate in a harmonious way.	It is a dish of use; the tuna losses are used for the fumet and for the pieces. It generates very little waste, and they are all organic, provided you buy the potatoes, onions, and garlic in bulk. As for the amount of energy consumed, the dish/consumption ratio is low. It is an elaboration of long cooking in a kettle. You can also change the variety of fish.

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Potato	5 kg	x		x		x	
Garlic	6	x			x		x
Onion	1 kg	x			x	x	
Green pepper	6 uu	x		x		x	
Chorizo pepper	8 u	x		x		x	
Tuna	1 kg	x		x		x	

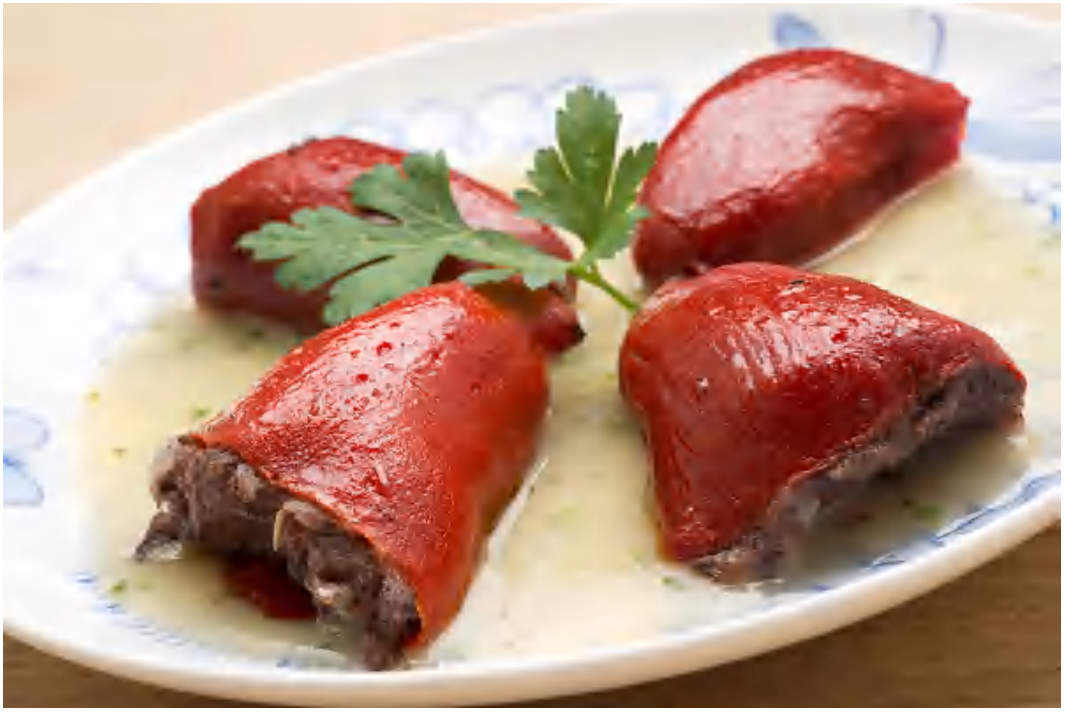


Image Source: https://www.hogarmania.com/cocina/recetas/ensaladas-verduras/pimientos-rellenos-morcilla-20137.html

Piquillo Peppers stuffed with morcilla

Stuffed peppers are a present dish, under different names and forms, in culinary traditions around the world.

In Spain, stuffed pepper dishes are usually made in the north, either cod, blood sausage, tortilla, meat, prawns, cod and prawns... with different varieties of peppers.
SPANISH TRADITIONAL RECIPE

Portions: 2	**Preparation time: 90 min.**	**Alergens/ Intolerances/ Food Restrictions: Eggs, dairy products, gluten.**

Elaboration:	**Sustainability tips:**

For the piquillo sauce: sauté the garlic and onion and add the piquillo peppers. Add cream and a little dark background. Reduce. Crush, strain, and lift. Add a pinch of salt. For the black pudding farce: Cut the garlic, onion, and leek into brunoise. Poach with olive oil in order of hardness. Crumble the black pudding and sauté it together with the vegetables until golden brown. Add the flour and form a roux. Wet the whole with milk and bring to a boil. Cook over medium heat until the mixture loses the flour flavor. Season and reserve. Fill the peppers with the farce, pass through flour, and egg. Fry in abundant oil until golden on the surface. Remove the absorbent paper. Cut the parsley into brunoise. Present the elaboration on a trench plate. Arrange the sauce in the center of the plate and place the fried peppers on it. Finish the preparation with parsley en brunoise and some cayenne pepper rings.	This dish has many ingredients, most of them local. Culinary techniques are varied. However, the farce of the peppers can be a product of use, in this case, black pudding. It is a dish that hardly generates solid waste. The carbon footprint goes up because of the transportation of seasonings like cayenne.

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
piquillo peppers	8 u	x		x		x	
cream	50ml	x			x	x	
olive oil		x			x		x
garlic	1u	x			x		x
oinion	180g	x			x	x	
black pudding	150g	x			x	x	
Milk	100ml	x			x	x	
flour	40g		x		x		x
egg	1u	x			x	x	
parsley	15 g	x			x	x	
cayenne	10 g		x		x		x

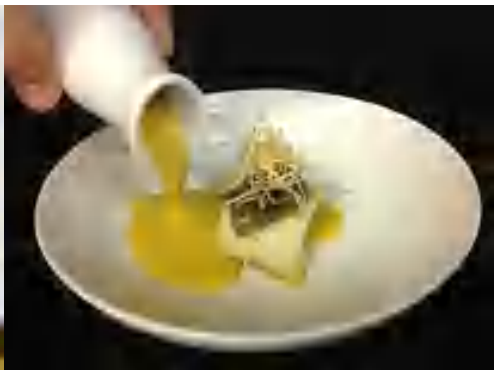


Image Source:
https://www.comedera.com/como-hacer-porrusalda-con-bacalao/
Self-made image

Porrusalda with cod confit

This *porrusalda* with cod is a well-known dish in the Basque Country (it means "leek broth" in Basque). It is a fishermen's recipe. It is an easy and cheap recipe that, the story goes, was prepared in the towns along the Basque coast with leftover fish, heads, and tails, as well as vegetables.
SPANISH TRADITIONAL RECIPE

Portions: 4	**Preparation time: 60 min.**	**Alergens/ Intolerances/ Food Restrictions: Fish.**

Elaboration:	**Sustainability tips:**

Cut garlic, carrot, leek, and pumpkin into mirepoix. Sauté in olive oil in order of hardness. Add the cascading potatoes and wet them with the poultry stock. Cook over medium heat until softened. Crush, strain, and season with salt. Reserve. Confit the cod in oil flavored with garlic and drain on absorbent paper. For the presentation, arrange the cod confit in the center of a soup plate and add the cream. Add a little olive oil at the last moment. You can accompany the preparation with some croutons to finish the plating.	Losses: Non-existent except for potato skins and other vegetables. Reuse: dehydrate and grind to pulverize and use as a flavor enhancer and thickener. Cod skin is also dehydrated. As a last option, you can make compost. The residue of the containers, such as the polystyrene from the fish, could be replaced by boxes of hard vegetable plastic. As for power consumption, it is low. It would be preferable to associate good energy practices with the preparation of cooking dishes over medium low heat.

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Potato	400g	x		x		x	
Leek	400g	x		x		x	
Carrot	100g	x		x		x	
Garlic	50g		x	x			x
Olive oil	sn	x			x		x
Cod	350g	x			x		x
Pumpkin	100g	x		x		x	

Image Source: https://www.sabordeamor.com/recipes/pisto

Ratatouille from La Mancha - "Pisto Manchego"

Ratatouille from La Mancha is a dish of humble origins with which farm workers used to feed themselves by making the most of seasonal vegetables. This is why there is no single recipe for ratatouille, which also has regional variations.

