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Die Gesund-Essen-Aktion für Kitas

DGE Quality Standard for Meals in Daycare Centres

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Die Gesund-Essen-Aktion für Kitas

DGE Quality Standard for Meals in Daycare Centres

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Message from the Federal Ministry of Food and Agriculture

Dear consumers,

what children eat shapes them for the rest of their lives. A balanced diet supports their growth and contributes to their good physical and mental development. The foundations for nutritional competence and healthy eating habits are formed early on. Therefore, even the youngest children should receive a variety of healthy meals.

Due to the increase in all-day care, many young children and preschoolers spend several hours a day in daycare centres and eat their meals there. Teaching the youngest children how often vegetables, fruits, meat or fish are part of the menu is more than just offering a wholesome and tasty diet. Those responsible for daycare catering are challenged every day to creatively implement the knowledge of nutritional science. It should be tasty for everyone and avoid food waste through appropriate portions. This is also part of a sustainable diet.

To enable daycare centres to set a good example, the Federal Ministry of Food and Agriculture (BMEL) commissioned the German Nutrition Society (DGE) to revise the "DGE Quality Standard for Meals in Daycare Centres". Together with representatives of the federal states, academia and practice. The Quality Standard is an important basis for catering in daycare centres and part of the National Action Plan „IN FORM – German national initiative to promote healthy diets and physical activity".

The Federal Ministry of Food and Agriculture (BMEL) strongly advocates that this Quality Standard will be implemented nationwide. In 2008 and 2009, networking centres were set up in the federal states to provide support, and in 2016 the National Quality Centre for Nutrition in Daycare Centres and Schools (NQZ) was established. The NQZ promotes and coordinates the cooperation of all stakeholders who are committed to good daycare and school meals.

With the "DGE Quality Standard for Meals in Daycare Centres", we make it easy to prepare dishes for the youngest members of our society with which they can grow up healthily. And through which they may enjoy a balanced and sustainable diet.

Sincerely yours,

Federal Ministry of Food and Agriculture (BMEL)

Preface

Dear readers,

approximately 580 million lunches are served in German daycare centres every year. Including breakfast and snacks, this number increases many times over. All these meals should be tasty, balanced and sustainable. Various competences are required for this. More than ten years ago, the German Nutrition Society, together with numerous experts from academia and practice, developed the "DGE Quality Standard for Meals in Daycare Centres" on behalf of the Federal Ministry of Food and Agriculture. Since then, the Quality Standard provides a framework for the optimal design of catering services in daycare centres.

Daycare centres should become places where children receive optimal nutrition. This is an important prerequisite for their development. At an early age, children should learn how to deal consciously with food and how they can protect their health and the environment through nutrition, because nutrition is responsible for 25 to 30 percent of climate gas emissions worldwide.

The increasing importance of sustainability in mass catering and the latest scientific evidence have caused us to comprehensively revise the DGE Quality Standard. Catering quality according to the DGE Quality Standard now includes aspects of sustainability in every step of the process.

Following an intensive participatory process involving representatives from academia and practice, the 6th edition of this DGE Quality Standard is structured in a new way, while retaining proven elements. For the first time, criteria for optimal catering are described in a process-oriented approach – beginning with the first planning step to serving and food disposal – and are supplemented by practical advice and background information. Ideally, food is carefully selected and used according to the region and the season, to avoid waste as much as possible.

"Quality management" was already part of the DGE Quality Standard – the revised version now contains a separate chapter explaining it in more detail. At the same time, the new chapter makes it clear once again how important it is to coordinate interfaces so that all those responsible for catering work together in the best possible way. This is only one aspect that shows how the DGE Quality Standard helps to optimise the catering offer.

Make a health-promoting and sustainable diet a flagship of your daycare centre or your company. More information is available at www.fitkid-aktion.de. For individual questions, please contact the team of "FIT KID – Die Gesund-Essen-Aktion für Kitas" 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 Daycare meals: An opportunity for more health and sustainability

The development of children depends to a large extent on what they eat and drink. Balanced, tasty and varied food choices should be available – not only at home, but especially at the *daycare centre*. Everyone agrees on this. But the daily eating routine in the *daycare centre* is not always that simple. Many stakeholders are involved in the design and preparation of meals. Different wishes, demands and opinions need to be reconciled. At the same time, there are certain general conditions and structures that set limits. Sponsors and *daycare centres* face the challenge of providing meals of a quality that promotes a healthy and sustainable lifestyle for children and at the same time takes the limits of our planet into account. It is unquestionable that nutrition has a decisive impact on health, performance and quality of life. Especially for the physical and mental development of children, it is important to provide a sufficient amount of energy and nutrients through a wholesome diet. Furthermore, it contributes to the prevention of diseases such as *obesity* or diabetes mellitus type 2, which are partly caused by nutritional habits. Accepting this challenge also means using the possibilities and opportunities of the daycare environment to have a positive long-term effect on children's eating habits. How this might work is demonstrated by the DGE Quality Standard for Meals in *Daycare Centres*.

In Germany, one out of seven children between the age of 3 and 17 is overweight, according to the recent data from the German Health Interview and Examination Survey for Children and Adolescents (KIGGS) of the Robert Koch Institute (RKI). The survey shows that children from families with a low socio-economic status are affected more often than their peers whose families have a high socio-economic status. At the same time, more than half of the children between the age of two and six with overweight or *obesity* were also overweight or obese as adolescents. This illustrates the importance of a healthy lifestyle already in the first years of life [1].

In Germany, about 3.7 million children attend one of the almost 57,000 childcare facilities. The majority of them spend more than seven hours a day there [2]. During this time, they eat at least one meal at the *daycare centre*. Therefore, in the first years of life, not only the family represents the central living environment of the children. *Daycare centres* increasingly take over tasks outside of the family. Parents and *daycare centres* are therefore challenged together to teach a health-promoting lifestyle and to promote daily life skills.

For quite some time now, the daycare catering has extended beyond the breakfast box. Every day, around 2.9 million children eat a lunch in a childcare facility [2]. There is still too much meat and too few vegetables in *daycare centres*, according to a key finding of the 2016 study on Catering in nurseries (VeKiTa) [3]. At the same time, the study made it clear that the implementation of the DGE Quality Standard has a positive effect. It provides orientation to secure the health-promoting catering offer and creates trust among parents.

The current figures clearly show that *daycare centres* are once again the central place to offer health-promoting and sustainable meals together with all stakeholders (e.g. daycare centre director, food providers, *educational staff*, parents) and can thus contribute to prevention and health promotion [1 – 6]. The German Advisory Council on Global Change also attributes daycare meals a pioneering function,

as they are particularly promising because of the educational effect. The Advisory Council calls for adequate attention for this topic [7].

High-quality daycare meals offer great potential in terms of **health promotion and more sustainability because of the following aspects:**

- **Wide reach:** A large number of potential meal participants are reached, and many children may benefit from it.
- **Healthy development for everyone:** A health-promoting and sustainable diet promotes physical and mental development of children.
- **A place for everyone:** Eating and drinking together connects children from all parts of our society and income groups. This promotes social interaction, enables participation as well as emotional and social development of children.
- **More sustainability:** Health-promoting and sustainable daycare meals offer 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. Children are able to experience and learn on a daily basis.
- **Central place for prevention:** Children are able to experience a variety of tastes through health-promoting and sustainable meals in an appealing dining environment. In addition, the *daycare centre* accompanies children in the first years of life and thereby can shape their eating habits throughout their lives to take a responsible approach to their health.

All aspects are **starting points for food and nutrition education activities** in the *daycare centre*; these should be closely linked to the expertise and requirements for health-promoting and sustainable meals. Eating competently and sustainably – also in later life – and thus investing in one's own health and environment depends, among other things, strongly on the learning processes and experiences at a young age. Thus, *daycare centres* may set the course for the development of eating habits that often have a positive impact for many years to come.

1.2 Who is the DGE Quality Standard addressed to?

Providing health-promoting and sustainable daycare meals on a daily basis is a joint and complex task in which stakeholders from different areas are involved, as shown in figure 6 (see chapter 5.1). First of all, there are the administrative bodies of the *daycare centres* and sponsors, as well as the daycare centre director and/or a daycare centre committee. Other relevant stakeholders are all those who plan, produce and/or offer catering services in *daycare centres*. These can be the kitchen management and -team, *housekeeping staff* and *meal providers*. In addition, there are parents and *educational staff*.

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

It is important that responsible persons for daycare meals 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.fitkid-aktion.de.

1.3 What is the goal of the DGE Quality Standard?

The DGE Quality Standard supports responsible persons for daycare meals in designing a health-promoting and sustainable meal offer in *daycare centres* in at least one menu line. This means that children 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 daycare meals. Each *daycare centre* may implement this Quality Standard step by step at its own pace. Every quality improvement of daycare meals results in healthier and more sustainable diets for children. The majority of the criteria relates to the catering design (see chapter 4). Criteria are presented along the process chain with the five steps of **planning, purchasing, preparation, serving** as well as **disposal** and **cleaning.** These process steps offer the potential to significantly influence the nutritional quality of food and beverages as well as to set the course for a sustainable diet.

However, good daycare meals are 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 offered meals (see chapters 2 and 5).

Figure 1 shows the process chain and the general conditions that are considered in daycare catering and therefore addressed in the DGE Quality Standard. The process chain plays a central role as a "pivotal point" for a health-promoting and sustainable offer. Usually, this is preceded by the tender and award procedure (however, this is not always mandatory) and, ideally, also by the development of a *catering concept*. This forms the foundation for all process steps in daycare catering. It must be clear to all stakeholders what role daycare meals should play in the daycare centre concept.

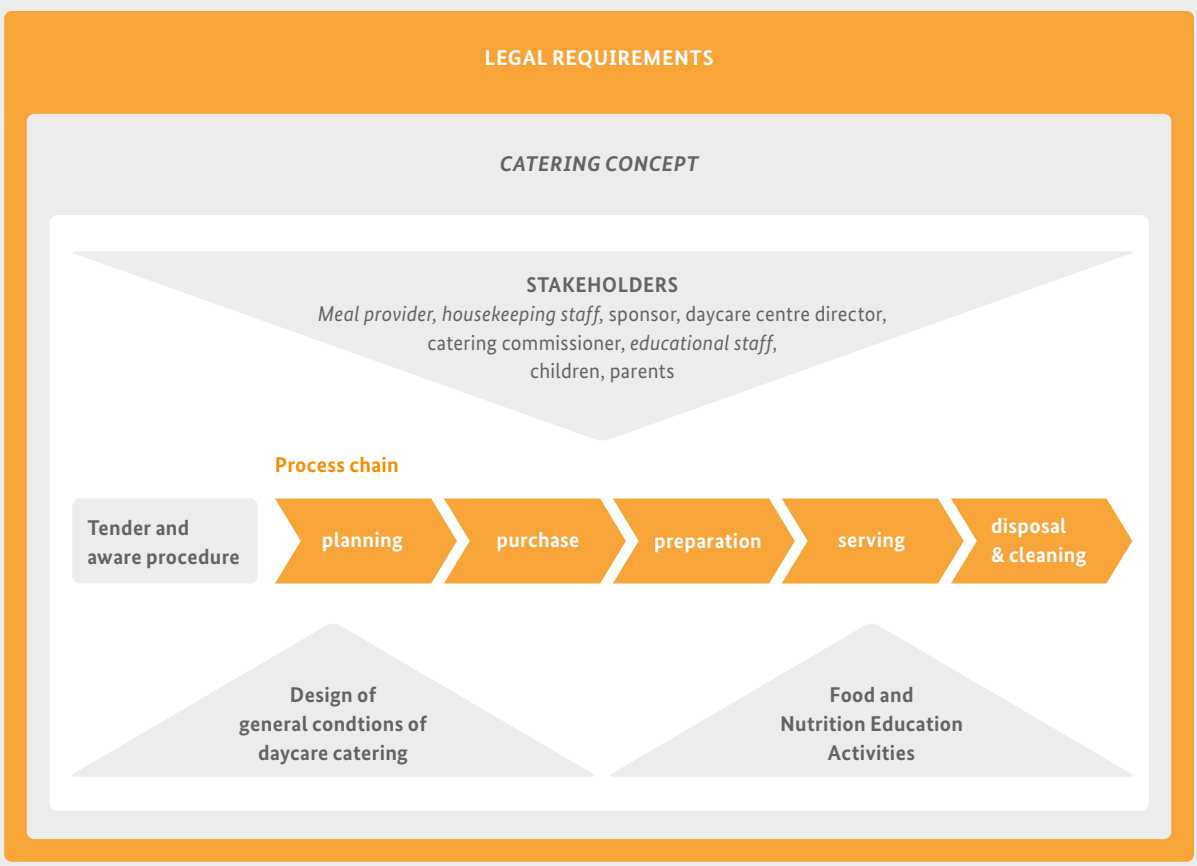


Figure 1: Aspects of health-promoting and sustainable daycare meals

1.4 How is the DGE Quality Standard structured?

The DGE Quality Standard includes six chapters with criteria and background information. Responsible persons for daycare meals find answers to the following questions:

› How does the DGE Quality Standard support responsible persons for daycare meals 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 daycare meals 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 according to the process chain in ↳ **chapter 4**.

