



**REFRESH**

# **REFRESH 2017 Food Waste Conference**

**Conference proceedings**



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## Acknowledgments & Disclaimer

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# 1 Executive Summary

This document contains the programme, conference proceedings, and participant list of the REFRESH Food Waste 2017 Multi-stakeholder Conference.

The REFRESH Food Waste 2017 Multi-stakeholder Conference took place on the 18th of May at the Umweltforum in Berlin, Germany. The Conference brought together leaders in food waste prevention, reduction and valorisation. REFRESH partners presented the latest results and ongoing work of the REFRESH Project.

The Conference featured keynote addresses by the Parliamentary State Secretary of the German Federal Ministry for Food and Agriculture Dr. Maria Flachsbarth and the European Commissioner for Health and Food Safety Vytenis Andriukaitis. Throughout the day project partners presented ongoing work in REFRESH with several high level panels and a debate. The winners of the REFRESH Food Waste Solution Contest presented their successful projects and several interactive networking sessions brought practitioners together with policy makers and entrepreneurs. Throughout the day, conference participants could tour the Innovator Fair which showcased successful food waste initiatives from across Europe.

The Conference featured several innovative elements including two food waste art installations and a performative interpretation of the days' events by an improvisational theatre group. Two live pigs joined the conference in the afternoon to bring attention to the controversial issue of using surplus food to feed livestock. Following the Conference, participants were encouraged to take part in a "Disco Chop" evening event. Participants helped prepare the evening meal chopping rescued fruit and vegetables. Craft beer brewed from surplus bread was made especially for the REFRESH Conference by the Berlin Brewery Straßenbräu.

The extended programme and presentations from Conference are available for download on the [REFRESH Website](#) as well as video and photo documentation of the day.

## 2 Programme

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| <i>Registration 8:30-9:00</i>  |
| <p>9:00-9:15 <b>Introduction</b> by Toine Timmermans - REFRESH coordinator (Wageningen University and Research)</p> <p>9:15-9:25 <b>Keynote speech</b> by Dr. Maria Flachsbarth - Parliamentary State Secretary, German Federal Ministry for Food and Agriculture</p>  |
| <p>9:25-10:05 <b>REFRESH Food Waste Solution Contest award presentation</b></p> <p>Presenter: Ignacio Gavilan (Consumer Goods Forum), Stephanie Wunder (Ecologic Institute)</p> <p>Recipients: Corinne Castle (Transition Surplus Food Project), Thomas Luttkhold (Wastewatchers), Diana Ioana Calin (Zero Waste Aiud)</p>   |
| <i>10:05-10:30 Networking session w/ coffee</i>  |
| <p>10:30-11:20 <b>Creating successful Frameworks for Action: Presentation and panel discussion on success factors and progress of REFRESH Frameworks for Action with representatives from 5 countries</b></p> <p>Presenters: David Rogers (WRAP), Kate Bygrave (WRAP)</p> <p>Panelists: Nora Brüggemann (Centre on Sustainable Consumption and Production), Balázs Cseh (Hungarian Food Bank Association), Raquel Díaz-Ruiz (CREDA-UPC-IRTA), Toine Timmermans (Wageningen University and Research), Gao Si (IVL Swedish Environmental Research Institute, China Division)</p> |
| <p>11:20-12:00 <b>Reasons for food waste at the consumer level: Presentation of behaviour models and cross-country comparison</b></p> <p>Presenter: Dr. Erica van Herpen (Wageningen University)</p> <p>Moderated by: Lisanne van Geffen (Wageningen University)</p>   |
| <p>12:00-12:05 <b>Showcasing innovative food waste catering</b> - Stephanie Wunder (Ecologic Institute)</p>  |
| <i>12:05-13:15 Lunch</i>   |
| <p>13:15-14:00 <b>Panel discussion and interactive session on EU food waste policy</b></p> <p>Panelists: Anne-Laure Gassin (European Commission), Angela Frigo (Fondazione Banco Alimentare Onlus), Thomas Candéal (International Food Waste Coalition), Maria Eulàlia Reverte I Casas (European Court of Auditors)</p> <p>Moderated by: Dr. Hilke Bos-Brouwers (Wageningen University and Research)</p>   |

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| <p>14:00-15:00 <b>Parallel sessions</b></p> <ul style="list-style-type: none"> <li>• Measuring food waste</li> <li>• Food waste communication: Using the "Community of Experts" digital platform</li> <li>• Food waste drivers across the supply chain &amp; the role of policy</li> <li>• Modelling food waste generation: Role of different influencing factors</li> <li>• Assessing environmental and cost impacts of food waste</li> <li>• Sourcing food components from co-products: What is the Food Waste Compositional Database and how can it help you?</li> <li>• Tour of the Innovator Fair</li> </ul> |
| <p>15:00-15:30 <i>Coffee break</i></p>  |
| <p>15:30-16:00 <b>Presentation of parallel session results and highlights</b></p>   |
| <p>16:00-16:45 <b>Debate on food waste as animal feed (multi-stakeholder panel)</b></p> <p>Panelists: Karen Luyckx (Feedback – The Pig Idea), Kees van Gorp (European Former Foodstuff Processors Association), Dr. Julian Parfitt (Anthesis Group)</p> <p>Moderated by: Prof. Keith Waldron (Quadram Institute Bioscience)</p>   |
| <p>16:45-17:00 <b>Keynote speech</b> by Vytenis Andriukaitis - EU Commission, Commissioner Health and Food Safety</p>   |
| <p>17:00-17:30 <b>Wrap up: Improvisational theater</b></p> <p>17:30-17:45 <b>Conclusion</b> by Toine Timmermans</p>   |
| <p>17:45-21:00 <b>Disco Chop public event with Feedback Global</b></p>  |

## 3 Conference Proceedings

### Welcome and introduction to the REFRESH Project

Starting the day **Toine Timmermans**, the REFRESH coordinator from Wageningen University & Research welcomes all participants and presents the REFRESH goals and project structure. He also introduces the Conference programme and day's events. For more details about REFRESH's objectives and existing results he refers to the [REFRESH interim results brochure](#), that is now available for download alongside the [extended program](#).

**The Introduction to REFRESH Presentation is Available Online [here](#).**

## REFRESH Food Waste Solution Contest award ceremony

**Presenters: Stephanie Wunder (Ecologic Institute), Ignacio Gavilan (Consumer Goods Forum)**

**Contest Winners: Corinne Castle (Transition Surplus Food Café), Thomas Luttikhold (Wastewatchers), Diana Ioana Calin (Zero Waste Aiud)**

**Stephanie Wunder**, REFRESH communication lead partner opens the award ceremony for the REFRESH Food Waste Solution Contest. She introduces the objectives of the contest, which aimed to highlight and spread innovations and to bring people working on food waste into interaction with the REFRESH project. The contest received 60 submissions, of which 47 met the contest criteria. Two winners were selected by the jury. A third winner was selected through an online public vote. The public voting was an unforeseen success, and helped to spread the word about food waste reduction initiatives and the REFRESH project with more than 61.000 votes recorded for all initiatives. Profiles of all submissions and projects can be viewed at the REFRESH website, together with information about the jury and contest procedures.

**Ignacio Gavilan** from the Consumer Goods Forum, and member of the REFRESH jury presents the first winner selected by the jury: Transition Surplus Food Café in the United Kingdom (UK), represented by **Corinne Castle**. He explains that the Transition Surplus Food Café was chosen because of its integrated approach to food waste and environmental sustainability, its role as pioneers and as a source of inspiration to other organizations. Corinne Castle explains that the idea grew from a member of the transition movement, and then became a pilot project supported by WRAP and other organizations. The initiative is now saving around 1000 kg a month while the café is a great way to bring a variety of people together and create a community hub. Mrs. Corinne Castle explains that the parent project, Transition Bro Gwaun is a small organization that is interested in supporting other groups, including the Transition Surplus Food Café by helping to spread best practices and help other groups find solutions to food waste.

Ignacio Gavilan then went on to introduce the second winner selected by the Jury: Wastewatchers in the Netherlands, represented by **Thomas Luttikhold**. He explains that Wastewatchers was selected due to the initiative's ability to bring sectors together and specifically in engaging the hospitality sector by providing data driven information and using an analytical measurement based approach. Thomas Luttikhold explains that the idea for Wastewatchers was founded out of his own personal experience working in the hospitality sector and seeing the enormous amounts of food waste. Wastewatcher was developed to inform and help managers and chef make better decisions about the food they use and waste by providing them with data on cost savings. By showing them the data, Wastewatchers gives them opportunities to innovate and change

Ignacio Gavilan returns to the podium to present the winner of the Public Award: Zero Waste Aiud from Romania, represented by **Diana Ioana Calin**. Diana Ioana Calin explains that the dedication of the Aiud community made it possible to win the contest, supported by the diversity of their volunteers and community. After posting about their participation in the Contest on facebook, media outlets in

Romania started to contact them about the initiative. They were even covered by National Geographic, national news, etc. The Romanian media likes to promote good causes. Zero Waste Aiud also worked a lot offline, collaborating with cafes and restaurants in town.

