





DGE Quality Standard for Catering with "Meals on Wheels" and in Residential Homes for the Elderly



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Message from the Federal Ministry of Food and Agriculture

Dear persons responsible for catering,

one in five people already belongs to the 65+ generation in Germany. My goal is that everyone is able to participate in our social life in a healthy and independent way for as long as possible.

An enjoyable, health-promoting diet is an important requirement for this. However, the feeling of hunger and thirst diminishes in many older people. On the one hand, this increases the risk of malnutrition and, on the other hand, also of obesity due to an unbalanced diet. That is why the nutrition of senior citizens, and the very elderly needs our special attention.

As part of the Nutrition Initiative for Senior Citizens, the Federal Ministry of Food and Agriculture (BMEL) is committed to strengthening the nutritional skills of the elderly and to improving the quality of catering for "Meals on Wheels" and in residential homes for the elderly according to scientific standards. The ministry has therefore commissioned the German Nutrition Society (DGE) to revise the "DGE Quality Standard for

Catering with 'Meals on Wheels' and in Residential Homes for the Elderly" within the scope of "IN FORM – German national initiative to promote healthy diets and physical activity". The standard supports all stakeholders in providing health-promoting and sustainable catering for the elderly.

The BMEL aims to ensure that the DGE Quality Standard is implemented nationwide. In order to achieve this together, the ministry has set up networking centres nationwide for senior nutrition. These intend to promote the practical implementation of the DGE Quality Standard in the federal states, train employees in catering for senior citizens and connect stakeholders.

As persons responsible for catering for older people, you make a decisive contribution to their well-being. With your commitment, you show them appreciation and enable them to grow old in dignity and health.

Sincerely yours,

Federal Ministry of Food and Agriculture

Preface

Dear readers,

a wholesome diet is important at every age to promote health and maintain quality of life. It becomes even more crucial in later life, as physical, mental or social changes as well as illnesses increase the risk of malnutrition over the years. At the same time, meals are often daily highlights of older people, enabling participation, offering enjoyment and evoking memories. It goes without saying, that wherever older people are catered for – whether in private households with "Meals on Wheels" or in residential homes for the elderly – a service that meets their needs and requirements should be available.

Increasingly it becomes clear that what we eat not only affects our health, but also the environment and the well-being of future generations. Due to its scope, mass catering offers great potential to contribute to more sustainability. Together with new scientific findings and more than ten years of practical experience with the DGE Quality Standards, this led us to revise them in a participatory process with experts from science and practice.

With this DGE Quality Standard, we support providers of "Meals on Wheels" and employees of residential homes for the elderly in designing health-promoting and sustainable catering. It combines the previously separate brochures for "Meals on Wheels" and residential homes for the elderly due to numerous parallels in catering. For the first time, criteria for the design of



catering are presented along the process chain, from planning to disposal. The DGE recommendations for a wholesome diet serve as their basis. Those interested can learn for the first time how the criteria are derived. "Beyond the Plate" describes aspects that contribute to proper catering beyond the kitchen. A new chapter describes the factors that contribute to the development of quality in catering within the context of quality management.

Providing good care for older people is a responsible task that requires knowledge, competence and close cooperation between all professions involved. You may use the DGE Quality Standard as a guideline. Show that you care as much about the health of your guests as you do about the well-being of our planet by offering a delighted, health-promoting and sustainable meal offer. The team of "Fit im Alter – Gesund essen, besser leben" provides further information at www.fitimalter-dge.de and gladly assists you with any questions you may have.

Sincerely yours,

Dr. Kiran Virmani

Managing Director of the German Nutrition Society

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Background, Goal and Design

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1.1 Catering for older people: An opportunity for more health and sustainability

The group of older people (65 years and older) is very heterogeneous in terms of their health and life situation. There are healthy and spry as well as sick and frail elderly people. This stage of life covers a far-reaching age range in which extensive physical changes take place [1]. The frequency of illnesses and impairments increases with age, functional reserves decrease and medication becomes frequently necessary [1]. All this may negatively affect the nutritional status and increase the risk for nutrition disorders, especially weight loss and malnutrition.

Adequate nutrition meeting the requirements is a precondition for a good nutritional status, even in old age and in the case of a need for care. It is crucial for maintaining health and functionality [2]. An adequate intake of energy and nutrients and a resulting good nutritional status contribute significantly to better survival in acute events, such as hospital stays or infections [2]. In addition, balanced, tasty and appealing meals play a central role in well-being and quality of life. They structure the daily routine, enable social interaction and are - especially in later life - highly connected with memories and emotions as well as customs and traditions. Finally, many older people have a comparatively high level of experience and competence in processing and preparing food. Given the deprivations that many have experienced during their lives, this frequently leads to a high appreciation of food.

Nutritional situation in later life: from obesity to malnutrition

Due to age-related physiological changes and increasing illnesses, older people bear a higher risk for nutrition disorders: On the one hand, the risk of overeating increases if the energy intake is not adapted to the decreasing energy requirement in advanced age. In the long term, this may result in overweight and obesity. On the other hand, declining sensory abilities, an age-related reduced appetite (anorexia of ageing) as well as increasing physical, mental, psychological and social impairments may cause people to no longer eat and drink sufficiently [2]. This increases the risk of *malnutrition* and dehydration (water deficiency) in old age. Various studies on the nutritional situation of older people show that overweight and obesity as well as malnutrition are widespread [2-4]. The risk of malnutrition increases as the need for care grows and health and general condition deteriorate [5].

Catering for older people: Responsibility and challenge

Health-promoting catering with "Meals on Wheels" and in residential homes offers the potential to promote health, well-being, and quality of life. It is an expression of appreciation and contributes significantly to ageing in dignity. At the same time, it needs to meet various demands: For example, a health-promoting catering offer should be tasty and according to the requirements, i.e. as nutritious as possible, reflect individual preferences and dislikes, as well as frequently occurring illnesses and impairments, such as dementia or chewing and swallowing disorders [2, 6].



In addition, mass catering is also a parameter for more **sustainability**. The entire catering process, from planning to disposal, reveals numerous starting points for acting more sustainably and using the limited resources of the earth responsibly. Aspects of sustainability are therefore included even more strongly than before in this DGE Quality Standard, with the objective of thinking about catering for older people in a more sustainable way.

Offering "Meals on Wheels"

In Germany "Meals on Wheels" is available since the beginning of the 1960s [7]. It enables older people who live in a private household, with or without the need for care, to enjoy a hot lunch in familiar surroundings and is often the first precondition for remaining at home [7]. Generally, the meals are produced by a manufacturer (kitchen, caterer) and delivered to the customers via an associated or external meal service. Providers of "Meals on Wheels" may be, for example, welfare organisations, home care services, residential homes, private companies or municipalities.

A health-promoting lunch may contribute significantly to the intake of energy and nutrients and thus may prevent malnutrition. As older people often receive "Meals on Wheels" at a time when they are still fairly independent, it offers the potential to reduce the possible consequences of diet-related illnesses and improve the quality of life in old age [7]. A balanced lunch is also of high preventive importance for maintaining and promoting muscle mass and strength in the sense of "timely preparation" for old age. It can also delay deterioration in the health of older people with care needs [7].

Last but not least, a varied, health-promoting offer also corresponds to the wish of many customers: When asked what is "important" or "very important", "variety" (approx. 94%), "digestibility" (91%) and "maintaining health" (89%) were the most frequently mentioned answers in the study on the "Situation, quality and satisfaction with the 'Meals on Wheels' service" [7].

Specific characteristics in residential homes for the elderly

In contrast to other living environments such as schools or companies, catering in residential homes includes all food and beverages of the day (full catering), regardless of the type of institution like retirement home, residential (care) home, or nursing home [6]. Moreover, the duration of the stay in the facilities is rarely limited in time, but extends over the entire remaining life span [6]. This and the fact that there is usually no alternative to the in-house range of foods and beverages underlines once again the need not only to make the catering particularly nutritious, but also to align it as closely as possible with the wishes and preferences of the residents.

Another specific characteristic of residential homes is the comparatively high number of residents with care needs caused by or associated with illnesses like dementia and/ or impairments, such as chewing and swallowing disorders. This results in additional catering demands. Providing meals both adequate to needs and requirements, and reflecting individual age- and illness-specific demands as well, is often challenging for the staff [6]. Only close interdisciplinary cooperation will ensure its success.

In addition to providing a healthy and sustainable food and beverage offer, other factors play a role in residential homes in order to ensure proper catering. These include, for example, the design of a pleasant dining environment or appropriate assistance for eating and drinking when needed.

An optimised catering offer in residential homes is a measure of structural prevention and thus contributes to the development and strengthening of health-promoting structures. The guideline on prevention in residential nursing care facilities [8] states the improvement of the nutritional situation of residents as a key goal of health-promoting and preventive interventions for the topic "nutrition". The implementation of the DGE Quality Standard is mentioned as a possible measure to achieving this goal and may be promoted within the scope of the German Prevention Act (PrävG). Residential care homes may be supported by the care insurance fund according to paragraph 5 of the 11th German Social Code (SGB XI).

