PROJEKT REKUK

Vocation Training for Chefs and Executive Chefs of Large-Scale Kitchens in Sustainable Food and Kitchen Management

Module Waste Script

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1 Glossary

Chef professional cook who often manages the kitchen, e.g. in restaurants, large-scale kitchens, hotels

Chef, executive chef who has an overall responsibility for the kitchen: purchase, staff, menu,… sometimes manager of several kitchens / restaurants

Cold chain constant cooling system of foods during delivery and storage

Convenience product already prepared meal, needs no or very little time to be ready for consume

First-in-first-out -system storage system where goods, that were stored first/are older, are taken out preferred

Foods defined as all substances or products which are intended or which one can expect that they can be consumed by human beings in processed, partly processed or raw state. Drinks, chewing gums and all other substances – including water, which are added on purpose for the production or processing of foods – are seen as foods as well [Regulation (EG) Nr. 178/2002].

Food waste the part of all edible products set for human consume which is thrown away, gets lost, bad or eaten by pests within the value chain [Nutrition and Agriculture of the United Nations (FAQ)]

Food turns into food waste, if:

- the roadworthiness doesn´t exist anymore, e.g. because of interruption of the cold chain or damage
- the use-by date is expired (meant for highly perishable foods)
- it was added to the waste circle, independent if it was still good/edible or not
- it is unbearable, e.g. because of contamination like dirt or a disadvantageous interaction – according to § 2 article 1 of the regulation of carrying out the collective law relating to food processing and distribution (regulation of food hygiene) it´s unsuited for the consumption or detrimental to one´s health

HACCP concept “Hazard Analysis and Critical Control Points”; concept to secure the consumer health

Ladle plan a plan that determines the number of ladles with which the food gets served on the plate. This way on every plate will be the same amount of food.

Meal consists out of many food components which are combined after a certain recipe and served as whole.

Menu if many different meals are served successive – e.g. as starter, main meal, dessert

Large-scale kitchen	commercial kitchen in which meals for numerous consumers get cooked e.g. for a restaurant or catering
Leftovers	Cooked food leftovers which didn´t leave the kitchen yet, that means that they weren´t in contact with the consumer yet
Low-waste	in its volume and weight the packaging material is reduced to the necessary measure of the filling – e.g. vacuum packaging
Organic	produced in an ecological way without pesticides and chemical-synthetic fertilizers
Packaging, environmental friendly	the packaging material is recyclable and free from environmentally harmful substances like PVC or aluminium
Packaging, more-way	a packaging type that can be reused several times
Packaging, one-way	a packaging type that can only be used one single time and needs to be disposed after usage
Pest	animals or insects that cause damage on foods
Recycling	to reuse old material as the raw product for the creation of something new
Regional	local, inside a radius til 150km
Seasonal	concerning a special season/ period of time of the year
Sustainable	***"***conserving an ecological balance by avoiding depletion of natural resources"[1]
Stakeholder	member of an interest group
Uneaten edible remains	food rests which already came into contact with the consumer and can´t further be reused

[1] en.oxforddictionaries.com/definition/sustainable

Waste	**"**any substance or object which the holder discards or intends or is required to discard"[changed according to Directive 2008/98/EC of the European Parliament and the Council, Art. 3]
Waste, avoidable	products / materials which can be used unlimited till the date of their disposal. Therefore they can be reused or exchanged with products/materials with less waste/packaging (changing one-way materials with more-way materials) according to law regulations [Waskow et al., 2016].
Waste, organic	all waste which arises through throwing away constituents of foods, rests of foods or meals that can´t be used furthermore for consume
Waste, partly avoidable	occurs partly through limited opportunities of the kitchen, through co-working with extern partners to reduce their waste (e.g. dictated container sizes and packaging offers of the deliverer, infrastructural possibilities for cooperation with social institutions or farmers, costumer demand)
Waste, unavoidable	predominantly inedible constituent of foods like shells or bones. But it can also be waste that occurs in the value chain of a large scale kitchen because of hygiene standards like hair protection, cleaning materials and so on [Waskow et al., 2016].

SLIDE 4-9

2 Why is waste prevention an important topic?

In the EU arise ca. 3 billion t waste annually, from that 100 M t dangerous waste. With that every European produces ca. 6 t waste per year [European Commission: Waste Prevention –Handbook: Guidelines on waste prevention programs, October 2012]. Germany causes 18 M t food waste along the whole process chain every year; that´s a daily amount of 225 g/person and a loss of ca. 235 €/ year and person in the private households. From that are ca. 10 M t avoidable [Tanja Dräger de Teran (WWF Germany), 2017]. Also in large scale kitchens arise enormous amounts of waste. Out of that ecological, social and economic problems arise. Nevertheless it´s noticed, that actual a large amount of waste would be avoidable, if we act wilful more sustainable.

Circular Economy Package

The European Commission has presented a "circular economy package" consisting of proposals amending six waste directives and an EU circular economy action plan.

The action plan lists about 50 concrete proposals to be implemented into national legislation by 2020. These include proposals for the entire life cycle of materials and products, starting with the increased use of sustainable raw materials and strengthening the market for secondary raw materials, recycling and waste disposal.

The proposals to amend the Waste Framework Directive (Directive 2008/98 / EC) and the Packaging Directive (Directive 94/62 / EC) intend to increase recycling and preparation targets for the reuse of municipal and packaging waste for 2025 and 2030. The proposal to amend the Landfill Directive (Directive 1999/31 / EC) provides for greater restrictions on disposing of municipal waste in landfills. The proposals also include new measures to promote the prevention and reuse of waste. For priority areas such as plastics, food, critical raw materials, construction and demolition waste, as well as biomass and bio-based products further targeted measures are planned. In the area of foodstuffs, halving the food waste is to be achieved by 2030, whereby from 2020 a reporting obligation for the EU states with regard to their reduction progress will be in place [Bundesministerium für Nachhaltigkeit und Tourismus, 2017].

