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DGE Quality Standard for Meals in Companies

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DGE Quality Standard for Meals in Companies

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Message from the Federal Ministry of Food and Agriculture

Dear managers in companies and company kitchens,

You know best: companies score points with a good canteen offer. While typical workdays are often extremely dynamic, you create a counterbalance with your company restaurants. At the same time, you might promote the health of your employees with nutrition-conscious offers.

The Federal Ministry of Food and Agriculture is committed to ensure that companies offer a choice of meals that are of high nutritional quality. And that the health-promoting dishes are chosen as often as possible, because you and your employees specifically point them out. Moreover, waste should be reduced so that catering becomes more sustainable.

The Federal Ministry of Food and Agriculture cares to support all those who organise, manage and design company catering. That is why the ministry has commissioned the German Nutrition Society (Deutsche Gesellschaft für Ernährung e. V., DGE) to revise the „DGE Quality Standard for Meals in Companies". Within the scope of our National Action Plan „IN FORM – German national initiative to promote healthy diets and physical activity", the standard has been further developed in accordance with the latest scientific findings.

The „DGE Quality Standard for Meals in Companies" supports you as an operations manager or head chef as well as catering managers in designing a balanced and varied menu. With a health-promoting offer for each taste, you motivate employees to eat a balanced diet. In times of climate change, by implementing the standard you also support catering services that save increasingly limited resources through sustainable preparation.

The Federal Ministry of Food and Agriculture would like to invite you to use this Quality Standard and the wide range of information provided the ministry. So that health-promoting and sustainable catering is on the menu for all employees in companies.

Thank you for your commitment!

Sincerely yours,

Federal Ministry of Food and Agriculture

Preface

Dear readers,

at work, meetings come close on the heels of another and there is often no chance to eat a balanced diet. This DGE Quality Standard offers the opportunity to change some of that. It enables you to serve health-promoting and sustainable meals to employees and thus help to conserve the earth's resources. Company restaurant should become a place that specifically anchors health-promoting catering in Corporate Health Management.

The challenges in the working environment increase – which makes it important to cope with pressure and to perform at a high level. Scientists have often pointed out the benefits of a wholesome diet for health and well-being.

Central sustainability goals are fundamental for catering that focuses on quality of life for future generations as well. After all, nutrition is responsible for up to 30 percent of climate gas emissions.

The urgency of sustainable action, new scientific findings and twelve years of practical experience with the DGE Quality Standards caused us to extensively revise the DGE Quality Standards in exchange with experts from academia and practice.

After an intensive participatory process with representatives from academia and practitioners, the 5th edition of this DGE Quality Standard is now available with a new structure. For the first time, this compact guidebook describes criteria for optimal catering in a process-oriented approach – beginning with the first planning step to serving and food disposal. In addition, information on avoiding food waste, guest communication and nudging has been expanded.

A separate chapter addresses the important topic of quality management. It presents the basics of quality development in more detail and illustrates the importance of coordinating interfaces so that all those responsible for catering work together in the best possible way.

It is in your hands: make health-promoting and sustainable nutrition a flagship in your company. More information is available at www.jobundfit.de, where details are continuously added digitally. For individual questions, please contact the team of "JOB&FIT" who will gladly offer advice and assistance.

Sincerely yours,

Dr. Kiran Virmani
Managing Director of the German Nutrition Society

1

Background, Goal and Design

1.1 Company Catering: An opportunity for more health and sustainability

Delicious dishes that can keep up with trends in restaurants, food blogs and social media, and are also well-balanced. A dining room that invites you to stay yet can be used multi-functionally. A menu that perfectly supports employees, prevents diet-related diseases and preserves the limited resources of our planet at the same time. More appreciation for food and the meals made from it. These are just a few of the challenges company catering currently faces.

Eating and drinking are crucial for our health, performance and quality of life. Health-promoting meals that provide an adequate amount of energy and nutrients **promote and maintain both physical and mental abilities**. Therefore, they contribute significantly to the prevention of diseases like *obesity* or type 2 diabetes mellitus.

What is the current nutrition situation? A glance at national and international studies reveals that the proportion of adults who are overweight and obese has been rising steadily over the last 20 years [1 – 3]. Today, two thirds of all men and half of all women in Germany are overweight [4, 5].

For a long time, company catering is more than just the provision of a hot meal. Increasingly, *company restaurant* orientates itself towards restaurants or bars and offers a compensation to the hectic working environment. The status of *company restaurant* within the *company* is also changing. Previously regarded as a necessary evil, it is now specifically used to recruit staff. Employees who spend a lot of time at work want to enjoy healthy and sustainable catering in a pleasant atmosphere.

For this particular reason, health-promoting and sustainable company catering that is equally accessible to employees from all parts of our society is of great importance. In addition, specific communication and information may influence eating habits and show how a responsible approach to health and the earth's resources may be combined. Therefore, the ***company* is a central place for prevention and health promotion**.

Optimising the catering offer in *companies* is a measure of **environmental prevention** and thus contributes to the development and strengthening of **health-promoting company structures**. The Guidelines for Prevention [6, 7] describe the health-promoting design of the environment in *companies*, including healthy meals, as a central prevention principle of Corporate Health Promotion. The alignment of the meals with the DGE Quality Standard is described as a possible goal. **Corresponding measures that contribute to achieving this goal might be promoted within the framework of the Prevention Act.** *Companies* can be supported by health insurances according to paragraphs 20 b and c of the 5th Social Code (SGB X).

High-quality company catering offers great potential in terms of **health promotion and more sustainability because of the following aspects**:

- **Wide reach:** The setting *company* reaches a large number of potential guests, and many employees may benefit from it.
- **Healthy development for everyone:** A health-promoting and sustainable diet promotes physical and mental abilities of the guests and preserves their health in the long term.
- **A place for everyone:** Eating and drinking together connects guests from all parts of our society and income groups and promotes social interaction.
- **More sustainability:** Health-promoting and sustainable company catering offers a wide range of opportunities for more sustainability in planning, purchasing, consumption, disposal and cleaning. In this way, "health" and "sustainability" go hand in hand. Guests are able to experience and learn on a daily basis.

All these aspects are **starting points for measures *Corporate Health Management***. In this context, information and expertise on health-promoting nutrition might be closely linked to the health-promoting and sustainable catering offer. Targeted information and communication may increase the willingness to eat accordingly and to invest in one's own health.

1.2 Who is the DGE Quality Standard addressed to?

Providing health-promoting and sustainable company catering on a daily basis is a complex task. The continuous cooperation of different stakeholders is therefore necessary.

- ***Meal providers:*** Anyone who plans, produces and/or provides company catering. These include the kitchen management and team, caterers and tenants who offer breakfast, snacks and lunch in the *company restaurant*.
- **Service Team:** The serving staff in the *company restaurant*, the conference anfd floor service.
- **Representatives of *Corporate Healt Management* and guests.**

This DGE Quality Standard addresses everyone who is in charge for company catering in their respective areas. In the following, these persons are referred to as **catering commissioners.**

It is important that catering commissioners work through the contents and criteria of the DGE Quality Standard in a practice-oriented way for the different sections and also consider the general conditions on site. Numerous additional information and implementation tools are available on the website www.jobundfit.de.

1.3 What is the goal of the DGE Quality Standard?

The DGE Quality Standard supports catering commissioners in designing a health-promoting and sustainable meal offer in the *company* in at least one menu line. This means that guests may choose from a range of appropriate breakfast, snack and lunch options

Based on current scientific data, the DGE Quality Standard describes the **criteria** for optimal, health-promoting and sustainable catering. Each *company* may implement this Quality Standard step by step at its own pace. Every quality improvement of company catering results in healthier and more sustainable diets for employees. The majority of the criteria relates to the catering design (see chapter 4). Criteria are presented along the process chain with the five steps of **planning, purchasing, preparation, serving** as well as **disposal** and **cleaning**. These process steps offer the potential to significantly influence the nutritional quality of food and beverages as well as to set the course for a sustainable diet.

However, good company catering is more than just offering health-promoting and sustainable dishes. Therefore, the DGE Quality Standard also focuses on stakeholders and general conditions that influence the quality and acceptance of meals as well as the enjoyment and pleasure of eating and drinking. These general conditions include, for example, staff qualifications, management of interfaces, environment in which eating, and drinking take place, as well as communication around the catering offer (see chapters 2 and 5).

Figure 1 shows the process chain and the general conditions that are considered in company catering and therefore addressed in the DGE Quality Standard. The process chain plays a central role as a "pivotal point" for a health-promoting and sustainable offer. Usually, this is preceded by the tender and award procedure and, ideally also by the development of a *catering concept*. This forms the foundation for all process steps in company catering

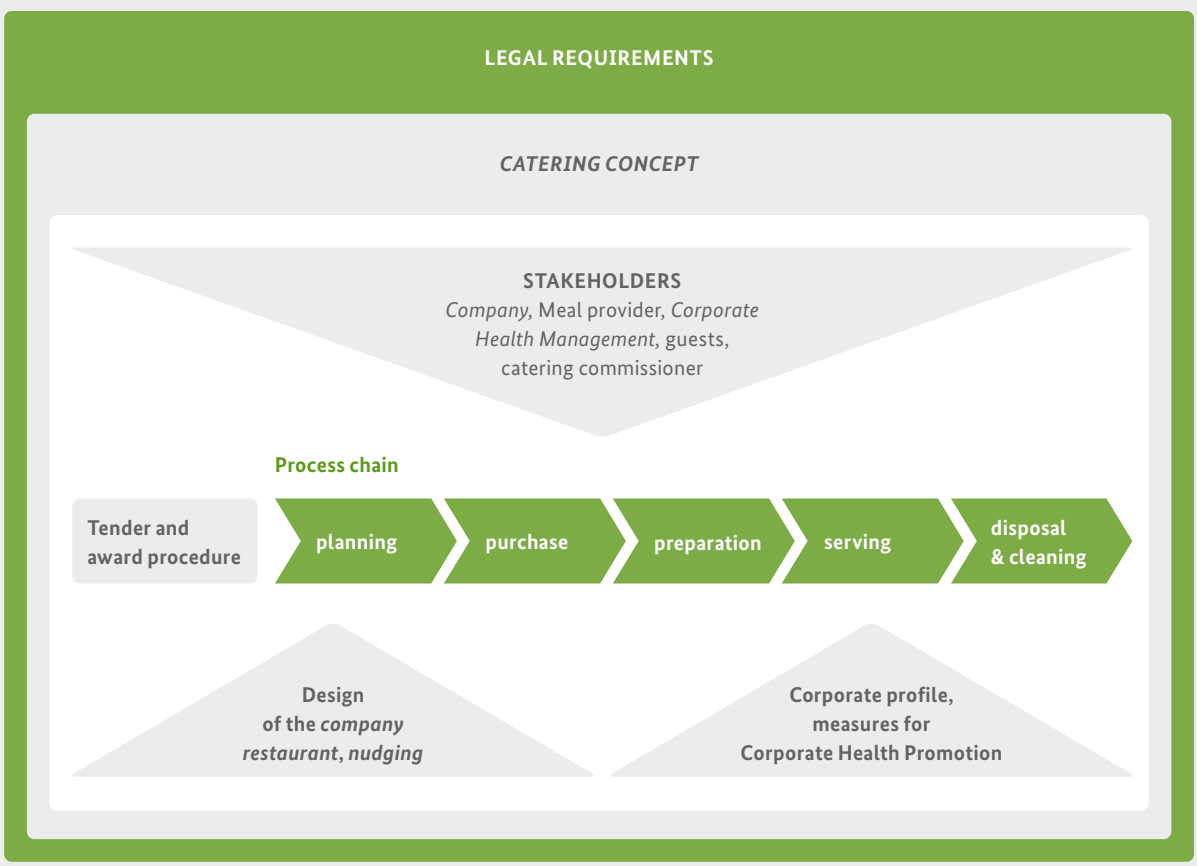


Figure 1: Aspects of health-promoting and sustainable company catering

1.4 How is the DGE Quality Standard structured?

The DGE Quality Standard includes six chapters with criteria and background information. Catering commissioners find answers to the following questions:

› How does the DGE Quality Standard support catering commissioners on their efforts to improve the catering quality?
The role of the DGE Quality Standard as an instrument of quality development and aspects that contribute significantly to more quality in company catering are explained in ⮑ **chapter 2**.

› Which are the basic principles of the criteria for "designing health-promoting and sustainable meals"?
When talking about nutrition or catering, health and sustainability must be considered together. Underlying reasons and how the criteria described in chapter 4 are developed are discussed in ⮑ **chapter 3**.

› How should a health-promoting and sustainable catering offer be designed?
Criteria for the catering design are described accordingly to the process chain in ⮑ **chapter 4**.

› What additional aspects need to be addressed?
Good company catering exceeds the offer of health-promoting and sustainable food and beverages. Stakeholders and general conditions influencing catering quality are described "beyond the plate" in ⮑ **chapter 5**.

› What is legally required?
Anyone who produces and serves meals must observe legal regulations. An overview of the laws and legal requirements that apply to mass catering can be found in ⮑ **chapter 6**.

1.5 What to keep in mind when reading?

› **Criteria** describing an optimal catering situation are listed and explained in text boxes with this symbol. The **checklist** starting on page 74 provides a criteria summary.

› Background information and advice on **sustainability** are marked with this symbol.

› This symbol additionally indicates **interesting facts**.

› This symbol highlights topics for which **further information** is available on the website www.jobundfit.de in the category DGE Quality Standard.

› Italic words or terms are technical terms that are defined in more detail in the **glossary**.

2

Developing quality company catering

This chapter explains what is defined as catering quality in the DGE Quality Standard. It shows how those responsible may continuously develop the catering quality and thus improve their offer. In addition, aspects that contribute and support this process are described. For all kitchens, caterers, and *companies* that already realise the DGE Quality Standard, it is also recommended to take a regular look at the current catering offer in order to identify possible deficiencies and initiate improvement strategies.

2.1 Quality of company catering

Company catering according to the DGE Quality Standard promotes the health of employees and is sustainable. All employees should be able to participate in company catering and their needs and wishes should be taken into account.

Thus, the criteria of the DGE Quality Standard describe an ideal catering situation. *Companies* may use them as orientation and benchmark for improving their catering service. Importantly, the catering commissioners should set priorities for criteria to be implemented first at their *company*.

DGE Quality Standard
as part of the company-specific *catering concept*
The development of a *catering concept* is an important first step. Each *company* should develop its own concept. It defines company-specific demands on the catering, describes the meals offered and served and reflects the structures on site. As part of such a *catering concept*, the DGE Quality Standard defines the criteria for a health-promoting and sustainable diet and thus ensures that an appropriate offer is available for every meal. The question "Who is served where, when and how?" is therefore answered.

DGE Quality Standard –
a quality development instrument
Through quality development, the *company restaurant* might become the *company's* flagship. The catering commissioner should initiate a joint development process towards health-promoting and sustainable company catering. **With the help of the criteria defined in the DGE Quality Standard, all stakeholders are able to improve the quality of company catering gradually together.**

Catering affects all stakeholders – the employees in the catering sector, the employees of the caterer, the management, the quality commissioner, the employees of *Corporate Health Management*, the company physician, the workers' council, the employees of the human resources department, all other employees of the *company* and the guests. Therefore, it is recommended to invite all stakeholders to an exchange. For example, a working group can be established in form of a "health circle" or a "catering committee" that meets at regular intervals. This way, everyone can participate, to learn about the different points of view and wishes, suggestions, and creativity can be expressed. A future-oriented *catering concept* may be developed and implemented together. This should be integrated into the *company's* mission statement and *Corporate Health Management* measures.

The collaborative, process-oriented quality development involves five steps that enable a continuous development towards health-promoting and sustainable meals. These are shown in Figure 2. The DGE Quality Standard supports each of these steps.

ANALYSIS
In this step, the current catering situation – the **ACTUAL situation** – is examined. The catering, beginning with the presentation in the menu and ending with the dining atmosphere in the *company restaurant*, as well as individual steps from planning to disposal and cleaning, are examined thoroughly. The checklist starting on page 74 helps to verify which criteria are already met by the *company's* catering offer and which are not.

Based on the analysis and description of the current catering situation, all stakeholders have the opportunity to discover which points are already implemented and what should and might be changed in the future. It is important that all stakeholders (see chapter 5) assess the situation and reflect on the conditions and structures prevalent at the *company*.

Checklist criteria on page 74 that have not been implemented in company catering so far may serve as **targets** for further quality development. It is recommended to prioritise and select those that could be implemented first. This way, it is possible to implement targets and the DGE Quality Standard gradually. The partial implementation of a criteria is also an important positive progress. For instance: if the objective is to offer a meat dish at lunch only **once a week**, while currently it is offered **daily**, initially reducing meat to **3 times a week** counts as an important quality improvement.

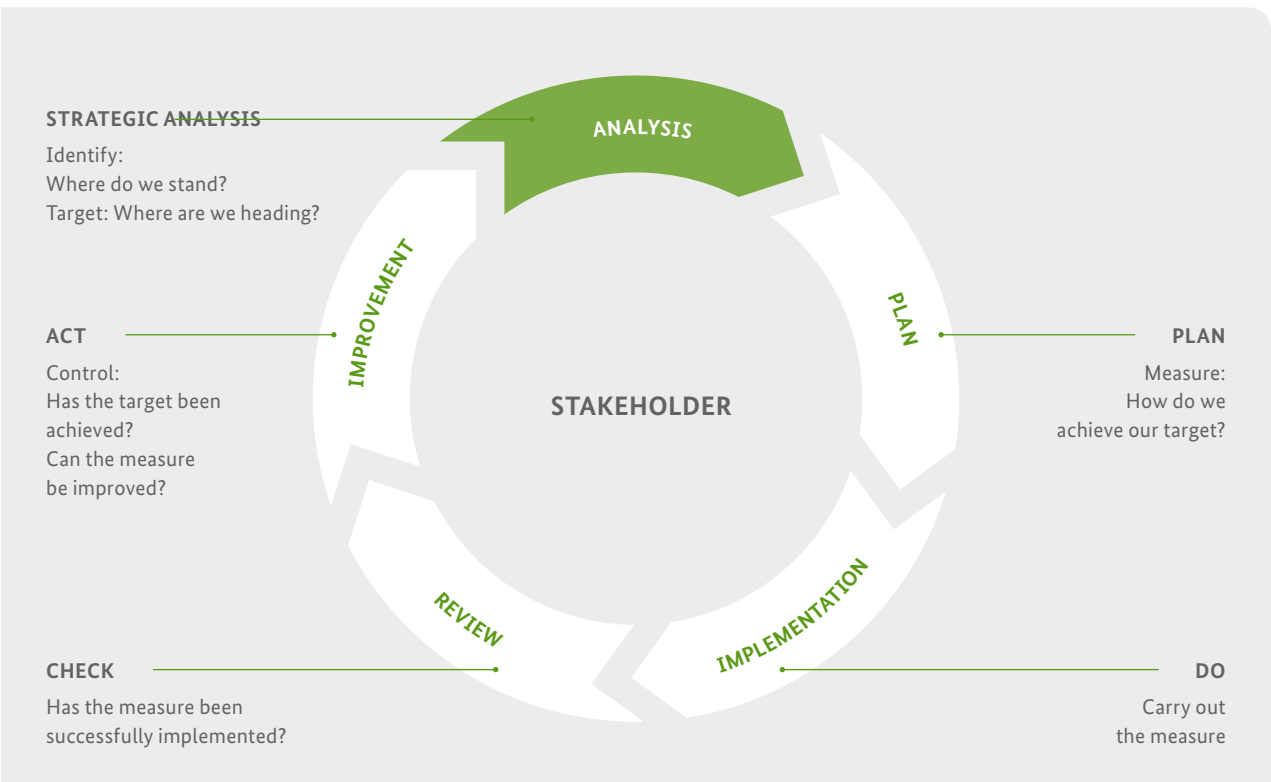


Figure 2: The five steps of collaborative, process-oriented quality development (modified according to Deming's life cycle [PDCA model])

ACT
Has the chosen target been achieved? Are there possible improvements for the future implementation of the measures? Should other measures and targets be adapted?