1.2 Who is the DGE Quality Standard addressed to?

Catering with "Meals on Wheels" and in residential homes is a complex task in which employees from different divisions are involved in addition to the customers or residents themselves and their relatives or caregivers. In each of the divisions, there are managers, specialists and assistants. The production of meals, which includes planning, purchase and preparation, is primarily carried out by kitchen staff. Other also contribute to the success of good catering. Figure 1 gives an overview of the divisions directly (white) and indirectly (grey) involved in catering for providers of "Meals on Wheels" and in residential homes. In addition to the provision of food and beverages by the kitchen, aspects beyond the kitchen also have an influence on the quality of the catering (see figure 2 and chapter 5).

This DGE Quality Standard addresses everyone who is in charge for catering in their respective divisions. In the following, these persons are referred to as persons responsible for catering. These include managers of the kitchen/caterer, nurses, home economists, nutritional specialists as well as directors at the management or sponsor level and employees in quality management.

The persons responsible for catering work out contents and criteria of the DGE Quality Standard for the staff in their area, coordinate them with other divisions and consider the structural, personnel and financial conditions on site. Numerous additional information and implementation tools are available on the website www.fitimalter-dge.de.



Figure 1: Divisions directly (white) and indirectly (grey) involved in catering for providers of "Meals on Wheels" and in residential homes for the elderly

1.3 What is the goal of the DGE Quality Standard?

The DGE Quality Standard supports persons responsible for catering of providers of "Meals on Wheels" and in residential homes in designing a health-promoting and sustainable meal offer in at least one menu line. This means that customers and residents may choose from a corresponding offer.

Based on current scientific data, the DGE Quality Standard describes the **criteria** for optimal, health-promoting and sustainable catering. These may be used to design the catering in residential homes regardless of the institutional concept like ward, living area or house community concept.

Each provider of "Meals on Wheels" and each residential home may implement this Quality Standard step by step at its own pace. Every quality improvement of the catering results in healthier and more sustainable diets for customers and residents. 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, purchase, preparation, serving as well as disposal and cleaning. These kitchen 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, catering for older people accordingly to their needs and requirements is more than just offering health-promoting and sustainable meals. Therefore, the DGE Quality Standard also focuses on aspects beyond the kitchen that influence the quality and acceptance of the meals as well as the enjoyment and pleasure of eating and drinking. They are also supported by employees in other divisions and include, for example, legal requirements, creation of a catering concept, staff qualification, designing of the environment in which eating and drinking take place, as well as communication around the catering offer (see chapters 2 and 5).

Figure 2 shows different aspects that are considered in health-promoting and sustainable catering for older people and therefore addressed in the DGE Quality Standard. The process chain located in the centre plays a key role as a "pivotal point" for such an offer.



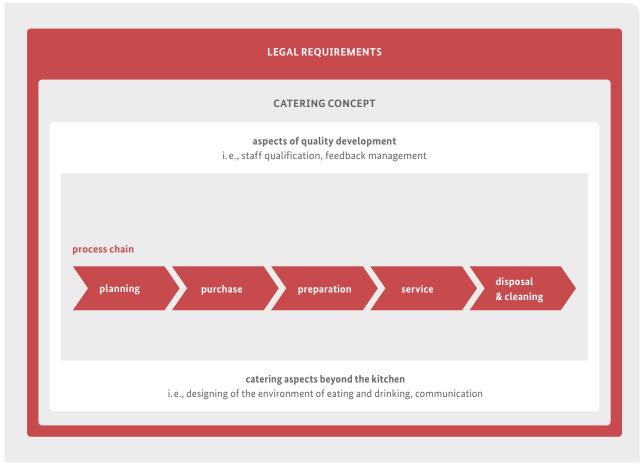


Figure 2: Aspects of health-promoting and sustainable catering

1.4 Features of the DGE Quality Standard in comparison to other standards and guidelines

The criteria for the catering design in chapter 4 refer to oral nutrition. In principle, they may serve as a basis for the planning and preparation of a menu line, but also for the entire offer. In addition, they may also be used for catering for older people with special requirements like chewing

and swallowing disorders, *malnutrition* or dementia, who may require adjustments in the menu and therefore need additional criteria (see chapter 4.6). The "Manual of Nutritional Therapy in Patient Care (LEKuP)" should be consulted for the nutritional therapy of different impairments.

In the case of illnesses and restrictions of a physical, mental or psychological nature and despite optimal support, sometimes adequate oral nutrition is no longer possible. Then (par)enteral feeding must be considered carefully, and the

benefits and risks have to be balanced with all those involved – the affected person, relatives or caregivers, the physician and the nurses.

Enteral and parenteral feeding are not part of the DGE Quality Standard. Corresponding information and recommendations are provided by the European Society for Clinical Nutrition and Metabolism (ESPEN) guideline "ESPEN guideline on clinical nutrition and hydration in geriatrics" and the guideline "Clinical nutrition in geriatrics" of the German Society for Nutritional Medicine (DGEM).

The DGE Quality Standard does not address nursing activities in the context of catering in detail. These are described thoroughly in the "Expert Standard on Nutrition Management for Ensuring and Promoting Oral Nutrition" of the German Network for Quality Development in Nursing [DNQP].

The above-mentioned guidelines and standards focus on different divisions and are aimed at different target groups. However, they complement each other and thus enable interdisciplinary work based on the current state of knowledge [9].

For the catering of older people in hospitals, rehabilitation clinics and geriatric wards, the "DGE Quality Standard for Meals in Clinics" applies.



Further information: www.fitimalter-dge.de Keyword: Leitlinien



1.5 How is the DGE Quality Standard structured?

The DGE Quality Standard includes six chapters with criteria and background information. Persons responsible for catering find answers to the following questions:

How does the DGE Quality Standard support persons responsible for catering on their efforts to improve the catering quality?

The role of the DGE Quality Standard as an instrument of quality development and aspects that contribute significantly to more quality in catering for older people are explained in \hookrightarrow 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 \(\bigcup \) Chapter 3.
- How should a health-promoting and sustainable catering offer be designed?
 Criteria for the catering design are described accordingly to the process chain in \(\rightarrow \) Chapter 4.



> What additional aspects need to be addressed?

A catering according to needs and requirements exceeds the offer of health-promoting and sustainable food and beverages. Aspects beyond the kitchen influencing catering quality are described "beyond the plate" in \(\subseteq Chapter 5.\)

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 \hookrightarrow Chapter 6.

1.6 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 98 provides a criteria summary.



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



 This symbol additionally indicates intersteing facts.



 This symbol highlights topics for which further information is available on the website www.fitimalter-dge.de in the category DGE Quality Standard.



Information and criteria that apply exclusively to providers of "Meals on Wheels" are marked with this symbol.



- This symbol indicates information and criteria that only apply to residential homes for the elderly. If not marked accordingly, text passages without one of the two symbols always apply equally to the offer of "Meals on Wheels" and to residential homes for the elderly.
- Italic words or terms are technical terms that are defined in more detail in the glossary.
- In the following, the term kitchen refers to the kitchen of a provider of "Meals on Wheels", caterers and kitchens in residential homes for the elderly (central kitchens and decentralised kitchens of the living areas), as well as relevant employees.
- In the following, residential homes for the elderly include all institutions providing inpatient care for the elderly. This includes, for example, residential homes, retirement homes or nursing homes.
- In the following, customers are to be understood as older people who receive "Meals on Wheels", while residents are those older persons who live in residential homes for the elderly.



2

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Development of catering quality for the elderly

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 for the elderly and thus improve their offer.

In addition, aspects that contribute to and support this process are described. For all providers of "Meals on Wheels" and all residential homes that already realise the DGE Quality Standard, it is also recommended to take a regular look at the current meals in order to identify possible deficiencies and initiate improvement strategies.

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2.6 Specification for tenders



2.1 Quality of Catering with "Meals on Wheels" and in residential homes for the elderly

Catering with "Meals on Wheels" and in residential homes according to the DGE Quality Standard promotes the health of older people and is sustainable. It prevents the development of *malnutrition*, overnutrition and dehydration and takes into account the needs and wishes of customers and residents.

Thus, the criteria of the DGE Quality Standard describe an ideal catering situation. Provider of "Meals on Wheels" and residential homes may use them as orientation and benchmark for improving their catering offer. Importantly, the persons responsible for catering of "Meals on Wheels" and in residential homes should set priorities for criteria to be implemented first.

DGE Quality Standard as part of the in-house catering concept

Every provider of "Meals on Wheels" and every residential home should develop an individual cross-divisional catering concept. In residential homes, it should ideally be part of the overall care concept. It defines in-house demands on the catering, describes the meals offered, the diets including specific diets offered as well as the catering services and reflects the structures on site. Relevant (nutritional) scientific standards and guidelines should be referred to when creating the catering concept (see chapter 1.4).

