

DOSSIERTÈCNIC

TRAINING AND GUIDANCE FOR THE AGRI-FOOD SECTOR

N92 | COMBATING FOOD WASTE. SAVING FOOD

July 2019

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INTRODUCTION



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The main purpose of the agri-food sector is to feed and support the people. Food provides us with health, energy, and pleasure. Beyond these things, in our culture, they generate spaces in which family and social ties flourish. Clearly, food products are valuable.

Yet despite its value, according to the FAO, one third of the food produced worldwide is lost or wasted without ever fulfilling its purpose. Throughout every phase of the process, we face food losses that add up to a waste of work, money and resources in a context in which none of these things are redundant.

Food producers are already showing signs of alarm. It is clear that the supposed lack of prestige associated with agricultural professions, and the frequent barriers they encounter in their work are adding up to a lack of generational renewal. Current agricultural and food policies have proven insufficient to build balanced relations between the rural and urban worlds, or to overcome the asymmetries existing among the various agents in the food supply chain.

Furthermore, when we make reference to the production, processing and sale of food products we also refer to the availability of fertile soil, access to seeds or water and the use of energy. Natural resources are limited. Impacts such as climate change and the generation of waste products underscore the need to rethink production and consumer models to advance toward a more sustainable food production system, based on the principles of circular bio-economy.

The paradoxes and complexity are all too apparent. What's happened to our relationship with food products, that has led us to trivialise and take them for granted?

How have we come to throw out so much food, when we know that 'food is not to be wasted' and we are keenly aware of the consequences when we do?

Common sense must guide us along a path that is also demanded in international policies: reduce food waste. This is a collective challenge that will require the raising of awareness and involvement of all parts of the food supply chain, to review food policies and redefine production, distribution and consumption models, working toward a circular model in which recycling and reuse are fundamental, and the main management objective is prevention.

We must progress in the quantification and diagnosis of the different causes of food waste, considering the close relationships that come about between the different links in the food supply chain. Above all, we must devise tools and instruments to effectively cut down food waste.

One such instrument is the Consell Català de l'Alimentació (Food Council of Catalonia), recently created by the Ministry of Agriculture, Livestock, Fisheries and Food with the objective of opening a forum for dialogue among all stakeholders involved in food policy proposals and debate.

Also significant is the work undertaken by the Parliament of Catalonia to pass the Food Waste Reduction Act, a regulatory framework that highlights the importance of the problem and the will to tackle it. It will coordinate the actions aimed at reducing waste in coming years.

This Technical Dossier aims to reclaim the value of food products, and the task carried out by the agri-food sector, while serving as a reminder that resources are limited. Readers will become familiarised with the reality of waste, and the causes behind it. This dossier will bring us closer to projects already under way to reverse the phenomenon here in Catalonia.

The primary sector and the agri-food industry, producers of the food that reaches our tables, have a great contribution to make to this debate. I invite you to take part.

Let's all work together to save food!

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Food waste at Merkabugati (Guipuzcoa)
Photographer: Javier Ansorena Miner



THE VALUE OF FOOD



Figure 1. Let's love food. Let's fight food waste. Author: Samuel Faber

I go for the offer: two loaves of bread for a euro. I already have bread at home, but it's a bargain.

The next day, the two practically-intact loaves are as rubbery as tennis balls. They're worthless. So I throw them out. After all, they only cost a euro.

This is an example of food waste.

01 Is its market price what a foodstuff is worth?

Food prices are one of the main causes of food waste. We have devalued foodstuffs to the point that we only associate them with their economic value.

It would be radically unpopular to say that food is too cheap. But the truth is that many foodstuffs are priced lower than what it costs to produce them, in environmental and economic terms. We must seek solutions to the devaluation they are often subject



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to. The solution is to reappraise them, to restore their value.

02 What are the values of foodstuffs?

An Internet search on 'value of food' only brings up content on nutritional value.

In truth, food is what keeps us alive; this is its primary value. But the human diet is laden with other meanings. We eat culture. We eat emotions. We eat commitment.

Beyond its nutrients and the pleasure it gives us, food embodies three fundamental values:

- *Value of effort.* Those who are not involved in the production process may think that food is made by machines. We dehumanise food, and the fact that it can be made by a machine only undermines its value. We don't associate food with the efforts of the people who prepared it.
- *Ethical and social value.* We don't stop to think that we're throwing out something that could be useful to others. We throw away good, nutritious food that many families would be happy to receive.
- *Value of anticipation.* Having exclusively seasonal foods year-round has caused us to grow bored. As a result, we no longer look forward to them with anticipation. Their constant availability has made us abandon the custom of making preserves with the surplus to be able to enjoy their flavour and nutrients over the rest of the year.



In truth, food is what keeps us alive; this is its primary value. But the human diet is laden with other meanings. We eat culture. We eat emotions. We eat commitment.

Throwing out food is an act of disrespect toward the people who have played a part in its preparation.

03 Let's recover the value of food

We must make every effort to recover, convey and instill the value of food, through awareness-raising campaigns amongst the public.

I remember how, years ago, in professional kitchens there were top-quality, prized food ingredients, and then everything else. Fine—mainly animal protein-based—foods formed part of all dishes on the menu, and the second-rate ingredients—mostly vegetables—were only meant to garnish the dish. Then a revolutionary chef named Ferran Adrià appeared on the scene, and changed every gastronomic paradigm in the 1990s. Among the many changes he brought to bear, I want to highlight his consideration of all foods as fundamental to cooking, and therefore deserving of our complete respect and care. To make it clear, he chose 'air of carrot', one of his most celebrated creations, for the New York Times magazine cover photo, which launched him to worldwide fame.

In Ferran's thinking, communication and awareness-raising must be focused on bringing prestige to austerity, and considering each ingredient a unique, and therefore valuable, element.



Figure 2. Foods on sale in a supermarket. Photo: P.M. Kamalakannan.



Shopping locally is the most essential way to balance the territory, at the environmental, economic and social levels.

If we give each foodstuff the importance it deserves, and we only buy what we know we will eat, we will eventually take more interest in the origin of the product, and no doubt buy foods produced near us, by people whose story we can discover, and whose efforts we can appreciate.

04 Further reading:

TV3 television series entitled 'Collita Pròpia': <http://www.ccma.cat/tv3/alacarta/collita-propia/fundacio-alicia/seccio/102940/>

EUROPEAN ECONOMIC AND SOCIAL COMMITTEE, 2017. 'Civil society's contribution to the development of a comprehensive food policy in the EU' <https://www.eesc.europa.eu/es/node/53990>

'Urban Food Policy Pact (2015): http://www.milanurbanfoodpolicypact.org/wp-content/uploads/2018/01/Milan-Urban-Food-Policy-Pact-and-Framework-for-Action_SPA.pdf

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WHAT IS FOOD WASTE?

In plain and simple terms, food waste means throwing away food. From this point on, discussion can begin on why food is thrown away, who throws it away and where, and what is done with these foodstuffs. Great value lies within such a debate, as it is where we will begin to understand this widespread phenomenon that surrounds us, and that quite often, we don't even see.

To realize the magnitude of the problem, one only needs to take a glance at the numbers that have been calculated up to now. According to data from the Food and Agriculture Organization of the United Nations (FAO), each year one third of the food produced worldwide is not consumed by anyone (FAO, 2011). Specifically, in Europe, the food wasted over the entire food supply chain totals approximately 300 kg per person per year. In his book, *Waste: Uncovering the Global Food Scandal* Tristram Stuart demonstrates how of the 4,600 kcal of edible harvest available per person, only some 2,000 kcal reach our tables. The difference is lost on the way from farm to fork (Stuart, 2009). While it is true that these are estimates that require some fine-tuning, there is a growing body of studies in the field that corroborate this general hypothesis.