SLIDE 10

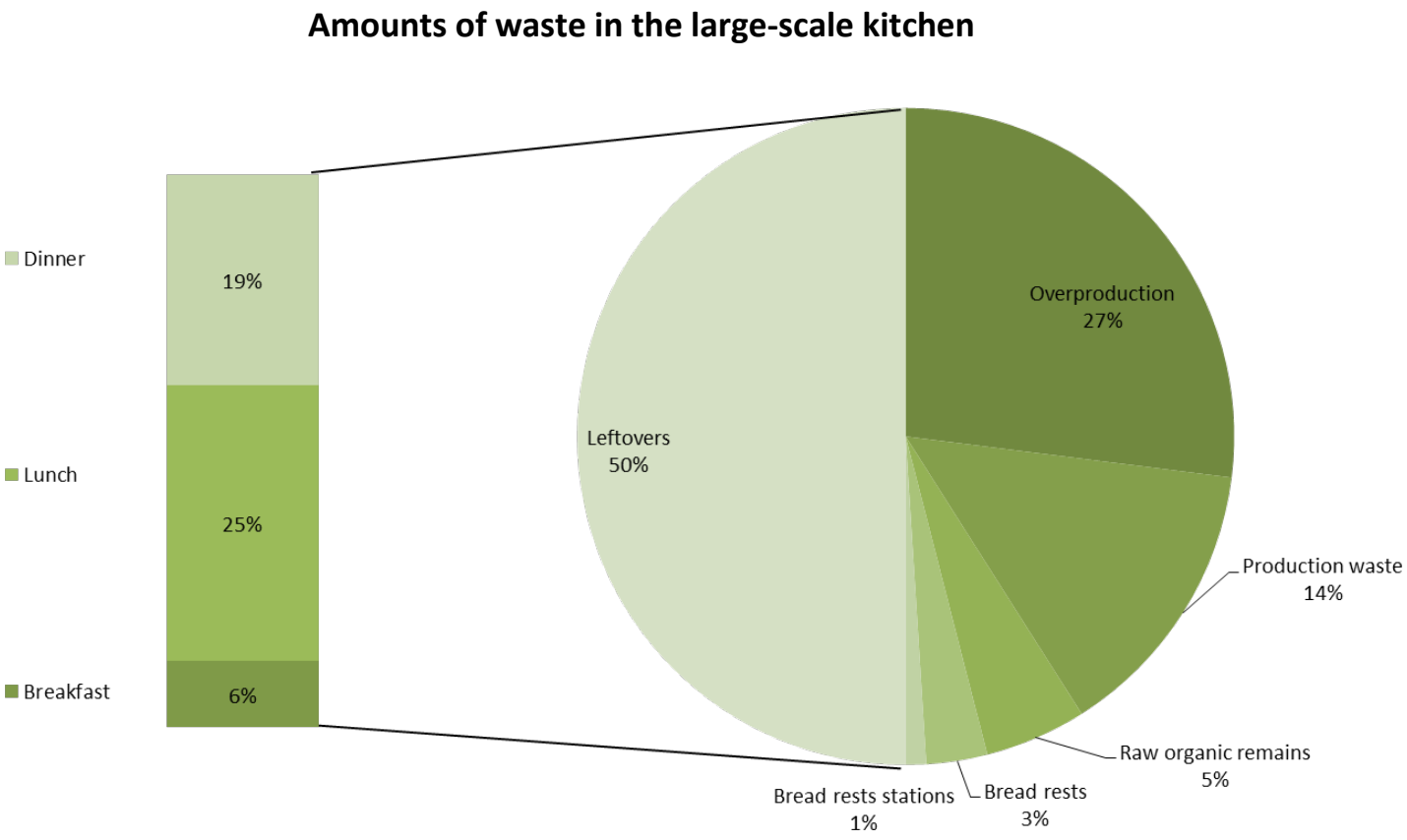

Fig. 1 Example for the percentage of kitchen waste in the large-scale kitchen of the hospital Oberwart

This diagram is just an example how waste can occur in a large-scale-kitchen of a hosptal but also in any other kind of large-scale-kitchen. What stands out clerly first is the huge amount of leftovers with 50%. Half of the meals aren´t eaten. Addionaly a lot of waste is caused by overproduction with 27%. Obviously the planning of the meals needs to be analyzed and adapted. Also the production waste could get reduced. Beside these interesting facts, it´s also good to know how much waste comes up for which mealtime. Clear to see is that during the breakfast just a smal amount of waste occurs while ¼ of the leftovers arise during the lunch. Such information help to identify the most problematic positions. For further information look up chapter 7 and 8.

SLIDE 11-12

3 What is the waste hierarchy?

In general the waste hierarchy describes single steps, how to deal with products within a value chain. The goal is to prevent waste as much as possible or to reuse products.