Further information: www.fitimalter-dge.de Keyword: Leitlinien As part of such a catering concept, the DGE Quality Standard defines the criteria for a health-promoting and sustainable catering—as mixed or vegetarian diet—and thus ensures that an appropriate offer is available for every meal. The criteria of health-promoting and sustainable catering also largely provide the basis for the preparation of special diets. In addition to the criteria of the process chain, the DGE Quality Standard describes further aspects of catering. The question "Who is served where, when and how?" is therefore answered.

DGE Quality Standard – a quality devlopment instrument

Those responsible for catering should encourage a joint development process towards health-promoting and sustainable catering. With the help of the criteria defined in the DGE Quality Standard, all participants are able to improve the quality of catering with "Meals on Wheels" and in residential homes gradually together.

Catering always involves employees from several divisions (see figure 1). In order to offer proper meals and to further develop their quality, regular exchange with one another is essential. Collaborative meetings and discussions, e.g., in the form of a quality circle, enable all participants to get to know the different perspectives and catering tasks, to contribute specific expertise, to ask questions and to address problems. This way, everyone has the opportunity to participate, to learn about the different points of view, and wishes, suggestions and creativity can be expressed. Feedback from customers and residents from the feedback management may also be included here. The exchange should be used to develop and implement a future-oriented catering concept together.

The collaborative, process-oriented quality development involves five steps that enable a continuous development towards health-promoting and sustainable catering. These are shown in figure 3. The DGE Quality Standard supports each of these steps.

ANALYSIS

In this step, the current catering situation – the **ACTUAL situation** – is examined. In this context, the catering, beginning with the presentation in the menu or the menu catalogue, the transport and distribution of meals, the dining atmosphere in the dining room or the resident's room, as well as the individual steps, from planning to disposal and cleaning, are examined thoroughly. The checklist starting

on page 98 helps to verify which criteria are already met by the catering offer and which are not.

Based on the analysis and description of the current catering situation, all participants have the opportunity to discover which points are already implemented and what should and might be changed in the future. Here, the opinions of all participants as well as the preconditions and structures of the provider of "Meals on Wheels" or the residential home are important; the same applies for the special needs and requirements of older people regarding the meals.

Checklist criteria on page 98 that have not been implemented in the catering offer so far may serve as **targets** for further

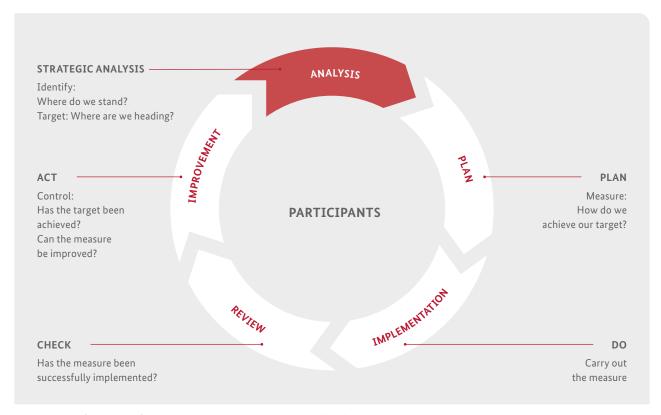


Figure 3: The five steps of collaborative, process-oriented quality development (modified according to Deming's life cycle [PDCA model])

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 3 times a week, while currently it is offered daily, resp. 7 times a week, initially reducing meat to 5 times a week counts as an important quality improvement.

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 whit whom should she/he work together?

Therefore, it is helpful to prepare a plan describing the measures as precisely as possible. For example, measures may include changes in the food offer and the preparation of dishes, or the remodelling of the dining room. Beforehand, all those involved should be thoroughly informed about the planned steps and the targets they are pursuing.

DO

Afterwards, the planned measures can be implemented. At the beginning of the new work process, structures, recipes or products are often unfamiliar for those involved. Therefore, the measures should be guided, and a contact person should be appointed for queries. Customers and residents might be involved in the development of new recipes, e.g. through food samples.

CHECK

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

ACT

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

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



The following criteria apply:

A cross-divisional catering concept is in place.

The catering concept clarifies the understanding of catering, which is anchored in the mission statement, and contains criteria for the implementation of a health-promoting and sustainable catering offer. A catering concept should be part of the in-house quality management.

All participants are involved in the process of quality development.

The cooperation and continuous exchange between all those involved in catering, such as the catering commissioner, persons responsible for catering in each division, employees and the elderly or their representatives, have the goal to jointly improve the quality of catering.

2.2 Interface management

Providing good catering for older people is a task with great responsibility in which several professional and personal groups (see figure 1) share the workload interdisciplinary. 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 reliably and smoothly, 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 (by whom, with whom, to whom).

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

Recommended are operating procedures that define responsibilities for all divisions of the provider of "Meals on Wheels" and in residential homes.

Examples of interfaces for catering for older people are:

Customer service - Customer

The customer service requests dining preferences, catering requirements, information on the need for care, degree of care and state of health from the customer or relatives, the meal service or the nursing service and passes this information on to the kitchen.

Nursing staff - Kitchen/Home economics staff

- If the nurses recognise the need for texture modified food, they pass this information on to the kitchen.
- If the nurses identify a need for eating and drinking aids, they pass this information on to home economics.
- The kitchen provides the food and beverage offer and, if necessary, food for preparation in the kitchens of living areas, taking into account the information provided by



the nurses and the wishes of the residents. The kitchen chef or home economics manager is the contact person for the nurses and vice versa.

Care staff - Nursing staff

 If care staff observe signs of malnutrition in residents, e.g. loss of appetite, they pass this information on to the nursing staff.

Kitchen staff- Resident

- The chef regularly visits the living areas and involves residents in the menu planning, presents new or optimised favourite dishes in the context of a tasting or, for example, cooks with a mobile kitchen trolley at the residents' bedsides. Wishes and criticism may be discussed and, if possible, realised.
- The kitchen knows the needs of the guests and, in the event of nutritional risks, within the nutrition team, may suggest which dishes might be offered as part of an individual nutritional concept.

In case of a **deteriorating health condition** and/or **critical nutritional situations** of individual customers or residents, like unintentional weight loss or illnesses that affect nutrition, it is important to react quickly and look for individual solutions together with the affected person, relatives or caregivers, the supervising physician or the nursing service.



- In the case of "Meals on Wheels", for example, the meal service, nursing or social services, physicians and relatives occupy important complementary interface positions. The consent of the customer or a relative resp. caregiver must be obtained before passing on relevant information.
- In residential homes, an interdisciplinary nutrition team ideally regulates individual nutritional interventions. Depending on the needs, it may consist of employees from the divisions of kitchen, nursing, home economics, medicine, and therapy as well as a nutritionist. The nutrition team ensures that the resident receives meals and beverages that correspond to the respective needs and requirements. Together with the person concerned and, if necessary, relatives or caregivers, individual goals are set, measures are planned, implemented, documented, evaluated and, if necessary, adjusted until the goals are achieved.

Each provider of "Meals on Wheels" and each residential home should have a catering commissioner for internal quality assurance who coordinates those responsible for catering in the different divisions.

The catering commissioner:

- is the main contact person for catering,
- coordinates catering by encouraging communication and exchange between the respective responsible persons for catering in the different divisions,
- establishes an appreciative way of interacting with each other, requiring the very same communication,
- > enables fixed time periods for cross-divisional exchange,
- is responsible for the coordination and implementation of a joint cross-divisional catering concept,
- is involved in the development of individual nutritional concepts in critical situations and defines responsibilities regarding the kitchen,

- represents the interests of customers and residents through the feedback management system,
- documents joint decisions on catering processes as operating procedures within the scope of quality management, thus making them transparent and ensuring smooth processes at the interfaces and
- > continuously stimulates quality development.



The following criterion applies:

A catering commissioner exists.

The large number of people responsible for catering in different divisions require central coordination. The catering commissioner should be aware of all requirements and wishes regarding nutrition, the dining environment as well as the prevailing conditions and coordinate them in the interest of all.



2.3 Staff qualification

In order to provide health-promoting and sustainable catering, employees with different professional qualifications, each with their own input, are required. Coordinated cooperation and close coordination at the interfaces of all divisions involved in catering (see figure 1) is crucial in this context. Since the DGE Quality Standard focuses on the "design of the meals", recommendations for the professional qualifications of the catering management as well as kitchen, serving and customer service staff and the nutritionist are given below. 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
- food service business economist.

Preparation and serving/distribution of meals

Staff skills and knowledge help to ensure consistent catering quality. Kitchen and service/distribution staff as well as employees from the customer service 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.

Employees who distribute or serve food contribute significantly to the meals' acceptance through their appearance and their communication. They should be able to provide information about the offered meals, their composition and allergens, name individual components and point out the health-promoting and sustainable choice to customers and residents. A friendly manner, communicative skills, a good comprehension as well as flexibility, empathy and willingness to help are therefore crucial.

