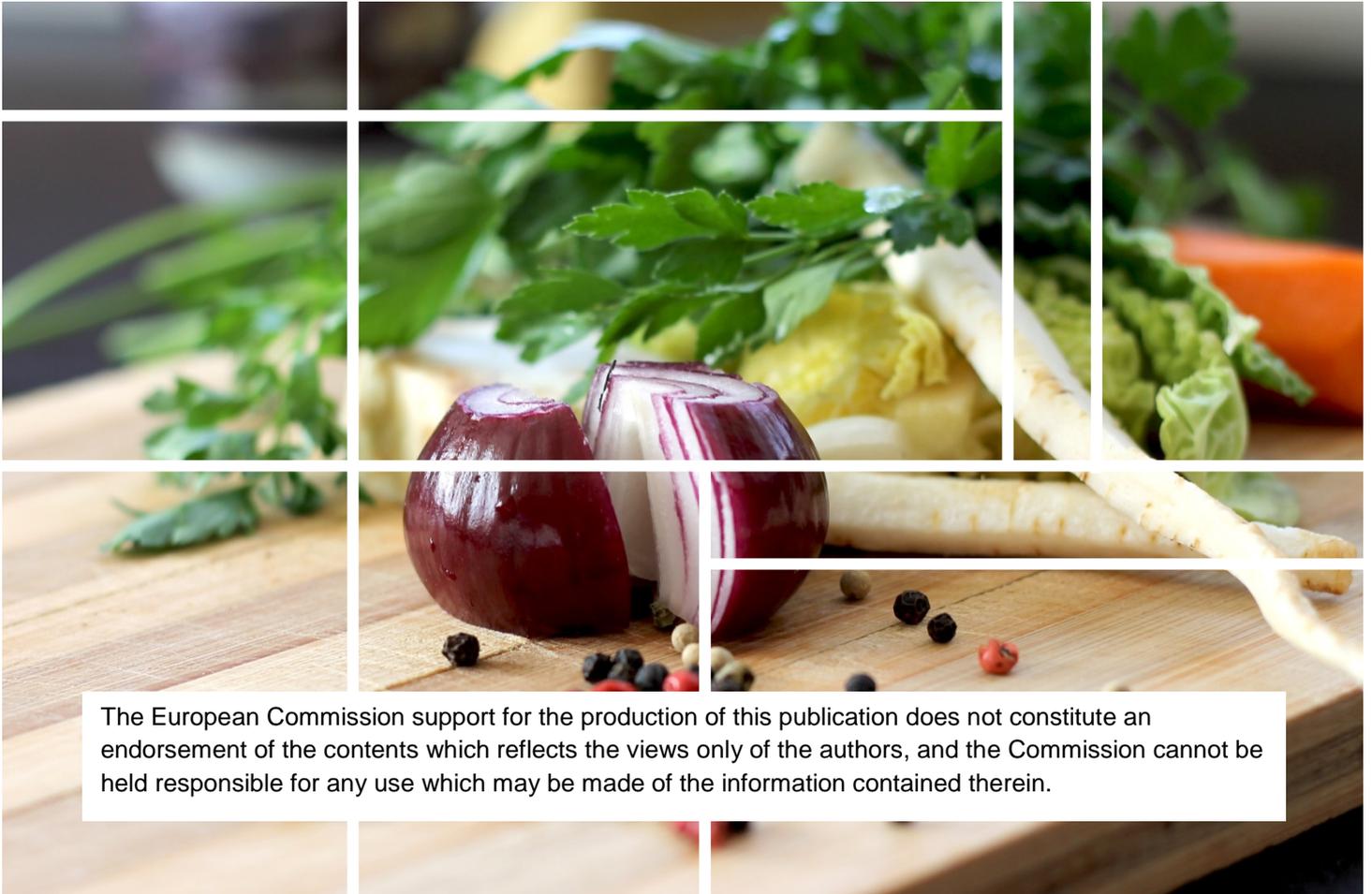




PROJEKT REKUK

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

Module Waste Handbook



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1 Glossary

Cold chain: Constant cooling system of foods during delivery and storage.

First-in-first-out-system: Storage system where goods, that were stored first/are older, are used before goods that were stored at a later time.

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.

Food waste: Food waste is 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

Food turns into food waste, if:

- the food safety cannot be guaranteed anymore, e.g. because of interruption of the cold chain or damaged packaging.
- the use-by date is expired (for highly perishable foods).
- it was added to the waste circle, regardless if it was still good/edible or not.
- it is unacceptable, e.g. because of contamination like dirt or a disadvantageous interaction.

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

Ladle plan: A plan that determines the number and kind of Ladle with which the food gets served on the plate. This way on every plate contains the same amount of food.

Meal: Meal consists out of many food components which are combined according to a recipe and served as whole.

Menu: A menu is if many different meals are served in succession – e.g. as starter, main dish, dessert.

Leftovers: Cooked food leftovers which didn't leave the kitchen yet, and therefore weren't in contact with the consumer.

Low-waste: In its volume and weight the packaging material is reduced to the necessary measure – e.g. vacuum packaging.

Packaging, environmentally friendly: The packaging material is recyclable and free from environmentally hazardous substances like PVC or aluminum.

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: Small animals or insects that cause damage on foods.

Recycling: Recycling means to reuse old material as the raw product for the creation of something new.

Sustainable: Conserving an ecological balance by avoiding depletion of natural resources.

Uneaten edible remains: Food leftovers which already came into contact with the consumer and can't further be reused.

Waste: Any substance or object which the holder discards. Intends to discard or is required to discard.

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.

Waste, organic: All waste which arises through throwing away components of foods, leftovers food or meals that are not fit for consumption.

Waste, partly avoidable: Occurs partly through limited opportunities of the kitchen, through co-working with external 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, consumer demand)

Waste, unavoidable: Predominantly inedible, composed of components like shells or bones. It can also define waste that occurs in the value chain of a large-scale kitchen because of hygiene standards like hair protection, cleaning materials and so on.

