IN FORM
Deutschlands Initiative für gesunde Ernährung
und mehr Bewegung

JOB&FIT
Mit Genuss zum Erfolg!

DGE-Quality Standard for Meals in Companies, Public Authorities and Universities

www.in-form.de | www.jobundfit.de

JOB&FIT
Mit Genuss zum Erfolg!

DGE-Quality Standard for Meals in Companies, Public Authorities and Universities

6th Edition

The photos shown in this DGE-Quality Standard are for illustrative purposes only. As they are not relevant to the comprehensibility of the content, they have not been provided with alternative texts for the (accessible) PDF.

Table of contents

Message from the Federal Ministry of Food and Agriculture 6
Preface 7

1 Background, Goal and Design 8

1.1 Catering for employees and students: An opportunity for more health and sustainability 9
1.2 Who is the DGE-Quality Standard addressed to? 11
1.3 What is the goal of the DGE-Quality Standard? 11
1.4 How is the DGE-Quality Standard structured? 13
1.5 What to keep in mind when reading? 13

2 Developing quality catering for employees and students 14

2.1 Quality of catering for employees and students 15
2.2 Interface management 18
2.3 Staff qualification 20
2.4 Feedback management 21
2.5 External quality control 23
2.6 Specification for tenders 23

3 Principles of health-promoting and sustainable meals 24

3.1 Importance of health-promoting and sustainable meals 25
3.2 Food groups – the basis for the optimal choice 30
3.3 Deriving criteria for a health-promoting and sustainable catering 34

4 Designing health-promoting and sustainable meals 36

4.1 Planning 37
4.1.1 Catering services and their characteristics 38
4.1.2 Food qualities and frequencies as well as other aspects of menu planning 40
4.1.3 The use of *processed food (convenience food)* in mass catering 50
4.1.4 Menu 52
4.2 Purchase 53
4.3 Preparation 55
4.4 Service 58
4.5 Disposal and cleaning 59
4.6 Together and yet individual 61
4.6.1 Food intolerances like allergies 61
4.6.2 Snacks 62

5 Beyond the plate 64

5.1 Importance of guest communication 65
5.2 Prepare and distribute information 66
5.3 *Nudging* 68
5.4 Design of the break period and the dining room 70

6 Legal requirements for catering 72

6.1 Food law key regulations 73
6.2 Hygiene and infection control 76
6.3 Labelling and public information 78
6.4 Product liability and retained samples 81
6.5 Waste management and the obligation to offer reusable (food) packaging 81

Checklist 82
References 93
Glossary 99
Imprint 102

Message from the Federal Ministry of Food and Agriculture

Dear catering commissioners in companies, public authorities, and universities,

visiting the canteen is about eating, of course – but that's not all. It's a place to catch up, talk about work and the day's events and maybe get some fresh ideas. During the pandemic, in particular, many employees and students have missed this experience. Also, the meals should be tasty and well-balanced – so you want to return the next day.

A healthy diet is the basis for our well-being. There are diet-related chronic diseases that limit our quality of life. With good meals in canteens, cafeterias, and company restaurants, we take steps in the right direction. It offers an excellent opportunity for all employees and students to access a variety of healthy meals, regardless of their social and economic background.

Mass catering also has great potential to protect the environment and climate. This is because food production impacts air, water, soil, climate and animals. Local food that is produced seasonally and organically can make a significant difference. This also applies to the increased consumption of plant-based foods. Kitchen technology and the preparation and prevention of food waste can contribute to climate and environmental protection. Every step, no matter how small, can help to protect the climate and the environment. Due to the increasing demand for plant-based meals – especially in university catering – it is important to specify criteria for vegan menus. Therefore, the DGE-Quality Standard for mass catering includes an optional vegan menu line for the first time. In addition, minimum social standards are observed in the food production process.

The German Federal Government's Food and Nutrition Strategy aims to ensure good nutrition for everyone in Germany. We want to improve the requirements to promote healthy and sustainable nutrition. Catering in companies, public authorities and universities is an essential approach to reaching many people. The DGE-Quality Standard provides a sound basis for well-balanced and sustainable catering.

Your important work can ensure that the DGE-Quality Standards are applied in practice. With the proper choice of food and the right menu design, you may promote the health of all guests and support local food producers. This way, you protect the environment and nature so we can still harvest what tastes good and is healthy tomorrow.

Sincerely yours,

Federal Ministry of Food and Agriculture

Preface

Dear readers,

the demands of the working environment and everyday university life are increasing – a high level of resilience and performance is therefore essential. A healthy diet that provides the right amount of energy and nutrients promotes and maintains both physical and mental abilities, thus contributing to health, performance and quality of life.

At work and while studying, 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 meal providers to serve health-promoting and sustainable meals to employees and students and thus help to conserve the earth's resources. Catering per the DGE-Quality Standards can be specifically anchored in Corporate or Student Health Management.

Central sustainability goals are fundamental for catering that focuses on quality of life for future generations. After all, the food system accounts for one-third of greenhouse gas emissions worldwide. For this reason, the last comprehensive revision of the DGE-Quality Standards in 2020 increasingly incorporated aspects of sustainability, which have been updated again in this edition.

The title of this 6th edition has been expanded to illustrate the vital role that catering at the workplace or place of study plays in the nutrition transition. This compact guidebook describes criteria for optimal catering, from the first planning step to serving and food disposal, for those responsible in companies, public authorities, and universities. Due to the increased demand for vegan meals in mass catering, criteria for vegan menus were developed for the first time and assessed by external experts from science and practice for this DGE-Quality Standard. Although this diet cannot guarantee a sufficient supply of nutrients with natural foods, implementing the criteria when designing a vegan breakfast, snack and lunch menu helps those responsible to ensure the best possible selection.

It is in your hands: make health-promoting and sustainable nutrition a flagship in your organisation. More background 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 Catering for employees and students: An opportunity for more health and sustainability 9

1.2 Who is the DGE-Quality Standard addressed to? 11

1.3 What is the goal of the DGE-Quality Standard? 11

1.4 How is the DGE-Quality Standard structured? 13

1.5 What to keep in mind when reading? 13

1.1 Catering for employees and students: An opportunity for more health and sustainability

For a long time now, catering is more than just providing a warm meal to many employees and students at the same time. Gastronomic offerings reflect the ambience and variety of restaurants and bars more and more and offer a break from the hectic work and university schedule. The pandemic also brought changes: in many sectors, hybrid work prevailed, resulting in lower utilization of gastronomic facilities. Due to necessity, new gastronomic concepts have emerged, incorporating to-go or take-away options along with adaptable utilization of dining rooms for events or small meeting areas. At the same time, the status of gastronomic facilities within the company, agency or university is changing. Previously regarded as necessary evil it is now specifically used to recruit staff. After all, anyone who spends a lot of time at work or university wants to enjoy healthy and sustainable meals in a pleasant atmosphere.

Currently there are many demands on the catering of employees and students: 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 multifunctionally. A menu that perfectly supports employees and students, 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 selected examples.

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**. Furthermore, they contribute significantly to the prevention of diseases like *obesity* or type 2 diabetes.

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, 2/3 of all men and 1/2 of all women in Germany are overweight [4, 5]. For this reason, health-promoting and sustainable catering that is equally accessible to employees and students from all parts of our society is of great importance. In addition, specific communication and information may influence the guests' eating habits and show how a responsible approach to health and the earth's resources may be combined. Therefore, **companies, public authorities and universities are central places for prevention and promoting health and sustainability.**

Optimising the catering offer in these fields 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 catering at work and university offers great potential in terms of **health promotion and more sustainability because of the following aspects, among others**:

- **Wide reach:** Companies, public authorities, and universities reach many potential guests, and many employees and students may benefit from it.
- **Healthy development for everyone:** A health-promoting and sustainable diet promotes the physical and mental abilities of the guests and preserves their health.
- **A place for everyone:** Eating and drinking together connects people from all parts of our society and promotes social interaction.
- **More sustainability:** Health-promoting and sustainable catering for employees and students 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 in *Corporate and Student Health Management***. In this context, information and classes 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.

By offering healthy and sustainable meals in a pleasant dining atmosphere, *meal providers* contribute to creating a ***fair food environment***. *Food environments* are places where eating decisions are made. Every *food environment* affects nutrition behaviour: what we see (exposition), what we can access (access), what we choose (choice) and what we eat (consumption). *Food environments* are fair if, among other things, they are tailored to the target group, enable healthy and sustainable choices, and make them easy, i.e. easily available, accessible, and affordable. In the long term, this can decisively shape the eating habits of guests [8–10].

1.2 Who is the DGE-Quality Standard addressed to?

Providing health-promoting and sustainable 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 catering in companies, public authorities and universities. These include the kitchen management and team, caterers and tenants who offer breakfast, snacks, and lunch in *mass catering*.
- **Service Team:** The serving staff in the gastronomic facilities, bistros, coffee bars, the conference and floor service.
- **Representatives of *Corporate Health 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 for employees and students. 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, public authority and university may implement this Quality Standard step by step at its own pace. Every quality improvement in catering results in healthier and more sustainable diets for employees and students. The majority of the criteria relate to the catering design (see chapter 4). Criteria are presented along the process chain with the 5 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 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 catering for employees and students 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 basis for all process steps in catering for employees and students.

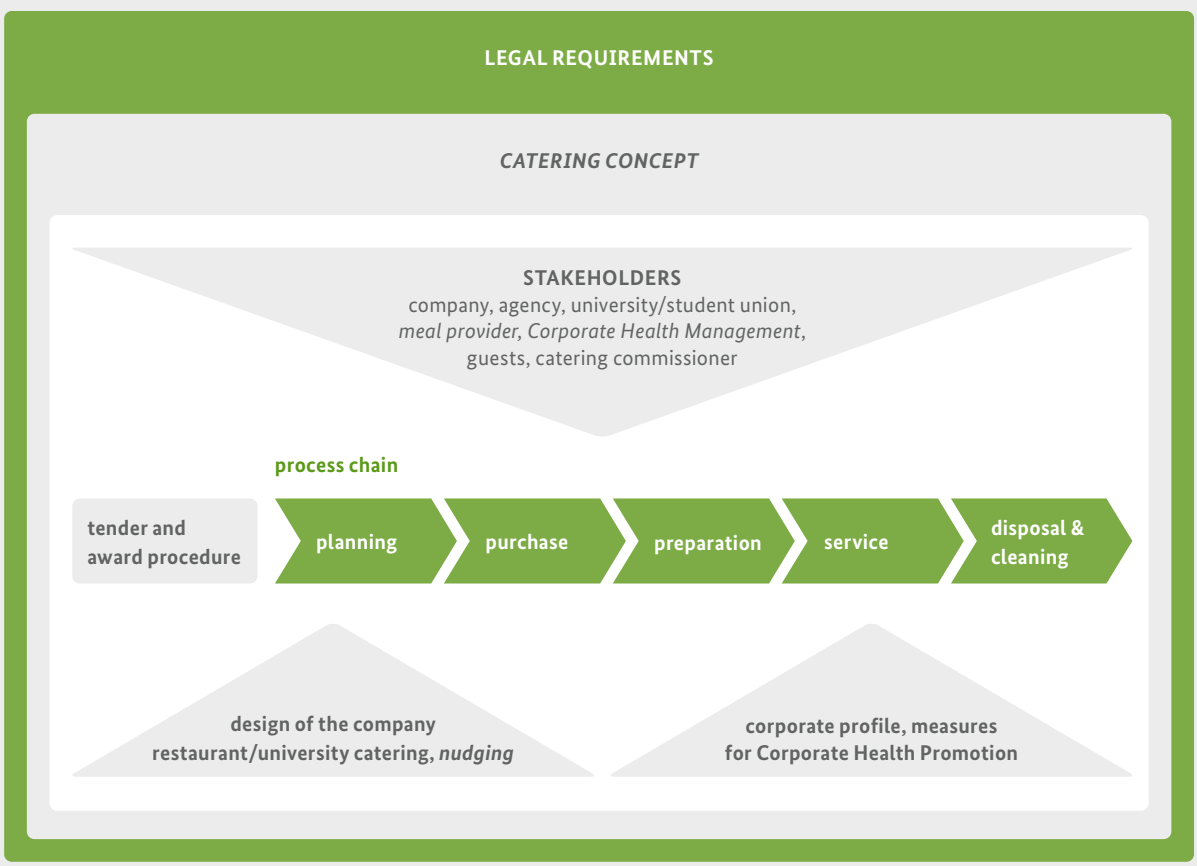


Figure 1: Aspects of health-promoting and sustainable catering

1.4 How is the DGE-Quality Standard structured?

The DGE-Quality Standard includes 6 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 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 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 82 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 catering for employees and students

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, companies, public authorities, and universities that already realise the DGE-Quality Standard, it is also recommended to take a regular look at the current catering offer to identify possible deficiencies and initiate improvement strategies.

2.1 Quality of catering for employees and students 15
2.2 Interface management 18
2.3 Staff qualification 20
2.4 Feedback management 21
2.5 External quality control 23
2.6 Specification for tenders 23

2.1 Quality of catering for employees and students

Catering according to the DGE-Quality Standard promotes the health of employees and students and is sustainable. All employees and students should be able to participate in the catering and their needs and wishes should be considered.

Thus, the criteria of the DGE-Quality Standard describe an ideal catering situation and may be used as orientation and benchmark for improving catering services. Importantly, the catering commissioners should set priorities for criteria to be implemented first at their own organisation.

DGE-Quality Standard
as part of the specific *catering concept*

The development of a specific *catering concept* is an important first step. It defines 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

The catering commissioner should initiate a joint development process towards health-promoting and sustainable catering for employees and students**. With the help of the criteria defined in the DGE-Quality Standard, all stakeholders can improve the quality of catering gradually together.** This way, the catering might become the organisation's flagship.

Catering affects all stakeholders – the employees in the catering sector, the employees of the caterer, the management, the quality commissioner, the employees of *Corporate* or Student *Health Management*, the company physician, the workers' or staff council, the employees of the human resources department, all other employees of the company, agency or university and the guests. Hence, engaging stakeholders in the planning of catering is crucial. At universities, catering is usually the responsibility of the student unions. There, committees and decision-making structures are often already established and regulated in the state-specific university laws. The situation is different in companies and public authorities. For this reason, it is recommended that all stakeholders be invited 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 gives everyone the opportunity to get to know the different points of view and wishes, suggestions, and creative ideas can be introduced – with the aim of creating a widely supported and sustainable *catering concept*. This, in turn, should be integrated into the mission statement of the company or agency and into the company's health management measures.

The collaborative, process-oriented quality development involves 5 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 gastronomic facility, as well as individual steps from planning to disposal and cleaning, are examined thoroughly. The checklist starting on page 82 helps to verify which criteria are already met by the 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 have already been implemented and what should and might be changed in the future. It is important that all stakeholders assess the situation and reflect on the conditions and structures prevalent at the company, agency, or university.

Checklist criteria on page 82 that have not been implemented in the 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 criteria is also an important positive progress. For instance: if the objective is to offer a meat dish at lunch no more than **twice a week**, while currently it is offered **daily, resp. 5 times a week**, initially reducing meat to **3 times a week** counts as an important quality improvement.

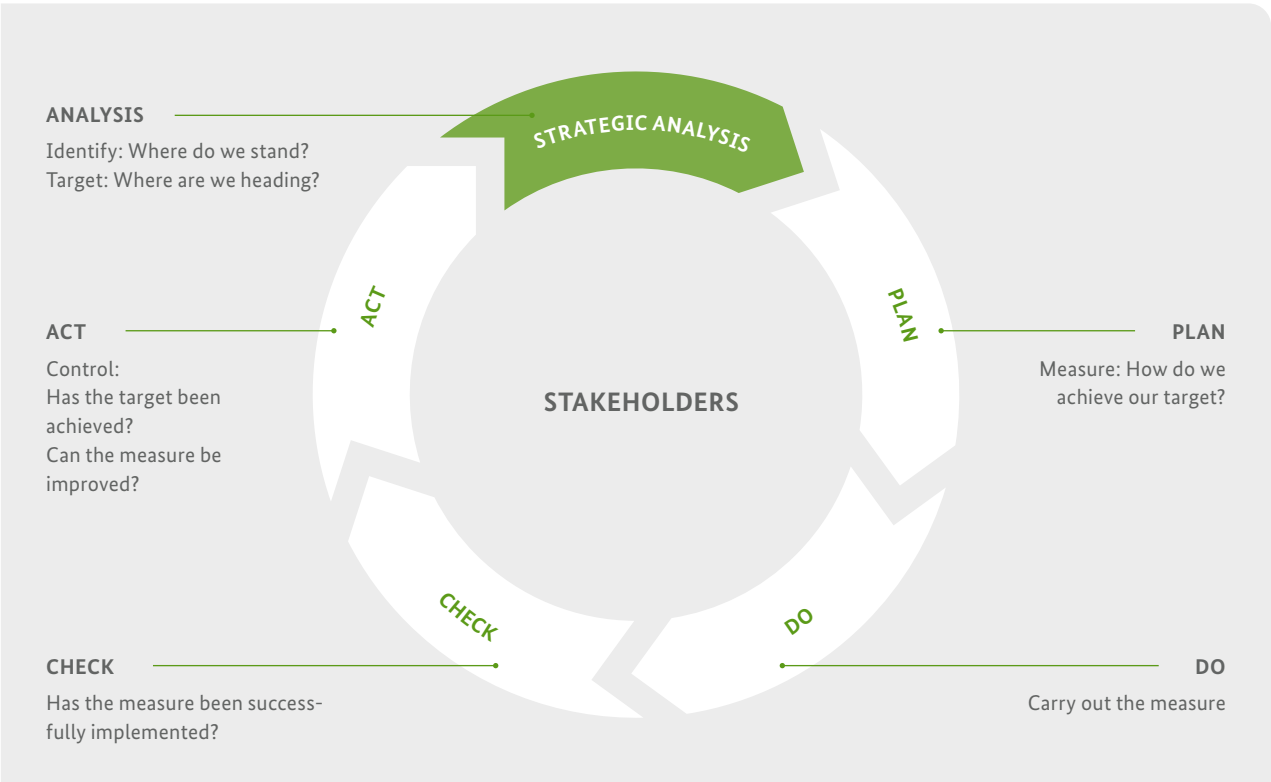


Figure 2: The 5 steps of collaborative, process-oriented quality development (modified according to [11])

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 remodelling of the gastronomic facilities. 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 stakeholders. Could the measures be implemented as planned?