To wrap up the session Ignacio Gavilan stated that the Contest indicated the momentum of the movement against food waste and marked it as the end of the beginning.

## **Keynote: Dr. Maria Flachsbarth**

The keynote was given by **Dr. Maria Flachsbarth** the Parliamentary State Secretary from the German Federal Ministry of Food and Agriculture (BMEL). Maria Flachsbarth speaks about the enthusiasm she has for the project and the broad cooperation taking place across teams, people and sectors. From the government's perspective: food waste is complex and the answers need to reflect this complexity in terms of the various solutions and actors involved. Dr. Maria Flachsbarth introduces the BMEL initiative 'Too good for the bin,' and emphasized the importance of new types of media. She cites that today's generations have a very different mode of communication and information than just a few years ago, which is also reflected in different shopping habits and preferences. Technological applications, she says, are important to facilitate and to engage. Since young start ups are increasingly engaged in initiatives against food waste, it is important that more research take place to find more diverse solutions. Maria Flachsbarth explains that intelligent food packaging is a goal in Germany and that this should also contribute to reducing food waste, and that there are many new innovations to intelligent packaging already. To close the keynote, she emphasizes the importance of changing policies alongside changed behavior. In this regard, the importance of multistakeholder and multisectoral cooperation between states, science and stakeholders is emphasized.

## **Presentation of voluntary alliance approach: panel discussion of success factors and presentation of interim results from REFRESH national platforms**

**Presenters: David Rogers (WRAP) and Kate Bygrave (WRAP)**

**Panelists: Toine Timmermans (Wageningen UR, NL), Nora Brueggemann (CSCP, DE), Raquel Diaz-Ruiz (CREDA, ES), Balazs Cseh (HFA, HU), Gao Si (IVL, China)**

The session started with a presentation by WP2 leads and REFRESH Partners David Rogers and Kate Bygrave from WRAP. They start by explaining what Frameworks for Action are, 'collaborative agreements between public and private organisations who agree to take action on mutually agreed target. They are voluntary agreements, do not require legislation.' In the UK, the Cortauld Commitment represents this type of action, and has been running for ten years, currently in its 4<sup>th</sup> version until 2025. Within REFRESH the FA approach is applied

in four test countries that have different conditions: the Netherlands, Germany, Hungary and Spain. There is also testing taking place in China. REFRESH work thus far has taken stock of success factors in voluntary agreements with an inventory of 62 alliances from around the world filtered down to 18 key in depth studies. To do this work, interviews were conducted. The results of the research identified five key stages to implementation as well as specific success:

- Success factors identified:
  - o Strong lead organization with right abilities and trust among stakeholders
  - o Broad group of stakeholders included
  - o Government involvement at early stage
  - o Threat of legislation drives engagement in private sector
  - o Engaging signatories in setting goals and actions
  - o Better to have fewer more engaged signatories than lots of minimally engaged signatories
  - o Effective monitoring/measuring
  - o Availability of funding aids effectiveness

In order to set up FAs and apply the lessons learned from the research, the Pilot Working Platforms (PWPs) identified local national priorities, mapped current policy activity and initiatives, conducted a gap analysis to target areas that would most likely bring the strongest results. With this information appropriate goals and actions were included in the FA and were agreed with all actors signing to pledge their commitment.

David Rogers briefly summarizes the situation in each of the pilot countries starting with Germany. In Germany, the identified priority area was in the retailer sector since retailers are particularly large corporate entities in Germany and could have a big impact. Of REFRESH's four pilot countries, Germany was the first to kickstart the FA process.

In the Netherlands, there are already many organizations working on food waste, therefore the challenge was extracting the best mix of organizations to participate in the FA. Within the Netherlands, the focus was to address the entire supply chain, and to capitalize on existing government support for many big name retailers and food industry companies.

In the Hungarian PWP, the platform was already in existence prior to the REFRESH project, however it was somewhat unfocused. In partnership with the Hungarian Food Bank Association, a partner of REFRESH and coordinator of the PWP, key actors were identified to get more dedicated action. The focus in Hungary is on quantification and data, education and food service/hospitality.

In the Spanish PWP, the focus was regional and on Catalonia. The PWP involved retailer organizations rather than individual retailers with a focus on consumers and education, hospitality, and primary production (esp. fresh vegetables which are produced in the region).

In China, a cooperating partner in REFRESH, there was not a lot of governmental support for the process in the beginning. However, a strong platform of organizations was identified and support is increasing. Currently they are working to conduct a gap analysis and identify actions.

David Rogers also pointed out that there are pilot projects within the PWPs. Each country has its own pilot projects that represent the FA and the national priorities and particularities.

Germany:

- Waste awareness training for retail staff
- Whole chain project using WRAP toolkit, converting to be relevant to Germany to identify problem areas

Spain

- Gastrofira catering for massive events, conducting data collection and testing several innovations to reduce waste
- Tomato whole chain project from farm to fork

Hungary

- Finding markets for “ugly” vegetables
- Anti-waste catering concepts

Netherlands

- Decision support systems
- Consumer response tests to in-store stock levels

David Rogers asks the panelists how they initiated the PWP process:

**Toine Timmermans (the Netherlands):** Dutch agriculture minister made a strong statement about reducing food waste, this catalysed action which we saw happening but it remained unclear whether it was enough to reach goals. In some areas waste was going down but in others maybe even going up. It took 2-3 years to find support from stakeholders and discuss next steps to connect at higher level, at the end of last year they reached the momentum and it became possible to recruit front-runner companies both large and small. They involved 7 global sustainability leaders as ambassadors to steering committee, e.g. champions 12.3 members. Identified 8 priority areas including aiming for 100 signatories, developing roadmap, creating more transparency. Also energy to spur consumer driven activities and achieve collectively developed ambitions.

**Balazs Cseh (Hungary):** There were two factors that contributed to the further development of the Hungarian FoA. First, having a person in a coordinating role, in this case from the Hungarian Food Bank. The second crucial factor was the early involvement of the government sector. This second task was not easy because food waste is not directly connected to specific government organisations, which tend to work in silos. It is also important to find the right person in an organization and that the person is also personally interested and committed. In Hungary they have luckily found an interested person at secretary of state level. Then asked the Ministry to use that network and name to support the PWP building process.

**Gao Si (China):** China is still in the process establishing a platform. On a national level there is almost confirmed a Chinese version of SDG 12.3. The leading person in this initiative and the media coverage have been important triggers for social responses, which trigger responses from central government. An anti-waste, anti-packaging waste and anti-overconsumption initiative exists now, and the platform is looking to contribute to that.

**Nora Brüggemann (Germany) :** It was not difficult to get people engaged because of existing contacts and by spreading the word of what REFRESH was aiming for. They have not concentrated on getting many people on board, but instead on a smaller group that is really willing to take action. The engagement level is high. Companies and other actors understand the need to act on food waste and have their own priorities within this. They appreciate the open discussion forum and info exchange and learning/getting inspiration from WRAP/Cortauld and REFRESH partners. Being able to use WRAPs expertise to learn from each other and also have internal discussions on how to push/exert peer pressure has been very helpful.

**Raquel Diaz-Ruiz (Catalonia, Spain):** As a starting point they wanted a diverse platform, and to balance Catalan and Spanish organizations. The idea was to invite different levels of government including municipalities into the FoA. At which point the focus of the platform became defining minimum commitments and initiating pilot projects such as Gastrofira.

**The presentation on creating successful Frameworks for Action is available online [here](#).**

## **Presentation and panel discussion on consumer insights: presentation of cross-country comparisons of consumer focus groups and graphic presentation of behavior models**

### **Dr. Erica Van Herpen, Wageningen UR**

This session featured an interactive presentation with agreed/disagree statement cards held up by the audience to respond to the following questions, upon which a discussion based the REFRESH behavioural and consumer research followed:

The session begins by asking the audience to respond to the statement: *The main motivation for the food waste is that people do not care enough (Agree / disagree)*

Members of the audience explain their answer. A member of the audience that agreed with this statement explains that people do care but that they do not think it's possible to avoid waste and non-monetary factors are not prioritised. While technological fixes can be found, the audience member emphasizes that they are also not the only solution.

**Dr. Erica van Herpen** explains the REFRESH research with emphasis on behavioural influencing factors such as: motivation (awareness, attitude, social norm), ability (skills and knowledge), opportunity (time, schedule, infrastructure

and technology) all affect food waste level indirectly. Income affects, for example, motivation: even if a person does have the motivation, maybe there are financial restrictions.