Although there were certain preliminary reports and initiatives, it was with the publication of the report *Global Food Losses and Food Waste* (FAO 2011) that the study of food waste began in earnest. Over the past decade, food waste as an important phenomenon has grown in importance, and is now present in every area of society. Public policies, and private sector initiatives are being developed to tackle the problem. NGOs and platforms exclusively devoted to it have been established. None of this means that food was not thrown away in the past, but rather, the awareness of the phenomenon has grown, and continues to do so exponentially.

This evolution has not been free from controversy. Over this time, a wide array of studies and initiatives have emerged, with different viewpoints and backgrounds concerning the problem. Several different approaches to the problem now co-exist. This makes it possible to see how international institutions have given more or less importance to the many dimensions of food waste: focusing on the aspects



Figure 1. Comparison of apples thrown away in an institutional dining facility. Author: Julieth Sánchez.

of waste, food safety, nutrition, environmental factors or access to food.

At present, there are no consensus definitions or vocabulary on the topic, which means that to refer to the same phenomenon, people speak of wastage, losses, waste, inventory shrinkage, surpluses or over-production. In other words, a single term like 'food waste' has multiple definitions. For example, the FAO addresses the problem from a food safety standpoint, distinguishing the stage in which waste is generated, to call it either food loss or food waste. Its definition only covers foods and parts of food safe for human consumption. On the other hand, the European Commission's view is more based on waste management and efficient resource use. It is working on a definition, which is not yet final, which considers food waste to be 'any food and inedible parts of food removed from the food supply chain', unless they are used to make animal feed, or are reused to make other foods or by-products for other industries.

It is an open and interesting debate. That is why it is difficult to make a comparison of the data provided up to now by various studies, both in terms of geography and time. Quantifying food waste is an important task, but it brings about a number of difficulties in its definition, as already discussed, as well as the methodology to be used.

Figure 1 shows apples photographed during the quantification of food waste in a restaurant. It is apparent that certain difficulties arise when deciding between the apples to add to the waste tally, and those that would not be counted as food waste.

There is a lot of work to be done to arrive at more accurate figures on food waste. However, it is undeniable that food is being thrown away. We only have to stop and look. Part of the work done in recent years has involved bringing visibility to the problem. Figure 2 shows the bread gathered by the group Zero Waste Bcn in a single establishment on one afternoon. This is not an isolated case. It happens at the end of the day in many establishments. The reasons are many, and can be extrapolated to other foods and business areas. The photograph, which shows the great variety of bread that has been available until the end of the day, is an example of the business dynamics now in place, our food culture or dysfunctional planning.

Perfectly edible, healthy, nutritious food is thrown away in every stage of the agri-food supply chain. The causes are many, and they play out at different scales. At the global level, there are food production and marketing models that tend to promote over-production. Additionally, certain rules and standards, either aesthetic or for food safety, trigger waste.



Quantifying food waste is an important task, but it brings with it a number of difficulties in the definition, as already discussed, as well as the methodology to be used.

The relationships between agents at different stages also give rise to difficulties. Part of the food waste is a consequence of erroneous behaviour or a process efficiency problem. Decisions made in one stage can cause food waste in others that are operatively or physically distant. Therefore, when food waste is studied by stage in the chain, it must be acknowledged that food waste volumes are not only attributable to the actors within a given stage, but that a number of responsible parties reside in other places.

In the same way, the solutions to food waste are many, and originate in different areas. Work must be done to improve certain incorrect behaviours, but when defining food waste prevention and reduction policies, the comple-



Figure 2. Bread gleaned from a shop in one day. Photo: Xènia Elias, of Zero Waste Bcn.

xity of the problem, and the systemic relationship between actors, causes and solutions must be borne in mind.

The FAO action prioritisation proposal shown in Figure 3 is based on guaranteeing access to food, expanding outlooks toward prevention and reduction of food waste, placing impor-

tance on human consumption, prevention of food waste and last, the best possible management of food waste.

Different proposals to prevent food waste are found throughout the chain. There are proposals that require cooperation among different stakeholders, such as improved planning of production or sales to act ahead of the problem. Debate could also focus on the aesthetic standards of the different actors involved. On another note, certain proposals could be undertaken at the internal level, such as measures meant to improve processes and conservation of food products. Furthering knowledge on the volumes of food waste generated, and the consequences this has, is also essential in every area. Finally, once all these prevention measures are fully developed, there are still a number of initiatives necessary for the system to be capable of redistributing this food, and keep it from being thrown away.

Figure 4 portrays an activity that covers both awareness-raising and recovery of food products. The photograph shows one of the 'adoption stands' set up by the Plataforma Aprofitem els Aliments ('Let's Recover Food' Platform) at one of their free public luncheons. Any of the fruits and vegetables in the picture could be in our kitchens. But they were going to be thrown out at some point of the food supply chain, and bound for the rubbish bin.

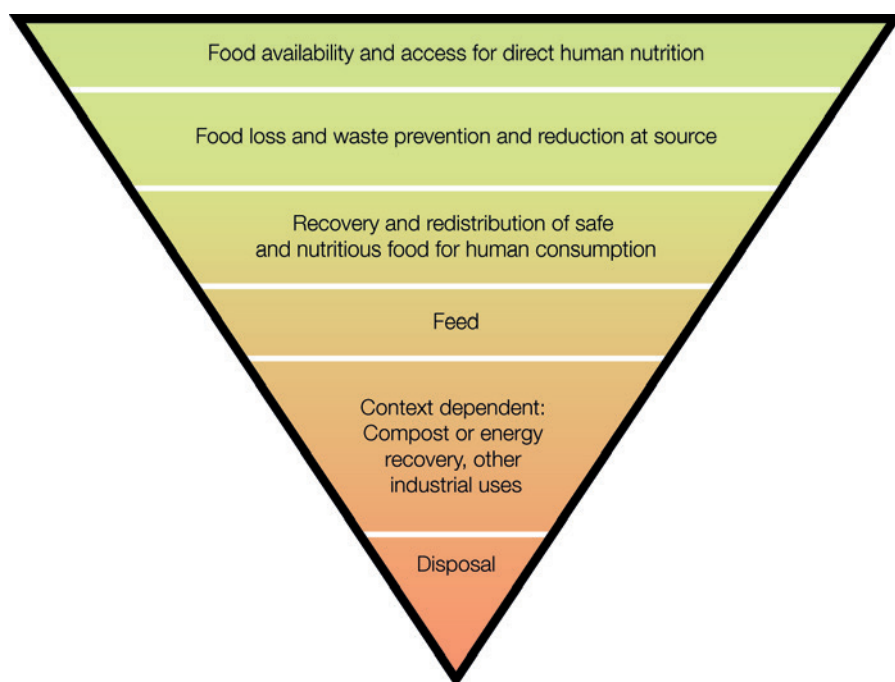


Figure 3. Prioritisation hierarchy for prevention and reduction of food waste. Source: Catalan adaptation of the FAO proposal based on CSF 41 and Bucatariu, C. 2016.



Figure 4. Fruit, vegetable and gleaned bread 'adoption stand'. Source: Plataforma Aprofitem els Aliments.



Work must be done to improve certain incorrect behaviours, but when defining food waste prevention and reduction policies, the complexity of the problem, and the systemic relationship between actors, causes and solutions must be borne in mind.