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 basis 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.

The following criteria apply:

- ☐ **A *catering concept* is in place.**
  The *catering concept* defines the qualitative and quantitative requirements for catering considering the structures on site of each company, public authority, or university. 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, and also to develop a *catering concept*. This increases acceptance and appreciation and ensures the continuous development of the catering service. For universities, participation and decision-making processes are generally regulated by state-specific university laws.

2.2 Interface management

Health-promoting and sustainable catering for employees and students is a joint task in which several professions and groups of people participate. 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),
- define competencies 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 workflows, promotes communication and cooperation, and ultimately saves time.

Examples of interfaces in catering for employees and students:

- **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. In addition, the kitchen team or the caterer receive information from the staff on site about food returns of different components for a better calculation and reduction of food waste. This exchange and mutual motivation are key to a successful and sustainable waste reduction [12].

› **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. The interface between the serving staff and the guests is particularly important when introducing new or unfamiliar food components or dishes, e.g. when transitioning to *plant-based* catering. 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 organisation.

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 a different 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 organisation and coordinate them in the interest of all.

2.3 Staff qualification

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 professions and qualifications like:

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

Preparation and serving of 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 in the areas of 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" dishes/components,
- basic knowledge of ways to avoid food waste,
- preparation of creative vegetarian/vegan recipes,
- ways to implement and increase the percentage of organic food in mass catering as well as organic certification,
- allergen management and labelling,
- planning and implementation of *nudging* techniques,
- feedback management,
- communication and dealing with guests as well as
- 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, but lack of praise can be frustrating. Possible ways are the personal dialogue, which can take place in the gastronomic facilities, 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.

The following criterion applies:

☐ **Feedback on the menu is regularly obtained, evaluated and measures are derived.**
Guests should be given the opportunity to express their wishes and criticisms about the meals. This provides helpful suggestions on the meal design as far as possible in line with the requirements and thus ensure that the food is well accepted. For example, questionnaires can be distributed, or a postbox set up for feedback.

2.5 External quality control

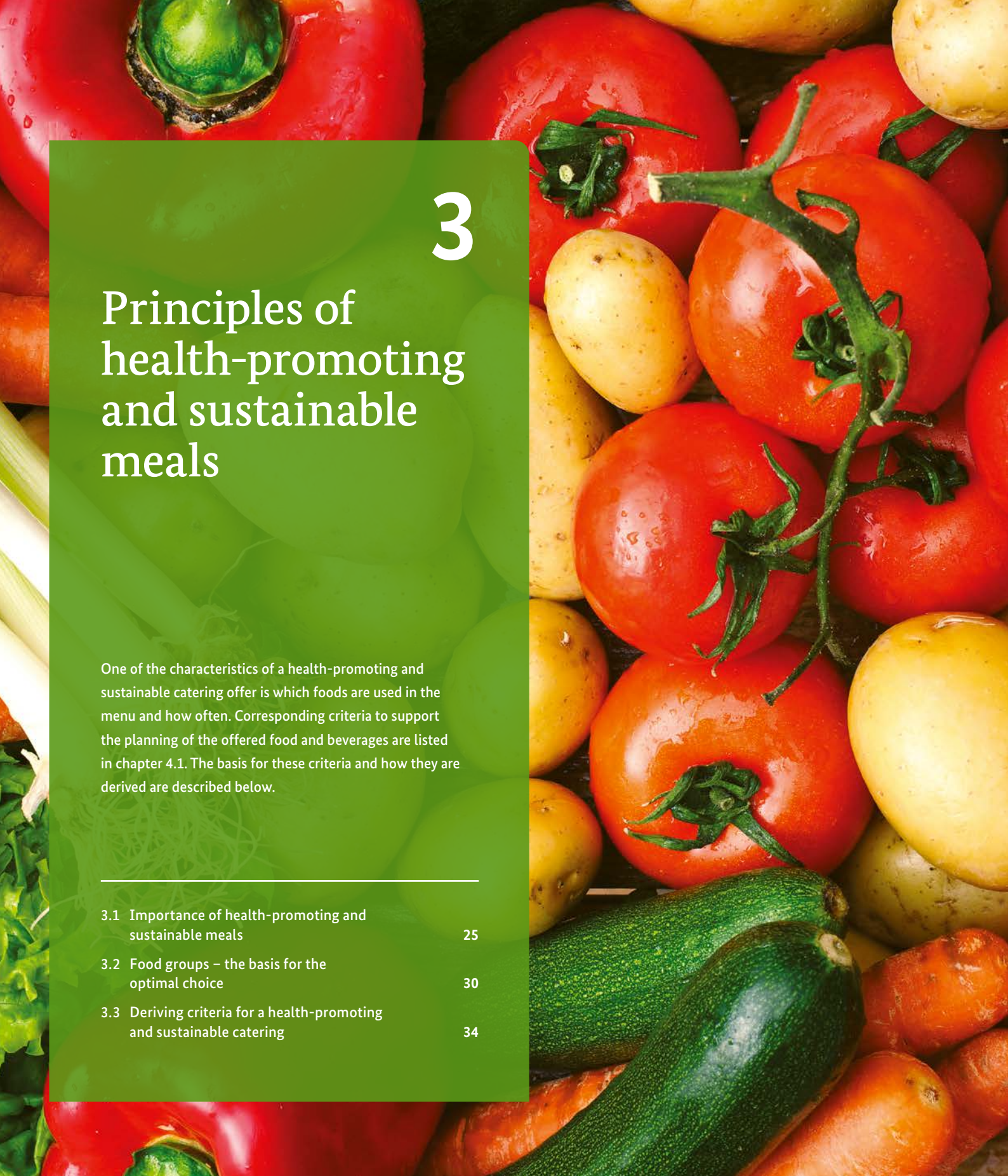
Whether the offered meals meet the set goals may be verified in an independent quality control. Usually, this is carried out by an external institution based on different audit systems and audit criteria. In this way, catering commissioners ensure the quality of the offer and are able to demonstrate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

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

2.6 Specification for tenders

When the 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 basis 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 must 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 25

3.2 Food groups – the basis for the optimal choice 30

3.3 Deriving criteria for a health-promoting and sustainable catering 34

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 (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. Nutrients like vitamins, minerals, dietary fibre, and phytochemicals are also contained in sufficient quantities. As a result, both malnutrition and overeating might be prevented. A wholesome diet also makes a decisive contribution to the prevention of diet-related diseases such as *obesity*, type 2 diabetes, and cardiovascular disease. The wholesome diet is diverse and highlights the consumption of vegetable food [13–15].

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" [16], p. 43. In 2015, the United Nations adopted the UN 2030 Agenda, with 17 Sustainable Development Goals (SDGs).

The EAT-Lancet Commission Report [17], published in 2019, uses a global reference diet (Planetary Health Diet) to show the supply for a future world population of 10 billion people in 2050 while respecting planetary boundaries. This could prevent around 11 million cases of early death worldwide each year due to malnutrition. In a strict sense, the Planetary Health Diet is not a nutritional recommendation; it merely provides a framework for orientation. It is, therefore, necessary to realize country-specific adaptions of the food choices and quantities, as well as the locally available resources [17, 18]. The food-based dietary guidelines for Germany are issued by the DGE. In this DGE-Quality Standard, these are transferred to mass catering (see chapters 3.3 and 4) and are largely consistent with the statements of the Planetary Health Diet [19].

Further information:
www.jobundfit.de
Keyword: Planetary Health Diet

Based on different definitions of sustainable nutrition [20–23] the Scientific Advisory Board on Agricultural Policy, Food and Consumer Health Protection (WBAE) [8] has formulated 4 central goal dimensions – health, environment, *social aspects*, animal welfare – for a more sustainable diet, which are explained in Figure 3. The DGE aligns its activities with these 4 goal dimensions, as set out in the "DGE position statement on a more sustainable diet" [10]. Accordingly, this DGE-Quality Standard follows these principles and thus helps to create *fair food environments* in companies, public authorities, and universities.

Many foods we consume cause a significant "footprint" in terms of environment, climate, *social aspects* and animal welfare [8]. Increasingly, our food is produced in complex and global **value chains**. The food value chain covers the input factors for agriculture, the agricultural production, up to processing, trade, 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 evaluation of food.

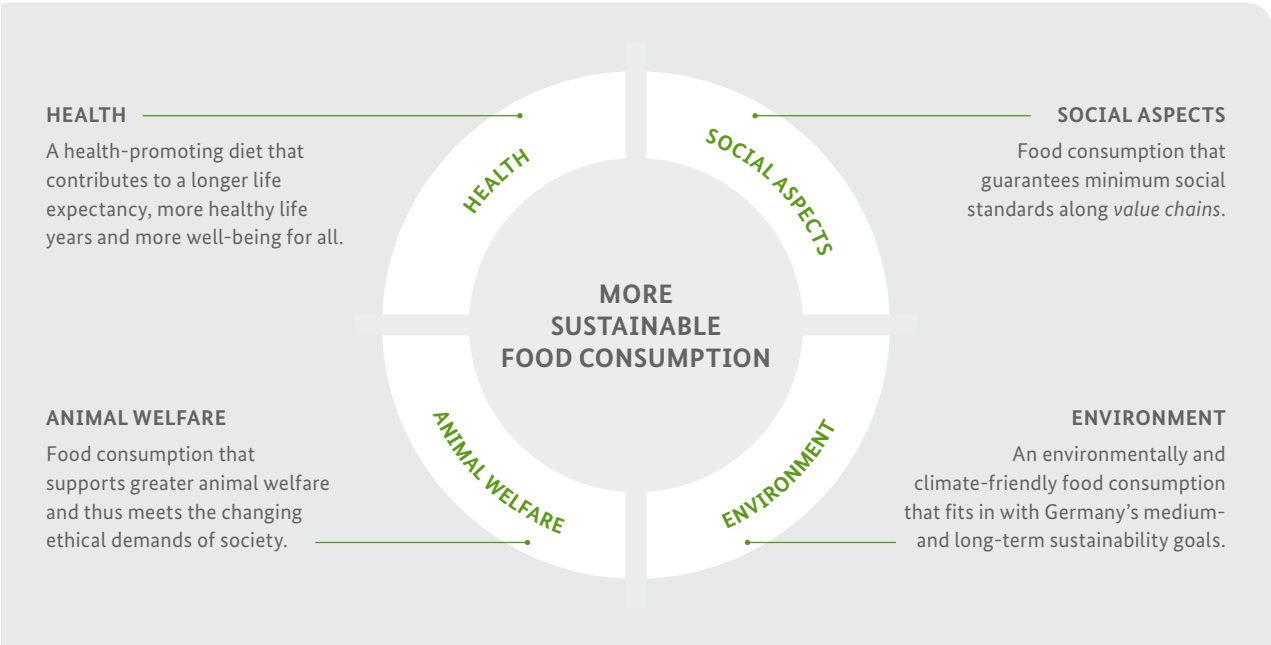


Figure 3: Goal dimensions of more sustainable food consumption [8]

The carbon footprint is one indicator of the environmental impact of food. It quantifies the amount of *greenhouse gas emissions* generated along the food value chain. It therefore represents its climate impact. In view of the limited availability of certain resources and the loss of biodiversity, other ecological footprints of food production, such as water, land, or biodiversity footprints, are also increasingly being considered [24, 25].

One-third of the worldwide *greenhouse gas emissions* are caused by the food system [26]. Food production 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 and by the animals themselves, food industry, through cooling or freezing food, its transport and ultimately the preparation of meals. In addition to *greenhouse gas emissions*, intensive 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*, lead to soil compactness and may cause the loss of soil fertility in the long term [27]. Intensive animal husbandry partly carries the risk of resistance due to the excessive use of antibiotics [28]. The application of fertilisers and pesticides significantly affects the biodiversity of plants and animals [29]. Intensive nitrogen fertilisation is responsible for water contamination with nitrate [30].

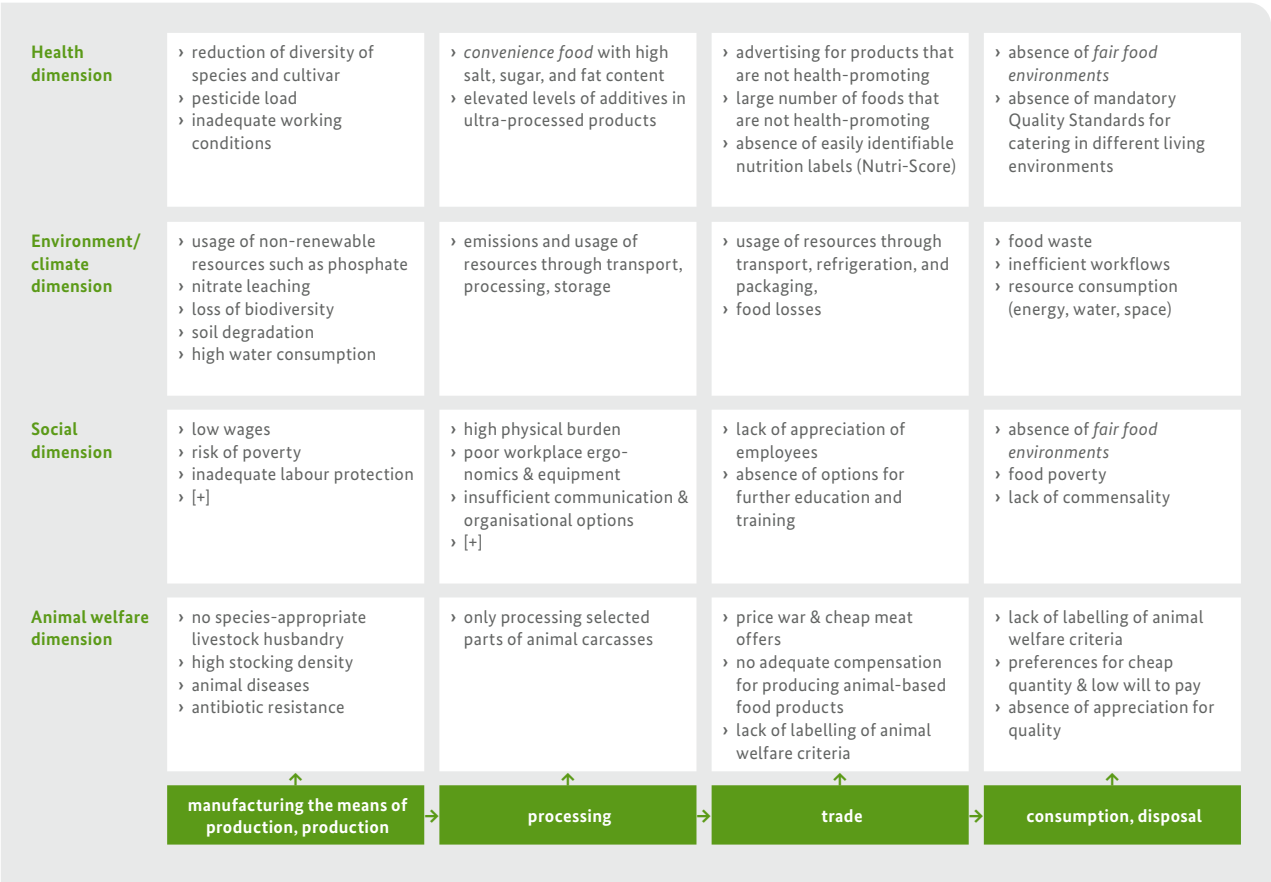


Figure 4: Examples of potential problem areas across the 4 goal dimensions of more sustainable nutrition and the value chain, modified according to [10]

Therefore, it is not sufficient to only adjust nutrition and catering to aspects of health promotion. Rather, it is essential to design diets and catering options to minimize the impact on the climate and the environment and consider the other goals of a more sustainable diet, such as animal welfare and *social aspects*.

According to calculations of the project "KEEKS – Climate-friendly School Kitchens", it is possible to save approximately 40 % of *greenhouse gas emission* in school kitchens [31]. According to the data, about ¾ 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 [32]. The production of animal-based food like meat, eggs, milk, and dairy products (especially those derived from ruminants like cattle, sheep, and goats) causes particularly high *greenhouse gas emissions*. In contrast, the share of vegetable food like grains, vegetables and fruits in *greenhouse gas emissions* is usually much lower. Generally, there are also differences within a food group. For example: Tomatoes from Germany grown in greenhouses heated with fossil fuels in winter cause 10 times higher *greenhouse gas emissions* than *seasonally* harvested German tomatoes from unheated greenhouses or open field [8, 24].

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, 1 kg of beef causes on average about 14 kg of CO_2 *equivalents* – whereas the same amount of ready-to-eat lentils causes 1.7 kg of CO_2 *equivalents* [24]. Even the production of nutritionally significant foods like milk and dairy products, fish or nuts may have comparably 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 (see Tables 2–4).