› What additional aspects need to be addressed?
Good daycare meals exceed the offer of health-promoting and sustainable food and beverages. Stakeholders and general conditions influencing catering quality are described in ↳ **chapter 5**.

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

1.5 What to keep in mind when reading?

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

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

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

› This symbol highlights topics for which **further information** is available on the website www.fitkid-aktion.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 daycare meals

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 daycare meals. In addition, aspects that contribute and support this process are described. For all kitchens, caterers, and *daycare centres* that already realise the DGE Quality Standard, it is also recommended to take a regular look at the current daycare meals in order to identify possible deficiencies and initiate improvement strategies.

2.1 Quality of daycare meals

Daycare meals according to the DGE Quality Standard promote the health of children and are sustainable. Children should be able to participate in daycare meals and their needs and wishes should be taken into account.

Thus, the criteria of the DGE Quality Standard describe an ideal catering situation. *Daycare centres* may use them as orientation and benchmark for improving their catering service. Importantly, the persons responsible for catering should set priorities for criteria to be implemented first at their *daycare centre*.

DGE Quality Standard as part of the daycare's individual *catering concept*

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

DGE Quality Standard – a quality development instrument

Through quality development, the menu might become the *daycare centre's* flagship. The responsible persons for catering should initiate a joint development process towards health-promoting and sustainable daycare catering. **With the help of the criteria defined in the DGE Quality Standard, all stakeholders are able to improve the quality of daycare meals gradually together**

Catering affects all stakeholders in *daycare centres* – employees of the *meal provider*, sponsor, daycare centre director, quality manager, *educational staff* and parents.

Therefore, it is recommended to invite all stakeholders to an exchange. For example, a working group in form of a "round table" or a *catering committee* that meets on a regular basis might be established. This way, everyone has the opportunity to participate, to learn about the different points of view, and wishes, suggestions and creativity can be expressed. A future-oriented *catering concept* that enables a healthy and sustainable diet may be developed and implemented together.

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

ANALYSIS

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

Based on the analysis and description of the current catering situation, all stakeholders have the opportunity to discover which points are already implemented and what should and might be changed in the future. It is important that all stakeholders (see chapter 5.1) assess the situation and reflect on the conditions and structures prevalent at the *daycare centre*.

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

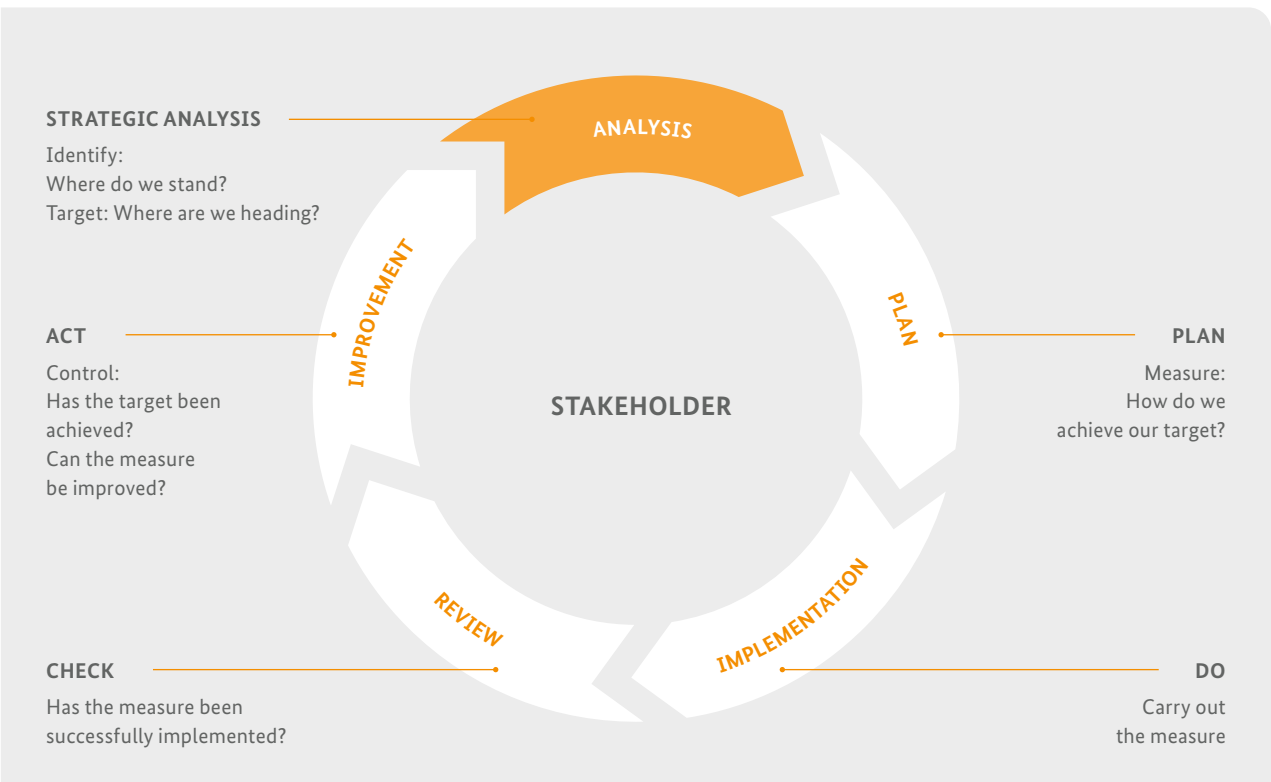


Figure 2: The five steps of collaborative, process-oriented quality development (modified according to Deming's life cycle [PDCA model])

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 as precisely as pos-sible. For example, measures may include changes in the food offer and the preparation of dishes, or the remodelling of the dining area at the *daycare centre*. Beforehand, all those involved should be thor-oughly 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
Wenn die Maßnahmen umgesetzt sind, werden diese mit den Beteiligten systematisch überprüft und bewertet. Konnten die Maßnahmen wie geplant umgesetzt werden?

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

These experiences form the foundation for a joint strategic analysis of the entire catering situation. The collaborative, process-oriented quality development is thereby repeated. Hence, it is possible to imple-ment 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 daycare-specific requirements for catering, considering the structures on site. In addition, it contains statements on the organisation, break periods and regarding food and drinks brought from home. The participation of children – e.g., designing the menu, or communication with parents are also included.

- ☐ **Parents receive information regarding the *catering concept*.**
  Parents should know from the beginning how the meals are organised in the *daycare centre*. The ad-mission interview is a good opportunity to provide all relevant information (preferably in written form).

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

2.2 Interface management

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

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

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

Examples of interfaces in daycare catering:

- **Sponsor – daycare centre director:** The sponsor decides on the catering design in the facilities. This involves the catering system, developing a comprehensive *catering concept* for all *daycare centres*, and deciding on its integration into the *educational concept*. It may contribute significantly to the implementation of a health-promoting and sustainable offer by supporting the material and personnel framework that enables the practical implementation of catering according to the DGE Quality Standard. At the same time, the sponsor controls the tender and award procedure of the catering service. It is optimal if the sponsor establishes a *catering committee* that is involved in the processes from the beginning. The sponsor passes on all regulations on the topic of catering to the daycare centre director.

- **Daycare centre director – *educational staff*:** The daycare centre director is responsible to ensure that the regulations of the sponsor are implemented by the *educational staff*. In addition to constructive support, the daycare centre director also plays a special part as a role model for staff, parents and ultimately for the children. At the same time, the daycare centre director may define further responsibilities. It guarantees the communication between the *educational staff*, the kitchen team/*meal provider* and the parents.

- ***Educational staff – meal provider*:** Within their sphere of influence, the *educational staff* is responsible for the food consumption as well as the teaching of skills and abilities related to eating and drinking. Often, the *educational staff* is also responsible for serving the meals. Within the framework of educational measures related to eating and drinking, they are in contact with the kitchen team or the *meal provider* in order to enable the best possible coordination of catering and educational offers.

Each *daycare centre* 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 *daycare centre*. This task is often performed free of charge, as an honorary position, by daycare centre staff or parents.

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 sponsor or the kitchen management,
- an external consultant with appropriate professional qualifications in the field of nutritional science, dietetics, home economics or catering.
- an employee of the *meal provider* as well as
- *educational staff*, who has the necessary basic knowledge due to professional requirements or further training. To enable this person to focus on the meals, he/she should be partially released from his/her other duties.

The following criterion applies:

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

2.3 Staff qualification

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

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

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

Preparation and serving 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. In the *daycare centre*, the *educational staff* is often the serving staff at the same time. This certainly makes sense because eating and drinking are closely connected to the educational tasks (see chapter 5). Therefore, they should also have the appropriate expertise.

The communication of the *educational staff* during serving and distribution of food contributes significantly to the acceptance of the meals by the children. They should provide information about the meals offered and their composition, name individual components and motivate the children to choose a healthy and sustainable option. A friendly manner, age-appropriate communication and educational skills are therefore crucial.

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

- basics of a health-promoting and sustainable diet,
- regeneration of "Cook & Chill" or "Cook & Freeze" offers (if used),
- basic knowledge of allergen management,
- ways to increase the percentage of *organically* grown food in mass catering,
- feedback management,
- communication and handling children during mealtime,
- development of eating habits as well as
- design of an age-appropriate menu.

Further information:
www.fitkid-aktion.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 children, parents and staff. 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

Expressing praise and criticism requires a certain linguistic competence. Especially with younger children, the development of language is not yet so advanced that they can differentiate between what they liked and what they did not like. A "yuck" may refer to the whole meal, to individual components, certain foods or even just ways of preparing it. Another reason for not liking something is that the best friend doesn't eat it. That is why it is important to observe children closely when they eat and drink. Sometimes it is only small expressions, such as "I want more", that allow a conclusion about the food on offer. The children's satisfaction may also be actively asked for. For example, neutral, laughing and crying smileys might be used to support the survey.

The children's opinions are important. Parents' feedback on the catering offer is also part of participatory quality development. Feedback management starts when spontaneous feedback (e.g. "on the fly") on the meals is expressed. This should always be seen as an opportunity to improve the offer. Feedback should also be actively asked for at regular intervals. It is important to have the opportunity both to report appreciation and praise as well as to criticise and give suggestions for improvement in order to optimise processes. Often no negative feedback is equated with praise. Thereby, an opportunity to motivate staff and stakeholders is missed. Appreciation and praise may mean a lot, lack of praise can be frustrating. Possible ways are the personal dialogue, which can take place at the "round table", as well as written or digital feedback, for example by using evaluation forms and/or post boxes for parents. 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. Parents and children are happy to be involved in the process, and employees are proud of their efforts and feel that their work is valued.

