EUROPEAN COMMISSION
HEALTH AND FOOD SAFETY DIRECTORATE-GENERAL

Food and feed safety, innovation
Food information and composition, food waste

SUMMARY REPORT

EU PLATFORM ON FOOD LOSSES AND FOOD WASTE:
SUB-GROUP ON FOOD WASTE MEASUREMENT

DG HEALTH AND FOOD SAFETY (SANTE)
2nd meeting
Brussels, 36 Rue Froissart (Albert Borschette building), Room AB-3A
25 September 2017 – From 10:00 to 17:00

Chair: Tim Gumbel, *Deputy Head of Unit, Food information and composition, food waste, DG SANTE*

Commission: DG SANTE: Anne-Laure Gassin, Bartosz Zambrzycki, Dora Szentpaly-Kleis, Manuela Marcolini; **DG AGRI:** Olivier Diana; **JRC:** Serenella Sala, Carla Patinha Caldeira, Sara Corrado; **EUROSTAT:** Hans-Eduard Hauser

Member States represented (14):

BE, DE, DK, ES, FR, IT, IE, NL, RO, SE, SK, UK

Other public entities (1): FAO

Private sector organisations:
COPA, Europatat, FoodDrinkEurope, FoodServiceEurope, HOTREC Hospitality Europe; OSTFOLD RESEARCH, Nofima and Matvett Consortium; RISE RESEARCH INSTITUTES OF SWEDEN AB, WRAP, Zero Waste Scotland

1. WELCOME AND ADOPTION OF THE AGENDA

The Chair, Mr. Tim Gumbel, welcomed members to the second meeting of the Sub-group on food waste measurement of the EU Platform on Food Losses and Food Waste. He thanked all participants for their interest in contributing to EU efforts to establish a common methodology for food waste measurement and also extended his thanks to colleagues present from other Commission services (DG AGRI, JRC and Eurostat).

The Chair pointed out that the Commission lacked a clear mandate in the field as the discussions on the Waste Framework Directive (WFD) were still on-going. Thus the sub-group would focus on data collection, sharing best practices and generating further discussion to help inform a future methodology for food waste measurement.
After adopting the new agenda, the Chair introduced the presentation on the state of play of the Waste Framework Directive.

2. UPDATE ON THE STATE OF PLAY OF THE WASTE FRAMEWORK DIRECTIVE – PRESENTATION BY THE COMMISSION

The Commission delivered a short presentation on the state of play of the discussion regarding the Commission's proposal to amend the Waste Framework Directive. While the Council document did not envisage specific actions in the field of food waste, the European Parliament proposed more ambitious measures, among which: a definition of food waste, an aspirational EU food waste reduction target of 50% by 2030 and the establishment of a food waste hierarchy. Last but not least, the European Parliament also proposed a revision clause that required the Commission to set binding EU food waste targets.

The Commission expressed its concern regarding the date when the Waste Framework Directive would be adopted, mentioning that the latest amendments were quite ambitious and needed to be thoroughly discussed before being accepted by all parties. However, there was hope for a political agreement to be obtained before the end of the year.

3. PRESENTATION OF COLLECTION OF DATA ON FOOD WASTE BY MEMBER STATES

3.1 Food waste and food losses. Monitoring in Flanders

As Belgian representative, Flanders offered an overview of its work in food waste prevention, beginning with the 2014 Declaration of Commitment "Together against food losses" which was signed by representatives from all sectors across the food supply chain and a coordinated public action plan Biomass for 2015-2020. In 2015, the region also launched a Food Supply Chain Roadmap for 2015-2020, setting a 15% reduction target in food losses from farm to fork and establishing 9 action programmes with 57 actions. One of the action programmes called 'Monitoring for knowledge' brings together public authorities and private actors in a shared effort to collect robust food waste data for knowledge based policy making, but also to agree on a common monitoring framework.

In terms of the monitoring approach, Flanders began with existent structural data collection (Eurostat food waste plug in data) based on a large sample survey, which was then integrated into a biannual general waste reporting. Additional data collection was required for specific issues and areas (e.g. food waste in the hospitality sector); being gathered through other data sources, extra studies, expert working groups etc.