2 Rules and laws

2.1 Definition of waste

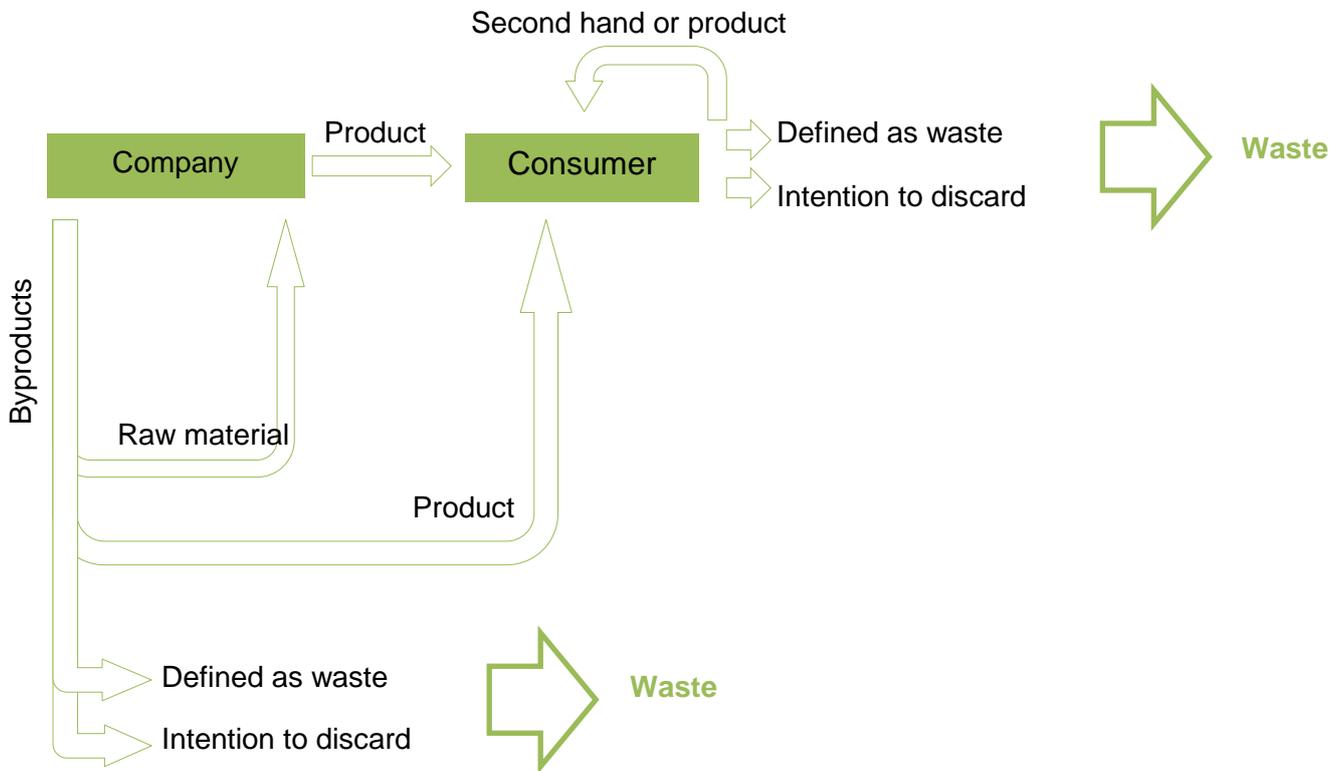


Fig. 1 Product circles, definition waste

3 Health regulations

a) Foods

- With every received goods there has to be a random control. There is a special need to check for infestation of pests, contamination and damage of the wholesale packaging. Goods with defects must get reworked, sorted out or rejected. This has to be documented. There is a need of enough lighting to be able of carrying out the necessary examination;
- The storage of the raw material and the processed products has to be product friendly which guarantees a flawless condition of the goods. They need to be stored in a way that they don't influence each other negatively. If there aren't enough premises available, it has to be taken care of a suitable campsite order;
- The same is valid for the storage of unpacked animal products and in carton packed goods. If there aren't enough premises available, it has to be taken care of a suitable campsite order;

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).

Regulation for reusing leftovers [aid infodienst and BfR, „Hygieneregelungen in der Gemeinschaftsgastronomie“]:

The exact documentation of temperature and duration of storage is essential. During the food distribution the meals must have had never a temperature under 65°C. The meals must get thrown away if their temperature in the distribution counter is over 10°C and under 65°C for more than 2 hours. The warm meals which can be reused have to cool down to 4°C in 90 minutes. The best way for speeding up the process of cooling down the warm meals should get filled into big, flat containers. These meals shouldn't be covered during the cooling down process to prevent the formation of condensation which supports the growth of germs. After the cooling down process there has to be a properly cover. If there should be again leftovers of the already warmed up meals, they need to be disposed. Another heating up isn't allowed.

Best-before date (BBD)

The best-before date of a food is defined as the date, till when this food keeps it's specific properties under appropriate storage conditions [§7 Lebensmittelkennzeichnungsverordnung (LMKV)].

Out of this definition it's clear that a food after passing the BBD isn't automatically inedible. In this sense the BBD is no use-by date. But a quality reduce of the food is possible after passing the BBD. This must be valued in every individual case. In this consequence it is still possible to process the food in the kitchen, serve it to the guest or donate it to social institutions (e.g. TAFEL) after the BBD passed when the sense control by the responsible kitchen staff was positive.

Use-by date (UBD)

For microbiological seen highly perishable foods which can be dangerous for the human health after a short time, the best-before date has to get replaced by the use-by date. (...) Foods according to paragraph 1 mustn't move on inside the value chain after passing the UBD [§7a Lebensmittelkennzeichnungsverordnung (LMKV)].

b) Passing on uneaten edible remains of a meal

With “uneaten edible remains of a meal” this hand book considers the food rests which already came into contact with the consumer and can't further be reused kitchen intern or given to third out of hygienic reasons. If the guest wishes, he can take home the leftovers from his own plate on his own responsibility. In this cause the guests should get informed about their self-responsibility. To prevent an eventual damage of the health, it is suggestive to give the guests suitable hygiene information to let them know how to deal with packed food to go. You can find an example how to write such comments in the attachments (A11).

5 Analysis of the current state, amount and composition of waste

5.1 Waste prevention –what about that?

5.1.1 Status quo: amount of waste in large scale kitchens

Owing to the massive differences of the economic, social and ecological preconditions of large scale kitchens in both the European comparison and the comparison of business sectors (catering in hospitals, schools, companies, ...) there are no general data about the amount of waste in large scale kitchens in the literature. Furthermore the most data base on assessments, so that here is still a lack of valid results. But one is mostly in agreement that a large part of the waste, which gets daily produced in large scale kitchens, would be avoidable. The main emphasis is put on the avoidable food waste. According to a survey of community catering companies within the framework of the INTERNORGA 2013 [Waskow et al., 2016] in Hamburg, one third of all community catering companies throws away food daily. These are especially (63%) leftovers of cooked food which can't be given out anymore. Further sources also mention production losses during the preparation of foods. Food spoilage and returned plates from the table guests are named as important reasons of food waste.

Amounts of waste in the large-scale kitchen

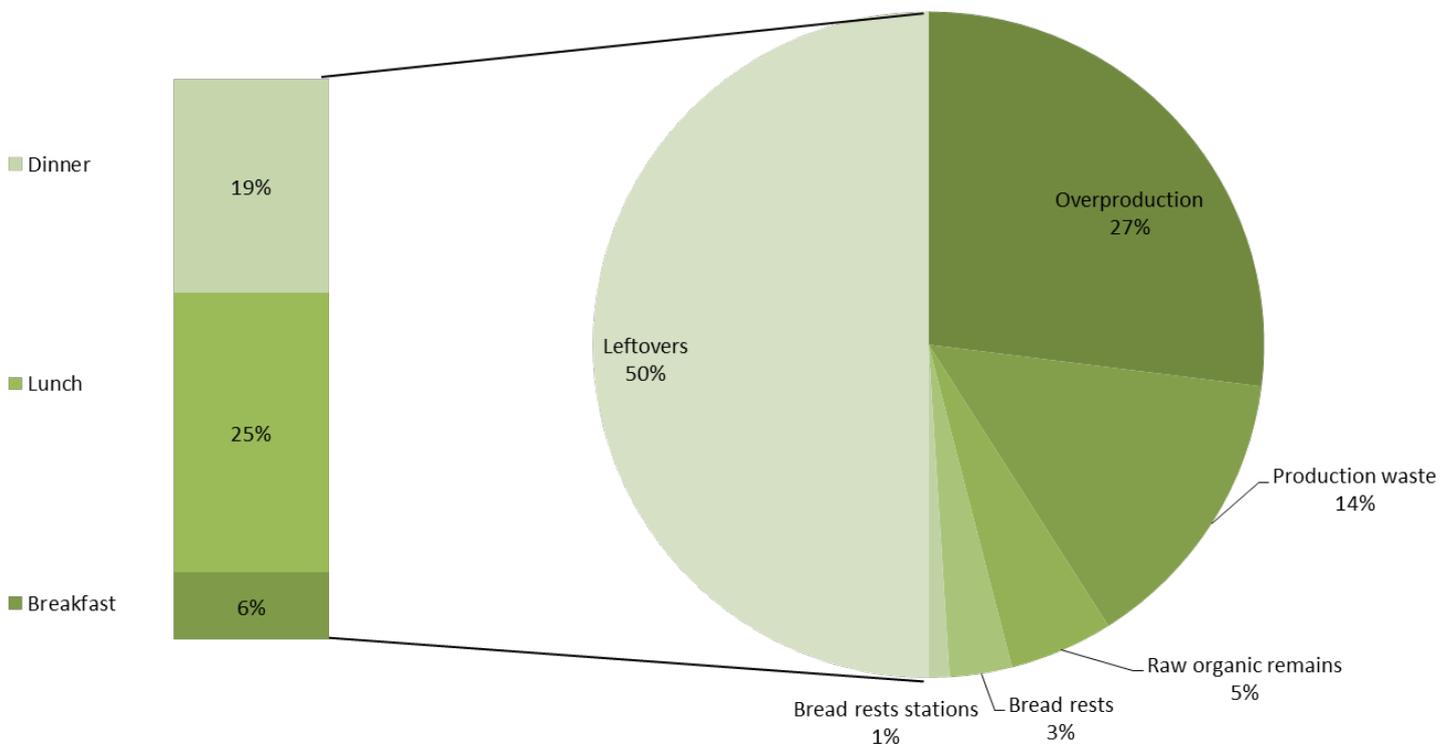


Fig. 2 Example for the percentage of kitchen waste in the large-scale kitchen of the hospital Oberwart