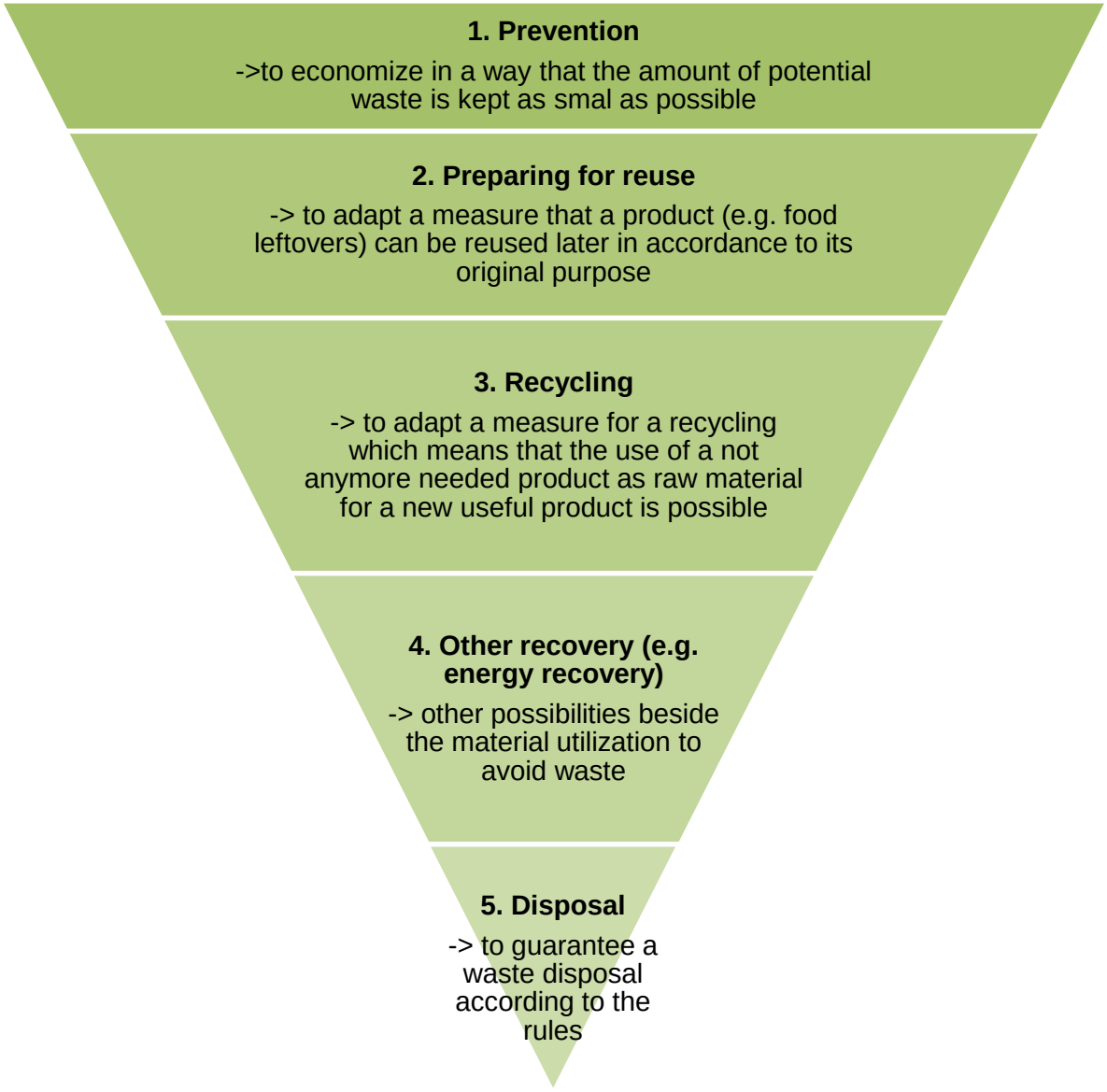

Fig. 2 Waste hierarchy with five steps

SLIDE 13-15

4 Which benefits come up for my kitchen through waste prevention?

Recycled paper becomes paper again, seperated colored and white glass is turned into new bottles, metals become manifold new products and some plastic bottles become plastic bottles again. Waste that can no longer, because the fibers are too small or impure, be recycled is incinerated. District heating and electricity are extracted from the incinerated waste [City of Vienna, see above-c].

Economic	Ecological	Social
✓ High cost savings through significant reduction of costs in all fields of the companies value chain ✓ Efficient waste prevention concept of the company may offer competitive advantages in accordance to costumer acquisition and co-working with different stake holders	✓ Reduction of greenhouse gas emissions ✓ Reduction of the entry of harmful substances in air, land and water ✓ Consideration of limited resources ✓ The opportunity of the usage of foods with high quality (specially ecological produced foods) on the base of reduced costs for waste disposal	✓ Improvement of the communication channels in the team ✓ Support the team spirit in the company ✓ Higher motivation of the single employees ✓ Better identification of the single employee with his company ✓ Stimulation of the employees´ and costumers´ environmental awareness

SLIDE 16

Notes:

5 What are the most important waste fractions in the large scale kitchen?

Organic waste

Here one classifies all waste which arises through throwing away constituents of foods, rests of foods or meals that can´t be used furthermore for consume. In large scale kitchens especially the following waste occurs:

- Waste of fruits and vegetables, egg shells, coffee grounds, tea herbs and so on, all cooked constituents of foods and meat waste count to this group as well
- Raw, not for consume suitable, animal waste (e.g. bones, cartilages, tendons)
- Overlaid and foul or cooked foods and meals
- Non-reused leftovers
- Left overs on the plate of the consumer

Packaging waste

To that counts especially the packaging of foods:

- Light material packaging
- Aluminium packaging
- Paper/paper board
- Used glass
- Residual waste

All one-way packaging should get collected separately according to material

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Notes:

6 Which kinds of waste are avoidable?

Avoidable waste	Partly avoidable waste	Unavoidable waste
➢ Products / materials which can be used unlimited till the date of their disposal. Therefore they can be reused or exchanged with products/materials with less waste/packaging according to law regulations e.g.: • changing one-way materials with more-way materials • exact weighting of meat parts, not only estimate • using vegetable peels for the preparation of broths [Waskow et al., 2016]	➢ Occurs partly through limited opportunities of the kitchen, through co-working with extern partners e.g.: • dictated container sizes and packaging offers of the deliverer • infrastructural possibilities for cooperation with social institutions or farmers • costumer demand	➢ Predominantly inedible constituent of foods like shells or bones. But it can also be waste that occurs in the value chain of a large scale kitchen because of hygiene standards e.g.: • cleaning materials and so on

Notes:

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7 Levels of action and organisation in waste collection

In waste prevention, purchasing, process organization, waste collection and separation as well as the raising of the awareness of of employees and customers are essential levels of action.

Purchase

By deliberately selecting the products in terms of packaging, quantity, number etc. during purchasing and good planning, large portion of waste can be avoided.

Workflow management; waste collection and separation

Waste collection and separation must comply with the requirements of the respective work area. The following should be noted in particular:

- Type of waste containers
- Size of the containers
- Clear and above all uniform labeling of the containers, preferably multilingual, in color and with pictograms
- Site and accessibility of the container

Awareness raising

Only by raising the awareness of employees an on the issue the long-term sustainable use of resources in the company can be consolidated.

SLIDE 19-25

8 Where does waste occur along the value chain of a large scale kitchen?

Purchase	Storage	Mise en place	Preparation	Portioning	Disposal

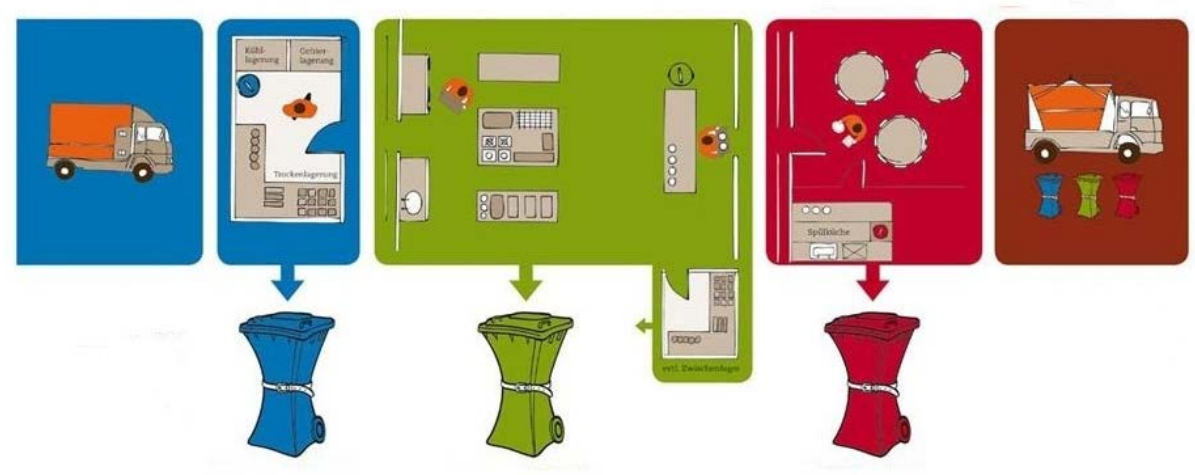

Fig. 3 Waste generation along the process chain

Purchase

Preventability

Notes:

• Purchase of too large amounts of food because of cheaper prices or a missing merchandise management system	Avoidable
• Usage of one-way packaging: o Cardboards o Tetra packaging o Drinks and preservative tins o One-way bottles o Synthetic material packaging	Partly avoidable

Storage

	Preventability
• Storage losses owing to careless storage like inopportune combination of certain foods, light influence, …	Avoidable
• Storage losses owing to over-maturing of the products, interruption of the cold chain or a missing quality control of the foods while goods purchase	Avoidable
• Inopportune order on the shelves (ignorance of the first-in-first-out principle)	Avoidable

Preparation

	Preventability
• Waste intensive kitchen system	Partly avoidable
• Incomplete utilization of the fresh materials	Partly avoidable
• Production mistakes (e.g. overcooked noodles)	Avoidable
• Unused, bulky raw goods (potatoes, cucumbers, apples, …)	Avoidable
• Not for consumption suitable wastes (e.g. shells, pips, bones, stalks, egg shells, coffee filters)	Unavoidable
• Used oil/fat	Unavoidable

Portioning/serving of meals

	Preventability
• Leftovers on the basis of under portioned serving of meals	Partly avoidable
• Missing/difficult calculation of the exact number of participants at the catering	Partly avoidable
• Leftover from the pattern plate	Avoidable
• Delivery of single meals in one-way packaging (e.g. aluminium shells)	Avoidable

Food return

	Preventability
• Leftovers from plates because of too large portions or portions not according to the wish of the costumer	Partly avoidable

Hygiene/Cleaning

	Preventability
• Latex gloves	Partly avoidable
• One-way head cover	Avoidable
• Paper towels	Partly avoidable
• Cleaning utilizations	Partly avoidable

Disposal

	Preventability
• Ignorance of the regulations for waste separation through which measures for obeying the waste hierarchy aren´t possible anymore	Avoidable

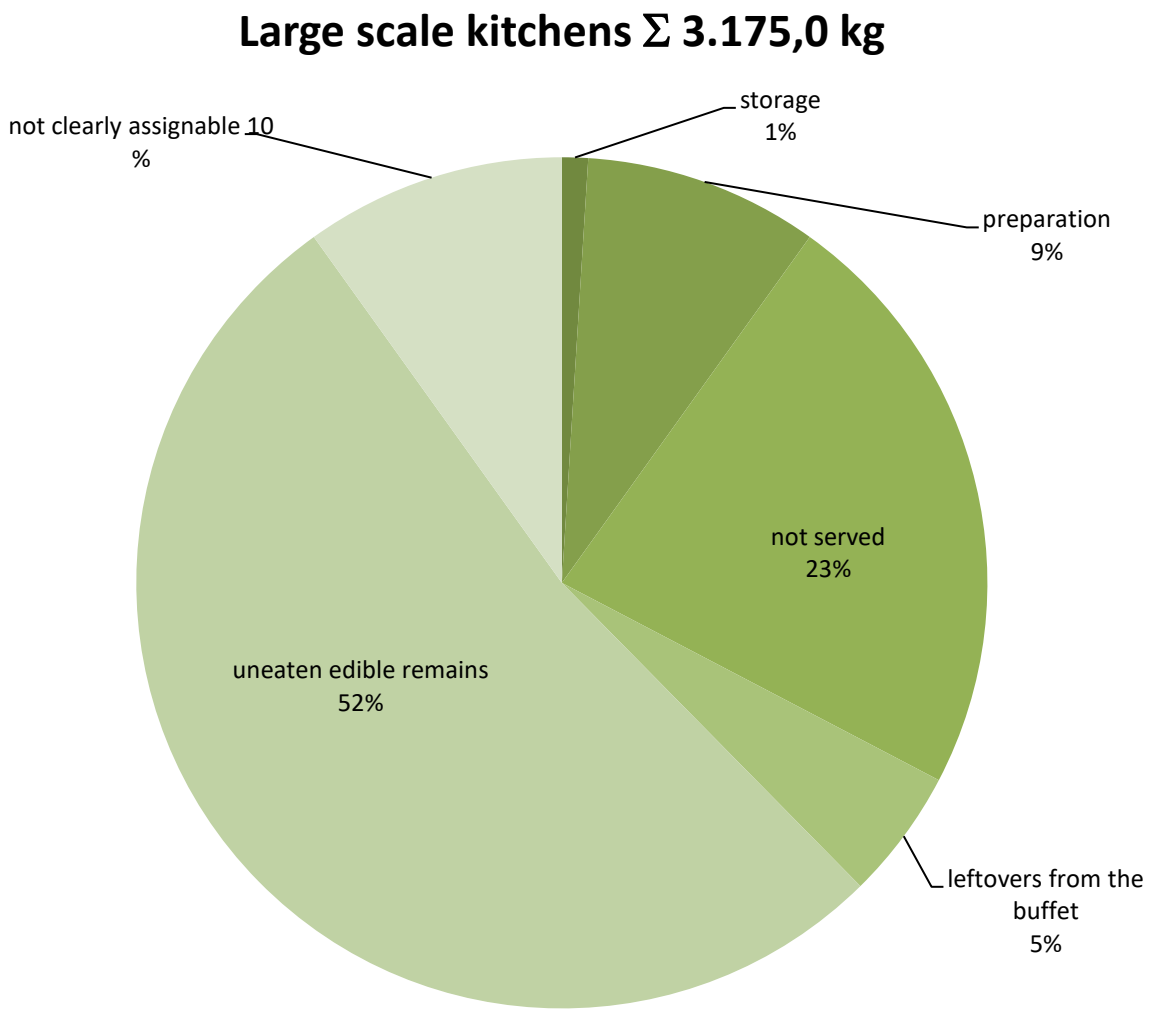

Fig. 4 Composition of the food losses from large scale kitchens in accordance to fields, in mass-%

Collecting data and creating diagrams helps to find the problem positions where most of the waste occurs. The point “uneaten edible remains” with 52% clearly shows the position with the biggest waste issue. To have an even better overview also the sill “not clearly assignable 10%” must get allocated to their origin.

Notes:

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9 How can I get an overview about these positions?

To be able to develop a solution oriented waste management for the own large scale kitchen, it is necessary to first get an overview of the whole kitchen processes with all flows of goods and information (phase 1). The time for analysis shouldn´t be too short so that it´s possible to identify seasonally conditional variation. The throughout the process analysis identified problematic positions or already existing potentials are used in the second step (phase 2) to plan concrete measures and develop a goal-oriented management plan.
You should do the data collecting and analyse of phase 1 for every single position of the value chain. Write check lists for yourself.