2.5 External quality control

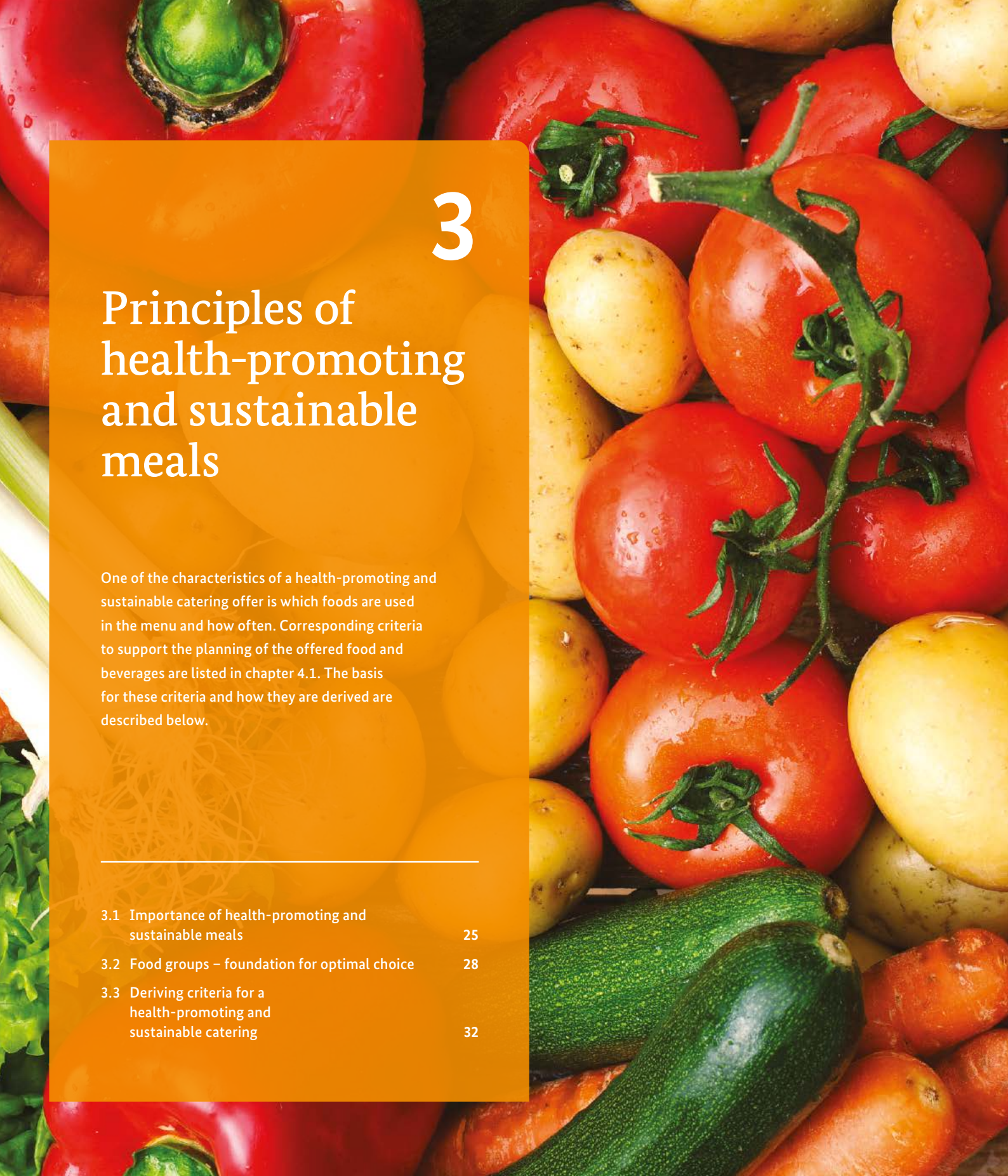
Whether the offered meals meet the set goals may be verified in an independent quality control. Usually, this is carried out by an external institution on the basis of different audit systems and audit criteria. In this way, the responsible persons for catering ensure the quality of the offer and are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

Further information:
www.fitkid-aktion.de
keyword: Externe Qualitätsüberprüfung

2.6 Specification for tenders

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

Further information:
www.fitkid-aktion.de
keywords: Ausschreibung und Vergabe **and** Beratung und Coaching



3

Principles of health-promoting and sustainable meals

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

3.1 Importance of health-promoting and sustainable meals

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

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

Many foods we consume carry a significant footprint in terms of environment, climate, social aspects and animal welfare [14]. Increasingly, our food is produced in complex and global *value chains*. The food ***value chain*** covers the input factors for agriculture, the agricultural production itself, up to processing and consumption. Aspects of sustainability, like environmental impact, can be tracked

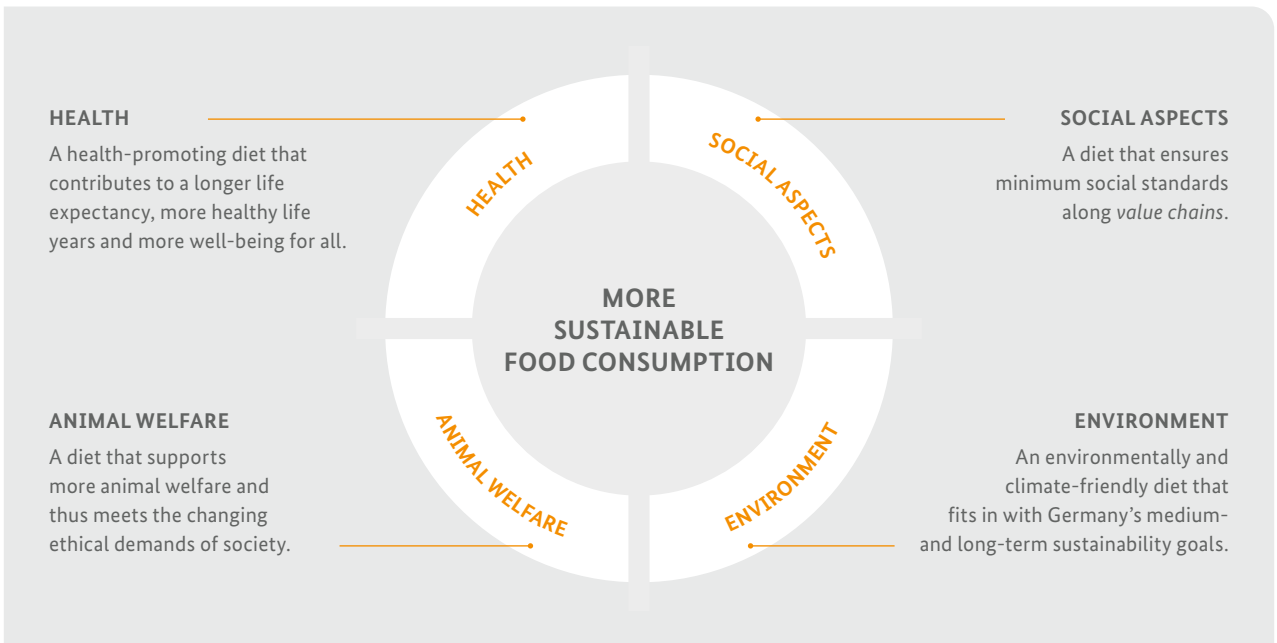


Figure 3: Goals of a more sustainable food consumption [14]

along these chains (see figure 4). Therefore, the **entire life cycle** of a product must be considered in the environmental impact evaluation of food.

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

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

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

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

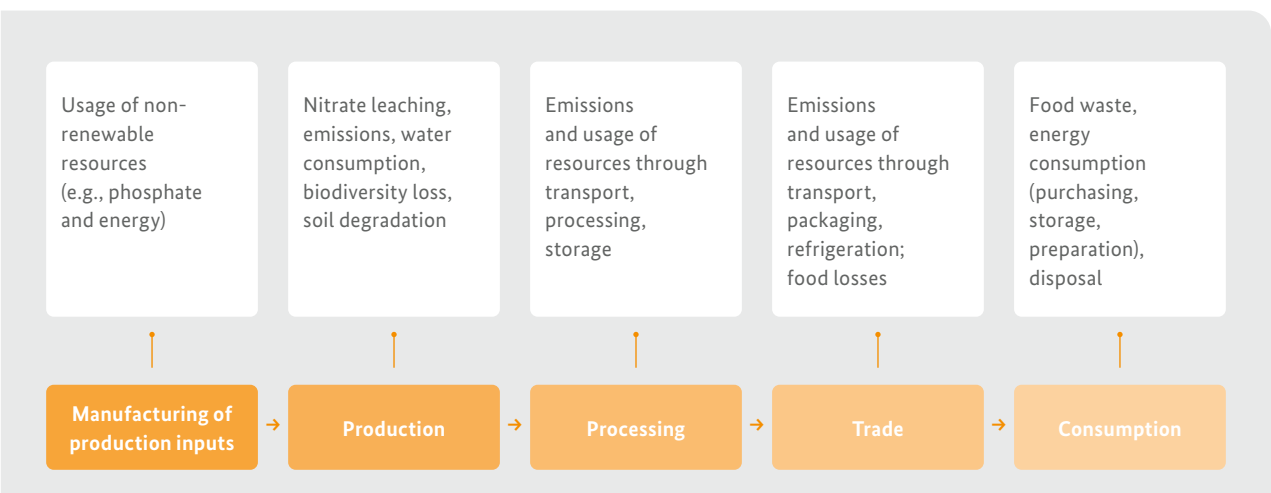


Figure 4: Key environmental impact along the *value chain* [14]

Table 1: Estimated *greenhouse gas emissions* from the production of selected foods [23]

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

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

Overall, in many cases the choice between different food groups makes the biggest impact on the environment, as differences between food groups are usually significantly higher than differences within a food or product group. For example, one kilogram of beef causes on average about twelve kilograms of CO_2 *equivalents* – whereas the same amount of lentils causes less than one kilogram of CO_2 *equivalents* [23].

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

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

The data shown and the fact that approximately 580 million lunches are served at German *daycare centres* every year [2], illustrate that in daycare catering the composition of the menu with predominantly plant-based foods may make a major contribution to climate protection. Kitchen technology and food waste prevention also play a crucial role. Preparing, cooling and keeping ingredients and food warm may have a significant environmental impact. This is where infrastructure, production planning and staff behaviour are essential [24 – 27]. Once food is discarded, all the steps from

farm to fork – and thus the linked *greenhouse gas emissions* – are wasted. In addition, the disposal process itself produces small amounts of greenhouse gases.

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

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

Further information:
www.fitkid-aktion.de
keywords: Nachhaltigkeit **and** Lebensmittelabfälle vermeiden

3.2 Food groups – foundation for optimal choice

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

Food group grains, grain products and potatoes

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

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

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

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

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

Food group vegetables and *salad*

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

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

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

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

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

Further information:
www.fitkid-aktion.de
keyword: Gemüse und Obst

Food group fruits

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

Nuts are also part of the fruits group. Being important sources of nutrients, they are part of a health-promoting diet. A (child's) handful of nuts or oilseeds may replace one portion of fruit a day.

Practical advice: Fruits should be available fresh or as a frozen product, without added sugar or other sweeteners, offered in a variety of ways on the menu. Examples are

fresh fruits for breakfast or snack, briefly steamed for a sweet entrée, as fruit puree in yoghurt or cut into small pieces in *muesli*. If children are too young to chew nuts, they may be ground and offered in yoghurt, for example. In terms of taste formation, children should have the opportunity to get to know fruits in the "natural" form. Therefore, fruits should be offered as often as possible as *whole fruit* as soon as the children have reached an age where they can chew it independently.

Further information:
www.fitkid-aktion.de
keyword: EU-Schulprogramm

Food group milk and dairy

Milk and dairy are a good source of calcium. Along with vitamin D, this is especially important for growing children – for bone formation as well as for healthy teeth. Cheese in particular contains a lot of calcium but compared to other dairy often has a high *fat content*. Cheese should be offered regularly, and varieties with an *absolute fat content* of less than 30 % should be preferred. Milk and dairy also provide high-quality protein, iodine and vitamins A, B_2 und B_{12}, among others.

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

Food group meat, sausage, fish and eggs

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

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

Regarding to meat, *white meat* from poultry should be the preferred choice; *red meat* and processed meat products should rarely – if at all – be offered.

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

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

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

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

Practical advice: Many children know and like fish, especially breaded. It may complement the menu. If children refuse to eat fish, imagination, creativity and some patience are needed. In this case, fish, like other foods with low acceptance, should be offered repeatedly. It usually takes a while before unfamiliar foods are accepted. One possibility is to combine fish with something familiar that children and adolescents like, for example fish filet with tomato sauce and pasta, fish patty in a burger or even using it in sauce or lasagna.

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.fitkid-aktion.de
keyword: Fisch

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

Food group oils and fats

Fat has twice as much energy as carbohydrates and protein, so 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. Oils and fats contain saturated, monounsaturated as well as essential polyunsaturated fatty acids and vitamin E.

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

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

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

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

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

Food group beverages

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

The *guiding value* for the drinking amount for children at the age of one to under seven years is about 0.8 to 1 litre per day. In some situations, the body needs more fluid, for example in very hot or extremely cold weather or during physical activity like sports.