A need for optimisation of the waste situation in large scale kitchens exists for the whole process chain. **This hand book shall serve as guiding thread for the step by step analysis and implementation of actions in terms of a waste reduction in your own large scale kitchen.**

5.1.2 Why avoid waste?

„Waste is a key environmental, social and economic issue and a growing problem, the amount of waste generated in Europe continuing to rise each year. Approximately 3 billion tonnes of waste - 100 million tonnes of it hazardous - are thrown away in the European Union annually. This amounts to about 6 tonnes of solid waste for every European” [European Commission: Waste Prevention –Handbook: Guidelines on waste prevention programs, 2012]

The growing and uninhibited production of waste has serious consequences:

- Exploitation of limited resources (water, oil, paper, energy, precious metals, ...)
- Damage of climate and environment (pollution of air, land and water)
- High costs for waste disposal for companies and communes (taxpayer)

Because of these problems 27 members of the EU have committed themselves to reduce their food losses by 50% till 2030. To reach this goal also large scale kitchens have to reduce drastically especially their amounts of organic waste.

5.1.3 Waste hierarchy

In the EU waste directives a waste hierarchy with five steps is set. It describes in general an order of priority for the handling with products inside a value chain. It is striving to avoid waste as much as possible or reuse products [Directive 2008/98/EC of the European Parliament and the Council, Art. 4]:

in accordance to costumer acquisition and co-working with different stake holders	quality (specially ecological produced foods) on the base of reduced costs for waste disposal	company ✓ Stimulation of the employees´ and costumers´ environmental awareness
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6 Waste in large scale kitchens

6.1 Most important waste fractions in the large scale kitchen

Attention: The following classification is suitable for German waste separation rules. In other states of the EU there could be some differences.

Organic waste

- 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 leftovers¹
- Uneaten edible remains of a meal

Packaging waste

As foods, more or less avoidable, are bought or delivered in a packed state, even the amount of packaging waste has an influence on the entire waste state in the large scale kitchen. Here one-way packaging of any kind plays a major role. These should get collected separately according to the material to enable possibly exploitation according to the positions 4 and 5 of the waste hierarchy (cf. chap. 5.1.3):

Light material packaging

- Foil
- Synthetic material and composite packaging
- Bottles consisting out of synthetic material
- Tetra packaging
- Tinplate

Aluminium packaging

- The separated collecting of aluminium makes sense because it can be melted down and recycled as often as desired without losing quality.
- Recycling of aluminium saves up to 95 % energy in comparison to acquiring new energy from the raw material bauxite.

Paper/paper board

- Cartons for transport/cardboards
- Newspapers

¹ Definition 'leftovers': Cooked food leftovers which didn't leave the kitchen yet, that means that they weren't in contact with the consumer yet

- Print papers
- Egg boxes

Used glass

- Pledge free glass bottles
- Preserving jar

Residual waste

Mixed settlement waste gets collected in the residual waste. Residual waste occurs in the large scale kitchen especially because of the usage of one-way hygiene and cleaning utensils:

- Paper towels (shouldn't be thrown into paper waste)
- Hair protection
- Rubber gloves

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

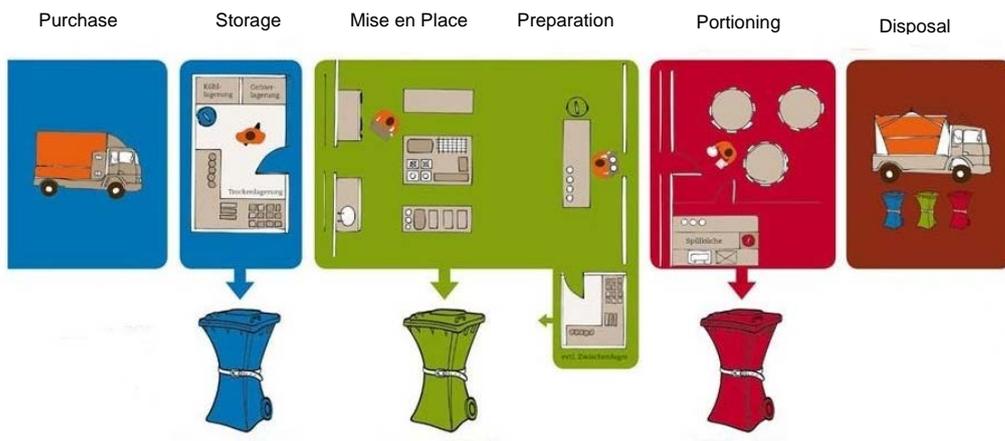


Fig. 4 Waste generation along the process chain

a) Purchase

	Preventability
- Purchase of too large amounts of food because of cheaper prices or a missing merchandise management system	Avoidable
- Usage of one-way packaging: <ul style="list-style-type: none"> o Cardboards o Tetra packaging o Drinks and preservative tins o One-way bottles o Synthetic material packaging 	Partly avoidable

g) Disposal

	Preventability
- Ignorance of the regulations for waste separation through which measures for obeying the waste hierarchy aren't possible anymore	Avoidable

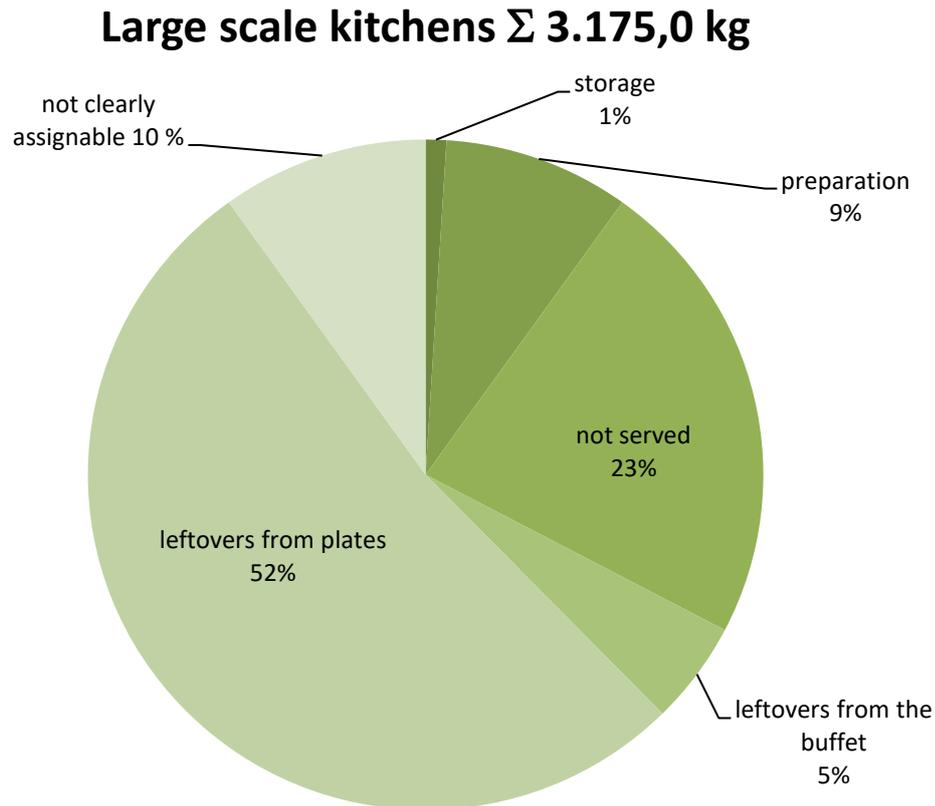


Fig. 5 Composition of the food losses from large scale kitchens in accordance to fields, in mass-%

7 Knowledge of the current state

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.

