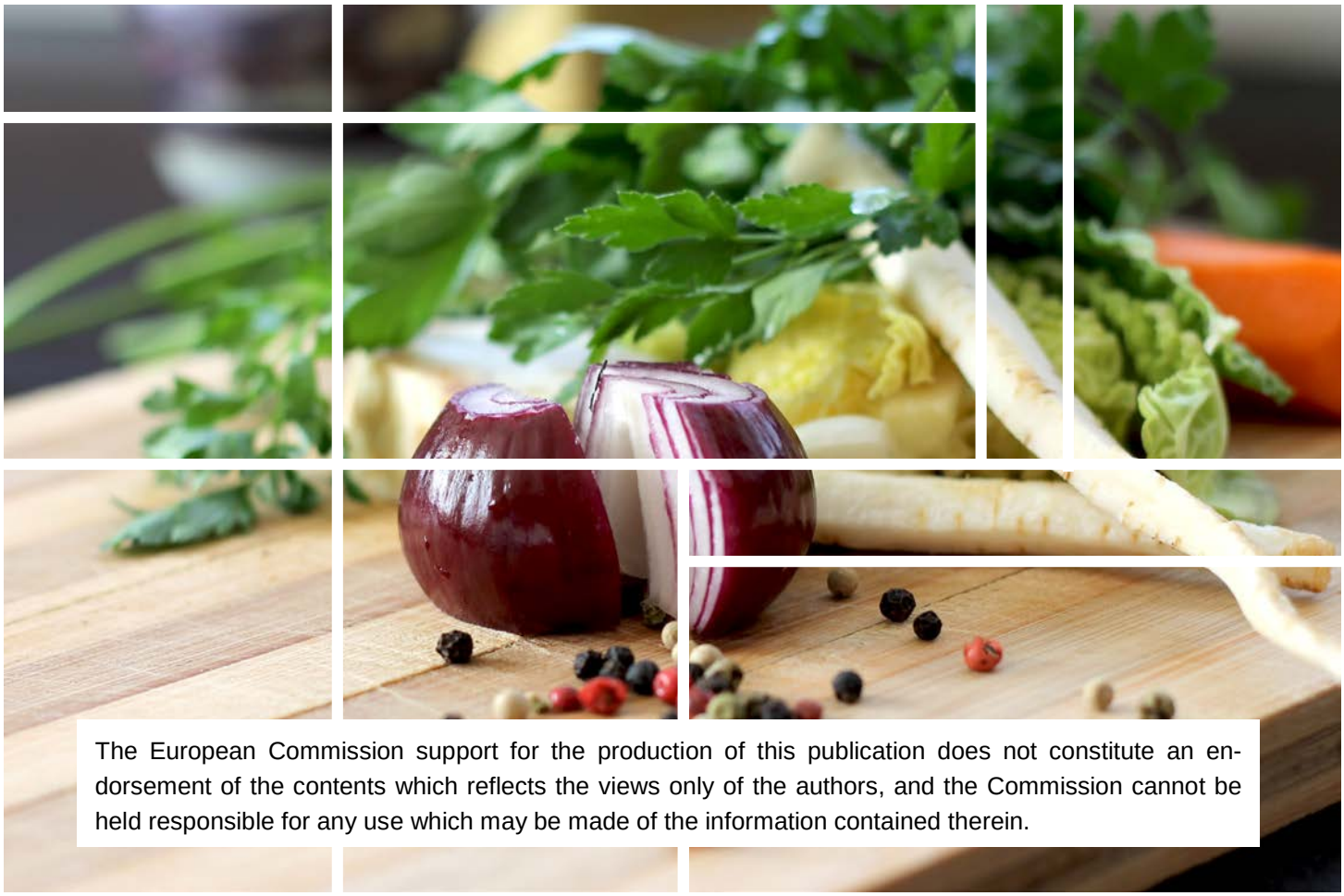
PROJEKT REKUK

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

Sustainable Menu Script



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1. Glossary

1.1 General Glossary

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

Communal catering/public catering: Large-scale catering facilities in the public sector. These include patient catering in hospitals and elderly residences, catering in educational institutions and businesses. In contrast to gastronomy the focus here is to provide well-balanced meals and maintaining cost efficiency, providing qualitative meals outside the home.

Executive Chef: Chef who has an overall responsibility for the kitchen: purchase, staff, menu, sometimes manager of several kitchens / restaurants. Sometimes referred to as kitchen manager.

Large-scale kitchen: Large-scale kitchen is a term for a kitchen that is used for commercial purposes and in which meals for numerous consumers get cooked, namely gastronomy and communal feeding (hospital, company canteen, nursing homes, halls of residence, student halls etc.).

Organic foods/produce: These products are produced within the scope of organic farming and has a certification marks which are regulated by law.

Regional food/ products: Regional food is food that is produced there where it is consumed. A common definition for regional or national products is that they are produced within a radius of 150 km around the processing commercial kitchen.

In fact, what is considered regional varies by country. In Italy the regions are geographically defined and it is common to use those definitions when referring to regionality. In other countries a max. distance of 150 km is determined. This distance was chosen because if the distance is greater the return benefits of sourcing produce locally diminish. In Germany and Austria, the word “regional food” is not regulated by law.