SPANISH TRADITIONAL RECIPE

Portions: 4	**Preparation time: 80 min.**	**Alergens/ Intolerances/ Food Restrictions: Sulfites.**

Elaboration:	**Sustainability tips:**

Explanation of the cooking process: Bring water to a boil to peel the tomatoes. Remove the hard part and make a cross cut at the base. Put them in the water for 15-20 seconds, remove them, and place them in a bowl of ice water. Peel and mash them. Then peel and finely chop the onion and garlic. In addition, wash the rest of the vegetables and chop them to the same size. Heat a good amount of oil in the pan and fry the garlic and onion over low heat for 15 minutes. Add the peppers and fry for another 15 minutes. Finally, add the courgette and tomato, season with salt and pepper, cover, and leave to cook for an hour and a half. Finally, remove the lid, turn up the heat, and cook until the water in the tomato has evaporated. It should be juicy, but with no traces of water.	Waste: electricity/gas wasted during the cooking process Losses: tomato peels, onion peels, garlic peels Options for reuse: 1. tomato peels: make tomato peels' chips by drying them with kitchen paper, putting them into a baking tray, and introducing them in the oven. 2. garlic and onion peels: dry them together in the oven, crush them, and use them as fertilizer for plants.

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Garlic cloves	2 u	x		x		x	
Onions	250 g	x		x		x	
Green pepper	200 g	x		x		x	
Red bell pepper	200 g	x		x		x	
Tomatoes	4 u	x		x		x	
Courgette	300 g	x		x			x
salt	5 g		x		x		x
Extra virgin oil	20 ml	x			x		x
black pepper	5 g		x		x		x

Image Source: https://www.hogarmania.com/cocina/recetas/ensaladas-verduras/patatas-riojana-3737.html

Rioja-style potatoes

Context of the dish, Associated cultural aspects, Origin:The history of this stew dates back to the 19th century, after the discovery of America and the introduction of potatoes in Spain. In a small village in La Rioja, potatoes were used to feed the day laborers who worked in the fields doing the threshing.

Due to the hunger and hardship of those years, one day the potatoes were mixed with Riojan chorizo sausage in earthenware jars that were kept in every house.

From the moment they saw the resulting flavor and consistency of this mixture, this dish has not stopped being cooked, to the point of being a well-known dish made in many homes all over Spain.
SPANISH TRADITIONAL RECIPE

Portions: 2	**Preparation time: 80 min.**	**Alergens/ Intolerances/ Food Restrictions: Sulfites.**

Elaboration:	**Sustainability tips:**

Explanation of the cooking process: In a casserole, put a little olive oil and brown the onion cut into small squares and the pepper cut in half. Add the skinless chorizo in slices and fry lightly. Add the potatoes, peeled, washed, and cut into regular pieces, not too big. Turn the mixture a few times, and add the paprika so that it cooks a little but does not burn. Finally, place the open, clean chorizo peppers in the casserole and cover with water. Bring to a boil, and then lower the heat so that the stew cooks slowly. When the potato is almost ready, add salt. Check the salt content of the stock and correct it if necessary. If we want the potato stock to be thicker, we should move the pan from time to time to help the potatoes release their starch. In any case, we can mash some of them with a fork along with a little liquid and add them.	Waste: electricity/gas used during the cooking process. Losses: chorizo skins (non reusable), potato peels, onion peels Options for reuse: 1. the potato peels can be converted into chips by seasoning them and letting them roast in the oven 2. The onion peels can be reused to flavor broths.

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
potatoes	4 u	x		x		x	
fresh chorizo sausage	1 u	x		x		x	
red bell pepper	1 u	x		x		x	
chorizo pepper	1 u	x		x		x	
onion	1 u	x		x			x
Sweet paprika	10 mg	x		x			x
Extra virgin oil	10 ml	x		x			x
Water	as required	x			x	x	
Salt	10 mg		x		x		x

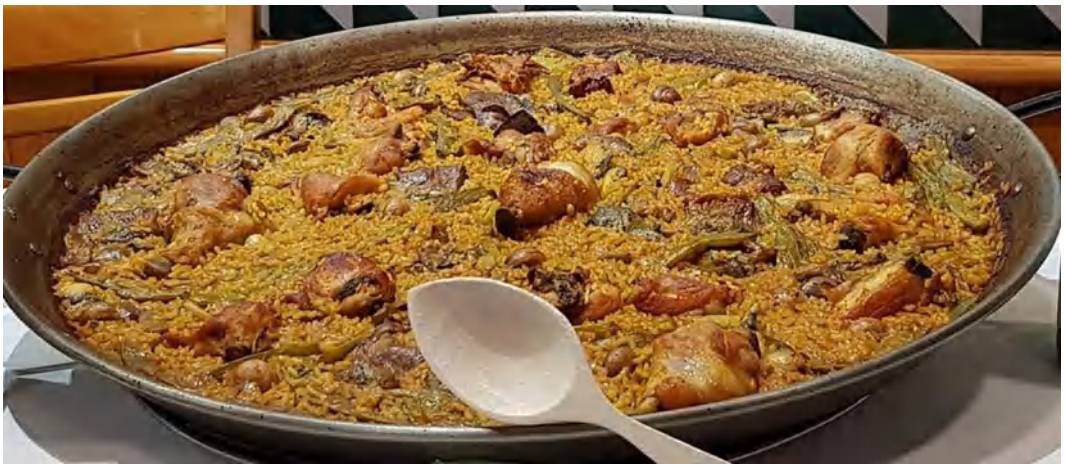


Image Source: https://www.tasteatlas.com/casaroberto/paella-valenciana

Valencian paella

The origin of Valencian paella dates back to the 15th and 16th centuries in the more rural areas of Valencia. This dish was born out of the peasants' need to prepare an easy meal with the ingredients they had at hand.

There are two legends about the name of this typical gastronomic dish. The first one is that the word "paella" comes from the Latin word "patella," which means frying pan. But others claim that it comes from the legend that a man prepared a paella to win the affection of his beloved, so he prepared a dish "for her" (para ella), the current paella.
SPANISH TRADITIONAL RECIPE

Portions: 12	**Preparation time: 85 min.**	**Alergens/ Intolerances/ Food Restrictions: Meat, non kosher.**

Elaboration:

In a paella pan, the bigger the better, fry the chicken, rabbit, beans, and artichokes in plenty of oil, seasoning with a little salt and paprika towards the end. When it is well browned, add the crushed tomato and sauté.

Sustainability tips:

losses: non-existent

waste generated: electricity/gas

When the sofrito is ready, add the water. The proportions depend a lot on the fire, how hot it is, the degree of humidity, and how big the paella is, but to start with, a good proportion is to add three times the volume of water as rice. We now add a few more logs to the fire to increase the heat and cook the broth for 25 to 30 minutes. This is a good time to add the saffron. Then we add the rice "en caballete" (diagonally) and distribute it around the paella pan. Cook for between 17 and 20 minutes. It must be completely dry and loose. Halfway through cooking, we can also add a few sprigs of rosemary, which we will remove before serving. Finally, it is a good idea to leave the paella to rest for a few minutes, covered with a large cloth.	consumption for the cooking process

		ORIGIN KNOWN		SEASONAL PRODUCT		LOCAL PRODUCT	
INGREDIENT	**QUANTITY**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Bomba rice	1kg 500g	x			x	x	
Chicken	1 u		x	x			x
Rabbit	0,5 u		x	x			x
Green bean flat	500 g	x		x		x	
Bean sprouts	500 g	x		x		x	
Optional artichoke	6 u	x		x			x
EVO oil	300 ml	x		x			x
Sweet paprika	2-3 tps	x		x			x
Crushed tomato	1 u	x		x			x
fresh rosemary	1 handful	x		x		x	
salt	90 g		x	x			x
water	4,5 lit	x			x	x	
Saffron	0,36 g	x			x	x	

RETHINK FOOD Virtual Challenge

Introduction

The RETHINK FOOD Virtual Challenge 2023 was a competition organized in the framework of the Erasmus + Project Rethink, Reduce, Reuse – VET LOVES FOOD.