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

The data shown and the fact that companies in Germany with over 100 employees provide annually around 1.6 billion meals in 13,800 company gastronomies as well as approximately 1,000 university cafeterias [33, 34], highlights the potential significant impact on climate protection through favouring predominantly vegetable menus in catering for employees and students. Kitchen technology and food waste prevention also play a crucial role. Preparing, cooling and keeping ingredients and food hot may have a significant environmental impact. This is where infrastructure, production planning and staff behaviour are essential [31, 32, 35, 36]. Once food is discarded, all invested resources and all 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* of selected foods [24]

vegetable food		kg CO_2-*equivalent*
grains, grain products and potatoes	1 kg rice	3.1
	1 kg bulgur	0.6
	1 kg pasta	0.7
	1 kg potatoes, fresh	0.2
vegetables and *salad*	1 kg lentils, dry	1.2
	1 kg carrots	0.1
	1 kg lamb's lettuce	0.3
fruits	1 kg pineapple, fresh, average	0.9
	1 kg apples, average	0.3
	1 kg walnuts, with shell	0.9
oils and fats	1 kg margarine, whole fat	2.8
	1 kg rapeseed oil	3.3

animal food resp. alternative vegetable products		kg CO_2-*equivalent*
meat, sausage, fish and egg and vegetable meat alternatives	1 kg beef, average	13.6
	1 kg chicken, average	5.5
	1 kg pork, average	4.6
	1 kg fish, aquaculture	5.1
	1 kg egg	3.0
	1 kg seitan	2.5
	1 kg tofu	1.0
milk and dairy products and vegetable milk alternatives	1 kg cheese, average	5.7
	1 kg yoghurt, plain	1.7
	1 kg whole milk, ESL	1.4
	1 kg milk alternative, oatmilk	0.3
	1 kg milk alternative, soymilk	0.4
oils and fats	1 kg butter	9.0

The DGE-Quality Standard 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 and sustainable perspective. These include vegetable products such as vegetables including *legumes*, *salad*, wholemeal products, and fruits. Additionally, a maximum frequency is specified for foods and food groups like meat, as well as ultra-processed and deep-fried products. There is scientific evidence that limiting these products is beneficial in terms of nutritional physiology and sustainability [37]. 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 the criteria for the design of a health-promoting and sustainable diet along the process chain – from planning to disposal. In this context, the reduction of avoidable food waste plays an important role.

Further information:
www.jobundfit.de
Keyword: Nachhaltigkeit

3.2 Food groups – the basis for the optimal choice

The food-based dietary guidelines of the DGE for a wholesome diet – as presented in the "DGE Nutrition Circle", the "Three-Dimensional DGE Food Pyramid" and the "10 guidelines of the DGE for a wholesome diet" – are based on the "*Reference values for nutrient intake*" and the DGE's evidence-based guidelines regarding fat and carbohydrate intake [14, 38–40]. These recommendations serve as the basis for health-promoting and sustainable mass catering. The **food quality** – **as the optimal choice** from each of the 7 food groups of the DGE Nutrition Circle shown in Tables 2–4 – 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 use in catering.

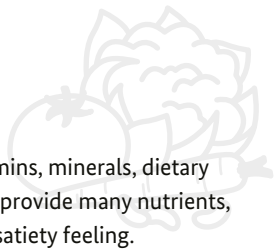
Food group grains, grain products and potatoes

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. Wholemeal 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 also 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 potato dish or pasta with vegetable sauce. Ideally, grains and grain products are offered as wholemeal products.



Food group vegetables and *salad*

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

Vegetables and *salad* usually cause comparatively low *greenhouse gas emissions*. In particular, *seasonal* and *regionally* produced vegetables and *salad* grown open-field or in unheated greenhouses are especially climate-friendly. Furthermore, local production strengthens the local economy.

Legumes like beans, lentils and peas also belong to this food group. They are an important protein source in a *plant-based* diet [19]. In addition, they contain a lot of dietary fibre and provide other nutrients such as vitamins B_1, B_6, folate and the minerals iron, magnesium, and zinc, as well as phytochemicals. Combining foods from this group with cereals, cereal products, potatoes, or animal-based products, increases the meal's *protein quality*. Examples include bean stew with potatoes, pasta salad with kidney beans, lentil Bolognese with wholemeal pasta and (wholegrain) bread with hummus.

Moreover, *legumes* excel in terms of sustainability; during growth, the crops fix the required nitrogen from the air, which is why less fertilizer is needed [41]. At the same time, they ensure more biodiversity in agriculture. *Legume*-based dishes should therefore be a regular part of the diet. The "Protein Crop Strategy" of the Federal Ministry of Food and Agriculture (BMEL) aims, among other things, to increase domestic production [42, 43].

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, salad dish or patty – there are no limits to 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 savoury, marjoram, rosemary or caraway and pureeing cooked *legumes* can also improve digestibility. Some varieties, such as red or yellow lentils, are peeled and thus often easier to digest.

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

Food group fruits

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

From a botanical point of view, **nuts** also belong to fruits. Being important sources of nutrients, they are part of a health-promoting diet.

Practical advice: Fruits should be available fresh or frozen, without added sugar and other *sweetening ingredients*, 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 products

Milk and **dairy products** provide calcium, high-quality protein, iodine, and vitamins A, B_2 and B_{12}. Cheese in particular contains a lot of calcium but compared to other dairy products often has a high fat content. Cheese should be offered regularly, and varieties with an *absolute fat content* of maximum 30 % should be preferred.

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

Food group meat, sausage, fish, and eggs

Meat is a good source for protein and, among others, Vitamin B_{12}, selenium, and zinc. In addition, it is a source of well available iron and high-quality protein. However, meat, especially in processed form like **sausage** also contains unfavourable ingredients. For example, it has a high proportion of saturated fatty acids which can affect certain blood lipid concentrations negatively. This is why lean meat is preferable. Sausage also contains a lot of salt. However, as part of a healthier and more sustainable diet, a small amount of meat can complement the choice of vegetable food, making it easier to obtain essential nutrients.

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.

Practical advice: The meat component in dishes may be reduced in favour of the vegetable and/or grain component. A sustainable diet also includes the aspect of animal welfare. Organic farms and, for example, the Neuland Association advocate for meat from species-appropriate animal husbandry.

Further information:
www.jobundfit.de
Keyword: Tierwohl/Fleisch

Fish is a good source of protein as well. Fatty fish species, which include both freshwater and saltwater fish (see box), are additionally 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 high-quality 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 for nutritional reasons. 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

Since fat provides twice as much energy as carbohydrates and protein, **oils** and **fats** 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 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.

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 [44, 45]. 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 plants yielding coconut oil, palm oil and palm fat is primarily conducted in *monocultures* causing substantial impacts on biodiversity and must hence be accessed as negative from an ecological perspective [46–48].

Further information:
www.jobundfit.de
Keyword: Palmöl

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 L 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.

Purchasing products with the fairtrade label, like coffee and tea, helps improving the living and working conditions of small farming families and plantation workers in countries of the Global South.

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.

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.

Practical advice: Drinking water should be placed at prominent locations in gastronomic facilities, on office floors, production areas, 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.

3.3 Deriving criteria for a health-promoting and sustainable catering

The way recommendations for a wholesome diet translate into criteria for catering in companies, public authorities and universities on a scientific basis is described below. Figure 5 illustrates this path in 4 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 *"Reference values for nutrient intake"* [40] and the evidence-based guidelines regarding fat and carbohydrate intake [38, 39]. 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-based dietary guidelines of the DGE form a basis, like the "DGE Nutrition Circle", the "Three-Dimensional DGE 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 *"Reference values for nutrient intake"* as follows.

When providing catering for employees and students, the "*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* for energy intake 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 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.

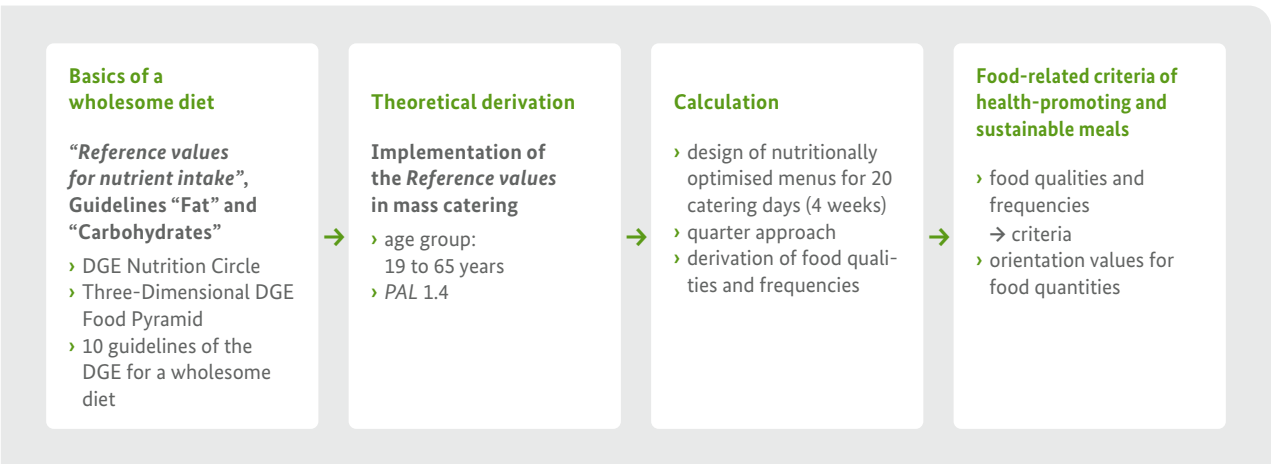


Figure 5: Path from the basics of a wholesome diet to food-related criteria for health-promoting and sustainable catering

... and calculation ...

Based on these principles, nutrient-optimised menus for a mixed diet, ovo-lacto-vegetarian diet and a vegan diet including breakfast, snacks, lunch, and dinner were composed. They are exemplary for 4 weekly menus respectively 20 catering days and considering the usual eating habits in Germany. The following aspects were taken into account:

- reaching the derived *Reference values* for mass catering for groups of people aged 19 to under 65 years,
- *physical 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 2 snacks,
- corresponding food qualities (see chapter 3.2),
- "5 a day" campaign (at least 3 portions of vegetables and 2 portions of fruit),
- with 90 % of the total energy, 100 % of the recommended reference values of nutrients (vitamins and minerals) are met, so that in the mixed diet and ovo-lacto-vegetarian diet, 10 % of the total energy may be allocated to foods with low *nutrient* and high *energy density*, like chocolate, jam, or potato chips. In a vegan diet, only 1 % of the total energy is available for foods with a low *nutrient and high energy density*.

... 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 food 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 in the mixed and the ovo-lacto-vegetarian diet, most likely all nutrients will cover the reference 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, public authorities and universities. The process chain is used to illustrate a catering offer for breakfast, snacks and lunch that is tailored to the needs and requirements of the target group. Optimally composed, this offers guests the opportunity to make a healthy and sustainable choice for every meal.

4.1 Planning 37
4.2 Purchase 53
4.3 Preparation 55
4.4 Service 58
4.5 Disposal and cleaning 59
4.6 Together and yet individual 61

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 are included (see 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. The analysis of waste measurements in companies reveals that an increasing amount of food waste is caused by overproduction, too much food being served, and food returns [12]. Therefore, a well-functioning order system or a good coordination with the company, public authority or university is advantageous and requires the collection and transfer of information about absent employees or students, e.g. due to work shifts, home office, field work, participation in training courses or term breaks [31, 49].

By the way:
The Competence Center for Out-of-Home Catering (KAHV) informs and advises gastronomic facilities on the implementation of measures to reduce food waste. Measuring food waste is the first step towards better use of resources, lower waste costs, and an improved carbon footprint.

When planning production, it's essential to consider guests' preferences regarding portion sizes, and ladle plans should be adjusted accordingly. Other measures to reduce food returns include offering different portion and plate sizes or allowing guests to have second helpings [12].

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

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

4.1.1 Catering services and their characteristics

Mixed diet
A varied mixed diet consists mainly of vegetable food (cereals, vegetables including *legumes*, fruits including nuts, vegetable oils and fats) and, to a lesser extent animal-based food (milk and dairy products, meat, fish, and eggs). This combination is the easiest way to ensure a sufficient nutrient supply.

Ovo-lacto-vegetarian diet
The ovo-lacto-vegetarian diet includes vegetable food and only incorporates animal products derived from living animals, such as milk (dairy products), eggs, or honey. Conversely, meat, meat products, fish, slaughter fats, and gelatine are excluded from this diet. To ensure a well-rounded nutrient supply, the following aspects should be considered when planning the diet:

Iron is a potentially critical nutrient in the ovo-lacto-vegetarian diet, as the human body tends to absorb this mineral more efficiently from animal-based sources than from vegetable ones. Enhancing iron absorption can be achieved by combining iron-rich plant foods such as *legumes*, millet, or oatmeal with foods high in Vitamin C, citric acid (found in vegetables and fruits), or lactic acid (found in sauerkraut). Examples of such dishes include falafel sandwiches with coleslaw, lentil-stuffed peppers, millet casserole with fruit, and rye rolls, or sourdough bread served with soups or *salads*. These options should be incorporated into the ovo-lacto-vegetarian menu.

Fatty fish serves as the main source of **long-chain omega-3 fatty acids** and is, therefore a crucial component of a mixed diet. If no fish is consumed, it is advisable to incorporate foods rich in alpha-linolenic acid, such as rapeseed oil, linseed oil, walnut oil, nuts, or oilseeds. While the human body can convert alpha-linolenic acid into long-chain omega-3 fatty acids, this process has limitations, and the complete substitution of fatty fish with other foods is not entirely feasible [50, 51]. Nevertheless, due to increasing demand, criteria for the ovo-lacto-vegetarian diet were included in the DGE-Quality Standard to ensure optimal nutritional provision.

Vegan diet
In a vegan diet, all animal-derived foods, including meat, fish, milk, eggs, honey, and ingredients of animal origin like lecithin from eggs, are excluded. The diet focuses on vegetable food, often offering a well-balanced composition with careful selection of vegetables, fruits, and dietary fibre-rich foods, which can be superior to the typical German mixed diet. However, the significantly restricted range of food choices raises the risk of potential undersupply or deficiency of certain nutrients. For individuals strictly adhering to a vegan diet, it is advisable to have their nutrient levels regularly monitored by a physician.

A sufficient supply of **Vitamin B_{12}** is not guaranteed with a vegan diet and is only possible by taking a Vitamin B_{12} supplement on a regular basis.

Alongside iron and long-chain omega-3 fatty acids (as mentioned earlier), other nutrients with potential critical importance include protein and essential amino acids, as well as vitamins B_2 and D, and minerals such as calcium, iodine, selenium, and zinc. It is crucial to thoughtfully select and combine *nutrient-dense* and fortified foods to guarantee a satisfactory intake of these essential nutrients.

Apart from soy protein, vegetable **protein** typically exhibits lower *protein quality* compared to its animal-based counterparts, making it less readily usable for humans. However, a carefully chosen combination and diverse selection of vegetable protein sources, such as wholegrain cereals, *legumes*, and potatoes, can enhance *protein quality* and fulfil the requirement for essential amino acids. Examples of dishes include lentil stew with bread, spelt dish with tofu and vegetables, chilli sin carne with rice, potato and lentil curry or hummus with bread.

Dark green vegetables low in oxalates (especially cabbages such as broccoli, kale, pak choi), sesame seeds (butter), tofu, nuts, calcium-containing mineral water with a minimum calcium content of 150 mg/L and calcium-enriched foods, e.g. vegetable milk alternatives, can be used to meet **calcium** requirements.

By avoiding animal-based products, sea fish as well as milk and dairy products cease to be significant sources of **iodine**. Iodine supply can be supported using iodized salt and processed products made with iodized salt. Additionally, algae preparations or seaweed, like nori with a specified iodine content of up to 20 mg/kg dried algae, may enhance iodine intake. Following consultation with a physician, consider an iodine supplement as well.

Oilseeds, nuts, *legumes* and wholegrain cereals are good vegetable sources of **Vitamin B_2** and **zinc**. Cabbage and onions, mushrooms, asparagus, *legumes* and especially Brazil nuts are rich in **selenium**.

For the critical nutrients **iron** and **long-chain omega-3 fatty acids**, the information in the section on an ovo-lacto-vegetarian diet applies.

While a vegan diet may not guarantee the complete coverage of all nutrients without the use of supplements or nutrient-enriched foods, criteria for the design of a vegan diet have been included in the 6th edition of the DGE-Quality Standard due to increasing demand for employees and students catering. The intention is to provide the best possible offer.

Irrespective of the dietary pattern, Vitamin D holds a unique position among vitamins. Typically, only a relatively small portion of the required amount is obtained through the diet. In contrast to other vitamins, our skin synthesizes Vitamin D when exposed to sunlight, with production varying depending on the time of year.

4.1.2 Food qualities and frequencies as well as other aspects of menu planning

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 5 catering days. This way, it becomes immediately clear, which offer is favourable for the individual meals. Table 4 describes how a vegan offer for breakfast, snacks and lunch should be designed.

Based on the 7 food groups (see chapter 3.2), the tables 2, 3 and 4 initially show **food qualities** – the **optimal food choice**. This includes foods that are highly recommended because of their nutritional composition.

By the way:
Although animal-based foods have a high *protein quality*, it is advisable to primarily fulfil the recommended protein intake through vegetable foods. To increase the *protein quality* of the catering offer, it makes sense to combine protein sources from varied food groups (animal-based and vegetable or vegetable and vegetable). This should be considered during menu planning, particularly in the context of *plant-based* catering (for further information see chapter 3.2.).

Additionally, the tables show criteria on **how often** certain foods or food groups must be used in a period of 5 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 Reference Values in Mass Catering for the mixed and the ovo-lacto-vegetarian diet and the tolerable upper intake level [52] is not exceeded for any nutrient. The criteria for the vegan diet are also designed in such a way that an adequate supply of most nutrients is ensured, and the exceeding of tolerable daily upper intake levels is avoided. A sufficient supply of the nutrients Vitamin B_{12}, Vitamin D and iodine cannot be guaranteed.