Seasonal foods: Foods available only at a certain time of the year from outdoor production (meaning available from local sources), typical fruits and vegetables. Some produce is available year-round as fresh or stock goods like onions, potatoes and apples.

Stakeholder: Member of an interest group.

1.2 Module specific glossary

Convenience products: These are products of which the producer performs certain process and processing steps and in this way enable that the product can be prepared in in an easier and faster manner. Products with a level of processing of more than 50% rate are assigned to this category. These terms are explained in more detail in Section 1.2.

Processing steps: By convenience products is it the basis for the allocation of food in stages of processing.

Tray system: In this system, the dishes are portioned in the kitchen and distributed accordingly on individual trays on a tray conveyor.

Food serving systems (buffets): With this system, there is a continuous serving counter. Consumers take a tray and walk along the counter, past various offered dishes which are portioned according to the order of the service personnel.

2. Food planning and sustainability

2.1 Criteria for a sustainable menu design and its advantages

Slide 7-8

Principles of future-oriented communal catering must be based on criteria of sustainability. The natural resources must be handled with care. This can be done through conscious, planned food purchasing, implementing waste prevention measures, recycling, energy efficiency, support for producers in the region, social fair purchasing and communication with the consumers about the measures they have implemented. What we eat not only promotes our well-being. but also the world around us: economically, socially and ecologically.
In this module we will discuss how to design menus sustainably after the previous module (food use) on which criteria you can design the grocery shopping, how to collect data and what measures can be taken to meet the criteria that the kitchen decides on.

Examples of criteria:

- Cook fresh instead of using convenience products
- Serve less meat and more vegetables (vegetarian/vegan menu, salad buffet)
- Offer organic menu lines or meals
- Offer seasonal dishes (speciality week)

Slide 9-11

Analysis needs to be done regarding the following criteria:

- Food use (organic, seasonal, regional foods)
- Preperation of meals with fresh produce
- Use less meat
- Optimize portion size

2.1.1 Regionality

Slide 5-6 and 12

We consider food to be regional if the production is within a maximum of 150 km of the processing kitchen, because otherwise the emissions transporting it are higher than the emissions producing the food.

Eating locally grown foods has many benefits, for example:

- You can be sure about the quality of the food and the origin is traceable.
- Each region has its own culinary heritage; their own typical dishes and food offer a wide variety which is preserved with the purchase of regional foods.
- The consumption of indirect energy and CO_2 emission is significantly lower in the case of regional foods due to the short transport route and short storage period.
- By consuming local food, regional jobs are also created and preserved as well as the rural cultural landscape and way of life.

- When using regional foods, food additives are frequently not required due to the frequently short shelf life, which in turn has a positive impact on quality, nutritional physiological and sensory characteristics.

Regionality will be examined more closely in Module 1: Food Use. It is important to consider regionality when designing a sustainable menu.

2.1.2 Seasonality

Slide 5-6 and 12
This term describes food that is only regionally available during a specific time of the year from outdoor production or stock goods. Thanks to the globalisation, it is possible to purchase fruit and vegetables all year round, even outside of the season.

In order to determine whether a food was purchased during the season, the season calendar of AMA Marketing [2010] in Section 1.5 is primarily used.

Eating foods that are in season has many benefits, for example:

- One can save energy by buying seasonal food. Outdoor cultivation consumes very little energy in contrast to cultivation in greenhouses or in foil tunnels and thus also results in reduced CO_2 emissions.
- Foods that are in season are treated with fewer additives, for example, for the ripening process or for storage.
- Due to the fact that seasonal foods are harvested once they are ripe, they contain vitamins, minerals and trace elements.
- In comparison with products that are grown in greenhouses, food which grows outdoors exhibits lower nitrite content.
- In late autumn and winter we can use typical winter vegetables (celery, onion, garlic, black root, beetroot, Brussels sprouts, carrot, parsley, parsley, leek, white radish, black radish, turnip, white cabbage and red cabbage ...). A regional fruit that is available year round trough storage is apples. These types of vegetables can be stored well or be preserved by fermentation.

Seasonality is also a well-suited marketing initiative. To promote a seasonal meal plan you coul initiate a “Vegetable of the month” campaign in kindergartens and schools, an additional integration into the classroom can take place.

Seasonality will be examined more closely in Module 1: Food Use.

