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Documentation of the Expert Forum 2017: Effectively Reducing Food Waste – Achieving more together

For our Environment

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Documentation of the Expert Forum 2017: Effectively Reducing Food Waste – Achieving more together

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BMEL	Federal Ministry for Food and Agriculture (the acronym stands for Bundesministerium für Ernährung und Landwirtschaft)
BMJV	Federal Ministry of Justice and Consumer Protection (the acronym stands for Bundesministerium der Justiz und für Verbraucherschutz)
BMUB	Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (the acronym stands for Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit)
DEHOGA	German Hotel and Restaurant Association (the acronym stands for Deutscher Hotel- und Gaststättenverband)
EDI	Electronic Data Interchange
FAO	Food and Agriculture Organization of the United Nations
GIZ	German Society for International Cooperation (the acronym stands for Gesellschaft für Internationale Zusammenarbeit)
SDG	UN Sustainable Development Goals
UBA	German Environment Agency (the acronym stands for Umweltbundesamt)

1 Introduction

According to the World Food Organization (FAO), about one-third of the food is lost every year on the way from field to plate, while at the same time about 800 million people suffer from hunger. This level of waste is not only irresponsible from an ethical and social point of view, but also represents a massive loss of natural resources that are necessary for the production and processing of food. Against this background, the Umweltbundesamt (German Environment Agency) in cooperation with Wuppertal Institute, Stakeholder Reporting and ifeu Institute, initiated the expert forum "Effectively Reducing Food Waste – Achieving More Together", which took place in Berlin on 5 September 2017. The aim of the forum was to set an impulse for ideas and approaches for the effective reduction of food waste and losses along the entire value chain and to discuss and develop such ideas and approaches with stakeholders from the whole value chain. The forum was supported by scientific research..

In the first part A, this report summarizes the current status of the discussion on food waste and names identified causes for food waste and food losses. Based on these findings the core topics for the expert forum were derived and discussed with the experts in five interactive workshops.

The second part B presents the results of the expert forum.

2 Part A – Status quo

2.1 Current state of debate

2.1.1 Food losses and their environmental impact

In the European Union (EU-27), approximately 89 million tonnes of food (around 179 kg per capita) are disposed of annually (without losses during agricultural production).[1] In comparison with the EU member states, Germany is only in 18th place in terms of per capita production, but has the second highest food waste generation in total after Great Britain. [2] The production and consumption of food is responsible for up to 30% of all environmental impacts in Germany.[3] In 2010, the German food consumption required in total around 20.1 million hectares of agricultural land in Germany and abroad. This means that 2,506 square metres of land are used per person, 57% of this is used for the cultivation of animal feed and imported food of animal origin, and about 43% for the cultivation and import of plant-based food.[4] In Germany, approximately 11 million tonnes of food waste are generated annually along the value chain from the food industry to the consumer - without taking into account the losses from the agricultural sector.[5]

Households generate approximately 6.7 million tonnes of food waste, or 82 kg per person per year, of which 53 kg are regarded as avoidable (47%) or partially avoidable (18%), which in principle would have been suitable for consumption, unlike for example bones.[6] The value of this avoidable and par-

1 V. Monier; S. Mudgal; V. Escalon; C. O'Connor; T. Gibon; G. Anderson; H. Montoux; H. Reisinger; P. Dolley; S. Ogilvie; G. Morton (2010): Preparatory Study on Food Waste in the EU 27. Final Report. Edited by the European Commission, Brussels, p. 11.

2 Monier et al. (2010), pp. 64 - 65.

3 Umweltbundesamt (Ed. 2015): Daten zur Umwelt. Umwelt, Haushalte und Konsum, p. 66.

4 Umweltbundesamt (Ed. 2015), p. 71.

5 M. Kranert; G. Hafner; J. Barabosz; H. Schuller; A. Kölbig; F. Schneider; S. Lebersorger; S. Scherhaufer (2012): Ermittlung der weggeworfenen Lebensmittelmengen und Vorschläge zur Verminderung der Wegwerfrate bei Lebensmitteln in Deutschland, Stuttgart, p. 204.

6 Kranert et al. (2012), p. 121-122.

tially avoidable household food waste amounts to about 234 € per capita and year.[7] Eating out produces approximately 1.9 million tonnes per year. In absolute terms, this is less food waste than in the household, but in proportion to this, almost one-third of the food used is lost. Eating out thus constitutes a relevant field of action. According to the calculations, approximately 550,000 tonnes are generated in the retail and approximately 1.85 million tonnes in the industry sector. In addition to the aforementioned food waste, in the agricultural sector, post-harvest losses (= losses that arise between harvesting and consumption) of four representative sample crops were determined (wheat, potatoes, eating apples, carrots): these ranged from 3.3% (wheat) to 11% (apples).[8]

The losses of food have significant ecological effects: food losses - avoidable and unavoidable - produce almost half a tonne of greenhouse gases (CO_2-equivalents) per capita per year, use about 500 square meters of agricultural land and consume around 2,700 litres of water. Extrapolated to the population of Germany, this equals more than 38 million tons of greenhouse gases (CO_2-equivalents), 43,000 square kilometres of agricultural land and 216 million cubic meters of water per year.[9] Greenhouse gas emissions caused by food losses account for around 4% of Germany's total emissions [10], which is as much as 270 billion passenger car kilometres.[11] Although the losses of meat are relatively low, animal products have a significant impact on the environment in terms of land use and climate-damaging greenhouse gases - for example, a single kilogram of beef is associated with around 13-15 kg of greenhouse gas emissions (CO_2-equivalents).[12] The greenhouse gas emissions related to the production of fruit and vegetables are lower, but the high losses of fruits and vegetables, however, lead to a large CO_2 footprint and high water loss.[13]

2.1.2 Political Context

Against the background of ecological relevance, international, European and national strategies and targets for the prevention of food waste are increasingly being adopted. At the international level, the United Nations decided in September 2015 with its goals for sustainable development (SDGs), to reduce the per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses by 50% until 2030 (SDG 12.3).[14] The Federal Government is also committed to this goal and emphasizes the necessary involvement of all actors in the value chain.[15] A similar approach is pursued by the German waste prevention programme, which involves the federal states and was adopted in 2013 [16]. This programme aims to reduce food waste by focusing on the entire value chain. In the food policy report[17] of 2016, the German Federal Government formulated that the initiative "Too good for the bin" should be continuously developed further and transformed into a national strategy against food waste in order to achieve the sustainability goal of reducing food waste (SDG 12.3). In addition to the federal states, all actors in the food value

7 Kranert et al. (2012), p. 125.

8 G. Peter; H. Kuhnert; M. Haß; M. Banse; S. Roser; B. Trierweiler; C. Adler (2013): Einschätzung der pflanzlichen Lebensmittelverluste im Bereich der landwirtschaftlichen Urproduktion, Braunschweig.

9 D. Jepsen; A. Vollmer; U. Eberle; J. Fels; T. Schomerus (2016): Entwicklung von Instrumenten zur Vermeidung von Lebensmittelabfällen. Endbericht. On behalf of the German Environment Agency, p. 88.

10 Jepsen et al. (2016), p. 22.

11 Calculation based on average car emissions according to emission data of the German Environment Agency, https://www.umweltbundesamt.de/themen/verkehr-laerm/emissionsdaten

12 M. Müller-Lindenlauf; G. Zipfel; J. Münch; S. Gärtner; N. Rettenmaier; D. Paulsch; G. Reinhardt (2013): CO_2-Fußabdruck und Umweltbilanz von Fleisch aus Baden-Württemberg. Heidelberg, p. 15.

13 FAO (2013): Food wastage footprint. Impacts on natural resources. Summary Report, p. 7.

14 https://sustainabledevelopment.un.org/sdg12

15 Deutscher Bundestag (2017): Drucksache 18/12631, p. 2.

16 Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (BMUB) (2013): Abfallvermeidungsprogramm des Bundes unter Beteiligung der Länder, Bonn.

17 Deutscher Bundestag (2016): Bericht der Bundesregierung zur Ernährungspolitik, Lebensmittel- und Produktsicherheit – Gesunde Ernährung, sichere Produkte (Ernährungspolitischer Bericht 2016). Drucksache 18/8650.

chain are to be involved in this process. The National Programme for Sustainable Consumption[18], published in January 2017 is part of the Federal Government's overall strategy for more sustainability and highlights the prevention of food loss as a key area of action in the field of nutrition. In March 2017, the Bundesrat (German Federal Council) passed a resolution to reduce food losses[19]. This calls on the Federal Government to draft a legal initiative to reduce food losses in Germany. In addition, it is also called for the planned national, cross-departmental coordination platform to be set up as quickly as possible and for a strategy to reduce food losses to be developed, which includes binding reduction targets. This national strategy is to be prepared by the Federal Government together with the federal states and involving all relevant actors. In addition, the Bundesrat asks to establish a nationwide research network and to enshrine the valuation of food as a topic in strategies and projects across all departments.

Also at the European Union level, food waste is dealt with in various approaches and strategies. In 2016, the European Commission established the "EU Platform on Food Losses and Food Waste"[20] as part of the EU's circular economy action plan. As a central forum at EU level, it aims to promote exchanges and cooperation between actors from public authorities, international organisations and the private sector and to support the identification and implementation of measures to reduce food waste in order to contribute to the achievement of SDG 12.3.

2.2 Approaches to reducing food losses

In order to reduce food losses at all stages of the value chain, various approaches are already being discussed and implemented.

In France, a law was passed in February 2016 imposing an obligation on supermarkets from 400 square metres upwards to donate unsellable but edible food to social institutions, or alternatively to use them as animal feed or compost.[21] To this end, agreements must be concluded with charitable institutions. Penalties may be imposed for violations of the law. Also in Italy, a law was passed in August 2016 regulating the transfer and distribution of surplus products, including food, for charitable purposes.[22] In Italy, however, there is no threat of sanctions; businesses receive tax benefits for their donations instead.