The goal was to collect recipes that demonstrate the green skills of the participants in the elaboration of sustainable, low carbon footprint, zero food-waste recipes.

Main dish: It is a dish generally defined as a single dish that contains, from a nutritional point of view, all the macronutrients that should make up every meal,i.e.

The following information about the recipe was presented in order to participate in the RETHINK FOOD - Virtual Challenge 2023:

- Name of the recipe
- Description of the recipe
- List of ingredients
- Knowledge of the proximity of each ingredient within 100 km from the place where the recipe is cooked (choosing between yes/no/I don’t know)
- Weight of each ingredient
- Photos (mandatory) and video (optional) of the recipe
- The carbon footprint values are extracted from the following formula, based on the CO2WEB carbon footprint values’ table, developed by Universidad de Alcalá:
- Plating of the dish
- Number of ingredients
- Sustainability options (options for utilization, waste reduction, and generated waste)

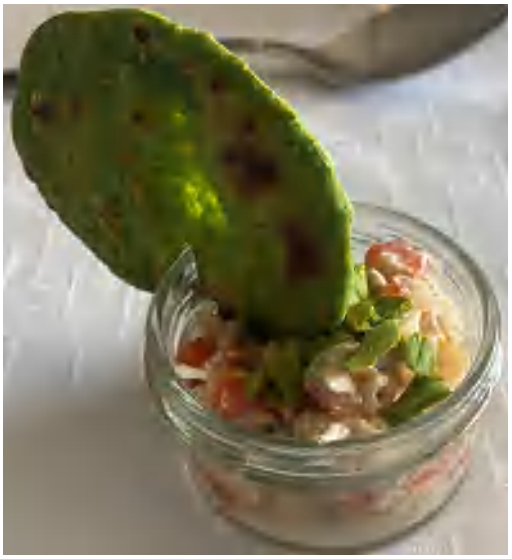
Recipes

Cheapskate (Tacaño)

Author: Raul Salinas (Student of ESHBI)

Ingredients:

Onion- 200 g
Pepper- 100 g
Tomatoes- 100 g
Lemon And Lima- 20 g
Wheat Flour- 100 g
Spinach- 150 g



Winner of the 3rd spot of the Challenge

Description of the recipe:

Cut all the ingredients for the pico de gallo in brunoise and reserve them in a bowl. Add oil, salt, and lime. Reserve.

Blend 150 grams of spinach with 30 ml of water. In a bowl, put 150 g of wheat flour and combine with the blended spinach. Once they are unified, make balls and reserve them.

Crumble the cooked chicken carcasses and reserve them.

We put baking paper on a cutting board. On the baking paper, put a ball of dough passed with a little flour, cover with the paper, stretch with a rolling pin, once the desired size is achieved, and mark on the pan. Mix the chicken with the pico de gallo and fill the tortilla.

CO2 EMISSIONS CALCULATION:

0,082 KG Co2 emissions[1]

Access to the recipe link[2]

[1] Access to CO2 emissions calculator: https://docs.google.com/spreadsheets/d/11s1HNC9qOeXH5OWHJKlZV20_mLRn41Wo/edit#gid=783861833

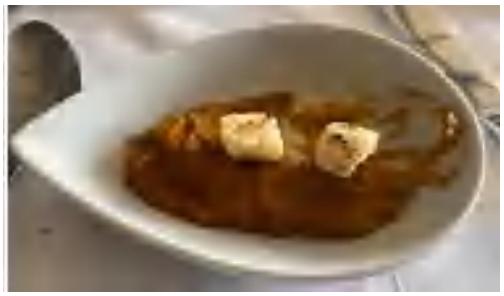
[2] Access to the recipe link: https://vetlovesfood.eu/recipe/tacano/

Vegetable cream with grana Padano Flakes

Author: Ane Gonzalez De Mendibil (Student of ESHBI)

Ingredients:

Grana Padano - 10g
Harvest Vegetables - 200g



Description of the recipe:

This recipe is made with vegetable leftovers.

1º- First, cut the parmesan rinds into approximately 1 cm cubes and place them on a plate.

2º- Then we put it in a microwave and program it for 3 minutes at maximum power.

3º- While the popcorn is cooking, poach the vegetables. Once poached, crush and reserve.

4º- In a bowl, add the vegetable cream and the Grana Padano flakes.

We dispose the parmesan popcorn with the vegetable cream into a bowl in a harmonic way

CO2 EMISSIONS CALCULATION:

0,092 KG Co2 Emissions[3]

Access to the recipe link[4]

[3] Access to CO2 emissions calculator:

https://docs.google.com/spreadsheets/d/10bQwop_QclxjgCc0tV93MKrgCWuv7B4O/edit#gid=512424698

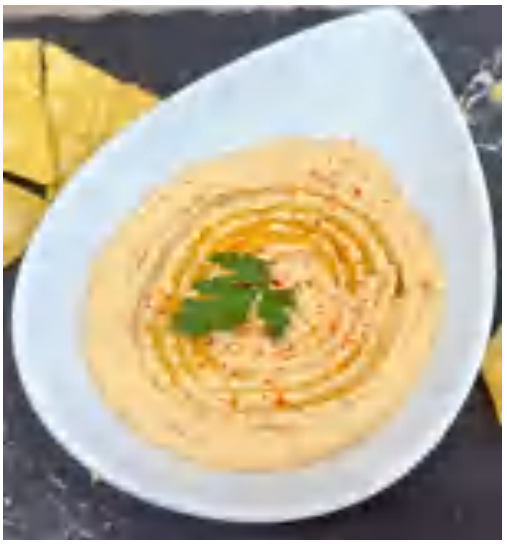
[4] Access to the recipe link: https://vetlovesfood.eu/recipe/vegetable-cream-with-gran-padano-flakes/

Hummus

Author: Miguel Muñoz
(Student of ESHBI)

Ingredients:

Legume Leftover- 400 gr
Tahini- 15 gr
Olive Oil- 50 gr
Corn- 125 gr
Paprika- 5 g



Description of the recipe:

Elaboration: For the hummus: add the legumes together with the tahini, garlic, lemon juice, water, sweet paprika, and hot paprika, along with salt and olive oil crushed to make it homogeneous.

For tortilla chips: cut tortillas into triangles and fry in plenty of oil.

CO2 EMISSIONS CALCULATION:

0,245 KG Co2 Emissions[5]

Access to the recipe link[6]

[5] Access to CO2 emissions calculator: https://docs.google.com/spreadsheets/d/1N5W5DUQCws7G5bbNQvbKzK_6TUyeM6Yx/edit#gid=57874213

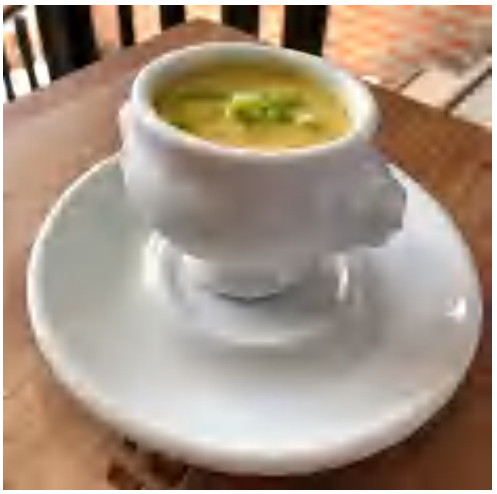
[6] Access to the recipe link: https://vetlovesfood.eu/recipe/hummus/

Poultry cream

Author: Josu Lizarralde
(Student of ESHBI)

Ingredients:

Leek- 100 gr
Carrot- 40 gr
Garlic- 3 cloves
Olive oil- 25 cl
Chicken- 400 g
Pepper- 1 und



Description of the recipe:

Elaboration : Add the leek, carrot, garlic, and oil. Add the water and blend. Add the chicken, parsley, and pepper on top of the crispy leek for decoration.