Overview over the approach of the waste management in the own large scale kitchen:

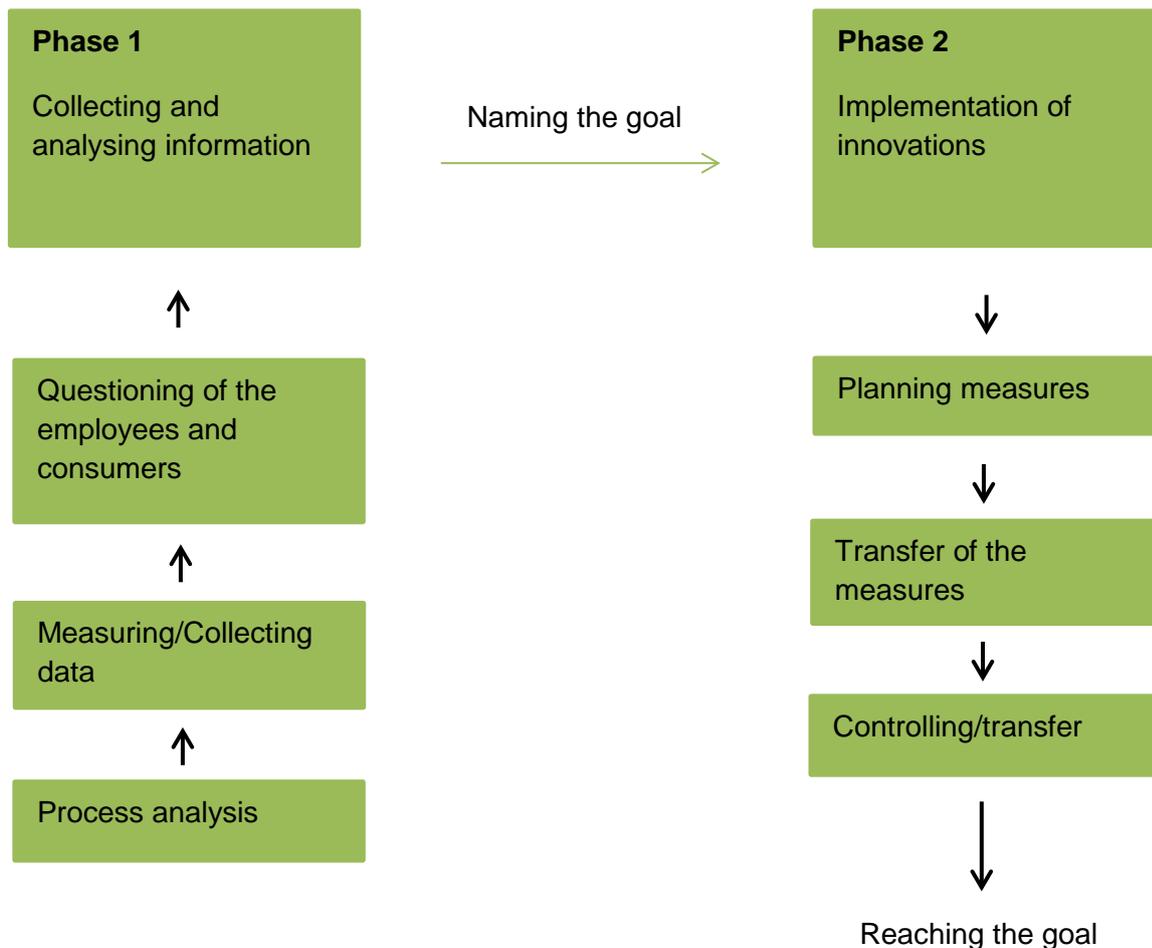


Fig. 6 First collecting information, later transfer of measures

The information gathering and analysis of phase 1 should occur subdivided into the single positions. Creating checklists for the single fields can be helpful for that. The analysis contains two main factors:

7.1 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.

7.2 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.

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:

Planning

- 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 favored food?

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

Purchase/delivery

- 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?

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

Storage

- Are the foods stored correctly? (side by side storing of certain foods, light influence, position, humidity, ...)
- Does the cold chain get regularly controlled for breaks/gaps?
- Does an extra storage for leftovers exist?
- Creating and managing of storage control lists:
 - o What was stored when?
 - o What was taken out for the planning of the meals and when?
 - o 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

...

- o 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 on refrigeration and its energy demands can be found in the module energy.

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 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. Information on foods from alternative crops can be found in the foods use module.

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)

8 Intended situation and the way to it

8.1 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	<ul style="list-style-type: none"> - 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 	<ul style="list-style-type: none"> - 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 	<ul style="list-style-type: none"> - 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 at the day of consumption and regenerated at the place of consumption - Forms of delivery (if central kitchen): single portions or more-portion sizes 	<ul style="list-style-type: none"> - 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. Planning of the meals:
 - ✓ Oriented on seasonality and regionality
 - ✓ Oriented on goods in stock
 - ✓ Leftovers from the day before get included in the meal planning (counts priority for warm food)
 - ✓ Exact calculation of the portion number

2. Purchase:
 - ✓ Purchase in line with demand

3. Preparation:
 - ✓ If possible restless preparation of the fresh food (cf. "Possibilities for reusing and conservation of foods" and module "food")

4. Serving of meals:
 - ✓ When required, offering variable portion sizes and working with a ladle plan

<p><i>Critical points for packaging waste and possible measures for regulation</i></p>	<p>1. <u>Purchase:</u></p> <ul style="list-style-type: none"> ✓ Utilization of more-way packaging systems ✓ Appropriate choice of the packaging sizes ✓ If possible, buying fresh and unpacked food <p>2. <u>Preparation:</u></p> <ul style="list-style-type: none"> ✓ To reduce the preparation of convenience products to a minimum, tendency to a fresh food kitchen 	<p>1. <u>Purchase:</u></p> <ul style="list-style-type: none"> ✓ Utilization of more-way packaging systems ✓ Appropriate choice of the packaging sizes ✓ If possible, buying fresh and unpacked food <p>2. <u>Preparation:</u></p> <ul style="list-style-type: none"> ✓ To reduce the preparation of convenience products to a minimum, tendency to a fresh food kitchen <p>3. <u>Storage and delivery:</u></p> <ul style="list-style-type: none"> ✓ Replace one-way packaging of the single portions with more-way alternatives (administration e.g. possible with help of deposit system between kitchen and customer)
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8.2 Evaluation of the kitchen systems with focus on the potentials concerning waste prevention

Kitchens that cook daily fresh for the direct consumption offer advantages in the fields menu design and purchase. The number of portions and meal offers can get currently calculated and adapted to the stock. This way e.g. the reprocessing of leftovers or the preparation of foods with short shelf life can contribute to the optimization of the amount of food waste. But for kitchen systems in which the processing time is decoupled from the delivery time, the flexibility is limited by longer forward planning. In view of packaging waste it can be generally ascertained that for large scale kitchens, which can offer a serving of meals, the delivery as decisive sector for a potentially higher amount of waste can totally be ignored. Therefore the potential for optimization in large scale kitchens of this kind is situated especially in the sectors purchase and food selection. Large scale kitchens that have to deliver meals as central kitchen to remotely customers, must consider another critical point of the delivery for their individual waste management. The more complex the value chain of a large scale kitchen is, the higher the total planning expenditure is going to be.

All in all, every of the named kitchen systems has extensive possibilities to reduce food and packaging waste to a minimum. How high the potentials of the regulation measures on the single in the table identified critical points are, depends on the kitchen system as well as the individual location factors of the large scale kitchen.

9 Opportunities for a complete food utilization

In this part of the handbook some important utilization opportunities are pointed out.

9.1 „From nose to tail“– utilization of the whole animal

In the past it was totally normal to use all parts of the slaughtered animal, because meat was a luxury product. So till the 1970s in Germany numerous recipes in canteens and guest houses existed which were created for maximal product utilization. With a growing average income of the households and the dropping prices for meat, more and more one asked for the exclusive parts of the animal. But this trend led to the fact that here in this area only 40-50% of the slaughtered animal are still used [Heinrich Böll Foundation, 2014]. As a consequence more and more avoidable food waste gets produced. The recollection of the origin, well the recovery of the knowhow for the utilization of the complete animal in the kitchen, is highly current both in view of the climate change and also morally very current these days. Furthermore the utilization of the whole animal is also financially worthwhile because complete or half pre-cut animals are much cheaper in the purchase than the final single fresh meat products.

Gilbert Bielen – cook in the children hospital “St. Marien” in Landshut

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 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 buffet².