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

Practical advice: Drinking water should be a regular part of the offer. 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. Juice spritzers should be the exception rather than the rule on special occasions such as birthday parties. [38]. Water is always available for the children.

Drinking is often forgotten during playtime. Regular hydration breaks are recommended.

Further information:
www.fitkid-aktion.de
keyword: Getränke

3.3 Deriving criteria for a health-promoting and sustainable catering

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

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

... to theoretical derivation ...
Because of organisational and economic reasons, in mass catering it is not possible to provide meals whose energy and nutrient contents correspond to the respective age- and gender-specific reference values of the guests. Therefore, summarised values for the different living environments of mass catering were derived from the detailed *"D-A-CH reference values for nutrient intake"* [39].

Children up to the age of seven usually attend a *daycare centre*. Infants under twelve months are fed individually and are not taken into account for the field of mass catering (see chapter 4.6.4). The *"D-A-CH reference values for nutrient intake"* for the age groups 1 to under 4 years and 4 to under 7 years were used for daycare meals. The *Physical Activity Level* (PAL) 1.4 was used to derive the *guiding values* for

energy intake in the age groups mentioned. Within these age groups, the *guiding values* of girls and boys 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 boys and girls differed, the higher reference value was used in order to ensure a minimum intake for all.

... and calculation...

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

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

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

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

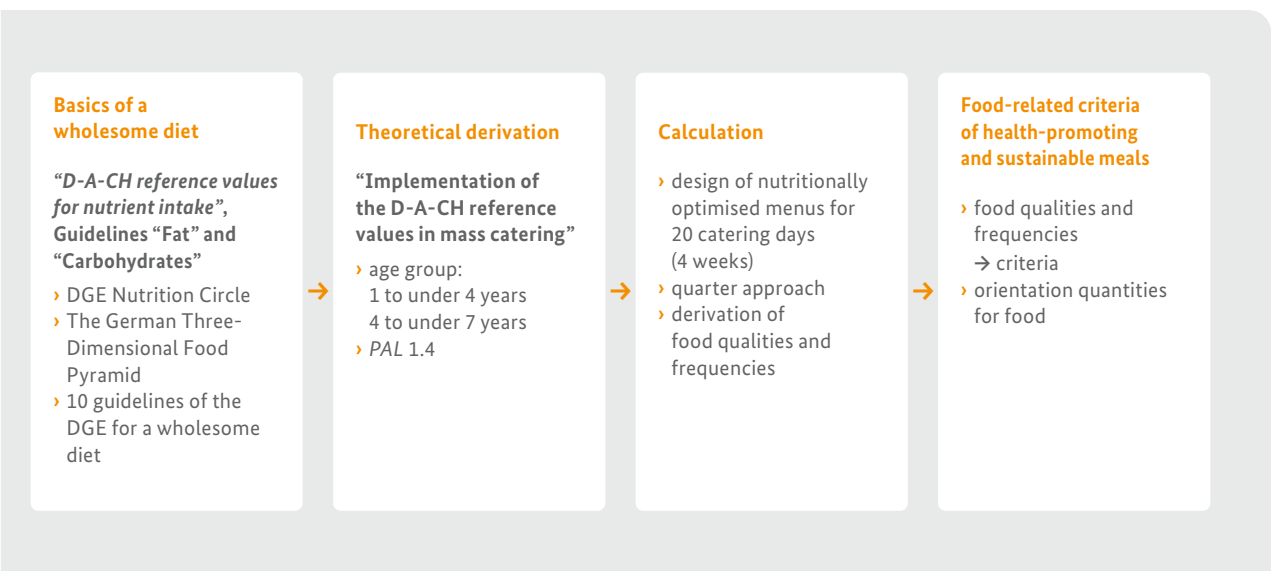


Figure 5: Path from the basics of a wholesome diet to food-related criteria for health-promoting and sustainable catering

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 *daycare centres*. The process chain is used to illustrate a catering offer for breakfast, snacks and lunch that is tailored to the needs and requirements of children from one to under seven years of age. Optimally composed, this offers children the opportunity to make a healthy and sustainable choice for every meal.

4.1 Planning

Planning | Purchase | Preparation | Service | Disposal & cleaning

Anyone who wants to provide a catering service must know upfront which or how many meals the *daycare centre* will offer (see also chapter 2.1). If, for example, only lunch is delivered by a caterer, 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 food waste and therefore to sustainability and economic efficiency.

Avoiding overproduction and large amounts of food waste requires the most accurate determination of guest numbers and the amount of food needed. Therefore, a well-functioning order system or a good coordination with the *daycare centre* is advantageous and requires the collection and transfer of information about absent children, e.g. due to illness or field days [24, 40].

Furthermore, through a targeted choice of food the menu planning influences the sustainability of the offered meals. The *greenhouse gas emissions* of dishes may vary greatly. Meals with a high proportion of plant components (e.g. vegetables, grains) generally generate fewer greenhouse gas than those with a high proportion of animal-based products (e.g. meat, cheese, butter) [23].

Further information:
www.fitkid-aktion.de
keyword: Nachhaltigkeit in der Gemeinschaftsverpflegung

At the same time, enjoyment also plays an important role, because health-promoting and sustainable food should taste good and be enjoyable. Children and adolescents in particular need a range of foods that offers variety in taste as well as in smell, consistency, appearance and auditory experiences in order to shape their senses. Olfactory and taste experiences shape the sensory memory.

Getting used to a standardised taste, e.g. through flavour enhancers, may result in a lost taste for the variety of natural foods. In principle, products without flavour enhancers and sweeteners are to be preferred. For reasons of taste formation and shaping, not natural and processed meat products like formed meat should not be used. Food that contains alcohol or alcohol flavourings as an ingredient should generally be avoided in daycare meals.

4.1.1 Food qualities and frequencies and other aspects of menu planning

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

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

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.

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

Moreover, **minimum and maximum requirements** are formulated to show particularly recommendable or less recommendable foods from a nutritional and sustainable perspective. The criteria on the foods' qualities and frequencies allow a balanced and varied menu. If the criteria are consistently observed in menu planning, all nutrients are assumed to likely meet the recommended values in the sense of the "Implementation of the D-A-CH reference values in mass catering" [39].

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

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

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

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

Breakfast and snacks

Both breakfast and snacks contribute significantly to the daily nutrient intake. Breakfast, whether eaten at home or at *daycare centre*, and the mid-morning and mid-afternoon snacks should be coordinated to a large extent. Partly these meals are organised by the *daycare centre*, partly delivered by the *meal provider*. Alternatively, meals are often taken from home in a "lunch box". 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 of different *daycare centres*, these three meals (breakfast, 1st and 2nd snack) were combined. Consequently, the orientation values for the weekly food quantities may be divided among all three meals. The weekly food frequencies are presented as a total for the three meals. To improve orientation and practicability, the daily frequencies are listed accordingly. If, for example, 10 x fruits is recommended on five days, it should be offered minimum 2 x per day and be flexibly shared among breakfast and/or snacks.

Lunch

While breakfast and snacks are usually offered on a voluntary basis at *daycare centres*, lunch is obligatory and organised centrally by the facility. It contributes significantly to the daily nutrient intake. Usually, the offered dishes contain several components, including a daily starch side dish, *raw vegetables*, *salad* or cooked vegetables and a beverage. For a balanced daycare meal, the food qualities and frequencies listed in table 3 apply. The food quantities given are for **orientation**.

Breakfast and snacks

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

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

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

food frequencies on five catering days

(orientation values for food quantities for five catering days, per child)

mixed diet	***ovo-lacto-vegetarian* diet**
min. 10 x (min. 2 x daily) (1 to under 4 years ca. 300 g) (4 to under 7 years ca. 350 g) › thereof: min. half of the daily offer from wholemeal products	**min. 10 x (min. 2 x daily)** (1 to under 4 years ca. 300 g) (4 to under 7 years ca. 350 g) › thereof: min. half of the daily offer from wholemeal products
min. 5 x (min. 1 x daily) (1 to under 4 years ca. 450 g) (4 to under 7 years ca. 500 g) › thereof: min. 3 x as *raw vegetables*	**min. 5 x (min. 1 x daily)** (1 to under 4 years ca. 450 g) (4 to under 7 years ca. 500 g) › thereof: min. 3 x as *raw vegetables*
10 x (2 x daily) (1 to under 4 years ca. 900 g) (4 to under 7 years ca. 1,000 g)	**10 x (2 x daily)** (1 to under 4 years ca. 900 g) (4 to under 7 years ca. 1,000 g)
min. 10 x (min. 2 x daily) (1 to under 4 years ca. 1,000 g) (4 to under 7 years ca. 1,100 g)	**min. 10 x (min. 2 x daily)** (1 to under 4 years ca. 1,000 g) (4 to under 7 years ca. 1,100 g)
0 x	**omitted in an *ovo-lacto-vegetarian* diet**
rapeseed oil is standard oil (1 to under 4 years ca. 20 g) (4 to under 7 years ca. 25 g)	**rapeseed oil is standard oil** (1 to under 4 years ca. 20 g) (4 to under 7 years ca. 25 g)
beverages are available at any time	**beverages are available at any time**

2 There is no recommendation on the number of eggs to be consumed.
In the nutrient-optimised meal plans no eggs were calculated for breakfasts and snacks.

Lunch

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

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

3 There is no recommendation on the number of eggs to be consumed. In the nutrient-optimised meal plans, approx. 40 – 50 g (mixed diet) or 60 – 70 g (*ovo-lacto-vegetarian* diet) of eggs per week were calculated for lunch.

food frequencies on five catering days

(orientation values for food quantities for five catering days, per child)

mixed diet	***ovo-lacto-vegetarian* diet**
5 x (1 x daily) (1 to under 4 years ca. 400 g) (4 to under 7 years ca. 450 g) thereof: › min. 1 x wholemeal products › max. 1 x *potato products*	**5 x (1 x daily)** (1 to under 4 years ca. 400 g) (4 to under 7 years ca. 450 g) thereof: › min. 1 x wholemeal products › max. 1 x *potato products*
5 x (1 x daily) (1 to under 4 years ca. 500 g) (4 to under 7 years ca. 600 g) thereof: › min. 2 x as *raw vegetables* › min. 1 x legumes (1 to under 4 years ca. 70 g, cooked) (4 to under 7 years ca. 90 g, cooked)	**5 x (1 x daily)** (1 to under 4 years ca. 550 g) (4 to under 7 years ca. 650 g) thereof: › min. 2 x as *raw vegetables* › min. 1 x legumes (1 to under 4 years ca. 80 g, cooked) (4 to under 7 years ca. 100 g, cooked)
min. 2 x (1 to under 4 years ca. 150 g) (4 to under 7 years ca. 170 g) › thereof: min. 1 x as *whole fruit*	**min. 2 x** (1 to under 4 years ca. 150 g) (4 to under 7 years ca. 170 g) › thereof: min. 1 x as *whole fruit*
min. 2 x (1 to under 4 years ca. 120 g) (4 to under 7 years ca. 140 g)	**min. 2 x** (1 to under 4 years ca. 120 g) (4 to under 7 years ca. 140 g)
max. 1 x meat/sausage (1 to under 4 years ca. 30 g) (4 to under 7 years ca. 35 g) › thereof: min. 2 x lean muscle meat within 20 catering days **1 x fish** (1 to under 4 years ca. 35 g) (4 to under 7 years ca. 45 g) › thereof: min. 2 x fatty fish within 20 catering days	**omitted in an *ovo-lacto-vegetarian* diet**
rapeseed oil as standard oil (1 to under 4 years ca. 20 g) (4 to under 7 years ca. 25 g)	**rapeseed oil as standard oil** (1 to under 4 years ca. 20 g) (4 to under 7 years ca. 25 g)
beverages are available at any time	**beverages are available at any time**

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

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

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

☐ **An *Ovo-lacto-vegetarian* meal is available when requested.**
Regardless of whether some of the children 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 when requested. Simply reducing the meat or fish components of the latter is not sufficient enough for a health-promoting and sustainable offer.

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

☐ **Local foods are preferred in the menu.**
Vegetables and fruits from Germany and other EU countries generally have fewer pesticide residues than products from non-EU countries [41].
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.