In Germany, the information campaign "Zu gut für die Tonne" ("Too good for the bin") is informing consumers as well as companies, municipalities and multipliers such as teachers about food waste. The campaign pools numerous information materials and campaigns, such as the campaign "Restlos genießen" ("Enjoy food without food losses"), which pursues the goal of encouraging restaurateurs and guests to take food leftovers home in "leftover boxes". Since 2016, the Federal Ministry of Food and Agriculture (BMEL) has awarded the Federal Prize against Food Waste to new initiatives and companies that are leading the way as pioneers. Against the background of the implementation of the national waste prevention programme, the German Environment Agency (UBA) and the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) conducted waste prevention dialogues in four action areas with experts and representatives of various interest groups from 2014 to 2017. The dialogues on the theme of food waste prevention[23] focused on out-of-home foodwaste and the interaction of food hygiene and waste prevention. A practical guide for the catering

18 Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (2017): Nationales Programm für nachhaltigen Konsum. Gesellschaftlicher Wandel durch einen nachhaltigen Lebensstil, Berlin.

19 Bundesrat (2017): Entschließung des Bundesrates - Lebensmittelverluste in Deutschland verringern. Drucksache 180/17 (resolution).

20 https://ec.europa.eu/food/safety/food_waste/eu_actions/eu-platform_en

21 LOI n° 2016-138 du 11 février 2016 relative à la lutte contre le gaspillage alimentaire

22 Staatsgesetz Nr. 166, 19. August 2016.

23 Umweltbundesamt (n.d.): Lebensmittelabfallvermeidung. https://www.umweltbundesamt.de/abfallvermeidung-lebensmittel

sector published by UBA in cooperation with the German Hotel and Restaurant Association (DEHOGA)[24] shows how targeted planning and the consideration of all process steps in the context of catering can significantly reduce food waste and leftovers. In addition, caterers and kitchen staff will also find practical tips in ten fact sheets, e. g. on how to clearly serve of the food, set up feedback loops for guests and customers, and pass on edible food to non-profit institutions. Apps such as "Too Good To Go" and "ResQ" are designed to save remaining meals from restaurants from being thrown away, while the "FoodLoop" app enables retailers to automatically discount products that are close to the best-before or the sell-by date and inform nearby app users about these discounts. Food can be offered via the Internet portal "Foodsharing" in order to save food from being disposed of. For example, since April 2016 PENNY has been adding fruits and vegetables to its organic product range that do not look conventionally perfect ("Naturgut Bio-Helden"). Fruits and vegetables that do not meet the standards are also used for other purposes – "CulinARy MiSfiTs" process it in their dishes, the "Slow Food Youth" fight against food waste through events where such "misfits" are prepared and eaten together, "Dörrwerk" produces snacks and "Querfeld" and "The Good Food" is selling them directly. In addition to charitable institutions such as the Tafeln (food banks, which collect high-quality food that would otherwise end up in the garbage and distribute them to the socially and economically disadvantaged), more and more start-ups are being set up to "rescue food" and fight food waste. Against the background of the multitude of impressive initiatives, the association "FoodFighters" is to be named, which has been carrying out educational projects on the subject of food waste for children, young people and adults since 2012. Actors from the food industry have, furthermore, joined forces to form the "United against Waste" association in order to network and disseminate solutions for out-of-home consumption.

2.3 Causes for the generation of food waste and losses along the value chain and derivation of innovative solutions at the interfaces

With regard to the quantities of food waste and losses, the environmental impact associated with it and the existing cost-saving potential related to its prevention, the question arises what are the structural causes for the loss of such a relevant proportion of food on the way from the field to the plate. Simple explanations are certainly not to be expected; the FUSIONS project has identified 105 causes, some of which are mutually reinforcing. At all levels of the value chain - from agriculture to households; - technical drivers (e. g. production techniques), institutional drivers (e. g. aspects of the taxation of food donations) and social drivers (e. g. purchasing behaviour) have been identified.[25] The analysis of these different causes allows solutions to be derived that were to be discussed in the forum. The main focus is on problems at the interfaces of the food value chain where innovative solution approaches should be applied.

2.3.1 "Cosmetic Standards" for food

One important aspect causing food waste and food losses is discussed under the heading of "Cosmetic Standards": quality requirements or product specifications of the rear stages of the value chain, especially in the value chain of vegetable products, lead to food waste generation at a preliminary stage due to requirements regarding form, size and appearance (e.g. sorting out undersized fruit). [26] High or ex-

[24] German Environment Agency (2016): Guideline. Prevention of food waste in the catering sector, Dessau- Roßlau. http://bit.ly/2eaCwc5

[25] M. Canali; K. Östergren; P. Amani; L. Aramyan; S. Sijtsema; O. Korhonen; K. Silvennoinen; G. Moates; K. Waldron; C. O'Connor (2014): Drivers of current food waste generation, threats of future increase and opportunities for reduction. FUSIONS-Report. https://www.eu-fusions.org/index.php/download?download=111:drivers-of-current-food-waste-generation-threats-of-future-increase-and-opportunities-for-reduction

[26] C. Göbel; P. Teitscheid; G. Ritter; A. Blumenthal; S. Friedrich; T. Frick; L. Grotstollen; S. Möllenbeck; L. Rottstegge; C. Pfeiffer; D. Baumkötter; C. Wetter; B. Uekötter; B. Burdick; N. Langen; M. Lettenmeier; H. Rohn (2012): Verringerung von Lebensmittelabfällen – Identifikation von Ursachen und Handlungsoptionen in Nordrhein-Westfalen, Münster, p. IX.

aggerated quality requirements, e.g. for trade, result in high amounts of products being sorted out as not marketable during harvest. It is therefore of particular importance to take a close look at the food losses along the entire value chain and to identify and activate the prevention potentials at the interfaces between the various stages.

2.3.2 Lacking cooperation in logistics

The potentials of an optimised interface management can especially be found in the field of lacking cooperation in logistics across all stages, leading to food waste generation. Nowadays, food is produced in collaborative global networks. Individual companies of different production stages are aiming at optimizing their own processes while at the same time accepting potential food waste at preliminary stages. [27] For example, a short-term planned and quantitatively low inventory combined with permanent product availability can increase the risk of food spoiling at preliminary stages.

2.3.3 Insufficient knowledge of reasons and relations of individual waste disposal behaviour in everyday life

The general public is significantly sensitized in the issue of food waste prevention. [28] However, implementing waste preventing behaviour remains one of the key challenges. A survey on environmental awareness of the German population shows that around one-third of all respondents (29%) throw away food at least once a weak or more often. At the same time, respondents show relatively high problem awareness. Approximately 65% indicate that they throw away food that was still edible. A guilty conscience derives from moral reasons, as many people do not have enough food to eat. Furthermore, 41% of the respondents are aware of the ecologically negative effects of food waste.[29]

2.3.4 Lack of an uniform and consistent policy framework

As a key barrier to food waste prevention or a cause for food losses, literature reviews identify the lack of an uniform and consistent policy framework that connects the issue of food waste prevention to regulations on food security or agricultural policies that offer clear incentives for improved stakeholder cooperation. A recent report of the European Court of Auditors (2016)[30] states with a view to the European level: “Many of the potential improvements do not require new initiatives nor more public funding, but rather involve a better alignment of existing policies, improved coordination, and clearly identifying the reduction of food waste as a policy objective.”

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27 Göbel et al. (2012).

28 S. Langsdorf; M. Hirschnitz-Gabers (2014): Die Zukunft im Blick: Trendbericht für eine vorausschauende Ressourcenpolitik. Edited by Umweltbundesamt, Dessau.

29 Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB); Umweltbundesamt (UBA) (2017): Umweltbewusstsein in Deutschland 2016. Ergebnisse einer repräsentativen Bevölkerungsumfrage.

30 European Court of Auditors (2016): Special report 34/2016. Combating Food Waste: an opportunity for the EU to improve the resource-efficiency of the food supply chain. Special report no 34/2016. Luxemburg. http://www.eca.europa.eu/Lists/ECADocuments/SR16_34/SR_FOOD_WASTE_EN.pdf

2.4 Key issues of the expert forum

Against the background of these challenges, the expert forum in Berlin on the 5th of September dealt with five concrete areas of discussion. In five workshops and in an exchange with experts these areas were examined for their practicability.

2.4.1 #1: Cosmetic Standards for food: Bent? Dented? – Edible!

Although the EU has reduced the validity of specific marketing standards for fruit and vegetables from 36 to 10 types in 2009, it is estimated that in Europe around 20%, in some cases up to 50%, of the harvest is still lost due to cosmetic standards defining e.g. form, colour or size for individual items[31]: apples of category I, colour group A are not allowed to exceed a size difference of 5mm regarding their diameter. All other fruits are either directly sorted out by the producer or at the following processing stages. Besides the EU given norms, these losses are also a consequence of norms regarding size, conformity or optical characteristics[32] defined by retail trade or industry. Supermarket operators also indicate that costumers have been accustomed to flawless products and that the operators therefore fear negative reactions and losing costumers to competitors if standards are loosened.[33] Hence, fruit and vegetables that do not fulfil the aesthetic requirements can hardly be found in supermarkets.

2.4.2 #2: Innovative logistic systems: Logistics as an aid to preventing food waste

Fresh goods such as baked goods, fruit and vegetables, pre-packaged salads, dairy products, eggs, meat and fish are significantly prone to becoming food waste. Spoilage and reaching the use-by date or the best-before date, but also damage to the food or its packaging, are the main reasons.[34] This leads to increasing insecurities among retailers about the quantities actually needed. Re-ordered products can imply surpluses and longer storage time, e.g. in warehouses. Longer storage times have negative impacts on the quality of fresh goods. If monitoring and forecasting systems are used, the collected data and the assumptions that are made are usually not shared and compared with up- and downstream stages like retailers, wholesalers and producers work with different forecasts.[35] Due to a lack of information, the condition and remaining shelf life of the food cannot always be estimated correctly. Goods that should go into sale as soon as possible are then kept in the warehouse for too long, as products that arrived earlier are delivered at first, even if they still have a longer shelf life. Approaches to food waste prevention that have been discussed until now only relate to one specific stage or actor. Overall, the system lacks an overarching communication and transparency across all stages of the value chain.