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, **orientation values for food quantities** are shown for planning purposes. 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 gastronomic facility.

The actual quantity should be based on the experience of the kitchen staff. Also the guests' wishes should be reflected in particular. Ultimately, a needs-based calculation is the precondition for responsible economic and ecological action.

Breakfast and snacks

Both breakfast and snacks contribute significantly to the daily nutrient intake. Breakfast, whether eaten at home, at university or at work, and the mid-morning and mid-afternoon snacks should be largely coordinated. Partly these meals are organised by the employees or students themselves or offered at the gastronomic facility. 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 3 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 3 meals. The weekly food frequencies are therefore presented as a total for the 3 meals. To improve orientation and practicability, the daily frequencies are listed accordingly. If, for example, 10 × fruits are recommended on 5 days, it should be offered 2 × per day and be flexibly shared among breakfast and/or snacks.

Lunch

Likewise, lunch contributes significantly to the daily nutrient intake. For a balanced catering for employees and students, the food qualities and frequencies listed in Table 3 apply.

The selection of foods and their frequency of use listed in tables 2–4 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 wholemeal products, *legumes* or the offer of a popular vegetarian dish like (wholemeal) spaghetti with tomato sauce instead of a meat dish helps to optimise the catering.

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*).

Breakfast and snacks

Table 2: Food qualities and frequencies for health-promoting and sustainable breakfast and snacks on 5 catering days

food group	food qualities – optimal choice
grain, grain products, and potatoes	› wholemeal products › *pseudocereals* › *muesli* without added sugar and other *sweetening ingredients*
vegetables and *salad*	› vegetables, fresh or frozen › *legumes* › *salad*
fruits	› fruits, fresh or frozen › nuts and oilseeds, unsalted → each without added sugar and other *sweetening ingredients*
milk and dairy products	› milk, plain yoghurt, buttermilk, sour milk, kefir: max. *absolute fat content* 3,8 % › quark: max. *absolute fat content* 5 % → each without added sugar and other *sweetening ingredients* › cheese: max. *absolute fat content* 30 %
meat, sausage, fish[2] and eggs[3]	› 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 added sugar and other *sweetening ingredients*

1 The orientation values given for food quantities are consumption quantities, i.e. peeling and cooking losses are already factored in.The actual quantities should be based on experience (see also chapters 3.3 and 4.1.1).

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

	food frequencies on 5 catering days orientation values[1] for food quantities on 5 catering days per guest	
	mixed diet	**ovo-lacto-vegetarian diet**
	min. 10 × (min. 2 × daily) ca. 600 g › thereof: min. 50 % of the daily offer from wholemeal products	**min. 10 × (min. 2 × daily)** ca. 600 g › thereof: min. 50 % of the daily offer from wholemeal products
	min. 5 × (min. 1 × daily) ca. 500 g › thereof: min. 3 × as *raw vegetables*	**min. 5 × (min. 1 × daily)** ca. 500 g › thereof: min. 3 × as *raw vegetables*
	10 × (2 × daily) ca. 1000 g › thereof: min. 2 × as nuts or oilseeds ca. 50 g	**10 × (2 × daily)** ca. 1000 g › thereof: min. 2 × as nuts or oilseeds ca. 50 g
	min. 10 × (min. 2 × daily) ca. 900 g	**min. 10 × (min. 2 × daily)** ca. 950 g
	max. 2 × meat/cold cuts offered ca. 50 g	**omitted in an ovo-lacto-vegetarian diet**
	rapeseed oil is standard fat ca. 60 g	**rapeseed oil is standard fat** ca. 60 g
	beverages are available anytime	**beverages are available anytime**

3 There is no recommendation on the number of eggs to be consumed. In the nutrient-optimised meal plans, approx. 6–12 g 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 5 catering days

food group	food qualities – optimal choice
grain, grain products, and potatoes	› wholemeal products › *pseudocereals* › potatoes, raw or parboiled › *parboiled rice* or brown rice
vegetables and *salad*	› vegetables, fresh or frozen › *legumes* › *salad*
fruits	› fruits, fresh or frozen › nuts and oilseeds, unsalted → each without added sugar and other *sweetening ingredients*
milk and dairy products	› milk, plain yoghurt, buttermilk, sour milk, kefir: max. *absolute fat content* 3,8 % › quark: max. *absolute fat content* 5 % → each without added sugar and other *sweetening ingredients* › cheese: max. *absolute fat content* 30 %
meat, sausage, fish and eggs[5]	› 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 added sugar and other *sweetening ingredients*

4 The orientation values given for food quantities are consumption quantities, i.e. peeling and cooking losses are already factored in. The actual quantities should be based on experience (see also chapters 3.3 and 4.1.1)

food frequencies on 5 catering days

orientation values[4] for food quantities on 5 catering days per guest

mixed diet	ovo-lacto-vegetarian diet
5 × (1 × daily) ca. 600 g › thereof: min. 1 × wholemeal products max. 1 × *potato product*	**5 × (1 × daily)** ca. 700 g › thereof: min. 1 × wholemeal products max. 1 × *potato product*
5 × (1 × daily) ca. 850 g › thereof: min. 2 × as *raw vegetables* min. 1 × *legumes* (ca. 100 g)	**5 × (1 × daily)** ca. 1000 g › thereof: min. 2 × as *raw vegetables* min. 2 × *legumes* (ca. 200 g)
min. 2 × ca. 200 g › thereof: min. 1 × as *whole fruit*	**min. 2 ×** ca. 200 g › thereof: min. 1 × as *whole fruit* min. 1 × as nuts or oilseeds ca. 25 g
min. 2 × ca. 150 g	**min. 2 ×** ca. 200 g
max. 2 × meat/sausage ca. 150 g › thereof: min. half of the offer lean muscle meat **1 × fish** ca. 150 g › thereof: min. 2 × fatty fish within 20 catering days	**omitted in an ovo-lacto-vegetarian diet**
rapeseed oil is standard fat ca. 35 g	**rapeseed oil is standard fat** ca. 35 g
beverages are available anytime	**beverages are available anytime**

5 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.

Vegan diet

Table 4: Food qualities and frequencies for a vegan breakfast, lunch and snacks on 5 catering days

food groups	food qualities – optimal choice
grain, grain products, and potatoes	› wholemeal products › *pseudocereals* › *muesli* without added sugar and other *sweetening ingredients* › potatoes, raw or parboiled › *parboiled rice* or brown rice
vegetables and *salad*	› vegetables, fresh or frozen › dark green leafy vegetables like broccoli, kale, pak choi › *legumes* › *salad*
fruits	› fruits, fresh or frozen › nuts and oilseeds, unsalted → each without added sugar and other *sweetening ingredients*
Vegetable milk and dairy products alternatives	› Vegetable milk alternatives, enriched with calcium, iodine, Vitamin B_2, Vitamin B_{12}, Vitamin D › Vegetable alternatives to dairy products → each without added sugar and other *sweetening ingredients*
Vegetable meat, sausage, fish and egg alternatives	› protein-rich alternatives such as tofu, seitan, tempeh
oils and fats	› rapeseed oil › linseed, walnut, soybean, olive oil › margarine made from the oils mentioned
beverages	› water › mineral water containing calcium (min. 150 mg calcium/L) › fruit and herbal tea → each without added sugar and other *sweetening ingredients*

6 The orientation values given for food quantities are consumption quantities, i.e. peeling and cooking losses are already factored in. The actual quantities should be based on experience (see also chapters 3.3 and 4.1.1).

food frequencies on 5 catering days

orientation values[6] for food quantities on 5 catering days per guest

breakfast and snacks	lunch
min. 10 × (min. 2 × daily) ca. 800 g › thereof: min. 75 % of the daily offer from wholemeal products	**5 × (1 × daily)** ca. 750 g › thereof: min. 1 × wholemeal products max. 1 × *potato products*
min. 10 × (min. 2 × daily) ca. 900 g › thereof: min. 3 × as *raw vegetables* min. 1 × dark green leafy vegetables ca. 100 g min. 1 × *legumes* ca. 100 g	**5 × (1 × daily)** ca. 1200 g › thereof: min. 2 × as *raw vegetables* min. 1 × dark green leafy vegetables ca. 100 g min. 3 × *legumes* ca. 300 g
10 × (2 × daily) ca. 1500 g › thereof: 4 × as nuts and oilseeds ca. 100 g	**min. 3 ×** ca. 350 g › thereof: min. 1 × as *whole fruit* min. 2 × as nuts or oilseeds ca. 50 g
min. 10 × (min. 2 × daily) ca. 1400 g	**min. 2 ×** ca. 100 g
	min. 1 × ca. 100 g › thereof: max. 1 × ultra-processed ready-to-cook alternatives to meat and fish
rapeseed oil is standard oil ca. 80 g	**rapeseed oil is standard oil** ca. 35 g
beverages are available anytime thereof: › min. 5 × mineral water containing calcium ca. 1500 mL	**beverages are available anytime**

In addition to the criteria for using food qualities and frequencies in Tables 2–4, 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. Main components on the plate should be vegetables, *salad* and/or *legumes*.

☐ **A vegan offer is available on request.**
In company catering and especially in university catering, the demand for vegan dishes is increasing. The criteria in Table 4 support the design of a corresponding offer. As with the mixed and the ovo-lacto-vegetarian diet, a wide selection must be ensured.

By the way:
Mixed and ovo-lacto-vegetarian menues may include vegan lunches for up to 3 days, all while adhering to the criteria for food quality and frequency.

☐ ***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* and *regional* 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.

Further information:
www.jobundfit.de
Keywords: Saisonale Lebensmittel and Regionale Lebensmittel

☐ **Local food is preferred in the menu.**
Vegetables and fruits from Germany and other EU countries generally have fewer pesticide residues than products from non-EU countries [53]. 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 and offered in a variety of ways.

... 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.

- [ ] **Meat and fish alternatives are offered for lunch no more than 4 times in 20 catering days.**
  This includes ultra-processed, ready-to-cook food like “sausages”, “schnitzel” or fried patties e.g., based on soy, tofu, lupine, mushrooms, or milk as well as seitan. Tofu, seitan, and tempeh (whether natural or marinated) that undergo no further processing are not considered in this context.

- [ ] **Beverages are available anytime.**
  Water should be placed in prominent locations in the organisation and gastronomic facility, if possible free of charge. Tap water is an economic and ecological alternative.

- [ ] **The lunch *menu cycle* is repeated after 4 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.

4.1.3 The use of *processed food (convenience food)* in mass catering

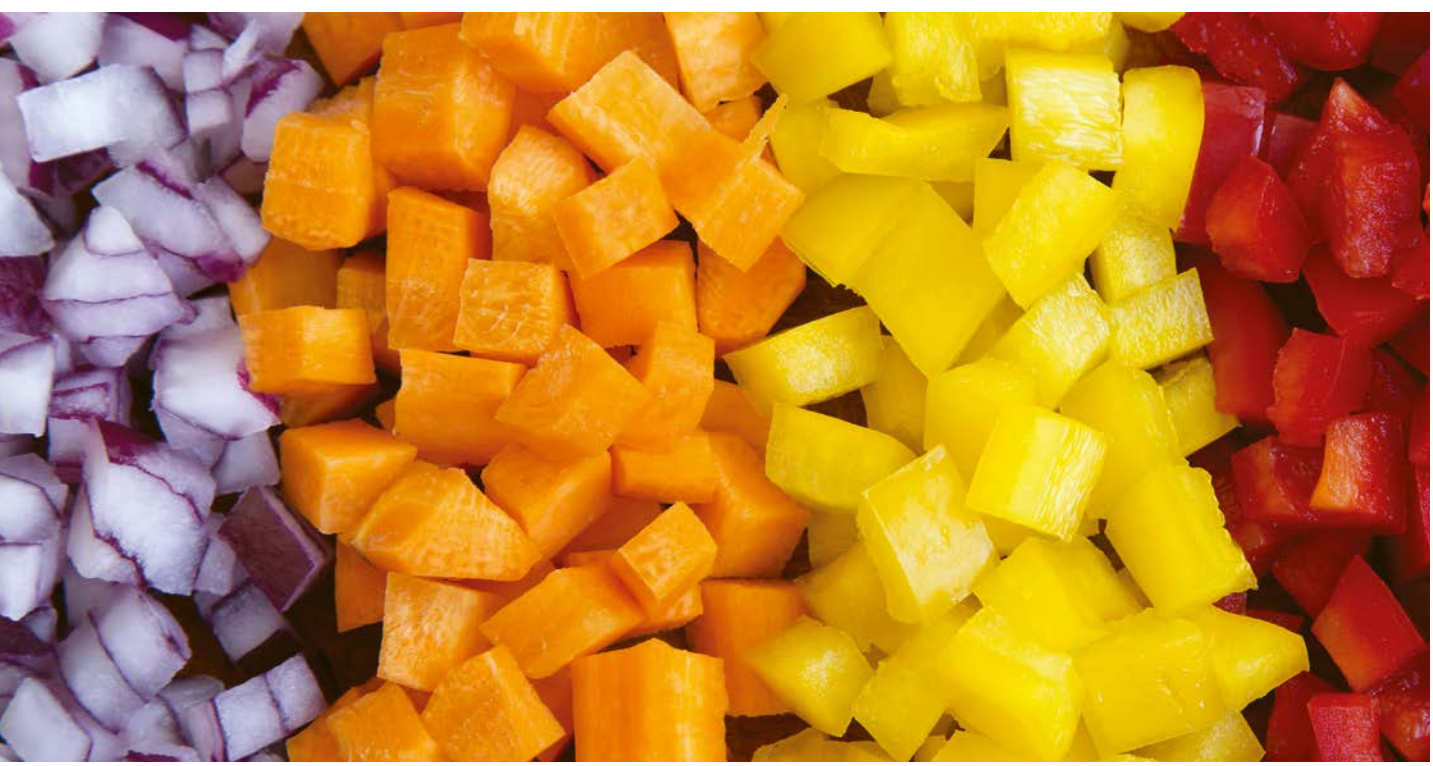
The use of *processed food* is a common practice in mass catering. This food is classified according to the degree of processing. The product range extends from low to ultra-processed:

low *processed food* are, e.g., pasta as dry products or pre-cut *salads*, frozen vegetables, and fruits, as well as dried fruits.

The food that has undergone several processing steps is referred to as ultra-processed food. 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.

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 food*. As part of the strategy, the food industry committed to reduce the sugar, fat, salt and/or calorie content in their products by 2025 with the help of concrete targets [54].

Further information:
www.jobundfit.de
Keyword: Verarbeitete Lebensmittel



When using *processed food (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 food* like fresh or frozen vegetables and fruits, meat or fish are preferred to be processed further on-site.**
Due to the higher nutrient content, vegetables and fruits, fresh or frozen food are preferred to canned products. From an environmental perspective, unprocessed or low *processed food* is also favourable, as the level of resource utilization tends to increase with food processing.

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

☐ **Food with a low content of sugar, fat, saturated fatty acids and/or salt and a low *energy density* is selected.**
There are significant differences in the sugar, fat, saturated fatty acid, salt and energy content of *processed food* within the product groups. Therefore, food should be carefully chosen and those of them that are considered to be more favourable from a nutritional perspective should be preferred. The document "Evaluation of selected *convenience food* in mass catering and recommendations for optimisation" provides assistance for evaluation of selected *processed food* [55] as well as the results of the "Start Low" project (see further information). Data from this project is available for estimating the sugar, salt and saturated fat content.

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

4.1.4 Menu

Similar to the way a business card contains all important information about a person, a 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.

- ☐ **Information is provided on allergens and food additives requiring labelling.**
  For further information see chapter 6.3.

Further information:
www.jobundfit.de
Keyword: Kennzeichnung

- ☐ **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.

- ☐ **The basis of alternatives to meat, fish, egg, milk, and dairy products is clearly defined.**
  The alternatives to meat, fish, egg, milk, and dairy products have grown considerably in recent years, offering a diverse range. Soybean, pea, lupin or wheat protein, as well as beans, sunflower seeds, milk, eggs and jackfruit, for example, serve as the basis for meat and fish substitutes. Vegetable beverages made from soy, oats, rice or almonds are available as milk alternatives. To enable guests to choose consciously, the menu should indicate the source of the alternatives, for example by stating "with pea protein" or "soy-based". Descriptions like "vegetable yoghurt alternative" or "vegan schnitzel" are insufficient.

- ☐ **If nutritional values are declared, the legal requirements are observed.**
  For further information see chapter 6.3.

- ☐ **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.

... furthermore:

- ☐ **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 and sustainable 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 the quality of the offer, especially on sustainable aspects.

For purchases the following criteria apply:

- ☐ **Organic food is used.**
  Organic food contains minimal pollutants and residues. In addition, organic farming makes significant contributions to environmental, climate, water, soil, and *resource protection*. E.g., soil and water conservation by avoiding the use of synthetic chemical pesticides and mineral fertilizers, by using antibiotics in animal husbandry only in emergencies and by reducing environmental pollution with pesticides. These examples have a positive effect on biodiversity [53, 56]. The full potential of organically produced food is realized when sourced locally and *seasonally* [57]. Incorporating a high proportion of organic food in mass catering serves as a crucial tool in fostering an increased demand for *seasonal* organic produce from the respective region. The new Organic Out-of-Home Catering Ordinance (Bio-AHVV) simplifies organic certification for professional catering facilities. Among other things, this regulation allows gastronomic facilities to showcase the organic share of 20 % or more of the total food input's monetary value with a three-stage logo after obtaining appropriate certification [58].

→

... furthermore:

The guideline "Auf dem Weg zu mehr Nachhaltigkeit in der Betriebsverpflegung" a publication of the project "NACHHALTIG BUND GESUND" shows ways to increase the organic share in mass catering even with a fixed and limited budget [59].