If residents receive meals exclusively in a decentralised way by preparing them in the kitchens of living areas or in residential groups, the qualifications mentioned above apply to the catering management as well as the job profiles of the staff in kitchens of living areas accordingly. If only individual meals or meal components are prepared in the kitchens of the living areas, the planning and preparation of meals can be carried out in close coordination with the catering management.

Meals with medical indications should be prepared by nutritionists who work for a provider of "Meals on Wheels" or a residential home, respectively may be consulted if necessary. These can be dieticians or, with equivalent qualifications for nutrition therapy, ecotrophologists or





nutritional scientists. The meals might be prepared by different persons. In addition to the dietician himself/herself, also by chefs with the additional qualification "dietetically trained chef/DGE", "dietetically trained specialist/DGE" or "certified dietary chef" (IHK). The preparation needs to follow standardised recipes with instructions or must be planned and instructed by a nutritionist.

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, also with different requirements,
- preparation of "Cook & Chill" or "Cook & Freeze" offers (if used),
- > basic knowledge of allergen management,
- ways to increase the percentage of organically grown food in mass catering,
- planning and implementation of nudging techniques,
- feedback management along with
- > cooperation in teams and with other professional groups,
- communication with older people,
 specifically people with dementia as well as
- > dealing with challenging behaviour.



Further information: www.fitimalter-dge.de Keyword: Fortbildungsangebote Mass catering staff carries a high responsibility regarding food hygiene. Regular instruction, e.g. on the German

Infection Protection Act, is obligatory for all employees who work with food (see chapter 6).



The following criteria apply for staff:

A nutritionist is available for special questions about nutrition and in situations that require individual nutrition interventions.

A nutritionist should be available to discuss meals with customers or residents and answer questions, especially in the case of specific diets that severely restrict the choice of food due to medical indications or where nutrition-specific expertise is required in the composition of the meal components. In this way, even within the limits of the specific diet, the individual wishes of the person concerned may be incorporated into the selection of meals.

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 involved. Nevertheless, in mass catering it is certainly not possible to satisfy every wish of the customers, residents, and those involved. Therefore, it is even more important to listen to all persons involved and to discuss wishes and possibilities in a constructive way, as well as to develop realistic solutions. This increases mutual understanding and the willingness to reach a consensus. Feedback management means also a continuous process that includes the following steps:



Step 1:

Receive praise and criticism

Feedback on meals is often unrequested and always an opportunity to improve the offer. Moreover, feedback should also be actively asked for at regular intervals. It is important to have the opportunity both to report appreciation and praise as well as to criticise and give suggestions for improvement in order to optimise processes. Often no negative feedback is equated with praise. Thereby, an opportunity to motivate staff and participants is missed. Appreciation and praise may mean a lot, lack of praise can be frustrating. Possible ways are the personal dialogue with customers or residents i.e., by telephone, as well as questionnaires and/or post boxes i.e., in the dining room. In addition to praise and criticism, the reasons behind them and specific suggestions for improvement should also be asked for. Customers and residents appreciate the opportunity to personally influence the offered meals.

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

Adopted measures in response to the feedback and achieved results should be subsequently made visible to all. The customers and residents are happy to be accommodated, and employees are proud of their efforts and feel that their work is valued.



The following criteria apply for the feedback management:

Suggestions regarding the meals and dishes on offer are received and passed on.

Customers and residents should be given the opportunity to express their wishes and criticism about the meals. These provide helpful suggestions for designing the catering to meet needs as far as possible and thus ensure good acceptance.

Satisfaction with the meals on offer is regularly assessed.

This may be done, for example, by distributing questionnaires or by setting up a mailbox for feedback.

2.5 External quality control

Whether the offered meals meet the set goals may be verified in an independent quality control. Usually, this is carried out by an external institution on the basis of different audit systems and audit criteria. In this way, persons responsible 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.fitimalter-dge.de

Keyword: Externe Qualitätsüberprüfung

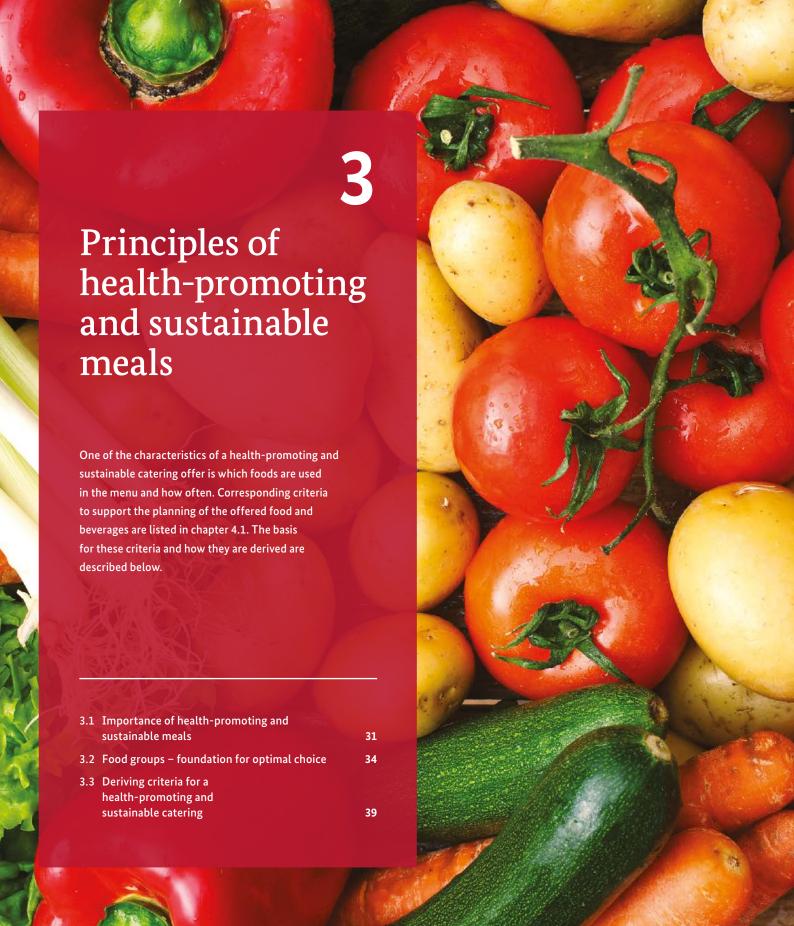
2.6 Specification for tenders

When the catering with "Meals on Wheels" or in residential homes is not organised and prepared by the provider or the care homes kitchen staff itself, but is outsourced, a specification 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, 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 is fundamental for the contract between the contracting authority (e.g. facility/sponsor) and the contractor (e.g. caterer). It is recommended to write the specification supported by external professionals who might also assist in the tender process.



Further information: www.fitimalter-dge.de

Keywords: Ausschreibung und Vergabe and Beratung und Coaching



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 [10].

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" [11], 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 [12 – 15] the Scientific Advisory Board on Agricultural Policy, Food and Consumer Health Protection has [16] formulated four central goals – health, environment, social aspects, animal welfare – for a more sustainable food consumption which are explained in figure 4. 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 [16]. Increasingly, our food is produced in complex and global value chains. The food value chain covers the input factors for agriculture, the agricultural production itself, up to processing and consumption. Aspects of sustainability, like environmental impact, can be tracked along these chains (see figure 5). Therefore, the entire life cycle of a product must be considered in the environmental impact evaluation of food.

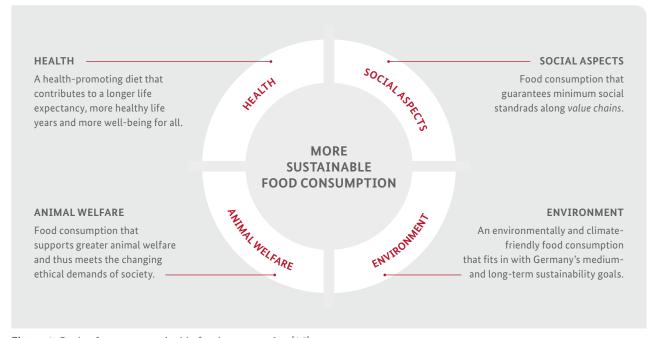


Figure 4: Goals of a more sustainable food consumption [16]

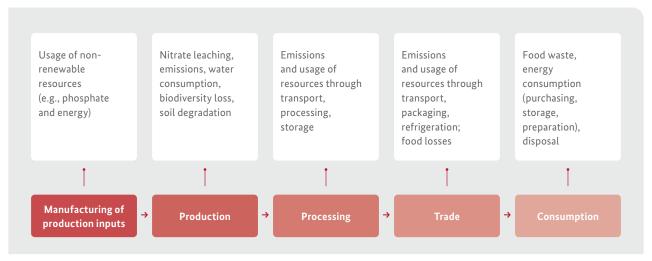


Figure 5: Key environmental impact along the value chain [16]

The contribution of food to greenhouse gas emissions is 25 - 30% worldwide [17 - 19]. 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 [20]. Intensive animal husbandry partly carries the risk of resistances due to the excessive use of antibiotics [21]. The application of fertilisers and pesticides significantly affects the biodiversity of plants and animals [22], and intensive nitrogen fertilisation is responsible for groundwater contamination with nitrate [23].