2.1.3 Organic food

What is the difference between organic produced foods and conventionally produced foods
Eating organic foods has many benefits, for example:

- Improved animal welfare through species-appropriate animal husbandry.
- Organic meat contains fewer drug residues and stress hormones; it has a lower nitrate level and contains a larger amount of polyunsaturated fatty acids, such as Omega3 fatty acids and linoleic acids. Organic fruits and vegetables also have a higher content of secondary plant substances (phenols, flavonoids) and more vitamin C. Organic wheat and organic legumes have a higher content of essential amino acids.
- Artificially or genetically produced flavours, dyes, flavour enhancers and stabilisers are prohibited.
- Farming managed by organic farmers structures the landscape by means of elements, such as hedges, ditches and fallow land and thus creates rare habitats for many, often endangered, plants and animal species.
    - Organic farming requires less fossil energy sources and concentrated feed
    - Binds climate-damaging gases, such as CO_2 in the soil by means of changing crop-rotation, organic fertilisation and soil cultivation.
- In comparison with commercial agriculture, the nitrate discharges resulting from organic cultivation are very low. By ceasing synthetic pesticides and reducing the use of conventional drugs to animals, hazardous substances may also not seep into the groundwater.
- Compared with conventional farms, organic farms release less ammonia with regard to the livestock density. One reason for this is the reduced addition of protein in the feed. The ammonia output is also lower in agriculture. This is done by ceasing intensive fertilisation, such as manure from livestock farming and easily soluble nitrogen fertilisers.

However, it can be said that organic foods very likely meet the hygienic standards and frequently have better nutritional values, improved durability as well as a higher sensory value than conventionally produced foods.
For actually switching out convential foods for organic alternatives it is suggested to start with fruits or veggies that are regionally available year-round trough harvest and storage. The prices of these foods are stable, in comparison to seasonal foods which can have big price differences. So they are not only cheaper but easier to integrate in menu planning and dishes prepared with them are fit to be offered year-round. How to implement organic foods in communal catering while minimizing the strain on the budget is covered in more detail in Handbook this Module.
More information on benefits of organic products can be found in the module communication and marketing.

2.1.4 Fresh cooking

The increased use of processed foods, so-called convenience products, is a trend in commercial kitchens.
This is primarily based on economic reasons, e.g. fewer personnel. However, the use of fewer personnel is compensated by higher purchasing prices. Due to the fact that food must be repeatedly cooled and reheated, additional packaging is needed and extra product kilometres (= kilometres travelled until the food is finally delivered to the kitchen) are also required in many cases, convenience products also have negative effects on the environment.

Fresh cooking has many benefits, for example:

- Fat, sugar and salt content of the prepared food can be determined by the cook.
- Even small quantities of trans-fatty acids contained in pre-fried products can result in damage to human health.
- Self-prepared food is more appreciated.
- The aim of ready-made meals is that the consumer gets the same taste experience every time, while the taste may vary when food is self-prepared.
- The nutrient loss is lower when fresh cooking than with convenience products.
- Money can also be saved with freshly cooked meals by taking personnel costs and energy costs into account.
- It is possible to align fresh foods to nutritional physiological recommendations, while ready meals often contain too few fruits and vegetables and too much fat and sugar, and hence, protein, carbohydrate and fat contents do not correspond to the nutritional physiological recommendations.
- CO_2 emission can be reduced with each processing step that can be avoided,
- It is possible to use high-quality, regional and organic foods, whereas the origin of the individual ingredients in finished products is often not clear and must also not be clearly defined according to the law.
- A regional social structure will be promoted.

Fresh cooking will be examined more closely in this module. As a result, convenience products are also covered in detail.

2.1.5 Reduced meat consumption

Slide 13
In international comparisons, Austria is among the leading countries in terms of meat consumption with a per capita consumption of 91kg per year in 2013 [FAOSTAT, 2013]. By purchasing convenience products, we additionally consume meat and meat products here in Austria. Particularly in products with a high degree of processing, such as convenience products, meat of poor quality can be found whose origin is often unclear. Until today, it is not mandatory in Austria to provide any information on the origin of the meat in such products.

Meat and sausage products are mainly responsible for the amount of CO_2 emissions from commercial kitchens.
With an average meat consumption of 11%, this product group is responsible for 69% of the CO_2 emissions from the used foods.

Advanteges of reduced meat consumption:

- Reduced meat consumption (when substiduted with vegetables) has a positive influence on the climate
- Livestock farming is responsible for around 18% global greenhouse gas emissions
- The adaption of the meat portions offered represents a first step towards sustainable menu
- A maximum of one third of the plate should be intended for sources of protein such as meat, fish or legumes

Meat in organic quality is usually more expensive than conventional meat. The reasons are based on the following guarantees for organic agriculture:

- Loose housing system
- Group housing system
- Access to open air or grazing areas
- Organic feed without genetic engineering
- Feed without antibiotics
- Feed without animal proteins (e.g. meat-and-bone meal)
- annual inspections

- Improved animal welfare through species-appropriate animal husbandry, good hygiene management, natural light, access to open air or grazing areas, straw in the stable and experiencing the seasons.
- Organic meat contains fewer drug residues and stress hormones; Organic foods have a lower nitrate level and a reduced pesticide exposure. Organic meat and organic milk also contain a higher amount of polyunsaturated fatty acids, such as Omega3 fatty acids and linoleic acids.
- Animals from organic production live longer, move more and grow slower than conventionally held conspecifics. Therefore, a higher meat quality is also ensured.

Reduced meat consumption will be examined more closely in this module and in module 1: Food Use.