CO2 EMISSIONS CALCULATION:

0,337 KG Co2 Emissions[7]

Access to the recipe link[8]

[7] Access to CO2 emissions calculator: https://docs.google.com/spreadsheets/u/2/d/1h79PVgfLF2EIM02BkYTpOsn2bQ6SJEgN/edit?usp=drive_web&rtpof=true&pli=1

[8] Access to the recipe link: https://vetlovesfood.eu/recipe/poultry-cream/

'Vegetable hamburger with vegetable stew' (Hamburguesa de vegetal acompañado de menestra de verduras)

Author: Pablo Estebala
(Student of Adema Universitary School)

Ingredients:

"Chikpeas - 250g
Wihite Onion - 1 und
Red Bell Pepper - 1/2 und
Green Pepper - 1/2 und
Courgette - 1/4 und
Carrot - 1/2 und"

Description of the recipe:

It is a vegetable hamburger made with chickpeas and various local vegetables from the island of Mallorca, such as white onion, green and red peppers, courgette, carrot, extra virgin olive oil, salt, and spices (sweet pepper, oregano, and sweet paprika, to taste).

CO2 EMISSIONS CALCULATION:

0,436 KG Co2 Emissions[9]

Access to the recipe link[10]

[9] Access to CO2 emissions calculator: https://docs.google.com/spreadsheets/u/2/d/1WPAOfdgiW_cAjW_AcjYjGfYOob4CFyYo/edit?usp=drive_web&ouid=116657535074997958215&rtpof=true

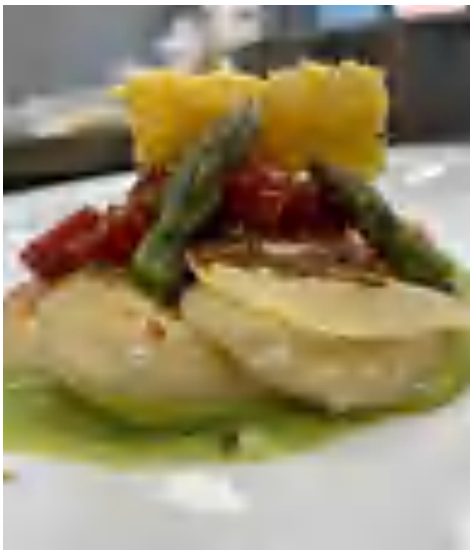
[10] Access to the recipe link: https://vetlovesfood.eu/recipe/hamburguesa-de-vegetal-acompanado-de-menestra-de-verduras/

Spelt ravioli filled with liquid pecorino cheese, served with sweet andsour cherries and broad bean sauce

Author: QuoQUo Modo - Zefiro
Zefiro Società Cooperativa Sociale

Ingredients:

Spelt Flour - 200g
Broad Beans - 300g
Pecorino Cheese - 100g
Cherrie s- 150g
Formentone 8 File
Corn Flour - 60g
Almonds - 50g



Winner of the 1st spot of the Challenge

Description of the recipe:

The main dish consists of ravioli made with spelt flour filled with liquid pecorino cheese seasoned with sweet and sour cherries, cream of broad beans, asparagus salad, crumbled fava peel, and a wafer of wheat formentone 8 file. The recipe is prepared with all local and typical ingredients from our land (the province of Lucca, Tuscany, Italy) and produced by local biodynamic farmers. Attention was paid to the recovery of all the parts of the ingredients in order to avoid waste: for the fava beans, in addition to the fruits used to prepare the dressing sauce, the peel (with which, dehydrating, we made a grain) and the skins (with which we made a topping sauce) were used. The cereals are all typical and autochthonous of our province: the spelled of the Garfagnana, and the corn formentone is typical of the Garfagnana region too. The pecorino cheese produced locally has been processed in such a way as to make it creamy to the point that it can be used as a filling for the ravioli. The cherries have been processed to obtain a sweet and sour compote. The edible rind of the cheese was used in addition to the formentone corn flour to obtain crunchy waffles.

CO2 EMISSIONS CALCULATION:

0,378 KG Co2 Emissions[11]

Access to the recipe link[12]

[11] Access to CO2 emissions calculator:
https://docs.google.com/spreadsheets/d/1Ee1bkwwR41rFayIH47zQuRDNebAkkJ-2/edit#gid=1062539099

[12] Access to the recipe link:
https://vetlovesfood.eu/recipe/spelt-ravioli-filled-with-liquid-pecorino-cheese-served-with-sweet-and-sour-cherries-and-broad-bean-sauce/

Prepared with all these ingredients, we steamed the ravioli, after which we grilled them. Once ready, we covered a serving dish with fava bean sauce and laid it on top of the ravioli. We garnished each ravioli with a sweet and sour cherry, dried fava bean peel, 8 rows of formentone wheat waffles, and asparagus salad. To be served warm: when you cut the ravioli with the fork, the pecorino cheese filling gently and creamily comes out and mixes with all the other flavors. Let your mouth have a tridimensional experience.	

'Boozies' (borrachas)

Author: Susana Estévez
(Piñeiral School)

Ingredients:

Bread- 250g
Milk- 200g
Eggs - 3 und
Olive Oil - 250g
Albariño Wine- 1 l
Sugar - 1 kg

Description of the recipe:

It is a dough made with leftover bread, milk, and eggs. This dough is fried in portions and then soaked in a syrup of Albariño wine.

CO2 EMISSIONS CALCULATION:

0,540 KG Co2 Emissions[13]

Access to the recipe link[14]

[13] Access to CO2 emissions calculator: https://docs.google.com/spreadsheets/u/2/d/1prG9UJjEYxmRzUGNZYQAdmirEqJ9jSmd/edit?usp=drive_web&ouid=116657535074997958215&rtpof=true

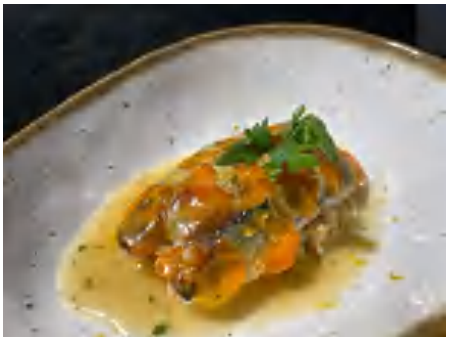
[14] Access to the recipe link: https://vetlovesfood.eu/recipe/borrachas/

'Smoked horse mackerel with vegetable scales, Portuguese couscous and orange sauce'

Author: Joana Carlos (Escola De Hotelaria E Turismo Do Porto)

Ingredients:

Smoke Mackerel - 300 g
Carrot - 1und
Courgete - 1und
Orange - 2 und
Onion - 1 und
Couscous - 140 g



Winner of the 2nd spot of the Challenge

Description of the recipe:

Season the fish fillets with salt, oranges, and herbs.

Bring small circles of courgette and carrot to make the false scales of the fish.