9.2 Processing of meat rests, fruit and vegetable rests

Always try to leave as less rests as possible. Meat rests as well as vegetable rests can be used for soups, sauces and stocks.

9.3 Conservation of foods

Likewise always known and luckily still versatile used is the food conservation. With the help of diverse methods, foods of all kind can get preserved. With view to the reduction of food waste, such conservation methods should be used especially for foods which can't get prepared in fresh state or before they rot.

9.4 Reusing leftovers or giving it to third

You can find general information to this topic in chapter 3 a).

9.5 Packing leftovers from plates to takeaway

You can find general information to this topic in chapter 3 b).

10 Measures for waste prevention along the value chain

10.1 General course of action

After collecting all necessary information about the situation of the large scale kitchen in accordance to the amount of waste in phase 1 (cf. Fig. chap. II, 1.3.), now in phase 2 you can derive adequate goals and measures for waste prevention and reduction and in consideration of all intern and extern involved people for the implementation of an overall concept.

² Cf. Fröhlich, Magdalena (30.03.2017):<http://www.bioland.de/im-fokus/interviews/detail/article/die-edelteile-koennen-sie-behalten.html>, “Koch Gilbert Bielen im Interview”

For the concrete goal-oriented transfer of phase 2 you need to take action 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 development of an action plan

On basis of the results from phase 1 you formulate a general main target. From this single problem positions get named. This also includes which goals shall get reached at the prevailing positions, in which period of time they may get reached (estimate as realistic as possible!) and which concrete measures are necessary therefore. It's appropriate to develop a clearly structured and easily understandable overview.

An overview could look like the following example:

Main target: reduction of the revenue from waste

Position	Targets	Measures	Measures put to practise till
Purchase	Reduction of the packaging waste about 30 %	<ul style="list-style-type: none"> - To establish more-way packaging systems - To favour deliverers which offer a great selection of unpacked foods 	<ul style="list-style-type: none"> - February 2018 - January 2018
Storage	Reduction of storage losses	<ul style="list-style-type: none"> - To optimize the sorting in shelves according to the first-in-first-out-system - To do a regularly inventory - - To establish a computerized storage control system 	<ul style="list-style-type: none"> - December 2017 - December 2017 - February 2018
...		-	-

Step 2: Setting responsibilities

For the in step 1 developed concrete measures you allocate persons who need to be involved for a goal-reaching transfer of the single measures. Beside the intern involved single persons (e.g. management, kitchen chef, kitchen staff, service staff, ...) also externs (e.g. deliverers, customers, consumers, sponsors, ...) have to be involved. For the surveillance of the main concept and the regular accounting in between it is appropriate to intend a main responsible or a group of main responsible.

Step 3: Training measures

To implement the total concept as role model of the company it is very important that the whole team and even extern stakeholders stand behind the management plan. The employees shall be able to understand the sense of the action plan to help reaching the goals according their possibilities. All in all it's necessary to have an open and innovated company atmosphere. Ongoing training and team forming measures contribute to a higher motivation and better identification of the single with his company. The trainings need to get repeated in line with demand and adopted to the level of the training participants to reach both new and more experienced team members.

Step 4: Regular documentation and evaluation

A regular documentation of the process is an important key element for the successful transfer of every project. The more clearly one can retrace the single steps of the process, the better one can measure the success or find weak spots and initiate appropriate countermeasures on the basis of process evaluation. Which kind of data entry is used (manual/computerized) is insignificant in the first case. But long-terms it's recommended to use the advantages of computerized systems because of the big amount of data. The documentation should contain all papers which came up during phase 1 and 2 (cf. Fig. chapter II 1.3.). For example:

- Reports about 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: Communication, external effectiveness and networking

If you advertise with your own sustainability concept, you may make an impression on the consumers and probably wide your regular clientele. But an optimized waste concept doesn't only give internal 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 (cf. module "communication").

10.2 Transfer of measures for different fields and target groups

The specific measures need to be considered at the one hand by the single target groups – management, employees, deliverers, costumers – on the other hand also the specific measures for the fields have to be taken in consideration. In the following you find a general catalogue of measures which got divided into three relevant parts:

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

10.2.1 Intern organizational conducting and planning

This topic is dealt from the perspective of waste management. Further and general information to the topic marketing you can find in the module communication and marketing.

- i. Increase of the self-confidence in accordance to the company's internal environmental protection

For the possibility to establish a sustainable and well-functioning waste management in your company, all have to work together. A sensitisation and esteem from all involved persons is absolute necessary. As the manager or kitchen chef you have the function of a role model. Increase the integration of measures for environmental protection into the company's philosophy, internal and external engagement for your employees' awareness as well as the awareness of extern partners, like for example deliverers, with an authentic and purposeful appearance.

It's advisable to take action step by step. The following measures may be helpful:

- Utilization of **transparent waste containers** to show the employees the daily arising waste
- Regular **offers for information and training** to the topic environmental protection and waste prevention
- To establish regular and for all obligatory **personnel training**:
 - o Goal: Every single employee shall be able to assess concrete opportunities for action in the optimized waste concept of the company. Furthermore he shall put these opportunities self-determined into the daily workflow.
 - o To reach not only beginners but also experienced employees, you should adapt the level accordingly to the target groups and repeat regularly.

- ii. Intern communication and planning of the meals

Every employee is the expert for his special area of responsibility in the company. Also use that as resource for planning the meals. That's why you discuss the planning of the purchase and the meals in regular meetings together with chosen responsible persons from the

different kitchen sections: planning, storage, processing, serving of the meals and disposal. A waste reduced planning of purchase and meals is based on two essential factors:

1. Guest oriented planning of the meals

To avoid a large meal return you adapt your offer of meals as exactly as possible to the needs of the consumers. During the planning of the meals keep in mind:

- **the current seasons and weather conditions.** On hot days the trend goes more to light meals while in winter the demand for stews and substantial meals grows. The preparation of mainly seasonal fruits and vegetables makes sense here as well.
- **the popularity of certain meals.** Remove unpopular meals from your card and replace them with more popular recipes. New recipes should get tested first, e.g. in form of an action week. To be able to assess the popularity of a meal, you should measure leftovers as well as the amount of waste through rejected plates. For this the staffs of the sections serving and disposal are asked. Beside that you can receive the customer's evaluation to a meal and reasons of not-eating something with questionnaires.

2. Exact calculation of the required amount

You decrease leftovers and keep an overview over goods in stock with detailed amount calculations. During the calculation take into consideration:

- the **number of consumers** and average **portion sizes**. If you deliver external customers as central kitchen, it's advisable to set concrete arrangements regarding to a good communication. This way the external customer should for example inform you unsolicited about changes of the number of consumers at short notice.
- **the results from leftovers**. Decide and evaluate together with your team, if and how the calculation needs to get adjusted.
- **current goods in stock**, to offer a clear view and avoid waste from overlaid foods.

Out of the huge amount of data, it's generally recommendable for large scale kitchens to use **computerized software systems for data collection** and the planning of the meals. They offer a lot of advantages like:

- simple calculation
- quick overview over current goods in stock, recipes, calculation numbers and amounts of waste
- clear reduced expenditure on employees in comparison with traditional, paper based data collecting and analysis
- visible for everybody at any time via cloud systems

10.2.2 Process steps

In the next step the optimization of the communication and planning ways must get expanded on all relevant processes along the value chain of your large scale kitchen.

a) Purchase/delivery

Generally the amount and quality of the measures in this first step in the process stands or falls with the relation between kitchen and deliverer. 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. For a better overview over the goods in stock it's also appropriate to work with maximal two main deliverers.

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. The better the quality of the foods at the time of processing, the less cleansing and peeling waste comes up during the preparation.
- Also ask for fruits and vegetables that can't get sold anymore in the retail trade because of **not standardised growth form** or similar. These fruits have the same quality in taste and nutrients as their standardized images but end too often on the compost because of their unnecessary optical imperfection. As the regional farms sell such products for less money, the kitchen makes a double profit.

For the transfer of this strategy the switch to regional delivery chains and receiving ways is unavoidable. As the order from the wholesaler seems to be more comfortable for all in the first sight, you should do a good planning of the switch to regional deliverers and act step by step. Also discuss the topic with your employees. In the attachment ("Principles for a sustainable food procurement") you find detailed information for a practical procedure.