Consumer food management is the link between the affecting factors and the amount of food that is wasted. During the REFRESH research, focus groups were conducted to gauge what affects consumer food management. The methodology applied in the REFRESH study, is also applicable for other cases and countries. A prominent element of the focus groups was 'feelings'. The focus group conversations showed that people had a bad feeling when throwing away food, but that this feeling goes away quickly. People feel guilty but not so badly that they deem food waste unavoidable. Data from Germany was analyzed with Machine learning: associated words: the term "food waste" was often used together with the terms "dispose anything", "go shopping", and "never thought". The term "leftover" was often used with terms: "feeling guilty", "Africa", and "shame". This shows moral issues and financial issues depending on countries.

People have different goals and priorities that affect the amount of food wasted: Variety, guests, taste, convenience, food safety, healthy, correct portions. Sometimes food waste is collateral damage.

Van Herpen asks the audience again to *agree/disagree with the statement: children make it difficult to not waste food*. The audience shows the same results as in the focus groups which have argument for both sides. On the one hand, children make it almost impossible to not waste food. On the other, children can also stimulate us to not waste food in the sense that older generations have to teach the younger to not waste. Some key barriers found in the REFRESH food waste research was that childrens' tastes and appetites change quickly, that people have unpredictable social and work lives, that large packaging can cause problems. Other influencing factors were shopping habits, for example, infrequent shopping can result in food wasting) as well as storing food, income, and food quality.

Van Herpen asks the audience about interventions: *what do consumers need: information and awareness campaigns or using practical tools and social norms to decrease food waste?*

The audience discussed and agreed that what was needed was tools to change the norms, policy, and behavior are the most effective intervention methods. Some audience members added that information and awareness campaigns still are important. However, even knowledgeable people who know about food waste, continue to waste food, therefore indicating that a lack of information is not the main barrier.

Van Herpen stresses that the focus groups showed the same result: that people think they need information and awareness but then state that they do not have the tools even though they have the knowledge and awareness.

Following the presentation, discussion and questions were invited from the audience. Both Van Herpen and the audience discussed and agreed that research confirms that simpler messages and tools work better than long messages, and the information needs to be useful/fill a need the consumer has. Many applications on food waste are not often used.

The presentation on Food Waste at the Consumer Level is available online [here](#).

## Panel discussion and interactive session on EU food waste policy

**Moderation: Dr. Hilke Bos-Brouwers (Wageningen University and Research)**

**Panel members: Anne-Laure Gassin (European Commission), Angela Frigo (Fond. Banco Alimentari Onlus), Thomas Candéal (International Food Waste Coalition(IFWC)), Maria Eulalia Reverte I Casas (European Court of Auditors (ECA))**

This session included a question and answer directed by the moderator to the panelists.

*Q1: What would be your main requirements for a successful future EU food waste prevention and reduction policy?*

**Reverte I Casas:** responded that the ECA is one of five EU institutions and conducts independent financial and performance audits. Normally they audit the Commission and Member States, i.e. those who implement legislation/use public funds. The issue of food waste was brought to the ECA because it was recognized as a cause of significant economic loss and an environmental problem. The EU influences how different actors in chain behave. It has less an influence on consumers and more focus across the whole chain. The main requirement for policy is to be aware of a problem and to have political will. For this reason, there was a recognized need for the inclusion of food waste in impact assessments. Also important is coordination within the Commission and between the Commission and other actors as well as recognition of the connection between food waste and finances.

*Q2: The Circular Economy Package has been around for about a year, the Platform on Food Losses and Waste is the center of action. What are the Commission's plans to improve on the EU food waste policy arena?*

**Gassin:** they are in line with the ECA report conclusion. There is a need to take an integrated approach to food waste from 'farm to fork'. The action plan put forward by the Commission as part of Circular Economy package is to support all actors in making progress to SDG 12.3. Actions at the EU level need to support concrete action on the ground. Getting sufficient data is key and is the cornerstone to monitor effectiveness. Current, EU data is insufficient for effective monitoring. Prevention of food waste has been strengthened in EU food waste policy, and measures have been introduced that require reductions and monitoring including the setting of indicators for monitoring. Doing so helps so diverse actors from different areas to understand and be on the same page.

*Q3: What are the important success factors for a successful cooperation along the food chain?*

**Candéal:** IFWC was created in 2015 as the starting point for food service business to collaborate along the value chain to reduce food waste together. It focused on the idea of bringing back the value of food. It is key to always adopt a value chain approach, since this helps to make changes outside of individual organizations.

*Q4: How can policy support donation and what issues are encountered by donation?*

**Frigo:** the Fond. Banco Alimentari Onlus is a network of 21 food banks. Its mission is to recover edible surplus food and deliver it to charitable organizations that assist people in need. In line with policy, their activities are part of the solution but not the only one. In Italy the new food waste law has provisions to foster food donation and limit waste. The law is important for food banks because throughout the drafting process, there was deep collaboration with public authorities. They worked together with 4 ministries and food supply chain and non-profits to draft and approve law. The law was therefore result of common work and had buy-in by stakeholders. This approach is different from in France. In Italy, the approach is to provide incentives for donation/collaboration instead of obligations/sanctions. It provides for fiscal incentives, e.g. reduction on waste taxes, but also improve consumer info and education

Discussion was then opened to audience questions:

*Audience: The ECA report highlights role of EU policies e.g. CFP and CAP (Common Agricultural Policy) and that they are not doing much to reduce food waste. If we want local and regional authorities to support action plans for food waste, what are best EU funding and provisions to help? Do we need an extra common EU framework across sectoral policies?*

Reverte I Casas: The ECA does not recommend new policies/funds, but instead advocates for better use of current policies and funds. The CAP and Rural Development Fund (RDF) have provisions that could be better used, same with CFP. Lots of work is yet to be done on fair trading practices.

Gassin: mainstreaming the SDGs into EU policies will facilitate further integration. The Food Losses and Food Waste platform has been established at EU level bringing together key players, from public entities we have Committee Of Regions who is very active and source of input. The platform is meant to be forum to facilitate exchange and best practice.

*Audience: Organizations are often asked to participate in many voluntary initiatives, and they have trouble choosing. How should they choose, and what is the experience of IFWC?*

Candéal: there is already lots of action and interest. The question for the private sector is which actions and interests to prioritize, and how to foresee benefit. The EU and COMM can do a lot of coordination, linking, catalysing to have external people understand the ecosystem better. REFRESH in this perspective is helpful.

Reverte I Casas: initiatives are welcome at all levels, but it needs to be kept clear that prevention should be the first focus.

*Audience: Is primary production not in the scope of the food waste definition of COMMA? Could this have a side effect of moving the problem to primary production?*

Gassin: we have not introduced our own definition. The Waste Framework Directive (WFD) sets the definition. Pre-harvest not within scope of legislation, and is also not considered "food". The WFD will be a big step and starting point considering there is currently little data. There is interest among platform members to address the issue of measurement and discussions on this will continue.

*Audience: What role do EU institutions have in scaling up transparency especially given the high number of voluntary initiatives?*

Candéal: It is not working for legislation/hard law but is working towards fixing targets. There have to be incentives for organisations to measure and then act. The logical next question is whether to make it public or not, as it currently is a private choice that allowed companies to decide. However, it would be in the common interest to have compensatory requirement for food waste. It is important to ensure that what the private sector communicates is homogeneous and comparable. Right now they all have their own practices so it is quite complicated and difficult to compare.

Through the work of the EU platform, the goal is to share best practices and promote evidence based sharing of what works as a first step. The bottom line to doing this is measurement. Research shows a return on investment of 14 dollars per invested dollar on food waste action, this is motivating to companies.

**Hilke Bos-Brouwers** (Moderator) concludes: what REFRESH does not want to do is create new food waste policy, but understand the drivers and mechanisms in supply chains in different countries and products. It is necessary to think about the role of policies there, and how to translate lessons learned through REFRESH as integrated results and advice.

## Presentation of parallel session results and highlights

**Group 1.** This parallel session explained REFRESH work on **Measuring Food Waste**. REFRESH conducted research to search for drivers and did a general survey of consumers compared to a more detailed survey. The best method for investigating food waste at home and the method applied is a short survey with tick boxes.

**Group 2.** This parallel session explained work on **Food waste communication: Using the "Community of Experts" digital platform**. The community of experts digital platform aids users to share best practice, knowledge and create contacts. The parallel session discussed the journeys of two users. The first journey showed a visitor to the website, and their ability to share this info with others. The second journey was of a person with user rights, who was able to change and add information, which added more value to the platform.

**Group 3:** This parallel session explained work on **Food waste drivers across the supply chain and the role of policy**. The parallel session noted peoples' surprise by the size of the food chain/web. This awoke a great discussion and

many insights, for example, the fact that there are important differences among member states, like who owns the wasted bread?