The definition employed aligned with that of FUSIONS: Flanders explained that food waste comprised both food that was not consumed i.e. 'food loss' and inedible biomass i.e. 'residues'. The report accounts for the total food waste per sector, the destination of food waste in relation to sector total, and distinguishes between food losses and residues. However, due to the fact that a large percentage of residues came from the industry that processed the food for export, Flanders explained that the total food waste quantity was not actually representative for the region's consumption. Regarding the valorisation of food waste, the most important destinations were animal feed (43%) and materials that could be possibly combined with energy production (44%).

Flanders planned to improve its calculation methods and repeat the Eurostat food waste plugin every 2 years, together with thorough monitoring in 2018 and 2020 to evaluate the accomplishment of the -15% target. An English version of the first monitoring report had been published on the Flemish Public Waste Agency's website for all interested

stakeholders. Among its final remarks, Flanders highlighted that monitoring should be part of a coordinated food waste policy framework with echoes across all sectors of the food value chain, serving as an opportunity to reach all actors involved and trigger change on many levels. Due to lack of data on food losses, the region recommended participants to start monitoring food waste in general, along with its destinations, in order to get a general idea of the phenomenon and possible means of valorisation. Last but not least, Flanders called for the creation of national and European policy instruments to trigger actions and behaviour change related to food waste.

A summary of the following discussion is provided hereafter:

- When inquired about the methodology to quantify food waste going to the sewage, Flanders replied that all the households that participated in the study were asked to fill out a questionnaire with information on each product group (including liquid foods) and its destination.
- NL raised the issue of quantifying food waste coming from products destined for export as part of the total food waste generated in a specific country, commenting that the data did not reflect the country's consumption.
- DK asked about the evaluation of uncertainty of data, Flanders explained that the aspect had not been included in the report, even though there have been assessments of data uncertainty for the overall generation of food waste. However, due to lack of data in certain areas, assumptions and models have been employed, created in collaboration with working groups of specialists in the field.
- FoodDrinkEurope suggested that the real learnings were in the granular data, which informed authorities about the hot points where action should be taken. To the organization's inquiry about ways to improve separate collection, Flanders explained that there was a need to expand the collection of organic vegetable waste to other organic waste in a way that was feasible for both food business operators and public authorities.
- While considering food donations, Flanders explained there is an online system in place that connects food business operators (who are able to post their available food) and social operators. The region had collected 16,400 tonnes of surplus food to donate for social purposes in 2015.
- The Commission noted that half of the amount reported (food material used for feed or agricultural purposes) was not within the scope of the Waste Framework Directive and should not be regarded as food waste, DE also remarked that some of the waste streams covered were outside the scope of the directive.
- In the context of waste codes, several members (WRAP, Zero Waste Scotland) highlighted the need to further investigate how manufacturing waste codes were employed, as sometimes variation could be found between sectors, depending on the materials used and their connection to food.

3.2 Food waste statistics in Austria

AT highlighted food waste as being one of the main areas in the Austrian Waste Prevention Programmes, which mainly focused on mixed municipal solid waste, the retail sector and the food service sector. In the absence of data from other sectors, they made rough estimations of food waste coming from home composting, separate collected bio-waste, sewerage and agriculture.

While referring to mixed municipal solid waste, AT highlighted the heterogeneous composition analyses practices, which varied from one federal state to another. Without a

legal requirement in place, each province carried out analyses at irregular intervals, mainly in the course of preparation of their waste management plans. As an example, the Lower Austria region considered land clusters according to socio-economic factors (rural with/without centre, urban regions) and collected samples from each of them in a random manner. The samples were then sieved into various sub-fractions, depending on the type of product found (e.g. waste from the preparation of food, leftovers, partly used food, organic waste etc.). In terms of challenges, AT pointed out at a lack of a uniform procedure to determine the food waste fractions in the past; making it difficult to compare results among studies. Thus there have been significant discrepancies between various federal states when it came to avoidable food waste, the food waste total and the biodegradable waste total.