These experiences form the foundation for a joint strategic analysis of the entire catering situation. The collaborative, process-oriented quality development is thereby repeated. Hence, it is possible to implement targets step by step and to continuously improve meals in agreement with all stakeholders.

PLAN
Once the targets are defined, specific measures to achieve them might be planned together. **Which** measures should be prioritised, **who** should implement them and **when**, and **with whom** should she/he work together? Therefore, it is helpful to prepare a plan describing the measures precisely as possible. For example, measures may include changes in the food offer and the preparation of dishes, or the re-modelling of the *company restaurant*. Beforehand, all those involved should be thoroughly informed about the planned steps and the targets they are pursuing.

DO
Afterwards, the planned measures can be implemented. At the beginning of the new work process, structures, recipes or products are often unfamiliar for those involved. Therefore, the measures should be guided, and a contact person should be appointed for queries.

CHECK
Once the measures have been implemented, they are systematically reviewed and evaluated with the stake-holders. Could the measures be implemented as planned?

The following criteria apply:

- ☐ **A *catering concept* is in place.**
  The *catering concept* defines the company-specific requirements for catering, considering the structures on site. In addition, it contains statements on the organisation, break periods and the number of expected guests.

- ☐ **All stakeholders are involved.**
  To ensure the participation and involvement of all stakeholders, a working group in the form of a “health circle” or a *catering committee* which meets at regular intervals might be established. Ongoing communication helps to clarify questions and problems, but also to develop a *catering concept*. This increases acceptance and appreciation and ensures the continuous development of the catering service.

2.2 Interface management

Health-promoting and sustainable company catering is a joint task in which several professions and groups of people participate (see chapter 5.1). Interfaces are points at which one person or group of people completes their work process and passes the outcome to another. To ensure that the joint goal is achieved, it is advisable to:

- describe individual activities and work processes as precisely as possible (what, how, when, with what goal),
- to define competences and responsibilities as well as rules for substitutes for the work processes (who),
- identify and regulate interfaces in work processes (who is responsible, who participates, to whom is information passed on).

Proper interface management improves the transfer of tasks, promotes communication and cooperation and ultimately saves time.

Examples of interfaces in company catering:

- **Kitchen team or caterer – serving staff:** The *meal provider* delivers the food to the desired extent and informs the serving staff e.g., about the offer, portion sizes and allergens. The serving staff informs the *meal provider* about the guests' wishes and suggestions. The kitchen team or the caterer receive information from the staff on site about possible leftovers of different components for a better calculation and reduction of food waste.

› **Serving staff – guest:** The serving staff distributes the meals on plates and serves them or fills the buffet. They are the contact persons at the food counter and support guests in choosing their meals. To ensure that a health-promoting and sustainable menu is accepted, communication between the staff and the guests is crucial. Competent and friendly communication improves the atmosphere at mealtimes and is essential for the acceptance and appreciation of the offer.

Each *company* should have a catering commissioner for internal quality assurance. This person is not only the contact person for all stakeholders, but also mediates the interfaces. This challenging task demands knowledge about the requirements and wishes for catering and the dining environment. In addition, these requirements and wishes must be coordinated in the interest of all and in consideration of the general conditions in the respective *company*.

For instance, the following persons or groups of people may be considered as catering commissioners:

› a person responsible for catering, like a representative of the kitchen management or *operations manager*,
› an external consultant with appropriate professional qualifications in the field of nutritional science, dietetics, home economics or catering.

The following criterion applies:

☐ **A *catering commissioner exists*.**
This may be the kitchen manager, *operations manager* or an appointed person. The catering commissioner should be aware of all requirements and wishes regarding nutrition and the dining environment, combine them with the prevailing conditions at the *company* and coordinate them in the interest of all.

2.3 Staff qualification

In order to provide health-promoting and sustainable meals, employees with different professional qualifications, each with their own input, are required. The DGE Quality Standard focuses on the management of the catering sector as well as on the kitchen and serving staff. The job profiles differ depending on the field of responsibility:

Catering management
The catering management requires a specific professional qualification. This includes qualifications like:

- (Operatioons) Manager of home economics,
- home economist,
- head chef,
- cook,
- nutritionist or dietician, if necessary, with additional business qualification, as well as
- food service business economist.

Preparation and serving meals
Staff skills and knowledge help to ensure consistent catering quality. Kitchen and service staff should therefore preferably have adequate vocational training. However, kitchen and service staff may also be employed without such qualifications, as long as they are instructed by qualified staff.

Service staff members contribute significantly to the meal's acceptance by guests through their appearance and their communication. They should be able to provide information about the offered meals, their composition and allergens, name individual components and point out the health-promoting and sustainable choice (see chapter 5). A friendly manner, communicative skills, willingness to help are therefore crucial.

Further education and professional advanced training promote the staffs' competence, update the knowledge and give confidence in the daily work. The catering manager should regularly attend training courses focused on nutrition and sustainability in order to put new insights into practice. Topics that are suitable for all catering staff are, e.g.:

- basics of a health-promoting and sustainable diet,
- regeneration of "Cook & Chill" or "Cook & Freeze" offers (if used),
- basic knowledge of allergen management,
- ways to increase the percentage of *organically* grown food in mass catering,
- planning and implementation of *nudging* techniques,
- feedback management along with
- communication and dealing with guests,
- teamwork and collaboration with different stakeholders.

Further Information:
www.jobundfit.de
Keyword: Fortbildungsangebote

Mass catering staff carries a high responsibility regarding food hygiene. Regular instruction, e.g., on the Infection Protection Act, is obligatory for all employees who work with food (see chapter 6).

The following criteria apply:

- ☐ **Catering staff receive continuous training.**
  Staff skills and knowledge help to ensure consistent catering quality.
- ☐ **Ergonomic workplaces and workflows are in place.**
  This includes, for example, back-friendly working heights, heat and noise protection as well as variety in tasks. Ergonomic workplaces and work processes maintain health, performance and satisfaction of employees.
- ☐ **Employees are valued.**
  Appreciation promotes satisfaction and motivation. Valuing employees is expressed through fair payment, open and objective communication and constructive interaction with each other.

2.4 Feedback management

Dealing professionally with praise and criticism – feedback management – contributes to the evaluation of measures and to set targets in a joint quality development. It is important that praise and recognition as well as wishes, complaints and suggestions may be voiced by all stakeholders. Nevertheless, in mass catering it is certainly not possible to satisfy every wish of the guests. Therefore, it is even more important to listen to all stakeholders and to discuss wishes and possibilities in a constructive way, as well as to develop realistic solutions. This increases mutual understanding and the willingness to reach a consensus. Feedback management means also a continuous process that includes the following steps:

Step 1:
Receive praise and criticism
Feedback on meals is often unrequested and always an opportunity to improve the offer. Moreover, feedback should also be actively asked for at regular intervals. It is important to have the opportunity both to report appreciation and praise as well as to criticise and give suggestions for improvement in order to optimise processes. Often no negative feedback is equated with praise. Thereby, an opportunity to motivate staff and stakeholders is missed. Appreciation and praise may mean a lot, lack of praise can be frustrating. Possible ways are the personal dialogue, which can take place in the *company restaurant*, in the "catering committee" or by telephone, as well as written or digital feedback, for example by using evaluation forms and/or post boxes. In addition to praise and criticism, the reasons behind them and specific suggestions for improvement should also be asked for.

Step 2:
Document and evaluate feedback
All feedback should be systematically documented and evaluated. If necessary, interventions for improvement are planned together with those involved. Praise is passed on to the addressed catering staff members.

Step 3:
Implement interventions and inform about them
The interventions in response to the feedback and the achieved results should be made visible to all. Guests are happy to be involved in the process, and employees are proud of their efforts and feel that their work is valued.

2.5 External quality control

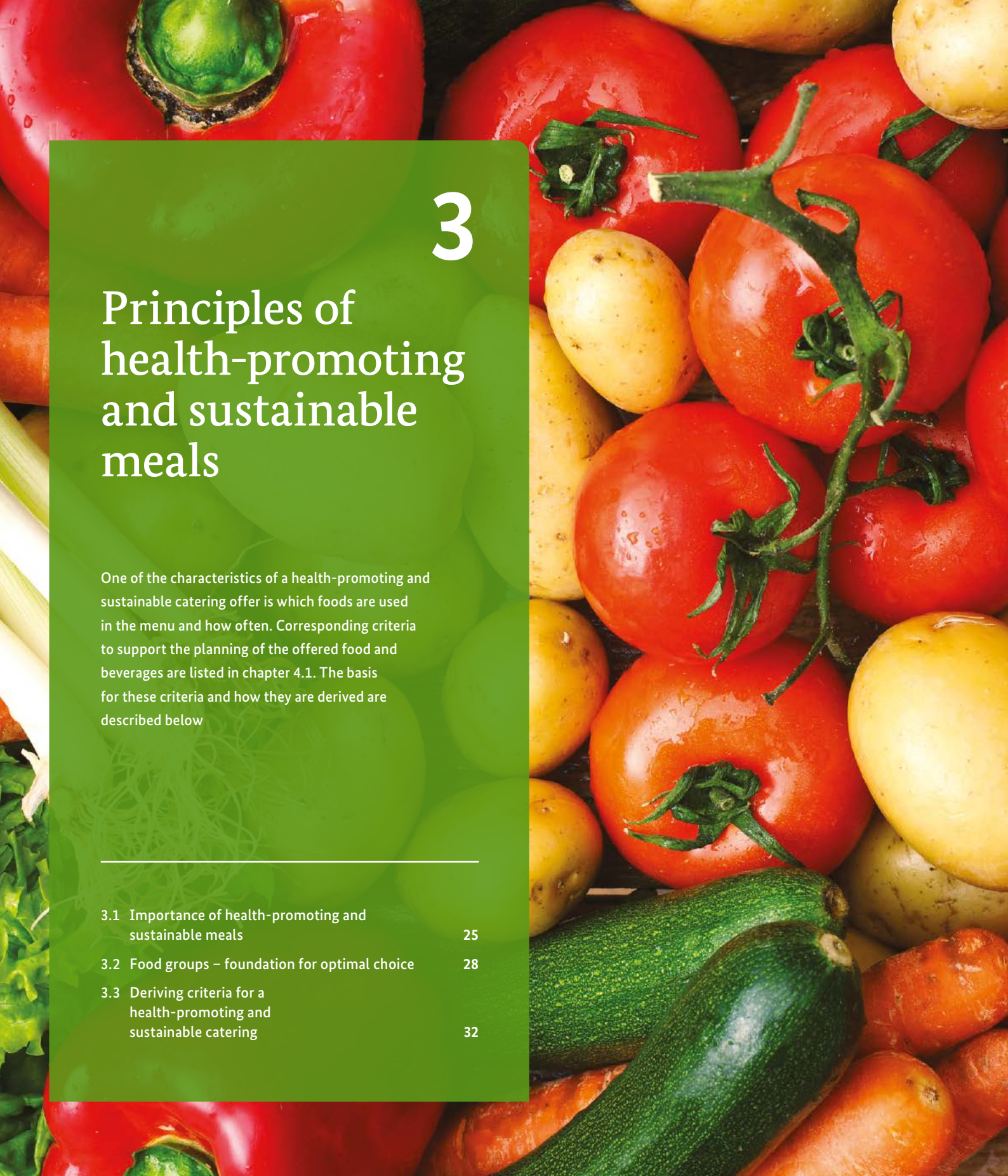
Whether the offered meals meet the set goals may be verified in an independent quality control. Usually, this is carried out by an external institution on the basis of different audit systems and audit criteria. In this way, catering commissioners ensure the quality of the offer and are able to demonstrate the performance publicly with an external seal of approval.

Further information:
www.jobundfit.de
Keyword: Externe Qualitätsüberprüfung

2.6 Specification for tenders

When a *company's* catering is not organised and prepared by the *company* itself or by its own staff, but is outsourced, specifications must be established within the context of public tenders. They serve as the foundation for the tender process and define the type and scope of the catering service. The DGE Quality Standard may serve as a reference for the specification of the tenders. The more detailed the requirements like preparation methods, serving system or the use of qualified staff, the easier it is to compare different offers. It is not recommended to demand the implementation of the DGE Quality Standard in general, but to describe in detail which of the individual criteria have to be fulfilled. The specification for tenders is fundamental for the contract between the contracting authority (e.g., *company*) and the contractor (e.g., caterer). It is recommended to write the specification for tenders supported by external professionals who might also assist in the tender process.

Further Information:
www.jobundfit.de
Keywords: Ausschreibung und Vergabe
and Beratung und Coaching



3

Principles of health-promoting and sustainable meals

One of the characteristics of a health-promoting and sustainable catering offer is which foods are used in the menu and how often. Corresponding criteria to support the planning of the offered food and beverages are listed in chapter 4.1. The basis for these criteria and how they are derived are described below

3.1 Importance of health-promoting and sustainable meals

We affect our health, quality of life, and well-being through what we eat and drink. A wholesome diet according to the recommendations of the German Nutrition Society (Deutsche Gesellschaft für Ernährung e.V. [DGE]) provides an adequate amount of energy and sufficient fluids. This diet ensures a balanced supply of the energy-supplying nutrients fat, carbohydrates and protein. Ingredients like vitamins, minerals, dietary fibre and phytochemicals are also contained in sufficient quantities. As a result, both malnutrition and overeating might be prevented. The wholesome diet is diverse and highlights the consumption of plant-based foods [8].

However, eating and drinking is more than just the intake of energy and nutrients. How we eat affects not only our own well-being, but also the well-being of present and future generations. The so-called Brundtland Report already characterised "sustainability" in 1987 as a development "that meets the needs of the present without compromising the ability of future generations to meet their own needs" [9], p. 43. In 2015, the United Nations adopted the UN 2030 Agenda, containing 17 Sustainable Development Goals (SDGs) as key element. Based on different definitions of sustainable nutrition [10 – 13] the Scientific Advisory Board on Agricultural Policy, Food and Consumer Health Protection has [14] formulated four central goals – health, environment, social aspects, animal welfare – for a more sustainable diet, which are explained in Figure 3. This DGE Quality Standard follows these objectives.

Many foods we consume carry a significant footprint in terms of environment, climate, social aspects and animal welfare [14]. Increasingly, our food is produced in complex and global *value chains*. The food ***value chain*** covers the input factors for agriculture, the agricultural production itself, up to processing and consumption. Aspects of sustainability, like environmental impact, can be tracked along these chains (see Figure 4). Therefore, the ***entire life cycle*** of a product must be considered in the environmental impact evaluation of food.

Figure 3: Goals of a more sustainable food consumption [14]

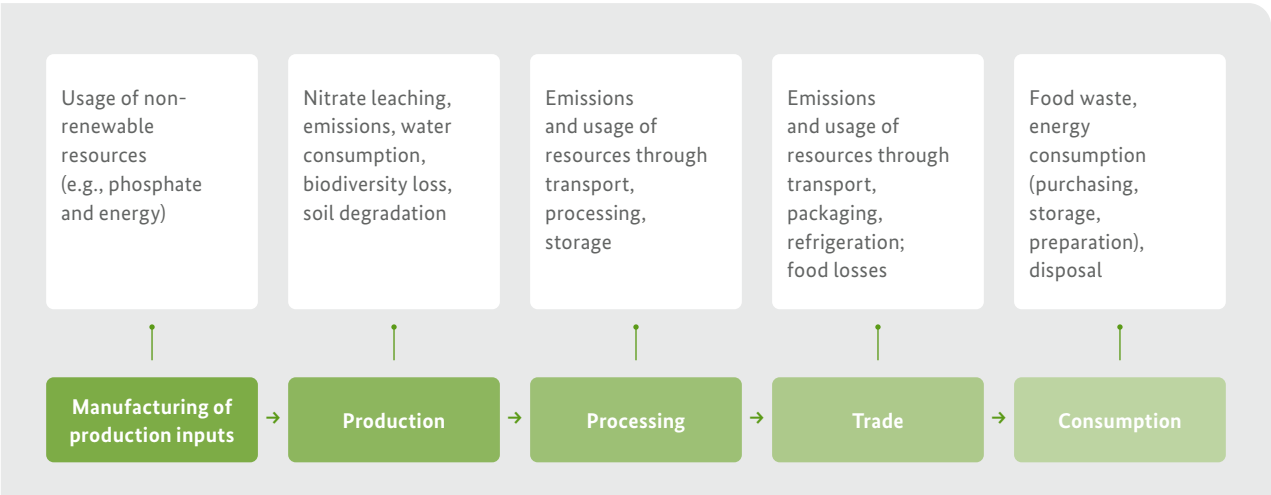


Figure 4: Key environmental impact along the *value chain* [14]

The contribution of food to *greenhouse gas emissions* is 25 – 30 % worldwide [15 – 17]. The production of food generates emissions of greenhouse gases like carbon dioxide (CO_2), methane (CH_4) or nitrous oxide (N_2O), e.g., through tractors or harvesting machines, fertiliser for the fields, heated greenhouses and animal stables, food industry, through cooling or freezing food, its transport and ultimately the preparation of meals. In addition to *greenhouse gas emissions*, the increasing intensification of agriculture has numerous other impacts on the environment and, as an open system, affects soil, water, animals and plants. For example, intensive tillage can increase the risk of *erosion*, leads to soil compactness and may cause the loss of soil fertility in the long term [18]. Intensive animal husbandry partly carries the risk of resistances due to the excessive use of antibiotics [19]. The application of fertilisers and pesticides significantly affects the biodiversity of plants and animals [20], and intensive nitrogen fertilisation is responsible for groundwater contamination with nitrate [21].