2.4.3 #3: Catering: The contribution of commercial kitchens and bulk consumers in practice

Commercial kitchens and bulk consumers still produce relatively high amounts of food waste. On the one hand, this waste is generated from food preparation and, on the other hand, leftovers and table waste that is not (always) avoidable from the viewpoint of the operator, e.g. if the serving was too big for the guest or the guest did not like it. Another reason for (mostly lower) food waste quantities is food storage and therefore also its purchase. Waste from food preparation is only partially preventable

31 F. Runge; H. Lang (2016): Lebensmittelverluste in der Landwirtschaft durch Ästhetik-Ansprüche an Obst und Gemüse – Gründe, Ausmaß und Verbleib. Berichte über Landwirtschaft, Zeitschrift für Agrarpolitik Landwirtschaft Bd. 94, Heft 3. Edited by Bundesministerium für Ernährung und Landwirtschaft, pp. 6-7.

32 Göbel et al. (2012), p. 27.

33 D. Frieling, V. Stricks, M. Wildenberg, F. Schneider (2013): The beauty and the beast – How quality management criteria at supermarkets create food waste. Conference paper, 6th International Conference on Life Cycle Management, Gothenburg, p. 3.

34 L. Janssen; J. Sauer; T. Claus; A. Wulff (2017): Abfallreduktion im Lebensmitteleinzelhandel mittels einer internen Warenumverteilung. In: uwf UmweltWirtschaftsForum Issue 1-2/2017

35 Oliver Weyman GmbH (2014): 'Schluss mit der Lebensmittelverschwendung - Was der Einzelhandel dazu beitragen kann', 2014.

and, if processed food is directly sourced, only shifted to the upstream chain. Waste generated in the course of serving the food it is differentiated between leftovers (surplus production) and table waste. If the customers are able to choose the amount of food themselves and pay according to the plate weight, table waste is usually less as the customer chooses the correct individual serving size. On the other hand, more waste can then be generated at the counters, so that the quantity of the produced food must also be correctly defined. According to statements by practitioners, there is a high avoidance potential in sauces and side dishes: Pre- and post-calculation by trained personnel, who are involved in handing out the food, is necessary for the correct portioning. At the same tome table waste also need to be recorded, just like serving leftovers and other waste. It is important to estimate the number of guests, portion sizes, and dish specific quantities (dependent on menu planning and other offered dishes) realistically, and to estimate small safety margin (surpluses). A concept to reduce table waste in commercial kitchens and restaurants could also include smaller serving sizes in conjunction with a (one time) free refill. For some concepts like Cook & Chill or Buffets, the unused surplus can be stored apart from the actual meal counter, and can be used on the following day. The UBA published a guideline for event catering including practical tips and advice on how avoidable waste can be reduced in this sector.

2.4.4 #4: Strengthen food donations: Eat, don't waste

Another possibility to prevent food waste is to share surpluses with third persons. Sharing food is implemented through various platforms, such as local food banks, Facebook, foodsharing.de and others. The focus of sharing and its conditions vary respectively: the food is partially transferred by companies, partially by private persons. For the different actors, there are different conditions for sharing the food: private individuals underlie other liabilities for food and its safety than companies do, so they can accept and re-distribute processed or expired products more easily. Furthermore, a quick distribution of processed food from catering and gastronomy through apps like "Too Good To Go" or take-away of food after events in so-called "Beste Reste Boxen", where liability is assumed by the private person receiving the food, show how food sharing can be strengthened. However, there are still many companies sceptically fronting this form of food distribution, e.g. due to insecurities about possible legal consequences. Even though there are some guidelines and information on sharing food with third parties available (e.g. guideline of the BMEL on sharing food with social institutions), a pooled information provision, e.g. on a platform or website informing actors about legal aspects of specific distribution ways, is still missing.

2.4.5 #5: Target group consumers: Effective approaches for preventing food waste

As presented above there are several and very diverse initiatives and projects supporting consumers in preventing food waste. Nevertheless, a recent survey has shown that almost one-third of all respondents (29%) still throw away food at least once a week or more often.[36] In the research project REFRESH, co-financed by the EU, results so far have shown that both motivation and ability, as well as the opportunity to prevent waste has to be strengthened on the consumer level. There is a wide range of information material and decision-support (e.g. by consumer associations, the federal government, civil society and consumer initiatives). In order to perceive the contents and implement them into daily life, an active and already interested consumer is required. Both politics and science state that there is no consistent and targeted nationwide strategy. There is a substantial need for connecting projects, create synergies and coordinate measures on the national level.[37] In the course of the BMEL elaborating a National Strategy, a window of opportunity is opened to close this gap. This topic could therefore deliver valuable hints and impetus. Research results also indicate that consumer behaviour and its

[36] Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB); Umweltbundesamt (UBA) (2017): Umweltbewusstsein in Deutschland 2016. Ergebnisse einer repräsentativen Bevölkerungsumfrage.

[37] Beschluss des Bundesrates 180/17 from 31th March 2017: Lebensmittelverluste in Deutschland verringern.

causes are not yet explored sufficiently. A better understanding of these reasons and incentives, as assumed, could foster the development of effective measures.[38]

2.5 Overall objective of the expert forum and next steps

With these thematic focuses, the expert forum aimed to contribute to the effective prevention of food losses and waste. The dialogue between the different actors along the value chain food – from agriculture to consumer – should contribute to pointing out innovative approaches and practical barriers to implementing already existing ideas.

By connecting the different thematic fields, the UBA wants to provide an impetus for preventing food waste and losses. Another aim was to identify key action areas and necessary measures on the one hand and on the other hand to bring together the necessary actors, as well as to tie up to existing initiatives. The overall objective is to emphasise all these aspects that can be implemented afterwards in cooperation between the UBA, BMEL and other actors, e.g. in the framework of implementing the National Programme for Sustainable Consumption.

[38] F. Waskow; A. Blumenthal; U. Eberle; T. von Borstel (2016): Studie. Situationsanalyse zu Lebensmittelverlusten im Einzelhandel, der Außer-Haus-Verpflegung sowie in privaten Haushalten und zum Verbraucherverhalten (SAVE). On behalf of the German Federal Environmental Foundation (Deutsche Bundesstiftung Umwelt (DBU)).

3 Part B – Forum Results

The "Expert forum 2017: Effectively Reducing Food Waste – Achieving More Together" took place in Berlin on 5 September 2017 at the location "Unicorn". About 80 stakeholders from all levels of the food value chain participated in the event, including consumers, bulk consumers, NGOs, initiatives and young adults, who as innovators representing ‚tomorrow's' generation contributed 'tomorrow's' ideas.

The following sections summarize the contents and results of the individual program items. The agenda, as well as the profiles of the speakers and the list of participants are attached.

3.1 Welcome

DR. THOMAS HOLZMANN, VICE-PRESIDENT OF THE GERMAN ENVIRONMENT AGENCY

In his welcoming speech, Dr. Thomas Holzmann underlined the extent of food waste and the necessity of taking measures to reduce it. The Food and Agriculture Organization (FAO) estimates that one-third of the food produced globally for human consumption is never used or ends up as waste. In Germany alone, the food processing industry and consumers crate approximately 11 million tonnes of food waste annually. The United Nations Sustainable Development Goals (SDGs) envisage cutting retail and consumer food waste by half and reducing losses in the production and supply chain by 2030. Dr. Holzmann pointed out that concepts for preventing food waste abound, for example, the "Too good for the bin" initiative[39], the waste prevention programme[40], the national programme for sustainable consumption[41], the catering industry guidelines[42] and, at the European level, the EU platform on food losses and food waste[43]. But, seemingly, food waste continues to form part of a food system that appears to accept, or at least tolerate such losses. A way must be found to once again show food the appreciation it deserves, also because of the expended resources. Admittedly, a lot is already happening; however, we still have no answer to the question "Are we doing it right?". The expert forum, therefore, serves to discuss which approaches can effectively prevent food waste, as well as which innovative ideas can lead to this goal, with participants from the gastronomy, retail, environmental, political and research sectors, and especially with the young people attending.

3.2 Keynote address: Food Revolution 5.0

DR. CLAUDIA BANZ, KUNSTGEWERBEMUSEUM BERLIN, CURATOR OF THE EXHIBITION "FOOD REVOLUTION 5.0 – DESIGN FOR TOMORROW'S SOCIETY"

In her keynote address, Dr. Claudia Banz presented selected projects from the exhibition "Food Revolution 5.0 – Design for Tomorrow's Society" at the Museum für Kunst und Gewerbe in Hamburg. The exhibition deals with the question of what the future holds for human nutrition. International designers present thought experiments on modern food production and consumption: in the "Insect farm" exhibit designed by the Austrians Katharina Unger and Julia Kaisinger, for example, insects can be produced by householders for their own consumption. In the "Edible Growth" exhibit by Chloé Rutzerveld, a 3D printer produces small snacks. Inspired by hyenas, Paul Gong developed a vision of

[39] https://www.zugutfuerdietonne.de

[40] Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (BMUB) (2013): Abfallvermeidungsprogramm des Bundes unter Beteiligung der Länder, Bonn.

[41] Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (Ed. 2017): Nationales Programm für nachhaltigen Konsum. Gesellschaftlicher Wandel durch einen nachhaltigen Lebensstil, Berlin.

[42] German Environment Agency (2016): Guideline: Prevention of food waste in the catering sector, Dessau- Roßlau. http://bit.ly/2eaCwc5

[43] https://ec.europe.eu/food/safety/food_waste/eu_actions/eu-platform_en

transhumanists who can utilise synthetic biology to modify their digestive systems to resemble that already existing in hyenas. The "human hyenas" are then capable of digesting rotten and mouldy food. In Marije Vogelzang's "Volumes" project, insights from behavioural research, which have shown that less is eaten if there is less on the plate, are implemented in such a way that objects are placed among the portion of food on the plate, thereby suggesting that the plate contains more, and thus sufficient, food.