In order to determine the quantity of food waste generated in the food service sector, there has been a study conducted by a consortium of universities together with an initiative of the food industry, which carried out waste analyses in 50 establishments, among which canteen kitchens, accommodation establishments, restaurants and catering services. After sorting and weighing the waste, allocating it to kitchen areas and product groups, an extrapolation of the annual national quantities was made. The total numbers obtained distinguished between avoidable and unavoidable food waste, the latter being residues from food preparation and representing a total of 22% of the total waste.

A study carried out by two universities and supported by the major food retailers in AT covering a market share of 83%, focussed on the generation of food waste in the retail sector. The companies provided internal data on their food losses for 2013, helping produce accurate estimations on food losses in retail according to categories of products wasted. The data also revealed a number of 6,600 tonnes of edible food donated to social institutions, which was not considered food waste as such.

AT was planning to start a national analysis of municipal solid waste across all of its 9 federal provinces in 2018, with results to be available in 2020 (to be repeated every 5-6 years). The analysis will employ a common methodology based on representative sampling, considering various food waste fractions such as 'avoidable', 'partly avoidable' and 'not avoidable'. Concurrently, due to a voluntary agreement with the retail sector, food waste data will be provided every 3 years, with new results expected in 2018. AT finished its presentation by inviting all participants to reflect on a series of open questions related to the baseline and the type of food waste considered for the 50% reduction of SDG 12.3 (avoidable/unavoidable), but also on how to integrate past efforts to curve food waste of certain Member States in the new target.

A summary of the following discussion is provided hereafter:

- On the issue of distinguishing between avoidable and unavoidable food waste, AT defined the latter as being residues from the preparation of food. DE emphasized that the approach had a subjective nature, explaining that some waste such as carrot peels could fall into more than one category. Thus staff conducting composition analysis will need to have clear manuals with instructions on each type of product. Matvett indicated that the main focus should be on the edible fraction of food waste, rather than on the inedible one.
- WRAP inquired whether the retail study also covered information on food shrinkage based on mass balance, to which AT replied that such data had not been included in the calculations.

- Matvett suggested a shift to studying more homogenous groups across the whole food value chain and obtaining relevant data which could be later on scaled up to national statistics, rather than relying on big data sets.
- To the Commission's question on the share of food waste in the mixed household waste, several Member States (AT, BE, DE) offered their data ranging between 17-20 kg of food waste per inhabitant. IT emphasized that such information referred only to the avoidable waste.
- In regards to the future baseline, the Commission mentioned that although the 2014 proposal offered Member States the flexibility to choose the year with the most reliable data on food waste, there was no certainty about how reporting obligations will look like on the basis of the future legal framework. The Commission also mentioned the possible need for a derogation clause, allowing Member States to align their efforts with that of the final target adopted in the Waste Framework Directive. At the Commission's inquiry on the best baseline for each Member State, WRAP highlighted the year 2007 for the UK and DK mentioned the year 2011.

4. COLLECTION OF DATA ON FOOD WASTE IN FOOD INDUSTRY BY FOOD BUSINESS OPERATORS – BY FOODDRINKEUROPE

The presentation by FoodDrinkEurope was delivered by a representative of Nestlé. After presenting a few of the company's figures in terms of products and business capacity, Nestlé offered an overview of their on-going commitments to respect targets related to environmentally sustainable business practices. As a member of the Consumer Goods Forum and a partner in drafting the World Resources Institute's Food Loss & Waste Protocol, the company pledged to achieve zero waste for disposal on the company's sites by 2020. Nestlé highlighted its efforts to reduce food waste through eco-design, packaging, responsible sourcing, manufacturing and distribution practices, but also information and education, long-term engagement and partnerships, and yearly reporting.

With respect to the methodology employed to quantify and report on site food waste, Nestlé explained that data was reported on a monthly basis on both food and beverages, but also inedible parts. At the same time, all destinations of food waste were taken into account in order to identify the streams which had not been valorised before. Thus the company managed to achieve a reduction of 76% in waste for disposal since 2006.

Next, Nestlé outlined the applicability of the Food Loss & Waste Protocol in the context of a pilot project concerning the Pakistani milk supply chain. The company collected data through direct weighing and surveys between May and December 2014, which was later on extrapolated for the whole year. Taking into account the socio-economic realities of the local milk value chain, the study identified the main waste destinations as being landfill, refuse/discards and sewer. Although the results showed there was room for improvement in market return practices, most significant losses were due to the unmet production potential of the cows, rather than waste.