The Platform, with the aid of volunteers, gleaned food in the fields, from wholesalers and in shops moments before it is destroyed or binned. The 'adoption stand' brings visibility to the problem of food waste and promotes food-related values in society.

The interest aroused by these efforts to recover food along the entire food supply chain, and the many initiatives already under way, show the momentum the issue now has, which it will need for the long journey that lies ahead.

01 Further reading:

FAO website on food loss and food waste:
<http://www.fao.org/food-loss-and-food-waste/es/>

European Union website on food waste:
https://ec.europa.eu/food/safety/food_waste/eu_actions/

DARP website on food waste reduction:
<http://agricultura.gencat.cat/ca/ambits/alimentacio/malbaratament-alimentari/>

ARC website on food waste reduction:
http://residus.gencat.cat/ca/ambits/dactuacio/prevencio/malbaratament_alimentari/

ACSA website on food waste reduction:
http://acsa.gencat.cat/ca/seguretat_alimentaria/seguretat_alimentaria_per_temes/donacio_i_reaprofitament_aliments/



Quantifying food waste is an important task, but it brings about a number of difficulties in its definition, as already discussed, as well as the methodology to be used.

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ORIGIN OF THE FIGHT AGAINST FOOD WASTE IN CATALONIA



Figure 1. Leftovers luncheon in Barcelona. Source: Barcelona Municipal Government (www.barcelona.cat)

01 Introduction

Everyone has heard, just as everyone has said, that ‘food is not to be thrown away’. It is something we’re sure about, at least in theory. But something is wrong when this belief is contradicted by our day-to-day reality, in which we throw edible food into the garbage can.

Around 2010, the Food and Agriculture Organization of the United Nations (FAO), the European Union and Tristram Stuart with his book: *Waste: Uncovering the Global Food Scandal* first sounded the alarm. The message was clear: the world over, a massive quantity of food is being wasted and thrown away, with severe social, economic and environmental consequences.

The figures and analysis of food waste arrived in Catalonia in the midst of a dire economic crisis. Rising social inequality, unemployment and difficulties in covering basic necessities forced many individuals into situations of precariousness, and life below the poverty line.

In Catalonia, the FAO and EU publications triggered the launch or intensification of efforts

to reduce food waste. Various projects converged from different realms to discover what was happening on the ground, raise awareness and create consciousness in our society, mobilising all sectors to implement specific actions.

02 We begin by quantifying the food wasted in Catalonia

The Agència de Residus de Catalunya (Waste Agency of Catalonia - ARC) took the initiative for the first quantification and analysis of the causes behind food waste in Catalonia in 2011. The focus was on the sectors of retail distribution, hospitality and households. The task was carried out in cooperation with the Autonomous University of Barcelona, precursor of these studies on its own campus.

In 2016, Mercabarna, the largest wholesale market in Catalonia, also began to evaluate its processes, quantifying the food thrown away, while the ARC worked to extend these analyses to the food production and processing phases, with the aim of gathering data on the entire food supply chain.

03 We reach a great social agreement to reduce food waste

The Pact for the Fight Against Poverty promoted in 2014 by social third sector organisations, municipal authorities, professional associations and the Government of Catalonia was another noteworthy landmark. It dovetailed with the fight against food waste, in the effort to cover one of the most basic needs of all: food assurance.

Municipal governments, food banks, numerous non-profit organisations and the agri-food industry all drove the redistribution of surplus fresh and pre-cooked foods from the primary sector, processing companies, large shopping centres, markets, and school and hospital dining halls.

In this context, especially noteworthy is the service to society, and the agri-food sector, to promote the fight against food waste carried out by the Food Bank of Catalonia from the time of its establishment by private initiative in 1987.

Existing tools, such as the Agri-food Market Regulation Service of the Ministry of Agriculture, Livestock Farming, Fisheries and Food (DARP), strengthened structures to channel fresh and processed products toward recovery, implementing a ground-breaking system of public cooperation and recovery of the excess products established in the Common Agricultural Policy.

This task was accompanied by the Agència Catalana de Seguretat Alimentària (Catalan Food Safety Agency - ACSA), which distributed criteria to guarantee safety in food donations, and accompanied the Food Bank, Càrites, the Red Cross and other non-profit organisations in the development of a best-practice guideline for safe food donations, and food safety training for their volunteers. This was done without overlooking the informative task on how to properly interpret the best-before and expiration dates of food products, and tips on reducing household food waste.

The Ministry of Welfare and Family regulated social dining halls. The Agència Catalana del Consum (Catalan Consumer Agency - ACC) promoted cooperation agreements between food distribution companies and the non-profit organisations to facilitate and promote donation of food and recovery of surpluses, in addition to dissemination and training to raise awareness of the problem among consumers.

Establishment of the Plataforma Aprofitem els Aliments in 2014 was another step in promoting the social agreement, bringing together organisations, entities and individuals committed to reducing waste, based on the 'End Food Waste' manifesto, which explains their lines of activity.

04 We keep working to raise awareness and find reduction solutions

Making the problem known, and disseminating alternatives and solutions is the third line of work in recent years. Among all the initiatives launched in this area, especially notable are, first, the campaign 'Som gent de profit' (We are food Wise), aimed at society in general to attribute their true value to food products, inform on food waste and convey recommendations and resources to reduce it, especially in households.

Second, the popular food recovery luncheons: the Gran Dinar (Great Luncheon), recovered food festivals, or leftover or recovered food luncheons held in cities and towns around Catalonia starting with the recovery of food products, and cooking them up into tasty dishes. All of them help bring us face to face with the need to reduce food waste.

Last, mention must be made of the Parliament of Catalonia's preparation of a draft bill to reduce food waste. It is a regulatory instrument that, along with the package of initiatives already running, will boost efforts toward the goals meant to be achieved: restore the foodstuffs' value and involve all parties in the prevention of food waste and recovery of surpluses.

05 Further reading:

ARC-UAB (2012). *Un consum més responsable dels aliments: Propostes per a prevenir i evitar el malbaratament alimentari*. http://residus.gencat.cat/web/.content/home/lagencia/publicacions/centre_catala_del_reciclatge__ccr/guia_consum_responsable-FINAL.pdf

Action plan for the fight against poverty and social inclusion in Catalonia 2015-2016: http://treballiaferssocials.gencat.cat/web/.content/03ambits_tematics/06pobresa_i_inclusio_social/lluïta_contra_pobresa/pla_pobresa.pdf

Safety requisites for food donations: http://acsa.gencat.cat/ca/eines_i_recursos/publicacions/guies-i-documentos-de-bones-practiques/documentos-de-bones-practiques/requisits-de-seguretat-alimentaria-en-la-donacio-daliments-00001/

'End Food Waste' Manifesto: <http://aprofitemelsaliments.org/ca/signa-el-manifest-3/>

'Som gent de profit' campaign: <http://somentdeprofit.cat>

IGNASI ARAGAY 'L'activisme contra el malbaratament alimentari perd Paco Muñoz'. (The fight to stop food waste loses Paco Muñoz) Ara. cat. 'Societat' 31 January 2018: https://www.ara.cat/societat/Lactivisme-malbaratament-alimentari-Paco-Munoz_0_1953404676.html

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IN MEMORIAM



We dedicate this article, and the entire *Technical Dossier*, to the memory of Paco Muñoz. Technician, researcher, activist, instigator and non-conformist, he was directly involved in the fight against food waste in Catalonia, and many of the activities carried out up to now, from the very beginning. To him goes the credit for so many others joining this fight. Thank you, Paco, for passing your commitment and enthusiasm on to us!