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

☐ **Fair trade products are used.**
Purchasing fair trade food like nuts, coffee, tea 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.

Further information:
www.jobundfit.de
Keyword: Fair gehandelte Lebensmittel

☐ **Fish is purchased from sustainable fisheries.**
The Marine Stewardship Council (MSC) and Aquaculture Stewardship Council (ASC) labels, as well as the EU-label for organic produced fish and organic labels like Bioland or Naturland, provide orientation when purchasing fish.

Further information:
www.jobundfit.de
Keyword: Fisch

☐ **Meat from species-appropriate animal husbandry is preferred.**
Species-appropriate animal husbandry is promoted, for example, by organic farms or the Neuland-Verein as well as 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: Tierwohl/Fleisch

☐ **Environmentally friendly packaging is preferred for all food.**
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 and saving costs.

4.3 Preparation

Apart from the food choice, the way meals are prepared and the following time they are kept hot 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.decategory Service

☐ **Fat is used consciously.**
Due to its high energy content and differences in composition, fat and high-fat food 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 fraîche, sour cream or sweet cream, should only be used in low quantities when preparing dishes like casseroles, dressings, sauces or desserts.

☐ **Sugar is used sparingly.**
Sugar-sweetened food and beverages increase the risk of caries, overweight and *obesity* as well as secondary diseases like type 2 diabetes. The addition of sugar and other sweetening ingredients 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.

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 [60]. Food like bread, sausage and cheese already contains larger amounts of salt, so there is only a small amount left to add. When using salt, choose iodized salt, which is an important source of iodine alongside sea fish, milk and dairy products. In order to promote the acceptance of low salt food, 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.

☐ **Maximum holding time for cooked food is 3 hours.**
The longer the food is kept hot, the more heat-sensitive vitamins are lost, and the food appearance, taste and consistency suffer. Keeping cooked food hot for a longer period of time also consumes additional energy. According to DIN 10508:2022-03 [61] and the “Hygiene rules in the catering sector” of the Federal Institute for Risk Assessment with the Federal Centre for Nutrition [62] the hot-keeping period, thus the time between the end of the cooking process and serving of the meal to the last guest, should be maximum 3 hours long. If a 3 hour hot-keeping period is not feasible, the food must be cooled down immediately after preparation and regenerated in batches before serving, according to DIN 10536:2023-03 [63].

☐ **The holding temperature of cooked food is at least 60 °C throughout the food.**
To protect food from spoiling and minimise the risk of foodborne infection or poisoning, the minimum temperature for keeping food hot is 60 °C throughout the food according to DIN 10508:2022-03. For safety reasons in practice, the mentioned norm recommends a temperature of 65 °C throughout the food. This applies to storage as well as transportation and serving [61].

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

☐ **Chilled food is stored at a maximum of 7 °C.**
Chilled food like *salads* or desserts can also spoil easily. According to DIN 10508:2022-03 [61], a storage, transport, and dispensing temperature of 7 °C should not be exceeded as a precaution. 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 cooling, freezing or dishwashing, the use of energy-efficient appliances is advisable. Replacing old models with new ones can amortise in a relatively short time [31].

- ☐ **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 [64]. In addition, in energy-intensive processes like cooling, 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 [31].

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 guests. 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 mentioned hot-keeping temperatures and periods as well as cold storage temperatures also play an important role at the food counter. In addition, communication with the guests in the sense of health-promoting and sustainable catering 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 hot-keeping periods. Towards the end of service time, smaller gastronorm containers should be used for refilling [65]. This also helps to avoid or minimize 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 or portioning independently 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 and are informed about the offer on request. An attractive presentation of all food, where cleanliness and quick refills of food and beverages are standard is crucial. 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 beneficial to access the overproduction, the food returns from the food counter and the food waste generated in the dishwashing room. As far as possible, measurements of each component of the food returns should be conducted over a period of time. The results help to reconsider 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 returns. While non-regenerated components can be re-integrated into the menu the following day as long as maintaining the cold chain, food returns 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*. Reducing food waste is an ongoing process that must be constantly reviewed and, if necessary, adjusted [12].

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! Further suggestions are available through The Competence Center for Out-of-Home Catering (KAHV).

In order to raise guests' 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 food returns, 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 food returns. Was the portion size not appropriate? Did individual components not taste good? Was the mealtime 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:

- ☐ **Food returns 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 food returns provides a basis for optimising menu planning, preparation, and presentation.

- ☐ **Unavoidable waste is made available for energy utilization.**
  Organic waste and food returns may be used to produce heat and electricity in biogas facilities and used fat to produce biodiesel. Today, several 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 the ecolabel "Blauer Engel" (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 structure of employees and students is very heterogeneous, and it is not possible to accommodate all needs and wishes. The requirements and expectations on mass catering 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. Mass catering is often faced with the challenge of how to deal with this aspect in the daily routine.

4.6.1 Food intolerances like allergies

Gastronomic facilities are often frequented by people with very different food intolerances like allergies. But how can those responsible in gastronomic facilities 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.

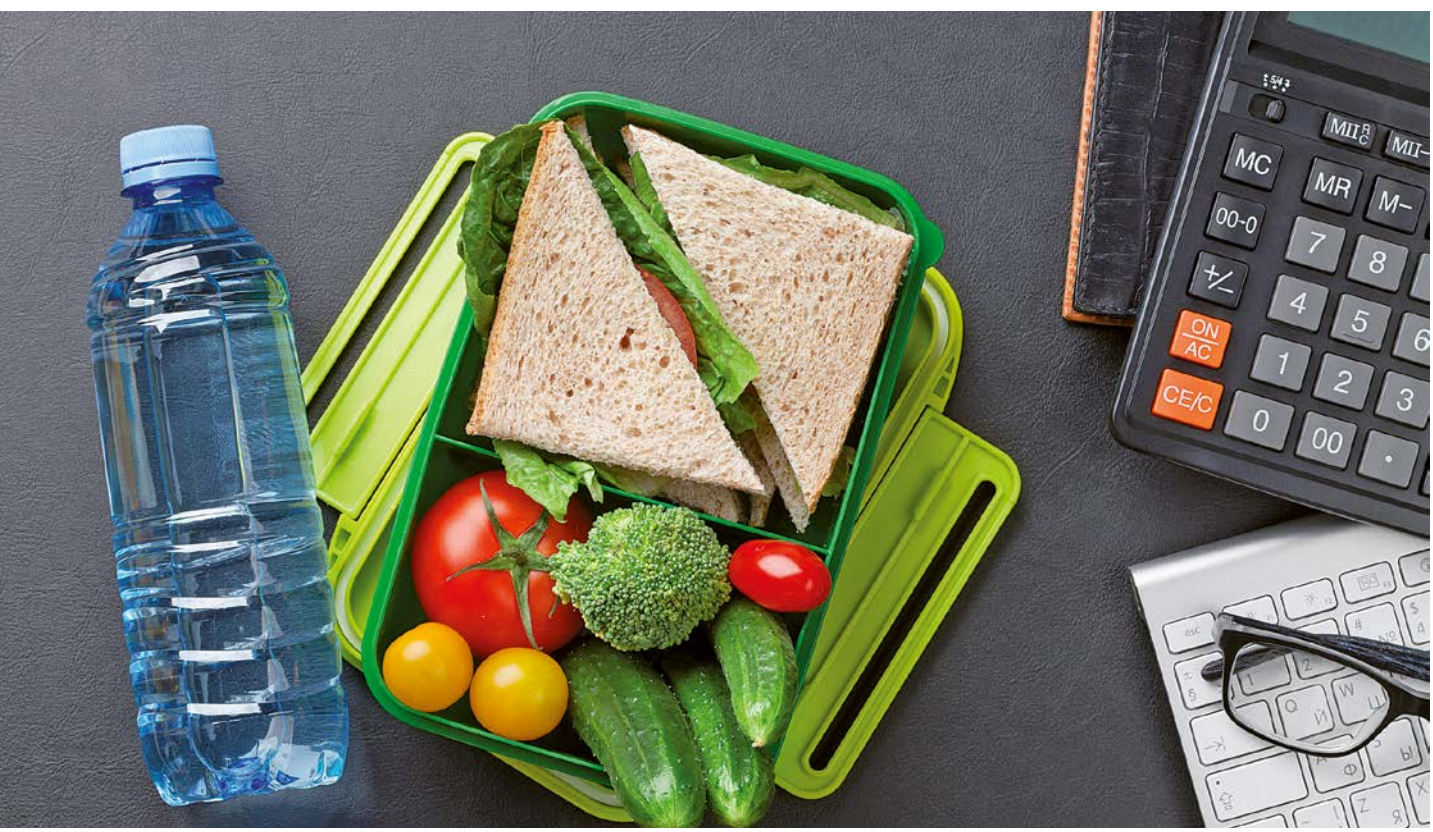
To plan accordingly, it is advisable to conduct a survey on food intolerances in the entire organisation. Only if those responsible know which intolerances are more prevalent in the company they can react accordingly.

Allergen labelling for unpackaged food (see chapter 6) is mandatory since the end of 2014 [66]. The implementation of this information requirement is described in chapter 6.3.

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

4.6.2 Snacks

In catering for employees and students, the focus shifts from lunch to numerous small meals [67]. Therefore, the offered breakfast and snacks should be expanded according to the target group and the general conditions in the organisation. Table 2–4 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 and unsweetened nuts, trail mix, yoghurt with fruit, sugar-free *muesli,* or *raw vegetables* may replace sweets and fatty snacks. Criteria are provided in Table 2 and 4, chapter 4.1.2. 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. European and national regulations have been adopted to reduce the amount of waste and the discharge of single-use plastic products into the environment (see chapter 6).



A snack offer is primarily addressed to guests who either eat a warm supper and, therefore, only a small lunch, or 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. Legal requirements are described in chapter 6.

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

5 Beyond the plate

Every *food environment* influences eating behaviour: from what we see, what is accessible to us, and what we choose, to what we eat. By creating appropriate, *fair food environments*, employees and students can be significantly supported in eating healthily and sustainably.

In *Corporate Health Management*, a wholesome catering offer for employees and students 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 gastronomic facility and break periods are also crucial.

5.1 Importance of guest communication 65

5.2 Prepare and distribute information 66

5.3 *Nudging* 68

5.4 Design of the break period and the dining room 70

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 and sustainable alternatives.

For coordinated communication, those responsible for *gastronomic facilities* 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 delighted 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 organisation. Information about 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 gastronomic facility 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 each other via social media platforms and apps. Here, it is possible to draw on what is already used by employees and students. Images and interactions may encourage guests to explore food from other perspectives as well as change their eating habits.

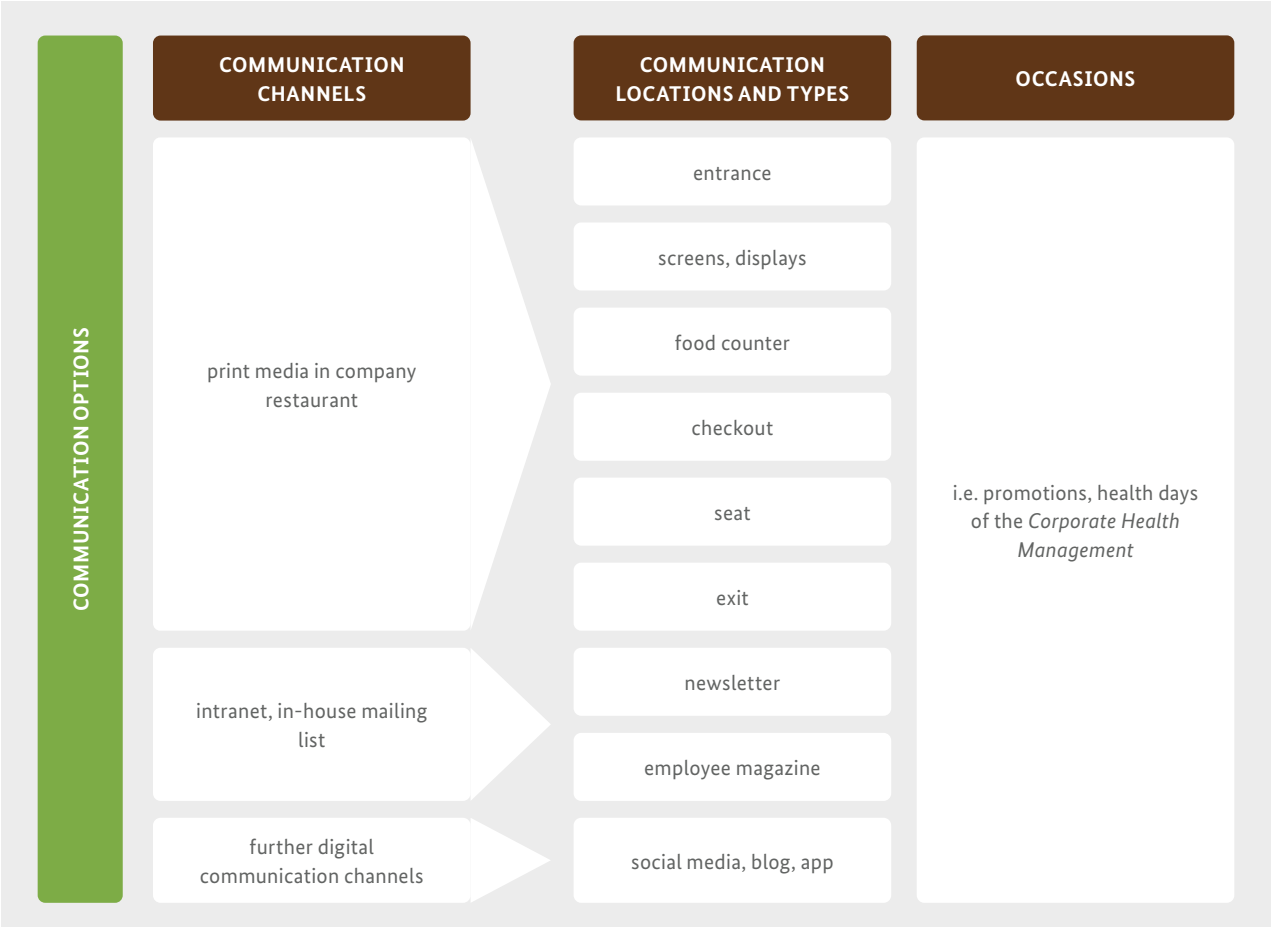


Figure 7: The diversity of communication types and locations

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 other influences that the guests are unaware of at the moment of deciding what to eat [8, 68, 69]. Therefore, what, how much and how guests eat something also depends on the design of the *food environment*. Changes of the *food environment* that make healthy and sustainable choices 'easier' are often referred to as '***nudging***'. In this context, it is important that there is still a choice, but the healthy and sustainable choice is made more accessible and attractive through, e.g., placement, options, descriptions, and presentation. Banning or reducing prices is by definition 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.

Basically, different types of nudges with proven effectiveness through scientific studies can be distinguished [70–77]:

› **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 presentation 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
- different portion 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 food returns. 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 catering for employees and students might be:

- to improve guests' water intake,
- to reduce consumption of sugar sweetened beverages,
- to increase consumption of health-promoting and sustainable food like vegetables, *salad*, *legumes*, wholemeal products and/or fruits; as well as
- to reduce intake of certain food like meat and meat products or sugary and fatty dishes

Nudging contributes significantly to the design of *fair food environments* by supporting healthy and sustainable habits and at the same time reduces obstacles.

Further information:
www.jobundfit.de
Keyword: Nudging

5.4 Design of the break period and the dining room

The design of the gastronomic facilities, especially the dining room, also influences whether the employees and students use and accept the catering. The gastronomic facilities are 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 day at work or university.

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 organisations, 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 gastronomic facilities should

be considered (for conferences, meetings, seminars, 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 respective working conditions, such as shift work. To avoid peak times, other possibilities are webcams that allow a view into the dining room 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 gastronomic facilities 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

Mass catering 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 all of them need to be known by those responsible for mass catering in detail. However, in terms of the duty of care under food law, they must know and comply with all responsibilities relevant to their food business activity. They are also obliged to keep up to date with any changes in the law.

6.1 Food law key regulations 73

6.2 Hygiene and infection control 76

6.3 Labelling and public information 78

6.4 Product liability and retained samples 81

6.5 Waste management and the obligation to offer reusable (food) packaging 81

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"). In particular, it stipulates that only safe food may be distributed and prohibits practices of fraud and deception. It also regulates the companies' obligations in crisis situations, such as public notification or removal of unsafe food from the market. The principle of staged responsibility applies to the adherence to food law regulations: 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.

The German Food and Feed Code (Lebensmittel- und Futtermittelgesetzbuch, [LFBG]) is also important for food companies in Germany. It complements the European Regulation (European LM-BasisVO) by incorporating national provisions related to aspects such as the structure of official food monitoring, penalties, and fines, as well as, regulations for public information.

The basis for food information and labelling is the European Food Information Regulation (FIR) (EU) No. 1169/2011, which regulates general labelling and further information for pre-packaged food in an EU-wide standardized way. It also outlines essential requirements for mass catering, including allergen declaration, which is also required for unpackaged food (loose goods). In Germany, the national Food Information Implementation Regulation (Lebensmittelinformations-Durchführungsverordnung, [LMIDV]) supplementing the LMIV, is also required. The LMIDV stipulates, for example, that food marketed in Germany must always be labelled in German or the allergen declaration on non-prepackaged food. Table 5 provides an overview of selected food law regulations and interpretation aids for mass catering.