The company ended the presentation by mentioning the 2016 Nestlé in Society Report, informing on the progress made in terms of commitments among which reducing and preventing food losses and food waste.

A summary of the following discussion is provided hereafter:

- When asked about the possibility to carry out future studies on food waste in Europe, Nestlé replied that there had been discussions with various Member States, among which a plant in DE seemed to be the most probable choice.
- To COPA's enquiry about a future study on food waste and hazelnuts, the company argued that to date hazelnuts are not foreseen to be assessed.
- In terms of capacity building (COPA), Nestlé confirmed they were engaging with local farmers through entrepreneurship programmes, trainings on best practices, especially in the management of feed where losses were substantial.
- Matvett asked about the different categories of farmers involved in the study and whether the size of the farm affected the generation of food losses and food waste. Nestlé expressed its willingness to share further details, while confirming that the quantification methods employed did not focus on that aspect.
- To the Commission's question on what were milk market returns, the company explained they were unsold goods due to damaged packaging or exceeding their expiration date.

5. UPDATE ON PLUG-IN EXERCISE - PRESENTATION BY THE COMMISSION (EUROSTAT)

Eurostat offered an update on the food waste plug-in exercise, with a focus on the List of Waste codes which mainly (EWC 9.1 and 9.3) or partly (EWC 10.1) consist of food waste. In particular, Eurostat parted from the assumption that mixed household waste consisted of 25% food waste (based on a survey among 13 Member States). On that basis, Eurostat estimated food waste generation in EU-28 at 81 million tonnes (161 kg/cap) in 2012 and 76 million tonnes (149 kg/cap) in 2014; figures that were generally similar to the results from the FUSIONS report (87.6 ± 13.7 mln tonnes for 2012). Eurostat intends to repeat the exercise on the basis of 2016 data.

A summary of the following discussion is provided hereafter:

- When asked about the availability of 2016 data on food waste, Eurostat explained there was usually a delay of 18 months for Member States to send in their data, giving October 2018 as an approximate date for delivering the results.
- In response to the Commission's comparison on the data used in FUSIONS and the plug-in exercise, Eurostat confirmed that all type of food waste had been considered and that the end result was close to the FUSIONS figure. However, Eurostat also highlighted the importance of ambient factors, such as heat, and the way in which it influenced the total mass of food waste.
- In terms of distinguishing between the waste generated for exported foods and waste coming from products destined for national consumption (Matvett), Eurostat explained that their statistics did not make such differences. The Chair confirmed that the Commission would have to address this issue further on in order to avoid discrepancies between Member States.
- RISE RESEARCH INSTITUTES OF SWEDEN AB asked about the assumption of 25% household waste being food waste and the way in which it will integrate the new data received from Member States. Eurostat defined the figure as a rough estimate due to different the methodologies to quantify food waste, emphasizing the fact that data had been accompanied by good documentation.
- To the Chair's inquiry on the correlation of different consumption patterns to food waste generation in households across Member States, Eurostat confirmed that some correlations have been studied (e.g. disposable income, purchase power parity etc.) but no significant equivalences had been found; and that

interconnection to cultural drives (food linked habits) could not be effectively measured.

- IT inquired whether estimations concerning the total amount of food waste generated per inhabitant were available in order to make comparisons across various sectors and Member States. Eurostat explained that data coming through the 3 EWC-Stat. codes regarding food waste could be compared, while voluntary data collected from Member States could not be aligned due to the different methodologies employed.

- Zero Waste Scotland emphasized that the uncertainty factor should be acknowledged while carrying out studies on food waste measurement, but it should not be considered a barrier in making assumptions. Eurostat highlighted that the approaches depended on the issue under investigation and the question of the study. The Commission explained that the latter would be discussed in a future meeting, in close connection with possible indicators to help quantify food waste (per capita or total); together with other issues such as quantifying waste coming from imported/exported foods. At the same time, members were reminded that food waste would be reported by the stage of the food supply chain in which it arises, in order to identify the reasons for its generation – in this sense following the approach taken by FUSIONS.