Make a fish smoke with the fish and vegetable trimmings (used to cook couscous and make the sauce for the dish)

Smoke the fillets with the peel of the oranges in a perforated tray over a flat one, and cover with foil.

Using the carrot and courgette from the stock, puree with a fork to finish the couscous.

CO2 EMISSIONS CALCULATION:

0,570 KG Co2 Emissions[15]

Access to the recipe link[16]

[15] Access to CO2 emissions calculator:
https://docs.google.com/spreadsheets/d/1DOQgem17HFPPFQJLqsGrROQdOM19p98C/edit#gid=2147461387

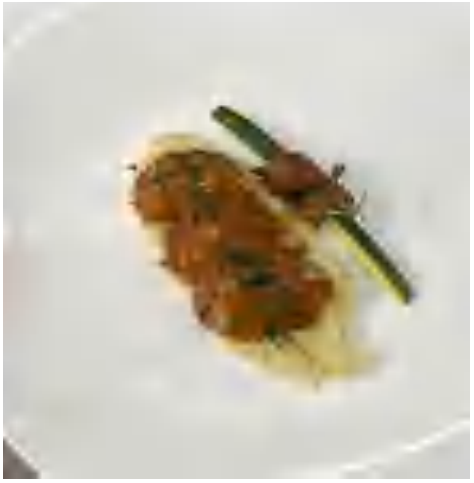
[16] Access to the recipe link:
https://vetlovesfood.eu/recipe/carapau-fumado-com-escamas-de-legumes-cuscuz-portugues-e-molho-de-laranja/

Tenderloin

Author: Marina García
(Student of ESHBI)

Ingredients:

Onion - 300 g
Carrot - 80 g
Red Wine - 90 cl
Potatoes - 400 g
Pork Tenderloin - 900 g
Milk - 168 cl



Description of the recipe:

Trim the tenderloin, fry it in oil, and set aside. Cut the vegetables into julienne and sweat. Drizzle red wine,add the tenderloin and water, and bring it to a boil.

Remove the tenderloin when it is tender. Blend the vegetables, drain the stock, and bring to a boil.

Boil the potatoes in a pot with water and a teaspoon of salt for 20 minutes.

Drain the potatoes and peel them.

Shred the potatoes and add it to a bowl.

Add butter and mix.

Add milk and mix.

CO2 EMISSIONS CALCULATION:

0,945 KG Co2 Emissions[17]

Access to the recipe link[18]

[17] Access to CO2 emissions calculator: https://docs.google.com/spreadsheets/u/2/d/10bQwop_QclxjgCc0tV93MKrgCWuv7B4O/edit?usp=drive_web&ouid=116657535074997958215&rtpof=true

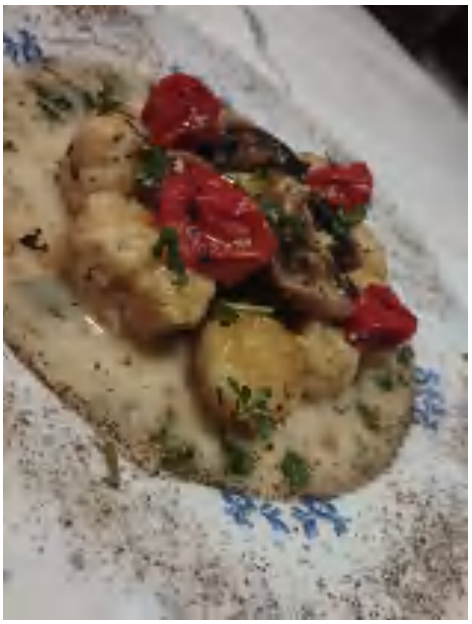
[18] Access to the recipe link: https://vetlovesfood.eu/recipe/tenderloin/

Gnocchi with sweet potatoes served with broccoli, cherry tomatoes, mushrooms leeks, and brocoglace sauce

Author: Ricardo Queiroz
Student of Espe (Escola Profissional De Espinho)

Ingredients:

Sweet Potato - 700 gr
Broccoli- 400 gr
Cherri Tomato - 200 gr
Leek- 100 gr
Mushrooms - 300 gr
Margarine - 100 gr



Description of the recipe:

Start by cooking the sweet potato with the skin on. After cooking, remove the skin with a fork, mash the potato, add butter, black pepper, salt, and flour, knead until a dough forms small balls, and cook in boiling water. Toast the broccoli. After cooking, sauté the mushrooms, the leek, and the broccoli. For the sauce, make an embamata (butter and flour), add the broccoli water, season with salt, cayenne pepper, parsley, thyme, and basil, let it cook, and serve.

CO2 EMISSIONS CALCULATION:

1,306 KG Co2 emissions[19]

Access to the recipe link[20]

[19] Access to CO2 emissions calculator: https://docs.google.com/spreadsheets/d/1lyn1n6hrUkgyf6MMZ8uoObMbGp3TAFXA/edit#gid=1180969150

[20] Access to the recipe link: https://vetlovesfood.eu/recipe/gnocchi-with-sweet-potatoes-served-with-broccoli-cherry-tomatoes-mushrooms-and-leek-and-brocoglace-sauce/

Carbon footprint calculator

The carbon footprint values were extracted from the following formula, based on the CO2 carbon footprint values table WEB developed by the University of Alcalá, this database was used to develop a simple spreadsheet with which students can calculate the carbon footprint of a recipe based on the ingredients used. In addition to this, factors such as knowledge of the origin of the product, its proximity, and the production season were included. These factors help in the reflection of the student and the professionals in the sector to make decisions with criteria and from a more sustainable point of view when choosing products to develop a gastronomic offer with less environmental impact.

CO2 EMISSIONS CALCULATOR: "RETHINK FOOD" VIRTUAL CHALLENGE	
Name of the recipe:	
How many people/portions:	2

Insert the names of ingredients (one per line)	**Select category of ingredients (please select the most appropriate typology)**	**Weight (example: 500 for half kilo)**	**Proximity (within 100 km)**	**Average emission**	**Proximity coefficient**	**CO2 by ingredient**
Cavala	Fish - Mackerel	560	YES	2	1	1.120
Arroz Arborio	Cereals - Rice	200	NO	2,66	1,25	665
Cenoura	Vegetables and legumes - Carrots	120	YES	0,21	1	25,2
Cebola	Vegetables and legumes - Onion	120	YES	0,18	1	21,6
Alho francés	Vegetables and legumes - Garlic	190	YES	0,57	1	108,3
Courgette	Vegetables and legumes - Zucchini	170	DON'T KNOW	0,87	1,5	221,85
CO2 by plate/portion			**1.080,975**			

Bibliography

Abeliotis, K; Lasardi, K. (2023). Food Waste Prevention: Reduction, Reuse, and Recycling. *Resources, ed,*. 12(1)-3. https://doi.org/10.3390/resources12010003

ANP - Associaçao Naturaleza Portugal; WWF. (2023). Eat4Change. A forma como te alimentas é o teu superpoder contra as alterações climáticas. *Eat4Change*. https://www.eat4change.pt/#receitas

Arozarena, I. (2023). Alimentos sin desperdicio. *Alimentos sin desperdicio*. https://alimentosindesperdicio.blog/

Arozarena, I. (2022). Agenda contra el desperdicio en Navarra. *Alimentos sin desperdicio.* https://alimentosindesperdicio.blog/2022/10/18/agenda-contra-el-desperdicio-en-navarra/

Aschemann-Witzel, J; Asioli, D; Banovic, M; Perito, M. A; Peschel, A. O; Stancu, V. (2023). Defining upcycled food: The dual role of upcycling in reducing food loss and waste. *Trends in Food Science & Technology*, *132*, 132-137. https://www.sciencedirect.com/science/article/abs/pii/S0924224423000018