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!

More-way packaging isn't just more environmental friendly and spares our waste incineration plants and recycling facilities, it even gives huge economic and logistical advantages for your company – e.g. the drop of disposal costs, because of standardized sizes simple nesting and space-saving. Out of this you should prefer deliverers who offer more-way packaging. If it's not always possible to use more-way systems, use low-waste and environmental friendly packaging.

For your purchase keep the following points in mind:

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

c) Preparation

The sensitization of the employees from the preparation field has a very high potential for minimization of food losses:

- Go as long as possible with a **fresh food kitchen**. The processing of unprepared foods changes the amount of waste. While the amount of organic waste in the kitchen grows, the amount of packaging waste decreases. Out of the ecological view a movement in this direction is to evaluate positively.
- Train your staff, to establish **low-waste preparation processes as well as the utilization of bones and peeling waste** (e.g. as base for soups). Furthermore the employees should be trained in the **sensory evaluation of foods that already passed the best-before date**. With the help of a company intern HACCP concept and the sensitized staff there is nothing against the preparation of such foods.
- Create the **work-flows quite flexible** so that the reaction to current demands is possible. Go without the production of bigger amounts of meals in advance and react to narrow passes with a **short-term post-production**. This way you can avoid a larger amount of leftovers. Furthermore it's appropriate to **first cook meal components separately** and combine them just before serving. This way leftovers can get stored separately from each other and can be reused more flexible.
- Use **standardized recipes** that are geared to the needs of your kitchen. In general the target group or the consumers, the season and the economy-size containers should be taken into account. Beside that standardized recipes assure a universal homogenous quality of the meals, preparation mistakes (e.g. inadequate roasted meat, overcooked noodles) get minimized and also food waste gets reduced.

d) Serving of the meals

In many large scale kitchens the **biggest amount of food waste is produced because of the rejection of not-eaten meals**. An optimization potential lays in this step of the process above all in the serving system and the adaption of the portion sizes. Pay concrete attention to the following:

- Offer your customers the opportunity to choose different portion sizes. Smaller portions should be offered to an according smaller price.
- If a pre-portioning of the meals isn't possible in the serving system (e.g. tray service system in the hospital catering), adopt the portion sizes to a realistic average customer of the prevailing target group.
- Independent from the serving system it's suitable for every large scale kitchen to work with a ladle plan. This makes it easier to calculate exactly the production amounts with precise guidelines of the ladle quantity of the single components of a meal. Only this way also your employees can guarantee constant portion sizes for the customer.

- Sensitize your employees not to prepare further food at the end of mealtime. To translate this measure successfully into praxis, you mustn't forget about the customer. Also train your employees in an acceptance increasing customer communication. The customer should get encouraged to buy already prepared meals at the end of the mealtime.

To help the customer with choosing a meal, kitchens often present their menus in form of representative plates. But keep in mind that the foods on these representative plates also need to be thrown as food waste out of hygienic reasons. Such food wastes are avoidable to 100 % for every large scale kitchen. Just photograph recurring meals and present them waste free as well as optical appealing, e.g. via monitors or on the counter.

Another critical point in the serving process is packaging waste because of one-way packaging. Depending on which serving system your kitchen uses and which target groups shall be reached, a large amount of waste can be increased by diverse packaging. Even here it's important to analyse and evaluate the situation in your own large scale kitchen:

- For the delivery of single portions (e.g. meals on wheels) replace one-way packaging with alternative more-way solutions. With the help of a deposit system they can be well managed.
- Go without single portion packaging when serving diverse meal components (e.g. light cream, butter, jam). Better replace them as far as possible with an offer of open foods. The higher hygiene standards for the serving of such open offered foods don't have to be an obstacle for the practical transformation. On the market there are several solutions with hygienic flawless dispenser systems. Beside that it's recommended to store foods, that easily adopt light smells (e.g. butter), in a separate fridge.
- If you should work with a target group that has a higher demand on take-away meals, reduce the amount of one-way crockeries as much as possible. Also here you could combine more-way alternatives with a deposit system. If the renunciation of one-way packaging isn't realizable for you, please pay at least attention to the selection of a packaging material that is degradable (e.g. material on base of sugar or starch).

e) Reuse/disposal

Before you dispose left overs, first you should prove, if they are appropriate for a reuse in accordance to the waste hierarchy (cf. chap. II, 1.3.) To make a reuse of food left overs happen in an optimal way, you need to check the following points in your kitchen:

- Manage your meal planning in such a flexible way that you are able to prepare also leftovers from the day before in short-time.
- Build good networks to charitable institutions which take left overs or stored but no longer needed foods.

Nevertheless as already pointed out in chapter II, 2.2 in large scale kitchens also daily arises unavoidable or partly avoidable waste. A disposal according to the rules contributes that reuse or recycling potentials of the single waste fractions can be optimal used:

- To make sure that all waste gets collected separately according to the single waste fractions (cf. chap. II, 2.1). Therefore provide well written waste containers and place them as far as possible close to the prevailing places where the waste arises.
- Separate organic waste in accordance to (*attention: this is suitable for german law, could differ in other countries*):

1. Raw plant-based waste
2. Animal-based waste and waste of prepared meals

The under point 2 categorized food waste falls within the ambit of the regulation for the disposal of animal-based by-products [Regulation (EG) No. 1069/2009] and need to be disposed professionally by a disposal company. Pure raw plant-based waste instead can be distributed as animal food to cooperating farmers. In consideration of the epidemic hygiene regulations, you can even use the under point 1 categorized waste for the house own compost. In the attachment (“compost”) you will find further information.

f) Hygiene and cleaning

In this process step analyse and evaluate both the used hygiene clothing of the staff and the quantity and quality of the used cleansing liquids:

- Replace one-way aprons and hair protection with washable clothing out of cotton.
- Train your employees in good hand hygiene. If correct washing of the hands as well as disinfection of the hands is guaranteed, you and your staff can go without wearing gloves. Working with gloves is only dictated in case of an injury.
- Take care for an optimization of cleaning expenditure. With a HACCP cleaning plan frequency and intensity of the cleaning works can get reduced to the necessary measure.
- Order cleansing liquids in container sizes and provide appropriate dosage as help for your employees. Furthermore it’s suitable to work with cleansing liquids which already have an optimized cleaning force in low dose. Throughout these measures you can save large amounts of packaging material and cleansing liquids.
- Also the protection of the environment shouldn’t be forgotten. So also go without cleansing liquids that contain phosphate, formaldehyde, chlorine or sulphate.

10.2.3 Interaction with table guests

In the praxis it has been shown that the return of not-eaten meal rests is much less, the more individual the large scale kitchen elaborates on the demands of the table guests. For a better interaction with your table guests consider the following measures:

- Restrictions by the costumers because of ethical, religious or health reservations for the food selection you prevent with exact and well apparent information about the ingredients of the offered meals.
- Inform your guests well-directed about your initiated measures for waste reduction and also make your guests think about an environmental friendly consume.
- If you have to work with a target group that is quite closed for the relevant measures, help your guests step by step into a new environmental consciousness and start with small, easily viable changes, e.g. renunciation of representative plates to increase the acceptance.
- Give your costumers the possibility to tell their own opinion. It might help to offer handouts for feedback on the table or tray (What are the reasons for the renunciation of the consume of certain meals or meal components?; How satisfied are you with the meal offer and the preparation?; Praise/critic/wishes?)
- To increase the general esteem of the costumer for the catering service and the environmental friendly actions, it´s important to have a good external communication. Therefore you can use special advertisement, action days or personal talks with guests (cf. module “communication”).

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

10.2.4 Obstacles for the practical implementation of diverse measures

In essence quality and potential of the waste prevention management depends on the human (experience, motivation, sense of responsibility, personnel capacity). Additionally the complex law regulations as well as the different catering concepts as well as premises and equipment of the single large scale kitchens can limit the practical implementation of measures. A general solution for the implementation of a sustainable waste management in the large scale kitchens doesn´t exist therefore. The in this handbook presented measures need to be checked, evaluated and eventual adapted individually to the demands of your kitchen.