- In terms of distinguishing between the waste generated during production of exported foods and waste coming from products destined for national consumption (Matvett), the Chair expressed that this issue may be a subject for further reflection in the future.

6. THE NEGOTIATED AGREEMENT FOR PREVENTION OF EDIBLE FOOD WASTE IN NORWAY – METHODOLOGIES FOR FOOD WASTE QUANTIFICATION

Matvett offered a short presentation on the Negotiated Agreement between the government and the food sector in Norway, focusing on its methodology to quantify edible food waste. The main elements of the Negotiated agreement relate to quantification and statistics, through means of data gathering and upscaling to national figures. The collected data covered households (generating over 60% of the total food waste) and other sectors, but it excluded losses from agriculture or food waste from the food services sector. With 70% of the total food waste in retail represented by fruits and vegetables, Matvett argued that a definition of food waste should also include recovered foods that go to feed, compost etc.; which were not at that time visible when taking prevention measures.

Last but not least, Matvett explained that due to the multitude of actors involved in the Negotiated agreement, the topic enjoyed a wide media coverage, which helped raise awareness on the issue of food waste among Norwegian consumers. However, not all actors were part of the agreement from the beginning, as it was the case of fish sector representatives that joined later on. Matvett explained that there was a discrepancy between the food waste generated by the fish sector and its total number of inhabitants; as a large quantity of fish produce was designed for export, while the production waste remained in the country.

When inquired whether the agreement helped improve the uncertainty degree of food waste data (DE), Matvett replied that methodological uncertainties were more numerous than statistical ones, highlighting the need for further training of all the people involved

in the collection of data. In terms of units of measurement, as most of the data on food waste from the retail and food service sectors was calculated in money (NL), Matvett developed a list of the most relevant 200 key food products and their prices; which was then used as a baseline for calculating the total amount of food waste generated by its economic value. While companies provided data on a voluntary basis, it was also possible for the statistical authorities to request data from food business operators under the national statistic regulation.

7. COMMISSION'S UPDATE ON THE INTERPRETATION OF THE DEFINITION OF FOOD WASTE FOR SDG 12.3 – PROPOSED BY THE WORLD RESOURCES INSTITUTE (WRI) ON BEHALF OF CHAMPIONS 12.3 AND UPDATE BY FAO ON MONITORING OF SDG 12.3

The Commission informed members about the latest publication issued by the WRI on monitoring food waste to achieve the SDG 12.3 target. WRI (who provides secretariat for the Champions 12.3) had prepared a non-binding document proposing an interpretation of SDG 12.3, which would serve as a basis for a global debate on how to approach this specific target. One of the suggestions was to quantify all foods and associated inedible parts of foods; which would simplify the reporting process yet provide less detailed information. Another important point referred to reporting non-harvested food; which would imply further research on measurement methodologies to cover this category of losses. The document is publicly available on the Champions 12.3 website.

FAO offered a quick update on its work: an Expert Consultation (28-29 September 2017) is providing the background for a FAO document which would serve as a baseline for discussions on a methodology to quantify food loss, food waste and post-harvest loss. The methodology for the Indicator (i.e. the Global Food Loss Index - GFLI) concerning the monitoring of SDG 12.3 will take into account the agricultural production systems, including crops, livestock, and fisheries sectors and will be based on the FAO Food Balance Sheets (FBS). The FBS are submitted as country reports, taking weight as a unit of measure. The GFLI should be obtained as a weighted average of the single indexes calculated for all world countries. The results could be later expressed in other units of measure such as calories (linked to human nutrition) or CO_2 equivalents (linked to greenhouse gas emissions).

Due to methodological reasons and the fact that SDG 12.3 refers to both food loss and food waste as well as to post-harvest loss, FAO decided to exclude losses caused by natural calamities, which would be addressed under SDG 1.5, and pre-harvest losses. Thus, the Organisation's interpretation suggested considering food losses as starting from the harvest point until the distribution sector, while food waste would cover the rest of the food supply chain until the household level - which is also included. To date, only 4.4% of countries report food loss within the FBS – therefore, the missing data needed to be estimated. FAO mentioned 2005 as the current proposed baseline for the GFLI, which could be later replaced by 2015, as soon as new data becomes available.