Further information:
www.fitkid-aktion.de
keyword: *Saisonale* Lebensmittel

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

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

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

- [ ] **Beverages are available at any time.**
  Every meal comes with a beverage. The children have the opportunity to drink at any time, even outside of mealtimes. Water and unsweetened fruit and herbal teas are the best choices. Tap water offers an inexpensive and ecologically recommendable alternative.

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

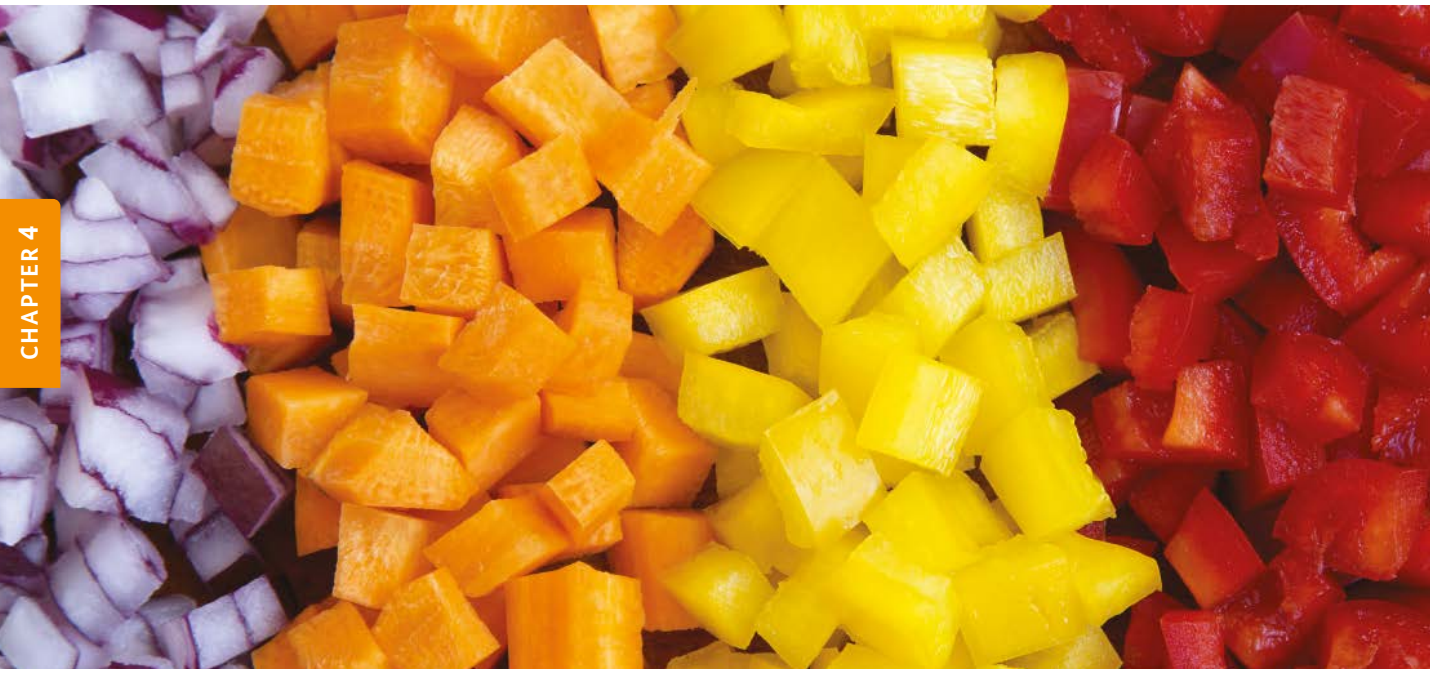
- [ ] **The dishes are colourful and the composition varies.**
  As early as the planning stage, a colourful composition of the dishes or components should be kept in mind.

- [ ] **Participation in meals is possible in case of food intolerances like allergies.**
  For this purpose, a special meal offer, a selection of individual components or (if otherwise not possible) a meal brought from home would work. Further information can be found in chapter 4.6 and chapter 6.3.

- [ ] **Certain animal-based and plant-based foods are not used for especially vulnerable groups due to possible contamination with pathogens.**
  Dies gilt beispielsweise für Rohmilchprodukte, Weichkäsesorten mit Oberflächenschmiere, frisches Mett, Tartar sowie streichfähige schnellgereifte Rohwürste wie frische Mettwurst und rohe Eier. Sprossen und tiefgekühlte Beeren sind vor dem Verzehr zu erhitzen [42].

- [ ] **Wünsche und Anregungen der Kinder sind in der Speiseplanung soweit wie möglich berücksichtigt.**
  This applies, for example, to raw milk products, soft cheeses with a surface smear, fresh ground pork, steak tartare, spreadable rapidly matured uncooked sausages (e.g. fresh Mettwurst) and raw eggs. Sprouts and frozen berries must be heated before consumption [42].

- [ ] **Culture-specific, *regional* and religious eating habits are taken into account in the planning.**
  If these aspects are respected, the children may identify themselves to a certain extent through the food. Themed weeks addressing traditional food from different countries or regions, major events (European and World Championships) or project weeks at the *daycare centre* on specific topics (grains, milk, herbs, sustainability) are particularly suitable for this purpose.



4.1.2 The use of *convenience food* in mass catering

The use of *convenience food* is common practice in mass catering. *Convenience food* is classified according to their degree of processing. The range of industrial *convenience food* extends from low to high processed:

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

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

Numerous processing steps require additional resources like energy and water. The packaging of *convenience food* also increases the amount of packaging waste.

The German Federal Ministry of Food and Agriculture (BMEL) initiated the "The National Reduction and Innovation Strategy: Less sugar, fats and salt in processed foods" in 2018 with the goal of reducing the content of sugar, unfavourable fats and salt as well as the energy content in processed foods. As part of the strategy, the food industry committed to reduce the sugar, fat, salt and/or energy content in products by 2025 with the help of concrete targets [43].

Further information:
www.fitkid-aktion.de
keyword: Zucker, Fett, Salz

When using *convenience food* 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.fitkid-aktion.de
keyword: Palmöl

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

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

☐ **Products with a low content of sugar, fat, saturated fatty acids and/or salt and a low *energy density* are selected.**
There are significant differences in the sugar, fat, saturated fatty acid, salt and energy content of *convenience food* within the product groups. Therefore, products should be carefully chosen and those of them that are considered to be more favourable from a nutritional perspective should be preferred. Due to the differences between the various product groups, it is not possible to give generally valid recommendations for maximum contents of sugar, fat and salt. This requires an individual look at the product groups. The document “Evaluation of selected *convenience food* in mass catering and recommendations for optimisation” provides assistance for evaluation of selected *convenience food* [44].

4.1.3 Menu

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

When designing the menu, the following criteria apply:

- ☐ **The menu is designed in a child-friendly way.**
  When designing the menu, make sure that children can "read" it. In practice, a presentation in the form of pictures has proven to be effective.

- ☐ **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 children and parents are regularly informed about the meals and can compare them with their meals at home.

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

Further information:
www.fitkid-aktion.de
keyword: Kennzeichnung

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

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

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

- ☐ **If nutritional values are declared, the legal requirements are observed.**
  The declaration of nutritional values on the menu is voluntary. If the nutritional values are declared, the requirements of the Regulation on the provision of food information to consumers (Lebensmittelinformationsverordnung, [LMIV]) must be observed (see chapter 6).

... furthermore:

☐ **Several menu lines are clearly presented, and the health-promoting and sustainable meal is particularly highlighted.**
There is usually only one daily menu in the *daycare centre*. Should there be more than one (e.g. when planning the menu in advance), it is easier to choose if the health-promoting meal is at the top of the menu and highlighted in colour or with a symbol.

4.2 Purchase

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

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

For purchases the following criteria apply:

☐ **Organic food is used.**
Organic food contains few pollutants and residues. In addition, in terms of environmental protection and *resource conservation, organic farming* has a number of advantages compared to conventional farming. Examples include soil and water protection through avoiding synthetic chemical fertilisers, reduced use of antibiotics in animal husbandry, less pollution of the environment with pesticides and therefore positive effects on biodiversity [41, 45]. The Federal Government's "Strategy for the Future of Organic Farming" formulates the goal of increasing the share of organic products in catering services to at least 20% [46].

The guideline "On the way to more sustainability in business catering" a publication of the project "NACHHALTIG B|UND GESUND" shows ways to increase the organic share in mass catering even with a fixed and limited budget [47].

Further information:
www.fitkid-aktion.de
keyword: Ökologisch erzeugte Lebensmittel

... furthermore:

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

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

Further information:
www.fitkid-aktion.de
keywords: Fisch **and** Nachhaltigkeit

☐ **Meat from species-appropriate animal husbandry is offered.**
Species-appropriate animal husbandry is promoted, for example, by the Neuland-Verein or the animal welfare initiative “Eine Frage der Haltung” of the Federal Ministry of Food and Agriculture (BMEL). 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.fitkid-aktion.de
keyword: Nachhaltigkeit

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

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

4.3 Preparation

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

The following criteria to the preparation of food apply:

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

Recipes and menus are available at www.fitkid-aktion.de category Rezepte

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

☐ **Sugar is used sparingly.**
Sugar-sweetened foods and beverages increase the risk of caries, overweight and *obesity* as well as secondary diseases like type 2 diabetes mellitus. The addition of sugar and alternative sweeteners like honey or fruit syrups should therefore be kept to a minimum. To get children 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.

☐ **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 children is 3 to 6 g per day, depending on age [48]. Foods like bread, sausage and cheese already contain larger amounts of salt, so there is only a small amount left to add. In order to promote the acceptance of low salt foods, the addition of salt may be reduced slowly and gradually, and more herbs and spices may be used instead.

Further information:
www.fitkid-aktion.de
keywords: Zucker, Fett, Salz

... furthermore:

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

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

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

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

☐ **Keeping heated food warm for a maximum of three hours.**
The longer the food is kept warm, the more heat-sensitive vitamins are lost, and the food appearance, taste and consistency suffer. Keeping food warm for a longer period of time also consumes additional energy. According to DIN 10508:2019-03 [49] and the "Hygiene rules in mass catering" of the Federal Institute for Agriculture and Food and the Federal Institute for Risk Assessment [50] the warm-keeping period, e.g. the time between the end of the cooking process and serving of the meal to the last child, should be maximum three hours long. If a three hour warm-keeping period is not feasible, the food must be cooled down immediately after preparation and regenerated in batches before serving, according to DIN 10536:2016-03 [51].

☐ **The warm-keeping temperature of heated food is at least 65 °C.**
To protect food from spoiling and minimise the risk of foodborne infection or poisoning, the minimum temperature for keeping food warm is 65 °C according to DIN 10508:2019-03. This applies to storage as well as to transport and serving [49].

Further information:
www.fitkid-aktion.de
keyword: Warmhalten und Regenerieren

☐ **Chilled food is stored at a maximum of 7 °C.**
Chilled food like *salads* or desserts can also spoil easily. Therefore the Federal Institute for Agriculture and Food and the Federal Institute for Risk Assessment [50] recommend a maximum storage, transport and serving temperature of 7 °C, similar to the DIN standard [49]. Until serving, chilled food should be cooled accordingly and consumed immediately after serving.

... furthermore:

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

- **Appliances are only turned on during operating times.**
  Appliances should not be operated longer than necessary in order to save energy. For this purpose, the power-on times of all kitchen appliances can be compared with the actual needed times of use and adjusted accordingly [52]. In addition, in energy-intensive processes like (deep) freezing or dishwashing, it is important to ensure efficient utilisation of the appliances. Switching off (deep) freezing units during daycare centre break or the efficient loading of dishwashers are some ways to save energy [22].

4.4 Service

Catering does not end at the kitchen door – only when it is handed over to the children, it reaches the guest. In the *daycare centre*, meals are served for a group at the table and the food is often served by the *educational staff*. Thereby, the presentation of the food components, no matter whether it takes place in the kitchen or later by the serving staff (*educational staff*), as well as the sensory quality of the meal are of great importance for the meal to be accepted. The serving staff (*educational staff*) is an important interface between the kitchen and the children.

They assist with the selection and during the meal, collect feedback and wishes from the children and make the mealtime situation pleasant.

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

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

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

- ☐ **Serving staff is informed in detail about the current menu.**
  This includes information about the meal components, portion size or number of pieces and which components may be exchanged. Practically a short consultation between kitchen and serving staff is beneficial. This way, the serving staff (*educational staff*) keeps track, respond to the children's wishes and order additional components if necessary.