**Group 4:** This parallel session explained work on **Modeling food waste generation: Role of different influencing factors.** During the session they discussed innovation, revision and unfair practices of businesses. The main insights were that networks, looking from different perspectives (for innovation) and pressure from the consumers levels are the most important conditions when modeling food waste generation.

**Group 5:** This parallel session explained work on **Assessing environmental and cost impacts of food waste.** The analysis requires strict guidelines as how to formulate Life Cost Assessment and combine it with Life Cycle Cost Approach. The session discussed and agreed on reducing food waste being as important in relation to climate change mitigation. By using the tools being developed, these issues could be addressed and mitigated further. There is still a need to have good examples for observability and trialability of these tools to increase diffusion.

**Group 6:** This parallel session explained work on **Sourcing food components from co-products: What is the Food Waste Compositional Database and how can it help you?** The Food Waste Compositional Database is a compositional food database which shows nutritional values from sidestreams, coproducts, and byproducts. Currently there are some 14000 values with proteins, fats, vitamins, digestability etc. Currently the database is looking for information on meat and dairy sidestreams.

**Group 7:** This parallel session took participants on a **tour of the Innovator Fair.** There is a huge variety of solutions to food waste represented at the fair from across Europe, from the technical to the social, for profit and non-profit. There is lots of creativity addressing different problems and a big variety of actors including: ministry, technical, IT, political campaigns, social initiatives. It was striking that many are already established and are now thinking strategically to diffuse further and get to the next level of impact.

## Debate on food waste as animal feed

**Moderation: Prof. Keith Waldron, Quadram Institute**

**Panelists: Karen Luyckx (Feedback – The Pig Idea), Kees van Gorp (European Former Foodstuff Processors Association), Dr. Julian Parfitt (Anthesis Group)**

Prof. Keith Waldron introduces the session. For using food waste as animal feed (esp. feed for pigs), the focus is on pre-consumer foodstuffs which have required traceability. The food waste hierarchy serves as a basis for mapping use of waste streams based on desirability of solution, animal waste in upper middle of hierarchy

**Luyckx:** Welcomes guidelines on surplus as feed in circular economy package. It addresses unnecessary barriers faced by food processors and will help to double

volume of feed from surplus. She spoke for a wider variety of waste to be able to be included. The Japanese model, as an example, uses any kind of leftover from kitchens, retail, manufacturers and then sterilizes and processes with rigorous safety management to feed. It is interesting from economic perspective because feed is up to 69% of production costs for pork, so if price of inputs goes up it creates big problems for producers. The Japanese model manages to produce feed at about half the price of feed in Europe. Safety is biggest barrier or issue. Here lies there is a difference between ruminants and pigs – pigs can not get diseases like mad cow, pigs can and do eat meat. Contamination protections would need to be similar to those for preventing cross contamination of raw and cooked meat. Studies confirm that heat treatment neutralizes pathogens in food waste for feed. They are working with microbiologists on quantitative risk management now to find out how to do this most safely. Feed is done safely in US too.

If the use of former foodstuffs is maximised under current legislation, it can grow the use of feed by 3%. But with Japanese style recycling and at similar rates, it could increase the use of former food by around 20% and reduce major environmental impacts of feed production.

**Van Gorp:** 3.5 million tones of former foodstuffs are processed in Europe now, and this can increase to around 6 million tones. 10 countries are currently active in EFFPA, and we are currently looking to spread wider. Also it is important to note that, EFFPA does not compete with food banks because they get first choice from suppliers. There has been a change in last few years, with food banks showing a growing willingness to pursue non-usable donations as feed. Feed legislation is different from food legislation, but using food helps transfer similar changes into feed legislation. Sometimes it is necessary to treat products to make them acceptable.

**Parfitt:** WRAP last year looked at the manufacturing and retail sectors, because regulations there are very precise in relation to byproducts in feed. In the UK, it is possible to identify another 20% that can be used as feed if barriers are addressed. In the UK, it is assumed that everything suitable should be redistributed. However, humans cannot live off bread alone and there is a lot of bread distributed from retail sector, which is difficult to use. Even taking into account maximum possible redistribution, there is potential for a 50% increase for feed use. There exists division in Member States on who is responsible for complying with which regulations. WRAP provides good guidance to help get through legislation. Food businesses often do not realize they are wasting, and usually it is easier to send waste to anaerobic digestion without finding out waste maps on production processes and if/how it could be suitable as feed. The feed sector could play bigger role helping manufacturers understand how they could use surplus instead of sending to AD.

Discussion opened to audience

*Q1: Pigs require very specific diets, what are the opportunities for replacing specifically soya with food waste? What is opinion of pig producers about this opportunity?*

Luyckx: yes pigs grow at slightly slower rate on food waste but since feed costs are so much lower, producers find it is worth it. In Japan they have computerized input monitoring systems. Inoculate feed once sterilized with bacteria increases nutritional value, they claim that pigs are healthier and need fewer antibiotics with this feed. Small scale pig farmers are very much in favor.

*Q2: What role do you think the feed sector has in helping food producers in calculating their surplus?*

Parfitt: The image of the issue and legislation are important to show that there is a benefit, as well as presenting the potential profit.

*Q3: Where is the market? Ecopork in Japan feed their pigs organic feed to make sure that the pork is organic. Increased visibility of environmental impact of meat could also help the producers want to engage in this idea and increase the price and profitability.*

Van Gorp: What we are doing is to try to put the feed to use, but also to mitigate food waste. With technological innovations they are trying to gather data of where the food producers and feed suppliers can make changes in their supply chain.

*Q4: is there a possibility of introducing the idea of not eating pork? Does the producer pay the supermarket to get the feed? Is there a risk that the supermarkets would prefer to sell their products as feed due to the price?*

Feed is less expensive than food therefore it does not compete with food. Luyckx stresses the necessity of using surplus food as feed instead of as a resource for renewable energy. That would be moving up the hierarchy and keeping it within the food chain.

*Q5: For this policy what is your collective system? We collect not only food from the stores but also from the households. Could you elaborate on your collective system?*

Parfitt: The most complex case is with the supermarkets to make sure that products for feed are clearly marked and not mixed with other waste. This shows the need for security checks and a developed collective system.

Van Gorp: The farmers do not want to find plastics or other waste in their food.

**The presentation on Food Waste as Animal Feed is available online [here](#).**

## **Keynote: Vytenis Andriukaitis: Rescuing and valorizing food resources in the circular economy**

The EU commission is happy to help with reducing food waste and encourages all actors to drive this and help incentivize solutions for actions.

88 million tonnes of food is wasted in the EU annually costing some 143 billion EURO. Firstly, he finds it hard to believe and secondly, wants the promise of reaching the SDG goals to really be achieved and is therefore very happy to take part in this project. Another related SDG is 0 hunger. He asks, 'How is this to be achieved if there is food waste?' Other relevant SDGs are: 12 (Responsible consumption and Production) 13 (Climate Action), 2 (Zero Hunger), and 8

(Decent work and economic growth). By stopping wasteful food supply chains several SDGs can be achieved and this is an important message to spread. It is imperative to develop a food chain where the food waste is minimized and food value is maximized.

Andriukaitis asks whether we are aware of the size of this opportunity? Each dollar invested in reducing food waste saves 14 dollars, which shows a clear message to the whole supply chain that minimizing food waste is a very good investment financially.

Food waste prevention is a central part in the transition towards a circular economy. The EU platform dedicated to food waste prevention has been launched and shows how this can be achieved by 2030. All member states benefit from food waste prevention and the platform brings together all the involved actors to help with their expertise and work.

In order to motivate change the waste legislation, Andriukaitis proposes to reduce food waste at every stage of the supply chain, monitor food waste levels and report progress.

EU guidelines are needed for food donations because wasting food is unacceptable. Currently EU guidelines are being developed for food as feed. These guidelines are scheduled for this autumn. There is, however, a need to ensure that food is safe to use as feed. This includes guidelines to not include animal products in the feed.

Date marking is another issue. Less than half understand the meaning of the date markings but 58% of consumers look to this marking for guidelines. The commission food waste website creates a digital platform in order to facilitate sharing of food waste reducing practices.

Andriukaitis highlights the need to facilitate cooperation and to establish a coordinated mechanism top down and bottom up that works.

He emphasizes that there is only 13 years until 2030. He would love to see us all again in 2030 saying "yes, we did our job"!

*A question from the Audience:*

*Q: Would you agree to support recommendations within the EU commission to address specific targets to cut food waste?*

Yes, of course. In an integrated web it is important to understand that it is difficult to discuss these issues as separate entities. Consumers also need to take their responsibility regarding their demands in the store.