Dr. Banz explained that the "Food Revolution 5.0" exhibition increasingly developed into a future workshop during the preparation period. From their point of view, it is important , in terms of future foods, to develop a new way of thinking for the new century and a digital design concept.

3.3 Round Table: Situation analysis insights – connecting existing knowledge, discovering new

BARBARA FRIEDRICH, GERMAN ENVIRONMENT AGENCY // DR. HENNING WILTS, WUPPERTAL INSTITUTE

In the round table talk with Dr. Henning Wilts (Wuppertal Institute), Barbara Friedrich (German Environment Agency) discussed the goals of the "Expert forum 2017: Effectively Reducing Food Waste – Achieving More Together": the expert forum is intended to contribute existing knowledge to the discussion, connect interfaces between the different added-value stages, to strengthen collaboration and drive dialogue on the topic. In addition, empirical insights will be discussed, such as experiences with the practical application of the food waste prevention guidelines in the catering industry. Dr. Wilts pointed out that, in addition to German domestic topics, it is important to keep an eye open for the bigger picture. With regard to EU member states, we can already see very diverse approaches among our neighbours: from legal provisions, as in France, to voluntary commitments, as in the United Kingdom. However, considering the numerous approaches and initiatives, the question arises why we have not advanced further progress in terms of prevention. Surveys reveal that people are conscious of the topic. So, what are the obstacles on the path to broad implementation? Often, the potentials can be found at the interfaces between the added-value stages. Here, it is important to realise that those who invest in solutions are not always the same as those who profit from the investment. The distribution of costs is therefore an important factor in the motivation to act.

3.4 Workshop sessions

CHAIR: JENNIFER SCHINKEL, WUPPERTAL INSTITUTE // JANA NICOLAS, WUPPERTAL INSTITUTE // FLORIAN KNAPPE, IFEU – INSTITUTE HEIDELBERG // JOACHIM REINHARDT, IFEU-INSTITUTE HEIDELBERG // CAROLIN FRIEDRICH, STAKEHOLDER REPORTING

The topics "cosmetics standards for foods", "innovative logistics systems", "food waste prevention in the catering industry", "strengthening food donations" and "effective approaches against food waste in consumer communication" were subsequently discussed in five parallel practical workshops. The workshops were introduced by inputs from the innovators Tanja Krakowski (Culinary Misfits), Leoni Beckmann (Restlos Glücklich), Jonas Bieber (Dörrwerk), Nicole Klaski (The Good Food), Luka Lübke (slow food chef-alliance cook), Michael Schieferstein (Food Fighters), Teresa Sophie Rath (Too Good To Go), Karola Braun-Wanke (Freie Universität Berlin) and Dr. Jana Diels (ConPolicy). Experiences in the application of solution approaches, obstacles and promising measures were discussed with experts from the practical side, and effective approaches identified. A workshop summary is given below.

3.4.1 Workshop #1: Cosmetic standards for food: Bent? Dented? – Edible!

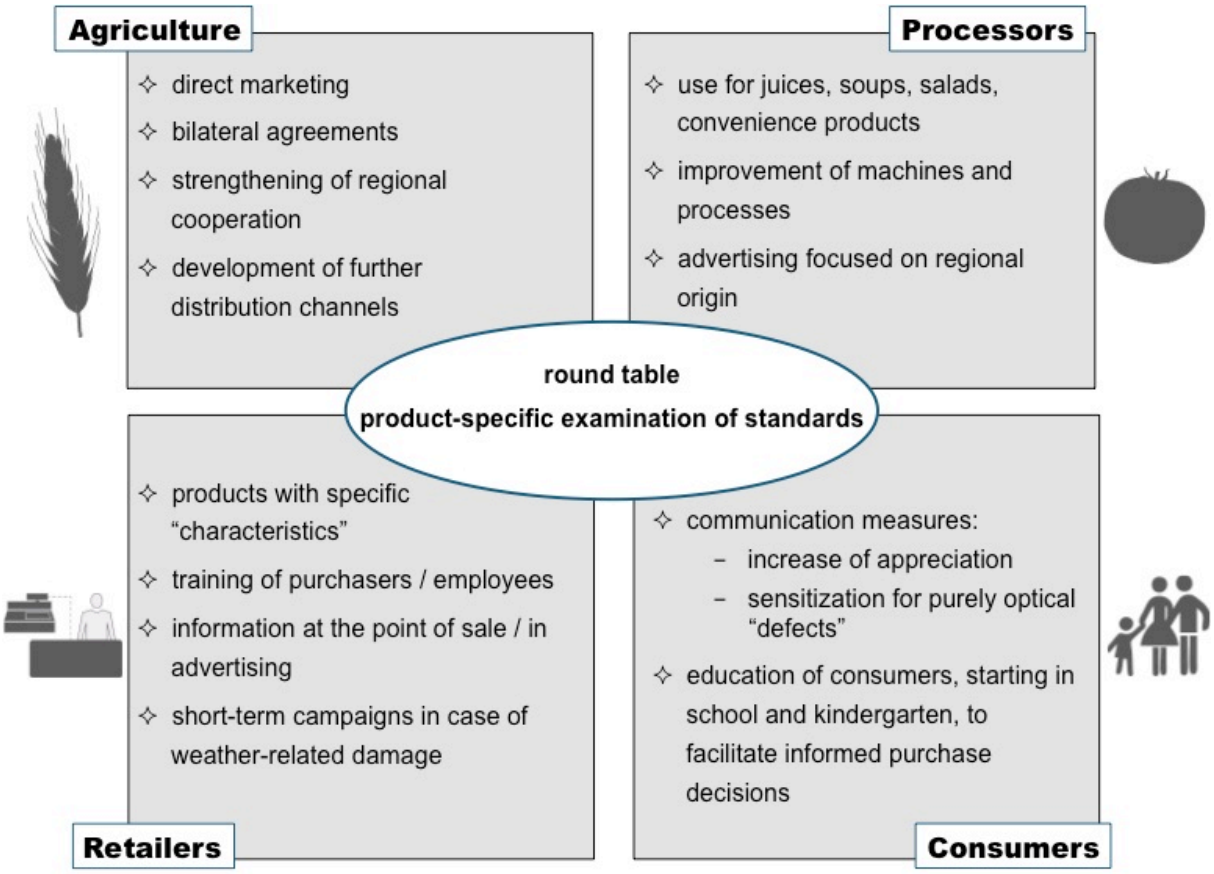
SUMMARY

According to estimates, approximately 20%of the harvest and, depending on the species, even up to 50%, is lost as a result of aesthetic and retail standards. The workshop participants shared the view that existing fruit and vegetable standards did not represent an insurmountable obstacle, and that problems can be solved using existing ways and means. To achieve this, it is necessary to create communication paths and networking opportunities in order to improve communications along the entire value-added chain, if possible in a round table format. It is crucial that all members in the value-added chain experience added value in order to promote a willingness to implement solutions. Education is regarded as an important task. Here, one should move away from campaigns and penetrate the regular education system. Because of its long reach, education by the retail was also regarded as a promising starting point. The following questions require clarification: What are people's true perceptions? What do awareness campaigns in supermarkets achieve? It has been pointed out that the problems must be solved where they arise; the consumer is part of the solution and must be taken on board.

POSSIBLE SOLUTIONS

- Create communication paths across all stages of the value-added chain, preferably by means of a round table
- Agricultural self-marketing: cooperation, in order to achieve the necessary volumes, resale to farms with farm shops via cooperatives
- Promotion of regional structures for self-processing by producer associations
- Further development of processing technologies
- Retail campaigns in collaboration with producers in cases of weather-related damage
- Personnel training
- Misfit marketing with processing notes/recipes
- Expansion of ranges to include grades allowing greater deviations from the norm
- Offer and communicate short-term added value (price/flavour/additional benefits)
- Communicate "good deeds" to consumers in dialogue with producers
- Implement consumer education in existing structures
- Positively implement behavioural psychology insights

Figure 1: Solution Landscape: Cosmetic standards for food: Bent? Dented? – Edible!



Own illustration

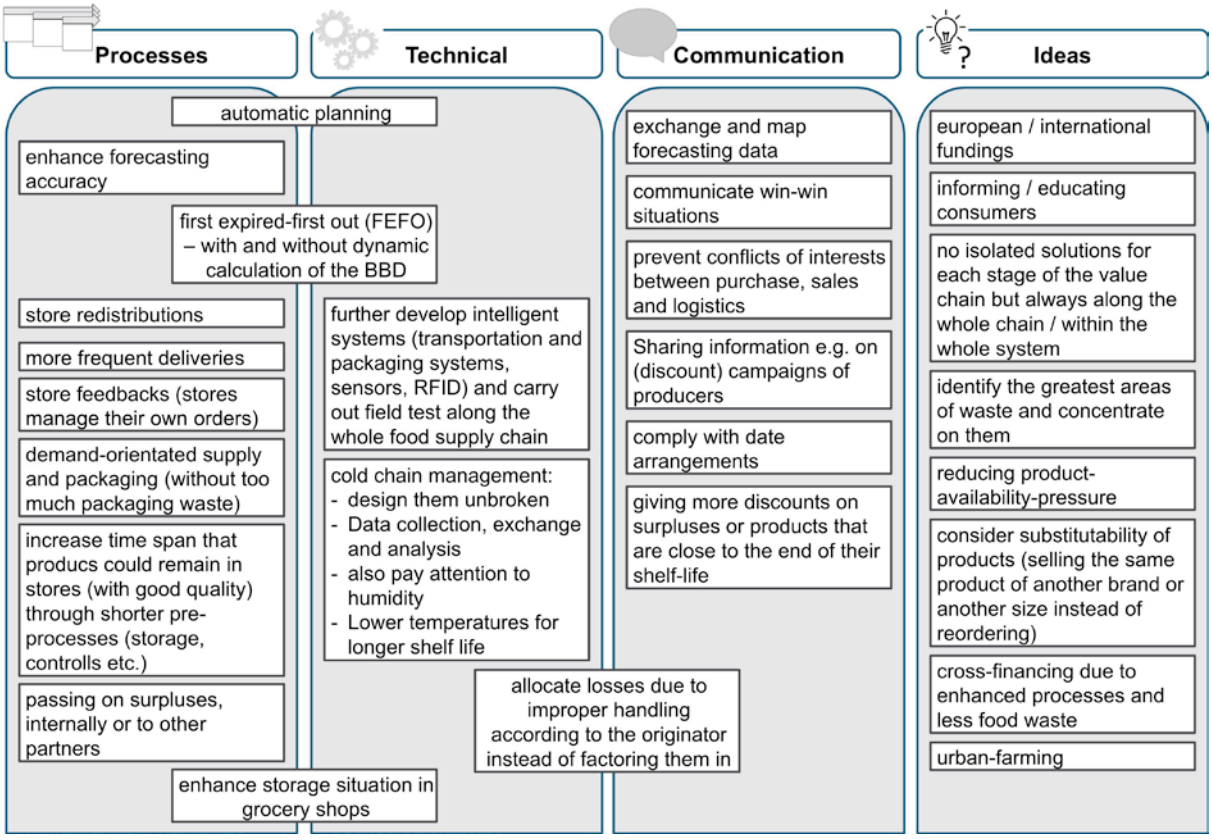
3.4.2 Workshop #2: Innovative logistic systems: Logistics as an aid to prevent food waste