- ☐ **Children are given opportunities to influence portion sizes.**
  Children should have the opportunity to determine the portion sizes themselves. Nevertheless, especially with younger children, guidance is needed on how to choose the right amount. With time, they learn to take portions accordingly to their hunger and appetite. Regularly comparing the served with the calculated quantities helps to plan them accurately.

4.5 Disposal and cleaning

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

After serving food and beverages, it is worth looking at the non-regenerated components, the returned food from the food counter and tables and the food waste generated in the dishwashing room. As far as possible, the returns per component should be measured over a period of time. The results help to reflect on and, if necessary, adjust the menu planning, the procedure and organisation of ordering, purchasing, production, the presentation of the meals as well as their calculated quantities. All these are starting points to avoid overproduction and food waste. While non-regenerated components can be re-integrated into the menu the following day as long as maintaining the cold chain, returned food from the food counter or dishwashing room have to be discarded. The resource-saving handling of food and the avoidance of food waste is an important aspect of calculation, menu planning and final disposal and should also be included in the *catering concept*.

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

In order to raise the children's awareness on the topic, joint projects and educational activities can be offered on the topic of food waste. In addition, good communication between the serving staff (*educational staff*) and the children or kitchen staff is of great importance for the interpretation of the food returns. In the kitchen, there is often a lack of information about the causes of leftovers. Was the portion size not appropriate? Did individual components not taste good? Was the 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.fitkid-aktion.de
keyword: Lebensmittelabfälle vermeiden

The following criteria apply to the disposal of waste:

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

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

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

The following criteria for cleaning and disinfection apply:

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

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

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

Further information:
www.fitkid-aktion.de
keyword: Hygiene

4.6 Together and yet individual

Christmas parties, summer celebrations or birthdays are just some of the exceptions to the regular "meal routine" in the *daycare centre*. Additionally to a defined meal offer for breakfast, snacks and lunch, a wide range of food is often brought from home on these days.

In addition, special diets and food intolerances like allergies require a differentiated view of the children's individual needs. *Daycare centres* as well as *meal providers* are often faced with the challenge of how to deal with this aspect in their daily routine.

First of all, clearly defined rules regarding meals for special diets that are transparent and accessible to all need to be in place. How these rules are formulated depends on local circumstances and structures. The *daycare centre* may define these procedures together with the parents and incorporate them in the *catering concept*. However, the sponsor can also define central specifications for special catering situations. Likewise, the specification for tenders of the *meal provider* should clearly outline the service description for special catering situations: What can be offered? Is it possible to respond to special allergies within the production process? Is there a special offer for children under three years of age?

It must be clear to all persons involved that there has to be room for individual needs and situational circumstances within the framework of daycare catering. At the same time, however, there are limits and not every preference can be realised.

The following section describes a number of situations related to the daily catering routine in order to make it easier to put them into practice.

4.6.1 Celebrations and parties at the *daycare centre*

There are many ways to celebrate parties and festivities with a special catering offer. Usually, there is a special meal for every celebration. The beautifully decorated Christmas table, the lovely baked birthday cake or the colourful buffet at the summer party are just a few examples. Accordingly, celebrations and parties in the *daycare centre* should be accompanied by a special culinary offer. They are an important element of food culture. Sometimes the *meal provider* offers something special for such occasions. However, cakes are also baked together with children or fruit salad is prepared as part of the educational programme. What food is put on the table and who provides or prepares it might be very different. If parents bring food from home, there should be rules about the food on offer and hygiene requirements (see chapter 6). It is advisable to develop these rules within the scope of a participatory approach and to record them accordingly in the *catering concept*.

4.6.2 How to handle sweets

Most children love sweets – whether as desserts, sweet spreads, gummy bears or sweet beverages. Sweets are ubiquitous in everyday life and often easily available. They are not necessary for a balanced diet. Sweet foods, sweets and sweet beverages usually contain a lot of sugar and possibly fat. In addition, they provide few micronutrients like vitamins and minerals. Therefore, it is very important to ask how the *daycare centre* deals with the subject of sweets.

Should there be a "sugar-free" morning to promote the remineralisation of the teeth? Should the range of sweets be controlled centrally by the *daycare centre*? Are sweets allowed in the lunch box?

As part of the menu calculations of the "DGE Quality Standard for Meals in *Daycare Centres*", 10% of the total energy was taken into account for foods with low *nutrient* and *high energy density*. In addition to the classic sweets, these include sweet beverages, sweet spreads, sugared breakfast cereals as well

as chips and savoury snacks. For children aged four to seven, this is about 150 kcal per day. For example, 10 gummy bears and 15 g (approx. 1 teaspoon) of hazelnut spread contain this amount. Some facilities strictly ban sweets in the *daycare centre* or agree on this jointly with the legal guardians. Regardless of how the daily routine in the *daycare centre* is organised, clearly defined rules are crucial for adequate handling of sweets.

Examples of such regulations:

- To teach children how to appropriately handle sweets, they are only given at defined times or on special occasions (e.g. birthday, summer party).
- Sweets are not part of breakfast or snacks. This also applies to the so-called child nutrition products.
- Sweets are not used as a reward or for comforting.
- Desserts, for example, are only available on selected days.

Remember – the parental compliance with these rules should be ensured and they should be placed accordingly in the *catering concept*.

Further information:
www.fitkid-aktion.de
keywords: Süßigkeiten **and** Zahngesundheit

4.6.3 Food intolerances like allergies

Lactose intolerance, coeliac disease, peanut allergy – food intolerances like allergies are not uncommon in *daycare centres*. So how do *daycare centres* and *meal providers* deal with this? 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,
- a choice of individual components,
- or (if no other option is possible) a meal brought from home.

It is indispensable to address this aspect in the admission interview with the parents. Only if the *daycare centre* and the *meal provider* know whether a food intolerance like an allergy exists, both can react accordingly. It is important for parents to know in advance how their child can be fed within the *daycare centre's* daily routine. Is it possible to provide an appropriate offer? May, should and are parents allowed to bring meals to the *daycare centre*? How can a mix-up of the food be prevented? If these questions are clarified in advance, they make daily life at the *daycare centre* easier. At the same time, the agreements show both possibilities and limits.

In order to plan appropriate measures, a medical certificate or an allergy passport is recommended. Only if the *daycare centre* and the *meal provider* know whether food intolerances like allergies exist, both can react accordingly.

Allergen labelling for unpackaged food (see chapter 6) is mandatory since the end of 2014 [53]. Information about the 14 main allergens may be provided either written or verbally. If written information is given, it must be easily visible, explicit and readable.

A copy of the medical certificate must be kept in the child's file. In case of doubt, the food intolerance is documented in this way.

In addition, appropriate instructions should be discussed with the parents and also documented. An information sheet on food intolerances like allergies should contain the following points:

- child's name,
- child's group,
- type of food intolerances like allergies,
- list of avoidable foods/allergens,
- if applicable, list of "substitute foods" that are tolerated and can be stored in the facility,
- information on initial emergency measures (after consultation with parents) and
- contact telephone numbers.

This information must be easily accessible to all supervising and responsible persons (e.g. *educational staff*, kitchen staff, trainees) at all times.

Further information:
www.fitkid-aktion.de
keywords: Kennzeichnung **and** Lebensmittelunverträglichkeiten

4.6.4 Special needs of catering for under three-year-olds

Since 2013, children from the age of one have the legal right to a childcare spot (§ 24 paragraph 2 section 1SGB VIII). The number of children under three years of age in nurseries increases steadily [54]. Thus, the topic of catering for children in this age group becomes more important. However, it is evident that infants (0-1 years) tend to attend nurseries less frequently (average childcare rate of approx. 2% nationwide in 2018) [54]. Therefore, the catering of infants is not the subject of this DGE Quality Standard. An overview of the most important facts on feeding infants in nurseries is available on the website www.fitkid-aktion.de. Recommended practices, more detailed information, materials and training are provided by the "Healthy Start – Young Family Network" at www.gesund-ins-leben.de. This is an association of important professional societies and institutions that deal with the topic of nutrition and health in pregnancy, during breastfeeding, for infants and young children [55, 56].

Depending on the developmental status, there is a smooth transition from infant feeding to the general family diet. This means that children, depending on their age, abilities and skills, may eat together with the "older ones". They do not need a special diet like infants do. However, they need help and support when eating and drinking independently. Chewing and swallowing solid food must first be learned. This needs time and more intense supervision.

It is important to motivate children to eat independently with cutlery. Sometimes it is helpful to chop or mash food. However, this does not mean turning food into puree. To strengthen the chewing muscles, children should, for example, eat bread cut into pieces, but still with crust. For many children it is easier to eat from a bowl than from flat plates. With a few exceptions, no restrictions are necessary in the food selection.

- **Cabbage, legumes and others**
  Foods that are flatulent or difficult to digest, such as legumes, cabbage and onions, are not forbidden. However, they should be gradually implemented.
- **Sharp-edged, hard, round food**
  Sharp-edged or very hard foods, such as nuts, are difficult to chew and can be easily swallowed [57]. Round foods such as grapes, blueberries or olives also pose an increased risk of choking. Therefore, these foods should be chopped into small pieces.
- **Meat rather tender than hard**
  Large fibres, hot fried or dry/hard meat is difficult to chew. Therefore, meat with a tender consistency should be offered.

Breast milk in the *daycare centre* – is that possible?
Certainly, it is possible. What *daycare centres* have to keep in mind is explained in the leaflet of the Federal Institute for Risk Assessment „Hinweise zum Umgang mit Muttermilch in der Kita" (Advice for handling breast milk in the *daycare centre*) www.bfr.bund.de.

5

Beyond the plate

A nutritionally balanced and sustainable meal offer in the *daycare centre* is essential. But the view must go "beyond the plate". Not only "what" is eaten matters, but also "how". This means that different general conditions like the dining environment or food and nutrition education are important: The variety of tastes that children get to know in their early years and what they associate with a positive dining atmosphere usually persists and remains until adulthood. Thus, the setting of a *daycare centre* as a place of education with different meals offers ideal conditions to positively influence the eating habits of children from the very beginning.

5.1 Stakeholders in daycare catering

In order to provide health-promoting and sustainable meals and to create a supportive dining environment and corresponding educational activities "around the plate", the cooperation of different stakeholders with different competences is necessary. Figure 6 shows selected stakeholders involved in daycare meals and illustrates the complexity of catering and food and nutrition education. According to their respective fields, they are divided into three groups: ***Meal providers***, who plan, produce and/or offer meals in or for *daycare centres* (green), all stakeholders involved in the ***daycare centre* environment** (orange) as well as **parents and children** (yellow), who should be considered as guests or relatives. All of them influence the design and quality of daycare catering and its general conditions in both direct and indirect ways.

Good communication between all stakeholders is essential for the success of good daycare catering. For this purpose, a *catering committee* (so-called "round table") may be established, in which all stakeholders meet at regular intervals (see chapter 2).