**The Keynote Presentation by Vytenis Andriukaitis is available online [here](#).**

## 4 Parallel Sessions Minutes

### Measuring food waste

**Organised by:** Erica van Herpen (Wageningen University and Research)

**Name of Rapporteur:** Lisanne van Geffen (Wageningen University and Research)

### Minutes/Main Discussion Points

#### **The results of REFRESH wp1.3 were presented: developing a method to measure consumer food waste in-home.**

The discussion centered on different methods to assess food waste:

- Diary
- Self-report (survey)
- In home observation
- Waste composition analyses
- Self-collection (kitchen caddies)

Advantages and disadvantages of each method were discussed.

Participants of the session brought up the issue of consumer 'cheating', that is, consumers may not report the true amount of food waste, due to faulty memory, misunderstanding, and/or social desirability.

Diary: increases awareness to lead to behavioral change. However, it is effortful for participant and researcher, tampering enthusiasm, risk of self-selection.

The REFRESH best practice was discussed. This measure pre-announces that participants will be asked about their food waste. In the survey, participants tick product categories in which food waste occurred in the past week. For each ticked category, they provide the amount in appropriate units (e.g., portions, spoons, items) and which phase the food was in (i.e., whether it was unused, partly used, meal leftover, or stored leftover). Explanations are tailored to the product category, and country differences need to be considered herein as well. The researcher then can calculate back how many grams were wasted using a calculation table.

A discussion point was that this method does not provide information about the reasons for wasting. Of course this could be added, but it is important to realize that consumers often do not have clear insights on this themselves, as food wasting is often the result of a multitude of behaviors. In the survey research (task 1.4 of REFRESH) reasons behind food waste will be examined further.

What is important to realize, is that in studies that try to understand the drivers of food waste, it is important to have a measure that can distinguish between those who waste a lot and those who waste little. If there is a constant underestimation for all participants, this does not negatively impact this type of research.

Interesting points for future research were brought up as well. For instance, whether shopping online would limit food waste compared to shopping offline. Whether a shopping list helps in lowering food waste.

### **Key Outcomes**

- A pre-announced survey asking participants about their food waste in the past week has surprisingly good correlation with other food waste measurements. This is a very promising research method for survey research.
- Kitchen caddies and photograph coding are good ways to measure food waste in small samples, although they require effort.
- More insight is needed into the drivers of food waste, as this can lead to the identification of potential effective interventions.
- Consistent underestimation of food waste in a method may not be too problematic for many types of studies, as it still allows for a distinction between high and low wasters. This distinction is what is needed to identify drivers of food waste.

## **Food Waste Communication: Using the “Community of Experts” digital platform**

**Organised by:** Kate Bygrave (WRAP)

**Name of Rapporteur:** David Rogers (WRAP)

### **Minutes/Main Discussion Points:**

The session was led by Ffion Batcup (WRAP) and Jennifer Wilson (Anthesis). The purpose of the session was to present the new Community of Experts (CoE) website which is currently under development.

The session began with an introduction to the CoE by Ffion – where it was outlined how the scope of the CoE supported the aims and objectives of the wider REFRESH project.

Ffion then took the audience through user journey 1 “to search for resources” mimicking the journey a new visitor might go through. She explained the different ways of searching through the resource library, and highlighted the main functionalities of the site.

Jennifer then spoke to the audience about the next steps to becoming a member and the associated benefits. Benefits include;

- \* being able to comment on and share resources
- \* to upload new resources
- \* to set preferences on what content you’re notified on and how often

\* to seek advice and support from other members

\* to provide expert advice on specific topics where appropriate

Jennifer then took the audience through a second user journey, demonstrating how to create a profile and how to comment on a resources

A key element of the session was being able to highlight our partnership with DG Santé in creating a shared digital platform. Benefits include increased visibility for REFRESH; a single platform where key resources on the subject of food waste prevention can be shared and discussed; and added value to the project, and to the EU in terms of cost saving and maximizing potential.

Questions asked during the session are outlined below:

- **language of entries / docs?:** we advised that the main language of the site would be in English. However if there were resources available only in native languages, the approach should be to write the summary/description in English, and then ,tag` the relevant country

- **links to other platforms:** we will link through to the REFRESH website, and also through to the Commissions page

- **scope?:** any resources / reports / tools that provide information or support to reduce food waste along the whole supply chain

- **how to manage entries?:** WRAP will provide resource to maintain the site, and monitor entries to ensure they comply with the scope of the site

- **what is the timeframe?:** the soft launch will be 5th July, with a public launch anticipated to tie in with the REFRESH Governing Council meeting in September

- **search function:** there are a number of ways to search on the site, as demonstrated in the user journey that Ffion walked through, for e.g. you can filter your search, to sort the resources by the most recent, or by choosing to look for a type of resource such as a report, or a tool.

- **tagging by country:** Yes there will be the option to tag by Country [EU-28 specifically] and wider.

## Food waste drivers across the supply chain & the role of policy

**Organised by:** Manuela Gheoldus, Deloitte Sustainability, Julian Parfitt (Anthesis)

**Name of Rapporteur:** Julian Parfitt (Anthesis)

### Minutes/Main Discussion Points

Manuela Gheoldus and Julian Parfitt presented the work carried out for the first deliverable (D.3.1), and in particular the approach adopted (top-down and bottom-up; steps of the value chain; identification of drivers). They then

presented how product specific system maps are structured, in order for participants to understand what they are asked to discuss. The main conclusions of the deliverable were not presented at this stage.

The participants then split into four groups based on product groups (potatoes, dairy, bread, and meat) & steps of the value chain. Each table had a facilitator. Participants were provided with copies of the system maps corresponding to the product group they had chosen, and were asked the following guiding questions:

1. For each driver (on the system map), identify the steps of the value chain it impacts
2. Identify the most suitable actors to tackle the driver(s) and why (EU/national level, voluntary agreements, etc.)
3. Do you know any policies implemented at the national level which tackle these drivers?

Following very interesting exchanges, each table facilitator presented briefly the conclusions from their table:

**Meat** (facilitator: Julian)

- The participants considered carcass utilisation, carcass balancing, downgrade markets for meat products that do not meet retailer quality specifications, novel markets for meat that would otherwise form part of the reject/ downgrade stream
- Formal definitions of food waste are less useful within the meat processing sector due to the high value of meat and the use of traditional markets for meat that is not sold into the intended market, or specific lower quality cuts and offal, where other end markets exist. In recent years many of these markets have developed in the Far East, red offal to China; meat processors attending the workshop highlighted how all parts of a pig carcass get used, although domestic demand for some parts of the carcass far higher than for others.
- Swiss meat processor told of the market that they had developed for 'BOM ends' from ham slicing (these are the small sections of pork that are used to grip the meat during the slicing process). In the past they sold these to UK sandwich makers for use on meat sandwich fillings, but now have a premium product supplying convenience 'pre-chopped ham' for use in salads.
- As part of the trend towards convenience foods, fewer EU households are able to cook whole chicken carcass, as chicken portions have become more popular. These portions mostly focus on chicken breasts & drum sticks. Traditional ways of using all nutritional possibility of meat/ poultry have been lost: soups, making of stock and broths
- Proper integration of different meat processing factories can result in higher overall carcass utilisation: for instance a combination of fresh meat supplier and meat pie manufacturer.
- Standardisation of product weight and appearance has become a more important issue with retail stage.
- A way to reduce food waste would be through better supply chain integration. Utilisation of a lot of EU meat that is not in great demand domestically is now highly dependent on the export market; however,

some important meat processing firms have put in place certain measures/actions that allow to tackle the food waste driver (e.g. development of a chain of butchers to use more of the meat slaughtered rather than always having more standardised meat).

- In terms of meat as food waste, the low prices paid for animal by-products, such as connective tissue and bone has pushed more of the Category 2/ 3 animal by-product towards energy recovery/ waste treatment options and away from traditional rendering routes. Around 18 mt of animal fat and meat industry by-products are produced in the EU every year, so there is considerable potential for the total amount of food waste to be increased if more of this material ends up in waste treatment.

### **Potatoes** (facilitators: Manuela & Stephanie B)

- Grading errors ("if in doubt, grade it out").
  - o Measures to tackle this driver could include staff training.
  - o Optical sorting can lead to mechanical errors, calibrated machinery is necessary to tackle this issue
  - o Sometimes downgrading happens to prioritise using the most profitable route such as AD or AF instead of prioritizing the food use hierarchy and redirecting downgraded food to other routes for human consumption (such as potatoes used for the starch industry).
- Cosmetic standards/expectations
  - o There are specific needs for particular industry (e.g.: crisps -> round; drips -> long), therefore even though potatoes are not going to be sold in their produce from which would lead us to believe that cosmetic standards are not as strict, processers are still quite selective for the form of the potato.
  - o As retailers are very strict, because they anticipate consumer expectations for what they believe that potatoes should look like, they impose tight standards on their producers. Producers therefore anticipate these strict standards and pre-sort out any imperfect potatoes beforehand. However, consumer expectations evolve over the years. For example, in the UK and starting in France, the trend to purchase and consume wonky veggies and fruit is rising. Therefore it could be possible that consumer expectations are less strict now than they were in the previous years. This is something that retailers should take into account in order to allow more misshapen veggies and fruit onto the market without having to downgrade them. As the nutritional value is no different from traditional-looking veggies, they should be sold for the same price. It could be interesting to make a link with the work undergone in WP1 in order to test the theory.
- The Common Agricultural Policy (CAP) should be considered as a driver also for the primary sector (disconnection of supply and demand).
- Measures to tackle these drivers could include:
  - o Voluntary agreements (example of the UK).
  - o Actions in the framework of CSR/ESG: big companies understand CSR better; businesses can have a huge impact (e.g. in the UK).
  - o Develop PPP (public-private partnerships).
  - o Work at the local level.