Therefore, it is not sufficient to adjust nutrition and catering through "Meals on Wheels" and in residential homes 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 [24]. 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 products (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 [16].

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 [25].

Even the production of nutritionally significant foods like milk and dairy products, 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 illustrate that for catering through "Meals on Wheels" and in residential homes 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, 26 – 28]. Once food is discarded, all the steps from farm to fork – and thus the linked *greenhouse gas emissions* – were wasted. In addition, the disposal process itself produces small amounts of greenhouse gases.

Table 1: Estimated *greenhouse gas emissions* from the production of selected foods [25]

plant-based food		kg CO ₂ equivalent
grains,	1 kg rice, dry	3.0
grain products,	1 kg bulgur, dry	0.5
potatoes	1 kg whole-grain pasta, dry	0.4
	1 kg potatoes	0.4
vegetables	1 kg lentils, dry	0.6
and salad	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,	1 kg beef	12.3
fish and eggs	1 kg turkey	4.2
	1 kg pork	4.2
	1 kg herring	2.9
	1 kg egg	2.0
milk and	1 kg cheese	5.8
dairy products	1 kg yoghurt	2.4
	1 kg milk	1.4
oils and fats	1 kg butter	9.2

The "DGE Quality Standard for Catering with 'Meals on Wheels' and in Residential Homes for the Elderly" combines aspects of health promotion and sustainability. In chapter 4, this DGE Quality Standard specifies minimum frequencies for foods and food groups that are particularly recommendable from a health promotion and sustainability perspective. These include plant-based products, such 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 [29]. 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 catering 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.fitimalter-dge.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 [1, 10, 30, 31].

These recommendations serve as foundation for health-promoting and sustainable mass catering. The **food quality** – as **optimal choice** from each of the seven food groups of the DGE Nutrition Circle as 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 catering.

Food group grains, grain products, 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. Ideally, grains and grain products are offered as whole-grain products. The transition to more whole-grain products may be made gradually, for example by mixing wheat and whole-grain pasta or wheat and whole-grain flour when baking cakes and waffles. Yield oats flakes or fine oats might be puréed with fruit and some milk into a drinkable *muesli*, make *smoothies* creamier, and provide texture in potato fritters and patties.

Combination of foods from this group with legumes or animal-based products increase the meal's *protein quality*. Examples include the combination of potatoes or grain products with legumes, milk, dairy products or egg, like bean stew with potatoes and bread, jacket potatoes with herb quark or whole-grain bread with lentil spread. Mashed potatoes may be varied in colour and taste by combining them with puréed legumes like peas or lentils.



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, seasonally-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 classic side dish, *salads*, *raw vegetable* sticks with dip, stew, vegetable pies, casserole and roulades – there are no limits for creative preparation. For people with chewing difficulties, vegetables may be offered finely grated as *raw vegetables*, in potato-vegetable fritters, puréed as a fresh *smoothie*, or in a creamy vegetable soup. Fresh or frozen vegetables are the optimal choice.



"5 a day": At least 3 portions of vegetables and 2 portions of fruit per day are considered the ideal amount. Vegetables and fruit should be consumed with as much variety as possible. This way, the different ingredients complement each other optimally. Regional and seasonal products offer older people orientation and approaches for biography work at the same time.



Further information: www.fitimalter-dge.de Keyword: Gemüse und Obst

Legumes are more digestible if the dry goods are soaked overnight, and the soaking water is then discarded. Adding herbs such as savory, marjoram, rosemary or caraway and pureeing cooked legumes may also improve digestibility.

Some varieties, such as red or yellow lentils, are already peeled and thus often easier to digest [33]. Legumes in the form of flour may also be used to fortify dishes with protein, e.g. for thickening sauces or preparing purees, roasts or fritters.



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. 25 g nuts or oilseeds may replace one portion of fruit a day.

Practical advice: Fruits should be available fresh or as a frozen product, without added sugar or other sweeteners, offered in a variety of ways on the menu: Whether in quark or *muesli*, sliced as finger food, briefly steamed for a sweet main course, with cake or as a fruit salad. People with chewing and swallowing disorders may find fresh fruit on the menu puréed in drinkable *muesli*, as fruit glaze with the dessert, or as a *smoothie*. Nuts and oilseeds finely ground or as pureéd nuts, e.g. in pastries, are easier to eat and also suitable for additionally fortifying dishes with energy.

Food group milk and dairy products

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

Practical advice: Milk and dairy products should be offered daily, e.g. as a drinkable *muesli*, a snack in the form of natural yoghurt with fresh fruit, or quark with herbs and *raw vegetables*. Some types of cheese, such as Parmesan or Emmental Cheese, contain particularly high levels of calcium and may be used to refine e.g. casseroles, pasta or rice dishes. For older people with increased energy needs, high-fat dairy products are suitable to fortify dishes such as sauces, purees, as a filling for pan cakes, cakes, waffles or cream puffs.

Food group meat, sausage, fish and eggs

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

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

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

Practical advice: Eating meat can often become difficult as people get older. Cooking methods like low-temperature cooking provide a tender texture and make it easier to eat.

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 iodin-rich fish: cod, haddock, pollock

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



Further information: www.fitimalter-dge.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 groups oils and fats

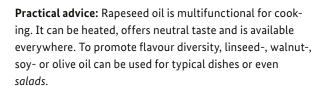
Fat has twice as much energy as carbohydrates and protein, so oils and fats should be used consciously. In addition to the quantity of fat, the quality of the fat, e.g. the fatty acid composition, is of special importance for health. Oils and fats contain saturated, monounsaturated as well as essential 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 [34, 35]. 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 [36 – 38].



In the case of higher energy requirements, vegetable oils are suitable for fortifying dishes such as sauces or purees. Nut oils are ideal for desserts.

Food group beverages

Fluids are important. The primary 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 *guidung value* for the drinking amount for older people is at least 1.3 litres per day. In some situations, the body needs more fluid, for example in very hot weather, physical activity, fever, diarrhoea or vomiting. Certain medications may also require more or less fluid. Cardiac or kidney diseases restrict the amount of fluid intake. Otherwise, the motto is: the more, the better.

Caffeinated beverages like unsweetened black or green tea and coffee are calorie-free beverages that add to the fluid balance. However, due to their caffeine content, they are not an optimal choice. Avoiding bottled water contributes to climate protection. Tap water offers a climate-friendly and at the same time cost-saving alternative, as packaging materials and transport routes are no longer required.

Practical advice: Beverages should be available at all times in residential homes. In addition, older people should be regularly reminded to drink.

When providing "Meals on Wheels", this can be done by the meal service.

Milk and *smoothies* are not considered as beverages because of their nutrient content, but they can be a valuable supplement for people with *malnutrition*.



Further information: www.fitimalter-dge.de Keyword: Getränke

3.3 Deriving criteria for a healthpromoting and sustainable catering

The way recommendations for a wholesome diet translate into criteria for mass catering on a scientific basis is described below. Figure 6 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" [1] and the evidence-based guidelines regarding fat and carbohydrate intake [30, 31]. The former specify amounts for the daily intake of energy and nutrients, including water and dietary fibre. These amounts are formulated for a total of 12 different age groups, each separately for both sexes. In addition, the food-related recommendations of the DGE form a basis,



Basics of a Food-related criteria wholesome diet Theoretical derivation Calculation of health-promoting and sustainable catering "D-A-CH reference values "Implementation of design of nutritionally for nutrient intake", the D-A-CH reference optimised menus > food qualities and Guidelines "Fat" and values in mass catering" for 4 weeks (with 7 days frequencies "Carbohydrates" each) → criteria) age group: y quarter approach orientation quantities > DGE Nutrition Circle 65 years and older derivation of for food > The German Three-> PAL 1.2 and 1.4 food qualities and Dimensional Food frequencies Pyramid > 10 guidelines of the DGE for a wholesome diet

Figure 6: Path from the basics of a wholesome diet to food-related criteria for health-promoting and sustainable catering

like the "DGE Nutrition Circle", "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 ageand 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].

For the catering for older people, the "*D-A-CH reference* values for nutrient intake" for the age group "65 years and older" were used, based on a *physical activity level (PAL)* of 1.2 for bedridden people and of 1.4 for mobile older people.

Within this age group and for each of the activity levels, the *guiding values* for energy intake of women and men were combined and the average value (arithmetic mean) was calculated. A different approach was used for the derivation of the reference values for vitamin and mineral intake: If the values for men and women differed, the higher reference value was used in order to ensure a minimum intake for all.

... and calculation ...