Table 5: 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	› German Food and Feed Code (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 hygiene rules for food of animal origin › Regulation (EC) No 2073/2005 on microbiological criteria for foodstuffs	› Food Hygiene Ordinance (Lebensmittelhygiene-Verordnung [LMHV]) › Animal Food Hygiene Ordinance (Tierische Lebensmittelhygiene-Verordnung [Tier-LMHV]) › Ordinance on foodstuff provisions to control zoonoses and zoonotic agents (Zoonose-Verordnung [ZoonoseV])
		› Infection Protection Act (Infektionsschutzgesetz [IfSG])
official monitoring	› Regulation (EU) No 2017/625 on official controls and other official activities	› Food Law Penalty and Fine Ordinance (Lebensmittelrechtliche Straf- und Bußgeldverordnung)
labelling and consumer information	› Regulation (EU) No 1169/2011 on the provision of food information to consumers (FIR) › Regulation (EC) No 1333/2008 on food additives › In the case of nutrient and health-related claims: Regulation (EU) No 1924/2006 on nutrition and health claims made on foods › In case of organic claims: Regulation (EU) 2018/848 on organic production and labelling of organic products	› Food Information Implementation Ordinance (Lebensmittelinformations-Durchführungsverordnung [LMIDV]) › Food-additive Implementing Regulation (Lebensmittelzusatzstoff-Durchführungsverordnung [LMZDV]) › In the case of organic claims: e.g. Ecological Production Act (Ökolandbaugesetz [ÖLG]), Organic Labeling Act (Öko-Kennzeichengesetz [ÖkoKennzG]), Organic Out-of-home Catering Ordinance (Bio-Außer-Haus-Verpflegung-Verordnung [Bio-AHVV])

	legally non-binding aids for practical implementation
	› Guidance on the Implementation of Articles 11, 12, 14, 17, 18, 19 and 20 of Regulation (EC) No 178/2002 on General Food Law (Dec. 2004)
	› "Guidelines of Good Hygiene Practice" » Guideline for good food hygiene practice in social facilities, (working version, 2022) » Guideline for good food hygiene practice in daycare facilities, (2nd edition, 2020) » Guideline for the gastronomy sector (3rd edition, 2022) › Selected 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 German Federal Institute for Risk Assessment » Safe food: Especially vulnerable groups in communal facilities, 2021 › Publication of the Federal Institute for Risk Assessment in cooperation with the Federal Centre for Nutrition » Hygiene rules in the catering sector, 2020 › European Commission Notice regarding » *HACCP* (Commission Notice 2022/C 355/01) » EU guidelines on food donation (Commission Notice. 2017/C 361/1)
	› Commission Notice on questions and answers on the application of the FIR (Commission Notice 2018/C 196/1) › Identifying the public perception: Designations of the German Food Code (Leitsätze des Deutschen Lebensmittelbuchs)

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 their size or whether they only offer sandwiches or a comprehensive hot lunch. 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]), statements and recommendations by authorities like the Federal Institute for Risk Assessment (BfR) or the sector-specific "Guidelines of Good Hygiene Practice". 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 persons responsible for food law must fulfil are essentially determined from 2 European regulations:

- **Regulation (EC) No 852/2004 on the hygiene on foodstuffs:**
  As required by law, the hygiene in food businesses must meet a high standard in order to fulfil the principle of ensuring optimal product safety. It is therefore required, that 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 outlines fundamental requirements for operating facilities where food is handled. These must generally be clean, constantly maintained, and easy to clean. Various other specifications, such as lighting and ventilation, floor conditions, the number of washbasins, are also stipulated. The implementation of legally mandated hygiene measures in specific cases depends on the unique circumstances at each location. 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 as well as DIN 10508:2022-03: 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 if a company processes food of animal origin. Excluded from its scope is food that contains both ingredients of plant origin and processed products of animal origin, for example salami pizza or breaded schnitzel. Of practical importance for mass catering establishments are the storage temperatures for certain food regulated in the annexes to Regulation (EC) No 853/2004 (see DIN 10508:2022-03). It is also regulated whether a mass catering business requires approval in accordance with Article 4(2)(d) of Regulation (EC) No 853/2004 or is only subject to registration.

In addition to these 2 key regulations, there are other European and national hygiene regulations that contain obligations for food business operators (see Table 5). For example, § 20a of the national Animal Food Hygiene Ordinance (Tier-LMHV) defines specific requirements for the distribution of raw egg products in mass catering.

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., in gastronomy or in kitchens of social facilities (see Table 5).

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 Article 5 of Regulation (EC) No 852/2004). 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 food and checked as scheduled, the necessary measures can be taken immediately in the event of deviations. Health hazards are already identified during the production process and can be ruled out. The safety of the end product is thus guaranteed by the self-monitoring system. The official food control checks the "Hazard Analysis and Critical Control Points" system, including associated documentation, as part of their control activities [78].

Further information:
www.jobundfit.de
Keyword: Hygiene

Hygiene training obligation

Anyone who produces, handles or distributes 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, regularly transport or serve food. 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. DIN 10514 also describes the training content for persons who are responsible for developing and applying the "*Hazard Analysis and Critical Control Points*" concept within the company. 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 for infection protection

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. The purpose of the training is to educate employees about specific rights and responsibilities related to infection protection thereby reinforcing their individual accountability. The focus is on prohibitions on activities and employment in the event of certain illnesses or symptoms of illness, such as vomiting and diarrhoea as outlined in § 42 of the IfSG. The local health authority is usually responsible for the initial instruction. It issues a corresponding certificate, which must be presented to the company. It must not be older than 3 months when the employee starts work. Subsequent training is required at this juncture and every 2 years thereafter. It can be conducted by the employer or an authorized person.

6.3 Labelling and public information

In mass catering, most meals are offered unpackaged. Certain information obligations also apply to them, but these are implemented somewhat differently than for packaged food, which are offered in supermarkets, for example.

However, a central principle of labelling law also extends to the menu: All information must be accurate and must not mislead guests. This means that names on the menu must be chosen carefully, ensuring they do not create false expectations in the target group and facilitate conscious consumer decisions. In the case of meat products, for example, specifying the animal species from which the meat originates is advisable. There are legally binding designations for some ingredients or dishes, such as “cheese”. This term is protected by law and is reserved for products made from milk. The description “gratinated with cheese” may only be used if it contains cheese. For instance, a “pudding” is typically prepared with milk. If a comparable vegan dessert is offered based on rice drink, this should be indicated.

Assistance in selecting suitable names for dishes: The guidelines of the “German Food Code” describe, as a kind of anticipated expert opinion, what is generally expected of a “cordon bleu”, a “rye bread” or a “milk ice cream”, for example.

Special information requirements on allergens and food additives

Some people have an allergic reaction or suffer from intolerances when they eat certain food. Others are sceptical about the use of additives and want to avoid them. For this reason, special information obligations apply to certain allergens and substances that trigger intolerances as well as additives. This enables everyone to make a conscious consumption decision, not only for packaged goods, but also for unpackaged food. These obligations apply wherever food is typically offered unpackaged – in bakeries, restaurants, ice cream parlours and also in mass catering. The information requirements are based on EU law. Details on implementation are regulated by 2 national regulations:

- the Food Information Implementation Ordinance (LMIDV) regarding allergens (see § 4(2) LMIDV in conjunction with Article 9(1)(c) FIR in conjunction with Annex II FIR) and
- the Food-additive Implementing Regulation (see § 5 LMZDV).

The information obligation under Annex II of the FIR covers 14 food or food groups that most frequently trigger allergies or intolerances in Europe – in common parlance, they are referred to as the “14 major allergens” (see box, p. 80). The obligation to provide information on additives does not apply to individual additives, but to certain groups of additives, including preservatives, sweetener and colorants. Information must always be provided on additives of certain classes if they are included in the food on offer. Detailed requirements are set out in § 5 (1) and (2) LMZDV (see Table 6).

Table 6: Overview of food additives subject to mandatory labelling

Class name or food additive	Labelling	Practical examples
colorants	› "with colorant"	› desserts, coatings
preservatives	› "with preservative" or "preserved"	› deli *salads*, mayonnaises
	› if only the food additives E 249 to E 252 are used: for food with curing salt "with curing salt", for food with sodium or potassium nitrate "with nitrate" and for food with curing salt and sodium or potassium nitrate "with curing salt and nitrate"	› meat products
antioxidants	› "with antioxidant"	› seasonings, instant soups, broths
flavour enhancers	› "with flavour enhancer"	› seasoning mixes, instant soups, sauces, flavoured products
iron salts E 579 or E 585 (no class name)	› "blackened"	› black olives
sweetener	› "with sweetener"*	› mustard, deli *salads*, sauces
	› for food with aspartame (E 951) or aspartame-acesulfame salt (E 962): "contains a source of phenylalanine"	› food with reduced energy value
	› for food with more than 10 % added polyhydric alcohols with the numbers E 420, E 421, E 953 and E 965 to E 968: "may have a laxative effect if consumed excessively"	
food additives with the numbers E 338 to E 341, E 343 and E 450 to E 452	› "with phosphate" only applies to meat products	› boiled sausages, cooked ham
food additives with the numbers E 445, E 471, E 473, E 474, E 901 to E 905 and E 914, which are used for surface treatment	› "waxed" only applies to fresh fruit and vegetables	› apples and pears, fresh citrus fruits, melons

* with the exception of tabletop sweetener: for these, the indication "based on ...", supplemented by the name of the sweetener used, is mandatory.

While the obligation to provide information on allergens and additives is governed by different regulations, it is implemented according to a single principle: in both cases, written information must be available in German before making a purchase. There are various ways to do this:

- on menus, beverage menus or in the price list, e.g. by stating “Wiener Schnitzel, contains egg and gluten” or “Bratwurst, with curing salt” (footnotes, symbols or abbreviations are possible if these are listed in close proximity and clearly itemized),
- on a sign on or near the food,
- in other directly and easily accessible written or electronic information (e.g. folder, leaflet, electronically on a terminal, etc.).

Verbal information is also possible, but only by an adequately informed person (about the relevant ingredients and processing additives) under the following conditions (see § 4 (4) LMIDV):

- There must be an additional written documentation on the allergenic ingredients and food additives used in the production of the specific food (as mentioned above).
- There must be a clear reference to this information option, e.g. a sign in the sales area or a note on the menu.
- This written documentation is easily accessible to the authorities and guests upon request.
- The required information must be promptly provided upon request before the purchase is made and before the food is handed over.

In the context of mass catering, providing only verbal information about allergens and food additives seams impractical, given that a substantial number of guests typically need to be served in a limited time frame.

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

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

Organic claims on the menu

The term “organic” (in German “öko” or “bio”) is protected by law. The Organic Out-of-home Catering Ordinance (Bio-AHVV) specifies 2 options for organic food labelling for catering companies. Firstly, the labelling of exclusively organic ingredients used in the kitchen is permitted. Additionally, the AHV label can convey the monetary percentage of organic content in 3 categories (bronze: 20–49 %, silver: 50–89 %, gold: 90–100 %). Both the labelling of organic ingredients and the indication of organic content require a valid organic certificate, granted after a successful inspection by a state-recognized inspection body [58].

Nutrition declaration

Nutrition declaration is not obligatory for loose goods – in contrast to pre-packaged goods. However, anyone who voluntarily wish to provide information on nutritional values, must comply with the requirements of Article 30 (5) of FIR in conjunction with Article 32 in conjunction with Annex XV FIR. 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 g or 100 mL are listed. It is also permitted to refer the information to a portion, as long as it is clearly quantified [79].

Nutrition claims like “low-fat” or “rich in Vitamin C” are only permitted if the requirements of Regulation (EC) No 1924/2006 on nutrition and health claims made on foods (HCVO) are met. For example, a food product advertised as “low-fat” in form of a dessert with a solid texture may contain a maximum of 3 g of fat per 100 g. Advertising the Vitamin C content is only permitted above a certain minimum content [79].

Further information:
www.jobundfit.de
Keyword: Kennzeichnung

6.4 Product liability and retained samples

Anyone who manufactures food is liable under the German Act on Liability for Defective Products (ProdHaftG) for damage to property and health resulting from defective products. This applies, for example, if a guest complains of stomach pains caused by eating a microbially contaminated dessert. In such cases, producers must prove that the dessert they produced was free of any defects when it was served. Otherwise, they are liable for any damage found. Liability exists regardless of fault.

In practice, retained samples can be used to prove that a company has adequately fulfilled its own duty of care under food law or to prove that the cause of the damage is to be found elsewhere. A retained sample is a representative product sample that is taken and stored under defined conditions. Guidance on this is provided by DIN 10526. The person responsible in the company usually decides whether retained samples are taken. There is no general legal obligation to do so. However, this can be useful for perishable food containing poultry, eggs, or fish.

6.5 Waste management and the obligation to offer reusable (food) packaging

Waste naturally occurs in mass catering, which cannot be completely avoided even with good resource management. Several regulations apply in this context, and those responsible for operations must be familiar with them. This includes the Animal by-products-Elimination Act (TierNebG) regarding the disposal of kitchen and food waste. EU hygiene legislation also outlines specific requirements for waste management. DIN 10506: Food hygiene in mass catering, for example, describes how these can be implemented in practice.

Efforts to minimize waste in mass catering are crucial, encompassing measures to reduce food waste. This may involve voluntarily redistributing surplus, still-edible food to interested third parties on-site.

Since January 2023, mass catering companies have been mandated to offer reusable packaging when offering food or beverages intended for immediate consumption takeaway: §§ 33 and 34 of the German Packaging Act (VerPackG) stipulate that, in addition to disposable plastic food packaging and disposable drinks cups, reusable alternatives must be offered, and customers must be informed of this choice. An exemption to this obligation is granted to companies with a sales area of up to 80 m^2 and a maximum of 5 employees.

Further information:
www.jobundfit.de
Keyword: Verpackungen

Checklist

The following checklist provides an overview of all criteria of this DGE-Quality Standard. It enables companies, public authorities, universities 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 in catering for employees and students	not fulfilled	partially fulfilled	fulfilled
A *catering concept* is in place.	☐	☐	☐
All stakeholders are involved.	☐	☐	☐
A catering commissioner exists.	☐	☐	☐
Catering staff receive continuous training.	☐	☐	☐
Ergonomic workplaces and workflows are in place.	☐	☐	☐
Employees are valued.	☐	☐	☐
Feedback on the menu is regularly obtained, evaluated and measures are derived.	☐	☐	☐

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 × (min. 2 × daily)** wholemeal products, *pseudocereals*, *muesli* without added sugar and other *sweetening ingredients*	☐	☐	☐
thereof: min. 50 % of the daily offer from wholemeal products	☐	☐	☐
vegetables and *salad* **min. 5 × (min. 1 × daily)** vegetables (fresh or frozen), *legumes*, *salad*	☐	☐	☐
thereof: min. 3 × as *raw vegetables*	☐	☐	☐
fruit **10 × (2 × daily)** fruits (fresh or frozen), nuts and oil seeds, unsalted → each without added sugar and other *sweetening ingredients*	☐	☐	☐
thereof: min. 2 × as nuts or oil seeds	☐	☐	☐
milk and dairy products **min. 10 × (min. 2 × daily) based on the following specifications** milk, plain yoghurt, buttermilk, sour milk, kefir: max. *absolute fat content* 3,8 % quark: max. *absolute fat content* 5 % → each without added sugar and other *sweetening ingredients* cheese: max. *absolute fat content* 30 %	☐	☐	☐
meat, sausage, fish and eggs **max. 2 × meat/cold cuts offered** meat and cold cuts as bread topping: max. fat content 20 %	☐	☐	☐
oils and fats **rapeseed oil is standard oil** rapeseed oil, linseed, walnut, soybean, olive oil, margarine made from the oils mentioned	☐	☐	☐
beverages **available anytime** water, fruit and herbal tea → each without added sugar and other *sweetening ingredients*	☐	☐	☐

	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 × (min. 2 × daily)** wholemeal products, *pseudocereals*, *muesli* without added sugar and other *sweetening ingredients*	☐	☐	☐
thereof: min. 50 % of the daily offer from wholemeal products	☐	☐	☐
vegetables and *salad* **min. 5 × (min. 1 × daily)** vegetables (fresh or frozen), *legumes*, *salad*	☐	☐	☐
thereof: min. 3 × as *raw vegetables*	☐	☐	☐
fruit **10 × (2 × daily)** fruits (fresh or frozen), nuts and oil seeds, unsalted → each without added sugar and other *sweetening ingredients*	☐	☐	☐
thereof: min. 2 × as nuts or oil seeds	☐	☐	☐
milk and dairy products **min. 10 × (min. 2 × daily) based on the following specifications** milk, plain yoghurt, buttermilk, sour milk, kefir: max. *absolute fat content* 3,8 % quark: max. *absolute fat content* 5 % → each without added sugar and other *sweetening ingredients* cheese: max. *absolute fat content* 30 %	☐	☐	☐
oils and fats **rapeseed oil is standard oil** rapeseed oil, linseed, walnut, soybean, olive oil, margarine made from the oils mentioned	☐	☐	☐
beverages **available anytime** water, fruit and herbal tea → each without added sugar and other *sweetening ingredients*	☐	☐	☐

	not fulfilled	partially fulfilled	fulfilled
Food qualities and frequencies for BREAKFAST and SNACKS, VEGAN DIET, 5 catering days			
grain, grain products, potatoes **min. 10 × (min. 2 × daily)** wholemeal products, *pseudocereals*, *muesli* without added sugar and other *sweetening ingredients*	☐	☐	☐
thereof: min. 75 % of the daily offer from wholemeal products	☐	☐	☐
vegetables and *salad* **min. 10 × (min. 2 × daily)** vegetables (fresh or frozen), *legumes*, *salad*	☐	☐	☐
thereof: min. 3 × as *raw vegetables*	☐	☐	☐
min. 1 × green leafy vegetables	☐	☐	☐
min. 1 × *legumes*	☐	☐	☐
fruit **10 × (2 × daily)** fruits (fresh or frozen), nuts and oil seeds, unsalted → each without added sugar and other *sweetening ingredients*	☐	☐	☐
thereof: min. 4 × as nuts or oil seeds	☐	☐	☐
vegetable milk and dairy products alternatives **min. 10 × (min. 2 × daily)** Vegetable milk alternatives fortified with calcium, iodine Vitamin B_2, Vitamin B_{12} and Vitamin D Vegetable dairy products alternatives → each without added sugar and other *sweetening ingredients*	☐	☐	☐
vegetable meat, sausage, fish and egg alternatives Protein rich alternatives like tofu, seitan, tempeh	☐	☐	☐
oils and fats **rapeseed oil is standard oil** rapeseed oil, linseed, walnut, soybean, olive oil, margarine made from the oils mentioned	☐	☐	☐
beverages **available anytime** min. 5 × mineral water with calcium ca. 1500 mL mineral water with calcium (min. 150 mg calcium/L) water, fruit and herbal tea → each without added sugar and other *sweetening ingredients*	☐	☐	☐