Aschemann-Witzel, J., Wang, Q., Skuland, S. E., Egelandsdal, B., Amdam, G. V., Schjøll, A., Pachucki, M. C., Rozin, P., Stein, J., Lengard Almli, V., & Van Kleef, E. (2017). Are school meals a viable and sustainable tool to improve the healthiness and sustainability of children´s diet and food consumption? A cross-national comparative perspective. *Critical Reviews in Food Science and Nutrition*, *57*(18), 3942-3958. https://doi.org/10.1080/10408398.2016.1197180

BBVA. (2021). BBVA y El Celler de Can Roca lanzan 'Sembrando el futuro'. *BBVA.* https://www.bbva.com/es/sostenibilidad/bbva-y-el-celler-de-can-roca-lanzan-sembrando-el-futuro-una-iniciativa-para-concienciar-sobre-la-relacion-entre-la-alimentacion-y-el-bienestar-medioambiental/

Boeckmann, C. (2023). How to Compost: A Guide to Composting at Home. *The Old Farmer's Almanac.* https://www.almanac.com/how-compost-guide-composting-home

British Columbia Ministry of Environment and Climate Change Strategy. (2018). FOODSERVICE FOOD WASTE PREVENTION Part 1: Toolkit Report for Restaurants, Drinking Places and Specialty Foodservice Operators. *British Columbia Ministry of Environment and Climate Change Strategy.* https://www2.gov.bc.ca/assets/gov/environment/waste-management/organic-waste/toolkits/part_1_toolkit_report-foodservice.pdf

Broomley, S. (2016). Evaluation Report. European Commission (FP7), Coordination and Support Action – CSA Contract number: 311972. EU Fussions. http://www.eu-fusions.org/phocadownload/Fusions%20Evaluation%20report%20Appendices.pdf

Buczacki, A., Gladysz, B., & Palmer, E. (2021). HoReCa Food Waste and Sustainable Development Goals—A Systemic View. *Sustainability, 13.* 5510. https://doi.org/10.3390/su13105510

Caldeira, ; Sala, S; De Laurentiis, V; Joint Research Centre (European Commission). (2019). Assessment of Food Waste Prevention Actions: Development of an Evaluation Framework to Assess Performance of Food

Waste Prevention Actions. *Publications Office of the European Union.* https://data.europa.eu/doi/10.2760/9773

Câmara Municipal de Leiria. (2019). *G*uia para a Redução do Desperdício Alimentar. *Câmara Municipal de Leiria.* https://www.cm-leiria.pt/cmleiria/uploads/writer_file/document/3934/guia_urban_reduz_completo.pdf

Clarck, M. (2011). Restaurants go full circle through waste composting. *New Orleans City Business*. https://neworleanscitybusiness.com/blog/2011/09/06/restaurants-go-full-circle-through-composting-scraps/

O'connor, C; Östergren, K; Quested, T; Soethoudr, H; Stenmarck, A; Svanes, E; Tostivint, C.

(2016). *Food Waste Quantification Manual*. EU Fusions. https://www.eu-fusions.org/phocadownload/Publications/FUSIONS%20Food%20Waste%20Quantification%20Manual.pdf

CNDA. (2023). Inicio. *Portuguese National Committee against Food Waste.* https://www.cncda.gov.pt/

Coste, M; Condamine, P; Feiteira, F. (2021). Reducing food waste at the local level. GUIDANCE FOR MUNICIPALITIES TO REDUCE FOOD WASTE WITHIN LOCAL FOOD SYSTEMS. *Zero Waste Europe.* https://www.slowfood.com/wp-content/uploads/2022/01/Guidance-on-food-waste-reduction-in-cities-EN.pdf

Ecodes. (2022). Desperdicio alimentario y cambio climático. La importancia de medir para mejorar. *ECODES.*

https://ecodes.org/hacemos/investigacion-ambiental-2022/lucha-contra-el-cambio-climatico-2022/desperdicio-alimentario-y-cambio-climatico

Ecodes. (2023.). Inicio. *ECODES.* https://ecodes.org/

Economic and Social Council - United Nations. (2021). Progress towards the Sustainable Development Goals: report of the Secretary-General. *Digital Library of the United Nations.* https://digitallibrary.un.org/record/3930067

Elginoz, N; Khatami, K; Owusu-Agyeman, I; Cetecioglu, Z. (2020). Life Cycle Assessment of an Innovative Food Waste Management System. *Frontiers in Sustainable Food Systems*, *2*(23). https://doi.org/10.3389/fsufs.2020.00023

Elika Fundazioa. (2023.). Plataforma de Euskadi contra el Desperdicio Alimentario. . *Elika Fundazioa.* https://zerodespilfarro.elika.eus/es/plataforma/

Encantado de comerte. (2023). Inicio. *Encantado de comerte*. https://encantadodecomerte.es/

EU Platform on Food Losses and Food Waste. (2023). Homepage. *EU Platform on Food Losses and Food Waste.* https://food.ec.europa.eu/safety/food-waste/eu-actions-against-food-waste/eu-platform-food-losses-and-food-waste_en

EU Platform on Food Losses and Food Waste. (2019). Recommendations for Action in Food Waste Prevention. *EU Platform on Food Losses and Food Waste.* https://food.ec.europa.eu/system/files/2021-05/fs_eu-actions_action_platform_key-rcmnd_en.pdf

European Commission. (2023). Food Safety-Food Waste. *European Commission.* https://food.ec.europa.eu/safety/food-waste_en

European Commission. (2021). *'Farm to fork' strategy for a fair, healthy and environmentally friendly food system*. *EUR-LEX Europe*. https://eur-lex.europa.eu/EN/legal-content/summary/farm-to-fork-strategy-for-a-fair-healthy-and-environmentally-friendly-food-system.html

European Commission. (2015). Closing the loop - An EU action plan for the Circular Economy. *EUR-LEX Europe*. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017XC10.25(01)

Cederberg, C; Gustavsson, J; Meybeck, A; Sonesson, U; van Otterdijk , R.. (2011). Global food losses and food waste – Extent, causes and prevention. *Food and Agriculture Organization of the United Nations - FAO*. https://www.fao.org/3/i2697e/i2697e.pdf

Federal Ministry of Food and Agriculture - Germany. (2019). *National Strategy for Food Waste Reduction*. Federal Ministry of Food and Agriculture - Germany. https://www.bmel.de/SharedDocs/Downloads/EN/_Food-and-Nutrition/Strategy_FoodWasteReduction.pdf?__blob=publicationFile&v=3

Filimonau, V., Coşkun, A., Derqui, B., & Matute, J. (2022). Restaurant management and food waste reduction: factors affecting attitudes and intentions in restaurants of Spain. *International Journal of Contemporary Hospitality Management*, *34*(1177-1203). https://doi.org/10.1108/IJCHM-07-2021-0899

Finney, J. (2022). Food bank donations: how to donate to local food banks. *Good Housekeeping*.

https://www.goodhousekeeping.com/uk/consumer-advice/a34573095/food-bank-donations/

Flanagan, K.; Robertson, K; Hanson, C. (2019). *Reducing Food Loss and Waste: Setting a Global Action Agenda*. World Resoruces Institute - WRI. https://www.wri.org/research/reducing-food-loss-and-waste-setting-global-action-agenda

Food and Agriculture Organization of the United Nations - FAO.. (2015). Composting: let's give the soil something back. Food and Agriculture Organization of the United Nations - FAO. https://www.fao.org/soils-2015/news/news-detail/en/c/280674/

Food and Agriculture Organization of the United Nations - FAO. (2018). Course: Food loss analysis case study methodology. *FAO elearning Academy.* https://elearning.fao.org/course/view.php?id=374