Therefore, it is not sufficient to adjust nutrition and company catering to aspects of health promotion only. It is rather essential to design the diet in such a way that resources are not wasted.

Potential savings in *greenhouse gas emissions* in the field of school kitchens are around 40 %, as calculations of the German project “KEEKS – Climate-friendly School Kitchens” show [22]. According to the data, about three quarters of the *greenhouse gas emissions* in school catering are caused by food selection. Around a quarter of the greenhouse gases are caused by kitchen technology, preparation and food waste. Comparable dimensions for *companies* were confirmed in the NAHGAST project [23].

The production of animal-based foods like meat, eggs, milk and dairy (especially those derived from ruminants like cattle, sheep and goats) cause particularly high *greenhouse gas emissions*. In contrast, the share of plant products like grains, vegetables and fruits in *greenhouse gas emissions* is usually much lower. Generally, there are also differences within a food group. For example, vegetables grown in a greenhouse heated with fossil energy cause *greenhouse gas emissions* that are between 5 and 20 times higher than *seasonal* vegetables grown in unheated greenhouses or open-field [14].

Overall, in many cases the choice between different food groups makes the biggest impact on the environment, as differences between food groups are usually significantly higher than differences within a food or product group. For example, one kilogram of beef causes on average about twelve kilograms of CO_2 *equivalents* – whereas the same amount of lentils causes less than one kilogram of CO_2 *equivalents* [24].

Even the production of nutritionally significant foods like milk and dairy, fish or nuts may have negative impacts on the environment. Nevertheless, these foods should be integrated into the diet in accordance with their recommended frequency and quantity due to their health-promoting impact.

Table 1 compares the estimated *greenhouse gas emissions* by example for the production of selected food, expressed in kilograms of CO_2 *equivalent*. The data shown provide orientation and may vary if conditions change.

The data shown and the fact that in Germany *companies* with more than 100 employees serve approximately 1,6 Billion meals in 13,800 *company gastronomies* every year [25],

illustrate that the composition of the menu in company catering with predominantly plant-based foods may make a major contribution to climate protection. Kitchen technology and food waste prevention also play a crucial role. Preparing, cooling and keeping ingredients and food warm may have a significant environmental impact. This is where infrastructure, production planning and staff behaviour are essential [22, 23, 26, 27]. Once food is discarded, all the steps from farm to fork – and thus the linked *greenhouse gas emissions* – are wasted. In addition, the disposal process itself produces small amounts of greenhouse gases.

Table 1: Estimated *greenhouse gas emissions* from the production of selected foods [24]

plant-based food		kg CO_2 *equivalent*
grains, grain products and potatoes	1 kg rice, dry	3.0
	1 kg bulgur, dry	0.5
	1 kg whole-grain pasta, dry	0.4
	1 kg potatoes	0.4
vegetables and *salad*	1 kg lentils, dry	0.6
	1 kg carrots	0.3
	1 kg iceberg lettuce	0.2
fruits	1 kg mango	1.7
	1 kg apples	0.3
	1 kg walnuts	1.0
oils and fats	1 kg margarine	1.8
	1 kg rapeseed oil	2.7

animal-based food		kg CO_2 *equivalent*
meat, sausage, fish and egg	1 kg beef	12.3
	1 kg turkey	4.2
	1 kg pork	4.2
	1 kg salmon	6.3
	1 kg egg	2.0
milk and dairy	1 kg cheese	5.8
	1 kg yoghurt	2.4
	1 kg milk	1.4
oils and fats	1 kg butter	9.2

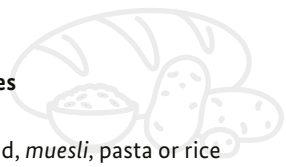
The "DGE Quality Standard for Meals in *Companies*" combines aspects of health promotion and sustainability. In chapter 4, this DGE Quality Standard specifies minimum frequencies for foods and food groups that are particularly recommendable from a health promotion perspective and a sustainable diet. These include plant-based products as vegetables including legumes, *salad*, whole-grain products and fruits. Additionally, a maximum frequency is specified for foods and food groups like meat, as well as highly processed and deep-fried products. There is scientific evidence that limiting these products is beneficial in terms of nutritional physiology and sustainability [28]. Regarding food qualities, the DGE Quality Standard refers, as an example, to fish from sustainable fisheries or aquaculture and to meat that complies with certain animal welfare criteria (see chapter 4.2).

Furthermore, chapter 4 describes criteria for the design of a health-promoting and sustainable diet along the process chain – from planning and purchasing to disposal. In this context, the reduction of avoidable food waste plays an important role.

Further information:
www.jobundfit.de
Keywords: Nachhaltigkeit and Lebensmittelabfälle vermeiden

3.2 Food groups – foundation for optimal choice

The DGE recommendations for a wholesome diet – as presented in the "DGE Nutrition Circle", the "German Three-Dimensional Food Pyramid" and the "10 guidelines of the DGE for a wholesome diet" – are based on the *"D-A-CH reference values for nutrient intake"* and the DGE's evidence-based guidelines regarding fat and carbohydrate intake [8, 29–31]. These recommendations serve as foundation for health-promoting and sustainable mass catering. The **food quality** – as **optimal choice** from each of the seven food groups of the DGE Nutrition Circle shown in Tables 2 and 3 – combines the recommendations from the models mentioned above. Thus, there are foods that should be consumed in different quantities and frequencies due to their nutritional composition, e.g., their *energy and nutrient density,* dietary fibre content and fat quality. For each food group, additional background information and aspects of sustainability are listed below, along with practical advice for the use in company catering.



Food group
grains, grain products and potatoes

Grains and grain products like bread, *muesli*, pasta or rice are important sources of energy, carbohydrates and dietary fibre. *Pseudocereals* or products made from them also belong to this group. Whole-grain varieties offer a higher *nutrient density* and are more filling than products made from refined flours or polished rice. *Parboiled* rice and other processed grains also provide a higher nutrient content than the polished variety.

Potatoes are among the possible sources of carbohydrates with high *nutrient density*.

Rice is a side dish containing starch with a comparatively large climate impact, as its cultivation releases larger quantities of climate-damaging greenhouse gases than potatoes or grains. Therefore, rice should only occasionally be integrated into the diet or replaced by local alternatives like spelt or green spelt.

Practical advice: Foods from this group should be offered in different ways, for example as mashed potatoes or pasta with tomato sauce. Ideally, grains and grain products are offered as whole-grain products. A slowly transition to the whole-grain alternative promotes acceptance among the guests. For example, it is recommended to mix a portion of wheat pasta with whole-grain pasta at the beginning and to gradually increase the amount of whole-grain pasta.

Combination of foods from this group with legumes or animal-based products increase the meal's *protein quality*. Examples include the pairing of potatoes with legumes, milk, dairy or egg, pea or bean stew with potatoes and bread, jacket potatoes with herb quark, mashed potatoes with scrambled eggs or whole-grain bread with hummus.

Food group vegetables and *salad*

Vegetables and *salad* are rich in vitamins, minerals, dietary fibre and phytochemicals. Thus, they provide many nutrients, little energy and contribute to a satiety feeling.

Vegetables and *salad* are climate-friendly too – they usually cause comparatively low *greenhouse gas emissions*. In particular, *seasonal-regionally* produced vegetables and *salad* grown in open fields or in unheated greenhouses are especially climate-friendly and might be positive for social sustainability.

Legumes like beans, lentils and peas also belong to this food group. They provide the most protein of all plant-based foods and also a lot of dietary fibre. Therefore, they are a versatile component of the diet and a good meat alternative.

In terms of sustainability, legumes also have a lot to offer: During growth, the crops fix the nitrogen they need from the air, which is why less fertiliser needs to be applied [32]. Meals with legumes should therefore be a regular part of the diet. If these are combined with grain products, as in a lentil stew with a whole-grain roll, the *protein quality* of the meal increases.

Practical advice: The possibilities for preparing vegetables and *salads* are as great as their variety. Whether as *raw vegetable* sticks with dip, classic side dish, stew, vegetable casserole or patty – there are no limits for creative preparation. Fresh or frozen vegetables are the optimal choice.

Legumes are more digestible if the dry goods are soaked overnight, and the soaking water is then discarded. Adding herbs such as savory, marjoram, rosemary or caraway and pureeing cooked legumes can also improve digestibility. Some varieties, such as red or yellow lentils, are already peeled and thus often easier to digest.

Further information:
www.jobundfit.de
Keyword: Gemüse und Obst

Food group fruits

Fruits is rich in vitamins, minerals, dietary fibre and phytochemicals and therefore has a high *nutrient density*.

Nuts are also part of the fruits group. Being important sources of nutrients, they are part of a health-promoting diet. 25 g nuts or oilseeds may replace one portion of fruit a day.

Practical advice: Fruits should be available fresh or as a frozen product, without added sugar or other sweeteners, offered in a variety of ways on the menu. Examples are fresh fruits for breakfast or snack, as fruit puree in yoghurt, as *whole fruit* or cut into small pieces in *muesli*. Nuts may be offered as a snack, in *muesli* or as a topping.

Food group milk and dairy

Milk and dairy provide calcium, high-quality protein, iodine and vitamins A, B_2 and B_{12}. Regular consumption supports bone health and is also associated with a reduced risk of colon cancer. Cheese in particular contains a lot of calcium but compared to other dairy often has a high fat content. Cheese should be offered regularly, and varieties with an *absolute fat content* of less than 30 % should be preferred.

Practical advice: The range of breakfast and snack options may be expanded to include porridge, overnight oats, *muesli* with milk or fresh fruits with yoghurt.

Food group meat, sausage, fish and eggs

Meat provides high-quality protein as well as Vitamin B_{12}, selenium and zinc, among others. In addition, it is a source of well available iron. However, meat and especially sausage also contain unfavourable ingredients. They are rich in saturated fatty acids and can affect the concentration of certain blood fats. This is why lean meat is preferable. Sausage also contains a lot of salt. People who eat a lot of *red meat* and sausage also have a higher risk of colon cancer. For *white meat*, there is no relationship to cancer according to current knowledge.

Due to their ingredients as well as the high *greenhouse gas emissions* of animal-based foods – especially products derived from ruminants like cattle, sheep and goats – they should be moderately included in the diet.

Regarding meat, *white meat* from poultry should be offered preferably, *red meat* and processed meat products should – if at all – only rarely be on offer.

Practical advice: The meat component in dishes may be reduced in favour of the vegetable component. For example, the Neuland-Verein, the animal welfare initiative "Eine Frage der Haltung" and the "Kompetenznetzwerk Nutztierhaltung" of the Federal Ministry of Food and Agriculture advocate for meat from species-appropriate animal husbandry.

Fish provides high-quality protein. Fatty fish species, which include both freshwater and saltwater fish (see box), are rich in valuable long-chain omega-3 fatty acids. Sea fish is also a good source of iodine.

Good sources for Omega-3 fatty acids:
trout, herring, salmon, mackerel

Examples for iodine-rich fish:
cod, haddock, pollock

Practical advice: Today, many fish species are overfished. When buying fish it is therefore important to look for fish from sustainable fisheries or aquacultures. The labels of the Marine Stewardship Council (MSC) and the Aquaculture Stewardship Council (ASC), for example, offer orientation.

Further information:
www.jobundfit.de
Keyword: Fisch

Eggs are a good source of protein and fat soluble vitamins. At the same time, the yolk is high in fat and cholesterol. Based on current studies, no upper limit for egg consumption can be derived. In the context of a plant-based diet, however, an unlimited amount is not recommended (see tables 2 and 3).

Food group oils and fats

Fat has twice as much energy as carbohydrates and protein, so fats and oils should be used consciously. In addition to the quantity of fat, the quality of the fat, e.g., the fatty acid composition, is of special importance for health. Fats and oils contain saturated, monounsaturated as well as essential polyunsaturated fatty acids and vitamin E.

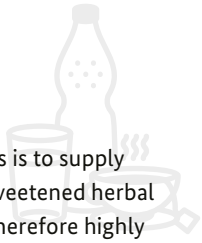
Consuming less saturated fatty acids, which are mainly found in animal-based foods, has a positive effect. Instead, more foods with unsaturated fatty acids should be used. Good sources are, e.g., vegetable oils, margarine, nuts or fatty fish. This way, the risk of cardiovascular diseases may be reduced.

The preferred oil is rapeseed oil, a perfect all-rounder. It contains the lowest proportion of saturated fatty acids and at the same time a high content of monounsaturated and polyunsaturated fatty acids as well as vitamin E. The positive ratio of omega-3 to omega-6 fatty acids should also be highlighted.

Other recommendable oils with a notable content of omega-3 fatty acids are linseed, walnut and soybean oil. Olive oil with its high content of monounsaturated fatty acids is also a good choice. Margarine made from the above-mentioned oils has a higher content of unsaturated fatty acids compared to butter and thus a better fatty acid composition. Additionally, margarine has a significantly lower impact on the environment [33, 34]. In contrast, coconut oil, palm (kernel) oil and palm (kernel) fat, as well as animal lard, contain large amounts of saturated fatty acids, which have a particularly unfavourable effect on blood lipids.

The cultivation of coconut oil, palm oil and palm fat is largely carried out in *monocultures* with significant effects on biodiversity and must therefore also be assessed as negative from an ecological perspective [35 – 37].

Practical advice: Rapeseed oil is multifunctional for cooking. It can be heated, offers neutral taste and is available everywhere. To promote flavour diversity, linseed, walnut, soy or olive oil can be used for typical dishes or even *salads*.



Food group beverages

Fluids are important. The task of beverages is to supply the body with water. Water as well as unsweetened herbal and fruit teas contain no calories and are therefore highly recommended.

The *guiding value* for the drinking amount is 1.5 litres per day for adults. In some situations, the body needs more fluid. The amount of drinking should be increased during heavy physical work, physical stress such as endurance sports, high temperatures or work in dry cold air.

Caffeinated beverages like unsweetened black or green tea and coffee are calorie-free beverages that add to the fluid balance. However, due to their caffeine content, they are not an optimal choice.

Avoiding bottled water contributes to climate protection. Tap water offers a climate-friendly and at the same time cost-saving alternative, as packaging materials and transport routes are no longer required.

Avoiding bottled water contributes to climate protection. Tap water offers a climate-friendly and at the same time cost-saving alternative, as packaging materials and transport routes are no longer required.

Practical advice: Drinking water should be placed at prominent locations in the *company restaurant*, on office floors, and during conference services. At every meal, it should be a regular part of the menu and preferably free of charge for the guests, e.g., through drinking water dispensers, water fountains or a special corner on office floors. Lemonades, cola and fruit juice drinks, fizzy beverages, nectars, fruit juices, iced teas, energy drinks and milkshakes are not suitable thirst quenchers. They contain a lot of sugar and thus provide many calories. So-called "flavoured water" may also be sweetened with sugar.

3.3 Deriving criteria for health-promoting and sustainable catering

The way recommendations for a wholesome diet translate into criteria for mass catering on a scientific basis is described below. Figure 5 illustrates this path in four steps, which are explained in more detail in the following text.

From the background ...
Basis for the derivation of criteria for health-promoting and sustainable catering, especially the food qualities and frequencies in chapter 4.1, are the scientifically based *"D-A-CH reference values for nutrient intake"* [29] and the evidence-based guidelines regarding fat and carbohydrate intake [30, 31]. The former specify amounts for the daily intake of energy and nutrients, including water and dietary fibre. These amounts are formulated for a total of 12 different age groups, each separately for both sexes. In addition, the food-related recommendations of the DGE form a basis, like the "DGE Nutrition Circle", the " The German Three-Dimensional Food Pyramid" and the "10 guidelines of the DGE for a wholesome diet".

... to theoretical derivation ...
Because of organisational and economic reasons, in mass catering it is not possible to provide meals whose energy and nutrient contents correspond to the respective age- and gender-specific reference values of the guests. Therefore, summarised values for the different living environments of mass catering were derived from the detailed *"D-A-CH reference values for nutrient intake"* [38].

For company catering, the *"D-A-CH reference values for nutrient intake* were used for the age groups 19 to under 65 years based on the *Physical Activity Level* (PAL) 1.4. Within this age group, the *guiding values* of women and men were combined, and the average value (arithmetic mean) was determined. A different approach was used for the derivation of the reference values for vitamin and

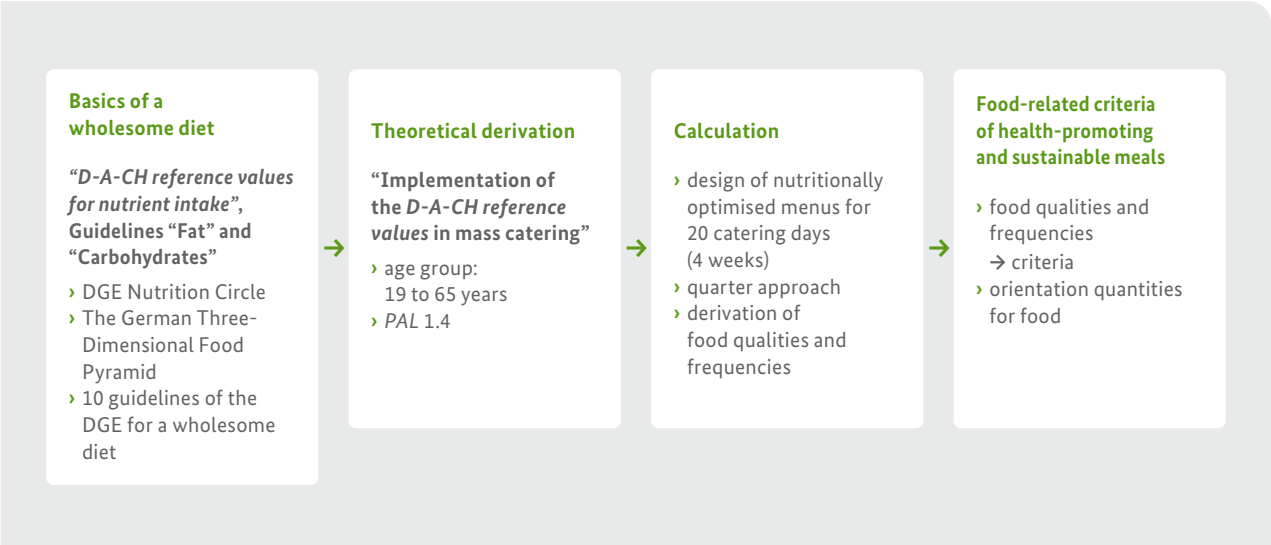


Figure 5: Path from the basics of a wholesome diet to food-related criteria for health-promoting and sustainable catering

mineral intake: If the values for men and women differed, the higher reference value was used in order to ensure a minimum intake for all.