FOOD WASTE, AN ESSENTIAL ITEM ON THE GLOBAL SUSTAINABILITY AGENDA



Figure 1. The Sustainable Development Goals (SDG). Global 2030 Agenda. Source: United Nations Development Programme

By the year 2050, world population will top 9.8 billion. That means an increase of 32% over 2015 (mainly in developing countries). According to data from the Food and Agriculture Organization of the United Nations, this growth, and increase in purchasing power, of large parts of the population (and the change in diet that this could bring about) makes foreseeable a 60% rise in the demand for food worldwide.

This reality, coupled with the pressure it could put on increasingly scarce natural resources, and the impacts of the global change in agri-food production, have led many international institutions to call attention to the risk of a worldwide food crisis.

The concern for food is not new. It has been the topic of the most relevant international conferences of recent decades.

For example, the World Food Summit, held in Rome in 1996, where the definition of food security now guiding the food policies of many countries was decided on: 'Food security exists when all people, at all times, have phy-

sical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life'.

Four years later, the UN General Assembly approved the Millennium Development Goals, which included the commitment to halve the percentage of the world population suffering hunger between 1990 and 2015.

Precisely in 2015, another step forward was taken: adoption of the 2030 Agenda for Sustainable Development, with 17 global goals (the SDGs, or sustainable development goals) to be reached by 2030.

These interdependent SDGs cover a wide range of topics: poverty, inequality, health, consumerism and sustainable production, economic growth, employment, infrastructures, sustainable management of natural resources, oceans, climate change, gender equality, peace, social inclusion and access to justice and responsible institutions.

Food has its own SDG (number 2): End hunger, achieve food security and improved nutrition and promote sustainable agriculture. But it is not the only SDG that deals with this topic: it also comes in SDG 12, which focuses on responsible consumption and production, and sets the goal to 'halve per capita global food waste at the retail and consumer level, and reduce food losses along production and supply chains, including post-harvest losses'.

Catalonia has already included the food waste reduction goal in its planning: the 2020 General Waste Prevention and Resource Management Plan of Catalonia states the will to halve food waste by 2020 (10 years prior to the time stipulated in the 2030 Agenda).

This is one of the commitments that will be included in the future National Plan for 2030 Agenda Implementation in Catalonia, now being prepared. One of its documents of reference is the report 'Agenda 2030: Transform Catalonia, improve the world', written by CADS in 2016.

→
SDG 12.3 aims to halve per capita global food waste at the retail and consumer level, and reduce food losses along production and supply chains, including post-harvest losses, by 2030.

In a world where a third of the food produced for human consumption (equivalent to 1.3 billion tons annually) is lost or wasted, commitments like Catalonia's in the framework of a global agreement, are important even if they seem minor.

This is especially true when 870 million people who suffer hunger in the world could be fed with a quarter of the unused food. Therefore, the challenge is urgent and unavoidable.

01 Further reading:

UNITED NATIONS. *Transforming Our World: the 2030 Agenda for Sustainable Development. Translation into Catalan by the Government of Catalonia.* http://cads.gencat.cat/web/.content/Documents/Publicacions/Colleccio_Documents/DOCUMENTS_21_Resolucio_NNUU_AGENDA_2030.pdf [Consulted: February 28, 2018].

GOVERNMENT OF CATALONIA. ADVISORY COUNCIL FOR SUSTAINABLE DEVELOPMENT. 2030 Agenda: transform Catalonia, improve the World. Available online at: http://cads.gencat.cat/web/.content/Documents/Informes/2016/Agenda_2030_CAT/CADS-Report_3_2016_The-2030-Agenda_Transform-Catalonia_Improve-the-World.pdf

ALEXANDRATOS, N.; BRUINSMA, J. (2012). World agriculture towards 2030/2050: the 2012 revision. ESA working document no. 12-03. Rome: FAO. On-line at: <http://www.fao.org/docrep/016/ap106e/ap106e.pdf> [Consulted: March 15, 2018].

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The Advisory Council for Sustainable Development is the strategic advisory body of the Government of Catalonia in the area of sustainability. Founded in 1998, it is made up of a president and 15 members, individuals of recognised prestige in the academic, institutional and business communities, with the mission to make Catalonia a more prosperous, equitable and respectful country in environmental terms.

The CADS also cooperates in the effort to achieve a more sustainable Europe through the network of European Environment and Sustainable Development Advisory Councils (EEAC) which it has chaired since 2015, and where it is active in different work groups.

Website of the Advisory Council for Sustainable Development of Catalonia: <http://cads.gencat.cat/ca/inici>

Website of the network of European Environment and Sustainable Development Advisory Councils (EEAC): www.eeac.eu

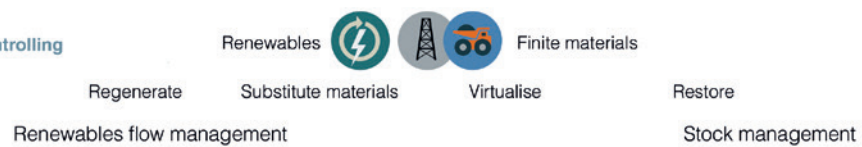
PUTTING THE BRAKES ON FOOD WASTE: THE EUROPEAN UNION'S CIRCULAR ECONOMY PACKAGE

OUTLINE OF A CIRCULAR ECONOMY

Principle

1

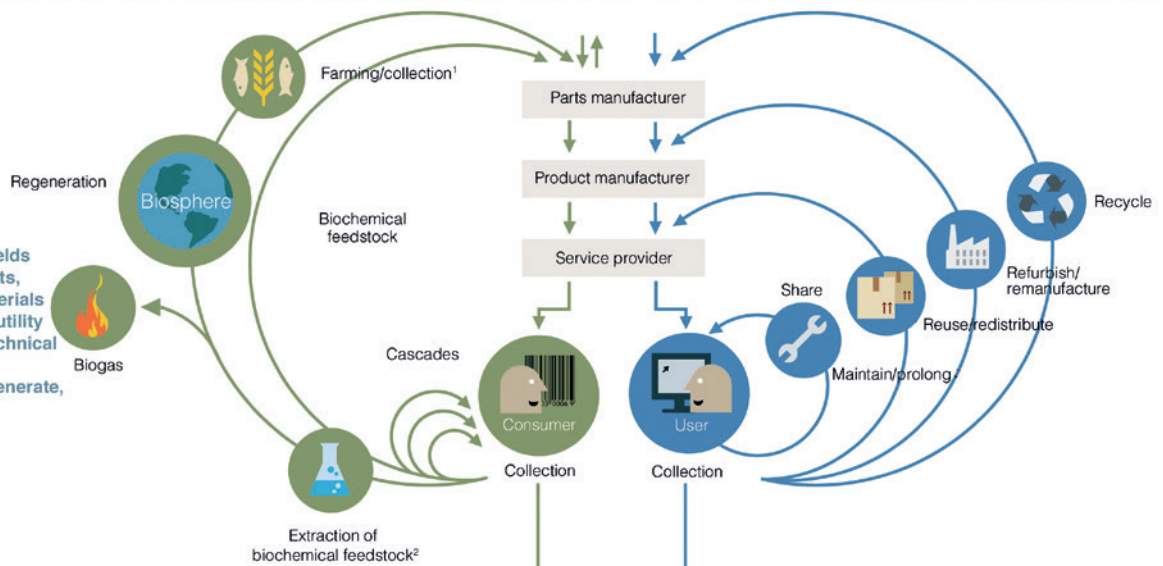
Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows
ReSOLVE levers: regenerate, virtualise, exchange



Principle

2

Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles
ReSOLVE levers: regenerate, share, optimise, loop



Principle

3

Foster system effectiveness by revealing and designing out negative externalities
All ReSOLVE levers

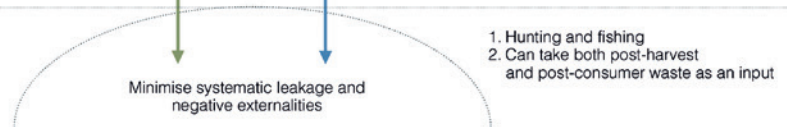


Figure 1. Circular economy. Source: Ellen MacArthur Foundation

01 Contribution of the EU to a global issue from a waste perspective

Although waste management has improved considerably in recent decades, one quarter of all municipal waste is still sent to landfill, and less than half is recycled or composted, with slight variations from one EU member state to another. Improving waste management would have positive effects for the environment, climate, public health and the economy.