2.2 Arguments for a Sustainable Menu Design

Slide 12

What we eat not only affects our well-being, but also the world around us, economically, socially and ecologically.
Depending on which food or dish we choose, it has also an impact on transport, water damage, workplaces, an energy-efficient and healthy way of preparation and in the long run

also on our general health condition. These three dimensions coincide and interact with each other. However, there is an attempt to cover them separately.

2.2.1 Ecological dimension - Co_2 emission: Fresh cooking against Fast Food, organic against conventionally

Slide 14-15

There is a link between our nutrition and the global greenhouse effect. 20% of all CO_2 emissions are generated by food production and nutrition. The ecological footprint shows: If all of the inhabitants on earth would be Austrians, we would need three planets in order to be able to cater them all. The ecological footprint of an Austrian is 5.3 hectares. To ensure that all people in the world would be supplied in the same way, they would be only entitled to an ecological footprint of 1.8 hectares [Austria, 2013].

Table 1: CO_2 eq in kg with domestic and foreign food production [Daxbeck et al., 2011]

Foods	Organic		Conventionally	
	Austria	Main import country	Austria	Main import country
Apple	0.11	0.16	0.18	0.17
Bread	0.93	1.49	1.23	1.65
Cucumber	0.08	0.11	0.11	0.14
Chicken meat	3.01	3.45	3.79	3.58
Yoghurt	0.93	1.37	0.84	0.90
Carrot	0.09	0.22	0.11	0.20
Potato	0.12	0.30	0.16	0.31
Mashed potatoes	2.71	3.03	2.93	3.09
Savoy cabbage	0.12	0.14	0.13	0.17
Cabbage	0.11	0.23	0.11	0.26
Flour	0.32	0.71	0.76	0.94
Milk	0.92	1.36	0.83	0.88
Peach	0.10	0.24	0.19	0.25
French fries	3.80	4.34	3.89	4.36
Beef	13.50	13.34	12,50	12.44
Salad	0.18	0.25	0,14	0.25
Pork	4.31	4.89	4.72	6.10
Rolls	0.85	1.26	1.10	1.39
Pasta	0.39	1.24	0.69	1.24
Tomato	0.09	0.25	0.09	0,26
Tomato, peeled	0.25	0.45	0.26	0.47
Tomato paste	0.54	0.73	0.57	0.86
Plum	0.08	0.15	0.22	0.15

Onion	0.14	0.16	0.15	0.16

Table 1 shows the equivalent of CO_2 emissions. The lowest emissions are marked respectively. In addition, it is obvious that organic meat is emitting more eq CO_2/kg. However, this is only due to the lower productivity of organic farming per hectare and does not include the other positive aspects of organic agriculture listed under 1.2.3 and 1.2.5. The costs for conventional cultivation do not include the costs that hereby arise for all of them.

The prices for conventional foods do not take the ecological and social follow- up costs of their production and processing into account. The consequence is that these follow-up costs must be paid indirectly by the company.
Thus, conventionally produced foods do not correspond to the true-cost pricing, while organic products do for the most part.

2.2.2 Social dimension

Slide 16
Globalization leads to many problems around the world.
Particularly problematic are the effects of globalization on food security, society, and food quality in the individual countries. In earlier times, when the transportation and storage of food were more difficult, the focus was on achieving self-sufficiency within a country.
However, as a result of progressing globalization, a global division of labour is being pursued. Countries should specialize and supply other countries.
However, this global division of labour leads to great problems (e.g. the emergence of huge monocultures of fodder plants, the loss of habitats, and increased CO2 emissions because of longer transport distances [Berghofer et al., 2016].
With respect to Austria, half of the animal feed for our meat consumption comes from developing countries. The agricultural production areas thus displace food production for the indigenous populations [Austria, 2013].
Furthermore, many producers of our food can barely make a living because they are insufficiently paid so that the products can be offered at lower prices in supermarkets.
More information on this can be found in the handbook or in the module communication and marketing.

2.2.3 Economic dimension

The economic dimension is often the decisive factor for purchasing decisions and will be covered in more detail in Section 2 and in the handbook for this module.

2.2.4 Traditional Austrian cuisine

Traditional recipes are frequently a good orientation for seasonality due to the fact that at the time when these dishes were created, there were still barely any opportunities to buy regional foods at affordable prices. This resulted in regional dishes that were prepared by regional foods and became traditional dishes in the end.

These days, it is often useful to adapt these foods to match the reduced level of movement and energy requirements of the population and to make them more sustainable through modernised use of meat and the exchange of some food since these dishes were frequently designed to feed heavy labourer.
In general, these foods are well accepted by consumers. In order to create a sustainable menu, it is important to respond to the wishes of the consumers in order to avoid any waste.

Examples of traditional Austrian dishes are: Apricot dumpling, cabbage vegetables “Old Viennese style”, Kaiserschmarrn and fried beef and onions in gravy.