... and calculation ...

Based on these principles, nutrient-optimised menus for both a mixed diet and *ovo-lacto-vegetarian* diet including breakfast, snacks, lunch and dinner were composed. They are exemplary for four weekly menus respectively 20 catering days and considering the usual eating habits in Germany. The following aspects were taken into account:

- reaching the derived *D-A-CH reference values* for mass catering for groups of people aged 19 to under 65 years,
- activity level (*PAL*) 1.4,
- energy is distributed to the individual meals according to the so-called "quarter approach": 25 % each to breakfast, lunch and dinner and 12.5 % of the *guiding value* for energy intake to each of the two snacks,
- corresponding food qualities (see chapter 3.2),
- "5 a day" campaign (at least three portions of vegetables and two portions of fruit),
- with 90 % of the total energy, 100 % of the recommended reference values of nutrients (vitamins and minerals) are met, so that 10 % of the total energy may be allocated to foods with low *nutrient* and high *energy density*, like chocolate, jam or potato chips.

... to food-related criteria for health-promoting and sustainable catering

Based on the nutrient-optimised menus for 20 catering days, corresponding quantities per day or per week were determined for each food group. These orientation quantities for foods create the basis for the derivation of corresponding food frequencies. Once these food quantities and frequencies are implemented in practice, and the defined food qualities are considered (see chapter 3.2), it can be expected that most likely all nutrients will cover the recommended values.

4

Designing health-promoting and sustainable meals

This chapter provides assistance in the design and implementation of health-promoting and sustainable food and beverages in *companies*. The process chain is used to illustrate a catering offer for breakfast, snacks and lunch that is tailored to the needs and requirements of employees. Optimally composed, this offers guests the opportunity to make a healthy and sustainable choice for every meal.

4.1 Planning

Planning | Purchase | Preparation | Service | Disposal & cleaning

Anyone who wants to provide a catering service must know upfront which or how many meals will be offered (see also chapter 2.1). If, for example, only lunch is delivered by a *meal provider*, the planning will differ from the planning for breakfast, snack and lunch.

Creating health-promoting and sustainable meals begins with planning. In this process step, among other things, the range of food and beverages is compiled, new recipes are developed, or existing ones are adapted, and the length of the *menu cycle* is determined. Proper planning not only affects the nutritional quality of the meals but may also contribute to reducing stocks and food waste and therefore to sustainability and economic efficiency.

Avoiding overproduction and large amounts of food waste requires the most accurate determination of guest numbers and the amount of food needed. Therefore, a well-functioning order system or a good coordination with the *company* is advantageous and requires the collection and transfer of information about absent employees, e.g. due to work shifts, home office, field work, or participation in training courses [22, 39].

Furthermore, through a targeted choice of food the menu planning influences the sustainability of the offered meals. The *greenhouse gas emissions* of dishes may vary greatly. Meals with a high proportion of plant components (e.g. vegetables, grains) generally generate fewer greenhouse gas than those with a high proportion of animal-based products (e.g. meat, cheese, butter) [24].

Further information:
www.jobundfit.de
Keyword: Nachhaltigkeit in der Gemeinschaftsverpflegung

4.1.1 Food qualities and frequencies and other aspects of menu planning

Based on the seven food groups (see chapter 3.2), the following tables 2 and 3 initially show the **optimal food choice**. This includes foods that are highly recommended because of their nutritional composition.

Table 2 supports the planning of breakfast and snacks, table 3 the planning of lunch. In this context, both a health-promoting and sustainable meal offer for the mixed diet and for an *ovo-lacto-vegetarian* diet are presented over five catering days. This way, it becomes immediately clear, which offer is possible for the individual meals.

Additionally, the tables show criteria on **how often** certain foods or food groups must be used in a period of five catering days. For the food groups that should be offered several times a day, like vegetables or grain products, the daily frequency is also shown in brackets.

Moreover, **minimum and maximum requirements** are formulated to show particularly recommendable or less recommendable foods from a nutritional and sustainable perspective. The criteria on the foods' qualities and frequencies allow a balanced and varied menu. If the criteria are consistently observed in menu planning, all nutrients are assumed to likely meet the recommended values in the sense of the "Implementation of the *D-A-CH reference values* in mass catering" [38].

By the way:
Foods not listed in the tables, like jam, honey or butter, are not included as optimal choices because of their composition.
Nevertheless, it is possible to use them.

One important parameter in the context of menu planning, purchasing and serving is the portion size of individual components. They provide orientation on how much of the food should be offered from a nutritional point of view. In both tables, **food quantities** are shown as planning orientation. The quantities are already intake quantities, e.g., peeling and cooking losses are factored in. They provide an orientation but are not a fixed parameter and must be calculated individually for each *company*. The guests' wishes in particular should be reflected. After all, a needs-based calculation is the precondition for responsible economic and ecological action.

The forth column of both tables shows the criteria for the *ovo-lacto-vegetarian* diet. In addition, the following aspects should be considered if meat and fish are not offered.

In the *ovo-lacto-vegetarian* diet, **iron** is one of the critical nutrients as the human body is able to absorb it better from animal-based than plant-based foods. Eating iron-rich plant-based foods like lentils, millet or oatmeal together with foods rich in vitamin C, citric acid (e.g., from vegetables and fruits) or lactic acid (e.g., from sauerkraut) can improve the absorption of iron. Therefore, accordingly composed dishes, like a falafel pocket with coleslaw, peppers filled with lentils, a millet casserole with fruits, and rye rolls or sourdough bread with soups or salads, should be part of the *ovo-lacto-vegetarian* menu.

Fatty fish is the main source of **long-chain omega-3 fatty acids** and therefore an important component of the mixed diet. If no fish is consumed, e.g., in an *ovo-lacto-vegetarian* diet, the human body is only able to produce these from the essential fatty acid alpha-linolenic acid to a limited extent itself. Therefore, foods with a high content of alpha-linolenic acid, like linseed oil, nuts or oilseeds, should be used more frequently. However, the consumption of fatty fish cannot be completely replaced. Nevertheless, criteria for the *ovo-lacto-vegetarian* diet are established in this DGE Quality Standard due to the increased demand to ensure the best possible offer.

Breakfast and snacks

Both breakfast and snacks contribute significantly to the daily nutrient intake. Breakfast, whether eaten at home or at work, and the mid-morning and mid-afternoon snacks should be coordinated to a large extent. Partly these meals are organised by the employees themselves or offered at the *company restaurant*. Regardless of the way breakfast and snacks are organised, the goal is to ensure an optimal offer for these meals too. To guarantee maximum flexibility due to the heterogeneous (meal) structures, these three meals (breakfast, 1st and 2nd snack) were combined in table 2.

Consequently, the orientation values for the weekly food quantities may be divided among all three meals. The weekly food frequencies are presented as a total for the three meals. To improve orientation and practicability, the daily frequencies are listed accordingly. If, for example, 10 x fruits is recommended on five days, it should be offered 2 x per day and be flexibly shared among breakfast and/or snacks.

Lunch

Lunch contributes significantly to the daily nutrient intake. Usually, the offered dishes contain several components, including a daily starch side dish, *raw vegetables*, *salad* or cooked vegetables. For a balanced company catering, the food qualities and frequencies listed in table 3 apply. The food quantities given are for **orientation**.

Breakfast and snacks

Table 2: Food qualities and frequencies for health-promoting and sustainable breakfast and snacks on five catering days

food group	food qualities – optimal choice
grain, grain products, and potatoes 	› whole-grain products › *pseudo cereals* › *muesli* without sugar or sweetener
vegetables and *salad* 	› vegetables, fresh or frozen › legumes › *salad*
fruits 	› fruits, fresh or frozen, without sugar or sweetener › nuts (unsalted) and oilseeds
milk and dairy 	› milk, plain yoghurt, buttermilk, sour milk, kefir: max. *fat content* 3,8 % › quark: max. *fat content* 5 % → each without sugar or sweetener › cheese: max. *fat content* 30 %
meat, sausage, fish[1] and eggs[2] 	› meat and cold cuts: max. 20 % fat
oils and fats 	› rapeseed oil › linseed, walnut, soybean, olive oil › margarine made from the oils mentioned
beverages 	› water › fruit and herbal tea → each without sugar or sweetener

1 Given the eating habits of German adults, fish was not included in the nutrient-optimised breakfast and snack menus.

food qualities and frequencies

orientation values for food quantities for five catering days per guest

mixed diet	*ovo-lacto-vegetarian* diet
min. 10 x (min. 2 x daily) (ca. 600 g) › thereof: min. half of the daily offer from whole-grain products	**min. 10 x (min. 2 x daily)** (ca. 600 g) › thereof: min. half of the daily offer from whole-grain products
min. 5 x (min. 1 x daily) (ca. 500 g) › thereof: min. 3 x as *raw vegetables*	**min. 5 x (min. 1 x daily)** (ca. 500 g) › thereof: min. 3 x as *raw vegetables*
10 x (2 x daily) (ca. 1,000 g) › thereof: min. 2 x as nuts or oilseeds (ca. 50 g)	**10 x (2 x daily)** (ca. 1,000 g) › thereof: min. 2 x as nuts or oilseeds (ca. 50 g)
min. 10 x (min. 2 x daily) (ca. 900 g)	**min. 10 x (min. 2 x daily)** (ca. 950 g)
max. 2 x meat/cold cuts offered (ca. 50 g)	**omitted in an *ovo-lacto-vegetarian* diet**
rapeseed oil as standard oil (ca. 60 g)	**rapeseed oil as standard oil** (ca. 60 g)
beverages are available at any time	**beverages are available at any time**

2 There is no recommendation on the number of eggs to be consumed. In the nutrient-optimised meal plans, approx. 6-12 g (mixed diet) or 6-12 g (*ovo-lacto-vegetarian* diet) of eggs per week were calculated for breakfast and snacks.

Lunch

Table 3: Food qualities and frequencies for a health-promoting and sustainable lunch on five catering days

food group	food qualities – optimal choice
grain, grain products, and potatoes 	› whole-grain products › *pseudo cereals* › potatoes, raw or *parboiled* › *parboiled rice* or brown rice
vegetables and *salad* 	› vegetables, fresh or frozen › legumes › *salad*
fruits 	› fruits, fresh or frozen, without sugar or sweetener › nuts (unsalted) and oilseeds
milk and dairy 	› milk, plain yoghurt, buttermilk, sour milk, kefir: max. *fat content* 3,8 % › quark: max. *fat content* 5 % → each without sugar or sweetener › cheese: max. *fat content* 30 %
meat, sausage, fish and eggs[3] 	› lean muscle meat
oils and fats 	› rapeseed oil › linseed, walnut, soybean, olive oil › margarine made from the oils mentioned
beverages 	› water › fruit and herbal tea → each without sugar or sweetener

3 There is no recommendation on the number of eggs to be consumed. In the nutrient-optimised meal plans, approx. 19 g (mixed diet) or 40 g (*ovo-lacto-vegetarian* diet) of eggs per week were calculated for lunch.

food qualities and frequencies

orientation values for food quantities for five catering days per guest

mixed diet	***ovo-lacto-vegetarian* diet**
5 x (1 x daily) (ca. 600 g) thereof: › min. 1 x whole-grain products › max. 1 x *potato products*	**5 x (1 x daily)** (ca. 700 g) thereof: › min. 1 x whole-grain products › max. 1 x *potato products*
5 x (1 x daily) (ca. 850 g) thereof: › min. 2 x as *raw vegetables* › min. 1 x legumes (ca. 100 g)	**5 x (1 x daily)** (ca. 1,000 g) thereof: › min. 2 x as *raw vegetables* › min. 2 x legumes (ca. 200 g)
min. 2 x (ca. 200 g) › thereof: min. 1 x as *whole fruit*	**min. 2 x** (ca. 200 g) thereof: › min. 1 x as *whole fruit* › min. 1 x nuts or oilseeds (ca. 25 g)
min. 2 x (ca. 150 g)	**min. 2 x** (ca. 200 g)
max. 2 x meat/sausage (ca. 150 g) › thereof: min. half of the offer lean muscle meat **1 x fish** (ca. 150 g) › thereof: min. 2 x fatty fish within 20 catering days	**omitted in an *ovo-lacto-vegetarian* diet**[3]
rapeseed oil as standard oil (ca. 35 g)	**rapeseed oil as standard oil** (ca. 35 g)
beverages are available at any time	**beverages are available at any time**

The selection of foods and their frequency of use listed in tables 2 and 3 provides a framework based on scientific principles. Within this framework, it is possible to design the catering offer in a varied and creative way or to optimise popular dishes. The use of whole-grain products, legumes or the offer of a popular vegetarian dish like (whole-grain) spaghetti with tomato sauce instead of a meat dish helps to improve the meals.

Optimising means: Changing a dish by substituting foods in such way that the original character still persists while the *nutrient density* increases. Optimisation can also be achieved by supplementing individual components (e.g. *salad*).

In addition to the criteria for using food qualities and frequencies in tables 2 and 3, the following additional criteria should be considered when planning a varied, health-promoting and sustainable meal offer:

☐ ***Ovo-lacto-vegetarian options* are available every day for every meal.**
Regardless of whether some of the guests follow an *ovo-lacto-vegetarian* diet, popular dishes without meat and fish are always enriching the menu. In case of an *ovo-lacto-vegetarian* diet, it must be ensured that the same variety of choices is available at all meals as with the mixed diet. Simply reducing the meat or fish components of the latter is not sufficient enough for a health-promoting and sustainable offer.

☐ ***Seasonal* and *regional* vegetables and fruits are included.**
Apart from having a positive effect on the environment, this also avoids or shortens storage times and longer transport distances. *Seasonal* products also give guests a feeling of *seasonal* orientation. Out-of-season products are transported long distances to Germany and/or produced in heated greenhouses. This costs energy and releases greenhouse gases.

☐ **Local foods are preferred in the menu.**
Vegetables and fruits from Germany and other EU countries generally have fewer pesticide residues than products from non-EU countries [40]. By using *seasonal* and *regional* food, long transport routes might be avoided, energy consumption and costs reduced, and at the same time the local economy may be supported.

☐ **Grains, grain products and potatoes are offered in varied ways.**
When planning the menu, this food group allows for variety. In addition to potatoes, pasta and rice, spelt, green spelt, bulgur and millet may also be prepared in different ways.

Further information:
www.jobundfit.de
Keyword: *Saisonale* Lebensmittel

... furthermore:

- [ ] **Deep-fried and/or breaded products are used at most 4 times in 20 catering days.**
  Deep-fried and/or breaded components like croquettes, battered vegetables, breaded schnitzels, chicken nuggets or fish fingers absorb larger amounts of fat during preparation. This category also includes dishes that are fried while floating in fat, like potato waffles or pancakes.

- [ ] **Industrially produced meat substitutes are offered for lunch no more than 4 times in 20 catering days.**
  This includes highly processed, ready-to-cook products like “sausages”, “schnitzel” or fried patties based on soy, tofu, lupine, mushrooms or milk as well as seitan. Tofu as well as pickled tofu that is not further processed does not count as an industrially produced meat substitute in this context.

- [ ] **Beverages are available at any time.**
  Water should be placed in prominent locations in the *company* and *company restaurant*, if possible free of charge. Tap water is an economic and ecological alternative.

- [ ] **The lunch *menu cycle* is repeated after four weeks at the earliest.**
  The *menu cycle* should be as long as possible to ensure variety in the menu. Within a week the same components, like potatoes or carrots, are possible, but should be prepared differently and combined with other components in a varied way.

- [ ] **The dishes are colourful, and the composition varies.**
  As early as the planning stage, a colourful composition of the dishes or components should be kept in mind.

- [ ] **Participation in meals is possible in case of food intolerances like allergies.**
  For this purpose, a special meal offer, or a selection of individual components might be provided. Further information can be found in chapter 4.6.

- [ ] **The guests’ wishes and suggestions are considered in the menu planning as far as possible.**
  Guests should be given the opportunity to express their wishes and criticism about the meals. This can take place in personal conversations, via questionnaires or the workers’ council. If wishes and suggestions may not be realised, giving an explanation is recommended (see chapter 2.4).

- [ ] **Culture-specific, *regional* and religious eating habits are taken into account in the planning.**
  If these aspects are respected, the guests may identify themselves to a certain extent through the food. Themed weeks addressing traditional food from different countries or regions, major events, special themes (European and World Championships, cultural events, *regional* events, sustainability) are particularly suitable for this purpose.

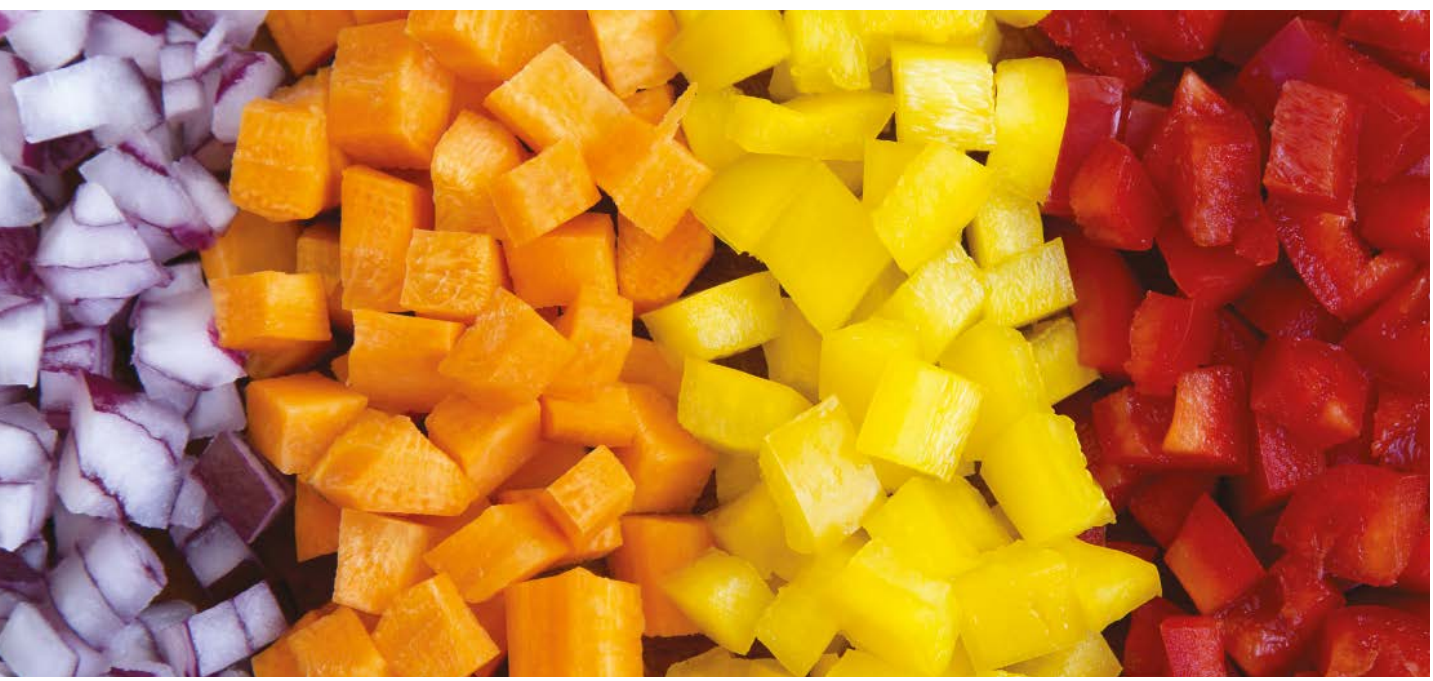
4.1.2 The use of *convenience food* in mass catering

The use of *convenience food* is common practice in mass catering. *Convenience food* is classified according to the degree of processing. The range of industrial *convenience food* extends from low to high processed: low-processed products are, e.g., pasta as dry products or pre-cut *salads*, frozen vegetables and fruits, as well as dried fruits.