Just as the FAO approaches food waste as a food security issue, the European Commission focuses on food waste reduction from a waste management regulation and efficient resource usage standpoint.

As a part of the change toward the circular economy, the European Commission approved the Circular Economy Package made up of four legislative proposals, in which food waste is among the issues addressed. The plan features objectives of a 30% reduction

by 2025 and 50% by 2030 in all 27 member states.

It also stipulates that a specific hierarchy must be set in food waste management.

In the circular economy, products and the materials they contain have high added value, as opposed to the traditional, linear economic model, based on a single-use pattern.

In practice, a circular economy involves reducing rubbish to the minimum, in addition to reusing, repairing, redesigning and recycling current products and materials. Making the transition toward a circular economy requires modifications in regulations, and a revision of objectives in the following areas: the Waste Framework Directive, the Landfill Directive, the Packaging Directive and directives on end-of-life vehicles, on batteries and accumulators and the waste from electrical and electronic equipment.

Importantly, the change toward a circular economy must also include improved management of waste products associated with the primary sector and food industry.

It has been calculated that in the EU some 89 million tons of food are wasted annually, equivalent to some 180 kg per inhabitant/year. If no measures are taken, it is estimated that by 2020 this could rise to 126 million tons of food per year. Households are where the bulk of the food waste occurs (42%) followed by agriculture and food processing (39%), food service and catering (14%) and retail and distribution (5%). (Stenmarck et al., 2016. 'Estimates of European Food Waste Levels'. Fusions. European Commission. <http://www.eu-fusions.org/phoca-download/Publications/Estimates%20of%20European%20food%20waste%20levels.pdf>)



In Catalonia, 7% of the food purchased is wasted by consumers, retailers and restaurants

The EU is contributing to the reduction of food waste in several ways. In the 'Roadmap to a Resource Efficient Europe' (2011) the European Commission (EC) already established waste reduction landmarks and ways to limit waste through the food supply chain. Under the Waste Framework Directive, member states were called upon to develop prevention plans by 2013. The EC produced a website that provided information on the causes of food waste, tips to prevent it and information on the quantity and impacts of waste at the EU and global levels.

The project 'Fusions' established a European platform of agents to generate a shared vision on how to prevent food waste throughout the food supply chain. At the national level, and from public and private organisations, a number of projects have already been carried out.

02 Catalonia, determined to reduce food waste

In Catalonia, 7% of the food purchased is wasted by consumers, retailers and restaurants. This is equivalent to 25.5 days' worth of food per year, simply thrown away. This volume of food could feed over half a million people over one year. Translated into economic terms, this waste is worth 841 million euros per year.

The Government of Catalonia, through the General Waste Prevention and Resource Management Programme of Catalonia, developed by the Waste Agency of Catalonia, has set out a number of objectives and activities. For instance, reducing the weight of food waste by 50% in areas such as retail distribution, food service, catering and households with respect to the 2010 base figures. There are also proposals to set food waste reduction goals for the primary and agri-food sectors, including wholesale distribution, before year-end 2018. The Government also plans to cooperate in regular diagnoses with the primary and agri-food sectors, and support actions taken against food waste carried out by private entities, and cooperation with food distribution companies, among others.

In Catalonia, the circular economy is oriented toward food waste reduction activities through participation in the European project ECOWASTE 4 FOOD to pinpoint the best ways to cut back food waste among the project's regional partners. The campaign "Som Gent de profit" (We are food Wise) - led by the Waste Agency of Catalonia along with the Municipal Government of Barcelona and the Barcelona Metropolitan Area Authority - and the European Week for Waste Reduction, are two other key projects among the activities to be carried out.

03 Further reading:

EUROPEAN COMMISSION (2015). 'Closing the loop: An EU action plan for the Circular Economy': http://eur-lex.europa.eu/resource.html?uri=cellar:8a8ef5e8-99a0-11e5-b3b7-01aa75ed71a1.0011.02/DOC_1&format=PDF

Website of the Waste Agency of Catalonia: <http://residus.gencat.cat/ca/inici/>

04 Author:



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Director of the Waste Agency of Catalonia
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The Government of Catalonia, through the General Waste Prevention and Resource Management Programme of Catalonia, has set out a number of objectives. For instance, by the year 2020, it aims to reduce the weight of food waste in areas such as retail distribution, food service, catering and households by 50% with respect to the 2010 base figures.

LET'S ALL WORK TOGETHER TO SAVE FOOD: PROJECTS TO REDUCE FOOD WASTE

01 Food waste prevention

INDULLEIDA, SA

<http://www.indulleida.com/ca>



Indulleida, SA was created by 50 fruit-growing cooperatives, SAT and fruit production distribution groups of Lleida and Osca in 1980, with the intent to absorb and valorise growing fruit production surpluses. Currently, the shareholders include over 170 cooperatives and fruit and vegetable production associations from Spain and southern France.

The fruits and vegetables that are not easily accepted on the market for aesthetic reasons (shape or colour defects) or due to minor quality issues (hail damage,

scars), are used to make high-quality processed products: juices, purées and concentrates.

In keeping with its valorisation approach, the company has invested in innovation and generated a range of products based on the secondary circuits of its production process, such as natural aromas, fruit fibres, essential citric oils, bases for beverages, fruit preparations for the dairy industry, etc.

BONÀREA AGRUPA

<https://www.bonarea.com/ca>



bonÀrea Agrupa is creating a production line of calves with greater vitality, lower mortality rates during the suckling phase, and sourced from local livestock farmers. It is meant to be a production alternative to solve the challenge of male calves, considered a by-product by cattle ranches. Their consideration as such, and the way production was organised, have led to a certain neglect of their raising conditions, to the extent that recent years have seen a rise in mortality, along

with increased pathologies and antibiotics use, and a worsening of diet efficiency.

The project calls for shortening the number of days the calves spend being raised in the livestock facility until they are taken to slaughter. This will bring about an improvement in productive efficiency, augment animal welfare and reduce mortality, in addition to diminishing methane emissions and manure generation.

EL ROSAL

<http://elrosal.cat>



El Rosal is an artisan biscuit bakery in Tàrraga. It forms part of the Associació Alba social project. This group works to improve the quality of life of individuals with disabilities and mental illness in Urgell and La Segarra Counties, offering services and comprehensive care in all areas of their lives.

El Rosal is an inclusive work environment where employment opportunities are provided for persons with difficulties and at risk of exclusion.

In fact, one of its employees is the creator of the renowned *arrugats* (wrinkled wafers). Lluís's job was to make *neula* cylindrical wafers, but more than once the dough was wrinkled, and the wafers were not sellable. But the bakery did not want to waste them. Though wrinkled, they had the same high quality and excellent taste as standard wafers. The idea they came up with was to create a new product, the *arrugats*. They are now the bakery's most popular item.