2.3 Seasonal Menu

Slide 17-18 and 30
A seasonal menu includes foods made up of food products which are regionally available at a specific time of the year from outdoor production or stock goods. Products from heated foil tunnels or greenhouses consume a lot more energy and the food produced in them cannot, strictly speaking, be designated as seasonal products, but only as regional products.
The significantly higher energy consumption and CO_2 emissions of vegetables from greenhouse cultivation and food from unheated greenhouses or foil tunnels is addressed in detail in the handbook and Section 2.7.3. – summer and winterplan.
Fig. 1- and Fig. 2 show the seasonal nature of fruit and vegetables in Austria. From the seasonal calendars, it is evident that between November and March only a small variety of vegetables is available, which makes the menu planning with exclusively seasonal food more difficult. It is therefore presupposed that food plans must be changed to vegetables which are available during the winter season. In order to ensure that these will be also accepted by the consumers, it is necessary to justify and communicate this measure. This aspect will be examined more closely in module 5 Information and Marketing.

The ”Vegetable of the Month” is a well-suited marketing iniaitve to promote a seasonal meal. In kindergartens and schools, an additional integration into the classroom can take place.

Fig. 1: Seasonal nature of fruit in Austria

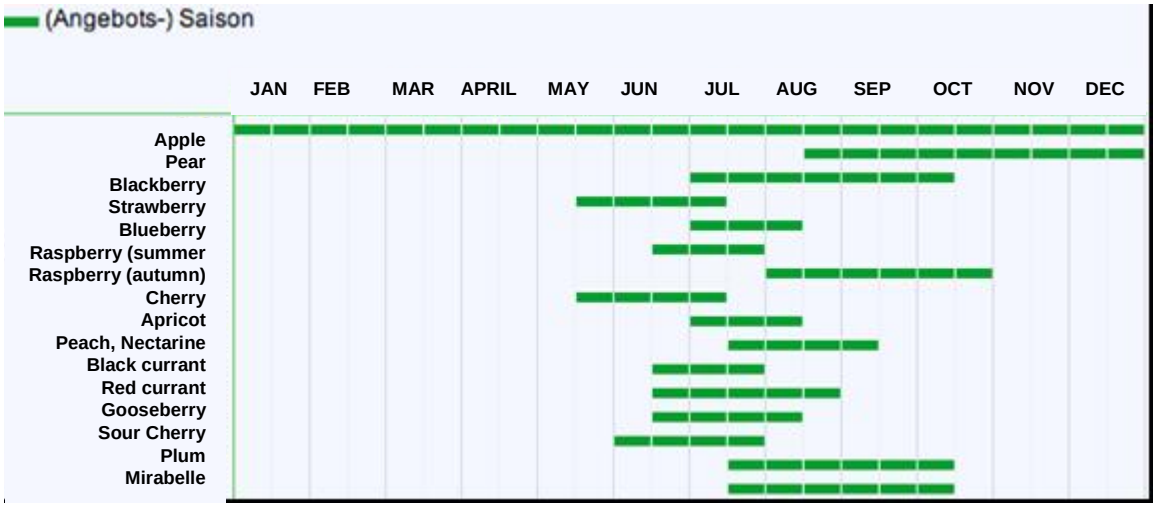

Fig. 2: Seasonal vegetable calendar [AMA Marketing, 2010]

Month	1	2	3	4	5	6	7	8	9	10	11	12
Vegetable	www.vitalia.cz											
Asparagus												
Bean pods												
Beetroot												
Bell pepper												
Brocolli												
Brussels sprout												
Cabbage white and red												
Carrot												
Cauliflower												
Celery												
Cucumbers												
Garlic												
Hokkaido pumpkin												
Chicory												
Chinese cabbage												
Kale												
Kohlrabi												
Leek												
Onion												
Parsnip												
Pattypan squash												
Pea												
Radish												
Radishes												
Root parsley												
Salad												
Spaghetti squash												
Tomatoes												
Zucchini												

3. Meal plan: economic and ecological aspects

Slide 19

3.1 Convenience foods in the 21st century

In agriculture, less and less people are employed and the food processing is increasingly decoupled by consumers. Consumers get used to taking advantage of the thus freed up time. Consumers and also commercial kitchens increasingly rely on industrially processed finished products in order to save personnel costs and time. However, experience has shown that possible savings are compensated by higher purchase prices.

Half-finished products may have different levels of readiness, in accordance to individual preparation processes (planning, buying, storing, prep-work, finishing, serving, maintaining a temperature, expenses, waste). Demands for larger proportion of freshly prepared products are rising. Fusion cuisine has high requirements for hygiene and staff. In general, good quality food can be achieved with adequately trained staff. The law sets out the operational measures to achieve the safe quality of the HACCP concept. Critical points such as serving temperature, maintaining a temperature or cooling the meals require increased attention in terms of avoiding quality damage (temperature control for chilled and frozen goods when handling). Staff must be motivated to create health-conscious food and adhere appropriate quality.

The more fresh food is used, the more you have to pay attention to hygiene. Demands for input inspection, storage and preparation as well as the need for storage and working space are increased. Working processes are not manageable without professional help. If these factors are sufficiently provided, this system can be used without difficulty.

During production of food, an increasing amount of energy is consumed with corresponding negative environmental impact, including climate change. Increased use of semi-finished products in communal catering facilities brings apparent economic benefits (less labour, saving space in the kitchen). The impacts of the use of semi-finished products or ready, processed and long-term storage products on the environment outweigh the impacts of the use of fresh products with respect to the heating and cooling of foods, special packaging and transport costs.