Those foods that have undergone several processing steps are referred to as high processed products. They include ready-made menu components like breaded schnitzels, spring rolls, meat substitutes, classic sauces and dressings (dry or wet products) or ready-made entrées like frozen lasagna or pizzas as well as ready-made soups. Depending on the product group, they may have a high content of sugar, fat, especially unfavourable saturated fatty acids, and salt. Numerous processing steps require additional resources like energy and water. The packaging of *convenience food* also increases the amount of packaging waste.

The German Federal Ministry of Food and Agriculture initiated the "The National Reduction and Innovation Strategy: Less sugar, fats and salt in processed foods" in 2018 with the goal of reducing the content of sugar, unfavourable fats and salt as well as the energy content in processed foods. As part of the strategy, the food industry committed to reduce the sugar, fat, salt and/or calorie content in products by 2025 with the help of concrete targets [41].

Further information:
www.jobundfit.de
Keyword: Zucker, Fett, Salz



When using *convenience food* the following criteria apply:

☐ **Products without palm (kernel) fat, palm (kernel) oil or coconut fat are preferred.**
The mentioned fats contain large amounts of unfavourable fatty acids and are therefore not recommended from a nutritional perspective. If products with palm oil are used, be sure to use only those made from sustainably certified palm oil. Products with rapeseed, walnut, linseed, soybean or olive oil should be preferred.

Further information:
www.jobundfit.de
Keyword: Palmöl

☐ **Unprocessed or low-processed products like fresh or frozen vegetables and fruits, meat or fish, are preferred to be processed further on site.**
Due to the higher nutrient content, for vegetables and fruits, fresh or frozen products are preferred to canned products. From an environmental perspective, unprocessed or low-processed products are also favourable. A product consumes more resources the more processed it is.

☐ **High processed products are always combined or supplemented with low processed products/components.**
Ready-to-cook vegetable patties for example may be combined with boiled potatoes and *salad* made from *raw vegetables* with home-made dressing.

☐ **Products with a low content of sugar, fat, saturated fatty acids and/or salt and a low *energy density* are selected.**
There are significant differences in the sugar, fat, saturated fatty acid, salt and energy content of *convenience food* within the product groups. Therefore, products should be carefully chosen and those of them that are considered to be more favourable from a nutritional perspective should be preferred. Due to the differences between the various product groups, it is not possible to give generally valid recommendations for maximum contents of sugar, fat and salt. This requires an individual look at the product groups. The document “Evaluation of selected *convenience foods* in mass catering and recommendations for optimisation” provides assistance for evaluation of selected *convenience foods* [42].

4.1.3 Menu

Similar to the way a business card contains all important information about a person, the menu should do the same: It is source of information for guests and represents the kitchen's flagship. Legal aspects must be considered when designing the menu. Chapter 6 provides background information.

When designing and providing the menu, the following criteria apply:

☐ **The current menu is in advance accessible on a regular and barrier-free basis.**
The menu is available in advance (e.g., on display or online) so that guests are regularly informed about the meals and can compare them with their meals at home.

☐ **Allergens are labelled or information is provided verbally.**
Allergens must be labelled in accordance with the national Food Information Implementing Regulation (Lebensmittelinformations-Durchführungsverordnung, [LMIDV]) (see chapters 4.6 and 6). Allergen labelling requires preparation according to a fixed recipe with regularly updated product specifications.

Further information:
www.jobundfit.de
Keyword: Kennzeichnung

☐ **Information is provided on food additives that require labelling.**
Which additives have to be labelled is defined EU-wide by Regulation (EC) No 1333/2008 and nationally for loose food in the Regulation on food additives (Lebensmittelzusatzstoff-Durchführungsverordnung [LMZDV]) (see chapter 6).

☐ **Food is named clearly.**
When using non-standard or ambiguous names, e.g., fantasy names like "Viking pan", non-German language indications like "Ratatouille" as well as general names like "vegetable stew" guests can only assume which dishes or components are meant. Therefore, it is important that the main ingredients of the dish are indicated on the menu. This also applies to classic garnishes like "Gardener's style" or "Hunter's style".

☐ **For meat, sausages and fish, the animal species is named.**
It is easier to choose when the animal species is known. This may also be important for religious reasons.

☐ **If nutritional values are declared, the legal requirements are observed.**
Die Kennzeichnung von Nährwerten auf dem Speiseplan ist freiwillig. Sollen die Nährwerte deklariert werden, sind dabei die Vorgaben der Lebensmittelinformationsverordnung (LMIV) zu beachten (siehe Kapitel 6).

☐ **Wenn Preise ausgewiesen werden, so sind diese eindeutig und übersichtlich dargestellt.**
The declaration of nutritional values on the menu is voluntary. If the nutritional values are declared, the requirements of the Regulation on the provision of food information to consumers (Lebensmittelinformationsverordnung, [LMIV]) must be observed (see chapter 6).

... furthermore:

- ☐ **If prices are mentioned, they are displayed clearly and transparently.**
  Prices on the menu are generally voluntary. If prices are mentioned, they should be clearly linked to the dishes or components. It should be instantly obvious whether the price refers to a portion or 100 g.

- ☐ **The menu is tailored to the particular target group.**
  When designing the menu, ensure that the font is large enough.

- ☐ **Several menu lines are clearly presented, and the health-promoting and sustainable meal is particularly highlighted.**
  It is easier to choose if the health-promoting meal is at the top of the menu and highlighted in colour or with a symbol. In this context the use of *nudging* techniques may be considered (see chapter 5.3).

4.2 Purchase

Planning | **Purchase** | Preparation | Service | Disposal & cleaning

In addition to the planning of food and beverages, purchasing also has a significant influence on nutritional and sustainable aspects.

For purchases the following criteria apply:

- ☐ **Organic food is used.**
  Organic food contains few pollutants and residues. In addition, in terms of environmental protection and *resource conservation organic farming* has a number of advantages compared to conventional farming. Examples include soil and water protection through avoiding synthetic chemical fertilisers, reduced use of antibiotics in animal husbandry, less pollution of the environment with pesticides and therefore positive effects on biodiversity [40, 44].

The guideline "On the way to more sustainability in company catering" a publication of the project "NACHHALTIG B|UND GESUND" shows ways to increase the organic share in mass catering even with a fixed and limited budget [45].

Further information:
www.jobundfit.de
Keyword: Ökologisch erzeugte Lebensmittel

... furthermore:

☐ **Fair trade products are used.**
Purchasing fair trade food like nuts or bananas contributes to securing a fair income for people in producing countries as well as providing better working and living conditions. This applies as well to direct purchasing agreements with producers.

☐ **Fish is purchased from sustainable fisheries.**
The Marine Stewardship Council and Aquaculture Stewardship Council labels, as well as organic labels like Bioland or Naturland, provide orientation when purchasing fish.

Further information:
www.jobundfit.de
Keywords: Fisch and Nachhaltigkeit

☐ **Meat from species-appropriate animal husbandry is offered.**
Species-appropriate animal husbandry is promoted, for example, by the Neuland-Verein or the animal welfare initiative “Eine Frage der Haltung” of the Federal Ministry of Food and Agriculture. If it is not possible to purchase only meat from species-appropriate animal husbandry for economic reasons, e.g. the offer may be limited to individual dishes.

Further information:
www.jobundfit.de
Keyword: Nachhaltigkeit

☐ **Environmentally friendly packaging is preferred for all foods.**
In order to contribute to the reduction of packaging waste, food in disposable packaging should be avoided and instead reusable packaging in bulk containers preferred. When purchasing it is recommended to look for recyclable, mono-material packaging.

☐ **The first-in-first-out principle is applied.**
Food that has a shorter shelf life or was stored first should be consumed first. This helps to use food before it spoils and contributes to wasting less food.

4.3 Preparation

Planning | Purchase | **Preparation** | Service | Disposal & cleaning

Apart from the food choice, the way meals are prepared and the time they are kept warm have an impact on the nutritional and sensory quality. Selecting and using kitchen equipment in a thoughtful way might also contribute to a higher level of sustainability.

The following criteria to the preparation of food apply:

☐ **Recipes, if required with preparation instructions, are used.**
With recipes, consistent food quality is ensured, even with staff turnover. They simplify the preparation process and provide a reliable basis for calculating products as well as for a functioning allergen management. Proven and optimised recipes additionally help avoiding food waste.

Recipes and menus are available at www.jobundfit.de category Rezepte

☐ **Sugar is used sparingly.**
Sugar-sweetened foods and beverages increase the risk of caries, overweight and *obesity* as well as secondary diseases like type 2 diabetes mellitus. The addition of sugar and alternative sweeteners like honey or fruit syrups should therefore be kept to a minimum. To get used to a less sweet taste, a gradual reduction in recipes is recommended. Instead of sugar, the sweetness from fresh or frozen fruits is often sufficient enough.

☐ **Fat is used consciously.**
Due to its high energy content and differences in composition, fat and high-fat foods should be used consciously, e.g., in moderate amounts and preferably in the form of high-quality vegetable oils. Dairy with a high fat content, like high-fat cheeses, crème fraiche, sour cream or sweet cream, should only be used in low quantities when preparing dishes like casseroles, dressings, sauces or desserts.

Further information:
www.jobundfit.de
Keyword: Zucker, Fett, Salz

☐ **Iodised salt is used, it is salted sparingly.**
Too much salt in food increases the risk of high blood pressure and thus cardiovascular diseases. The guidance level for table salt intake for adults is 6 g per day [46]. Foods like bread, sausage and cheese already contain larger amounts of salt, so there is only a small amount left to add. In order to promote the acceptance of low salt foods, the addition of salt may be reduced slowly and gradually, and more herbs and spices may be used instead.

... furthermore:

☐ **Herbs (fresh, frozen, dried) and spices are used in a variety of ways.**
Herbs and spices don't simply help to save salt, they may also create a greater variety of flavours.

☐ **Nutrient-preserving and low-fat cooking methods are used.**
In addition to appearance, taste and consistency, the cooking method also influences the nutritional quality of the food. To keep losses of vitamins and minerals to a minimum, vegetables and potatoes should be cooked without or with little fat and water by sautéing, steaming, or grilling.

When preparing meat, sautéing, roasting, stewing, grilling and low-temperature cooking in little fat are among the low-fat cooking methods. For fish, these are steaming, sautéing, grilling and short frying in low fat.

☐ **Cooking periods are kept as long as necessary and as short as possible.**
Extended cooking results in unnecessary vitamin losses and additional energy consumption, while appearance, taste and texture of the food also suffer. If vegetables and fruits are pureed afterwards, a short cooking period is also sufficient.

☐ **Keeping heated food warm for a maximum of three hours.**
The longer the food is kept warm, the more heat-sensitive vitamins are lost, and the food appearance, taste and consistency suffer. Keeping food warm for a longer period of time also consumes additional energy. According to DIN 10508:2019-03 [47] and the "Hygiene rules in the catering sector" of the Federal Institute for Agriculture and Food and the Federal Institute for Risk Assessment [48] the warm-keeping period, e.g. the time between the end of the cooking process and serving of the meal to the last guest, should be maximum three hours long. If a three hour warm-keeping period is not feasible, the food must be cooled down immediately after preparation and regenerated in batches before serving, according to DIN 10536:2016-03 [49].

☐ **The warm-keeping temperature of heated food is at least 65 °C.**
To protect food from spoiling and minimise the risk of foodborne infection or poisoning, the minimum temperature for keeping food warm is 65 °C according to DIN 10508:2019-03. This applies to storage as well as to transport and serving [47].

Further information:
www.jobundfit.de
Keyword: Warmhalten und Regenerieren

☐ **Chilled food is stored at a maximum of 7 °C.**
Chilled foods like *salads* or desserts can also spoil easily. Therefore the Federal Institute for Agriculture and Food and the Federal Institute for Risk Assessment [48] recommend a maximum storage, transport and serving temperature of 7 °C, similar to the DIN standard [47]. Until serving, chilled food should be cooled accordingly and consumed immediately after serving.

... furthermore:

- ☐ **Resource-efficient kitchen appliances are used.**
  Kitchen appliances differ widely in their energy and water consumption. Gas and induction appliances are usually very efficient. The size of the appliances should be chosen according to the amount of food to be prepared. Too large appliances consume unnecessary energy and water. In addition, for energy-intensive processes like (deep) cooling or dishwashing, the use of energy-efficient appliances is advisable. Replacing old models with new ones can amortise in a relatively short time [22].

- ☐ **Appliances are only turned on during operating times.**
  Appliances should not be operated longer than necessary in order to save energy. For this purpose, the power-on times of all kitchen appliances can be compared with the actual needed times of use and adjusted accordingly [50]. In addition, in energy-intensive processes like (deep) freezing or dishwashing, it is important to ensure efficient utilisation of the appliances. Switching off (deep) freezing units during breaks or the efficient loading of dishwashers are some ways to save energy [22].

4.4 Service

Planning | Purchase | Preparation | **Service** | Disposal & cleaning

Catering does not end at the kitchen door – only when the meal is handed over it reaches the guest. Thereby, the presentation of the food components, no matter whether it takes place in the kitchen or later by the serving staff, as well as the sensory quality of the meal are of great importance for the meal to be accepted. The service at the food counter is an important interface between kitchen and guests. Here they receive their food, have the opportunity to give feedback and express wishes about what is being offered or portion sizes. In turn, this is helpful and important information for the kitchen.

This chapter provides criteria about how to design the serving situation, e.g. by presenting the food in an appealing way on the plate or at the buffet. The above-mentioned warm-keeping periods and temperatures also play an important role at the food counter. In addition, communication with the guests in the sense of health-promoting and sustainable meals may contribute significantly to an appropriate choice.

The following criteria are to be considered for service at the food counter:

- ☐ **Proper timing between kitchen and serving is realised.**
  Good organisation or regeneration of food in batches, for example, allow for short warm-keeping periods. This also helps to avoid food waste.

- ☐ **Serving staff is informed in detail about the current menu.**
  This includes information about the meal components, portion size or number of pieces and which components may be exchanged. Practically a short consultation between kitchen and serving staff is beneficial. This way, the serving staff keeps track, respond to the guests' wishes and order additional components if necessary. Ladle plans and portioning aids support the serving of calculated quantities.

- ☐ **Guests are given opportunities to influence portion sizes.**
  Enabling guests to express their wishes about portion sizes has a positive effect on food returns. Regularly comparing the served with the calculated quantities helps to plan them accurately.

- ☐ **Guests are given friendly advice when ordering and choosing food. The principle of *nudging* is considered.**
  Health-promoting and sustainable food options are communicated positively at the time of serving. Guests receive assistance and the opportunity to give feedback. This includes an attractive presentation of all food, where cleanliness and quick refills of food and beverages are standard. Further *nudging* aspects are explained in chapter 5.3.

... furthermore:

- ☐ **Questions about a wholesome diet and food intolerances are answered.**
  At least one responsible person is appointed for answering to detailed questions about the dishes. Basically, the offer of health-promoting and sustainable meals should be known and supported throughout the team.

  This implies a positive attitude of the staff towards the food served to the guests. All serving staff should be trained and able to provide information. Further aspects on this topic are explained in chapter 4.6.1 and chapter 6.

4.5 Disposal and cleaning

Planning | Purchase | Preparation | Service | **Disposal & cleaning**

After serving food and beverages, it is worth looking at the non-regenerated components, the returned food from the food counter and the food waste generated in the dish-washing room. As far as possible, the returns per component should be measured over a period of time. The results help to reflect on and, if necessary, adjust the menu planning, the procedure and organisation of ordering, purchasing, production, *nudging* techniques, the presentation of the meals as well as their calculated quantities. All these are starting points to avoid overproduction and food waste.

While non-regenerated components can be re-integrated into the menu the following day as long as maintaining the cold chain, returned food from the food counter or dishwashing room have to be discarded. The resource-saving handling of food and the avoidance of food waste is an important aspect of calculation, menu planning and final disposal and should also be included in the *catering concept*.

Measuring food waste is a simple method to identify potential savings. It is worth making the (alleged) effort, as measuring offers the possibility of saving costs for purchase, disposal and unnecessary labour!

In order to raise guest's awareness on this topic, waste prevention strategies are important. This may result in activities like the introduction of a waste barometer or a guest survey on portion sizes. In addition, for interpreting the returned food, good communication between service and guests or kitchen staff is of great importance. In the kitchen, there is often a lack of information about the causes of leftovers. Was the portion size not appropriate? Did individual components not taste good? Was the meal-time too short? By systematically collecting this information and passing it on to the kitchen or the caterer, they are able to react accordingly to the food returns.

Further information:
www.jobundfit.de
Keyword: Lebensmittelabfälle vermeiden

The following criteria apply to the disposal of waste:

- ☐ **Returned dishes are recorded separately by meal and component and the outcomes are used for future menu planning.**
  Are the portion sizes calculated correctly? Which dishes are less popular and cause larger quantities of returns? Controlling the returned food provides a basis for optimising menu planning, preparation and presentation.

- ☐ **Unavoidable waste is made available for energy utilization.**
  Organic waste and leftovers may be used to produce heat and electricity in biogas facilities, and used fat to produce biodiesel. Today, a number of *companies* have specialised in the collection and sustainable utilisation of such residues.