In particular, optimised interface management potentials in logistics are seen in the previously absent to indistinct cross-stage coordination, contributing to the creation of food waste. In many companies, internal processes are already being optimized. However, under certain circumstances, this can lead to (more) waste being produced either upstream or downstream due to poor cooperation and communications. The question arises of how collaboration and communications can be comprehensively reinforced within the value-added chain so that food waste can be effectively prevented along the entire chain.

POSSIBLE SOLUTIONS

- Acquire and analyse the relevant data (e.g. temperature, ripening gases) and make them available to other actors within the chain.
- By more data and data interchange (e.g. on sales forecasts, actions, producer advertising campaigns), thereby increasing transparency, improving forecasts and reducing buffer reserves.
- Planner education for better understanding and improved application of existing technologies (for example on automatic scheduling or EDI).
- Implement practical projects with scientific monitoring and including several participants from complete chains.
  - Test new scheduling technologies and apply existing ones.
  - Continuously test demand-oriented order sizes, more flexible (more frequent) goods deliveries and goods redistribution between branches.
- In projects, take into account the European dimension of the food trade and focus on typically (e.g. fruit, vegetables and bakery products) or individually sensitive product groups with particularly high loss rates.

Figure 1: Solution Landscape: Innovative Logistic Systems: Logistic as an aid to prevent food waste



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3.4.3 Workshop #3: Catering: The contribution of commercial kitchens and bulk consumers in practice

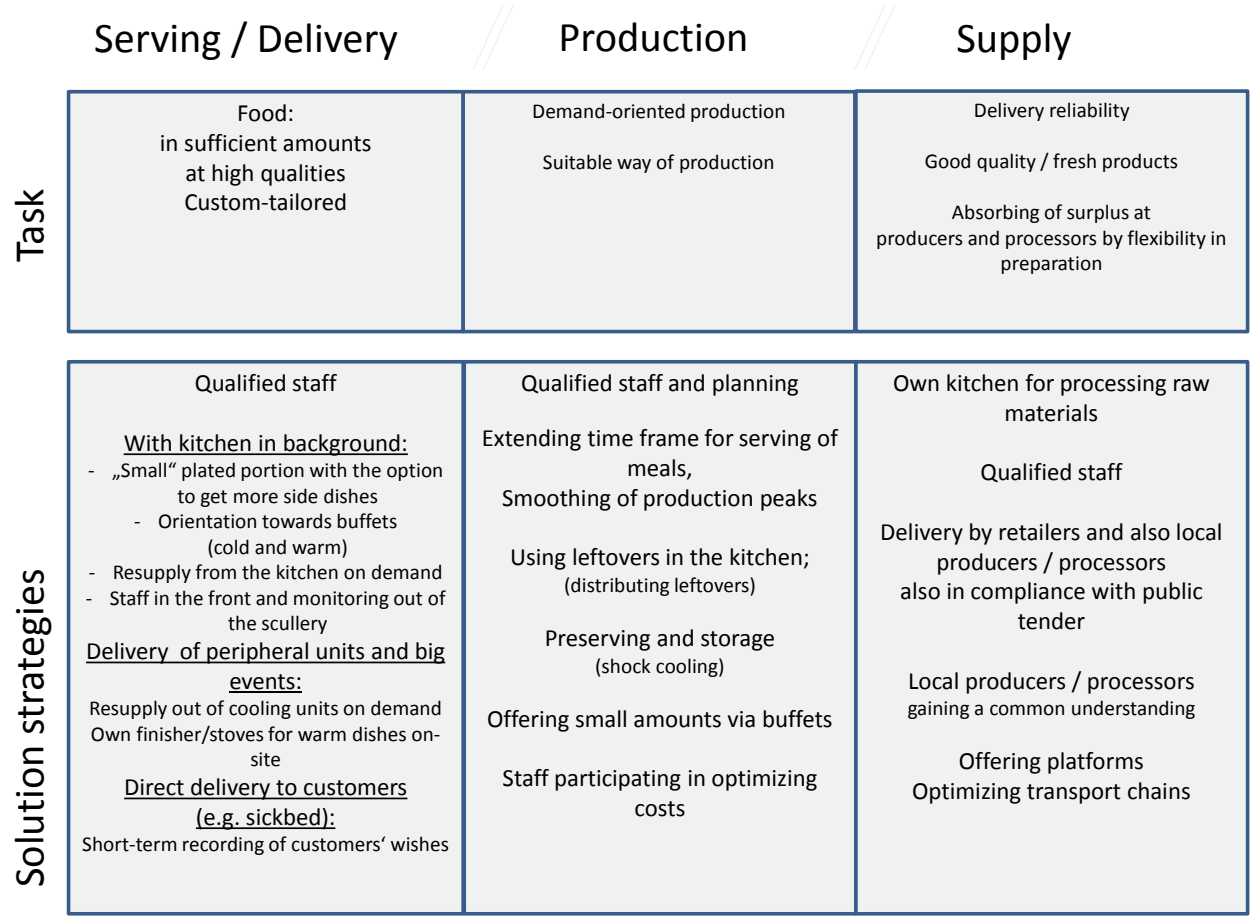
SUMMARY

In the topic area of catering and commercial kitchens, a number of good practical examples for the avoidance of surplus food. The workshop focused on the question of what stands against their broad implementation in practice to date (obstacle analysis), and how and using what instruments successful implementation can be launched. The central goal must be to design how meals are served, such that the customer is able to configure the meals to their own taste and in the desired portions. The meals must also be tasty. In total, leftovers can be considerably reduced in this way.

POSSIBLE SOLUTIONS

- Production on demand
- Sufficient flexibility, in conjunction with monitoring, allowing targeted production and resupply from the kitchen corresponding to demand
- Focus on buffets instead of set meals
- "Braving the gap" towards the end of serving times, in conjunction with an offer, if feasible, to resupply directly from the kitchen on demand
- Create legal certainty for utilisation of surplus production
- Identify the respective operation's scope in close cooperation with the responsible veterinary surgeon or factories inspectorate
- Clarify opportunities for reducing surplus production and utilising agricultural products not conforming to the norm to reduce producer-side losses
- Personnel motivation and qualification
- Catering industry networking to generally advertise good examples and solutions

Figure 2: Solution landscape: Catering: The contribution of commercial kitchens and bulk consumers in practice



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3.4.4 Workshop #4: Strengthen food donations: Eat, don't waste

SUMMARY

The workshop discussed how to strengthen food donations. The objectives of increasing the supply of donation systems by raising further potential, improving framework conditions, simplifying the transfer of goods, avoiding over and undersupply, and accepting problematic goods, are counteracted by problems such as numerous sources, accountability issues, image problems and food safety. Where food is issued by volunteers, the proponents are not professionals and difficult to keep informed. Solutions discussed here included better community integration, improved communications and education, positive connotations of food donations and collaboration with food authorities. It was apparent that the legal situation is unclear for many. In this context, the EU Commission has now published the EU Guidelines on Food Donations as a yardstick for the development of national guidelines. Its applicability to distributing organisations must be reviewed on a case-by-case basis.