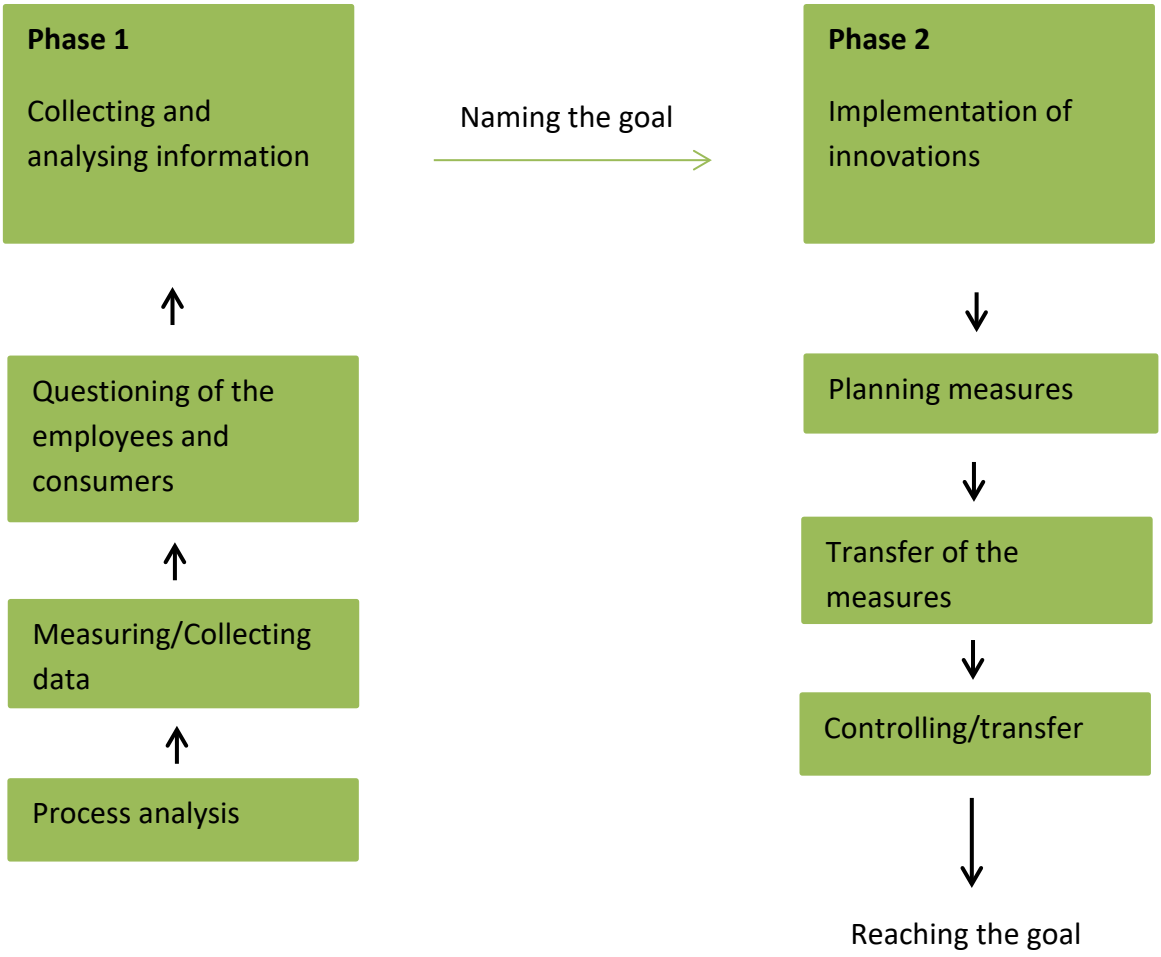

Fig. 5 First collecting information, later transfer of measures

1. **Analysis of documents**

That means to have a look on all documents concerning the material, value and information flows of the company – e.g. contracts with deliverers and disposal companies, bills, purchase plans, storage plans, visualised workflows, work instructions, kitchen plans, hygiene rules and cleaning plans, disposal plans.

2. Analysis/measurement of the amount of waste at the concrete process point

That means going through the single stations of the process chain, probably measuring the amount of waste with adequate measuring methods.

<u>For breakfast, lunch and dinner:</u>
Production waste
Food that has not been distributed
Meal leftovers

<u>Weighting of the waste on three measure points:</u>
Production kitchen
Distribution kitchen
Distribution

To gain an overview about the status quo in accordance to the amount of waste in the own large scale kitchen, the following points should be included:

<u>Planning</u>

- Is there a regular plan of menus and meals?
- Are you including experiences from previous calculations in the current planning?
- Are you considering seasonal fluctuations of the consumers or the favorited food?

More information on meal plans can be found in the module sustainable menu.

<u>Purchase/delivery</u>

- Which packaging sizes are ordered?
- Do the single deliverers offer different packaging sizes?
- Which packaging materials are currently used? - documentation of the currently used packaging materials with following breakdown of the materials into one-way and more-way packaging materials
- Which amounts of goods are ordered – is there a calculation in line with demand?
- Does the deliverer offer variable purchased quantities?
- Is a short in time/just in time delivery possible?
- Are regional products available in the delivery assortment? If yes, are regional products bought preferable?
- Do contracts with the deliverers according to certain purchase quantity exist or does everything get specifically ordered?
- Is there an incoming goods inspection to check the quality of the incoming goods?

Notes:

More Information on portion sizes can be found in the module sustainable menu.

Storage

- Are the foods stored correctly? (side by side storing of certain foods, light influence, position, humidity, …)
- Is the cold chain regularly controlled for breaks/gaps?
- Is an extra storage for leftovers existing?
- Creating and managing of storage control lists:
    - What was stored when?
    - What was taken out for the planning of the meals and when?
    - What got directly sorted out of the storage and for which reason?
        - Measuring the storage loss through listing (e.g. 10 apples, 2 ½ breads,…) and weighting (e.g. 18 kg potatoes, 7 kg milk)

Month	Product	Reason for disposal	Amount at the time of warehousing	Storage loss
January	apples … …	mould … …	35,5 kg … …	3,7 kg … …
…	…	…	…	…

    - When/how often does a storage inventory occur?
- Does the storing of the products occur according to the first-in-first-out-system?

More information about storage, such as the quality of food, seasonal storage and storage tests if conventional versus organic produce can be found in the module foods use.

Preparation

- Which kitchen system is used? (e.g. fresh food kitchen, cook & chill, cook & freeze)
- How large is the amount of convenience products?
- Documentation of the work flow
- Is the calculation of the amount of meals in line with demand?
- Do standardized recipes exist? If yes, which factors are in included in the standardization (e.g. target group of the consumers, packaging sizes, seasonality)
- Measurement of food waste during the meal preparation (sorted for the kind of waste: still for the consume suitable food waste, not anymore for consume suitable food waste) – probably separately for different daytimes (e.g. breakfast, lunch, dinner) or kitchen fields:

Date	Daytime	Kitchen field	Kind of waste	Empty weight of the collecting bucket	Full weight (bucket + waste)	Weight waste (= full weight - empty weight)

This measuring table can also be used for the waste measuring in other kitchen fields

More information on convenience products and suggestions for sustainable recipes can be found in the module sustainable menu.