ROLER

<http://www.roler.es>



Roler is a leading company in the production of fresh poultry, beef and pork products. It offers a wide range of products such as hamburgers, minced meat, sausages, meatballs, filets, etc.

The company has implemented a system to identify and quantify the food waste taking place in the productive process due to loss during processing of the product, non-compliance with expiration dates due to unsuitable formulations or due to having to dispose of a non-reprocessible product in the company.

Among the improvement actions implemented, especially important are first, the proper planning of demand to prevent the excess of raw materials, expiration or non-compliance with technical specifications; second, making an impact on the packing and packaging phase, to prevent ruptures and conserve the conditions of the meat sold; and last, efficient logistics management to ensure that the products are in distribution outlets in less than 24 hours.

02 Recovery of surpluses

ESPIGOLADORS

<http://www.espigoladors.cat>

Espigoladors (Gleaners), was born with the three-fold objective of reducing food waste, providing healthy diets for vulnerable individuals and generating job opportunities for this group through a circular economy model.

To do so, they recovered the ancient activity of gleaning: going into a field once a farmer has harvested it, following their instructions, and recovering the fruits and vegetables that, though unsellable, are still fit for consumption.

The group works with farmers and social organisations to recover fruits and vegetables. They channel the recovered produce toward social organisations (90%) and to be processed for tinning (10%). They make high-quality artisan products in their workshop, where they offer training and employment opportunities to individuals in situations of vulnerability. Sales of the product, under the 'Es imperfect' trademark, achieve the economic sustainability of the model.

ART CERVESERS

<http://www.artcervesers.com>

In 2016 Art Cervesers began its project to make beer with leftover bread from bakeries, as was already done in other countries, to follow up on a proposal from the Plataforma d'Aprofitament dels Aliments (PAA).

The project soon saw the birth of the '9 Hores' beer. It's a seasonal beer made with the aim of recovering bread, and creating a commercially profitable production process to be put in action at a larger scale.

The project began with little information, which made necessary extensive in-house experimentation on how

to extract sugars from the bread and filtering systems, as well as resolution of specific technical and biochemical problems.

The result was the creation of the formula, and work protocols, based on evaluating the type of maceration, yield in fermentable sugars, and organoleptic contribution of the bread.

In 2017, the first batch of this unique and satisfying beer met with high praise. In 2018, with the second batch, they doubled production.

SOBRES MESTRES



sObres mestres (the name consists of a play on words in Catalan combining 'leftovers' and 'masterpieces' – master leftovers) is a pop-up restaurant that aims to prevent food waste in a fun, direct way, by holding gastronomic gatherings (dinners, catering, cooking classes) using fresh, local recovered foods.

The proposal is based on the fact that much of the food that winds up in the waste bin is in optimum condition for consumption, even though the establishment

throws it away for reasons of size, shape or accumulation of surpluses.

sObres mestres strives to raise awareness in society, and in a fun way, introduce more people into the fight against food waste.

The initiative works with other organisations involved in reducing food waste, and is a member of the Plataforma Aprofitem els Aliments.

FOOD BANK

<https://www.bancdelsaliments.org>

The food bank of Barcelona performs the collection of inventory shrinkage products to prevent food waste and provide a response to the dietary shortcomings suffered by a percentage of the population in Catalonia. Inventory shrinkage consists of surplus food products that are fit for consumption, but unsellable (due to an imminent expiration date, damaged packaging, etc.). These products are generated by the logistics platforms as well as in retail establishments of food distribution chains.

Shrinkage products are for practically immediate consumption. That is why the social organisations near the donor establishment pick up the shrinkage donations on behalf of the Food Bank and distribute the products among their users. In the case of logistics platforms, the food products go through the Food Bank warehouse, and are later distributed among the approved entities.

In 2017, this programme facilitated recovery of 1,253,498 kilos of food.

NUTRITION WITHOUT BORDERS

<http://www.nutricionsinfronteras.org/ca>



Nutrition Without Borders (NSF) is an organisation keenly aware of the economic crisis that affects certain pockets of the population. Its teams' experience in nutritional matters and food safety have enabled development of the project 'BCN comparteix el menjar' (Barcelona Shares Food), with the aim of protecting the right to food of citizens at risk of social exclusion, and reducing food waste in the Barcelona Metropolitan Area.

The project is based on recovering surplus cooked food from 23 major hotels, and 40 food companies and schools of the city, to provide social entities with food. Food is collected and distributed from the hotels or food companies to 18 beneficiary centres on a weekly basis. By carefully monitoring the food, and training the food handlers at the social dining facilities, NSF guarantees optimum hygiene and food safety conditions throughout the entire process.

PONT ALIMENTARI (FOOD BRIDGE)

<http://www.pontalimentari.org>



The project PONT ALIMENTARI (FOOD BRIDGE) began by diagnosing the food thrown out from the retail food distribution, catering and restaurant sectors. Improvement proposals are put forth to reduce waste. Last, a network of interaction (bridge) is created between these companies and the social organisations that support vulnerable groups in Barcelona to make use of the food products still in good condition.

At the same time, awareness-raising actions aimed at customers and employees of the companies and soci-

ety at large are carried out, with the goal of promoting a change in behaviour and attitudes toward food waste.

The number of businesses participating in the project tripled from 2016 to 2017. In 2017 alone, over 250,000 kg of product were recovered.

This is an initiative of the Resource Bank Foundation (<http://www.bancderecursos.org>) and Rezero (<http://www.rezero.org>).

FOOD MANAGEMENT PROGRAMME

<http://www.reus.cat/serveis/gestio-alimentaria-responsable>



The goal of the Food Management Programme of the Reus Municipal Government is to recover food products still fit for human consumption, sort and then distribute them to underprivileged citizens, adding fresh food to their diets and minimising the generation of waste.

Supermarket and market stall operators from the Mercat del Camp offer the fresh foods that are not fit for the commercial circuit. The Baix Camp Workshop (a non-profit organisation that serves adults with intellectual disabilities and their families) collects

this food and sorts it; and the city's social organisations within the food distribution network, led by the Food Bank Foundation, distribute it among the underprivileged families that social work professionals refer them to (using software called eQualiment). Since 2014, the organisation has also been collecting cooked food from a number of caterers and school dining halls. This entire process is supported by cooperation from the Catalan Public Health Agency for Food Safety.

03 Awareness-raising in the food supply chain

**PLATAFORMA APROFITEM ELS ALIMENTS
(LET'S RECOVER FOOD PLATFORM)**<http://www.aprofitemelsaliments.org>

The Plataforma Aprofitem els Aliments (PAA) is a non-profit organisation that operates within a network made up of individuals and entities that promote a food recovery culture. Their roadmap is outlined in the 'End Food Waste!' Manifesto: (<http://aprofitemelsaliments.org/ca/manifest-prou-malbarataraliments-2/>).

They work in social awareness-raising, promoting training in all stages of the food supply chain and households. The platform lobbies for regulatory changes and economic and tax measures that target prevention of

loss and waste, according to the waste management hierarchy. They support transparency in the information on the use of food, and food waste, in addition to recovering and donating foodstuffs to social action entities and underprivileged groups. The PAA is the promoter of the Food Festivals, free, popular meals prepared with recovered food, to reclaim and celebrate the value of food all over Catalan territory.

AECOC<https://www.aecoc.es>

AECOC, the association of large-scale consumer companies, leads the food waste reduction project entitled 'La alimentación no tiene desperdicio' (Nothing goes to waste in food)(<http://www.alimentacionsindesperdicio.com/>)

The project has three main goals:

- Establish practices of prevention and efficiency throughout the entire food supply chain, thus achieving reduction of waste.
- Maximise recovery of surpluses produced in the different stages of the value chain (redistribution, reuse and recycling).