- Bypass the various stages, i.e. go from primary production directly to the consumer.

### **Bread** (facilitator: Stephanie W)

- There are differences between countries as to who owns the bread (e.g. in SE and NL the retailers do not own the bread).
- IT is in favour of having a law that makes redistribution mandatory. NL and some other countries are against it: they consider that voluntary agreements work better.
- Policy makers should also promote voluntary agreements.
- There is a need for monitoring to be in place, as it is difficult to discuss anything if there is no monitoring baseline
- Unfair trading practices were also debated.
- Hygiene regulation: there can be competition between food that goes to AD and food for human consumption.

### **Dairy** (facilitator: Åsa)

- Cooperation, trust and transparency is needed.
- Power in the value chain: supermarket vs farmers => more equal power is needed; this could be done through increased cooperation, trust and transparency (although this would not necessarily be easy to achieve) -> i.e. new cooperation/business models.
- Potential solutions could include:
  - Give status to the product
  - Reduce the 'distance' between the consumer and products ("know your cow")
  - Higher prices (with the 'delta' going to farmers)
  - On date labelling: necessary to provide information to consumers on content + tips on how to use it

### **Key Messages**

- There was a high level of discussion in each of the product tables and many of the identified drivers were endorsed by participants.
- It was noted that interesting differences exist between Member States although we are dealing with the same food products (e.g. UK vs SE for dairy) and that the overall approach to break the food waste problem down into constituent components within food businesses and supply chains has exposed some of the key linkages between drivers across different supply chain stages.
- A conclusion is that there are no simple sets of policies that relate to food processing, manufacturing and retail stages. Identification of policy gaps has benefitted from working at this level of detail and along supply chains, particularly in highlighting the need for policies that promote more collaborative supply chain working: joint planning, sharing of information, issues of responsibility and ownership of food surpluses.

## Modelling food waste generation: Role of different influencing factors

**Organised by:** Matteo Vittuari (University of Bologna)

**Name of Rapporteur:** Matteo Vittuari (University of Bologna)

### Minutes/Main Discussion Points

The meeting started with a short introduction from all the participants. About 20 participants from very diverse organizations: from research institutions to NGOs to SMEs.

- General overview of the current status of REFRESH WP4;
- Focus on the definition of behavioral economics and on the two major methods: BNs and ABM;
- Focus on business innovation and food waste: "Business innovation and food waste: What we can learn from behavioural economics?"
- Focus on the report "Socio-economic implications of food waste: Economics of innovation" and on the work on "Price Transmission"
- Focus on the next steps and challenges of REFRESH WP4: development the integration between BNs and ABM;
- Short anticipation of the way how the ABM consumer model and the ABM supply model have been approached;
- Questions on the work on Price Transmission;
- Extended discussion on "Fair / Unfair Trading Practices" considered by most of the participant as a major challenge to address via policy intervention to stimulate food waste reduction;
- Discussion on the databases to be used to gather data on price transmission and "Fair / Unfair Trading Practices"
- Interesting point for consideration would be to model the impact of Groceries Code Adjudicator Bill on food waste reduction as a part of market power problem. Currently this is not a part of the modeling. This could be interesting to consider in policy scenario modeling in later stage in case if this will be interesting policy to consider as output from WP3 to WP4.

### Key Messages/Outcomes

Potential items to be considered in future work includes:

- Better understanding of price transmission mechanisms in the frame of food waste;
- Better understanding of "Fair / Unfair Trading Practices";
- To identify datasets to be used to gather data on price transmission and "Fair / Unfair Trading Practices"

## Assessing environmental and cost impacts of food waste

**Organised by:** Jennifer Davis (RISE Agrifood and Bioscience), Karin Östergren (RISE Agrifood and Bioscience), Silvia Scherhauser (University of Natural Resources and Life Sciences BOKU)

**Name of Rapporteur:** Karin Östergren (RISE Agrifood and Bioscience)

### Minutes/Main Discussion Points

#### Introduction

- Welcome
- Framing the problem: Environmental impacts of food waste and its potentials to reduce food waste;
- Presenting the work by REFRESH so far: Life Cycle Assessment and Life Cycle Costing complementary tools for taking informed decisions
- Introduction to the simplified Excel tool

#### Positive feedback to the tool:

- User ability to add different options also on national level to the tool (e.g. national electricity mixes).
- Tool is nice to visualize case studies.
- Nice to visualize environmental impacts and costs
- A pool of validated data is the basis. Some tools lack with data quality and have therefore a lot of uncertainties when using it. This should be avoided with our tool.
- Certain degree of freedom in the tool to integrate also own equipment or processes

#### Doubts to the tool:

- Usefulness for e.g. pig farmers. User of the tool: for breweries this tool might be useful, but the participant doubts the usefulness for e.g. pig farmers. What they would need to know or have from this kind of tool, is to compare conventional feed with other feed from food which is not used.
- LCA practitioners might use LCA tool than simplified tool What is the advantage of this tool compared to an LCA tool? Idea is to pinpoint what matters in a changing system, awareness shall be raised for what matters most from environmental and economic point of view.

#### Other questions:

- Who is the audience of the tool? It was explained that the idea is that LCA practitioners sit together with companies and go through the tool. The tool is not aimed for consumer to illustrate the impact of consumer waste
- It is important to understand that the tool provides the impact of a change on a system level not a stakeholder level. Cost and impact that only are moved between actors will not be seen

- Example for assessment: sourcing ugly fruits from abroad (e.g. 700 kg ugly cucumbers from Spain to Germany). The participant would like to know if this option is still environmental beneficial. Cucumber will be processed in Germany. In Spain it would have been wasted.
- How is the water content considered in the tool? Is dry matter used? Participant gave the example of rice. Depending on the side flow, but even in apple pomace there is certain water content and this is considered when e.g. used for bioenergy.
- Detail of costs? Total or from one sector of the chain?

About half of the audience could see themselves as users of the tool when finished! Further on it was pointed out that the best way to promote the tool by worked out examples

### **Key Messages:**

- Reducing food waste is important to combat climate change
- It is important to look for improvements of the whole system (food chain /valorisation chain) to avoid moving cost and environmental burdens up and down the food chain.
- The simplified tool developed has a potential. The challenge is to find balance between specific enough to be relevant and general enough to reach out.
- To spread and engage non-experts we need to show worked out example

## **Sourcing food components from co-products: What is the Food Waste Compositional Database and how can it help you?**

**Organised by:** Paul Finglas (Quadram Institute Bioscience), Tome Eftimov (Jožef Stefan Institute)

**Name of Rapporteur:** Graham Moates (Quadram Institute Bioscience)

### **Minutes/Main Discussion Points**

Paul Finglas (Quadram Institute Bioscience) introduced the background and aims of the Food Waste Compositional Database which was focused on 75 priority waste streams (side flows). The database was being developed by Quadram Institute Bioscience, EuroFIR and Jožef Stefan Institute.

Currently the database is populated with 14,000 values from c. 25 waste streams covering components such as protein, fat, vitamins and bioactives.

Nitrogen digestibility is also included (where available) due to its relevance to animal feed although this would not normally appear in a food database.

The top two food products covered at present are sugar and vegetable oil although this is, to some extent, due to the information sources utilized e.g. 2012

Feed Compendium. There is currently less information on dairy and meat side-streams so any data would be gratefully received. Data has generally not been sourced from trade associations at present but this may be necessary to fill data gaps.

Tome Eftimov (Jožef Stefan Institute) demonstrated the current structure which consisted of three parts: a 'back-end', a cloud server and a 'front-end'.

The 'back-end' (used by data managers) would enable entry of data, administration and validation of data and be hosted on the EuroFIR servers for sustainability. The 'front-end' (interface with data users) would be a browser-based tool with a secured log-in. The search tool will provide statistics on searching.

The database is expected to be available for testing in winter 2017 and will be linked with the REFRESH website / Community of Experts.