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

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

	not fulfilled	partially fulfilled	fulfilled
Food qualities and frequencies for LUNCH VEGAN DIET, 5 catering days			
grain, grain products, potatoes **5 × (1 × daily)** wholemeal products, *pseudocereals*, *potatoes*, *raw or precooked*, *parboiled* rice or brown rice	☐	☐	☐
thereof: min. 1 × wholemeal products	☐	☐	☐
max. 1 × *potato products*	☐	☐	☐
vegetables and *salad* **5 × (1 × daily)** vegetables (fresh or frozen), dark green leafy vegetables like broccoli, kale, pak choi, *legumes*, *salad*	☐	☐	☐
thereof: min. 2 × as *raw vegetables*	☐	☐	☐
min. 1 × green leafy vegetables	☐	☐	☐
min. 3 × *legumes*	☐	☐	☐
fruit **min. 3 ×** fruits (fresh or frozen), nuts and oil seeds, unsalted → each without added sugar and other *sweetening ingredients*	☐	☐	☐
thereof: min. 1 × as *whole fruit*	☐	☐	☐
min. 2 × as nuts or oil seeds	☐	☐	☐
Vegetable milk and dairy products alternatives **min. 2 ×** Vegetable milk alternatives fortified with calcium, iodine, Vitamin B_2, Vitamin B_{12} and Vitamin D Vegetable dairy products alternatives → each without added sugar and other *sweetening ingredients*	☐	☐	☐
Vegetable meat, sausage, fish and egg alternatives **min. 1 ×** Protein rich alternatives like tofu, seitan, tempeh	☐	☐	☐
thereof: max. 1 × ultra-processed ready-to-eat alternatives of meat and fish	☐	☐	☐
oils and fats **rapeseed oil is standard oil** rapeseed oil, linseed, walnut, soybean, olive oil, margarine made from the oils mentioned	☐	☐	☐
beverages **available anytime** water, fruit and herbal tea → each without added sugar and other *sweetening ingredients*	☐	☐	☐

	not fulfilled	partially fulfilled	fulfilled
Additional criteria for menu planning			
Ovo-lacto-vegetarian options are available every day for every meal.			
A vegan offer is available on request.			
Seasonal and *regional* vegetables and fruits are included.			
Local food is 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.			
Meat and fish alternatives are offered for lunch no more than 4 times in 20 catering days.			
Beverages are available anytime.			
The lunch *menu cycle* is repeated after 4 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 the planning.			
Criteria for the use of *processed food (convenience food)* in mass catering			
Products without palm (kernel) fat, palm (kernel) oil or coconut fat are preferred.			
Unprocessed or low *processed food*, like fresh or frozen vegetables and fruits, meat or fish, are preferred to be processed further on-site.			
Ultra-*processed food* are always combined or complemented with low *processed food*/components.			
Food with a low content of sugar, fat, saturated fatty acids and/or salt and a low energy density is selected.			

	not fulfilled	partially fulfilled	fulfilled
Menu criteria			
The current menu in advance is accessible on a regular and barrier-free basis.	☐	☐	☐
Information is provided on allergens and food additives requiring labelling.	☐	☐	☐
Food is named clearly.	☐	☐	☐
For meat, sausages and fish, the animal species is named.	☐	☐	☐
The basis of alternatives to meat, fish, egg, milk, and dairy products is clearly defined.	☐	☐	☐
If the nutritional values are declared, the legal requirements are observed.	☐	☐	☐
If prices are mentioned, they are displayed clearly 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 preferred.	☐	☐	☐
Environmentally friendly packaging is preferred for all food.	☐	☐	☐
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.	☐	☐	☐
Maximum holding time for cooked food is 3 hours.	☐	☐	☐
The holding temperature of cooked food is at least 60 °C throughout the food.	☐	☐	☐
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**			
Food returns are recorded separately by meal and component and the outcomes are used for future menu planning.	☐	☐	☐
Unavoidable waste is made available for energy utilization.	☐	☐	☐
Attention is paid to the use of environmentally friendly cleaning agents.	☐	☐	☐
Dosage 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.	☐	☐	☐

Please note:
“Guidelines for DGE certification” including “DGE certification checklists” are available for DGE certification. These documents explain the criteria examined during the audit and provide guidance on verifying implementation.

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

References

[1] Robert Koch-Institut: Die Gesundheit von Erwachsenen in Deutschland (DEGS), Berlin (2012)

[2] statista: Immer mehr stark Übergewichtige, 2019 https://de.statista.com/infografik/17609/anteil-eebergewichtiger-in-deutschland/ (eingesehen am 08.05.2023)

[3] statista: Prognostizierter Anteil adipöser Erwachsener (Fettleibigkeit*) in ausgewählten Ländern nach Geschlecht im Jahr 2025 https://de.statista.com/statistik/daten/studie/582427/umfrage/anteil-adipoeser-erwachsener-fettleibigkeit-nach-laendern-und-geschlecht/ (eingesehen am 08.05.2023)

[4] statista: Anteil der Frauen mit Übergewicht und Adipositas in Deutschland in den Jahren 2005 bis 2017, 2005–2017 https://de.statista.com/statistik/daten/studie/233461/umfrage/entwicklung-von-uebergewicht-und-adipositas-in-deutschland-unter-frauen/#professional (eingesehen am 08.05.2023)

[5] statista: Anteil der Männer mit Übergewicht und Adipositas in Deutschland in den Jahren 2005 bis 2017, 2005–2017 https://de.statista.com/statistik/daten/studie/233449/umfrage/entwicklung-von-uebergewicht-und-adipositas-in-deutschland-bei-maennern/ (eingesehen am 08.05.2023)

[6] GKV-Spitzenverband: Leitfaden Prävention Handlungsfelder und Kriterien nach § 20 Abs. 2 SGB V Leitfaden Prävention in stationären Pflegeeinrichtungen nach § 5 SGB XI (2018)

[7] GKV-Spitzenverband: Kapitel 6: Betriebliche Gesundheitsförderung nach §20b SGB V (2017)

[8] Wissenschaftlicher Beirat für Agrarpolitik, Ernährung und gesundheitlichen Verbraucherschutz (WBAE) beim BMEL: Politik für eine nachhaltigere Ernährung: Eine integrierte Ernährungspolitik entwickeln und faire Ernährungsumgebungen gestalten. Gutachten, Berlin (Juni 2020)

[9] Wissenschaftlicher Beirat für Agrarpolitik, Ernährung und gesundheitlichen Verbraucherschutz (WBAE) beim BMEL: Ernährungsarmut unter Pandemiebedingungen. Stellungnahme, Berlin (März 2023)

[10] Renner B, Arens-Azevedo U, Watzl B et al.: DGE-Positionspapier zur nachhaltigeren Ernährung. Ernährungs Umschau international (2021) 144–154

[11] Deming WE: Out of the Crisis. MIT Press, Cambridge (2000)

[12] Borstel T v., Prenzel, G. K., Welte, B.: FOOD WASTE 4.0 – Zwischenbilanz 2020, Plankstadt (September 2020)

[13] Deutsche Gesellschaft für Ernährung (Hrsg.): Vollwertig essen und trinken nach den 10 Regeln der DGE (2018)

[14] Deutsche Gesellschaft für Ernährung (Hrsg.): Vollwertig essen und trinken mit den Empfehlungen der DGE. Bonn, 1. Auflage (2022)

[15] Deutsche Gesellschaft für Ernährung (Hrsg.): Vollwertig essen und trinken nach den 10 Regeln der DGE, 2. überarbeitete Auflage (2021)

[16] Hauff V: Unsere gemeinsame Zukunft. Der Brundtland-Bericht der Weltkommission für Umwelt und Entwicklung. Eggenkamp Verlag, Greven (1987)

[17] Willett W, Rockström J, Loken B et al.: Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems. The Lancet 393 (2019) 447–492

[18] Willett W, Rockström J, Loken B: The EAT-Lancet Commission: a flawed approach? – Authors' reply. Lancet 394 (2019) 1141–1142

[19] Breidenassel C, Schäfer AC, Micka M et al.: Einordnung der Planetary Health Diet anhand einer Gegenüberstellung mit den lebensmittelbezogenen Ernährungsempfehlungen der DGE. Ernährungs Umschau 69(5) (2022) 56–72. e1–3

[20] Koerber K v., Kretschmer J: Ernährung nach den vier Dimensionen. Ernährung & Medizin 21 (2006) 178–185

[21] Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (BMZ): Der Zukunftsvertrag für die Welt. Die Agenda 2030 für nachhaltige Entwicklung (2017)

[22] Burlingame B, Dernini S: Sustainable diets and Biodiversity – Directions and solutions for policy, research and action. Proceedings of the International Scientific Symposium „Biodiversity and Sustainable Diets United Against Hunger", Rome (2010)

[23] High Level Panel of Experts on Food Security and Nutrition (HLPE): Food losses and waste in the context of sustainable food systems. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome (2014)

[24] Reinhardt F, Gärtner S, Wagner T.: Ökologische Fußabdrücke von Lebensmitteln und Gerichten in Deutschland, Heidelberg (2020)

[25] WWF Deutschland (Hrsg.): So schmeckt Zukunft: Der kulinarische Kompass für eine gesunde Erde – Ernährung und biologische Vielfalt, Berlin (Februar 2022)

[26] Crippa M, Solazzo E, Guizzardi D et al.: Food systems are responsible for a third of global anthropogenic GHG emissions. Nature Food (2021)

[27] Bundesanstalt für Landwirtschaft und Ernährung (Hrsg.): Reduzierte Bodenbearbeitung – schont Boden und Klima https://www.oekolandbau.de/landwirtschaft/pflanze/grundlagen-pflanzenbau/boden/reduzierte-bodenbearbeitung-schont-boden-und-bodenleben/ (eingesehen am 05.06.2023)

[28] Bund für Umwelt und Naturschutz Deutschland e.V. (Hrsg.): Industrielle Tierhaltung braucht Antibiotika – und erhöht das Risiko resistenter Bakterien https://www.bund.net/massentierhaltung/antibiotika/ (eingesehen am 05.06.2023)

[29] Umweltbundesamt (Hrsg.): Pflanzenschutzmittel in der Landwirtschaft https://www.umweltbundesamt.de/themen/boden-landwirtschaft/umweltbelastungen-der-landwirtschaft/pflanzenschutzmittel-in-der-landwirtschaft (eingesehen am 05.06.2023)

[30] Umweltbundesamt (Hrsg.): Stickstoff https://www.umweltbundesamt.de/themen/boden-landwirtschaft/umweltbelastungen-der-landwirtschaft/stickstoff#einfuhrung (eingesehen am 05.06.2023)

[31] Scharp M, Engelmann T, Muthny J et al.: KEEKS-Leitfaden für die klimaschonende Schulküche, 2019 https://elearning.izt.de/pluginfile.php/4807/mod_resource/content/3/Leitfaden_KEEKS_190429_www.pdf (eingesehen am 05.06.2023)

[32] Fachhochschule Münster, Institut für Nachhaltige Ernährung: NAHGAST https://www.nahgast.de/praxishandbuch/ (eingesehen am 05.06.2023)

[33] statista: Kennzahlen der Verpflegung/Gastronomie in Betrieben in Deutschland, 2013 https://de.statista.com/statistik/daten/studie/680162/umfrage/kennzahlen-der-versorgung-in-unternehmen-in-deutschland/ (eingesehen am 08.05.2023)

[34] statista 2023: Hochschulgastronomie: Anzahl der Mensen und Cafeterien | Statista https://de.statista.com/statistik/daten/studie/692828/umfrage/anzahl-der-mensen-und-cafeterien-in-deutschland/ (eingesehen am 12.06.2023)

[35] Fachhochschule Münster, Institut für Nachhaltige Ernährung (Hrsg.): Der Nahgast Rechner https://www.nahgast.de/rechner/ (eingesehen am 05.06.2023)

[36] Wirtz A, Theurl M, Schäfer F et al.: CO_2OK: CO_2 – optimierte Großküchen in Hessen - Bilanzierung und Optimierung - (2016)

[37] EAT-Lancet Commission: FOOD PLANET HEALTH – Healthy Diets From Sustainable Food Systems. Summary Report (2019)

[38] Deutsche Gesellschaft für Ernährung (Hrsg.): Fettzufuhr und Prävention ausgewählter ernährungsmitbedingter Krankheiten – Evidenzbasierte Leitlinie. 2. Version 2015. Bonn (2015) https://www.dge.de/wissenschaft/dge-leitlinien/leitlinie-fett/ (eingesehen am 05.06.2023)

[39] Deutsche Gesellschaft für Ernährung (Hrsg.): Kohlenhydratzufuhr und Prävention ausgewählter ernährungsmitbedingter Krankheiten – Evidenzbasierte Leitlinie. Bonn (2011) https://www.dge.de/wissenschaft/dge-leitlinien/leitlinie-kohlenhydrate/ (eingesehen am 05.06.2023)

[40] Deutsche Gesellschaft für Ernährung (DGE), Österreichische Gesellschaft für Ernährung (ÖGE), Schweizerische Gesellschaft für Ernährung (SGE): Referenzwerte für die Nährstoffzufuhr. DGE, Bonn, 2. Auflage, 7. aktualisierte Ausgabe (2021)

[41] Deutsche Gesellschaft für Ernährung (Hrsg.): Ein Hoch auf Hülsenfrüchte. DGE aktuell (07/2016)

[42] Bundesministerium für Ernährung und Landwirtschaft (BMEL) (Hrsg.): Ackerbau – Eiweißpflanzenstrategie des BMEL https://www.bmel.de/DE/themen/landwirtschaft/pflanzenbau/ackerbau/eiweisspflanzenstrategie.html (eingesehen am 05.06.2023)

[43] Bundesministerium für Ernährung und Landwirtschaft (BMEL) (Hrsg.): Ackerbohne, Erbse & Co. – Die Eiweißpflanzenstrategie des Bundesministeriums für Ernährung und Landwirtschaft zur Förderung des Leguminosenanbaus in Deutschland, Januar 2020 https://www.bmel.de/SharedDocs/Downloads/DE/Broschueren/EiweisspflanzenstrategieBMEL.pdf?__blob=publicationFile&v=5 (eingesehen am 05.06.2023)

[44] Nilsson K, Flysjö A, Davis J et al.: Comparative life cycle assessment of margarine and butter consumed in the UK, Germany and France. Int J Life Cycle Assess 15 (2010) 916–926

[45] Liao X, Gerichhausen MJW, Bengoa × et al.: Large-scale regionalised LCA shows that plant-based fat spreads have a lower climate, land occupation and water scarcity impact than dairy butter. Int J Life Cycle Assess 25 (2020) 1043–1058

[46] Reinhardt G, Rettenmaier N, Gärtner S et al.: Regenwald für Biodiesel? Ökologische Auswirkungen der energetischen Nutzung von Palmöl. Eine Studie des WWF Deutschland in Zusammenarbeit mit dem WWF Schweiz und WWF Niederlande, Frankfurt am Main (2007)

[47] Wuppertal Institut für Klima, Umwelt, Energie GmbH (Hrsg.): Sozial-ökologische Bewertung der stationären energetischen Nutzung von importierten Biokraftstoffen am Beispiel von Palmöl, Wuppertal (2007)

[48] Poore J, Nemecek T: Reducing food's environmental impacts through producers and consumers. Science (2018) 987–992

[49] Schmidt TG, Baumgardt S, Blumenthal A et al.: Wege zur Reduzierung von Lebensmittelabfällen – Pathways to reduce food waste (REFOWAS): Maßnahmen, Bewertungsrahmen und Analysewerkzeuge sowie zukunftsfähige Ansätze für einen nachhaltigen Umgang mit Lebensmitteln unter Einbindung sozio-ökologischer Innovationen. Thünen Report 73 (2019)

[50] Deutsche Gesellschaft für Ernährung (Hrsg.): Kriterien für eine ovo-lacto-vegetarische Menülinie in der Gemeinschaftsverpflegung – Umsetzung der wissenschaftlichen Empfehlungen für die Gemeinschaftsverpflegung https://www.dge.de/fileadmin/Bilder/gemeinschaftsverpflegung/publikationen/Hintergrund-vegetarische-Menuelinie.pdf (eingesehen am 22.08.2023)

[51] Deutsche Gesellschaft für Ernährung (Hrsg.): Kein Fisch?! – Merkblatt zu Omega-3-Fettsäuren, Fischverzehr und der DGE-zertifizierten vegetarischen Menülinie https://www.dge.de/gemeinschaftsgastronomie/publikationen/ (eingesehen am 22.08.2023)

[52] European Food Safety Authority (efsa): Overview on Tolerable Upper Intake Levels as derived by the Scientific Committee on Food (SCF) and the EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA). Scientific Report, September 2018 https://www.efsa.europa.eu/sites/default/files/assets/UL_Summary_tables.pdf (eingesehen am 12.06.2023)