Based on these principles, nutrient-optimised menus for full catering with seven catering days, each for a mixed diet and an *ovo-lacto-vegetarian* diet, were composed. They are exemplary for four weekly menus and considering the usual eating habits in Germany. For the provision of "Meals on Wheels", only lunch was considered from these.

The following aspects were taken into account:

- reaching the derived D-A-CH reference values for mass catering for the age group "65 years and older" with seven catering days (too much or too little of a nutrient in one day might be compensated within one week),
- physical activity level (PAL) 1.2 and 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, cake or ice cream.



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

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

4

Designing health-promoting and sustainable meals

This chapter uses criteria along the process chain to illustrate a menu for full catering and, derived from this, for lunch, taking into account the needs and requirements of older people. Optimally composed, it provides them the opportunity to make a healthy and sustainable choice for every offered meal. Chapter 4.6 also includes criteria for preparing meals for people with special needs, such as chewing or swallowing disorders.

4.1	Planning	4	4
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16	Together and yet individual		



As people age, physiological changes cause a decrease in energy requirements while the nutrient requirements remain the same or, in some cases, even increase. Therefore, it is particularly important to offer foods and meals with a high *nutrient density* to reduce the risk of nutrient deficiencies and subsequent *malnutrition*. In terms of maintaining muscle mass and preventing *sarcopenia*, offering protein-rich foods is crucial.

The senses of smell, taste, and sight may decrease with age, so special attention should be paid to the sensory quality of food and beverages. Variety in terms of taste, smell, texture, and appearance of food and beverages stimulates the senses, supports the pleasure of eating, and influences the appetite positively. The latter may be reduced e.g. by taking medication, depression, or age-related changes in the hunger and satiety regulation.

Eating biography: basis for designing meals

The eating biography is the starting point for needs-based catering and should enable customers and residents to maintain their personal eating habits as far as possible.

In the case of "Meals on Wheels", this information may be collected during an initial meeting between the customer service and the customer; in residential homes, before or immediately after the resident moves in. Recording the eating biography helps to get to know the elderly person and to identify individual wishes, preferences and any aversions related to food and beverages, in order to consider them in the menu planning (see chapter 4.1).

Memory and the ability to express wishes concretely often diminish in advanced age. In these cases, looking at the eating biography helps to keep catering oriented towards needs. Moreover, it may support prevention or nutritional interventions in the case of an existing *malnutrition*.

If desired, the eating biography may be included in the customer file of providers of "Meals on Wheels"; in residential homes, it should be part of the nursing documentation.

As a "living document" that is regularly supplemented or updated by new findings and developments, the eating biography should be accessible to all catering divisions or be passed on accordingly.



The following information may be recorded as part of an eating biography:

- geographical origin, religion, ethnic and cultural characteristics,
- previous occupation, usual daily routine, eating habits and distribution of meals throughout the day, e.g. whether/when cold or hot meals were usually eaten,
- eating rituals on special occasions such as birthdays or Christmas
- lifelong or long-standing popular foods (possibly also from childhood),
- favourite foods, also with regional and seasonal reference,
- > favourite drinks and their distribution throughout the day,
- individual dislikes and food intolerances,
- diseases that influence eating and drinking habits.

The customer himself/herself, relatives or caregivers, the meal and nursing service as well as attending physicians may provide helpful information, observations and experiences about the individual eating biography in the case of "Meals on Wheels".

In residential homes, in addition to the resident, relatives or caregivers, friends and employees from all divisions involved in catering may also provide relevant information.

The relevant information for the design of a supportive and pleasant dining environment is discussed in chapter 5.1.

4.1 Planning

Planning

Purchase

Preparation

Service

Disposal & cleaning

Creating health-promoting and sustainable catering 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 meal participants numbers and the amount of food needed. A flexible ordering system as well as close coordination between the meal service staff or the nurses and the kitchen staff, also with regard to food returns, is therefore a precondition

(see chapter 4.5). Before serving, the quantities produced should be compared with the quantities currently needed, if possible.

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 gases than those with a high proportion of animal-based products (e.g. meat, cheese, butter) [25].





The wishes and needs of the customers and residents should be respected as much as possible when compiling the offer (see section eating biography).



Further information: www.fitimalter-dge.de Keyword: Nachhaltigkeit in der Gemeinschaftsverpflegung

4.1.1 Food qualities and frequencies and other aspects of menu planning

Health promoting and sustainable catering are essentially characterised by quality and frequency of the selected food during a certain period of time. Irrespective of the daily number of meals, it is therefore necessary to decide which foods should be offered and how often.

Tables 2 (full catering) and 3 (lunch) in this chapter provide support. Based on the seven food groups (see chapter 3.2), they show the **optimal food choice** in the second column. Included are foods that are highly recommended because of their nutritional composition.

Additionally, columns 3 and 4 show **how often** certain foods or food groups must be used in a period of seven catering days. Details for a mixed diet as well as for an *ovo-lacto-vegetarian* diet are presented here. 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.

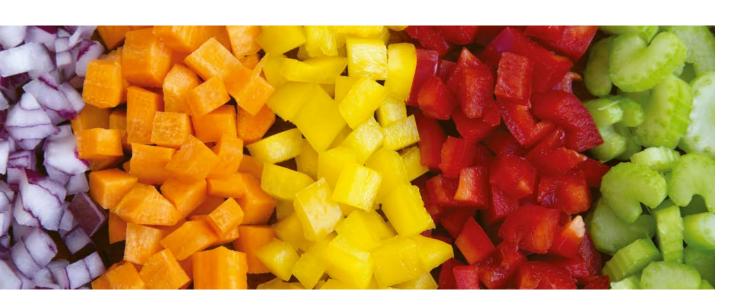
Moreover, minimum and maximum requirements are formulated to show particularly recommendable or less recommendable foods from a nutritional and sustainable perspective. The criteria on the foods' qualities and frequencies allow a balanced and varied menu. If the criteria are consistently observed in 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].



By the way:

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

One important parameter in the context of menu planning, purchasing and serving is the portion size of individual components. They provide orientation on how much of the food should be offered from a nutritional point of view. In the tables 2 and 3, **food quantities** (*PAL* 1,2 and 1,4) are shown as a planning orientation for seven days. 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 provider of "Meals on Wheels" or each residential home. The wishes of the elderly persons should be particularly reflected. After all, a needs-based calculation is the precondition for responsible economic and ecological action.



The fourth column of table 2 and table 3 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 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.



Food qualities and frequencies for lunch on five catering days per week: www.fitimalter-dge.de category DGE Quality Standard
Gestaltung der Verpflegung



Full Catering

Table 2: Food qualities and frequencies for health-promoting and sustainable full catering on seven catering days

food group		food qualities – optimal choice
grain, grain products, potatoes		 > wholemeal products > pseudocereals > muesli without sugar or sweeteners > potatoes, raw or precooked > parboiled rice or brown rice
vegetables and salad		 vegetables, fresh or frozen legumes salad
fruits	Color	 > fruits, fresh or frozen, without sugar or sweeteners > nuts (unsalted) and oilseeds
milk and dairy products		 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 and eggs*		> lean muscle meat > meat and cold cuts: max. 20% fat
oils and fats		rapeseed oillinseed-, walnut-, soybean-, olive oilmargarine made from the oils mentioned
beverages		 > water > fruit and herbal tea → each without sugar or sweeteners

	food frequencies for seven catering days orientation values for food quantities on seven catering days per person each for PAL 1.2 and 1.4	
mixed diet	ovo-lacto-vegetarian diet	
min. 21 x (min. 3 x daily) PAL 1.2: ca. 2,000 g, PAL 1.4: ca. 2,200 g thereof: min. 14 x wholemeal products max. 2 x potato products	min. 21 x (min. 3 x daily) PAL 1.2: ca. 2,000 g, PAL 1.4: ca. 2,200 g thereof: min. 14 x wholemeal products max. 2 x potato products	
21 x (3 x daily) PAL 1.2: ca. 2,900 g, PAL 1.4: ca. 3,500 g thereof: min. 7 x raw vegetables min. 2 x legumes PAL 1.2: ca. 210 g, PAL 1.4: ca. 260 g One portion may be offered daily as vegetable juice or smoothie.	21 x (3 x daily) PAL 1.2: ca. 3,000 g, PAL 1.4: ca. 3,600 g thereof: min. 7 x raw vegetables min. 2 x legumes PAL 1.2: ca. 230 g, PAL 1.4: ca. 270 g One portion may be offered daily as vegetable juice or smoothie.	
14x (2x daily) PAL 1.2: ca. 1,600 g, PAL 1.4: ca. 1,900 g thereof: min. 7 x fresh or frozen, without sugar or sweeteners min. 3 x nuts or oilseeds PAL 1.2: ca. 60 g, PAL 1.4: ca. 70 g One portion may be offered daily as juice, smoothie or dried fruits.	14x (2x daily) PAL 1.2: ca. 1,600 g, PAL 1.4: ca. 1,900 g thereof: min. 7 x fresh or frozen, without sugar or sweeteners min. 3-4 x nuts or oilseeds PAL 1.2: ca. 70 g, PAL 1.4: ca. 90 g One portion may be offered daily as juice, smoothie or dried fruits.	
min. 14 x (min. 2 x daily) PAL 1.2: ca. 2,100 g, PAL 1.4: ca. 2,500 g	min. 14 x (min. 2 x daily) PAL 1.2: ca. 2,300 g, PAL 1.4: ca. 2,700 g	
max. 3 x meat/sausage for lunch thereof: > min. half of the offer lean muscle meat Total in alle meals in seven catering days: PAL 1.2: ca. 240 g, PAL 1.4: ca. 280 g 1-2 x fish PAL 1.2: ca. 150 g, PAL 1.4: ca. 170 g thereof: > min. 1 x fatty fish	omitted in an ovo-lacto-vegetarian diet*	
rapeseed oil as standard oil PAL 1.2: ca. 120 g, PAL 1.4: ca. 130 g	rapeseed oil as standard oil PAL 1.2: ca. 120 g, PAL 1.4: ca. 140 g	
beverages are available at any time min. ca. 9.1 l	beverages are available at any time min. ca. 9.1 l	