### **Key messages/Outcomes**

- Currently the Food Waste Compositional Database is populated with 14,000 values from c. 25 waste streams covering components such as protein, fat, vitamins and bioactives.
- Nitrogen digestibility is also included (where available) due to its relevance to animal feed although this would not normally appear in a food database.
- The database is expected to be available for testing in winter 2017 and will be linked with the REFRESH website / Community of Experts.
- There is currently less information on dairy and meat side-streams so any data would be gratefully received.

## 5 Participant List

| No | First Name     | Last Name      | Institution   | Country         |
|----|----------------|----------------|---|-----------------|
| 1  | Stefanie       | Albrecht       | Ecologic Institute  | Germany         |
| 2  | Vytenis        | Andriukaitis   | European Commission - Directorate General of Health & Food Safety     | Belgium         |
| 3  | Oula           | Antere         | ResQ Club   | Finland         |
| 4  | Lusine         | Aramyan        | Wageningen University   | The Netherlands |
| 5  | Noor Alifa     | Ardianingrum   | Food and Agriculture Organization (FAO)                               | Italy           |
| 6  | Stefanie       | Awe            | METRO   | Germany         |
| 7  | Coby Zaphyr    | Babany         | FSEN Amsterdam  | The Netherlands |
| 8  | Ffion          | Batcup         | WRAP  | United Kingdom  |
| 9  | Sophia         | Bensch         | Taste Before You Waste  | The Netherlands |
| 10 | Philippe       | Birker         | Selo  | Germany         |
| 11 | Hilke          | Bos-Brouwers   | Wageningen University   | The Netherlands |
| 12 | Daniel         | Botterill      | Cloud Sustainability  | United Kingdom  |
| 13 | Alicia         | Boyano Larriba | JRC European Commission   | Spain           |
| 14 | Adrian         | Braz           |   | Italy           |
| 15 | Irina-Nicoleta | Breniuc        | Green Report  | Romania         |
| 16 | Nora           | Brüggemann     | CSCP - Collaborating Centre on Sustainable Consumption and Production | Germany         |
| 17 | Sarina         | Bstieler       | Ecologic Institute  | Germany         |
| 18 | Stephanie      | Burgos         | Deloitte  | France          |
| 19 | Kate           | Bygrave        | WRAP  | United Kingdom  |
| 20 | Diana Ioana    | Calin          | Society for Responsible Consumption Romania                           | Romania         |
| 21 | Thomas         | Candea         | International Food Waste Coalition (IFWC)                             | France          |
| 22 | Ruby           | Casellini      | Humboldt University   | Germany         |

|    |                  |             |   |                |
|----|------------------|-------------|---|----------------|
| 23 | Rudolf           | Castillo    | Green Food Interactive                              | Sweden         |
| 24 | Corinne          | Castle      | Transition Bro Gwaun                                | United Kingdom |
| 25 | Emily Cheng      | Ching-Chang | Academia Sinica                                     | Taiwan         |
| 26 | Afentia          | Chorafa     | Boroume   | Greece         |
| 27 | Grazia           | Cioci       | Health Care Without Harm Europe                     | Belgium        |
| 28 | Marion           | Cocina      | Level IT  | Belgium        |
| 29 | Alice            | Codsi       | Food Win  | Belgium        |
| 30 | Xavier           | Corval      | EQOSPHERE   | France         |
| 31 | Balázs           | Cseh        | Hungarian Food Bank Association                     | Hungary        |
| 32 | Jennifer         | Davis       | RISE Agrifood and Bioscience                        | Sweden         |
| 33 | Charlotte        | Denis       | The Real Junk Food Project Berlin                   | Germany        |
| 34 | Joris            | Depouillon  | FoodWIN   | Belgium        |
| 35 | Raquel           | Díaz-Ruiz   | CREDA-UPC-IRTA                                      | Spain          |
| 36 | Ivo              | Dimitrov    | CogZum  | Bulgaria       |
| 37 | Elena Clementina | Dinu        | Ministry of Agriculture and Rural Development       | Romania        |
| 38 | Zanne            | Dittlau     | The Danish veterinary and Food Administration       | Denmark        |
| 39 | Juan Francisco   | Donoso      | Humboldt University                                 | Chile          |
| 40 | Tome             | Eftimov     | Jožef Stefan Institute, Computer Systems Department | Slovenia       |
| 41 | Nieves           | Espinosa    | JRC Seville   | Spain          |
| 42 | Raphael          | Fellmer     | SirPlus   | Germany        |
| 43 | Samuel           | Feret       | CIHEAM-IAMM   | France         |
| 44 | Paul             | Finglas     | Institute of Food Research                          | United Kindom  |
| 45 | Maria            | Flachsbarth | German Federal Ministry of Food and Agriculture     | Germany        |
| 46 | Daniel           | Fox         | Mad Med Aere  | Danmark        |
| 47 | Barbara          | Friedrich   | German Environment Agency                           | Germany        |
| 48 | Angela           | Frigo       | Fondazione Banco Alimentare Onlus                   | Italy          |

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|----|----------------|------------------|--|-----------------|
| 49 | Karin          | Führ Lindqvist   | Ministry of Enterprise and Innovation                        | Sweden          |
| 50 | Erika          | Galland          | Sodexo   | France          |
| 51 | Nick           | Garrod           | Cloud Sustainability   | United Kingdom  |
| 52 | Anne-Laure     | Gassin           | European Commission  | Belgium         |
| 53 | Ignacio        | Gavilan          | The Consumer Goods Forum                                     | France          |
| 54 | Maria Teresa   | Germosen         | FSEN Amsterdam   | The Netherlands |
| 55 | Manuela        | Gheoldus         | Deloitte   | France          |
| 56 | Jose M.        | Gil              | CREDA-UPC-IRTA   | Spain           |
| 57 | Carole         | Goebel           | Ministry of Agriculture, Viticulture and Consumer Protection | Luxembourg      |
| 58 | Tobias         | Goecke           | Real Junk Food Project Berlin                                | Germany         |
| 59 | Daniela        | Gruber           | European Federation of Food Science and Technology (EFFoST)  | The Netherlands |
| 60 | Tainá          | Guedes           | Entretempo Kitchen Gallery                                   | Germany         |
| 61 | Franziska      | Hamma            | Sodexo   | Germany         |
| 62 | Gunnar         | Hansen           | MediaCompany - Agentur für Kommunikation GmbH                | Germany         |
| 63 | Sabih ul       | Hassan           | University of Hohenheim                                      | Pakistan        |
| 64 | Peter          | Haugelund        | Det Runde Bord   | Denmark         |
| 65 | Olivier        | Hault            | Level IT   | Belgium         |
| 66 | Janina         | Heel             |  | Germany         |
| 67 | Miriam         | Heil             | Foodsharing  | Germany         |
| 68 | Sarah          | Hermges          | Federal Office for Agriculture and Food                      | Germany         |
| 69 | Paola          | Hernandez Olivan | Health Care Without Harm Europe                              | Belgium         |
| 70 | Anne           | Hildebrand       | METRO  | Germany         |
| 71 | Anastasia      | Hofmann          | KITRO  | Switzerland     |
| 72 | Alena          | Horn             | Foodsharing  | Germany         |
| 73 | Tony Shih-Hsun | Hsu              | National University  | Taiwan          |
| 74 | Susanne        | Huyskens-Keil    | Humboldt University  | Germany         |

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| 75  | Julia          | IJsselmuiden | Contronics Engineering  | The Netherlands |
| 76  | Casandra       | Ioan         | SRC   | Romania         |
| 77  | Corneliu Sorin | Iorga        | University of Agronomic Sciences and Veterinary Medicine of Bucharest | Romania         |
| 78  | Bettina        | Jakobsen     | European Court of Auditors  | Luxembourg      |
| 79  | Jutta          | Jaksche      | Verbraucherzentrale Bundesverband (vzbv)                              | Germany         |
| 80  | Vita           | Jarolimkova  | Food Power (FoPo)   | Germany         |
| 81  | Dominika       | Jarosz       | Feedback  | United Kingdom  |
| 82  | Vibeke         | Joergensen   | Ministry of Environment and Food                                      | Denmark         |
| 83  | Jennifer       | Josenhans    | Ecologic Institute  | Germany         |
| 84  | Melanie        | Kemper       | Ecologic Institute  | Germany         |
| 85  | Sebastiaan     | Kennes       | FoodWIN   | Belgium         |
| 86  | Hanna          | Kuisma       | City of Vantaa  | Finland         |
| 87  | Inés           | Lauber       | Studio Inés Lauber  | Germany         |
| 88  | Odile          | Le Bolloch   | Environmental Protection Agency                                       | Ireland         |
| 89  | Carol Sze Ki   | Lin          | City University of Hong Kong  | Hong Kong       |
| 90  | Thomas         | Luttikhold   | Wastewatchers   | The Netherlands |
| 91  | Christine      | Lutz         | Restlos glücklich   | Germany         |
| 92  | Karen          | Luyckx       | Feedback  | United Kingdom  |
| 93  | Erwin          | Maathuis     | Ministry of Economic Affairs  | The Netherlands |
| 94  | Ioana          | Man          | Society for Responsible Consumption                                   | Romania         |
| 95  | Gerald Perry   | Marin        | Food Power (FoPo)   | Germany         |
| 96  | Dalibor        | Matijevic    | FoodPlus  | Ireland         |
| 97  | Melissa        | Maxter       | Ecologic Institute  | Germany         |
| 98  | Hannah         | McCollum     | ChicP   | United Kingdom  |
| 99  | Keighley       | McFarland    | Ecologic Institute  | Germany         |
| 100 | Isabel         | Meyer        | Ministry for Climate Protection, Environment, Agriculture,            | Germany         |