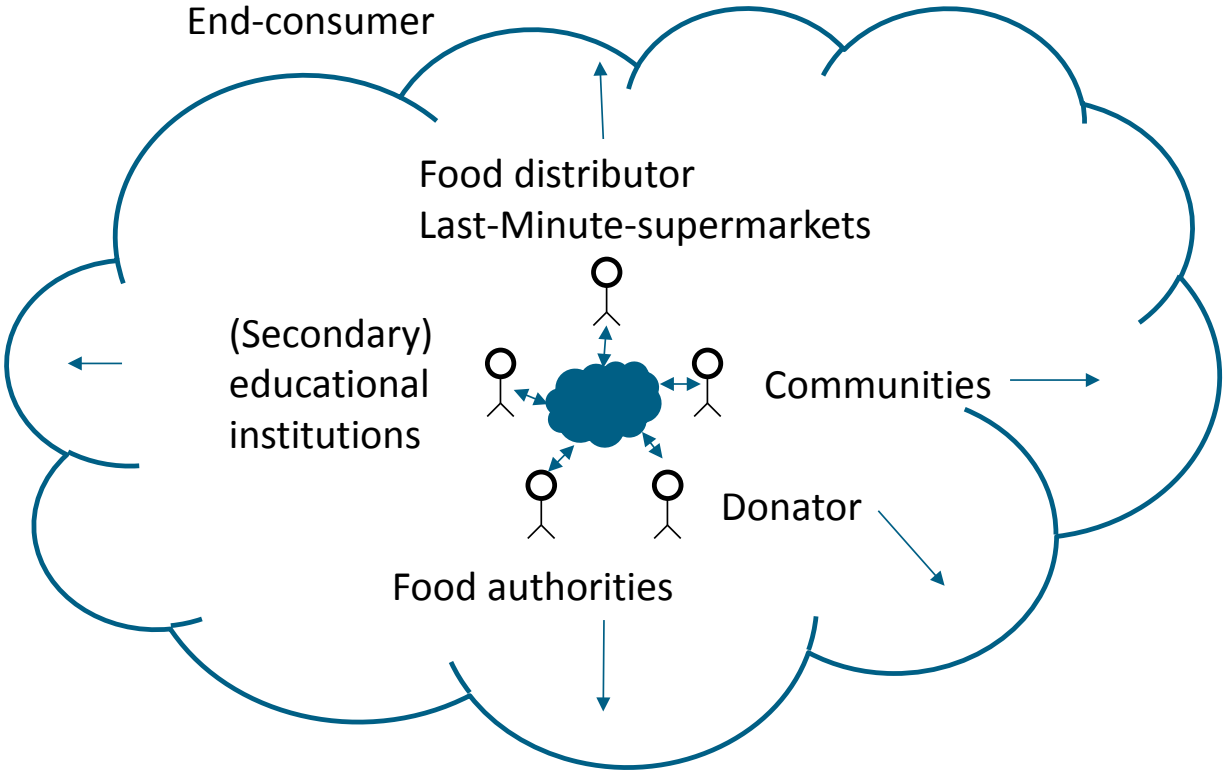
PROBLEMS

- Legal regulations are unclear. Voluntary distribution stations cannot be constantly monitored → food safety aspects.
- VAT regulations for food donors are unclear. Negative image of surplus food.
- Consumers lack awareness, basic skills in food distribution and the use of leftovers are lacking.
- Logistical effort and hygiene issues (in the case of preheated food) when passing on ready meals such as buffet leftovers or unissued surplus.

POSSIBLE SOLUTIONS

- Strengthening the communication of food donation opportunities: collaboration with educational institutions, communicating food donation through media and the press (radio, television, newspapers).
- Education regarding the law and hygiene, continuing consumer education.
- Do not label food surplus as waste.
- More retail food surplus transparency (quantities).
- Food donation systems can complement each other well, as well as in combination with last-minute supermarkets.
- Transfer of ready meals in line with the "Too good to go" and "ResQ" systems, exploiting synergy effects between distribution systems.
- Inclusion of communities as active operators of distribution stations or at least providing a responsible point of contact for volunteers, guidelines.
- Learn from other lighthouse projects (via guidelines, etc.).
- Seek active cooperation with food authorities. Support food donations better politically.
- Clarify and clearly communicate legal regulations, clarify financial regulations on food donations.

Figure 3: Strengthen food donations: Eat, don't waste



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3.4.5 Workshop #5: Target group consumers: Effective approaches for preventing food waste

SUMMARY

Today, numerous and varied initiatives, measures and projects already exist to help consumers to avoid unnecessary food waste. However, recent studies suggest that behavioural change cannot be

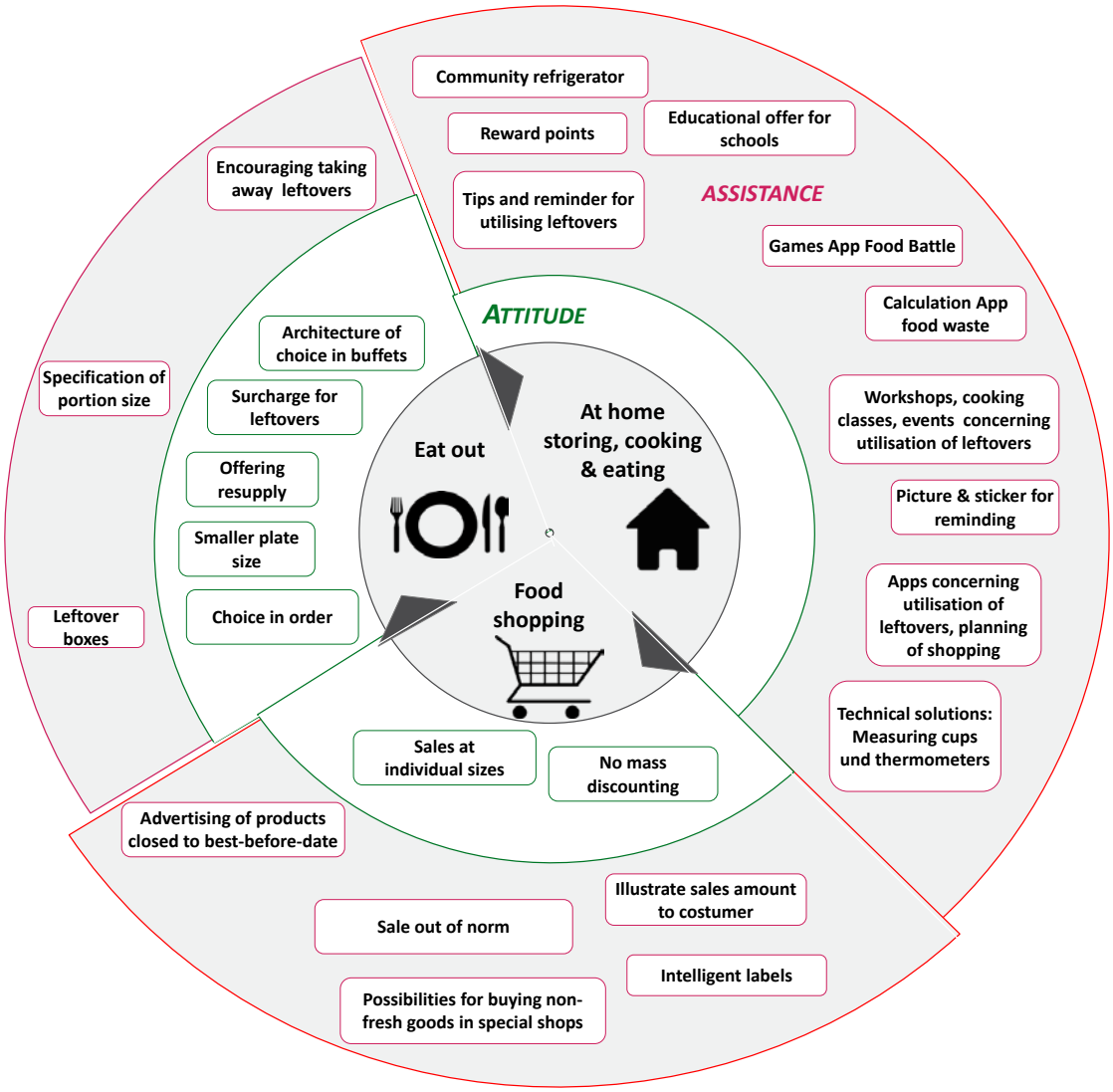
achieved by more or better information alone.[44] The fundamental proposition of the workshop was that it has not yet been possible to address consumers at the specific decision-making centres, nor on a broad range. Overall, supporting consumers in sustainable consumption still requires a wide range of efforts at all levels, as well as a common vision. A greater appreciation of food by the consumer remains a necessity. However, broad-based campaigns do not appear promising. In the future, the target groups should be addressed more specifically and, if necessary, integrated with a view to their different needs. The participants supported the fundamental proposition that communication relating to social norms, as well as an emotional approach and involvement, hold the potential to support behavioural change. This requires further research, as well as testing concrete measures or intervention in practice. The participants agreed that further exchange was needed to achieve more sustainable consumption. Ideally, this involves institutionalising a round table with representatives of all relevant stakeholder groups. However, as a minimum measure, such an exchange should be implemented in the relevant networks.

POSSIBLE SOLUTIONS

- Initiate public discussions of values by better coordinating communication measures between the relevant stakeholders to promote a change in attitudes towards increased appreciation of food.
- Develop communication offerings and support tailored to the specific needs of different target groups.
- Show appreciation and recognition even for small advances and positively occupy socially desirable behaviour (e.g. by announcements or influencers).
- Strengthen collaboration to disseminate existing knowledge, scale good approaches and encourage the further development of ideas.

[44] M. Grainer; G. Stewart (2016): Consumers' behavioural economic interrelations and typologies, p. iii (REFRESH project).

Figure 4: Solution landscape: Target group consumers: Effective approaches for preventing food waste



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3.5 Workshop findings commentary

TIMO SCHMITT, MEMBER OF "ERNÄHRUNGSRAT BERLIN"

According to Timo Schmitt (Ernährungsrat Berlin (Berlin Food Council)), the expert forum has shown that there is no shortage of ideas and initiatives, neither in the private sector nor in other areas - many proponents are concerned with the topic. However, he criticised that accusations are still made, even though everybody knows that this problem involves society as a whole. It is important not to let competitive situations arise, but to uncover common ground, identify interfaces and exploit existing synergies.

A "round table" should be established, in which the relevant proponents exchange specific views, as well as a central point, where all activities are bundled and which has sufficient financial resources at its disposal. Another exciting question revolves around how those responsible can be reached.

Consumers should be brought closer to food again, allowing food appreciation to increase once more. At the same time, excessive mechanisation and digitisation must be counteracted (smart refrigerators), because this merely further promotes consumer alienation from food. In the education field, the implementation of existing knowledge in dealing with food in daily life should be taught. Caution should be exercised with regard to the choice of words. It is better to talk about excess or surplus food in order to increase the appreciation of foods that are still edible. Finally, according to Timo Schmitt, consumer action can only have a positive effect in this field if facilitated and supported by the state by creating the appropriate conditions by means of structures and laws.