When cleaning the food counter and kitchen area as well as the storage rooms, there must be a defined cleaning plan and, if applicable, a corresponding disinfection plan. The plans contain information on the cleaning agents and disinfectants to be used, as well as their usage and dosage.

The following criteria for cleaning and disinfection apply:

☐ **Attention is paid to the use of environmentally friendly cleaning agents.**
Large quantities of cleaning agents are used in kitchens every day to clean surfaces, dishes and laundry. After use, they are discarded as wastewater. Depending on the ingredients, they can be hazardous to the environment and health. Therefore, environmentally compatible cleaning agents are preferable, for example those labelled with the EU Ecolabel and/or "Blue Angel". If the cleaning agents contain palm (kernel) oil-based tensides, sustainably certified palm oil should be used.

☐ **Dosage aids are used.**
Besides the cleaning agents' ingredients, it is also important to know how much detergent to use. Dosing aids help to ensure that not more cleaning agent than necessary is used. This protects the environment and reduces costs at the same time.

☐ **Hygiene requirements are observed.**
The principles of good hygiene practice and the *"Hazard Analysis and Critical Control Points"* concept (HACCP concept) must be strictly observed. Excellent hygiene practices and compliance with relevant laws and standards ensure the health of staff and guests (see chapter 6).

Further information:
www.jobundfit.de
Keyword: Hygiene

4.6 Together and yet individual

The question that often arises in everyday contact with guests is how much individuality might be allowed in mass catering. The employee structure is very heterogeneous, and it is not possible to accommodate all needs and wishes. The requirements and expectations on the *company restaurant* are constantly changing. They become more and more restaurant-oriented with guests seeking individualised dishes. Special diets or food intolerances, including allergies, require a detailed look at individual needs. *Company restaurant* is often faced with the challenge of how to deal with this aspect in the daily routine.

4.6.1 Food intolerances like allergies

Often, employees with very different food intolerances such as allergies work in a *company*. But how can those responsible for *company restaurant* deal with the challenge? The primary goal should be that those affected are able to participate at mealtime without restriction as far as possible. This might be achieved by:

- a special dish, for example, a low-allergen basic dish, which can be individualised in simple steps, or
- a choice of individual components.

To plan accordingly, it is advisable to conduct a survey on food intolerances in the entire *company*. Only if those responsible know which intolerances are more prevalent in the *company* they can react accordingly.

Allergen labelling for unpackaged food (see chapter 6) is mandatory since the end of 2014 [51]. Information about the 14 main allergens may be provided either written or verbally. If written information is given, it must be easily visible, explicit and readable.

Written information is possible:

- **on menus or list of beverages**
- **on price lists**
- **in a separate allergen menu**
- **on a sign attached to or near the food**
- **through a notice in the place of sale**
- **through electronic media provided by the supplier which are directly and easily accessible**

For verbal information, the following conditions apply:

- prior to purchase or serving of the meal, the notice that verbal information is provided and that written documentation on allergens is available upon request must be clearly visible,
- a properly instructed serving or kitchen staff member must be available during all opening hours,
- written documentation must be easily accessible to guests and food control authorities (register, information sheet).

This simplifies implementation and creates transparency and safety for those concerned.

Further information:
www.jobundfit.de
Keywords: Kennzeichnung and Lebensmittelunverträglichkeiten

4.6.2 Snacks

In company catering, the focus shifts from lunch to numerous small meals [52]. Therefore, the offered breakfast and snacks should be expanded according to the target group and the general conditions in the *company*. Table 2 and Table 3 regarding food qualities and frequencies provide guidance so that breakfast and snacks might also be designed in a health-promoting and sustainable way. The offer in vending machines may also be adapted accordingly. Wholesome alternatives such as unsalted nuts, trail mix, yoghurt with fruit, sugar-free *muesli*, or *raw vegetables* may replace sweets and fatty snacks. Criteria are provided in Table 2, chapter 4.1.1. In principle, a snack may consist of cold and hot meals as well as beverages. “Food to go” or “hand-held food” are particularly popular at the office and with a targeted food selection these meals may also be designed in a health-promoting and sustainable way. However, an increased amount of packaging must be taken into account with this form of meal presentation. Meetings and conferences with external participants should also be monitored.

In order to minimise the use of limited resources and the amount of waste produced in the form of packaging and food waste, the following principle applies: avoid → reduce → recycle

A snack offer is primarily addressed to guests who either eat a warm supper and therefore do not want to eat much for lunch, but also to guests who prefer an uncomplicated meal. Snacks may be included in the menu as a supplement to the classic lunch offer, the plate dish. Snacks should also be consumable on site.

The sale of unpackaged meals and food is recommended, as well as the use of reusable packaging. This helps to reduce packaging waste and is part of a sustainable diet.

5 Beyond the plate

In *Corporate Health Management*, a wholesome company catering offer is an important element of the nutrition component. The acceptance of the meal offer depends not only on what but also on how and where it is presented and how the respective information is communicated. The design of the *catering gastronomy* and break periods are also crucial.

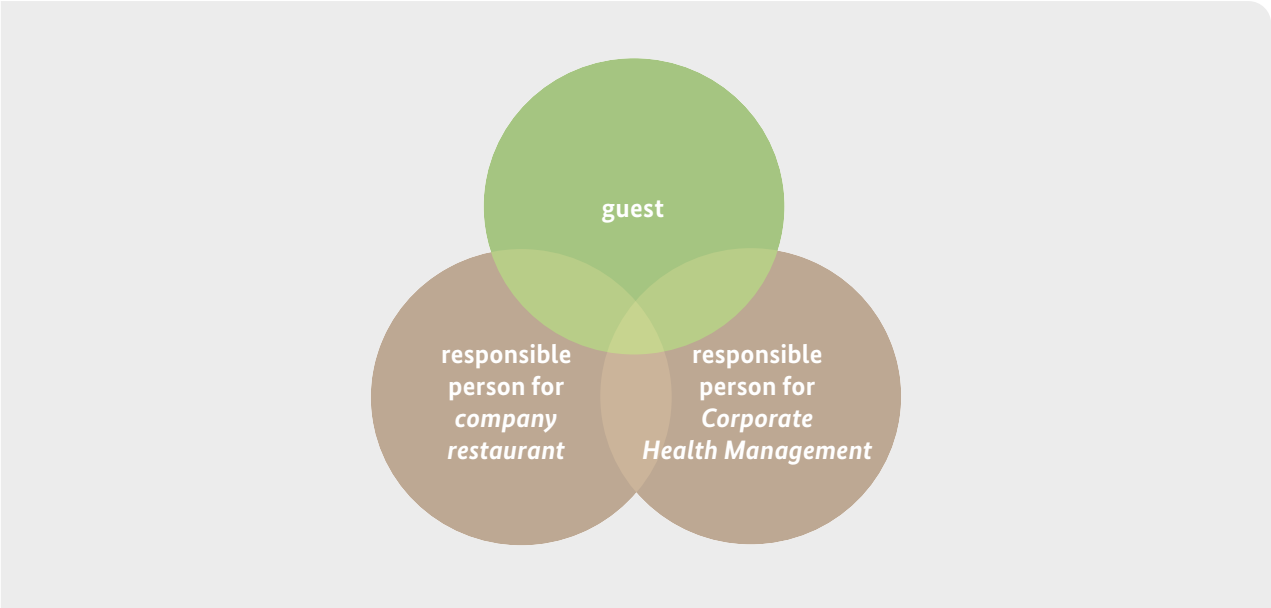


Figure 6: Interfaces for exchange and collaboration in guest communication

5.1 Importance of guest communication

In addition to the design of the meals, guest communication plays a central role. The guest is supported in his or her choice by appropriate information and thus receives assistance in choosing wholesome alternatives.

For coordinated communication, those responsible for *company restaurant* work closely together with those responsible for *Corporate Health Management*. It is important to highlight the additional benefits of the wholesome offer with suitable information. For example, a campaign week with the topic "A healthy heart" might be supplemented with additional nutritional information and suitable dishes. When preparing information, upcoming promotions are complemented with short nutritional statements. This is challenging due to the heterogeneous guest structure and the fact that the same guests need to be motivated every day. By using different methods and communication channels, a large number of guests can be reached.

Further information:
www.jobundfit.de
Keyword: *Betriebliches Gesundheitsmanagement*

5.2 Prepare and distribute information

Communication channels are diverse and result from the existing conditions in the *company*. Information about company catering should also be posted on the intranet or distributed via the *company* mailing list. This way, those who regularly, sporadically or not at all visit the company catering are reached.

Corporate Health Management campaigns and health days are further ways of attracting new customers and arousing interest.

A change in communication channels and methods makes it possible to address and reach guests on different levels. The spectrum of topics ranges from the composition of the dishes to their effect on health and environment. Social media and apps provide additional information, for example background information on preparation, origin of the food ingredients, sustainability aspects, a recipe picture or quotes. Guests may also exchange information with

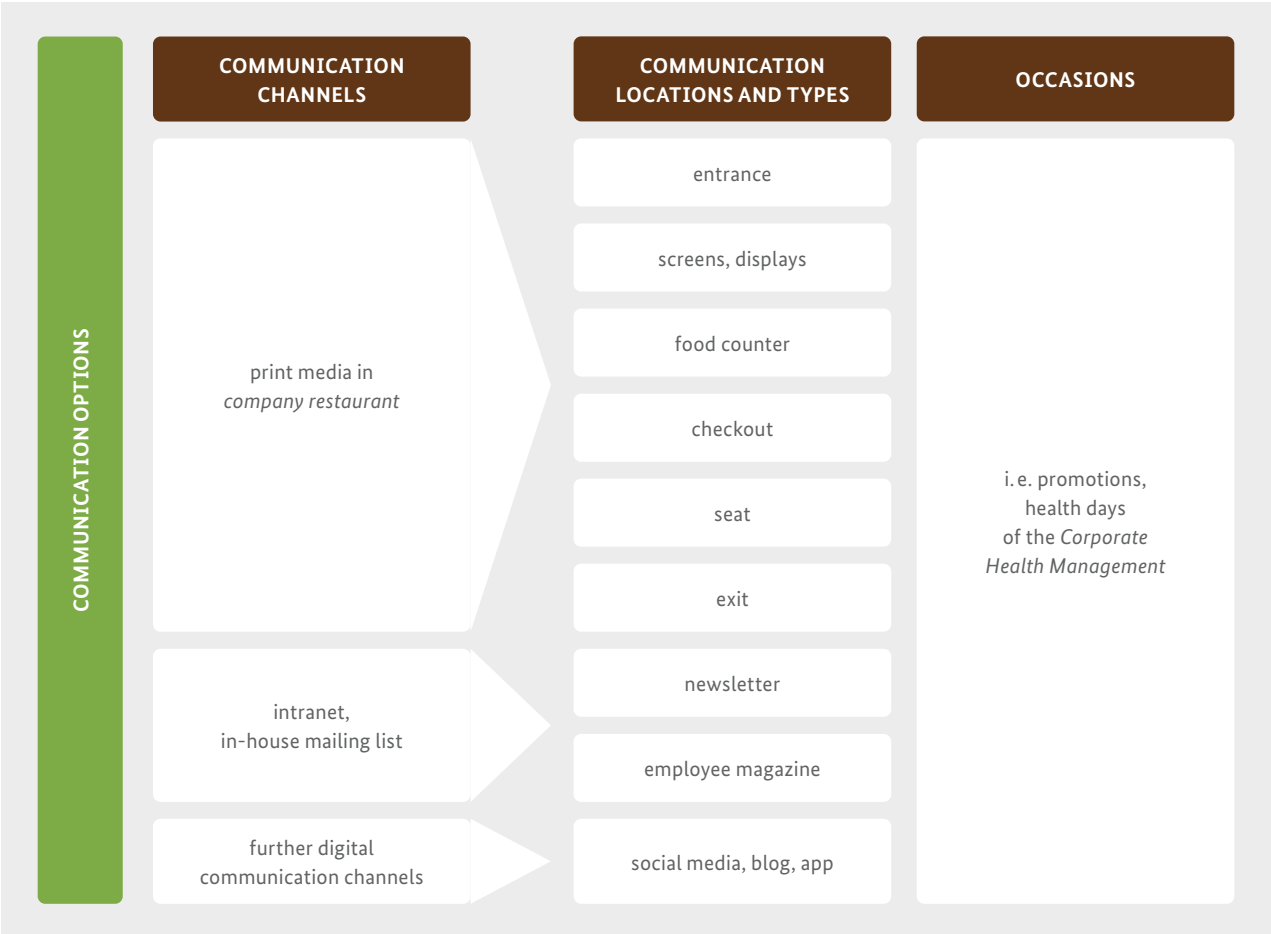


Figure 7: The diversity of communication types and locations

each other via social media platforms and apps. Here, it is possible to draw on what is already used in the *company* or by employees. Images and interactions may encourage employees to explore food from other perspectives as well as change their eating habits.

Once the channels for guest communication are identified, it is important to find suitable information carriers or to complement existing ones in such way that, if necessary, different target groups are addressed appropriately.

Responsible persons from *Corporate Health Management*, from the supplier base or local nutritionists are able to contribute important stimuli.

Further information:
www.jobundfit.de
Keyword: zertifizierte Ernährungsberater*innen

These criteria apply to the planning and preparation of information:

- ☐ **Additional information for guests is provided.**
  Regular coordination with *Corporate Health Management* takes place and additional information for guest communication is prepared. Coordination and a survey on the success of the various activities take place regularly at defined intervals.

- ☐ **Communication channels are identified, and different concepts are used.**
  Several communication channels and methods are used. Various information carriers which are didactically and methodically diversified are used in the design and presentation of information.

5.3 *Nudging*

Eating habits are not only the result of conscious and reflected decisions, but often also a consequence of existing offers, habits and unaware influences at that particular moment [14, 53, 54].

Therefore, what, how much and how guests eat something also depends on the very specific design of the dining environment. For example, the placement or visual highlighting of choices, as well as the size and shape of the dishes, might encourage more balanced food choices and enjoyment. Changes of the dining environment that make healthy and balanced choices "easier" are often referred to as ***"nudging"***. In this context it is important that there is still a choice, but the healthy and balanced choice is made more accessible and attractive through, e.g., placement, options, descriptions and presentation. Banning or reducing prices is therefore not a nudge. Several *nudging* techniques have proven to be effective and often do not require much effort or cost. To achieve wider acceptance, all stakeholders should support the measures. The appropriate and feasible approach on site depends on the general conditions of the respective *company*.

Basically, different types of nudges with proven effectiveness through scientific studies can be distinguished [55–62]:

› **Cognitive nudges: attention and thinking**
These draw the guests' attention to the more balanced option and reduce the exposure of the less balanced option.

One of these are guiding labels. Such labelling provides information on classification and evaluation, for example through symbols or colour coding. However, improving visibility also falls into this category. The health-promoting and sustainable option is positioned in a way that is more visible, e.g. by presenting it directly at eye-level, putting it in the middle of the shelf or on top of the menu.

› **Emotional nudges: wishes and preferences**
These make the more balanced option more attractive and interesting.

Through direct interaction or signs, guests are prompted and encouraged to make a balanced choice. A short and friendly reminder right before the choice or purchase might influence the decision positively. To do this, the serving staff might ask specific questions, like: "Would you like some fruits with your dessert?" Descriptions, pictures or the form of presentation highlight the positive taste experience of the more balanced option and emphasise how it feels to eat it. Lighting and arrangement may also make the meals more attractive. Sample pictures or plates might illustrate the offer.

COGNITIVE NUDGES
attention and thinking

- signs, flags, stickers
- traffic lights
- coloured tableware
- placed on top of the menu
- eye-level of the guests
- multiple placement
- extra distributing area

EMOTIONAL NUDGES
wishes and preferences

- verbal request: would you like more vegetables?
- attractive pictures in serving area and break room
- appealing arrangement
- illumination or lighting
- sample plate
- attractive combination
- attractive name for the dish
- attractive tableware
- appealing decoration
- subconscious recommendations (e.g. funny slogans)

BEHAVIOURAL NUDGES
enabling behaviour

- wholesome components as "standard"
- variety of options and servings (e.g. different *whole fruits*, pre-cut and/or ready-to-eat)
- to-go-option
- samples
- dishes in different shapes and sizes
- *salad* bar easily accessible in entrance hall
- use of counters with the highest sales figures
- use of waiting areas (e.g. checkout, in front of counter)
- use the entrance area of the food counter
- reach hight of guests
- free choice of components

Figure 8: Different types of nudges with examples

› **Behavioural nudges: enabling habits**
These simplify the more balanced choice and habits.

The more balanced option is more easily accessible and conveniently placed or it becomes the "standard" by offering it first. For example, health-promoting sides may be the dishes' "standard", fruits are offered pre-cut and ready-to-eat for easier handling, or the *salad* bar in the entrance hall of the food counter makes the choice more convenient. Shape and size of tableware and cutlery as well as serving and portion sizes set the "standard" for the "regular" amount of food to be eaten. The larger it is by default, the larger the amount of food consumption or leftovers. For example, portions on smaller plates are perceived as larger. The choice for more balanced options increases when vegetables and fruits are offered in different options and forms of presentation or as a to-go option at the checkout. Additional "samples" may reduce the inhibition threshold towards new options.

Goals of *nudging* measures in company catering might be:

- imporve guests' water intake,
- reduce consumption of sugar sweetened beverages,
- increase consumption of health-promoting and sustainable foods like vegetables, *salad*, legumes, whole-grain products and/or fruits; and
- reduce intake of certain foods like meat and meat products or sugary and fatty dishes.

Further information:
www.jobundfit.de
Keyword: *Nudging*

5.4 Design of the break period and the dining room

The design of the *company restaurant*, especially the dining room, also influences whether the employees use and accept the company catering. The *company restaurant* is a central, everyday meeting point and a place of communication for the guests. Sharing a meal together is an important way to "slow down" and "set the pace" of the working day.

A modern dining room is bright, friendly and inviting. Flooring, ceiling panelling and furniture absorb noise and allow chairs to be moved silently. Flexible multifunctional elements for room separation offer the possibility for a group to withdraw, e.g. for conversation, or for the room to be used multifunctionally. The air system in the serving area should be controlled according to the DIN standard (DIN EN 16282, VDI 2052) so that no food odour can be perceived in the dining room.

Especially in smaller *companies*, it is advisable to physically connect the kitchen and the serving area. In this way, the individual areas for lunch, breakfast, snack and activities may be connected for optimal staff and space utilisation. The processes and routes are planned better, and it is possible to react flexible to changing conditions. Likewise, multi-use options for the rooms of the *company restaurant* should be considered (for conferences, meetings, mobile workplaces, etc.). A professional planner should always

be consulted for the planning and design of the serving area and the dining room. In this way, the combination of ambience and functionality is already realised during the planning phase.