Food and Agriculture Organization of the United Nations - FAO. (2023). Homepage. Food and Agriculture Organization of the United Nations - FAO. https://www.fao.org/home/es

Foodsafety.gov. (2019). *FoodKeeper App.* FoodSafety.gov. https://www.foodsafety.gov/keep-food-safe/foodkeeper-app

Friederike, L; Schmidt, T. (2023). Sustainability assessment of food-waste-reduction measures by converting surplus food into processed food products for human consumption. *Sustainability, 15(635).* https://doi.org/10.3390/su15010635

Fruta Feia. (2023). Homepage. *Fruta Feia*. https://frutafeia.pt/en

Fundació Alícia/UAB. (2013). ¡Aprovechemos la comida! Una guía para la reducción del desperdicio alimentario en el sector de la hostelería, la

restauración y el catering. *Fundació Alícia/UAB.* https://aprofitemelsaliments.org/es/aprovechemos-la-comida-una-guia-para-la-reduccion-del-desperdicio-alimentario-en-el-sector-de-la-hosteleria-la-restauracion-y-el-catering/

Garlich, H; Lowe, R; Fernandez, C. (2014). Food Industry Alliance Publishes Toolkit for Reducing Food Waste. *Food Waste Reduction Alliance.* https://www.foodwastealliance.org/food-industry-alliance-publishes-toolkit-for-reducing-food-waste/

Generalitat de Catalunya; Agència de Residus de Catalunya. (2013). More Responsible Food Consumption: Proposals to Prevent and Avoid Food Wastage. *Genecat.* http://www20.gencat.cat/docs/arc/Home/LAgencia/Publicacions/Centre%20catala%20del%20reciclatge%20(CCR)/guia_consum_responsable_EN.pdf

Gobierno de Aragón; ECODES. (2018). Guía de buenas prácticas frente al desperdicio alimentario. *Ministerio para la Transformación Ecológica y el Reto Demográfico.* https://www.miteco.gob.es/es/ceneam/recursos/materiales/guia-desperdicio-alimentario.html

Gobierno Vasco. (2022). Plan Estratégico de la Gastronomía y Alimentación de Euskadi 2024 - Agricultura, Ganadería y Forestal. *Departamento de Desarrollo Económico, Sostentabilidad y Medio Ambiente.* https://www.euskadi.eus/plan-departamental/plan-estrategico-de-la-gastronomia-y-alimentacion-de-euskadi-2024/web01-a2nekabe/es/

Goodwin, L., Blondin, S., Bassett, G., Roberts, M., Wistrand, L., White, H., Swannell, R., Leib, E. B; Plekenpol, R; Rouse, H. (2022). A guide: Changing

Behavior to Help More People Waste Less Food. *Champions 12.3.* https://champions123.org/publication/guide-changing-behavior-help-more-people-waste-less-food

Government of Ireland. (2022). Public Consultation on the Draft National Food Waste Prevention Roadmap. *Government of Ireland.* https://www.gov.ie/en/consultation/96a04-public-consultation-on-the-draft-national-food-waste-prevention-roadmap/

Greenview; WWF. (2021). Hotel Waste Measurement Methodology v1.0. *Sustainable Hospitality Alliance.* https://sustainablehospitalityalliance.org/resource/hwmm/

Homebiogas. (2023). Guidelines on How to Make a Compost at Home. *HomeBiogas.* https://www.homebiogas.com/blog/how-to-compost-at-home/

HOTREC Hospitality Europe. (2017). European Hospitalty Industry Guidelines to Reduce Food Waste and Recommendations to Manage Donations. *HOTREC Hospitality Europe.* https://www.hotrec.eu/wp-content/customer-area/storage/cf00d7c3286a238145bdc6545df90492/HOTREC-guidelines-to-reduce-food-waste-and-recommendations-to-manage-food-donations-19-January-2017.pdf

Lasaridi, K., Abeliotis, K., Manios, T., Zorpas, A., Chroni, C., & Terzis, E. (2017). Food waste prevention in the hospitality sector: prospects and challenges. *National Technical University of Athens.* http://uest.ntua.gr/athens2017/proceedings/pdfs/Athens2017_Lasaridi_Abeliotis_Manios_Zorpas_Chroni_Terzis.pdf

LIDL. (2023.). Lidl Feed It Back. *Neighbourly.* https://www.neighbourly.com/FeedItBack

Llorca, J. (2023). Por una escuela bien nutrida. *Juan Llorca.* https://juanllorca.com/por-una-escuela-bien-nutrida/

Metro Turkey, T.C, Ministry of Agriculture and Forestry; Food and Agriculture Organization of the United Nations - FAO.(2020). Guidelines on the Prevention of Food Waste at Hotels, Restaurants and other Public Consumption Points. *Food and Agriculture Organization of the United Nations - FAO.* https://www.fao.org/3/cc0816en/cc0816en.pdf

Ministerio de Agricultura, Alimentación y Medio Ambiente - Gobierno de España. (2014). Guía práctica para reducir el desperdicio alimentario en centros educativos. *Ministerio de Agricultura, Alimentación y Medio Ambiente - Gobierno de España.* https://www.miteco.gob.es/es/ceneam/recursos/pag-web/guia-reducir-alimentos-centro-educativos.html

Ministerio de Agricultura, Pesca y Alimentación - Gobierno de España (2022). Proyecto de Ley de prevención de las pérdidas y el desperdicio alimentario. *Ministerio de Agricultura, Pesca y Alimentación - Gobierno de España.* https://www.mapa.gob.es/es/prensa/anteproyectoleydesperdicio_tcm30-620834.pdf

Ministerio de agricultura, pesca y alimentación - Gobierno de España. (2020). Memoria Final. Estrategia: "Más alimento, menos desperdicio". *Ministerio de Agricultura, Pesca y Alimentación - Gobierno de España.* https://www.mapa.gob.es/es/alimentacion/temas/desperdicio/3memoria_estrategia_mas_alimento_menos_desperdicio_final_tcm30-627823.pdf

Ministry of Agriculture, Nature, and Food Quality of the Netherlands. (2022.). Champions 12.3 - Target 12.3: A Global Challenge. *World Resources Institute.*. https://champions123.org/target-123

Ministerio de Agricultura, Pesca y Alimentación - Gobierno de España. (2020). Panel de cuantificación del desperdicio alimentario fuera de hogares. *Ministerio de Agricultura, pesca y alimentación - Gobierno de España.* https://www.mapa.gob.es/es/alimentacion/temas/desperdicio/9metodologia_panel_cuantificacion_desperdicio_alimentario_extradomestico_tcm30-620784.pdfadomestico_tcm30-620784.pdf

Ministerio de Agricultura, Pesca y Alimentación - Gobierno de España. (2021). Informe sobre el desperdicio alimentario fuera de los hogares. *Ministerio de Agricultura, pesca y alimentación - Gobierno de España.* https://www.mapa.gob.es/es/alimentacion/temas/desperdicio/11informepanelcuantificaciondesperdicioextradomestico2021_tcm30-639557.pdf

Morello, P. (2020). What to donate to a food bank and what to avoid. *Feeding America.* https://www.feedingamerica.org/hunger-blog/what-donate-food-bank-and-what-avoid

Morrisons, J. (2018). What Foods Do Food Banks Need Most?. *Morrisons Blog.* https://my.morrisons.com/blog/community/what-foods-do-food-banks-need-the-most/

Mudatuga. (2023.). Tudo sobre compostagem .*Mudatuga.* https://www.mudatuga.com/

Muneera, Z; Lateef, H. (2022). An Overview of Food Waste and Its Conversion Technology Into Animal Feeds. *Research Square*. https://doi.org/10.21203/rs.3.rs-2085532/v1