3.6 Panel discussion: 50% less food waste by 2030 – what are the most effective levers?

DR. CLAUDIA BANZ, KUNSTGEWERBEMUSEUM BERLIN // FREDERIK SCHULZE-HAMANN, SLOW FOOD GERMANY // DR. BETTINA RECHENBERG, GERMAN ENVIRONMENT AGENCY // PROF. JANA RÜCKERT-JOHN, FULDA UNIVERSITY OF APPLIED SCIENCES

CHAIR: STEPHANIE VON HAYEK

In the concluding panel discussion, Dr. Claudia Banz (Kunstgewerbemuseum Berlin), Frederik Schulze-Hamann (Slow Food Germany), Dr. Bettina Rechenberg (German Environment Agency) and Prof. Jana Rückert-John (Fulda University of Applied Sciences) debated what needs to be done to achieve the 50% reduction target by 2030. Together, they discussed what the most effective levers for reducing food waste are, how to support consumers and how food appreciation can be increased.

Dr. Bettina Rechenberg: It is important to consider the entire value chain. Consumers are open and sensitive to the topic. This can also be seen in the numerous initiatives. How they can be supported and sustained requires clarification. However, expectations should not be directed at the consumer alone. They are important drivers, but retail and the food processing industry are also important trailblazers in areas that consumers cannot influence. Connectivity between the different stages of the value-added chain and between different agricultural and environmental stakeholders is important. In addition, it should be noted that voluntary measures at a high level are limited. Standards and regulations affecting upstream and downstream sectors in the value-added chain must also be reviewed. Legal requirements and hygiene standards should be more closely examined – where is there leeway? Is everything that is legally possible actually necessary? Dialogue and networking should be continued.

Prof. Jana Rückert-John: The assumption that action comes from knowledge is based on an unrealistic concept of humankind. Humankind often acts despite knowing better. We need to ask ourselves: Have we truly recognised the problem? People have fixed routines in their daily lives that need to be ques-

tioned. Through food, I also define my identity, describe myself. This must also be considered. Appreciation and recognition of changes in everyday life are just as important. In Germany, this discussion is usually conducted from a loss-making perspective. Enjoyment is not adequately emphasised and is unfortunately still regarded as decadent. Work on other food and nutrition concepts is necessary, with a focus on enjoyment (sensual, aesthetic, creative). Food can not only be appreciated through price but also with the aid of other factors, such as rewarding sustainable consumption practices. For example, by demonstrating which projects are financed by the purchase of a specific product, who stands behind it, who is the beneficiary. With a view to communications, how the topic is "framed" and which narratives are used must also be taken into consideration.

It is important to consider the entire value-added chain and not to expect the consumer to shoulder the responsibility alone. Here, responsibility must be shared. Here, too, research is needed to better understand everyday practices and routines, in order to clarify why, despite the knowledge already available, we are making no progress.

Frederik Schulze-Hamann: Among other things, food serves as a relationship builder - between people, culturally and socially, as well as in the relationship to nature. Diversity in food (different varieties, including older varieties and breeds, depending on the region in which they are cultivated or bred) provides a diversity of tastes and cultures. In addition, direct involvement with the food may also create a relationship to its origin and context. Given the added value of the variety of tastes on the tongue and knowledge of the history of the food, appreciation can be enhanced. Here, enjoyment also plays an essential, indispensable role! The consumer is not a passive link at the end of the value-added chain, but a protagonist who can actively shape the food system - for example by conscious consumer choice.

We need to reinstate upstream processing structures. They have not existed since the 1960s. In terms of food appreciation, identification with persons within these structures is important, i.e. small rural butchers near the farms, for example - if you know the farmer and the butcher, you also appreciate the food more and are less likely to waste any. People who can regard the area of origin of their food as a regional cultural space also understand more about the products they eat. Here, "regional" actually refers to a short distance; not only as a short route between shopping and the kitchen table, however, but instead in conjunction with the small-scale production and processing structures that can effectively counteract waste.

Dr. Claudia Banz: We need to apply our knowledge more forcefully - get out of the comfort trap, emerge from established patterns, take on more responsibility. To date, the food system is generally about increasing efficiency, about profit. A change of mindset is important. From food security to food sovereignty. This also incorporates food welfare, personal responsibility and self-sufficiency as part of everyday life. However, such a transformation is not possible overnight.

3.7 Closing remarks

DR. BETTINA RECHENBERG, GERMAN ENVIRONMENT AGENCY

In her closing remarks, Dr. Bettina Rechenberg (German Environment Agency) delivered an outlook for the future: the discussion within the German Environment Agency and with other stakeholders will be continued, taking the findings of the expert forum into account. Important topics will be consumer communications and connectivity. Here, the important role of the "Kompetenzzentrum Nachhaltiger Konsum" (Sustainable Consumption Centre of Excellence) should be noted. Within the German Environment Agency, how retail and its ideas can be better supported and integrated will be discussed. In the further discussion, the ecological incentives and regulatory requirements that may be available will also be debated, because voluntary incentives alone are unlikely to be sufficient.

4 Annex

Agenda

Table 1: Agenda of the expert forum

Time	Program item
10.00	**Arrival and registration**
10.30	**Welcome** – Dr. Thomas Holzmann, Vice-President German Environment Agency
10.45	**Keynote: Food Revolution 5.0** – Dr. Claudia Banz, Kunstgewerbemuseum Berlin, curator of the exhibition Food Revolution 5.0 – Design for Tomorrow's Society. http://food.mkg-hamburg.de/
11.15	**Round Table: Situation analysis insights – connecting existing knowledge, discovering new** Dr. Henning Wilts, Wuppertal Institute // Barbara Friedrich, German Environment Agency
12.00	**Concurrent workshop sessions on the subject of food waste**
	#1: Cosmetic standards for food: Bent? Dented? – Edible! Innovator: Tanja Krakowski, Culinary Misfits
	#2: Innovative logistic systems: Logistics as an aid to prevent food waste Innovator: Jonas Bieber, Dörrwerk
	#3: Catering: The contribution of commercial kitchens and bulk consumers in practice Innovator: Michael Schieferstein, Food Fighters
	#4: Strengthen food donations: Eat, don't waste Innovator: Teresa Sophie Rath, Too Good To Go
	#5: Target group consumers: Effective approaches for preventing food waste Innovator: Dr. Jana Diels, ConPolicy
13.00	Lunch and networking
14.00	**Concurrent workshop sessions, part 2**
15.30	Coffee break
16.00	**Findings of the workshop sessions** with comments by Timo Schmitt, member of 'Ernährungsrat Berlin'
16.15	**Panel discussion: 50% less food waste by 2030 – what are the most effective levers?** Dr. Claudia Banz, Kunstgewerbemuseum Berlin // Frederik Schulze-Hamann, Slow Food Germany // Dr. Bettina Rechenberg, German Environment Agency // Prof. Dr. Jana Rückert-John, Fulda University of Applied Sciences
17.00	**Closing remarks, get together** Dr. Bettina Rechenberg, German Environment Agency

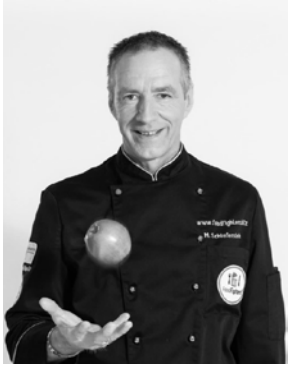
Chair: Stephanie von Hayek, moderator and journalist

Speaker's profiles

Table 2: Speaker's Profiles

Picture	Description
	**Dr. Claudia Banz, Kunstgewerbemuseum Berlin** After completing her doctor's degree at the Freie Universität Berlin, the art and design historian worked at various museums. She curated numerous exhibitions, most recently "Food Revolution 5.0 - Design for Tomorrow's Society" at the Museum für Kunst und Gewerbe in Hamburg. In 2016, Dr. Banz published the book "Social Design - Designing for the Transformation of Society". In this book, together with design and cultural scientists as well as curators and designers, she explored the question of the social impact that designers can have and the responsibilities they could bear.
	**Jonas Bieber, DÖRRWERK** The business economist founded DÖRRWERK in 2015 together with the medical doctor Zubin Farahani and the computer scientist Philipp Prechtner. They are aiming to find a solution to food waste with entrepreneurial means. Fruit and vegetables, which would no longer be sold for various reasons, are preserved by drying and thus made attractive again for grocery stores. Jonas Bieber is responsible for the production, controlling and DÖRRWERK's strategy. DÖRRWERK received the Green Buddy Award in 2016 for creating a highly efficient drying plant. In 2017, the prize of the Federal Ministry of Food and Agriculture followed for the whole concept ("Zu Gut für die Tonne"). DÖRRWERK's products are currently in the market entry phase and are sold at EDEKA Minden, Rewe, Galeria Kaufhof, Kaufland, Famila, Manufactum and in various delicatessen shops all over Germany.
	**Dr. Jana Diels, ConPolicy** Dr. Jana Diels is an expert on research on consumers. At ConPolicy, she is responsible for conducting scientific studies in the areas of behavioural economics, consumer behaviour and consumer policy. She earned her doctor's degree at the Humboldt-University of Berlin in the Department of Marketing, specializing in influencing factors of decision making in different buying situations. At ConPolicy, she carried out research and consulting projects for the Federal Ministry of Justice and Consumer Protection (BMJV) and the Gesellschaft für Internationale Zusammenarbeit (German Society for International Cooperation, GIZ). In a project for the UBA, she analysed the potentials of the nudge theory for promoting sustainable consumer decisions.