In addition to the atmosphere in the dining room, the break periods play an important role. Staggered breaks allow peak times to be equalised and to respond to the general conditions in the *company*, such as shift work. To avoid peak times, other possibilities are webcams that allow a view into the restaurant via the intranet (in compliance with data protection laws), or price scales starting at a certain time of day.

The following criterion applies:

☐ **When designing the dining room, a bright, friendly and inviting ambience is considered.**
The design of the *company restaurant* and the dining room is modern, bright, friendly and inviting. Floor covering, ceiling panelling and furniture absorb noise and allow chairs to be moved without making a sound.

6

Legal requirements for catering

Companies offering catering services must observe a wide range of legal requirements. Food and hygiene law is of central significance, with the primary goals of food safety, protection against misleading and fraud, as well as the provision of information to consumers and guests. More than 200 European and national legal norms regulate how these goals are to be achieved. Not every food business operator needs to know about all of them in detail. However, in terms of the duty of care under food law, he/she must know and comply with all responsibilities relevant to his/her food business activity. He/she is also obliged to keep up to date with any changes in the law.

6.1 Food law key regulations

Key regulation of the food law is the Regulation (EC) No 178/2002 laying down the general principles and requirements of food law (Lebensmittel-Basisverordnung, [LM-BasisVO]). Like all EU regulations, it applies directly in all EU member states and fundamentally regulates how the protection of health and the prevention of fraudulent or deceptive practices is to be guaranteed at all stages of the process ("from farm to fork"). It includes a number of general principles, like food safety, transparency or the principle of public information, risk management and traceability. Another general principle is the responsibility of the food business duty of care, which includes the principle of staged responsibility: Each food business operator is responsible for what happens in his/her own, controllable field. His/her primary responsibility ends when other business operators influence the food, e.g., at the beginning of the next *value chain* level. If, for example, frozen vegetables are delivered to a mass catering facility for further processing, the kitchen management can generally assume that the goods are safe. However, they must always fulfil their own duties of care under food law by, for example, checking the temperature and packaging when receiving the goods, complying with the temperature specifications during storage and further processing, and defining and implementing criteria for selecting suppliers.

In addition to Regulation (EC) No 178/2002 in Germany, the Food and Feed Act (Lebensmittel- und Futtermittelgesetzbuch, [LFBG]) applies as well, containing detailed regulations. These are, for example, requirements for monitoring, penalties and fines as well as regulations for public information.

Another key regulation is Regulation (EU) No 1169/2011 on the provision of food information to consumers (Lebensmittelinformationsverordnung, [LMIV]). It contains basic requirements for mass catering, e.g., for nutrition and allergen declaration. This is specified and complemented by the national Food Information Implementing Regulation (Lebensmittelinformations-Durchführungsverordnung, [LMIDV]). This regulation stipulates, for example, that foodstuffs marketed in Germany must generally be labelled in German and how allergen labelling must be carried out for not pre-packaged goods. Table 4 provides an overview of selected legal regulations and interpretation aids for mass catering.

Table 4: Selected legal regulations and interpretation aids for mass catering

topic	law and regulations	
	EU level	**national level**
basic regulations	› Regulation (EC) No 178/2002 laying down the general principles and requirements of food law (Lebensmittel-Basisverordnung [LM-BasisVO])	› Food and Feed Act (Lebensmittel- und Futtermittelgesetzbuch [LFGB])
hygiene and infection control	› Regulation (EC) No 852/2004 on the hygiene of foodstuffs › Regulation (EC) No 853/2004 laying down specific rules on the hygiene of food of animal origin	› Food Hygiene Ordinance (Lebensmittelhygiene-Verordnung [LMHV]) › Animal Food Hygiene Ordinance (Tierische Lebensmittelhygiene-Verordnung [Tier-LMHV]) › Regulation on the monitoring of zoonoses and zoonotic agents (Zoonose-Überwachungs-verordnung [ZoonLMÜV])
		› Infection Protection Act (Infektionsschutzgesetz [IfSG])
official monitoring	› Commission Delegated Regulation (EC) No 2019/624 concerning specific rules for the performance of official controls on the production of meat and for production and relaying areas of live bivalve molluscs › Regulation (EC) No 2019/627 laying down uniform practical arrangements for the performance of official controls on products of animal origin intended for human consumption › Regulation (EU) No 2017/625 on official controls and other official activities	
labelling and consumer information	› Regulation (EU) No 1169/2011 – on the provision of food information to consumers (Lebensmittel-informationsverordnung [LMIV]) › Regulation (EU) No 1924/2006 on nutrition and health claims made in foods (Health-Claims-Verordnung [HCVO]) › Regulation (EU) 2018/848 on organic production and labelling of organic products › Regulation (EC) No 1333/2008 on food additives	› Food Information Implementing Regulation [LMIDV] › Regulation on food additives (Lebensmittelzusatz-stoff-Durchführungsverordnung [LMZDV]) › In the case of organic claims: e.g. Organic Farming Act (Ökolandbaugesetz [ÖLG])

	legally non-binding aids for practical implementation
	› EU-Commission guidelines on the application of Art. 11, 12, 16, 17, 18, 19 and 20 Regulation (EC) No 178/2002 (Dec. 2004)
	› "Good Hygiene Practice Guidelines" » Guideline on good food hygiene practice in social facilities, 2nd edition (expected 7/2022) » Guideline on good food hygiene practice in daycare facilities (2014) › DIN-Standards on Food Hygiene » 10506: Food hygiene – Mass catering » 10508: Food hygiene – Temperature requirements for foodstuffs » 10514: Food hygiene – Hygiene training » 10516: Food hygiene – Cleaning and disinfection » 10524: Food hygiene – Work wear in food business » 10526: Food hygiene – Retained samples in mass catering » 10536: Food hygiene – Cook & chill method – hygiene requirements › Publications of the Federal Institute for Risk Assessment » Safe food: Especially Vulnerable Groups in communal facilities, 2017 › Publication of the Federal Institute for Risk Assessment in cooperation with the Federal Office of Agriculture and Food » Hygiene rules in the Catering Sector, 2020 › Announcement of the EU-Commission regarding HACCP (ABl. EU Nr. 278/1, July, 30th 2016)
	› EU-Commission Communication: Questions and Answers on the LMIV (ABl. EU C 196 v. 6.8.2018, p. 1 ff.) › Designations: » German Food Code

From legal obligation to practical implementation

Laws and regulations regulate a large number of legally binding matters for an undefined group of people. For example, food law applies to all food business operators – regardless of whether they only offer sandwiches or a comprehensive hot lunch, whether the food is served with the intention of making a profit or not, whether the facility is privately or publicly run or whether it is a small daycare centre for children or a large catering company. Therefore, it is sometimes difficult for food business operators to know how to implement the generally applicable legal obligations in relation to their individual field. Guidance is provided by various legally non-binding publications, like the technical standards of the German Institute for Standardisation (Deutsches Institut für Normung e. V., [DIN]) that accompany the law, statements and recommendations by authorities like the Federal Institute for Risk Assessment or the sector-specific "Guidelines for Good Hygiene Practice", some of which have been reviewed by competent authorities. In addition, the EU Commission sometimes publishes legally non-binding guidelines to contribute to the EU-wide harmonised application of EU law.

6.2 Hygiene and infection control

A comprehensive hygiene management is obligatory in every food business. The requirements that food business operators must fulfil are essentially derived from two European regulations and the national regulations that supplement them:

› **Regulation (EC) No 852/2004 on the hygiene on foodstuff:** The hygiene in food businesses must meet a high standard in order to fulfil the principle of ensuring optimal product safety. For this purpose, the business hygiene management must put a so-called basic hygiene concept in place, which is supplemented by a mandatory *"Hazard Analysis and Critical Control Points"* concept (HACCP concept). Annex II of the regulation specifies this requirement. A company-specific approach is necessary. In other words, in order to comply with its hygienic duty of care, each *company* must implement all those specifications or requirements that are necessary for the individual conditions on site, e.g. those concerning the receipt of goods, the floors or windows within the business facilities, as well as those for the storage rooms. Interpretation aids for the practical implementation of Annex II are provided by sector-specific "Guides for good hygiene practice" and the relevant DIN standards, like DIN 10506:2018-07: Food hygiene – Mass catering, DIN 10508:2019-03: Food hygiene – Temperature requirements for foodstuffs.

› **Regulation (EC) No 853/2004 laying down specific hygiene rules for food of animal origin:** The regulation complements Regulation (EC) No 852/2004 with regard to the processing of food of animal origin. Excluded from its scope are foods that contain both ingredients of plant origin and processed products of animal origin, for example salami pizza or breaded schnitzel. Of particular practical importance for mass catering establishments are the storage temperatures for certain foods regulated in the annexes to Regulation (EC) No 853/2004 (see DIN 10508:2019-03), as well as the mandatory EU approval stipulated in Article 4 (§ 2d), as long as the conditions specified are met by the respective *company*.

The EU Regulation is supplemented by the national Animal Food Hygiene Ordinance [Tier-LMHV], which, among other things, addresses the special requirements for the provision of raw egg-containing food in mass catering in § 20a.

In addition to these two key regulations, there are other European and national hygiene regulations that contain obligations for food business operators (see table 4).

Good hygiene practice

According to EU law, food business operators must establish their hygiene management with regard to the basic principles of good hygiene practice. Compliance with these principles ensures basic hygiene in the *company*. Elements of good hygiene practice are in particular

- guarantee of adequate constructional facilities,
- equipment and transport hygiene,
- hygienic handling of foodstuffs,
- personal hygiene,
- cleaning and disinfection,
- storage and pest management, and
- waste management.

Guidance on how these aspects should be implemented into practice is provided in particular by the sector-specific "Guidelines for good hygiene practice", e.g., by the German Hotel and Restaurant Association [DEHOGA].

Obligatory self-monitoring according to *"Hazard Analysis and Critical Control Points"* principles

In addition to good hygiene practice, food business operators must introduce, apply and maintain a documented self-checking system in their business in accordance with the *"Hazard Analysis and Critical Control Points"* principles (see Regulation [EC] No 852/2004 Article 5). This is based on the general hygiene policy of the business. The aim of such a self-checking system is to identify and evaluate possible health hazards already during food production and to minimise or eliminate them by taking appropriate precautions. If, for example, cooling temperatures are set for certain foods and checked as scheduled, health risks can already be prevented when deviations occur during the production process, thereby increasing the safety of the end product. The official food control checks the *"Hazard Analysis and Critical Control Point"* system, including associated documentation, as part of their control activities [63].

Training obligation

All employees who produce, handle or distribute food or dishes to guests must be regularly trained in food hygiene matters (see Regulation [EC] No 852/2004, annex II, chapter XII in combination with the Food Hygiene Ordinance [LMHV]) § 4). This regulation also applies to persons who, for example, only serve food to guests. Annex 1 of the Food Hygiene Ordinance [LMHV] and DIN 10514:2009-05: Food hygiene – Hygiene training provides good orientation on essential requirements for this training. The latter also contains special content requirements for the instruction of persons who are responsible for the development and application of the *"Hazard Analysis and Critical Control Point"* concept. In terms of good hygiene practice, employees should be trained at least once a year. The standard also recommends a success assessment and documentation.

Instruction obligation

According to § 43 of the Infection Protection Act [IfSG], there is also an obligation to instruct all persons who produce, handle or place food on the market or hand it out to guests. This regulation also applies – similarly to the obligation to train – to all persons who come into contact in any way with the food to be served. The aim is to teach staff about specific rights and obligations in connection with infection protection, including existing prohibitions on work and employment in accordance with § 42 of the Infection Protection Act. The reason for this is that it strengthens the employee's personal responsibility. The local health department is usually responsible for the initial instruction and the corresponding certificate. At the time of starting work, the employee's certificate must not be older than three months. Subsequent instruction is required when the employee starts to work and every two years thereafter. This can be done by the employer.

Further information:
www.jobundfit.de
Keyword: Hygiene

6.3 Labelling and public information

In mass catering, meals are usually offered unpackaged. Mandatory information for guests is therefore only provided regarding allergen and additive labelling.

Otherwise, the following applies: information and names must be accurate and may not mislead consumers. Names on the menu, for example, must correspond to the legitimate consumer expectation. In some cases, there are legally prescribed designations, like what may or may not be named as "cheese". In other cases, the general public perception must be determined. The "German Food Code", as a kind of anticipated expert opinion describes what is generally to be expected from a product e.g. named as "rye bread" or "milk ice cream".

In some cases, special regulations apply. For example, anyone who wants to label their food as "organic" or "eco" must comply with the relevant European and national regulations on food from *organic farming* [64].

Obligatory allergen information

The entire menu must indicate whether one or more of the 14 most important substances or products causing allergies or intolerances in the European population are contained in a meal component. This obligation results from the Regulation on the provision of food information to consumers ([LMIV], see Article 9, Paragraph 1c) or the Food Information Implementing Regulation (LMIDV), which provides concrete specifications for the practical realisation of allergen information. Annex II of the Regulation on the provision of food information to consumers determines which ingredients must be labelled.

In mass catering – similar to the entire gastronomy sector – information on allergens may be provided on menus and beverage menus or in price lists. Footnotes may be used as well – similar to the labelling of additives – as long as they are clearly referred to in the name of the food or dish. Caution must be taken to ensure that this designation does not cause confusion with the additives. Another – equally important – possibility is verbal information. For this purpose, it must be indicated on the menu, on the corresponding displays or other notices clearly visible to the guests

The 14 foods or food groups (main allergens) are:

- **cereals containing gluten**
- **crustaceans**
- **eggs**
- **fish**
- **peanuts**
- **soybeans**
- **milk**
- **nuts**
- **celery**
- **mustard**
- **sesame seeds**
- **sulphur dioxide and sulphites**
- **lupin**
- **molluscs**

that they may ask the service or counter staff for information on the allergens. The precondition for the verbal information is a written documentation of all dishes with the respective allergens contained, which the guests may examine if requested, as well as a training of the staff [64].

Exact specifications for these trainings are currently not available. In this context, it is recommended to develop and implement an allergen management as part of the hygiene management. It not only provides safety for the staff, but also trust for the guests.

Labelling of additives

According to § 5 of the Regulation on food additives [LMZDV], additives of certain categories must be labelled when offering loose goods. In contrast to pre-packaged goods, the additive itself does not have to be named, but its functional category is sufficient, e.g. “with preservative” or “with colouring”. Brief information via footnotes in the menu, price list or via a notice is permitted [64].

Nutrition declaration

Nutrition declaration is not obligatory for loose goods – in contrast to pre–packaged goods. Those who voluntarily wish to provide information on nutritional values, need to comply with the requirements of Art. 30 (5) of the Regulation on the provision of food information to consumers.

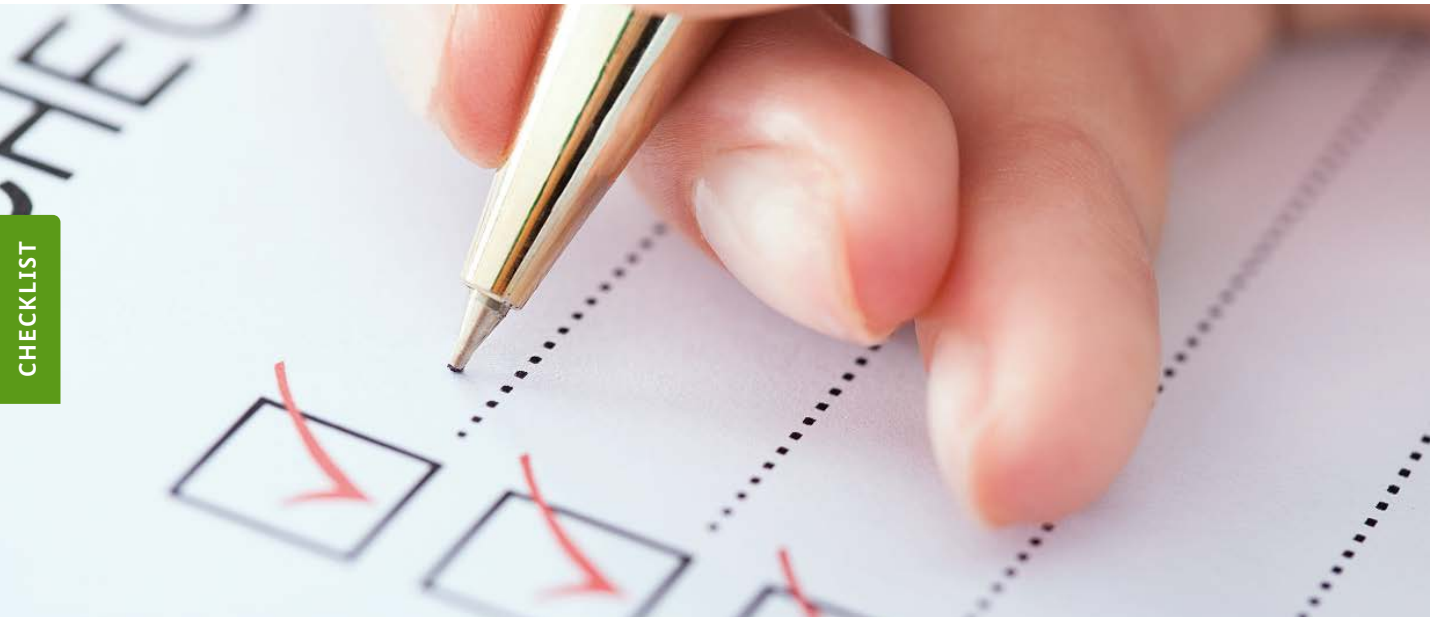
According to this, either

- only the energy value (in kcal and kJ) or
- the energy value and the amounts of fat, saturated fatty acids, sugar and salt,

each per 100 grams or 100 millilitres are listed. Moreover, it is permitted to refer the information to a portion, as long as it is clearly quantified [64].

Nutrition claims like “low-fat” or “rich in vitamin C” are regulated separately. They are only permitted if the requirements of Regulation (EC) No 1924/2006 on nutrition and health claims in foods [HCVO] are met [64].

Further information:
www.jobundfit.de
Keyword: Kennzeichnung



Checklist

The following checklist provides an overview of all criteria of this DGE Quality Standard. It enables *companies* and *meal providers* to independently review their current catering situation and, if necessary, identify potential for improvement. Thus, it might be the starting point for planning appropriate steps and supporting them on the way to more catering quality (see chapter 2). The criteria are listed along the individual chapters of the DGE Quality Standard. For explanations of the criteria, see the respective chapter.