10.2.5 Best practice examples

Aramark Holdings GmbH & Co. KG

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

Maritim hotel association

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 needed⁴. 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 careful, energy saving way and in line with demand. For drinks the hotels use mainly more-way packaging. Additional to the usual meals the customers can also choose out of a vegetarian menu, so that all wishes get fulfilled⁵.

Guest house “Fischküche Reck“

The guest house “Fischküche Reck“ in Möhrendorf is specialized for Franconian classics new interpreted. The special point is that nearly everything is homemade⁶ and mainly seasonal products from local producers are bought⁷. 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 sizes⁸. On the menu plan is also a detailed list with allergy information⁹ and it’s extra pointed out that the leftovers from the own plate can get packed by the staff to takeaway¹⁰.

³ Cf. <http://www.aramark.de/ideen-und-konzepte/>

⁴ Cf. Federal Ministry of food and agriculture: Engagement gewinnt. Ausgezeichnete Projekte gegen Lebensmittelverschwendung, July 2016, p16

⁵ Cf. https://www.maritim.de/upload/media/media/220/BPA_Flyer_Fact_Sheet_Green%5b12786%5d.pdf

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

⁷ Cf. Federal Ministry of food and agriculture: Engagement gewinnt. Ausgezeichnete Projekte gegen Lebensmittelverschwendung, Juli 2016, S.15

⁸ Cf. http://fischkueche-reck.de/?page_id=53

⁹ Cf. a.a.O., S.15

¹⁰ Cf. http://fischkueche-reck.de/?page_id=53

Biond Ltd

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 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”¹¹

¹¹ Cf.. Federal Ministry of food and agriculture: Engagement gewinnt. Ausgezeichnete Projekte gegen Lebensmittelverschwendung, Juli 2016, S.13

11 Attachement

A1: HACCP storage control

HACCP control refrigerated storage building No. _____ (weekly)

Date	Yes	No	Measure
1. All foods (even self-packed goods) are labelled with the best-before date			
2. All foods still didn't pass the BBD			
3. Overproductions must be marked with the storing date and the denomination			
4. All open foods are covered			
5. New delivered goods are placed behind the old goods			
6. All foods are placed on the shelves (not on the ground)			
7. Foods out of cartonage or wooden crates are filled in appropriate containers			
8. Egg layers are packed in a closed and carton-free container			
9. Foods from opened cans are filled in appropriate containers			
10. Different product groups are stored in a good distance to each other			

11. Raw goods are far away enough from cooked goods			
12. A calibrated thermometer is available			
13. The temperature of the refrigerated storage building fulfils the stated intended values			
Name/ Signature received:	Name/ Signature controlled:		

Source: <http://www.haccp-kueche.de/haccp-dokumentation:1.html> (14.2.2017)

A2: Principles for a sustainable food procurement

1. Procurement of information

a) Information about purchase sources

In contrast to the wholesale, direct marketers don't make a move towards kitchens or mass catering. That's why mostly the kitchens have to go the first step themselves to contact direct marketers. Lists of and about direct marketers are a help therefore. They are given out by the following:

- Ecological cultivation associations
- Registered societies for ecological cultivation (e.g. Thüringer Ökoherz e.V., Weimar, Germany)
- Agriculture departments
- Farmer societies

Single federal states in Germany have given out a list with direct sources of supply of foods. Information therefore are also to find via the agriculture ministries.

With these contact data, the first approach can start oral or written. Another possibility are advertisements in local newspapers or on Internet platforms.

The first steps of the approach to direct deliverers can claim much time and persistence. At the end you get through the personal, direct relationship an enormous added value and hope for receiving information about further sources of supply of other food groups on demand.

b.) Information about Quality, prices and delivery conditions

Before the first order from the new deliverers you need to clear up the following points:

- Product palette (fruits and vegetables with seasonal availability)
- Amounts (minimum purchasing quantity)
- Prices
- Packaging units and probably packaging material (one-way / more-way system)
- Processing level, quality, sorting
- Delivery intervals
- Arrangements of delivery notes and bills
- Payment

Generally it's recommendable to get in contact with the direct marketer in time when you plan long-term and especially regular orders. He can already bear the needs of the large scale kitchen in mind during the following building and construction planning. Even certain conditions can already get coordinated than. During the start of the new work relationship both sides have to offer much open communication, understanding and willingness.

A3: Compost

(Attention: this is suitable for German regulations, could differ in other countries)

Under consideration of epidemic hygienic regulations, a large scale kitchen can recycle pure plant-based raw food waste via an own compost heap or composter.

Pre-conditions:

- Further training/information for staff: What is degradable and what isn't?
- A responsible employee who controls the obeying of the regulations
- Appropriate and sufficient room for composter or compost heap
- Meaningful opportunities to use the arising humus (e.g. cooperation with a garden centre or farmer, usage for company own plants, handing out to employees)

What needs to be considered while creating a compost:

- Contact to the grown floor
- Versatile composition
- Guarantee aeration through a change between coarse and fine parts
- Protection of the compost of too much wetness or dryness

What is allowed to be on a compost:

- Peels of fruits
- Peels of potatoes
- Vegetable waste
- Egg shells
- Grounds of coffee and tea incl. filter paper
- Pure ash of wood
- Sawdust, untreated wood chips

What isn't allowed to be on a compost:

- Cooked leftovers
- Bones
- Rets of meat and sausages
- Peels of sprayed and waxed citrus fruit

A4: Checklists for the prevention of food waste in the catering section

Source: Umweltbundesamt (Edit.) (2016): Leitfaden Vermeidung von Lebensmittelabfällen beim Catering. Dessau-Roßlau.

Online available:

https://www.umweltbundesamt.de/sites/default/files/medien/1968/publikationen/161020_uba_fachbroschure_catering_bf.pdf

last checked on July 3rd 2017

A5: Checklist for the planning of the catering

- Also talk about the topic “Prevention of food waste” during the creation of the offers
- Always coordinate yourself with the costumer from the offer to the evaluation of the catering.
- Take the structure of the guests in consideration (e.g. age male/female, number of vegetarians) and the reason for the catering (e.g. conference during the celebration).
- Ask again for the number of guests immediately before the catering.
- Use standardized recipes for the calculation of amounts.
- Reduce the usual safety surcharge from 30% to 10-20%.
- Use for the offer a defined basket of goods and consider it for following catering commissions.
- If possible, work with own qualified staff or integrate “borrowed staff” closely in the direct preparations.
- Inform and sensitize all kitchen and service workers for the topic prevention of food waste before every catering
- Standardize all process steps and develop them during a continuous improving process.

A6: Checklist for the food purchase

- Determine your demand on base of standardized recipes
- Always compare your shopping list with the goods in stock
- Organize your purchase contemporary before the preparation
- Build up relations based on a partnership to your deliverers
- Only buy the pre-calculated amounts
- Develop the purchase of fresh ware, high in quality as part of your purchase philosophy
- As far as possible, always prefer fresh raw goods
- Continuously optimize your purchasing process
- Accept only food packaging, that serve for keeping the quality
- Prefer more-way or simple packaging

A8: Checklist for preparation and processing

- Regularly train your employees in view of the prevention of food waste of preparation and processing.
- Regularly check the single process steps to identify potential for optimizations.
- Sensitize all employees, who prepare and process foods, for the esteem of the food parts.
- If possible, strive for full utilization for all of your products.
- Separate waste that arises nevertheless and take it into a meaningful utilization.

A9: Checklist delivery, provision and distribution

- Obey the keeping of the statutory cold chain and optimal sensory quality maintenance during the transport.
- Choose the serving system according to the best suitability for the event type.
- Assign preferred the trained skilled for the serving.
- Offer the guests individual portion sizes.
- Use containers and plates with different sizes for the presentation and the serving of the meals.
- For the buffet use preferred smaller than bigger plates.
- Place small, pre-portioned and varied starters or desserts together.
- For the replacing of new food use preferred smaller containers and plates in small amounts.

A10: Checklist for the consume and the meal return

- Try meals directly before the offer and serving.
- Inform your costumers about your quality philosophy and your concept for the prevention of food waste. Consider this also for the presentation of your offer in front of your guests.
- Note the consume behaviour of your guests in a random check, to put some more meals in line with demand. Even talk well-directed with single guests, if the meals have been tasty or why they didn't taste good.
- Note down the actual consumed amounts and level them off with the calculated amounts. Which meals were the real hit, which weren't and why?
- Regulate an appropriate utilization / disposal of leftovers and waste.
- Establish an appropriate waste separation for arose food waste.