[53] Bundesamt für Verbraucherschutz und Lebensmittelsicherheit (BVL) (Hrsg.): Nationale Berichterstattung: „Pflanzenschutzmittelrückstände in Lebensmitteln". Zusammenfassung der Ergebnisse des Jahres 2018 aus der Bundesrepublik Deutschland (2020)

[54] Bundesministerium für Ernährung und Landwirtschaft (BMEL) (Hrsg.): Nationale Reduktions- und Innovationsstrategie für Zucker, Fette und Salz in Fertigprodukten (2018)

[55] Arens-Azevêdo U, Bölts M, Schnur E et al.: Beurteilung ausgewählter Convenience-Produkte in der Gemeinschaftsverpflegung und Handlungsempfehlungen zur Optimierung, Bonn (2020)

[56] Umweltbundesamt (Hrsg.): Umweltbelastende Stoffeinträge aus der Landwirtschaft Möglichkeiten und Maßnahmen zu ihrer Minderung in der konventionellen Landwirtschaft und im ökologischen Landbau, 2015 https://www.umweltbundesamt.de/sites/default/files/medien/378/publikationen/umweltbelastende_stoffeintraege_aus_der_landwirtschaft_1.pdf (eingesehen am 05.06.2023)

[57] Zamecnik G, Schweiger S, Lindenthal T et al.: Klimaschutz und Ernährung – Darstellung und Reduktionsmöglichkeiten der Treibhausgasemissionen von verschiedenen Lebensmitteln und Ernährungsstilen – Endbericht, Wien (Oktober 2021)

[58] Bundesrat: Drucksache 172/23: Verordnung zur Kennzeichnung von Bio-Lebensmitteln in gemeinschaftlichen Verpflegungseinrichtungen und zur Änderung der Öko-Kennzeichenverordnung https://www.bundesrat.de/SharedDocs/drucksachen/2023/0101-0200/172-23.pdf?__blob=publicationFile&v=1 (eingesehen am 22.08.2023)

[59] Deutsche Gesellschaft für Ernährung (Hrsg.): Auf dem Weg zu mehr Nachhaltigkeit in der Betriebsverpflegung: Empfehlungen und Tipps für Dienstleisterinnen und Dienstleister aus dem Projekt NACHHALTIG B|UND GESUND (2020)

[60] Strohm D, Boeing H, Leschik-Bonnet E et al.: Speisesalzzufuhr in Deutschland, gesundheitliche Folgen und resultierende Handlungsempfehlung. Wissenschaftliche Stellungnahme der Deutschen Gesellschaft für Ernährung e.V. (DGE). Ernährungs Umschau 63 (2016)

[61] Deutsches Institut für Normung e.V. (DIN): 10508:2022-03 – Lebensmittelhygiene – Temperaturen für Lebensmittel (2022)

[62] Bundesinstitut für Risikobewertung (BfR) in Zusammenarbeit mit dem Bundeszentrum für Ernährung (BZfE): Hygieneregeln in der Gemeinschaftsgastronomie, 2020 https://mobil.bfr.bund.de/cm/350/hygieneregeln-in-der-gemeinschaftsgastronomie-deutsch.pdf (eingesehen am 05.06.2023)

[63] Deutsches Institut für Normung e.V. (DIN): 10536:2023-03 – Lebensmittelhygiene – Cook & Chill-Verfahren – Hygieneanforderungen (2023)

[64] IN VIA Akademie (Hrsg.): Ökologische Hauswirtschaft in der Gemeinschaftsgastronomie – Best-Practise-Beispiele https://www.invia-akademie.de/bilden/nachhaltigkeit-in-der-hauswirtschaft (eingesehen am 05.06.2023)

[65] Kuntscher M, Goossens Y, Schmidt T: Lebensmittelabfälle in der Außer-Haus-Verpflegung reduzieren – Handlungsempfehlungen für die Praxis. Ernährungs Umschau international (2022) 18–23

[66] Amtsblatt der Europäischen Union: Verordnung (EU) Nr. 1169/2011 des Europäischen Parlaments und des Rates vom 25. Oktober 2011 betreffend die Information der Verbraucher über Lebensmittel und zur Änderung der Verordnungen (EG) Nr. 1924/2006 und (EG) Nr. 1925/2006 des Europäischen Parlaments und des Rates und zur Aufhebung der Richtlinie 87/250/EWG der Kommission, der Richtlinie 90/496/EWG des Rates, der Richtlinie 1999/10/EG der Kommission, der Richtlinie 2000/13/EG des Europäischen Parlaments und des Rates, der Richtlinien 2002/67/EG und 2008/5/EG der Kommission und der Verordnung (EG) Nr. 608/2004 der Kommission (2011)

[67] Rützler H, Reiter WL: Hanni Rützlers Food Report 2020. Zukunftsinstitut GmbH, Frankfurt (Juni 2019)

[68] Renner B: Ernährungsverhalten 2.0 Veränderungen durch explizite und implizite Interventionen. Ernährungs Umschau 62 (2015) M36–M46

[69] Renner B, Sproesser G, St. Strohbach et al.: Why we eat what we eat. The Eating Motivation Survey (TEMS). Elsevier (2012) 117–128

[70] Cadario R, Chandon P: Which healthy eating nudges work best? A meta-analysis of field experiments. Appetite 130 (2018) 300–301

[71] Pfannes U, Adam S, Rossi CD: „Gäste auf gesunde Wege locken.". Ernährungs Umschau 65 (2018) M338–M341

[72] Kompetenzzentrum für Ernährung (KErn): Smarter Lunchrooms Nudging – leicht gemacht Praktische Handlungsempfehlungen für die Schulmensa (2018)

[73] Winkler G, Berger B, Filipiak-Pittroff B et al.: Nudging in der Mensa. Ernährungs Umschau 65 (2018) M546 – M554

[74] Metcalfe JJ, Ellison B, Hamdi N et al.: A systematic review of school meal nudge interventions to improve youth food behaviors. International Journal of Behavioral Nutrition and Physical Activity (2020)

[75] Marcano-Oliver M, Horne PJ, Viktor S et al.: Using Nudges to Promote Healthy Food Choices in the School Dining Room. J Sch Health (2020) 143–157

[76] Kompetenzzentrum für Ernährung (KErn): Smarter Lunchrooms Impulse für die Essenswahl (2016)

[77] Kompetenzzentrum für Ernährung (KErn): Smarter Lunchrooms. Nudging – leicht gemacht Praktische Handlungsempfehlungen für die Hochschulgastronomie (2018)

[78] Bundesanstalt für Landwirtschaft und Ernährung (Hrsg.): Wichtige Bestimmungen des Lebensmittelrechts für Gastronomie und Gemeinschaftsverpflegung, Bonn, 10. Auflage (2017)

[79] Bundesanstalt für Landwirtschaft und Ernährung (Hrsg.): Kennzeichnungsvorschriften für Gemeinschaftsverpflegung und Gastronomie, Bonn, 7. Auflage (2017)

[80] Deutsche Adipositas-Gesellschaft e.V. (Hrsg.): Definition von Übergewicht und Adipositas https://adipositas-gesellschaft.de/ueber-adipositas/definition-von-adipositas/ (eingesehen am 05.06.2023)

[81] Bundesanstalt für Arbeitsschutz und Arbeitsmedizin: Betriebliches Gesundheitsmanagement https://www.baua.de/DE/Themen/Arbeit-und-Gesundheit/Betriebliches-Gesundheitsmanagement/_functions/Bereichs-Publikationssuche_Formular.html?nn=8580646 (eingesehen am 08.05.2023)

[82] Umweltbundesamt (Hrsg.): Erosion https://www.umweltbundesamt.de/themen/boden-landwirtschaft/bodenbelastungen/erosion#bodenerosion-durch-wasser-eine-unterschatzte-gefahr (eingesehen am 05.06.2023)

[83] Deutsche Gesellschaft für Ernährung (Hrsg.): Hülsenfrüchte – versteckte Vielfalt entdecken, Bonn, 3. überarbeitete Auflage (2021)

[84] Deutsche Lebensmittelbuch-Kommission (Hrsg.): Leitsätze für Kartoffelerzeugnisse, 1997 https://www.deutsche-lebensmittelbuch-kommission.de/fileadmin/Dokumente/leitsaetzekartoffelerzeugnisse.pdf (eingesehen am 05.06.2023)

[85] Spektrum.de (Hrsg.): Lexikon der Biologie https://www.spektrum.de/lexikon/biologie/monokultur/43788 (eingesehen am 05.06.2023)

[86] Thaler, R., H., Sunstein, C., R.: Nudge – Improving decisions about health, wealth, and happiness. Penguin, New York, NY, Rev. and expanded ed., with a new afterword and a new chapter (2009)

[87] Deutsche Gesellschaft für Ernährung (Hrsg.): Ausgewählte Fragen und Antworten zu pflanzenbasierter Ernährung (Februar 2023) S. 2

[88] Deutsche Gesellschaft für Ernährung, Österreichische Gesellschaft für Ernährung, Schweizerische Gesellschaft für Ernährung (Hrsg.): Referenzwerte für die Nährstoffzufuhr. DGE, Bonn, 2. Auflage, 5. aktualisierte Ausgabe (2019)

[89] Spektrum.de (Hrsg.): Lexikon der Ernährung https://www.spektrum.de/lexikon/ernaehrung/proteinqualitaet/7285 (eingesehen am 05.06.2023)

[90] Regionalfenster.de (Hrsg.): Regionalfenster https://www.regionalfenster.de/ (eingesehen am 05.06.2023)

[91] Umweltbundesamt (Hrsg.): Glossar zum Ressourcenschutz https://www.umweltbundesamt.de/sites/default/files/medien/publikation/long/4242.pdf (eingesehen am 05.06.2023)

[92] o.A.: Soziale Nachhaltigkeit in der Ernährung berücksichtigen. DGEwissen (1/2023) 27–28

[93] Office P: Verordnung (EG) Nr. 852/2004 vom 29. April 2004 über Lebensmittelhygiene. Stand 24.03.2021. (2004)

Glossary

Absolute fat content: *see fat content absolute (cheese)*

Body-Mass-Index (BMI): BMI (kg/m²) 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 [m²] [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 respective gastronomic facility and describes its self-conception regarding eating and drinking.

Convenience food: see *processed food*

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 [81].

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*.

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, food 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 [82].

Fair food environment: A *food environment* is described as fair when it is primarily aligned with human perception and decision-making capabilities and behaviours, and secondly, it is more health-promoting, socially, environmentally and animal welfare-friendly. Thus, it contributes to sustaining the livelihoods of both current and future generations [8].

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.

Food environment: A food environment covers all environmental factors that influence nutrition behaviour throughout the entire behavioural process. Therefore, the influence of the food environment extends well beyond the actual decision in the moment of consumption and spans the entire behavioural process. This is divided into the 4 phases of exposition (perception, e.g. via advertising and social media), access (depending on price, availability of information, social food and behavioural norms), choice, and consumption [8, 10].

Greenhouse gas emissions: The most relevant greenhouse gases are water vapour (H_2O), carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and 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.

Legumes: Legumes are plant seeds that grow in a pod. They are harvested when fully mature and subsequently dried. Among vegetable food, dried legumes offer the highest protein content. Examples include pea, bean, lentil, soybean, chickpea, and lupin. In addition to dried legumes, fresh varieties such as green peas, sugar snap peas and string beans also belong to this botanical group. They are not as rich in protein, are harvested unripe and prepared like vegetables [83].

Meal provider: Meal provider is used here as a generic term for all service providers who offer food and/or beverage services in the gastronomic facility.

Menu Cycle: The menu cycle refers to the period of time after which the lunch meal 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 [85].

Muesli: Muesli consists of one or more cereals without added sugar and other *sweetening ingredients*. These cereals might be processed in different ways, like crushed, ground or extruded. Other ingredients may include milk, plain yogurt, quark or their vegetable alternatives, 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 [86].

Nutrient density: Nutrient density describes the amount of a nutrient in a food per unit of energy (e.g. mg/kcal).

Obesity: Obesity refers to the accumulation of body fat that exceeds the normal level. It is diagnosed using the *body mass index (BMI)* [80].

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

Parboiled: Parboiling is a technical process for the 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 PAL is 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 plans [88].

Plant-based: A plant-based diet according to the recommendations of the DGE predominantly consists of plant-based food such as vegetables and fruit, whole grains and legumes as well as nuts and vegetable oils. This selection is supplemented by a small amount of food of animal origin. The term flexitarian diet refers to this type of diet. Other plant-based diets include the Mediterranean and Nordic diets, the Planetary Health Diet and vegetarian and vegan diets [87].

Potato Products: These are processed products made from potatoes. Included are french fries, instant potato, mashed potato, potato dumplings, pre-shaped potato dough, fried potato and potato snack products [84].

Processed food: According to current legislation, processed food are all primary products that have been significantly altered, for example by “heating, smoking, curing, maturing, drying, marinating, extracting, extruding or a combination of these different processes” [93].

Protein quality: The protein quality or biological value provides information on the extent to which dietary protein can replace degraded 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) [89].

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.

Reference values for nutrient intake: The reference values specify quantities for the daily intake of energy and nutrients, including water and dietary fibre. The German Nutrition Society (DGE) publishes them together with the Austrian Nutrition Society (ÖGE).

Regional: A region is an area that forms a geographical, political, economic and/or administrative unit. The manufacturing food company 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) [90].

Resource protection: 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 [91].

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

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

Social aspects: Social aspects of a more sustainable diet relate on the one hand to the conditions under which food and meals are produced. These include, for example, appropriate wages, compliance with labour rights as well as training, and further education opportunities. On the other hand, they refer to the conditions under which food and meals are offered and consumed, e.g. the creation of *fair food environments* that allow everyone access to a healthy and sustainable diet or eating and drinking in community (commensality) [92].

Sweetening ingredients: In this DGE-Quality Standard, sweetening ingredients are those ingredients that are used as an alternative to sugar to sweeten food. In addition to sweetener such as aspartame or sugar substitutes, these can also be honey or fruit syrups.

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

Imprint

Publisher:
Deutsche Gesellschaft für Ernährung e. V.
(German Nutrition Society)
Godesberger Allee 136
53175 Bonn
www.dge.de

Conception, text and editing:
Deutsche Gesellschaft für Ernährung e. V.
Referat Gemeinschaftsverpflegung und Qualitätssicherung
IN FORM in der Gemeinschaftsverpflegung
JOB&FIT – Mit Genuss zum Erfolg!
Phone 0228 3776-873
Fax 0228 3776-78-873
info@jobundfit.de
www.jobundfit.de

The "DGE-Quality-Standard for Meals in Companies, Public Authorities and Universities" was published in 2008. It was fundamentally revised in 2020 in collaboration with:

- Federal Ministry of Food and Agriculture (Bundesministerium für Ernährung und Landwirtschaft [BMEL]),
- Federal Office for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung [BLE]),
- representatives of the respective federal state ministries,
- related professional associations,
- representatives of the consumer centres of the German Federal States as well as
- representatives from academia, business and practice

The 2023 update was carried out in cooperation with

- the Federal Ministry of Food and Agriculture (BMEL),
- the Federal Office for Agriculture and Food (BLE) and
- representatives from academia.

Image credits:
123rf.com: scyther5 (S. 10), gresei (S. 11), Yuriy Kirsanov (S. 17), pixelbliss (S. 54), Jean-Marie Guyon (S. 41, 57), Dmytro Sidelnikov (S. 60), karandaev (S. 62), yurakp (S. 65), rawpixel (S. 67), dionisvera (S. 68), Sucharut Chounyoo (S. 70), atlasfoto (S. 78), Andriy_Popov (S. 82); **Deutsche Gesellschaft für Ernährung e. V.:** (S. 7, 15, 35, 68); **fotolia:** anoli (S. 76); **iStock.com:** zoranm (S. 1), _ jure (S. 14), artisteer (S. 20), www.fotogestoeber.de (S. 21), porcorex (S. 22), suken (S. 25), peterschreiber.media (S. 26), Ales-A (S. 29), carlosgaw (S. 39), dulezidar (S.40), AnSyvanych (S. 59), eleganza (S. 63), skynesher (S. 64), Talaj (S. 72), Andrey Elkin (S. 73); **shutterstock.com:** Gilles Lougassi (S. 24), **stock.adobe.com:** engel.ac (S. 8), Gerhard Seybert (S. 9), CandyBoxImages (S. 13), CandyBox Images (S. 18), slawek_zelasko (S. 19), auremar (S. 23), gpointstudio (S. 36), ExQuisine (S. 37), Liudmyla (S. 50), Pixel-Shot (S. 51), interiorphoto (S. 71)

Design:
kippconcept gmbh, Bonn; rheinsatz, Köln

Translation:
Dr. Katharina A. Goerg

Order:
The DGE-Quality Standard is available from the DGE-Media Service for a fixed shipping fee:
www.dge-medienservice.de

Information and free download of the brochure and additional media: www.jobundfit.de

Reproduction – including extracts – as well as any form of copying or distribution with additions, imprints or stickers is only permitted with the explicit authorization of the publisher. The contents have been carefully reviewed by the DGE, however no guarantee may be assumed. Any liability of the publisher for personal injury, property damage or financial loss is excluded.

Copyright © DGE Bonn, 12/2024

Bonn, 6th edition

Gefördert durch:

Bundesministerium
für Ernährung
und Landwirtschaft

aufgrund eines Beschlusses
des Deutschen Bundestages

Durchgeführt von:

Deutsche Gesellschaft
für Ernährung e. V.
Godesberger Allee 136
53175 Bonn
www.dge.de

www.dge.de

Art.-Nr.: 300315

About IN FORM

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**.