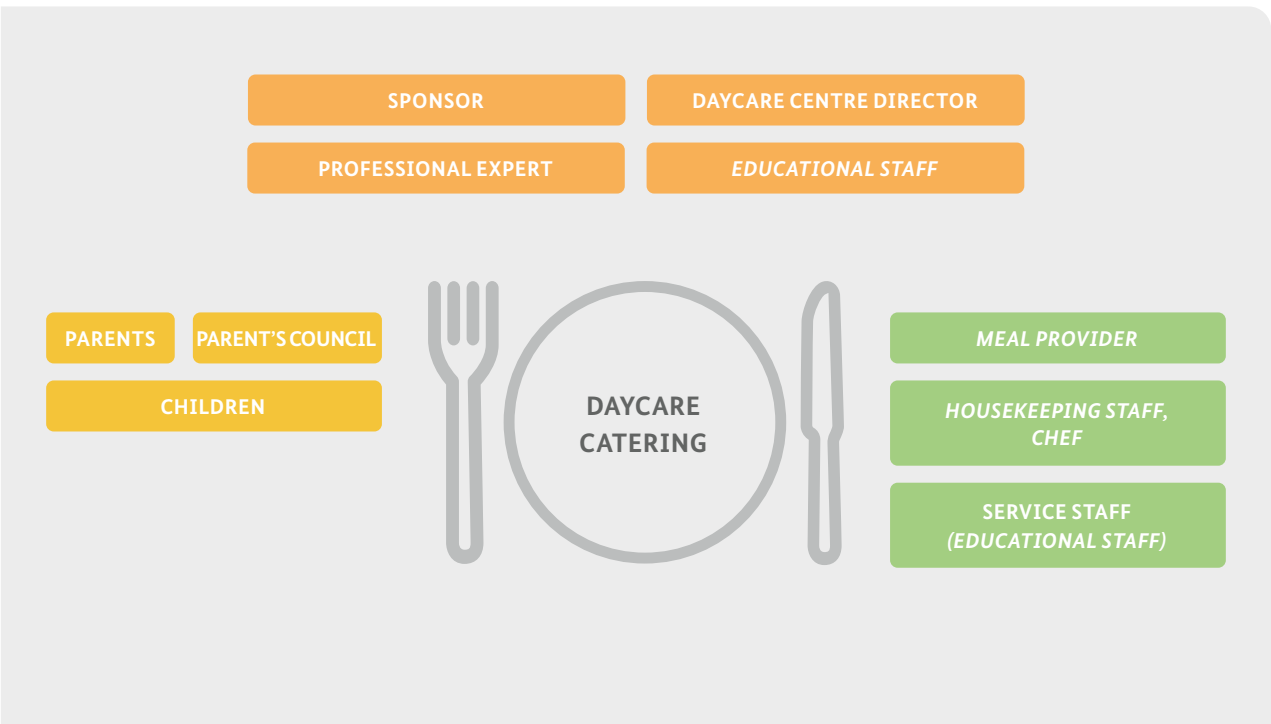


Figure 6: Selected stakeholders involved in daycare catering

In the following, the stakeholders are presented with their tasks and influence possibilities (see also Figure 1). This is followed by some general conditions that stakeholders may influence. This chapter intends to raise awareness of the various topics and provide suggestions for transferring them into practice. Due to the large number of stakeholders and the wide variety of general conditions in daycare catering, it is impossible to present a comprehensive overview; this is why only examples can be given.

Sponsor, professional expert, *daycare centre* director, *educational staff*

This group of people not only influences what is offered on the plate, but also has a direct influence on the general conditions of the dining environment. They act on different levels with indirect or direct contact to the child. While the sponsor decides on the material and personnel framework, the *educational staff* actively creates the eating situation in the *daycare centre*. Decisions about the direction of catering and its integration into the *educational concept* as well as the status of catering in the *daycare centre* are made by the sponsor, the professional expert, the *daycare centre* director and the *educational staff*, who all play a central role.

Parents, parents' council, children

The foundation for eating and drinking habits is laid at home. Parents act as role models and shape the child's attitudes and eating habits. The child's dining environment expands when he or she enters the *daycare centre*. Since the child often eats several meals a day at the facility, the *daycare centre* increasingly gains influence [58].

The best chance to positively influence children's eating habits is when parents and *daycare centres* work together and complement each other. Parents and parents' representatives are therefore important partners for the topic of eating and drinking as well as for food and nutrition education [59]. A regular exchange between all participants

promotes transparency, is elementary for quality development and creates mutual understanding (see chapter 2).

Meal provider, housekeeping staff, chef, service staff (educational staff)

The *meal provider* and the kitchen team are responsible for what is offered on the plate. Depending on the general conditions, they have a direct or indirect influence on the catering situation with their possible actions.

If the food is prepared or regenerated in the *daycare centre* itself, the children experience this process directly. They know the kitchen team, smell the aroma while preparing the food and have the opportunity to ask questions. If food is delivered by a *meal provider*, the influence is more indirect. A pictured menu as a service for the children or regular background information on dishes or food for the parents are just a few examples of how a *meal provider* may influence the catering situation, far beyond the preparation of the meals. In the *daycare centre*, the food is usually served by the *educational staff*. They are in direct contact with the children, have an influence on the food's acceptance, assist at mealtimes, encourage children to eat and drink independently and motivate them to try new foods. Regardless of whether the food is prepared directly in the facility or delivered, the *educational staff* and the catering team are an important connection for the optimal design of the meals.

In this context, it makes sense to establish a *catering committee* with the participation of the above-mentioned stakeholders (see chapter 2.1).

5.2 General conditions around daycare catering

The numerous stakeholders described above illustrate the various responsibilities that need to be coordinated in order to ensure that the catering on and around the plate might be optimally designed (see chapter 2.2). In addition to the stakeholders, there are also general conditions and activities that may influence the food and beverages in the *daycare centre*. These framework and activities can vary, depending on the structure and conditions on site.

5.2.1 Development of a *catering concept*

Due to longer daycare hours, meals at the *daycare centre* are becoming more important – especially for parents. In some cases, the food offered can also be the decisive criterion for or against a *daycare centre*. Families have their own eating habits, which are shaped by different attitudes, preferences, wishes and views. Uniting all of these in a *daycare centre* is impossible. A *catering concept* shows how eating and drinking is "lived" in the *daycare centre*. It serves as external communication (e.g. for parents). It creates trust, security and transparency. At the same time, it defines a scope of action for staff and is an instrument for quality development (see chapter 2).

Ideally, the *catering concept* is firmly anchored in the *educational concept*. What a *catering concept* ultimately looks like, which points are addressed, defined and regulated depend on the respective general conditions and structures of the *daycare centre*. In order to develop a *catering concept* for the facility, it is helpful to involve all participants (see chapter 2). This participatory process creates transparency and understanding for the different concerns and thus promotes acceptance.

5.2.2 Design of dining environment and atmosphere

Whether children like and accept the offered meals also depends on how they eat. The dining atmosphere is of great importance. An appealing dining atmosphere creates space for joint conversations. It gives children enough time to enjoy the meal and the opportunity to learn social skills such as listening, showing respect and helping each other. The most important factors that positively influence the dining environment and atmosphere include the

- room and table design,
- mealtimes as well as
- pedagogical assistance during mealtime.

The following criteria apply for designing the dining environment and atmosphere:

☐ **The dining area is bright, offers sufficient space and is furnished age-appropriate.**
A separate dining room in the *daycare centre* is ideal. This makes the daily meal routine easier, as tableware, cutlery and glasses, for example, can be stored centrally. It should be bright and may be designed around eating and drinking. Sufficient space, age-appropriate furniture and mobility around the table make it easier for children to handle cutlery and fill their plates independently. Accordingly, the tableware should also be suitable for children. Spoons that are too big do not fit in the mouth. Large knives are often too heavy to hold. In addition to the interior design, the noise level during mealtimes affects the dining atmosphere. Clear communication rules help to reduce the noise level.

☐ **Meals are separated from other activities and mealtimes are defined.**
Set mealtimes structure the day, which is especially important for children and provides security. Therefore, the facility should define firm mealtimes or mealtime periods. This applies to all meals. If there is no separate dining room, meals should be clearly separated from other activities. This signals clearly to the children that mealtime is starting now. They are not distracted by other activities.

... furthermore:

The duration of the meal corresponds to the children's needs. A continuous meal offer, such as a fruit plate that is always available, is not recommended. A permanent meal offer is unfavourable for dental health and can lead to children eating beyond their hunger and energy needs. Therefore, "meal-free" periods are absolutely reasonable and recommended. This can be two to three hours after a complete meal. There should always be an opportunity to drink. Water and unsweetened fruit and herbal teas are the first choice.

While lunch in *daycare centres* is usually eaten together, there are different concepts for breakfast and snacks. Depending on the structure and conditions in the facility, it may be either an open/free breakfast or snack (with defined mealtimes, e.g. from 8 a.m. to 10 a.m.) or a closed/common breakfast or snack (start and end together).

Both approaches have advantages. If the institution decides to have a joint breakfast, this usually results in a more peaceful atmosphere, table rituals can be cultivated, and the *educational staff's* role model function is more effective. At the same time, "bad eaters" may be motivated by the community. Unfamiliar foods are often better tried in this way.

Where open breakfasts are favoured, children have more freedom in deciding what they want to do. There is no need for them to interrupt their play abruptly and so they can follow their own feeling of hunger and satiety more. This also influences the duration of the meal. When the child is full, he or she may get up again. Autonomy is promoted more, as he/she is responsible for putting the tableware on and off the table.

☐ **All meals are supervised by the *educational staff*.** Children learn through role models. They observe and imitate behaviour [58, 60]. Learning also happens at mealtimes. Therefore, the *educational staff* acts as role models, especially at mealtimes. They teach the children skills and explain unfamiliar foods. How the meal assistance looks like should therefore be defined and determined within the scope of the quality management. Sharing a meal is an educational task. In the case of young children, a high level of supervision is often required. Consequently, the shared meal is not a break period.

5.2.3 Food and nutrition education

"Every young person has the right to support his or her development and to be educated to become a responsible and socially competent person" (§ 1 Abs. 1 SGB VIII). In addition to the task of care and education, *daycare centres* have an educational mandate (§ 22 Abs. 3 SGB VIII) [61]. Although the federal states differ in their orientation and education curricula for early childhood development and education in *daycare centres*, they all have one common goal: to promote the social, emotional, physical and mental development of the child [62].

In the context of developing health-promoting behaviour, food and nutrition education plays an elementary role. This is not about teaching nutritional knowledge. The classification of food into "healthy" and "unhealthy" is not helpful. Above all, eating and drinking should be experienced.

Special educational programmes for food and nutrition education are not necessarily required for this purpose. The everyday life of a *daycare centre* provides numerous starting points for food and nutrition education. For example, children should have the opportunity to learn about **food diversity** through a varied menu. They may also learn about **food culture** and cultural techniques by learning about table manners, rules at mealtimes or by being offered *regional* and country-specific foods. Children have a natural feeling of hunger and satiety. It is important to maintain this perception. This is supported, for example, by allowing them to help themselves independently at mealtimes. In this way, over time they learn not only to estimate the right portion size according to their hunger, but also to avoid leftovers and learn to **appreciate food** [15].

Through the (eating) experiences and early knowledge of the variety of tastes, it is very likely that children will also choose from a wide range of foods in adulthood [60, 63].

In addition to food and nutrition education, cooperation with the parents is also important. It is a good prerequisite, if *daycare centres* and parents complement each other, for enabling children to deal with eating and drinking in a self-determined and self-responsible manner. Thus, the *daycare centre* is an ideal place to introduce children to health-promoting and sustainable behaviour and to support them in acquiring everyday skills [60].

5.2.4 Communication and parental participation

Parents are the most important partners for the *daycare centre*. Good communication around catering is fundamentally important.

What proves to be good and practicable communication around meals can vary from *daycare centre* to *daycare centre*. It is essential that information is passed on and transparency is created. This gives security, creates trust and forms a good basis for an educational partnership. It is not only the *educational staff* who have to pass on the information. *Meal providers* as well as *housekeeping staff*

are relevant stakeholders who can support the communication about the catering in a professional way. Parents' concerns and children's wishes should also be included in the communication (see chapter 2.4). A professional view on the subject of daycare meals is important. Questions such as "How much meat should be served?" or "Why are wholemeal products important?" should be answered equally and correctly by each person. The *educational staff's* own eating biography, individual likes and dislikes have no place here. Reliable, scientifically based information is important. This is provided by the "DGE Quality Standard for Meals in *Daycare Centres*".

Some communication examples are presented below to simplify the implementation in practice.

- **Menu:** When it comes to the meals, the menu is the most important communication tool. In addition to certain obligatory labelling (see chapter 6), the menu should be designed in such a way that it is clearly visible what food is being served. This includes not only lunch, with starters and desserts, but also breakfast and snacks. Pictures, pictograms, drawings or a sample plate (with dummy food) also give children the opportunity to "read" the menu.

- ***Catering concept*:** A *catering concept* describes in detail how catering is practised in the *daycare centre*. Ideally, it is written down and known to the parents from the beginning (see chapter 5.2.1).

- **Displays, flyers, brochures, parents' newspaper:** These communication tools provide scope for very different contents and depth of information. For example, it can be a recipe/food of the month to be cooked by the *meal provider* or the *housekeeping staff*. It can also be specific information about pedagogical offers around eating and drinking. Perhaps there is also room for the families' favourite recipe to be displayed. This encourages sharing and cooking. The possibilities are endless and the subject of catering remains a matter of conversation.