This point will be examined more closely in Section 2.4 and in the module manual. More information on this topic as well as an outline of the backgrounds can be found in the manual.

3.2 Processing steps of convenience products

Slide 20-21

The table of the processing steps of convenience products of [Blömker, Perschke, Voigt & Zacharias, 1999] (Table 2-1) is the basis for the allocation of food in stages of processing.

Table 2: Overview of processing steps of convenience products [Blömker, Perschke, Voigt & Zacharias, 1999]

Convenience level	Stage	Definition	Examples
Basic level	0 %	Preparation still has to take place in the kitchen	Cutting of animal halves, baking of bread
Ready to be prepared	15 %	Food still has to be prepared before cooking	Fish, cut meat, unprepared vegetables
Ready to be cooked	30 %	Cooking without any preparation	Fillet, pasta, frozen vegetables
Ready to be mixed	50 %	By mixing of different foods, finished meals are prepared	Salad dressing, mashed potato powder
Ready to be regenerated	100 %	After the food has been heated, it is ready to be sold.	Ready-made meals (individual components or finished menus)
Ready- to-eat	100 %	Can be immediately consumed.	Bread, pastry, matie, tomato paste

These processing steps are used in order to allocate the food to the “convenient” processing stage.

Fresh

Those foods are described as “fresh”, which are included in the convenience level “Basic”, “Ready to be prepared” and “Ready to be cooked”.
Exceptions in this context include rice, bread, pasta and pastries. These foods are allocated to the freshness category, contrary to Table 2-1 of [Blömker et al., 1999].

It makes sense to increasingly use frozen vegetables and fruit in the period from November to April, since there are only a few types of vegetables and fruit available during this season (Please see Figure 1-1 and Figure 1-2). Otherwise, foods of the category “Ready to be cooked” or “basic level” should be preferred.

Convenient

Those foods are described as “convenient”, which have a degree of processing of more than 50% (mixed, regenerated and ready-to-eat) are identified as convenience foods.

3.2.1 Advantages and disadvantages of convenience products

Ready-to-eat and convenience products are attractive for large kitchens because they require less preparation, thereby reducing operating times and personnel costs.

Slide 22-23
Further advantages result from:

- Compliance with hygiene standards and possible legal conditions
- Pre-sorting and pre-processing, delivery in large containers
- A simple business relationship or delivery by a producer association
- A reliable delivery taking into account the respective lead time
- Frozen fruits and vegetables have the same nutritional value as fresh seasonal products because these are frozen directly after harvest. Nutrients, vitamins, minerals, and trace elements are largely retained.

The global trend towards processed food and convenience products has a negative influence on the health of the Austrian population. In Austria, the number of nutrition-related diseases (e.g. obesity, diabetes mellitus type 2, and cardiovascular disease) is on the rise. The reason for this is an excess of meat, sausage, eggs, highly processed sugar, and salty foods as well as a lack of vegetable foods [Austria, 2013].

Slide 24-26
Disadvantages are:

- Convenience products often contain a lot of sugar or fat; their energy content is often comparatively high.
- The fat quality of convenience products is sometimes not optimal. In particular, trans fat are problematic.
- The often high salt content of ready-to-use meals can be disadvantageous, especially for people with elevated blood pressure.
- Imported products are generally not prepared with iodized and fluoridated salt. It is therefore important to use iodine and fluorine-containing salt for self-prepared meals.
- Most prepared meals do not represent a balanced meal: often low/missing vegetable and fruit content and thus unhealthy (five servings of fruits and vegetables per day). Ready-to-serve meals with a missing or low proportion of fruits and vegetables should therefore always be supplemented with a serving of fruit or vegetables.
- Those who are sensitive to certain substances (e.g. gluten, lactose, milk protein, soya, or additives) must carefully read the labels.
- Depending on the type of preservation (e.g. drying and heating), the content of vitamins and minerals may be reduced.
- In most cases, energy-intensive processes are necessary (e.g. freezing, packaging, and processing). For this reason, convenience products should not be consumed

daily (not only from a nutritional physiological but also from an ecological point of view).

- Finally, convenience products are almost always more expensive than fresh products

The advantages of convenience products can also be met by suppliers or agricultural producers and therefore do not provide an argument for convenience products.

3.3 Ecological aspects of fresh cooking

Slide 27

Table 3: CO_2 eq in kg in domestic and foreign food production, focus potato [Daxbeck et al., 2011]

Foods	Organic		Conventionally	
	Austria	Main import country	Austria	Main import country
Potato	0.12	0.30	0.16	0.31
Mashed potatoes	2.71	3.03	2.93	3.09
French fries	3.80	4.34	3.89	4.36

Table 3 significantly shows that each additional working step is emitting a higher amount of CO_2. Potatoes from organic cultivation emit 0.12kg eqCO_2/kg and instant mashed potato flakes, which were also made of potatoes from organic farming, 2.71kg eqCO_2/kg, while French fries, which were also made of potatoes from organic farming, already emit 3.8kg eqCO_2/kg.