- Sensitisation and awareness-raising in society regarding this problem and the need to reduce food waste.

The initiative has the support of over 350 manufacturing and distribution companies from the large-scale consumer sector, logistics and transport operators, business associations, consumer organisations and other institutions. It is coordinated by the AECOC. The campaign intends to publicise the efforts companies make to prevent food waste, and drive best cooperation practices to progressively reduce the problem. (<http://www.rezero.org>).

SOM GENT DE PROFIT<http://www.somgentdeprofit.cat>

In 2014, the Waste Agency of Catalonia, the Barcelona Metropolitan Area Authority and the Municipal Government of Barcelona launched 'Som Gent de Profit', a communication campaign aimed at citizens, to raise awareness of the fact that wasting food means throwing away the money it cost to produce it, the natural resources invested in it, and squandering a highly valuable resource.

The campaign includes a number of different activities: a travelling exhibition that explains the origin of food

waste, and provides figures and recommendations on how to prevent it; recovery recipes and tips; a number of videos to learn simple tricks to make use of all the food we have at home.

The campaign works to achieve a change of behaviour and attitude, meant to reinstate the value of food, and conceive leftovers as a resource.

PESA I PENSA<http://www.pesaiensa.org>

Pesa i Pensa (Weigh and Think) is an educational project to raise awareness of the food waste problem in school dining halls, to recover the value of food, and change the outlook of children, preparing them to be the responsible consumers of tomorrow. The methodology leads the children to take responsibility for decisions such as whether to have an entire second helping, or serve themselves more bread or fruit. Thirty-one Catalan schools are now participating.

The 'Pesa i Pensa' method is summed up in six steps:

- 1) Separate in three recipients (inedible organic, edible organic, water).
- 2) Weigh daily.
- 3) Record data through a web application.
- 4) Think: analyse the data with relation to the waste generated.
- 5) Propose: set goals to achieve with the children and dining hall monitors/kitchen staff.
- 6) Give value: safe recovery of food through projects with social organisations, and generation of compost for school and other local gardens.

RESEARCH AND INNOVATION FOR REDUCTION OF FOOD WASTE



Figure 1. Research projects to reduce food waste: Fusions Project, Refresh Project, Interreg Project, Ecowaste 4 food and Effect Project

The European Union has promoted a number of research projects in recent years. The scope and approach of these projects differ, but they all converge around a single goal: reduce food waste. To do so, they address different areas, such as the generation of knowledge, awareness-raising, development of action plans, and creation of involved agent networks at the different territorial levels.

01 FUSIONS Project

FUSIONS (Food Use for Social Innovation by Optimising Waste Prevention Strategies) conducted between 2012 and 2016, meant to contribute to a more effective Europe through the prevention and reduction of food waste.

01.01 What were its aims?

- Coordinate the quantification and monitoring of food waste in the European Union.
- Improve knowledge on social innovations that are useful to reduce waste.
- Define recommendations to develop waste prevention policies for the EU-27.

FUSIONS was financed by the Seventh Framework Programme of the European Union (EU) for Research and Technological Development.

01.02 Who took part?

Twenty-one partners from 13 different countries took part, among them: companies, consumer organisations, universities and research centres. Additionally, numerous organisations from different sectors supported and gave their cooperation to FUSIONS. The project established a European platform of involved agents, with over 200 affiliated organisations, to generate a shared vision and strategy in food waste prevention and reduction throughout the food supply chain, by means of social innovation.

01.03 Results

- Proposing recommendations and guidelines for a common European food waste policy framework <https://www.eu-fusions.org/phocadownload/Publications/D3.5%20recommendations%20and%20guidelines%20food%20waste%20policy%20FINAL.pdf>
- Debate and propose a definition of food waste.
- Estimates of European food waste levels <https://www.eu-fusions.org/phocadownload/Publications/Estimates%20of%20European%20food%20waste%20levels.pdf>
- Progress toward the goals of the European Commission of reducing food waste to 50% by 2030, and the resources used in the food chain by 20% by 2020

Further information at: <https://www.eu-fusions.org/index.php>

02 REFRESH Project

REFRESH (Resource Efficient Food and dRink for the Entire Supply cHain) is a European project to tackle the reduction of food waste. The continuation of the FUSIONS project, it will be carried out between 2015 and 2019. REFRESH is financed by the EU Framework Programme for Research and Innovation (EU) (H2020).

02.01 What is the goal?

REFRESH specialises in the reduction of avoidable waste and revalorisation of food waste. The project will contribute to better decision-making, at the company and individual levels, through research on the root causes of food waste.

The project has the following objectives:

- Develop strategic agreements to reduce food waste with governments, business and local stakeholders in four pilot countries

(Spain, Germany, Hungary and the Netherlands).

- Formulate EU policy recommendations and support national implementation of food waste policy frameworks.
- Design and develop technological innovations to improve valorisation of food waste, e.g. from food processing, and ICT-based platforms and tools to support new and existing solutions to reduce food waste.

REFRESH is financed by the EU Framework Programme for Research and Innovation (EU) (H2020).

02.02 Who is taking part?

The REFRESH consortium brings together 26 partners from 12 European countries and China, among them the Center for Agro-food Economy and Development (CREDA-UPC-IRTA), which is working to achieve Sustainable Development Goal 12.3.

Further information at: <http://eu-refresh.org/espanol>

03 Interreg Project and Ecowaste 4 Food

Ecowaste 4 Food is a project that has been developed within the Interreg Programme of the European Union, meant to span the 2017-2020 period. It focuses on the connections that link food safety, resource efficiency, circular economy and governance..

03.01 What is the goal?

With Ecowaste 4 food the intention is to help territorial authorities better manage food waste reduction throughout the food supply chain, with the addition of eco-innovations to regional and local policies, all of it forming part of a more holistic territorial food safety strategy.

It is structured into an initial learning and experience exchange phase, that culminates with

the drafting of an action plan, and in a second phase, the plan's implementation.

03.02 Who is taking part?

Seven partners from six regions, and one city, coordinated by the Centre Internacional d'Estudis Agronòmics Superiors del Mediterrani - Mediterranean Agronomic Institute of Montpellier (CIHEAM-IAMM). The Waste Agency of Catalonia is also a partner.

03.03 Expected results

- Draw up seven regional and local plans, Draft an action plan to reduce food waste in Catalonia (2019-2020).
- Identify over 40 eco-innovation best practices.
- Form seven regional and local strategic committees, with actors from different sectors.
- Define political recommendations for improved food waste reduction management in the European Union.

Further information at: <https://www.interreg-europe.eu/ecowaste4food/>

04 EFFECT Project

EFFECT (Europe Fights Food Waste Through Effective Consumer Training) was a European project (Erasmus plus) that ran from 2015 to 2017.

04.01 What was the goal?

Its goal was to raise awareness of food waste with the implementation of an on-line platform featuring training and educational content.

The project targeted the adult population, touching on diverse subject matter: a study of food waste impacts, daily measures to minimise their consequences and identification of the best ways to involve and motivate others in this field.

04.02 Who took part?

A number of European organisations took part in EFFECT: the Federation of Polish Food Banks, as general coordinator; the Food Bank in Olsztyn Olsztynie (FBO-PL); Eurocrea Merchant (IT); Feedback (UK); Avaca (GR) and the Autonomous University of Barcelona (UAB).