Picture	Description
	**Barbara Friedrich, German Environment Agency** Barbara Friedrich has been working as Legal Officer at the UBA since 2010 in Section III 1.5 “Municipal Waste, Hazardous waste, Focal Point to the Basel Convention”. She is responsible for environmental law, the law on transfrontier-shipment of waste and product law, and is responsible for the topic of food waste prevention. Since 2011, she has planned and supervised various projects and events, including a workshop at the EXPO 2015 in Milan. In 2016, she contributed to the guideline “Prevention of food waste in the catering sector”, which also included Fact Sheets on the topic.
	**Dr. Thomas Holzmann, Vice-President German Environment Agency** Dr. Thomas Holzmann holds a doctor's degree in law and has been a member of the Executive Board of the UBA since 1990. He has been Vice President and therefore the president's permanent representative since 2002. He is, furthermore, chairman of the Environmental Committee and the Health and Safety Committee of the UBA. Directly subordinate to him is the staff of the Central Office Division Z as well as, among others, the specialist for work safety, the agent for information technology security and the environmental officer.
	**Frederik Schulze-Hamann, Slow Food Germany** Frederik Schulze-Hamann is a member of the board of Slow Food Germany and represents the interests of Slow Food Youth. He studied Governance and Public Policy (BA) with a focus on History at the University of Passau and is currently a student of the Master's Program Global History at Humboldt Universität Berlin and Freie Universität Berlin. He gained practical experience in sustainability and regional policy issues at the Ministry of Energy Change, Agriculture, Environment and Rural Areas of the State of Schleswig-Holstein, the European Parliament in Brussels and at a family-run catering company in Schleswig-Holstein.
	**Tanja Krakowski, CulinARy MiSfiTs** After many years as an optician, among other places in San Francisco and New Zealand, she began to study product design at the University of Applied Sciences Potsdam. She completed her studies in 2011 with the thesis “CulinARy MiS-fiTs”, a food activist approach against food waste. One year later, together with the designer Lea Brumsack, this approach formed the business model with the same name, which was going to establish the term “MiSfiTs” (special product) for sorted and forgotten vegetables over the next few years. Under the slogan “Eat MiSfiTs - eat the whole harvest”, the designers have been creating a wide variety of culinary events and workshops to make crooked vegetables and forgotten old regional products presentable again. The key elements are always sustainability in the food culture, the diversity of the region, taste, the food handicraft and the farmers.

Picture	Description
	**Teresa Sophie Rath, Too Good To Go** Teresa Sophie Rath is a founding member of Too Good To Go in Germany. After studying environmental policy, she first deepened her expertise in a research institute before deciding to work on a concrete solution to avoid food waste. At Too Good To Go she takes care of partnerships, marketing, and communication and aims at two things: to make a direct contribution to environmental protection by saving food and at the same time to raise society's awareness of the problem related to wasting food.
	**Dr. Bettina Rechenberg, German Environment Agency** Dr. Bettina Rechenberg leads the UBA Division III “Sustainable Products and Production, Circular Economy” since 2015. The biologist has been working at the UBA since 1992, where she has been working among other things in the areas of water protection and chemical safety and was head of the department “Sustainable Production, Resource Conservation and Material Cycles” for 5 years. Division III analyses the environmental impacts associated with the extraction of raw materials, industrial production and the use of products and seeks practical, environmentally friendly solutions. An important issue in this context is the prevention of waste, including the prevention of food waste along the entire value chain.
	**Professor Dr. Jana Rückert-John, Fulda University of Applied Sciences** The sociologist has been a professor of “Sociology of Food” at Fulda University of Applied Sciences since 2014. After her doctoral thesis on “Natural food - the organisation of sustainable diet in out-of-home food”, she worked at the University of Hohenheim and the Centre for Technology and Society at the Technical University of Berlin. Her research interests include sustainable diet, social innovations, and sustainable consumption as well as the organisation of eating in the everyday life.
	**Michael Schieferstein, FoodFighters®** Thirty years of international professional experience in the high-end gastronomy and more than 25 years of voluntary work against food waste and for the “diet of the future” have shaped the life of Michael Schieferstein. Since 2012, the master chef has been an expert on food in the committee of the German Bundestag, advises the Environment Ministry of Rhineland-Palatinate and is a lecturer on healthy nutrition at many schools in Germany. As food ambassador of the German Pavilion at the world exhibition “Expo Milano 2015” Schieferstein represented innovative approaches for the diet of the future' Made in Germany'. His first book “Projekt Globaler Wegwerf-Wahnsinn” (Project Global Disposable Throwaway Madness) was published in 2013.

Picture	Description
	**Timo Schmitt, Ernährungsrat Berlin** Timo Schmitt has graduated in ecotrophology with a focus on nutritional ecology and humanitarian aid. He has been working for ten years at food banks, eight of them full-time at the Berlin food bank where he is responsible for hygiene, food safety and logistics. He is furthermore responsible for the development of concepts for the creation of a consciousness for sustainable nutrition and improvement of nutritional competence of adolescents. He is participating in organisations such as FÖL, Prinzessinengarten or Youth Food Movement as well as active networking with numerous other food savers such as SirPlus, foodsharing or ResQ Club. He is also participating in numerous campaigns and projects against food waste and is a Member of the Nutrition Council of Berlin, specialising in food sovereignty.
	**Dr. Henning Wilts, Wuppertal Institute** As head of the Circular Economy Unit, Dr. Henning Wilts coordinates a research project to update the German waste prevention programme and is responsible for the European Environment Agency's annual progress report on waste prevention. He is motivated by the question of how a resource-efficient circular economy could look like and how the necessary transition could be achieved. Before joining the Wuppertal Institute, he studied economics at the University of Cologne. He received his doctor's degree in waste management infrastructure planning at the Technical University of Darmstadt.

List of attendees

Table 3: List of attendees

Surname	Name	Organisation
Lena	Anders	Stakeholder Reporting
Dr. Claudia	Banz	Kunstgewerbemuseum, Staatliche Museen zu Berlin
Dr. Hans-Georg	Basikow	Dr. Basikow Sachverständigenbüro
Leoni	Beckmann	RESTLOS GLÜCKLICH
Jonas	Bieber	Dörrwerk
Frank	Bowinkelmann	foodsharing
Karola	Braun-Wanke	Freie Universität Berlin, Forschungszentrum für Umweltpolitik
Patricia	Brunn	REWE Group
Jan Stefan	Dams	ALDI SÜD
Carina	Diedrich	Collaborating Centre on Sustainable Consumption and Production
Dr. Jana	Diels	ConPolicy – Institut für Verbraucherpolitik
Tanja	Dräger	WWF
Verena	Exner	Deutsche Bundesstiftung Umwelt
Barbara	Friedrich	Umweltbundesamt
Carolin	Friedrich	Stakeholder Reporting
Eugen	Friesen	Wigwam
Dr. Norman	Götz	EDEKA / LUNAR
Laura	Gross	Die VERBRAUCHER INITIATIVE
Dr. Evelyn	Hagenah	Umweltbundesamt
Claudia	Hasse	Tafel Akademie
Stephanie	von Hayek	Moderatorin & Journalistin
Tim	Hermann	Umweltbundesamt
Dr. Thomas	Holzmann	Umweltbundesamt
Dr. Carolyn	Hutter	Lidl Deutschland
Alfred	Jansen	iglo Deutschland
Larissa	Janssen	Jade Hochschule
Dagmar	Keßling	Bundesverband Deutsche Tafel
Nicole	Klaski	THE GOOD FOOD
Julia	Kleineidam	Technische Universität Berlin

Florian	Knappe	ifeu - Institut für Energie- und Umweltforschung Heidelberg
Franziska	Koch	Max Rubner-Institut
Susanne	Köppen	ifeu - Institut für Energie- und Umweltforschung Heidelberg
Christina	Kossmann	BMUB
Tanja	Krakowski	CulinARy MiSfiTs
Dr. Anette	Küster	Umweltbundesamt
Sebastian	Lange	REWE Group
Ulrich	Langhoff	DEHOGA Bundesverband
Inga	Leffers	Bundesverband Deutsche Tafel
Luka	Lübke	Slow Food Chef Alliance Deutschland
Dr. Petar	Mandaliev	Bundesamt für Umwelt
Dr. Anja	Meutsch	BMUB
Nadine	Muchow	ifeu - Institut für Energie- und Umweltforschung Heidelberg
Anne	Müller	Wuppertal Institut
Arnold	Neveling	Studierendenwerk Heidelberg
Ulrich	Nicklas	BMUB
Jana	Nicolas	Wuppertal Institut
Dr. Anke	Niederhaus	BMEL
Marie	Ohnesorge	ResQ Club
Jörg-Markus	zur Oven	Deutsches Studentenwerk
Teresa Sophie	Rath	Too Good To Go
Dr. Bettina	Rechenberg	Umweltbundesamt
Joachim	Reinhardt	ifeu - Institut für Energie- und Umweltforschung Heidelberg
Stefan	Rest	Vorwerk
Christian	Reuter	DEHOGA Bundesverband
Sascha	Rieth	Bio Company
Rainer	Roehl	a'verdis Roehl & Dr. Strassner
Prof. Dr. Jana	Rückert-John	Hochschule Fulda
Michael	Schieferstein	FoodFighters
Jennifer	Schinkel	Wuppertal Institut
Timo	Schmitt	Berliner Tafel, Ernährungsrat Berlin
Dr. Felicitas	Schneider	Thünen Institut
Klara	Schubert	Umweltbundesamt

Frederik	Schulze-Hamann	Slow Food Deutschland
Christina	Söhner	Bündnis 90/Die Grünen
Rüdiger	Stein	PACE Paparazzi Catering & Event
Finn	Steinmann	Stakeholder Reporting
Christina	Strotmann	Fachhochschule Münster
Thomas	Voß	LWL-Kliniken Münster und Lengerich
Anita	Wälz	Lidl Deutschland
Frank	Waskow	Verbraucherzentrale Nordrhein-Westfalen
Dr. Henning	Wilts	Wuppertal Institut
Clemens	Wirbel	Europa-Universität Viadrina
Stephanie	Wunder	Ecologic Institute
Rainer	Würz	tegut... gute Lebensmittel
Dr. Joachim	Wuttke	Umweltbundesamt
Dr. Susann	Zahn	Technische Universität Dresden
Dr. Lutz	Zengerling	Veterinär- und Lebensmittelaufsicht Berlin Pankow