- **Parents' activities:** The focus lies on interaction and the exchange of information about eating and drinking. In addition to providing information, parental activities also help to make the work of the *educational staff*, the *meal provider* and the *housekeeping staff* transparent and create understanding. Being open to suggestions and help from parents promotes the educational partnership. In addition to the popular cooking and baking activities on certain themes, this might also include a visit to a producer or the *meal provider*. Especially when the daycare year begins and many new children visit the facility, a parents' night about eating and drinking is a good idea.

6

Legal requirements for daycare meals

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

6.1 Food law key regulations

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

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

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

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

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

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

From legal obligation to practical implementation

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

6.2 Hygiene and infection control

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

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

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

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

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

Good hygiene practice

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

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

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

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

In addition to good hygiene practice, food business operators must introduce, apply and maintain a documented self-checking system in their business/facilities in accordance with the *"Hazard Analysis and Critical Control Points"* principles (see Regulation (EC) No 852/2004 Article 5). This is based on the general hygiene policy of the business. The aim of such a self-checking system is to identify and evaluate possible health hazards already during food production and to minimise or eliminate them by taking appropriate precautions. If, for example, cooling temperatures are set for certain foods and checked as scheduled, health risks can already be prevented when deviations occur during the production process, thereby increasing the safety of the end product. The official food control checks the "*Hazard Analysis and Critical Control Point*" system, including associated documentation, as part of their control activities [64].

Further information:
www.fitkid-aktion.de
keyword: Hygiene

Training obligation

All employees who produce, handle or distribute food or dishes to children's must be regularly trained in food hygiene matters (see Regulation (EC) No 852/2004, annex II, chapter XII in combination with the Food Hygiene Ordinance [LMHV]) § 4). This regulation also applies to persons who, for example, only serve food to children, like *educational staff* or trainees. Annex 1 of the Food Hygiene Ordinance [LMHV] and DIN 10514:2009-05: Food hygiene – Hygiene training provide good orientation on essential requirements for this training. The latter also contains special content requirements for the instruction of persons who are responsible for the development and application of the "*Hazard Analysis and Critical Control Point*" concept.

In terms of good hygiene practice, employees should be trained at least once a year. The standard also recommends a success assessment and documentation.

Instruction obligation

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

6.3 Labelling and public information

In mass catering, meals are usually offered unpackaged. Mandatory information for customers (e.g. children and parents) is therefore only provided regarding allergen and additive labelling.

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

In some cases, special regulations apply. For example, anyone who wants to label their food as “organic” or “eco” must comply with the relevant European and national regulations on food from *organic farming* [65].

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

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

Obligatory allergen information

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

In mass catering – similar to the entire gastronomy sector – information on allergens may be provided on menus and beverage menus or in price lists. Footnotes may be used as well – similar to the labelling of additives – as long as they are clearly referred to in the name of the food or dish. Caution must be taken to ensure that this designation does not cause confusion with the additives. Another – equally

important – possibility is verbal information. For this purpose, it must be indicated on the menu, on the corresponding displays or other notices clearly visible to the parents that they may ask the relevant staff for information on the allergens. The precondition for the verbal information is a written documentation of all dishes with the respective allergens contained, which the parents may examine if requested, as well as a training of the staff.

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

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

Further information:
www.fitkid-aktion.de
keyword: Kennzeichnung

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

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

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

Nutrition claims like “low-fat” or “rich in vitamin C” are regulated separately. They are only permitted if the requirements of Regulation (EC) No 1924/2006 on nutrition and health claims in foods [HCVO] are met [65].

Checklist

The following checklist provides an overview of all criteria of this DGE Quality Standard. It enables meal providers and *daycare centres* 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 DAYCARE MEALS	not fulfilled	partially fulfilled	fulfilled
A *catering concept* exists.	☐	☐	☐
Parents receive information regarding the *catering concept*.	☐	☐	☐
All stakeholders are involved.	☐	☐	☐
A catering commissioner exists.	☐	☐	☐
Catering staff receive continuous training.	☐	☐	☐
Ergonomic workplaces and workflows are in place.	☐	☐	☐
Employees are valued.	☐	☐	☐

DESIGN OF HEALTH-PROMOTING AND SUSTAINABLE MEALS

	not fulfilled	partially fulfilled	fulfilled
Planning · Purchase · Preparation · Service · Disposal & cleaning			
Food qualities and frequencies for BREAKFAST and SNACKS, MIXED DIET, 5 catering days			
grain, grain products, potatoes **min. 10 x (min. 2 x daily)** wholemeal products, *muesli* without sugar or sweetener	☐	☐	☐
thereof: min. half of the daily offer from wholemeal products	☐	☐	☐
vegetables and *salad* **min. 5 x (min. 1 x daily)** vegetables (fresh or frozen), legumes, *salad*	☐	☐	☐
thereof: min. 3 x as *raw vegetables*	☐	☐	☐
fruits **10 x (2 x daily)** fruits (fresh or frozen); without sugar or sweeteners nuts (unsalted) or oil seeds	☐	☐	☐
milk and dairy **min. 10 x (min. 2 x daily) based on the following specifications** milk, plain yoghurt, buttermilk, sour milk, kefir: max. *fat content* 3,8 % quark: max. *fat content* 5 % → each without sugar or sweetener cheese: max. *fat content* 30 %	☐	☐	☐
meat, sausage, fish and eggs **0 x meat / cold cuts**	☐	☐	☐
oils and fats **rapeseed oil is standard oil** rapeseed-, walnut-, linseed-, soybean-, olive oil, margarine made from the oils mentioned	☐	☐	☐
beverages are available **at any time** water, fruit and herbal tea → each without sugar or sweetener	☐	☐	☐

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

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

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

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

	not fulfilled	partially fulfilled	fulfilled
Menu criteria			
The menu is designed in a child-friendly way.	☐	☐	☐
The current menu is accessible in advance on a regular and barrier-free basis.	☐	☐	☐
Allergens are labelled or information is provided verbally.	☐	☐	☐
Information is provided on food additives that require labelling.	☐	☐	☐
Food is named clearly.	☐	☐	☐
For meat, sausages and fish, the animal species is named.	☐	☐	☐
If the nutritional values are declared, the legal requirements are observed.	☐	☐	☐
Several menu lines are clearly presented, and the health-promoting and sustainable meal is particularly highlighted.	☐	☐	☐

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

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

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

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

Beyond the plate

The dining area is bright, offers sufficient space and is furnished age-appropriate.	☐	☐	☐
Meals are separated from other activities and mealtimes are defined.	☐	☐	☐
All meals are supervised by the *educational staff*.	☐	☐	☐

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Glossary

Catering Committee: This is a working group in which all stakeholders in *daycare centre* catering meet at regular intervals. These stakeholders include the sponsors, *daycare centre* director, *educational staff*, parents, parents' representatives, *housekeeping staff* and *meal providers*. The term catering committee is used here as a synonym for "round table" or catering board.

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

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

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

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

Daycare centre: The definition of a daycare centre varies from region to region and from country to country. In this DGE Quality Standard, daycare centre means a facility that provides all-day care for children. Daycare centre is used here synonymously with nursery, preschool, childcare facility.

Educational concept: A educational concept is a description of the main features of a *daycare centre's* pedagogical work and its focal points.

Educational staff: Used here as a synonym for educator, educational staff, educational specialist, pedagogical specialist.

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

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

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

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

Housekeeping staff: is used here synonymously for housekeeper, domestic staff.

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

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

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

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

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

Obesity: Obesity refers to the accumulation of body fat that exceeds the normal level. It is diagnosed using the *body mass index (BMI)*. Since the body mass index depends on age and sex, in childhood *BMI* reference curves must be used. In children and adolescents, obesity is defined as a *BMI* above the *BMI* percentile of 97 – 99.5. Extreme obesity is classified as *BMI* above the 99.5 *BMI* percentile [66].

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

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

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

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

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

Protein quality: The protein quality or biological value captures how dietary protein can be incorporated into the proteins of the organism´s body. The protein´s amino acid pattern and its digestibility are crucial factors. The protein quality is often indicated relatively by comparison with a reference protein (egg's protein or cow's milk casein) [70].

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

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

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

Regional: A region is an area that forms a geographical, political, economic and/or administrative unit. The food producer is free to choose the region´s label, but it must be clearly comprehensible for consumers. This can be done by political-administrative borders (counties, administrative districts, federal states), by a kilometre radius around a place to be defined, by indicating metropolitan regions (e.g. southern Germany) or defined regions (e.g. Altes Land, Rhineland, Hessische Bergstraße) [71].

Resource conservation: Natural resources, like soil, air or water, should be considered as components of nature. In this context, resource protection is the totality of all actions to preserve or restore natural resources [72].

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

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

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

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

White meat: The term refers to poultry meat.

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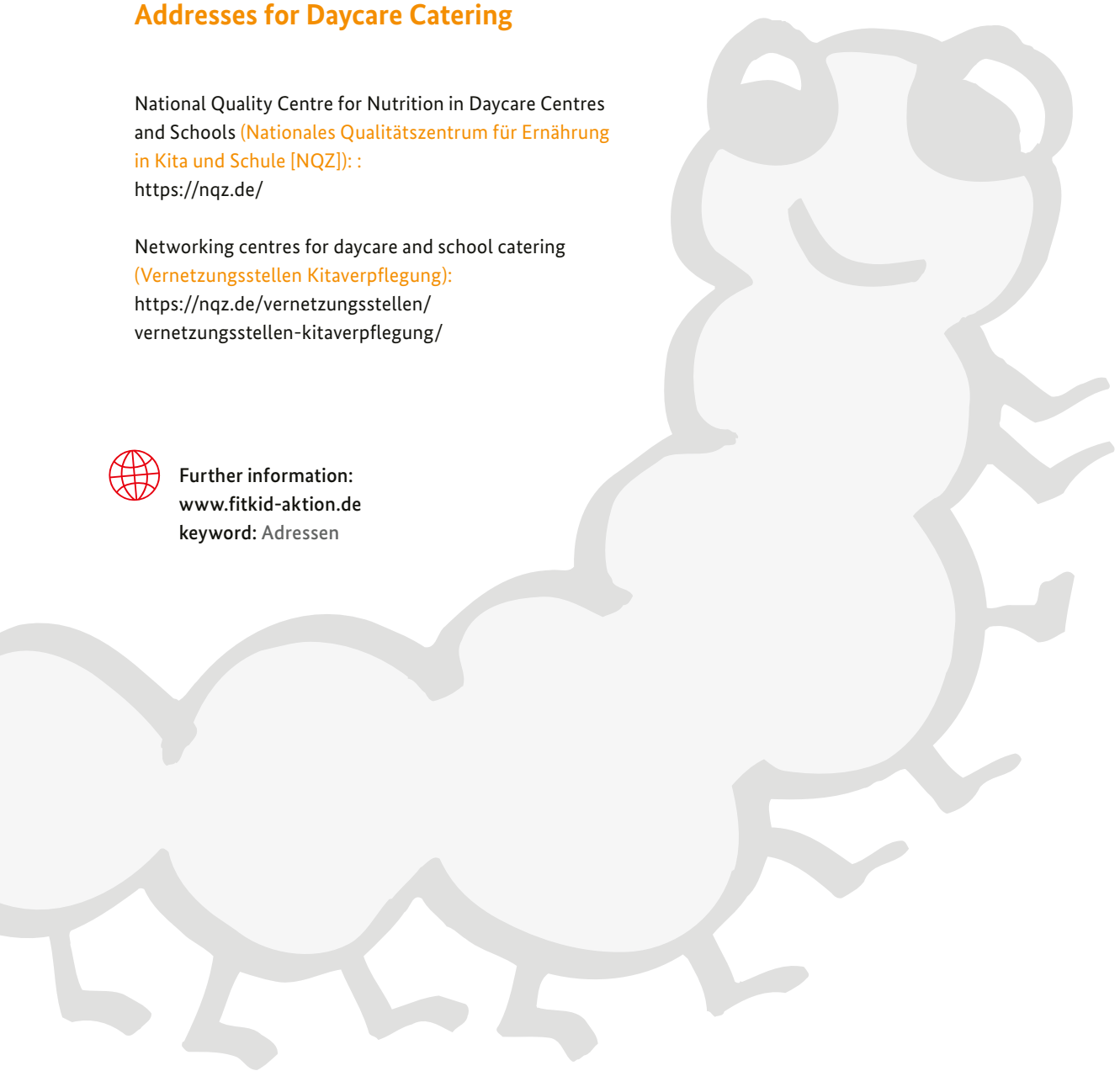

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