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|     |                |                 | Conservation and Consumer Protection North Rhine-Westfalia |                 |
| 101 | Carina         | Millstone       | Feedback   | United Kingdom  |
| 102 | Graham         | Moates          | Quadram Institute  | United Kingdom  |
| 103 | Lena           | Nauland         | Foodsharing  | Germany         |
| 104 | Thai Binh Hanh | Nguyen          | Humboldt University  | Germany         |
| 105 | Lone Lykke     | Nielsen         | Danish EPA   | Denmark         |
| 106 | Torsten        | Nissen          | ReFood   | Germany         |
| 107 | Karin          | Östergren       | Research Institutes of Sweden                              | Sweden          |
| 108 | Philipp        | Paeslack        | Humboldt University  | Germany         |
| 109 | Julian         | Parfitt         | Anthesis   | United Kingdom  |
| 110 | Tuure          | Parkkinen       | ResQ Club  | Finland         |
| 111 | Daniel         | Pleissner       | Leuphana University Lüneburg                               | Germany         |
| 112 | Adam           | Podhola         | Zachran jidlo  | Czech Republic  |
| 113 | Raluca         | Popan           | Society for Responsible Consumption Romania                | Romania         |
| 114 | Liliana        | Potter          | Waste Journal  | United Kingdom  |
| 115 | Ludovica       | Principato      | Barilla Center for Food and Nutrition                      | Italy           |
| 116 | Philip         | Ras             | Green Food Interactive                                     | Sweden          |
| 117 | Carmen         | Redondo Borge   | HISPACOOOP   | Spain           |
| 118 | Diana          | Reinoso         | CREDA-UPC-IRTA   | Spain           |
| 119 | Jose           | Revatta         | Jose Revatta   | The Netherlands |
| 120 | Maria Eulàlia  | Reverté i Casas | European Court of Auditors                                 | Luxembourg      |
| 121 | Christian      | Reynolds        | The University of Sheffield                                | United Kingdom  |
| 122 | Maria Giovanna | Righetto        | Consorzio Agrituristico Mantovano                          | Italy           |
| 123 | Guido          | Ritter          | University of Applied Sciences Münster                     | Germany         |
| 124 | Pascale        | Robinson        | Feedback   | United Kingdom  |
| 125 | David          | Rogers          | WRAP   | United Kingdom  |
| 126 | Elco           | Rouwmaat        | Milgro   | The Netherlands |

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|-----|----------------|-------------|---|-----------------|
| 127 | Antonio Julián | Saiz García | Science and food sector                                       | Germany         |
| 128 | Leo            | Sakaguchi   | MealSaver   | Germany         |
| 129 | Katherine      | Sales       | Deloitte  | France          |
| 130 | Marta          | Sapała      |   | Poland          |
| 131 | Sarah          | Schade      | Humboldt University   | Germany         |
| 132 | Silvia         | Scherhauser | BOKU University of Natural Resources and Life Sciences Vienna | Austria         |
| 133 | Thomas         | Schmidt     | Thünen-Institut   | Germany         |
| 134 | Marjolijn      | Schrijnen   | Netherlands Nutrition Centre                                  | The Netherlands |
| 135 | Ninja          | Schröder    | Freiwild Improviationstheater Berlin                          | Germany         |
| 136 | Nikola         | Schulz      | Project Management Juelich/ERA-Net SUSFOOD2                   | Germany         |
| 137 | Axel           | Schunk      | Brotpiloten   | Austria         |
| 138 | Gao            | Si          | IVL Swedish Environmental Research Institute                  | China           |
| 139 | Lucy Olivia    | Smith       | Ecologic Institute  | Germany         |
| 140 | Christina      | Söhner      | B'90/Grüne  | Germany         |
| 141 | James          | Southwood   | DYCLE   | Germany         |
| 142 | Mirka          | Stark       | REWE Group  | Germany         |
| 143 | Martin         | Stasek      | European Commission   | Germany         |
| 144 | Åsa            | Stenmarck   | IVL Swedish Environmental Research Institute                  | Sweden          |
| 145 | Matthias       | Stocker     | Crispy Carrot   | Germany         |
| 146 | Anna           | Strejcová   | Zachraň jídlo   | Czech Republic  |
| 147 | Tristram       | Stuart      | Feedback  | United Kingdom  |
| 148 | Anke           | Stübing     | Nestlé Deutschland  | Germany         |
| 149 | Gaby           | Susanna     | Platforma Aprofitem Els Aliments                              | Spain           |
| 150 | Diane          | Taillard    | GS1 Global Office   | Belgium         |
| 151 | Tekla          | ten Napel   | Ministry of Economic Affairs                                  | The Netherlands |
| 152 | Valentin       | Thurn       | Thurn Film  | Germany         |
| 153 | Toine          | Timmermans  | Wageningen University   | The Netherlands |

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|-----|------------|----------------|---|-----------------|
| 154 | Regina     | Treutwein      | MealSaver   | Germany         |
| 155 | Zeynep     | Turgay         | Migros  | Turkey          |
| 156 | Kristina   | Tylaite        | Charity foundation Food bank                                      | Lithuania       |
| 157 | Katalin    | Újhelyi        | Hungarian Food Bank Association                                   | Hungary         |
| 158 | Marco      | Valletta       | European Commission - Directorate General of Health & Food Safety | Germany         |
| 159 | Anton      | van den Brink  | European Former Foodstuff Processors Association (EFFPA)          | Belgium         |
| 160 | Corné      | van Dooren     | Netherlands Nutrition Centre                                      | The Netherlands |
| 161 | Rowena     | van Doorn      |   | The Netherlands |
| 162 | Lisanne    | van Geffen     | Wageningen University   | The Netherlands |
| 163 | Kees       | van Gorp       | European Former Foodstuff Processors Association (EFFPA)          | Belgium         |
| 164 | Erica      | van Herpen     | Wageningen University   | The Netherlands |
| 165 | Alex       | van Kuilenburg | Milgro  | The Netherlands |
| 166 | Hilde      | van Lancker    | Flemish Governement   | Belgium         |
| 167 | Hans       | van Trijp      | Wageningen University   | The Netherlands |
| 168 | Angelique  | Vandevenne     | BroodNodig  | The Netherlands |
| 169 | Jan        | Velghe         | BV-OECO   | Belgium         |
| 170 | Matteo     | Vittuari       | University of Bologna   | Italy           |
| 171 | Caroline   | Wächter        |   | Germany         |
| 172 | Keith      | Waldron        | Quadram Institute   | United Kingdom  |
| 173 | Iseult     | Ward           | FoodCloud   | Ireland         |
| 174 | Mari       | Wigham         | Wageningen University   | The Netherlands |
| 175 | Channy     | Wild           | IPB Youth Network   | Germany         |
| 176 | Jennifer   | Wilson         | Anthesis  | United Kingdom  |
| 177 | Friederike | Wöhrlin        | German Federal Ministry of Food and Agriculture                   | Germany         |
| 178 | Fredrik    | Woods          | Swedish Board of Agriculture                                      | Sweden          |
| 179 | Stephanie  | Wunder         | Ecologic Institute  | Germany         |
| 180 | Seda       | Yildirim       | University of Applied Sciences Eberswalde                         | Germany         |

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| 181 | Stephan | Ziron     | Freiwild Improviationstheater Berlin   | Germany         |
| 182 | Thomas  | Zug       | Freiwild Improviationstheater Berlin   | Germany         |
| 183 | Irina   | Zuza      | Maastricht University                  | The Netherlands |
| 184 | Bianca  | Bellani   | Kitchen gallery                        | Germany         |
| 185 | Grazia  | Cioci     | Health Care Without Harm (HCWH) Europe | Belgium         |
| 186 | Camilla | Ferri     | Kitchen gallery                        | Germany         |
| 187 | Mai     | Goth      | RESQ / Mealsaver                       | Germany         |
| 188 | Tanja   | Ivanovska |  | Macedonia       |
| 189 | Judith  | Karis     | Durch foodbanks                        | The Netherlands |
| 190 | Fredrik | Woods     | Swedish Board of Agriculture           | Sweden          |