NoWaste. (2023). Homepage. *NoWaste.* https://www.nowasteapp.com/

Olio. (2023.). Food waste facts to motivate you to waste less. *Olio.* https://olioapp.com/en/waste-and-our-planet/food-waste-facts-to-motivate-you-to-waste-less/

Onethird. (2023). 11 methods for retailers and distributors to reduce food waste. *OneThird.* https://onethird.io/one-third-blogs/11-methods-for-retailers-and-distributors-to-reduce-food-waste

Open Access Government. (2022). How to compost: saving the planet with food waste. *Open Access Government.* https://www.openaccessgovernment.org/how-to-compost/143069/

Organico. (2023). *Sabe o que são Resíduos Orgânicos?* Conheça o projeto Orgânico - Agora está na sua mão. Organico. https://organico.portoambiente.pt/

Phenix. (2023.). La aplicación que actúa contra el desperdicio. *Phenix.* https://www.wearephenix.com/es/aplicacion/

Planas, L. (2022). Informe de Consumo Alimentario y de Desperdicio Alimentario de España en 2022. *Ministerio de Agricultura, Pesca y Alimentación - Gobierno de España.* https://www.youtube.com/watch?v=gU4rCyi_zBw

Pons, P. (2023). No existe el desperdicio para Ricard Camarena. *Valencia Plaza.* https://valenciaplaza.com/no-existe-el-desperdicio-para-ricard-camarena

Rasool, S., Cerchione, R., Salo, J., Ferraris, A., & Abbate, S. (2021). Measurement of consumer awareness of food waste: construct development with a confirmatory factor analysis. *British Food Journal - Emerald Publishing Limited*, *123*(13), 337-361. https://www.emerald.com/insight/content/doi/10.1108/BFJ-02-2021-0160/full/html

Revolve. (2020). How to Go Zero Waste. *Revolve*. https://revolve.media/opinions/how-to-go-zero-waste

Revolve. (2021). Moving Toward a Zero Waste Lifestyle. *Revolve.* https://revolve.media/opinions/moving-toward-a-zero-waste-lifestyle

Ricard Camarena Restaurant. (2023). *Tienda*. Ricard Camarena Restaurant. https://ricardcamarena.com/tienda/

The Rockefeller Foundation. (2023.). *Food Waste Toolkit for the Office*. The Rockefeller Foundation. https://www.rockefellerfoundation.org/wp-content/uploads/Food-Waste-Toolkit-for-the-Office.pdf

Science Advice for Policy by European Academies - SAPEA. (2020). A sustainable food system for the European Union. Science Advice for Policy by European Academies - SAPEA. https://scientificadvice.eu/advice/a-sustainable-food-system-for-the-european-union/

Simon, J. (2022). Composting can help fight climate change. Get started in 5 easy steps. *NPR*. https://www.npr.org/2020/04/07/828918397/how-to-compost-at-home

Slow Food Foundation. (2007). Declaración de Puebla. *Slow Food Foundation*. https://slowfood.com/filemanager/Convivium%20Leader%20Area/Declaration_of_Puebla_SPA.pdf

Slow Food Foundation. (2023). What is the Foundation?. *Slow Food Foundation*. https://www.fondazioneslowfood.com/en/what-is-the-foundation/

Sudego. (2022). Sustainable Development Goals in the Schools. *Sudego.* https://sudego.eu/

Sundin, N; Persson, C; Strid, I; Eriksson, M. (2022). Surplus food donation: effectiveness, carbon footprint, and rebound effect. *Resources, Conservation and Recycling*, *181*(106271). https://doi.org/10.1016/j.resconrec.2022.106271

Sustainability Guide. (2018). Karma – Save food with a tap of a button. *Sustainability Guide.* https://sustainabilityguide.eu/?guide=karma

The Portugal News. (2021). Food bank collection campaign.Banco Alimentar will be collecting donations between 27th May and 6th June. *The Portugal News*. https://www.theportugalnews.com/news/2021-05-27/food-bank-collection-campaign/60061

Too Good to Go. (2023). Salva comida do desperdício. *Too Good To Go.* https://www.toogoodtogo.com/pt

United Nations Environment Programme - UNEP. (2021). UN: 17% of all food available at consumer levels is wasted. *United Nations Environment Programme - UNEP.* https://www.unep.org/news-and-stories/press-release/un-17-all-food-available-consumer-levels-wasted

United Nations Environment Programme - UNEP. (2021). Reducing Consumer Food Waste Using Green and Digital Technologies. *United Nations Environment Programme - UNEP.* https://unepccc.org/wp-content/uploads/2021/11/reducing-consumer-food-waste-using-green-and-digital-technologies.pdf

United Nations. (2023). Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development. *United Nations.* https://unstats.un.org/sdgs/report/2021/goal-17/

United Nations. (2020). Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development. *United Nations Stats.* https://unstats.un.org/sdgs/report/2021/goal-13/

United Nations Environment Programme - UNEP. (2021). Food Waste Index Report 2021. *United Nations Environment Programme - UNEP.* https://wedocs.unep.org/20.500.11822/35280.

United States Envionrmental Protection Agency - EPA. (2016). *Wastes-WasteWise Programme. United States Envionrmental Protection Agency -EPA.* https://archive.epa.gov/epawaste/conserve/smm/wastewise/web/html/prevent.html

United States Environmental Protection Agency - EPA. (2022). January 19, 2017 Snapshot. *United States Environmental Protection Agency - EPA.* https://19january2017snapshot.epa.gov/sites/production/files/201701/foodcost3.xls

United States Environmental Protection Agency - EPA. (2023). Reducing the Impact of Wasted Food by Feeding the Soil and Composting. *United States*

Environmental Protection Agency - EPA. https://www.epa.gov/sustainable-management-food/reducing-impact-wasted-food-feeding-soil-and-composting

United States Environmental Protection Agency - EPA. (2015). Tools for Preventing and Diverting Wasted Food. *United States Environmental Protection Agency - EPA.* https://www.epa.gov/sustainable-management-food/tools-preventing-and-diverting-wasted-food

United Nations - Women. (2018). Infographic: Why gender equality matters to achieving all 17 SDGs. *United Nations - Women.* https://www.unwomen.org/en/digital-library/multimedia/2018/7/infographic-why-gender-equality-matters-to-achieving-all-17-sdgs

Vinje, E. (2023). How to Compost at Home: Step by Step Guide for Beginners. P*lanet Natural.* https://www.planetnatural.com/home-composting/

Winnow. (2023). Homepage. *Winnow*. https://www.winnowsolutions.com/

WRAP. (2022). The Food Waste Reduction Roadmap toolkit. *WRAP.* https://wrap.org.uk/sites/default/files/2020-10/Food-waste-reduction-roadmap-toolkit.pdf

WWF. (2023). How does what you eat affect the planet? *WWF.* https://planetbaseddiets.panda.org/impacts-action-calculator

WWF. (2020). Bending the Curve: The Restorative Power of Planet-Based Diets. *WWF.* .https://files.worldwildlife.org/wwfcmsprod/files/Publication/file/7b5iok5vqz_Bending_the_Curve__The_Restorative_Power_of_Planet_Based_Diets_FULL_REPORT_FINAL.pdf.pdf

WWF. (2021). A Toolkit for Communicating Food Waste to Guests. *WWF.* https://www.worldwildlife.org/publications/a-toolkit-for-communicating-food-waste-to-guests

WWF, Fundación Vida Silvestre, Estonian Fund for Nature, Asociaçao Naturaleza Portugal, & AIESEC. (2021). WWF Eat4Change survey International research Consumers report April 2021. *WWF.* https://wwfeu.awsassets.panda.org/downloads/wwf_food_habits_scr_report_consumer_290421_1.pdf