Lunch

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

food group	food qualities – optimal choice
grain, grain products, potatoes	 wholemeal products pseudocereals 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 sweeteners > nuts (unsalted) and oilseeds
milk and dairy products	 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 and eggs*	› lean muscle meat
oils and fats	rapeseed oillinseed-, walnut-, soybean-, olive oil

^{*} There is no recommendation on the number of eggs to be consumed. In the nutrient-optimised meal plans, approx. 20 g for PAL 1.2 and for PAL 1.4 (mixed diet) resp. 40 g for PAL 1.2 and 60 g for PAL 1.4 (ovo-lacto-vegetarian diet) of eggs per week were calculated.

food frequencies for seven catering days orientation values for food quantities on seven catering days per person each for PAL 1.2 and 1.4	
mixed diet	ovo-lacto-vegetarian diet
7x (1x daily) PAL 1.2: ca. 700 g, PAL 1.4: ca. 800 g	7x (1x daily) PAL 1.2: ca.750g, PAL 1.4: ca. 850g
thereof: min. 1 x wholemeal products	thereof: → min. 1 x wholemeal products
> max. 2 x potato products	> max. 2 x potato products
7x (1x daily) PAL 1.2: ca. 1,200 g, PAL 1.4: ca. 1,500 g thereof: min. 3 x raw vegetables	7x (1x daily) PAL 1.2: ca.1,300 g, PAL 1.4: ca. 1,600 g thereof: min. 3 x raw vegetables
> min. 1 x legumes PAL 1.2: ca.100g, PAL 1.4: ca. 140g	> min. 1 x legumes PAL 1.2: ca. 150g, PAL 1.4: ca. 170g
min. 3 x PAL 1.2: ca. 450 g, PAL 1.4: ca. 550 g thereof: min. 2 x fresh or frozen, without sugar or sweeteners	min. 3 x PAL 1.2: ca. 450 g, PAL 1.4: ca. 550 g thereof: min. 2 x fresh or frozen, without sugar or sweeteners
One portion may be offered as dried fruits, nuts or oilseeds.	> min. 1 x nuts or oilseeds PAL 1.2: ca. 15 g, PAL 1.4: ca. 20 g
min. 3 x PAL 1,2: ca. 350 g, PAL 1,4: ca. 400 g	min. 3 x PAL 1,2: ca. 400 g, PAL 1,4: ca. 450 g
max. 3 x meat/sausage PAL 1.2: ca. 130 g, PAL 1.4: ca. 150 g	omitted in an ovo-lacto-vegetarian diet*
thereof: min. half of the offer lean muscle meat	
1–2 x fish PAL 1.2: ca.130 g, PAL 1.4: ca. 150 g	
thereof: min. 1 x fatty fish within two weeks	
rapeseed oil as standard oil	rapeseed oil as standard oil
PAL 1.2: ca.30 g, PAL 1.4: ca. 30 g	PAL 1.2: ca.30 g, PAL 1.4: ca. 40 g

The selection of foods and their frequency of use listed in the tables 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 potato fritters with applesauce instead of a meat dish helps to improve the catering.

This also applies to special catering requirements. In this case, the chef, as part of the nutrition team, contributes her/his expertise in accordance with the DGE Quality

Standard and her/his practical experience, considering special diets when planning and implementing them in an enjoyable way.



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:

The wishes and suggestions of customers and residents are considered in the menu planning as far as possible.

Customers and residents are given the opportunity to express their wishes and criticism about the meals. This may take place in personal conversations, via questionnaires or the residents' advisory board. For those who can hardly communicate their wishes, it is helpful to examine their eating biography.

Culture-specific, regional and religious eating habits are taken into account in the planning.

If these aspects are respected, the customers and residents may identify themselves through the food and a feeling of familiarity and home is created in a less and less self-determined life period.

Ovo-lacto-vegetarian options are available every day for every meal.

Regardless of whether some of the customers or residents follow an ovo-lacto-vegetarian diet, popular dishes without meat and fish are always enriching the menu. In case of an ovo-lacto-vegetarian diet, it must be ensured that the same variety of choices is available at all meals as with the mixed diet. Simply reducing the meat or fish components of the latter is not sufficient enough for a health-promoting 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 older people a feeling of seasonal orientation. Out-of-season products are transported long distances to Germany and/or produced in heated greenhouses. This costs energy and releases greenhouse gases.

Further information: www.fitimalter-dge.de

Keyword: Saisonale Lebensmittel

Local foods are preferred in the menu.

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

Grains, grain products and potatoes are offered in varied ways.

When planning the menu, this food group allows for variety. In addition to potatoes, pasta and rice, spelt, green spelt, bulgur and millet may also be prepared in different ways. Particularly for people with chewing and swallowing disorders, who frequently find mashed potatoes on their daily menu, variation is important, e.g. by preparing them with different mashed legumes.

Deep-fried and/or breaded products are used at most twice in seven 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 fritters or pancakes.

Industrially produced meat substitutes are offered for lunch no more than once in seven catering days.

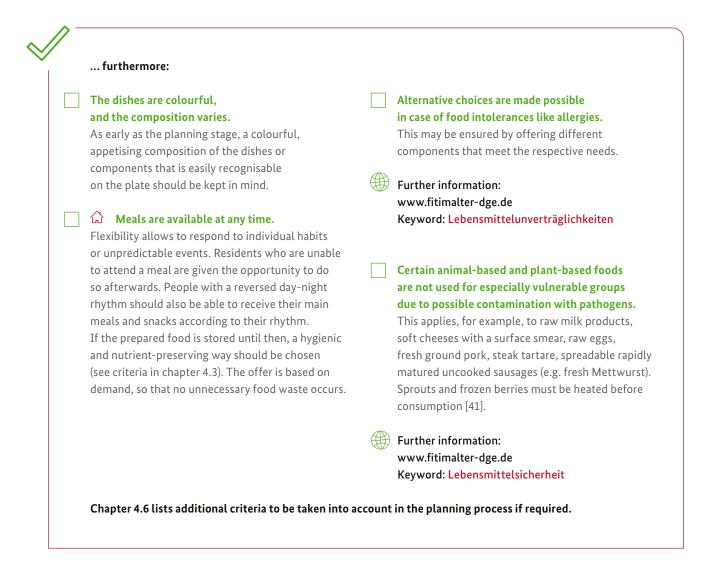
This includes highly processed, ready-to-cook products like "sausages", "schnitzel" or fried patties based on soy, tofu, lupine, mushrooms or milk as well as seitan. Tofu as well as pickled tofu that is not further processed does not count as an industrially produced meat substitute in this context.

☐ Choosing a warm component for breakfast or dinner is possible.

This allows residents to choose even more according to their individual eating habits.

The lunch menu cycle is repeated for "Meals on Wheels" after four weeks and for residential homes after six 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.



4.1.2 The use of convenience food in mass catering

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

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

Those foods that have undergone several processing steps are referred to as high processed products. They include ready-made menu components like breaded schnitzels,

spring rolls, meat substitutes, classic sauces and dressings (dry or wet products) or ready-made entrées like frozen tarte flambée, patties as well as ready-made soups.

Depending on the product group, they may have a high content of sugar, fat, especially unfavourable saturated fatty acids, and salt. Numerous processing steps require additional resources like energy and water. The packaging of convenience food also increases the amount of packaging waste.

The German Federal Ministry of Food and Agriculture initiated "The 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 [42].



Further information: www.fitimalter-dge.de Keyword: Zucker, Fett, Salz



When using convenience food, the following criteria apply:

Products without palm (kernel) fat, palm (kernel) oil or coconut fat are preferred.

The mentioned fats contain large amounts of unfavourable fatty acids and are therefore not recommended from a nutritional perspective. If products with palm oil are used, be sure to use only those made from sustainably certified palm oil. Products with rapeseed, walnut, linseed, soybean or olive oil should be preferred.