3. PRESENTATION OF COLLECTION OF DATA ON FOOD WASTE BY MEMBER STATES (continuation)

3.3 Measuring household food waste. The Spanish experience

ES presented its national strategy called "More food, less waste", which came as a response of the Spanish government to the European Parliament's resolution of January 2012, urging Member States to address the problem of food losses and food waste along

the food supply chain. The initial implementation period lasted between 2013 and 2016 and included five main focus areas: knowledge generation, good practices and awareness raising, regulatory aspects, collaborating with other actors and new technologies. In the context of the first focus area, ES developed a specific monitoring method for households: the *Household food waste panel* which quantified the food and drinks that were thrown away/discarded via the sewer, with and without any previous preparation.

In order to monitor food waste at a household level, ES employs data from both its *Purchase* and *Usage panels*. The first panel offers an overview of the daily purchases of foods and drinks, the second panel monitors the recipes cooked by households on a daily basis. Data collection is carried out through sample reports - which include information on the day and place of purchase etc.; and online questionnaires of weekly consumption patterns spread throughout the whole year – with data on the products consumed, way of cooking etc. Based on the two panels, ES has created a general *Food waste panel* which takes into account a sample of 4000 households and follows a similar methodological line as the previous two panels.

ES' approach offered detailed data on sociodemographic aspects, while covering all foods and drinks wasted at household level. The information constitutes a good basis to design effective interventions in order to prevent food waste. While considering the methodology employed, ES explained that sample households had a wide experience in panel participation and that questionnaires allowed participants to quantify food waste in different units of measure according to the selected product. The resulting data - on products that had been wasted and the way in which they were bought, as well as on the parts of the recipes that had been wasted - was fragmented according to sociodemographic criteria such as regions, age of the housewife, presence of children in the home, socioeconomic level and life cycles.

The Spanish national strategy entered a new implementation period between 2017 and 2020, expanding the areas of action to eight: knowledge generation, training and awareness, good practices, collaborating with other agents, sectorial agreements, regulatory aspects, research and innovation and food waste, environment and climate change. Among the next steps, ES would continue to improve its measurement methodology (i.e. measuring waste discarded via the sewer or composted at household level), design effective interventions to prevent food waste and create an on-line database with data according to calendar years.

A summary of the following discussion is provided hereafter:

- When asked about the reliability of the data (Commission, Copa) in relation to reporting practices or biased answers, ES explained that all methodological tools employed were part of the national statistical plan. On the consumers' side, the households involved in the panel had experience with participating in surveys and were not aware of the final purpose of the questionnaires in order to avoid biased answers. The replies were later on screened for quality control and households that provided faulty information were replaced with other panellists.
- DE inquired about the way in which private companies could be asked to hand over data on product purchasing, to which ES replied that the data collection process was done through external contractors who collaborated with private companies in order to design the different panels.
- In terms of units of measurement for food waste (DE), ES explained that households were only asked to provide the amount of wasted food. This was later on converted into kg based on conversion factors and specific bibliography.

Matvett highlighted the importance of measuring the total food waste per individual per year, rather than focusing on the total amount of waste produced by the household. Spain replied that the *Purchase panel* – which offered sociodemographic information regarding household members - allowed extrapolation of data on individual waste per year.

- DE inquired whether there was any distinction made between edible and non-edible food; Spain clarified that this type of data could be extrapolated by using tables that distinguished between different categories of products and their compositions. In terms of quantifying waste resulted from food preparation/cooking (IT), ES explained that such waste was not accounted for.
- In terms of priority areas for action (Matvett), the first focus area was to generate knowledge, and later on to raise awareness and foster good practices in food waste prevention. With the new implementation period of the national strategy, ES would focus on the households, as they waste the most food.
- When asked about the explanation behind the data indicating an increase of meat and fish waste against data showing a decrease of total food waste (NL), ES replied that such information could be obtained through ad hoc surveys with specifically targeted questions on a smaller sample of households.