3.4 Economic aspects of fresh cooking

Slide 32-35 and 40-48

There are many arguments that speak for fresh cooking. However, in practice it is often decided from an economic standpoint.

In 2005, during the performance of the Austrian projects BIOFAIR I AND II, it was investigated whether the costs remained the same when using more fresh foods in commercial kitchens instead of convenience products.

When replacing the finished products with organic fresh products, a cost saving was achieved in 12 of the 18 examined foods [Daxbeck & Pinterits, 2005].
More information on this as well as examples can be found in the module manual.
F39

3.5 How is it possible to use organic foods in commercial kitchens without putting too much strain on the budget?

Slide 28

Projects showed that freshly cooked foods in organic quality are cheaper on average than the alternative finished products. In addition to the freshness aspect, price differences between organic and conventional foods are lower when purchased during the season.

In order to counteract price increases, 4 points must be particularly considered:
Source of supply, seasonality, food and degree of processing.

The decision of a commercial kitchen to change to an organic kitchen is associated with organisational and economic challenges. A prerequisite for a successful changeover is a good preliminary planning, reliable delivery structures and an analysis of the total costs. A careful menu composition is the guarantee that the additional costs for an organic operation remain within reasonable limits.

- This means the following:
- Observing seasonality
- Buy storable vegetables
- Process meat pieces at a more favourable price
- Reduce the size of meat portions (cooking loss with organic meat is 10% lower)
- Avoidance of expensive convenience and frozen products
- Offer more vegetarian dishes

Price of organic food

Slide 36-48

The difference in the price of organic food and conventional products is not as significant as it may seem at first glance. The price of organic food usually exceeds the price of conventional products in the order of 20-40%, because they have higher costs throughout the whole production process. Environmental protection against pests, weeds and diseases is more common in conventional agriculture than in conventional chemicals. Organic-farmers cannot use a number of synthetic products to increase production and for that reason they have lower yields of crops and lower yields of livestock. The higher price is also a more demanding way of processing with a high proportion of manual labor and the cost of packaging and distributing small batches.

Favorable contracts or quantitative discounts on ordered foods can be achieved more easily, the higher the number of customers in a given facility. The biggest savings result in communal catering to purchase fresh, unprocessed raw materials directly at the farmer. In season, prices are lowest, and the difference between conventional and organic production is minimal. Milk products, meat and sausages, vegetables and fruits, all in the organic-quality can be bought at a similar price as the quality products of conventional agriculture. "For example, organic and non-organic milk and yogurts are not much different in supermarkets. For meat, vegetables and fruits, it is better to turn directly to the farmer, "

An example of price comparison of several products in Czech republic
(Pro-bio 13th week 2013):

In Billa supermarkets you can buy white farm yoghurt with 3.5% fat 200 g more expensive than 200 g of the Organic-yoghurt from Valašské Meziříčí (min. 3% fat). In Albert supermarkets, the cheapest whole milk is 19.90 CZK / 1l (1 EUR = 26 CZK), and the cheapest organic-milk is 19.90CZK / 1l (note: the organic-milk is always whole - content of 3.5% fat at a minimum). The litter of whole organic-milk is around 18 CZK on farms. If we compare the prices of meat, after deducting the proportion of water (see scandals in previous days), the price would be not very different. On the organic beef farm for soup you will buy for 110, - CZK / kg, organic pork knee with bone at the price of 89, - CZK / kg, or your favorite beard, and the boned, for 99, - / kg. Organic potatoes from the farm today you can buy for 15 CZK per kilogram, at the time of harvest the prices are even more favorable. For the comparison last week in Tesco, standard potatoes stood at 17.90 CZK / kg, in the Penny Market there was an event, so for 2 kg the customer gave a 23% discount, at 22.90 CZK. But without an action rebate he would have paid less than ten penny for these potatoes than organic-potatoes from Bio-farm Sasov.
It is recommended to switch out ingredients in a blocked fashion. For example, switch all the salads and extras to organic quality so the salad bar can be marketed as organic. This is going to create more visibility and will be an easier sell to the communal catering participants versus switching individual ingredients. More information on marketing can be found in the module communication and marketing.

3.6 Options to adapt the menu to seasonality and regionality

3.6.1 Direct linkage of agricultural producers with commercial kitchens

Slide 49-51
On the one hand, the importance of outside communal catering is steadily increasing, and on the other hand, farms are not able to sell their digestible food for various reasons. One way of counteracting this situation is a direct linkage between agricultural producers and commercial kitchens.

The 7 most important vegetables and fruits produced in Austria from a quantitative point of view are:
Vegetables: Potatoes, onions and leeks, carrots, tomatoes, cucumbers, peppers, cabbage
Fruits: Apples, pears, plums, other berries, strawberries, cherries/sour cherries, apricots.
There is a potential, however, there are some problems with the merger of producers to communities in order to meet the volume requirements of commercial kitchens in terms of food, but this could be solved by means of an online communication platform.