A11: Checklist for the time directly after the end of the catering

- Determine internal, how unprepared foods get reused
- Store prepared meals for the restocking in closed containers, so that they can still be used after the catering.
- Clear up with the costumer, if remaining meals can be given away to guests or employees.
- Ask your costumer, if the guests get informed about the possibility to takeaway foods after the catering.
- Offer your guests or employees meals form the serving to takeaway.
- Make suitable possibilities to takeaway remained meals available.

- For the lawful protection have a form ready for exclusion of liability and let it sign by the guests who want to take leftovers.
- Organize the passing on to other costumers early enough before the event.
- Reach a written agreement to the modalities of the takeaway including the exclusion of liability with your costumer
- Make the handout of meals to a routine of the whole catering process.
- Identify together with your team potentials to improve the reuse and passing on of leftovers.
- Use the existing analyse tools for arose food waste or observe the food waste that arises at your place and derive consequences.

A12: TOP 15 Checklist catering at big events like fairs and festivals

1. Discuss the topic “Prevention of food waste” during the offer creation.
2. Always coordinate yourself with your costumer from the offer till the evaluation of the catering.
3. Keep the guest structure (e.g. number, amount female/male, number vegetarians, age) in mind for the planning of your meal offer.
4. Clarify with the organizer that you need a kitchen area for the fresh completion of the offered meals.
5. Reduce the usual safety charge of 30% to 10%. Especially if the catering is a selling to the fair or festival visitors, you should go with the mindset “When I´m sold out – I´m sold out”.
6. In the run-up organize to whom remained meals can get distributed after the end of the catering (e.g. to the crews who build up and down, security staff or people with night duty).
7. Find out your demand for the food purchase on base of standardized recipes.
8. Observe the first-in-first-out principle when foods are taken out of the storage.
9. Train your employees regularly in view of prevention of food waste during the preparation.
10. Choose the serving system in accordance to the best suitability for the event (e.g. for selling, front cooking for a defined group of people, menu service or buffet).
11. Offer different portion sizes for the guests.
12. Inform the guests about your quality philosophy and your concept for the prevention of food waste.
13. Keep prepared meals in closed containers so that they can be reused or distributed after the catering.
14. Give clear hints for separation of waste in accordance to the remained meals from the plates of the guests and other waste. Often the guests on fairs and festivals discard their waste themselves.



15. Use existing analyse tools for arising food waste or observe your own amounts of food waste during several events.

A13: Top 15 Checklist catering at congresses, receptions, conferences and seminars

1. During the creating of the offer discuss the topic “Prevention of food waste”.
2. Always coordinate yourself with your costumer from the offer till the evaluation of the catering.
3. Keep the guest structure (e.g. number, amount female/male, number vegetarians, age) in mind for the planning of your meal offer.
4. Reduce the usual safety charge of 30% to 10%.
5. In the run-up organize to whom remained meals can get distributed after the end of the catering (e.g. to guests or needy persons).
6. Find out your demand for the food purchase on base of standardized recipes.
7. Observe the first-in-first-out principle when foods are taken out of the storage.
8. Train your employees regularly in view of prevention of food waste during the preparation.
9. Choose the serving system in accordance to the best suitability for the event. Possible are e.g. light food in form of finger food or lunchbox solutions (creation of already prepared foods like sandwiches, salads, fruits).
10. Make sure of a contemporaneous provision of all guests e.g. first through finger food at tall tables and then throughout a buffet (several identic service stations) or menu service.
11. Offer individual portion sizes for the guests.
12. Inform the guests about your quality philosophy and your concept for the prevention of food waste.
13. Keep prepared meals in closed containers so that they can be reused or distributed after the catering.
14. Make a written agreement with the costumer to the modularities for the takeaway including exclusion of liability.
15. Use existing analyse tools for arising food waste or observe your own amounts of food waste.

A14: Top 15 Checklist for the catering at family festivals and parties

1. During the creating of the offer discuss the topic “Prevention of food waste”.
2. Always coordinate yourself with your costumer from the offer till the evaluation of the catering.
3. Keep the guest structure (e.g. number, amount female/male, number vegetarians, age) in mind for the planning of your meal offer.
4. After agreement with your costumer reduce the usual safety charge of 30% to 10%.
5. In the run-up organize to whom remained meals can get distributed after the end of the catering (e.g. to costumers or guests).



6. Find out your demand for the food purchase on base of standardized recipes.
7. Observe the first-in-first-out principle when foods are taken out of the storage.
8. Train your employees regularly in view of prevention of food waste during the preparation.
9. Choose the serving system in accordance to the best suitability for the event.
10. Offer individual portion sizes for the guests.
11. Place small, pre-portioned and varied starters or desserts together, to go against the impression of a plucked buffet.
12. Inform the guests about your quality philosophy and your concept for the prevention of food waste.
13. Keep prepared meals in closed containers so that they can be reused or distributed after the catering.
14. Make a written agreement with the costumer to the modularities for the takeaway including exclusion of liability.
15. Use existing analyse tools for arising food waste or observe your own amounts of food waste.

A15: Help for the questioning of the guest clients

- How many guests are registered or invited?
- Does a date exist till when the guests can still register or deregister?
- How is the guest cliental connected to the event?
- How many femal or male guests are expected?
 - women
 - men
- How is the structure of the guests´age?
 - Number of children
 - Number of adolescents
 - Number of grown ups
 - Number of seniors
- Do certain cultural eating habits exist, e.g. vegetarians or vegans?
 - If yes, which ones and for how many?
- Do some guests have any food intolerance?
 - If yes, which one and for how many?
- Do certain religious eating habits exist?
 - If yes, which ones and for how many?

- Is there anything special about the origin of the guests, that could have an effect on the food consume?
 - If yes, what exactly and for how many does that count?
- Do meals or single foods exist which the guests don't like?
 - If yes, which ones and in which amount (give the according number!)
- Do the guests come from far away?
- Are the guests "international" or do they come from the local region?



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R R R R R M M M M M A A A A
Ressourcen Management Agentur



Jihočeská univerzita
v Českých Budějovicích
University of South Bohemia
in České Budějovice

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A16: Formulation suggestion for the assumption of liability during the distribution of remained meals to guests

I hereby confirm, that the meals, which I got from [NAME CATERER], fulfil the hygienic regulations and are in a flawless condition.

The [NAME CATERER] doesn't take responsibility anymore from the moment of the handing over of the meals.

Signature of the costumer

Signature of the caterer

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Fig. 1 Product circles, definition waste

Changed according to 'Figure 1: Illustration of EU legal definition of waste' out of European Commission: Waste Prevention –Handbook: Guidelines on waste prevention programs, October 2012

Fig. 2 Example for the percentage of kitchen waste in the large scale kitchen of the hospital Oberwart

Changed according to Daxbeck, H. et al.: Ressourcen Management Agentur. Bedeutung der Küche für die gesamten CO₂-Emissionen des KH Oberwart und Identifikation der Möglichkeiten und Grenzen zur CO₂-Reduktion in der Küche (Projekt: OWA Energie), 2010

Fig. 3 Waste hierarchy with five steps

Self-created figure according to Directive 2008/98/EC of the European Parliament and the Council, Art. 4

Fig. 4 Waste generation along the process chain

Waskow et al. "Situationsanalyse zu Lebensmittelverlusten im Einzelhandel, der Außer-Haus-Verpflegung sowie in privaten Haushalten und zum Verbraucherverhalten (SAVE)", June 2016, Fig. 33

Fig. 5 Composition of the food losses from large scale kitchens in accordance to fields, in mass-%

Changed according to Schranzhofer, A. et al.: Vermeidung von Lebensmittelabfall in Gastronomie, Beherbergung und Großküchen. May 2015, Fig. 3.4

Fig. 6 First collecting information, later transfer of measures

Changed according to Fig. 4 out of Göbel et al. "Reduktion von Warenverlusten und Warenvernichtung in der AHV", November 2014

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