8. FOOD WASTE ACCOUNTING: ONGOING RESEARCH AT THE JOINT RESEARCH CENTRE (JRC) – PRESENTATION BY THE COMMISSION (JRC)

The Joint Research Centre (JRC) of the European Commission presented its ongoing research on food waste accounting which focusses on two main areas: the quantification of biomass flows and the identification of valorisation areas. In order to assess the sustainability of food waste prevention and valorisation options, the study employs the Life Cycle Thinking and Life Cycle Assessment-based approaches (LCT and LCA) – used to measure the performance of goods, services, systems, waste management options etc. The methods help identify the most important burdens and the most relevant life cycle stages contributing to environmental impacts, covering over 15 categories of impact (climate change, eutrophication, land use, resource depletion etc.).

In the context of the EU Circular Economy Action Plan, the JRC has been offered a mandate to develop a study on Bioeconomy, with the purpose to assess the global and EU biomass flows and sustainability; to create scenarios and projections for biomass supply and demand and their respective impacts; to cover all sources and uses of biomass and to address impacts linked to the production and use of biomass. As one of the priority areas of the EU Circular Economy Action Plan, food waste has a huge potential for prevention and valorisation as energy and materials. The study covers 4 areas: the assessment of available quantities, reviewing possible prevention and valorisation pathways, the technical and economic assessment of the process and the environmental benefits and burdens of the current scenario compared to alternative options.

When discussing food waste definitions, the JRC highlighted that clarifying the distinction between avoidable/unavoidable and edible/inedible was key in order to improve the quantification of food waste. Concurrently, combining top-down and bottom-up food waste accounting approaches allowed a better characterization of the total amount of food waste generated at a European level; with the goal to identify the priority areas and evaluate the prevention and valorisation options.

The study assesses potential routes of valorisation, together with their economic and environmental impacts, for the most relevant food loss and waste streams; considering consolidated and innovative practices based on both EU statistics and scientific literature.

In terms of food waste prevention, the research employs the LCA approach to assess the economic and environmental burden and benefits of prevention actions in 2 scenarios: at household level and at other stages before consumption. Last but not least, the presentation highlighted that different policy areas (such as Prevention, Management or Valorisation) would require different food waste accounting methodologies.

A summary of the following discussion is provided hereafter:

- In terms of assessing consumer behaviour and the impact of generated food waste according to the manner in which the food had been processed (IT), JRC confirmed that the on-going study included behavioural scenarios and consumption patterns.
- FAO asked for more details on how the investments and return of investment had been calculated, to which JRC replied that a team of technical engineers helped identify the key processes based on which costs were calculated (the chemical transformation of ingredients, transport, employees etc.).
- While distinguishing between waste and by-products and the different options for valorisation (FAO), JRC explained that the distinction was based mostly on cultural grounds.
- Zero Waste Scotland offered to share the results of their latest study on bioeconomy (including solutions for inedible parts of food) with other members, but also with the "Action and Implementation" sub-group. FoodDrinkEurope also announced their study on by-products and valorisation routes, as well as their collaboration with WRAP on a study on food waste and nutrition, which employed the LCA approach. The latter focused on the retail and household levels, but did not offer clear conclusions due to inconclusive data.
- COPA asked about the relevance of the LCA method in quantifying food waste, to which JRC responded that the approach helps prioritize areas of action according to the different environmental impacts (emissions). Further on, the method applies to all the stages of the food supply chain and helps distinguish between levels of efficiency and environmental impacts in different food processing practices.
  Matvett commented that the traditional LCA approach increased the impact of the initial food producer; while the more recent method allocated the impact of extra production to various sectors of the food supply chain, rather than only to the farmer. The Commission emphasized the need to map food flows in order to identify food waste generators, highlighting the added value of sharing such information as to compare figures with other members' and fill out the missing data.

Before closing the meeting, the Chair reiterated the objective of the sub-group to discuss how to best facilitate data development and the establishment of a measurement methodology. He also announced the upcoming plenary meeting of the EU Platform on FLW on the 7th of November and promised to keep members updated on the latest developments concerning the Waste Framework Directive.

In ending the discussion, the Chair thanked members for their contribution and interest in the work of the "Food waste measurement" sub-group.