DEVELOPMENT OF QUALITY COMPANY CATERING	not fulfilled	partially fulfilled	fulfilled
A *catering concept* exists.	☐	☐	☐
All *stakeholders* are involved.	☐	☐	☐
A catering commissioner exists.	☐	☐	☐
Catering staff receive continuous training.	☐	☐	☐
Ergonomic workplaces and workflows are in place.	☐	☐	☐
Employees are valued.	☐	☐	☐

DESIGN OF HEALTH-PROMOTING AND SUSTAINABLE MEALS

	not fulfilled	partially fulfilled	fulfilled
Planning · Purchase · Preparation · Service · Disposal & cleaning			
Food qualities and frequencies for BREAKFAST and SNACKS, MIXED DIET 5 catering days			
grain, grain products, potatoes **min. 10 x (min. 2 x daily)** whole-grain products, *pseudicereals*, *muesli* without sugar or sweeteners	☐	☐	☐
thereof: min. half of the daily offer from whole-grain products	☐	☐	☐
vegetables and *salad* **min. 5 x (min. 1 x daily)** vegetables (fresh or frozen), legumes, *salad*	☐	☐	☐
thereof: min. 3 x as *raw vegetables*	☐	☐	☐
fruits **10 x (2 x daily)** fruits (fresh or frozen); without sugar or sweeteners nuts (unsalted) or oil seeds	☐	☐	☐
thereof: min. 2 x as nuts (unsalted) or oil seeds	☐	☐	☐
milk and dairy **min. 10 x (min. 2 x daily) based on the following specifications** milk, plain yoghurt, buttermilk, sour milk, kefir: max. fat content 3,8 % quark: max. *fat content* 5 % → each without sugar or sweeteners cheese: max. *fat content* 30 %	☐	☐	☐
meat, sausage, fish, eggs **max. 2 x meat / cold cuts offered** meat and cold cuts as bread topping: max. *fat content* 20 %	☐	☐	☐
oils and fats **rapeseed oil is standard oil** rapeseed-, walnut-, linseed-, soybean-, olive oil, margarine made from the oils mentioned	☐	☐	☐
beverages are available **at any time** water, fruit and herbal tea → each without sugar or sweeteners	☐	☐	☐

	not fulfilled	partially fulfilled	fulfilled
Food qualities and frequencies for BREAKFAST and SNACKS, *OVO-LACTO-VEGETARIAN* DIET, 5 catering days			
grain, grain products, potatoes **min. 10 x (min. 2 x daily)** whole-grain products, *pseudocereals*, *muesli* without sugar or sweeteners	☐	☐	☐
thereof: min. half of the daily offer from whole-grain products	☐	☐	☐
vegetables and *salad* **min. 5 x (min. 1 x daily)** vegetables (fresh or frozen), legumes, *salad*	☐	☐	☐
thereof: min. 3 x as *raw vegetables*	☐	☐	☐
fruits **10 x (2 x daily)** fruits (fresh or frozen); without sugar or sweeteners nuts (unsalted) or oil seeds	☐	☐	☐
thereof: min. 2 x as nuts (unsalted) or oil seeds	☐	☐	☐
milk and dairy **min. 10 x (min. 2 x daily) based on the following specifications** milk, plain yoghurt, buttermilk, sour milk, kefir: max. *fat content* 3,8 % quark: max. *fat content* 5 % → each without sugar or sweetener cheese: max. *fat content* 30 %	☐	☐	☐
oils and fats **rapeseed oil is a standard oil** rapeseed-, walnut-, linseed-, soybean-, olive oil, margarine made from the oils mentioned	☐	☐	☐
beverages are available **at any time** water, fruit and herbal tea → each without sugar or sweeteners	☐	☐	☐

	not fulfilled	partially fulfilled	fulfilled
Food qualities and frequencies for LUNCH, MIXED DIET, 5 catering days			
grain, grain products, potatoes **5 x (1 x daily)** whole-grain products, *pseudocereals, potatoes (raw or precooked)* *parboiled* rice or brown rice	☐	☐	☐
thereof: min. 1 x per week whole-grain products	☐	☐	☐
max. 1 x *potato products*	☐	☐	☐
vegetables and *salad* **5 x (1 x daily)** vegetables (fresh or frozen), legumes, *salad*	☐	☐	☐
thereof: min. 2 x as *raw vegetables*	☐	☐	☐
min. 1 x legumes	☐	☐	☐
fruits **min. 2 x** fruits (fresh or frozen); without sugar or sweeteners nuts (unsalted) or oil seeds	☐	☐	☐
thereof: min. 1 x as *whole fruit*	☐	☐	☐
milk and dairy **min. 2 x, based on the following specifications** milk, plain yoghurt, buttermilk, sour milk, kefir: max. *fat content* 3,8 % quark: max. *fat content* 5 % → each without sugar or sweetener cheese: max. *fat content* 30 %	☐	☐	☐
meat, sausage, fish, eggs **max. 2 x meat / sausage products** lean muscle meat	☐	☐	☐
thereof: min. half of the offer lean muscle meat	☐	☐	☐
1 x fish	☐	☐	☐
thereof: min. 2 x fatty fish within 20 catering days	☐	☐	☐
oils and fats **rapeseed oil is a standard oil** rapeseed-, walnut-, linseed-, soybean-, olive oil, margarine made from the oils mentioned	☐	☐	☐
beverages are available **at any time** water, fruit and herbal tea → each without sugar or sweeteners	☐	☐	☐

	not fulfilled	partially fulfilled	fulfilled
Food qualities and frequencies for LUNCH, *OVO-LACTO-VEGETARIAN* DIET, 5 catering days			
grain, grain products, potatoes **5 x (1 x daily)** whole-grain products, *pseudocereals, potatoes (raw or precooked)* *parboiled* rice or brown rice	☐	☐	☐
thereof: min. 1 x per week whole-grain products	☐	☐	☐
max. 1 x *potato products*	☐	☐	☐
vegetables and *salad* **5 x (1 x daily)** vegetables (fresh or frozen), legumes, *salad*	☐	☐	☐
thereof: min. 2 x as *raw vegetables*	☐	☐	☐
min. 2 x legumes	☐	☐	☐
fruits **min. 2 x** fruits (fresh or frozen); without sugar or sweeteners nuts (unsalted) or oil seeds	☐	☐	☐
thereof: min. 1 x as *whole fruit*	☐	☐	☐
min. 1 x as nuts (unsalted) or oil seeds	☐	☐	☐
milk and dairy **min. 2 x, based on the following specifications** milk, plain yoghurt, buttermilk, sour milk, kefir: max. *fat content* 3,8 % quark: max. *fat content* 5 % → each without sugar or sweeteners cheese: max. *fat content* 30 %	☐	☐	☐
oils and fats **rapeseed oil is a standard oil** rapeseed-, walnut-, linseed-, soybean-, olive oil, margarine made from the oils mentioned	☐	☐	☐
beverages are available **at any time** water, fruit and herbal tea → each without sugar or sweeteners	☐	☐	☐

	not fulfilled	partially fulfilled	fulfilled
Additional criteria for menu planning			
Ovo-lacto-vegetarian options are available every day for every meal.			
Seasonal and *regional* vegetables and fruits are included.			
Local foods are preferred in the menu.			
Grains, grain products and potatoes are offered in varied ways.			
Deep-fried and/or breaded products are used at most 4 times in 20 catering days.			
Industrially produced meat substitutes are offered for lunch no more than 4 times in 20 catering days.			
Beverages are available at any time.			
The lunch *menu cycle* is repeated after four weeks at the earliest.			
The dishes are colourful and the composition varies.			
Participation in meals is possible in case of food intolerances like allergies.			
The guests' wishes and suggestions are considered in the menu planning as far as possible.			
Culture-specific, *regional* and religious eating habits are taken into account in planning.			
Criteria for the use of *convenience food* in mass catering			
Products without palm (kernel) fat, palm (kernel) oil or coconut fat are preferred			
Unprocessed or low processed products, like fresh or frozen vegetables and fruits, meat or fish, are preferred for further processing on site.			
High processed products are always combined or complemented with low processed products/components.			
Products with a low content of sugar, fat, saturated fat and / or salt and a low *energy density* are selected.			

	not fulfilled	partially fulfilled	fulfilled
Menu criteria			
The current menu is accessible in advance on a regular and barrier-free basis.			
Allergens are labelled or information is provided verbally.			
Information is provided on food additives that require labelling.			
Food is named clearly.			
For meat, sausages and fish, the animal species is named.			
If the nutritional values are declared, the legal requirements are observed.			
If prices are mentioned, they are displayed explicitly and transparently.			
The menu is tailored to the particular target group.			
Several menu lines are clearly presented, and the health-promoting and sustainable meal is particularly highlighted.			

Planning › **Purchase** › Preparation › Service › Disposal & cleaning

Organic food is used.			
Fair Trade products are used.			
Fish is purchased from sustainable fisheries.			
Meat from species-appropriate animal husbandry is offered.			
Environmentally friendly packaging is preferred for all foods.			
The first-in-first-out principle is applied.			

	not fulfilled	partially fulfilled	fulfilled
Planning · Purchase · **Preparation** · Service · Disposal & cleaning			
Recipes, if required with preparation instructions, are used.	☐	☐	☐
Fat is used consciously.	☐	☐	☐
Sugar is used sparingly.	☐	☐	☐
Iodised salt is used, it is salted sparingly.	☐	☐	☐
Herbs (fresh, frozen, dried) and spices are used in a variety of ways.	☐	☐	☐
Nutrient-preserving and low-fat cooking methods are used.	☐	☐	☐
Cooking periods are kept as long as necessary and as short as possible.	☐	☐	☐
Keeping heated food warm for a maximum of three hours.	☐	☐	☐
The warm-keeping temperature of heated food is at least 65 °C.	☐	☐	☐
Chilled food is stored at a maximum of 7 °C.	☐	☐	☐
Resource-efficient kitchen appliances are used.	☐	☐	☐
Appliances are only turned on during operating times.	☐	☐	☐
Planning · Purchase · Preparation · **Service** · Disposal & cleaning			
Proper timing between kitchen and serving is realised.	☐	☐	☐
Serving staff is informed in detail about the current menu.	☐	☐	☐
Guests are given opportunities to influence portion sizes.	☐	☐	☐
Guests are given friendly advice when ordering and choosing food. The principle of *nudging* is considered.	☐	☐	☐
Questions about a wholesome diet and food intolerances are answered.	☐	☐	☐

	not fulfilled	partially fulfilled	fulfilled
Planning › Purchase › Preparation › Service › **Disposal & cleaning**			
Returned dishes are recorded separately by meal and component and the outcomes are used for future menu planning.	☐	☐	☐
Unavoidable waste is recycled for energy utilization.	☐	☐	☐
Attention is paid to the use of environmentally friendly cleaning agents.	☐	☐	☐
Dosing aids are used.	☐	☐	☐
Hygiene requirements are observed.	☐	☐	☐

Beyond the plate

Additional information for guests is provided.	☐	☐	☐
Communication channels are identified, and different concepts are used.	☐	☐	☐
When designing the dining room, a bright, friendly and inviting ambience is considered.	☐	☐	☐

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Glossary

Body-Mass-Index (BMI): BMI (kg/m^2) is a parameter used to classify body weight into underweight, normal body weight and overweight. It is calculated by dividing the body weight [kg] by the squared body height [m^2] [65].

Catering Concept: A catering concept is a written document with criteria for company catering. It describes who, when, where, how and what meals must be provided. A catering concept is usually individually designed for the company and describes its self-conception regarding eating and drinking.

Company: The term is used synonymously with enterprise or business or facility.

Company restaurant: The term company restaurant is used as a synonym for company canteen.

Convenience food: The meaning of "convenience" is comfort or ease. In the context of food, this describes a product that is industrially pre-processed to safe kitchen time. Consequently, convenience food has a higher degree of processing than raw foods.

Corporate Health Management: The term Corporate Health Management covers all activities to maintain and promote the health of employees. This includes obligatory measures for occupational health and safety, reintegration into the workplace and voluntary offers for corporate health promotion [66].

CO_2 equivalents: In addition to CO_2 other greenhouse gases (e.g. methane or nitrous oxide) have an impact on global warming. Their climate impact can be converted into the equivalent amount of CO_2 and thus offers the advantage of a standardised indicator of *greenhouse gas emissions*.

D-A-CH reference values for nutrient intake: The D-A-CH reference values for nutrient intake specify quantities for the daily intake of energy and nutrients, including water and dietary fibre. They are published by the German Nutrition Society (DGE) together with the nutrition societies of Austria and Switzerland.

Energy density: The energy density of food is defined as the amount of energy (in kcal or kJ) per unit mass (g or 100 g). The energy density is affected, among other things, by water and fat content (9 kcal/g), and to a lesser extent by the carbohydrate (4 kcal/g) or protein content (4 kcal/g). Thus, foods with low energy density are often characterised by a high water and dietary fibre content compared to those with high energy density.

Erosion: The natural process whereby fertile soil on the earth's surface is eroded by wind and water. The process can also be triggered or intensified by agricultural use of soil [67].

Fat content (absolute; cheese): This declaration refers to the actual fat content of the ripened cheese, whereas the usual commercial information refers to the fat content in the dry matter. The absolute fat content is expressed in g/100 g of food. This information is part of the nutrition declaration.

Greenhouse gas emissions: The most relevant greenhouse gases are water vapour (H_2O), carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) und ozone (O_3). Greenhouse gas emissions are the emissions of these gases into the earth's atmosphere. Greenhouse gas emissions can be used, for example, as a measure of the climate impact of a product and are usually expressed in *CO_2 equivalents*.

Guiding values: Guiding values are stated in terms of aids for orientation and are given for nutrients that are not essential for the organism. In addition, guiding values are given if there is a need, but it varies widely depending on numerous influences (e.g. energy requirements depending on lifestyle, occupation, etc.). Preventive effects of these nutrients are factored in when deriving guiding values.

Hazard Analysis and Critical Control Points (HACCP): This concept aims to carry out a hazard analysis and control of critical control points in food handling.

Meal provider: Meal provider is used as an generic term for all food service providers who offer food and/or beverage services in *companies*.

Menu Cycle: The menu cycle refers to the period of time after which the lunch meals sequence is repeated.

Monocultures: Monocultures are a form of agricultural land use where only one type of crop is grown on the same area for several years. In the long run, this can reduce the nutrient content of the soil and require the frequent use of pesticides or artificial fertilisers [69].

Muesli: Muesli consists of one or more cereals without added sugar or other sweeteners. These cereals might be processed in different ways, like crushed, ground or extruded. Other ingredients may include milk, natural yoghurt, quark, fruits (fresh or frozen), nuts or oilseeds.

Nudging: Nudges are those environmental aspects that regularly and predictably influence decisions without prescribing or prohibiting certain courses of action through regulations and laws or through setting economic incentives that are relevant to decisions [70].

Nutrient density: Nutrient density describes the amount of a nutrient in a food per unit of energy (e.g. mg/kcal); "nutrient-dense" foods are foods that are both low in energy and high in nutrients.

Obesity: Obesity refers to the accumulation of body fat that exceeds the normal level. It is diagnosed using the *body mass index (BMI)* [65].

Operations manager: The operations manager is the manager of the catering sector. The operations manager is usually employed by a caterer.

Organic Farming: Organic farming is a particularly sustainable form of farming. Therefore, the use of food from organic production is recommended. The promotion of an organic offer in mass catering requires participation in the control programme according to the EU-Regulation on Organic Production (EG-Öko-Verordnung).

Ovo-lacto-vegetarian: The ovo-lacto-vegetarian diet combines plant foods with only those products of animal origin that come from living animals, e.g. milk, eggs or honey. The vegetarian diet basically excludes foods from slaughtered animals, e.g. meat and meat products, fish as well as slaughter fats.

Parboiled: Parboiling is a technical process for treatment of rice or other grains. During this process, vitamins and minerals are pressed out of the outer layers into the grain. Parboiled varieties are therefore nutritionally more valuable than polished varieties.

Physical Activity Level (PAL): The average daily energy need for the physical activity as a multiple of the basal metabolic rate. It is therefore a parameter that is included in the calculation of the *guiding value* for energy intake. PAL levels are derived for different occupational and leisure activities. Depending on the physical activity, the *guiding value* for energy intake can vary accordingly. A PAL of 1.4, which corresponds to a low level of physical activity, was used as a basis for the design of the nutritionally optimised menu plan [29].

Potato Products: These are processed products made from potatoes. Included are french fries, instant potato, mashed potato, potato dumpling, pre-shaped potato dough, fried potato and potato snack products [68].

Protein quality: The protein quality or biological value captures how dietary protein can be incorporated into the proteins of the organism's body. The protein's amino acid pattern and its digestibility are crucial factors. The protein quality is often indicated relatively by comparison with a reference protein (egg's protein or cow's milk casein) [71].

Pseudocereals: These are grains that do not belong to the botanical group of sweet grasses like wheat and rye, but visually resemble them. They include quinoa, amaranth and buckwheat. Due to their nutrient composition, pseudocereals are good supplements to the food group grains and make an important contribution to the nutrient requirement.

Raw vegetables: Raw vegetables refer to raw, unheated vegetables or lettuce, with or without dressing.

Red meat: Refers to meat from pigs, cattle, sheep and goats.

Regional: A region is an area that forms a geographical, political, economic and/or administrative unit. The food producer is free to choose the region's label, but it must be clearly comprehensible for consumers. This can be done by political-administrative borders (counties, administrative districts, federal states), by a kilometre radius around a place to be defined, by indicating metropolitan regions (e.g. southern Germany) or defined regions (e.g. Altes Land, Rhineland, Hessische Bergstraße) [72].

Resource conservation: Natural resources, like soil, air or water, should be considered as components of nature. In this context, resource protection is the totality of all actions to preserve or restore natural resources [73].

Salad: Salad includes all leafy salads or preparations containing vegetables and/or lettuce as the main ingredient.

Seasonal: If vegetables and fruits growing open-field in classical agriculture are harvested and sold during the harvest period, e.g. the most profitable time, they are referred to as seasonal foods.

Value chain: This is an accumulation of activities through which a product is designed, manufactured, distributed, delivered and supported.

White meat: The term refers to poultry meat.

Whole fruit: Whole fruit is raw, unprocessed fruit, whole or cut into pieces ready for consumption, without the addition of other foods.

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IN FORM is German's national initiative to promote healthy diets and physical activity. It was initiated 2008 by the Federal Ministry of Food and Agriculture (Bundesministerium für Ernährung und Landwirtschaft [BMEL]) and the Federal Ministry of Health (Bundesministerium für Gesundheit [BMG]) and has since been active nationwide with project partners in every living environment. Aim is to permanently improve people's dietary and exercise habits. Further information is available at **www.in-form.de**.