Portioning/serving of meals

- Which forms of serving of meals do exist? (e.g. portioning at the counter, salad buffet, delivery to single persons)
- Is the buffet prepared in line with demand? – measuring and evaluation of the buffet leftovers
- Are you already using more-way systems for the single portioning?
- How does the portioning occur? (e.g. ladle plan, by eye)
- Do the guests have a selection between different portion sizes?
- Does one prepare pattern plates for the single menus?
- Who is involved in the serving of meals?
- Documentation of the single work flows
- Measuring the leftovers (cf. preparation: measuring table)
- Are you already using possibilities for reusing leftovers? (e.g. reprocessing to a new meals, handing out to the staff, cooperation with charity institutions)

More information on portion sizes, methods of food distribution and information on nutrition can be found in the module sustainable menu.

Food return

- Measuring of the leftovers from the plates sorted for food group (cf. Preparation: measuring table)
- Questioning the consumers for reasons of not-eating in form of questionnaires that are handed out on the tables or added to the meals
- Is there a possibility that the consumers can get their own leftovers packed? If yes, which packaging material is chosen?

More information about surveys and other tools of communication can be found in the module communication and marketing.

Hygiene/cleaning

- Work flow/ work organisation (existing cleaning plan?)
- Which cleansing agents are used?
- Do guidelines for the amount of the used cleansing agents exist? (e.g. standardized measuring cups or dosing units)

- Which cleansing utilities (cloth, towels, …) are used? – listing sorted for one-way and more-way articles
- Which hygiene equipment does exist for the kitchen employees (apron, gloves, hair protection) – listing sorted for one-way and more-way articles
- Measuring the amount of waste produced by kitchen hygiene (measuring through listing the single articles)

Disposal

- Does the waste get separated in accordance to the rules?
- At which positions are waste containers to find?
- With which disposal company are you cooperating, which conditions do exist?
- Do cooperation's exist with local farmers or something similar which partly picks up peeling waste and reuses it?
- Which disposal ways are used? (e.g. composting, burning, recycling, energetic utilization)
- Overview over amount/costs of the monthly/yearly produced waste all in all (e.g. information from the disposal company, waste bills

Notes:

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10 Comparison of common kitchen systems in accordance to the amount of waste

Kitchen system	Fresh and mixed food kitchen (cook & serve)	Warm catering (cook & hold)	Cook & chill	Cook & freeze
Characteristics	- The preparation of the meals occurs only right before consumption - Proportional preparation of the fresh, unprepared foods and convenience products - The serving of the meals occurs on-location	- The preparation of the meals occurs on the day of the consumption in a remotely central fresh or mixed food kitchen - The meals get delivered from the central kitchen to the costumer - Forms of delivery: single portions or more-portion sizes	- The preparation of the meals occurs in a kitchen on site or in a remotely central kitchen (fresh or mixed food kitchen) 3-5 days before the consumption - The prepared meals get cooled down to 3°C directly after the production and are stored at this temperature - The meals get portioned cold on the day of consumption and regenerated at the place of consumption - Forms of delivery (if central kitchen): single portions or more-portion sizes	- The preparation of the meals occurs in a kitchen at site or a remotely central kitchen (fresh or mixed food kitchen)up till nine months before the consumption - The prepared meals get cooled down to - 18°C directly after the production and are stored by this temperature - When required the meals get proportioned before the cooling - At the day of consumption regenerated

				- Forms of delivery (if central kitchen): single portions or more-portion sizes
Critical points for food waste and possible measures for regulation		1. <u>Planning of the meals:</u> ✓ Oriented on saesonality and regionality ✓ Oriented on the goods in stock ✓ Leftoovers from the day before get included in the meal planning (counts especially for warm catering) ✓ Exact calculation of the number of portion 2. <u>Purchase:</u> ✓ Purchase in line with demand 3. <u>Preparation:</u> ✓ Preparation of fresh foods as restless as possible 4. <u>Serving of the meals:</u> ✓ To offer variable portion sizes and work with a ladle plan		

Critical points for packaging waste and possible measures for regulation	1. <u>Purchase:</u> ✓ Utilization of more-way packaging systems ✓ Appropriate choice of the packaging sizes ✓ If possible, buying fresh and unpacked food 2. <u>Preparation:</u> ✓ To reduce the preparation of convenience products to a minimum, tendency to a fresh food kitchen	1. <u>Purchase:</u> ✓ Utilization of more-way packaging systems ✓ Appropriate choice of the packaging sizes ✓ If possible, buying fresh and unpacked food 2. <u>Preparation:</u> ✓ To reduce the preparation of convenience products to a minimum, tendency to a fresh food kitchen 3. <u>Storage and delivery:</u> ✓ Replace one-way packaging of the single portions with more-way alternatives (administration e.g. possible with help of deposit system between kitchen and costumer)

SLIDES 37-39

11 Which rules for reuse or handing out of foods do I have to observe?

Leftovers
To reuse unprepared foods or prepared meals you need to take care of the hygiene.

Temperature
As far as all temperatures laid down by law are obeyed and a comprehensive cold chain is guaranteed, unprepared foods or leftovers can get processed and given to third (table guests, social institutions, employees).

For self-control

- Document exactly the temperature and the period of time of the storaging.
- Take care that the temperature of the meals never falls under 65°C during the serving.
- If the meals on the serving counter had a temperature over 10°C and under 65°C for more than 2 h, you must discard them.
- Cool down warm meals, which are appropriate for reuse, to 4°C within 90 min.
  - Fill the meals into big, flat containers to accelerate the cooling down process
  - To prevent the formation of condensation which supports the growth of germs, don´t cover the colling down meals.
  - After the cooling down process you can put on a cover.
  - If there should be again leftovers from the already reused meals, you have to dispose them. You aren´t allowed to heat them up another time.

Notes:

Best-before date (BBD)

After the BBD passed, the product isn´t automatically inedible but a decrease in value may occur. That has to be evaluated by the kitchen staff in every concrete individual case. After a positive check with the senses by the responsible kitchen staff, you are allowed to use the product, after the BBD passed, for reprocessing in the kitchen and serving to the guests or as donation to social institutions (e.g. TAFEL) for reuse.

Use-by date

In contrast to the BBD, the use-by date is a binding expiry date. Therefore you mustn´t give out the food for further consumption after a passed UBD because these highly perishable foods can endanger the human health[2].