There are already a few projects on this subject and the analysis of these initiatives and projects identifies the obstacles on the part of agricultural producers and commercial kitchens with regard to direct linkage:

Own surveys of regional agricultural producers (10 companies, including cooperatives of several affiliated enterprises) and selected Viennese commercial kitchens result in the following prerequisites for a successful direct linkage between regional producers and Viennese commercial kitchens:
An alternative is the production of preserved foods from the producers, which however represents additional expenses and requires investments.

3.6.2 Culinary specialty weeks

Slide 52-57
Culinary specialty weeks have already been customary in the food service industry for a long time. Seasonal foods are thereby brought to the fore and processed into specialties.
In that regard, food plans for commercial kitchens are usually determined for 8-12 weeks in advance and supplemented or broken down by seasonal specialties.

In this context, such food is suitable which is seasonally available only for a short time, for example:

- The asparagus season lasts from April until the end of June.
- The cherry season lasts from May to June.
- The strawberry season lasts from May to July.
- The pumpkin season lasts from June to October.
- The mushroom season lasts from September to November.
- The venison season for pheasant, rabbit, deer lasts from October to December.

This is a great opportunity for the commercial kitchen to get to know regional producers and to connect directly with each other.
Expand the culinary specialty weeks (p.20) with examples.
Summer and winter meal plan
Suggestions for detailed food plans that are coordinated with the seasons are freely accessible on the Internet at:
http://umbesa.rma.at/sites/new.rma.at/files/Projekt%20UMBESA%20-%20Rezeptsammlung%20(Vers.%201.6).pdf

In addition, recipe suggestions on sustainable food preparation are also provided in Appendix 2 of the handbook.

4. Meal selection and resource efficiency

4.1 Nutritional physiology and nutritional values

Slide 58-62

Fig. 3: The Austrian Nutrition Pyramid of BMGF [Bundesministerium für Gesundheit (Federal Ministry of Health, 2016]

The nutrition pyramid in Fig. 3-1 provides assistance in the selection of food. The food at the bottom is the cornerstone for a balanced nutrition, while food at the top should be consumed rather infrequently. It is constructed in such a way that each component corresponds to one portion of the food group per day.
Expert recommendations for the various food groups can be found in the handbook for this module.

More detailed information on other quality, sensory, hygienic and technological quality is contained in food module materials.

4.2 Portion sizes

Slide 63-67

4.2.1 Methods of food distribution

The food distribution has an impact on how the meal is perceived. In this context, some food distribution systems are available and the needs of the target group as well as the spatial conditions should be taken into account.

4.2.1.1 Food serving systems (buffets)

With this system, there is a continuous serving counter. Consumers take a tray and walk along the counter, past various offered dishes which are portioned according to the order of the service personnel.

Advantages:

- You can get a fast overview of what is offered.
- The portion size can be individually adjusted.
- The portion size can be exactly met by using ladles and other dispensers, which is especially valuable in case of any nutrient-optimised meals.

Disadvantages:

- Wait times often occur; consumers have to opt early in case of several menu outlets (which, on the other hand, shorten the wait times).
- For reasons of space, usually only a limited choice of food can be offered.
- Overproduction and waste of food are created.

4.2.1.2 Tray system

With this system, the dishes are portioned in the kitchen and distributed accordingly on individual trays on a tray conveyor. An appropriately trained staff and a good distribution of duties shall enable the kitchen employees to fill a large number of trays within a short time.
Once the trays have been filled entirely (compact tray system), the individual plate or the individual tableware (Clochen system) are covered up. In this way, the temperature of hot meals can be kept for approximately one hour. Food trolleys can be used in case of long distances between kitchen and food dispensing points. As needed, the food has to be heated or cooled during transport in order to ensure that the food arrives at a corresponding temperature that meets the hygienic requirements of the consumers.

Advantages:

- The system makes it possible to also supply communal catering participants with limited to no mobility.
- The portion size can be exactly met by using ladles and other dispensers, which is especially valuable in case of any nutrient-optimised meals.

- The trays are filled individually; this enables that individual dietary requirements can be also taken into account

Disadvantages:

- This requires additional time and effort to collect the individual meal orders and to fill the trays properly in accordance with the meal order.
- If food trolleys are used, it may result in higher power consumption.

These are the most common methods of food distribution. In addition, there is also the possibility to cook fresh any dishes that can be prepared in a fast manner right after they have been ordered, such as steak or pasta with pre-cooked noodles; or to let the consumers take the food themselves at a buffet counter or to prepare meals on the tables in advance. However, these possibilities are rather unusual.

If experiences are available about consumer habits and a proper planning has been made, there is hardly any waste with food serving systems (buffets) as well as with tray systems.

[DGE]

4.3 Options on how to design food on the meal plan in a resource-efficient manner

Slide 68-72

- Replace meat with plant-based food
- Reduce the amount of meat and increase the quantity of the side dishes and make them look more attractive (lamb's lettuce, potato salad and various sets (e.g. cranberries, herbs))
- Replace specific side dishes by more resource-efficient ones that require less processing steps (rice instead of French fries, potatoes instead of mashed potatoes).
- Replace convenience side dishes by freshly cooked side dishes (potatoes instead of convenience mashed potatoes from potato flakes).

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