At the Catalan level, the Autonomous University of Barcelona led this process based on a joint project of the Oficina de Medi Ambient (Environmental Management Office) and the Complex Research Group of the Mathematics and Experimental Science Education Depart-

ment, of the Faculty of Education, with expertise in sustainability, consumer affairs, food waste and teaching.

04.03 What actions were carried out?

A number of actions were taken to make citizens associate food management and sustainability in an innovative, disciplined manner adapted to the diversity of each individual:

- Study of the habits and behaviour of consumers: Description of food shopping or preparation behaviour and its connection with food waste, as well as awareness-raising around this issue.
- A multifunctional, interactive educational platform: Learning and training resources to cut back on waste: links to on-line learning content, tips, a web TV and board game (on-line, downloadable version).
- Disco Soup: Citizen participation action in which participants prepare a meal together using recovered food. In Catalonia, this event was held in the city of Sabadell in conjunction with the Sabadell Municipal Government and the Plataforma Aprofitem els Aliments (PAA).

Further information at: <http://foodwasteeffect.eu/>

Institute of Agrifood Research and Technology (IRTA)

<http://www.irta.cat/>

The Institute of Food and Agriculture Research and Technology (IRTA), affiliated with the Ministry of Agriculture, Livestock, Fisheries and Food of the Catalan Government, prioritises research in reducing food waste on three fronts:

- Improvement of production systems: By being more efficient, we can reduce loss, both by reducing the waste and pollutants generated as well as by not wasting resources. This will be important not only from an environmental but also an economic standpoint. Both aspects are clearly related with a mid-to-long-term outlook. Most of IRTA's research and technological development projects align with this philosophy; a wide array of examples can be cited, such as improving livestock diets, guaranteeing microbiological safety and prolonging the shelf life of fruits and vege-

tables. In short, progressing in the profitability and competitiveness of agri-livestock farms and companies.

- Once waste generation and/or food waste itself has been prevented from an efficiency standpoint, the portion of organic waste derived from biological processes must be assumed. This way, the organic waste management programme, specifically, but within a larger framework of concrete projects from other programmes, approaches the optimum management options for this waste. Especially notable are their research projects to improve management of compost and produce biogas as a renewable energy generation system. This entails production of organic fertilisers that, when correctly managed, act not only as contributors of nutrients for crops but also enhancers of soil quality and potential car-

bon sequestration agents. Another relevant field consists of the growing number of alternative products made from organic waste by the food industry: additives, flavourings, etc. This includes biomaterials, like innovative plastics.

- Finally, IRTA works especially hard to quantify the solutions proposed in environmental terms: we must be certain that the logistics and processes we apply are not only well-suited in technical terms, but also more environmentally sustainable. That is why we use the life cycle analysis tool, which gives us an overview of the entire production chain and an evaluation of different environmental impacts. This is how we can be sure of not externalising the problems to other parts of the chain or among environmental impact categories.



In this interview, we discuss food waste with the renowned world expert Tristram Stuart, author of the best-selling book *Waste: Uncovering the Global Food Scandal* and other books, course instructor and lecturer. Also taking part is Carina Millstone, executive director of Feedback, founded by Stuart in 2009, and which promotes, among other international campaigns, the 'Feeding the 5000' meals, which have also been held in Catalonia

Tristram, in 2009 you published the book *Waste: Uncovering the Global Food Scandal* which brought the issue of food waste into the light. How do you think the perception of the problem has evolved over these years?

Tristram Stuart: When I published the book, food waste at the global level simply wasn't talked about, and now it is. This change is thanks in large part to Feedback (<https://www.feedbackglobal.org>), which I formed with my colleague Niki Charalampopoulou, and the work we have done to transform something that was seen as a personal option into a concept broadly accepted as a symptom of the problems related with the food system. My book uncovered how food waste is endemic in the current supply chain, and its catastrophic environmental impact. Over these years, to the extent in which this message has been spread, a popular movement has arisen to revalorise the foods we grow, and tackle the challenge represented by waste for our ecosystems and our planet. It is now clear that our political and economic leaders are aware of the need to deal with this issue. What is not so clear is whether they are taking enough action on the climate crisis we are facing.

In addition to the Feedback organisation, you have promoted the 'Feeding the 5000' meals, to feed some 5,000 people using food products that otherwise would have gone to waste. These meals have also been held in Catalonia. What are these mass events and what do you hope to achieve with them?

INTERVIEW

Tristram Stuart

Communicator, activist and expert on food waste, founder of Feedback.

Carina Millstone

Executive director of Feedback, author and sustainability expert

"IN CATALONIA, WE ARE PRIVILEGED TO WORK WITH HIGHLY DEVELOPED AND ACTIVE ORGANISATIONS"

From the interview published at <https://ruralcat.gencat.cat>

Tristram Stuart: We want people to enjoy delicious food at the same time we feed the message that food waste is a serious problem. This is one of the basic goals of the movement articulated around Feedback. The 'Feeding the 5000' meals, which began in London in 2009 and have spread around the world, are not only celebratory events. They also help build alliances and coalitions among local organisations that, after the last bite is finished, take new responsibility to combat food waste. In Catalonia, we are privileged to work with highly developed and active organisations that are now at the forefront of this movement.

You have also created a gleaning network that involves farmers, volunteers and social organisations. What role do you think gleaning can have in the reduction of food waste?

Tristram Stuart: Gleaning combines different elements of the Feedback approach to food waste. It puts people directly in touch with the foods they grow or eat, emphasising the systemic causes of food waste, while providing the opportunity to take practical actions that contribute to a more global change. The gleaning network takes volunteers into the fields and farms of the United Kingdom to recover, for a good cause, the surpluses that otherwise would be lost. Food is often wasted due to the business practices of supermarkets; last-minute changes in orders, unreliable forecasts of the quantities they will purchase, or strict shape, size or colour specifications for the products. Gleaning not only recovers fresh, high-quality food to feed hungry mouths. It also enables a dramatic portrayal of the magnitude of waste on farms, which is something often hidden from the public eye.

The use of resources and generation of food waste are tied into the food production model. With Feedback, you have designed a model for an improved food system. What is this model made up of?

Carina Millstone: Our model for a more sustainable system is based on simply understanding that the current one is too gluttonous and gre-

edy: it consumes too many resources to produce food and, throughout the supply chain, a third of them are wasted.

Food waste must be understood, first of all, as an over-production problem. We can produce enough food for everyone, while reducing the quantities the system demands, and creating a more circular model that is better at reusing what is now considered waste. In fact, one of the principles of our circular model is the valorisation as a resource of what used to be considered waste. It would be best for these surpluses to fulfil the purpose they were produced for. In other words, if they were for human consumption, that should be their use. But if not, they can also be foods for livestock or aquaculture, or even soil fertilisers. All levels of the food system (soil, plants, livestock and human beings) must be fed and restored to create a sustainable future.

Some European countries have begun to legislate on food waste. Do you think that regulations can be useful tools in this realm? Do you favour regulations that would have an impact on the use of surpluses, or that also include prevention? Should this be done through promotion measures, or control mechanisms?

Carina Millstone: Actually, prevention of over-production and promoting the effective reuse of surpluses are two sides of the same coin. Many causes of food waste are rooted in the imbalance of powers in market structures. One clear example is supermarkets, which who have disproportionate power over the farmers who provide the products. Nor do they assume the economic or environmental costs of the waste generated on farms by their practices. This is something the suppliers have to do. A volunteer approach will not solve it. Legislation is also necessary to tackle unfair commercial practices. We support the legislation being debated in the European Union to regulate best commercial practices. In a market that monitors to prevent harmful practices, it is more likely that a volunteer approach toward other aspects related with food waste will garner good results.