Leftovers from plates

Consumer advice for the takeawy of the own meal rests

Because these food rests already came into contact with the consumer, it is forbidden for you to reprepare them kitchen intern or to give them away to third out of hygienic reasons. But of course you can ask the guest, if he wants to take home the leftovers from his own plate on his own responsibility.

Notes:

[2] Cf. §7a German food labelling regulation (LMKV)

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12 Which steps shall I go to adapt measures for waste prevention?

For the concrete target orinted transfer of phase 2 you should act step by step.

For a more in depth look at networking, internal/ external communication and marketing refer to the module communication and marketing.

Step 1: Target and devolpment of an action plan

On base of the results of phase 1 you can formulate a generall *main target*.
From this you name single *problem positions*. To this counts which goals can be reached at the individual positions, in which *period of time* they can be reached (asses as realistic as possible!) and which concrete *measures* are necessary therefore. It offers itself to develop a clear structured and easyily understandable overview.
An overview could look like the following example:

Main target: Reduction of the amount of waste

Position	Target	Measure	Measure converted till
Purchase	Reduction of the packaging waste by 30 %	• To establish more-way packing systems • To prefer deliverers who offer a great selection of unpacked foods	• February 2018 • January 2018
Storage	Reduction of storage losses	• To optimize the sorting in shelves according to the first-in-first-out system • To do a regular inventory • To establish a computerized storage controll system	• December 2017 • December 2017 • February 2018

…		•	•

Notes:

Step 2: To set responsible persons

Step 3: Training measures

Step 4: Regular documentation and evaluation

Use the advantages of computerized systems. Your documentation should contain all papers, that occurred during phase 1 and 2, e.g.:

- Reports abut the annual amount of waste
- Contracts with deliverers
- Overview about all used foods (food group, convenience state, storage, extension method, origin, type of packaging)
- Storage lists
- Documents of measures of the waste
- Main target and detailed action plan
- Reports about measure transfer, upcoming problems and initiated countermeasures
- Evaluation reports
- Training materials inclusive participant lists and probably certificates
- Minutes of diverse team meetings
- And so one …

The success and reaching the goal of the sustainable waste management should get checked and evaluated regularly, at least every 3 years.

Step 5: Communikation, external effectiveness and networking

An optimized waste concept dosn´t only give intern advantages for your company. Through networking with actors of equal values, more sustainable structures can get established and further developed beyond the borders of your company. In the following, possible measures shall get presented:

1. Measures in regard to the intern organizational conducting and planning
2. Measures in regard to critical point of the single steps in the process
3. Measures for the well-directed interaction with table guests

Notes:

Intern organizational conducting and planning

a) Increase of the self-confidence in accordance to the company internal environmental protection
   - Use your role model function as kitchen chef!
   - With transparent waste containers you show the daily arising waste.
   - Establish Information and training offers!

b) Intern communication and planning of the meals
   - Discuss the planning of the purchase and the meals in regular meetings together with chosen responsible persons!

1. Guest oriented planning of the meals
   Exactly adapt your meal offer to the demand of the consumers. While planning the meal consider:
   - Current seasons and weather conditions
   - The popularity of ceretain meals

2. Exact calculation of the required amount

Remarke: Using computerized software systems for data collection and planning of the meals. offer numerous advantages like:

- Simple calculation
- Quick overview over current goods in stock, recipes, calculation numbers and amounts of waste
- Clearly reduced personnel costs in comparisson to traditional paperbased data collecting and analysis
- Via cloud-system visible for everybody at any time

slide 52

Best practice example:

The **Aramark Holdings GmbH & Co. KG** with headquarter in Neu-Isenburg is the second largest catering company of Germany. It is responsible for ca. 500 customers in the sections company gastronomy, sport, free time and fair gastronomy as well as hospital, senior, school and day care catering. The company always wants to be one step forward. To fulfil this goal Aramark Holdings thinks both creative and innovative: for the waste prevention the amounts of demand are planned exactly, leftovers from meals get collected, recorded and analysed. The employees have a provided e-learning program and trainings concerning the practical processing. To fix the topic waste prevention even more in the employees 'minds, transparent waste containers are used. This way avoidable food waste got reduced up to 50% until now. With their sustainable concepts and varied actions Aramark Holding also fills the costumers with enthusiasm. It is the first catering company throughout Germany that is to 100% MSC certificated and takes action this way for sustainable fishery. With the campaign "Hot Pot Bar" consumers can create their own soup out of a selection of ingredients. Once a year in September the so called "Earth Week" takes place for which only ingredients from the immediate region are used for the processing of the meals. This way

especially the CO2 balance can be kept down. Because of this and many other ideas Aramark Holdings gained a great popularity not only on the part of the costumers also on part of the employees. A company with future![3]

Notes:

[3] Cf. http://www.aramark.de/ideen-und-konzepte/

SLIDES 43-44

Process steps

a) Purchase/delivery

Regional delivery networks and a good harmony are clear advantages for a waste reduced and packaging reduced food procurement because they really expand the possibilities of individual agreements and flexible delivery systems.
On one hand with waste oriented food procurement you can already fight against the arise of food waste during the purchase:

- Carry out exact controls of the incoming goods to guarantee freshness and long storage life of your products.
- Buy privileged regional products, this way the deliverer can also guarantee more freshness.
- Also ask for fruits and vegetables that can´t get sold anymore in the retail trade because of not standardised growth form or similar.

On the other hand you should embrace on low-waste packaging solutions. The general devise here is: more-way instead of one-way, as much as possible!
If it´s not always possible to use more-way systems, use low-waste and environmental friendly packaging. Additonaly regional and seasonal foods often can get delivered unpacked.

- Non-perishable products can be bought in bulk in container sizes.
- Deliverers are obliged to take back the most transport packaging. Absolutely talk with your delivery partners and us the advantages of an immediate redemption.

Notes:

For more information on local food networks and effects of buying regional produce refer to the foods use module.

b) Storage

With optimized storage conditions and control you can decrease your storage costs and reduce the losses because of food spoilage to a minimum:

- Really smal storage amount
- Storing foods according to their needs/characteristics (side by side storing of certain foods, influence of light, position, humidity, …)
- Creating storage lists
- First-in-first-out principle (FIFO)for the storage sorting
- Storage room open, clean and tidy; regular stocktaking
- Reduce packaging material during storing

For more information on the effect of storage on produce quality and storage tests refer to the foods use module.

c) Preparation

- To use fresh food kitchen
- Training for the staff
- To create work-flows quite flexible
  - Short-term post-production
  - To cook meal components seperately
- To use standardized recipes

SLIDE 53

Best practice example:

Also the **Maritim hotel association** attaches great importance to sustainability and waste prevention. Especially the Maritim proArte hotel Berlin takes action. For the exact entry of food waste the leftovers are weight with the feedback scale “ResourceManager-FOOD“ which doesn´t just collect the data but also analyses and visualises them on a screen in real time. The employees get trained in accordance to the topic food waste. Beside that the preparations of the meals are adapted to the demand at the buffet as well as the portion sizes. So it was possible to reduce the food waste at the breakfast buffet up to 80%. As a consequence ¼ less waste containers are needed [4]. Seasonal, regional as well as ecological and Fair Trade products are bought preferred. In the purchase additional attention is paid to optimal logistics. In the kitchen area the goods get finally prepared in a carful, energy saving way and in line with demand. For drinks the hotels use mainly more-way packaging.

[4] Cf. Federal Ministry of Food and Agriculture: Engagement gewinnt. Ausgezeichnete Projekte gegen Lebensmittelverschwendung, July 2016, p.16

Additional to the usual meals the customers can also choose out of a vegetarian menu, so that all wishes get fulfilled[5].

d) Serving of the meals

Adaption of the portion sizes:

- Costumers choose portion sizes
- To adapt the portion sizes to a realistic average costumer of the prvailing target group
- To work out a ladle plan
- Not to prepare further meals at the end of meal time
- To present meals to make a selction easier (e.g. Foto in the card or on screens)
- To replace one-way packaging with more-way packaging (deposit system) or look after degradable materials
- Go without single portion packaging when serving diverse meal components (e.g. light cream, butter, jam); to replace with the offer of open foods

e) Reuse/disposal

- Before disposing left overs, first prove, if they are appropriate for a reuse

To make a reuse of food leftovers happen, check the following points in your kitchen:

- Can the planning of the meals get managed more flexible to process reusable food rests?
- Can you build uo networks to charitable institutions?
- Is the disosal according to the rules of left waste fixed?
- Can waste get collected in accordance to the single waste fractions?
- Separate organic waste for:
    1. Raw plant-based waste
    2. Animal-based waste and waste of prepared meals

SLIDE 54

Best practice example:

The **Guesthouse „Fischküche Reck“** in Möhrendorf is specialized for Franconian classics new interpreted. The special point is that nearly everything is homemade[6] and mainly

Notes:

[5] Cf. www.maritim.de/upload/media/media/220/BPA_Flyer_Fact_Sheet_Green%5b12786%5d.pdf

[6] Cf. http://fischkueche-reck.de/?page_id=53

seasonal products from local producers are bought [7]. Furthermore the guest house gets its deliveries several times a week to guarantee fresh ingredients all the time. Waste prevention is really important here and so all parts of the animal are used in the meal preparation. Meat rests are processed to sausage, vegetable peels and meat rests are used for stocks and soups and out of surplus fruits and vegetables they make jam and chutney. Another fact is that the menu of the day is adapted to the current goods in stock and the expected number of guests. To avoid food left overs the guests can choose out of different portion sizes[8]. On the menu plan is also a detailed list with allergy information[9] and it´s extra pointed out that the leftovers from the own plate can get packed by the staff to takeaway[10].

f) Hygiene and cleaning

How can you act more sustainable regarding to the hygiene?

- Replace one-way aprons and hair protection with washable clothing out of cotton
- Training of th eemployees in good hand hygiene
- Renunciation of gloves (except when injury)
- Optimisation of the cleaning expenditure
- Cleansing liquids in container sizes, dosage as help
- Cleansing liquids which already have an optimized cleaning force in low dose
- Renunciation of cleansing liquids that contain phosphate, formaldehyde, chlorine or sulphate
-

SLIDE 55

Best practice example:
Gilbert Bielen is a chef in the children hospital „St. Marien“ in Landshut. He is specialized for the utilization of the whole animal, only the exclusive parts he doesn´t take. And he has to go without the innards because of hygienic reasons. He and his team cook daily on average 350 portions. In line with the offer of the farmers from whom he gets his foods, Bielen adapts his meals according to the available ingredients. When the tomatoes from the organic farmer are ripe, Bielen buys them from him. Even if he doesn´t need them right now, he preserves the vegetables and processes them later. Through this the tomatoes

Notes:

[7] Cf. Federal Ministry of food and agriculture: Engagement gewinnt. Ausgezeichnete Projekte gegen Lebensmittelverschwendung, July 2016, p.15
[8] Cf. http://fischkueche-reck.de/?page_id=53
[9] Cf. a.a.O.,p. 15
[10] Cf. http://fischkueche-reck.de/?page_id=53

don´t need to get overripe and have to rot. As another possibility not to waste food Bielen names the renunciation of the decoration on the plates. The consumers can choose the size of their portion and take independently food from the salad buffet[11].

g) Interaction with table guets

- Exact and well apparent information about the ingredients of the offered meals
- Inform the guests about your initiated measures for waste reduction
- When target group quite closed: initiate guests step by step into a new environmentaö consciousness
- Offer possibilities for feedback
- Good external communication/advertisement

For more in-depth information refer to the module communication and marketing.

SLIDE 56

Best practice example:
The **Biond Ltd** is one of the best examples, that intensive waste prevention is also possible in large scale kitchens. This private-sector company with headquarter in Kassel has beside the utilization of organic foods, the waste prevention as main goal. Biond offers lunch in schools and nursery schools in which nearly everything is exploited. Peel rests of vegetables get processed to vegetable stocks. 2/3 of the meals are prepared freshly and directly before

[11] Cf. www.bioland.de/im-fokus/interviews/detail/article/die-edelteile-koennen-sie-behalten.html

the lunch break, the rest only, if necessary. Another point of the concept is the renunciation of a pre-order system. The caterer offers a buffet from which the costumers can take as often as wished. The condition is that they have to give an empty plate at the end. In a consequence one can eat in many small courses instead of getting one big portion from which half of it ends in the container. As a further creative idea Biond implemented a “waste barometer”. This shall motivate not to exceed a fixed amount of meal left overs. If the amount of waste is settled even under the striven limit, the consumers get a reward. Furthermore, Biond serves little pieces for trying, if wished. So, if the food doesn´t taste good, no bigger portion gets disposed. In accordance to a study of the Institution for Sustainable Nutrition and Food Industry (university of applied sciences Münster) in the Biond large scale kitchen only 2,8 kg waste per 100 kg raw food is produced.
Another special activity is the companys´ educational work. In workshops they talk with the children how they can avoid waste themselves and how to reprocess rests of fruits and vegetables, e.g. as smoothies. Throughout this the caterer doesn´t only sensitize its employees, it also makes the costumers aware of the importance of waste prevention and its usage.
Because of the well thought-out concept and intensive engagement the Biond Ltd was honoured with the German “price for engagement against food waste 2016”[12].

[12] Cf. Federal Ministry of food and agriculture: Engagement gewinnt. Ausgezeichnete Projekte gegen Lebensmittelverschwendung, July 2016, p.13

Notes:

13 References

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