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.



Keyword: Palmöl











>



High processed products are always combined or supplemented with low processed products/components.

Ready-to-cook vegetable patties for example may be combined with boiled potatoes and *salad* made from *raw vegetables* with home-made dressing.

Products with a low content of sugar, fat, saturated fatty acids and/or salt and a low energy density are selected.

There are significant differences in the sugar, fat, saturated fatty acid, salt and energy content of *convenience food* within the product groups.

Therefore, products should be carefully chosen and those of them that are considered to be more favourable from a nutritional perspective should be preferred. Due to the differences between the various product groups, it is not possible to give generally valid recommendations for maximum contents of sugar, fat and salt. This requires an individual look at the product groups. The document "Evaluation of selected *convenience foods* in mass catering and recommendations for optimisation" provides assistance for evaluation of selected *convenience foods*" [43].

4.1.3 Menu

Similar to the way a business card contains all important information about a person, the menu (below this also refers to a menu catalogue) should also transparently present all

relevant information about the meals. It is source of information for customers, residents, staff and relatives and represents the kitchen's flagship. Legal aspects must be considered when designing the menu. Chapter 6 provides background information.



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

The current menu is in advance accessible on a regular and barrier-free basis.

To allow customers and residents, as well as relatives or guests, to inform themselves regularly about the catering offer, the menu is available in advance, e.g. digitally or on display (also at eye level for older people who use a wheelchair). It is handed out in case of immobility or communicated in case of visual impairment.



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





Allergens are labelled or information is provided verbally.

Allergens must be labelled in accordance with the national German Food Information Implementing Regulation (Lebensmittelinformations-Durchführungsverordnung, [LMIDV]) (see chapter 6). Allergen labelling requires preparation according to a fixed recipe with regularly updated product specifications.

Further information: www.fitimalter-dge.de

Keyword: Kennzeichnung

Food is named clearly.

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

For meat, sausages and fish, the animal species is named.

It is easier to choose when the animal species is known. This may also be important for religious reasons.

The use of alcohol is declared.

Due to possible interactions between alcohol and medications, alcohol must be declared on the menu.

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 German Regulation on the provision of food information to consumers (Lebensmittelinformationsverordnung, [LMIV]) must be observed (see chapter 6).

If prices are mentioned, they are displayed clearly and transparently.

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

The menu is tailored to the particular target

When designing the menu, ensure that the font is large enough. A supplementary presentation of the menu in the form of pictures may i.e., help older people with cognitive impairments to make their choice.

Several menu lines are clearly presented, and the health-promoting and sustainable meal offer is particularly highlighted.

It is easier to choose if the health-promoting meal is at the top of the menu and highlighted in colour or with a symbol. In this context the use of nudging techniques may be considered (see chapter 5.2.3).

4.2 Purchase

Planning

Purchase

Preparation

Service

Disposal & cleaning

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



For purchases the following criteria apply:

Organic food is used.

Organic food contains few pollutants and residues. In addition, in terms of environmental protection and resource conservation, organic farming has a number of advantages compared to conventional farming. Examples include soil and water protection through avoiding synthetic chemical fertilisers, reduced use of antibiotics in animal husbandry, less pollution of the environment with pesticides and therefore positive effects on biodiversity [25, 44]. The German 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% [45].

The guideline "On the way to more sustainability in company catering" a publication of the project "NACHHALTIG B|UND GESUND" shows ways to increase the organic share in mass catering even with a fixed and limited budget [46].

Further information: www.fitimalter-dge.de

Keyword: Ökologisch erzeugte Lebensmittel

Fair trade products are used.

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

Fish is purchased from sustainable fisheries.

The Marine Stewardship Council and Aquaculture Stewardship Council labels, as well as organic labels like Bioland or Naturland, provide orientation when purchasing fish.

Further information:

www.fitimalter-dge.de

Keywords: Fisch and Nachhaltigkeit



7



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 German 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.fitimalter-dge.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 applies.

Food that has a shorter shelf life or was stored first should be consumed first. This helps to use food before it spoils and contributes to wasting less food.



4.3 Preparation

Planning

Purchase

Preparation

Service

Disposal & cleaning

Apart from the food choice, the way meals are prepared and the time they are kept warm have an impact on the nutritional and sensory quality. Selecting and using kitchen

equipment in a thoughtful way might also contribute to a higher level of sustainability.

The following criteria to the preparation of food apply: Recipes, if required with preparation Fat is used consciously. instructions, are used. Due to its high energy content and differences in With recipes, consistent food quality is ensured. composition, fat and high-fat foods should be used even with staff turnover. They simplify the consciously, e.g. in moderate amounts and preferably preparation process and provide a reliable basis in the form of high-quality vegetable oils. Dairy for calculating products as well as for a functioning products with a high fat content, like high-fat allergen management. Proven and optimised cheeses, crème fraiche, sour cream or sweet cream. recipes additionally help avoiding food waste. should only be used in low quantities when preparing dishes like casseroles, dressings, sauces or desserts. Recipes and menus are available at: www.fitimalter-dge.de category Rezepte Further information: www.fitimalter-dge.de Sugar is used sparingly. Keyword: Zucker, Fett, Salz Sugar-sweetened foods and beverages increase the risk of caries, overweight and obesity as well as secondary diseases like type 2 diabetes mellitus. Iodised salt is used, it is salted sparingly. The addition of sugar and alternative sweeteners Too much salt in food increases the risk of high like honey or fruit syrups should therefore be kept blood pressure and thus cardiovascular diseases. to a minimum. To get used to a less sweet taste, The guidance level for table salt intake for adults a gradual reduction in recipes is recommended. is 6 g per day [47]. Foods like bread, sausage and Instead of sugar, the sweetness from fresh or cheese already contain larger amounts of salt, so frozen fruits is often sufficient enough. 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.



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 puréed 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 consinstency suffer. Keeping food warm for a longer period of time also consumes additional energy. According to DIN 10508:2019-03 [48] and the "Hygiene rules of the mass catering" of

German Federal Institute for Agriculture and Food and the Federal Institute for Risk Assessment [49] the warm-keeping period, e.g. the time between the end of the cooking process and serving of the meal to the last guest, should be maximum three hours long. If a three hour warm-keeping period is not feasible, the food must be cooled down immediately after preparation and regenerated in batches before serving, according to DIN 10536:2016-03 [50].

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 [48].

Further information: www.fitimalter-dge.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 [49] recommend a maximum storage, transport and serving temperature of 7 °C, similar to the DIN standard [48]. Until serving, chilled food should be cooled accordingly and consumed immediately after serving.

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Frozen food is delivered to customers at -18 °C or colder.

According to DIN 10508, the temperature of frozen food and food components is -18 °C or colder, although a short-term rise to a maximum of -15 °C is permitted.

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 [24].

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 [51]. In addition, in energy-intensive processes like (deep) freezing or dishwashing, it is important to ensure efficient utilisation of the appliances. The efficient loading of dishwashers is for example a way to save energy [24].



4.4 Service

Planning

Purchase

Preparation

Service

Disposal & cleaning

Catering does not end at the kitchen door – only when the food is distributed/delivered, in other words when it is handed over to the customers and residents, it reaches the guest. Thereby, the presentation of the food components, no matter whether it takes place in the kitchen or later by the serving staff, as well as the sensory quality of the meal are of great importance for the meal to be accepted. The distribution, which in the case of "Meals on Wheels" is carried out by the meal service, is an important interface between the kitchen staff and the elderly people. Here, customers and residents receive information, have the opportunity to give feedback and express wishes about what is being offered or about portion sizes. Feedback that

meal service staff or the serving staff receive from customers and residents and pass on to the kitchen staff is again helpful and an important information for planning.

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 warm-keeping periods and temperatures mentioned in chapter 4.3 also play an important role in serving. In addition, communication with the elderly in the sense of a health-promoting and sustainable catering may contribute significantly to an appropriate choice.



The following criteria are to be considered for service:

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. For longer transport routes, good coordination with logistics and efficient route planning are crucial.

Serving staff is informed in detail about the current menu.

This includes portioning during serving as well as pre-portioning in the kitchen. Employees who portion or serve food know the meal components, the calculated portion size or number of pieces and which components may be exchanged.

Practically speaking, a short consultation between the kitchen and the serving staff is beneficial. This way, the serving staff keeps track, is able to advise residents at the buffet or buffet trolley in kitchens of the living areas, respond to their wishes and, if necessary, reorder components. Ladle plans and portioning aids support the serving of calculated quantities.

Staff members know the meal requirements of the individual customers or residents.

Staff who receive food requests, prepare food, pre-portion food or distribute/serve meals should be aware of the specific diets of the customers or residents.

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Food intolerances like allergies as well as special catering requirements are taken into account.

Especially in the case of older people with disabilities or cognitive impairments who need support, this should be monitored, as they are no longer able to shoulder this responsibility by themselves. This also applies to religious requirements for catering.

Further information: www.fitimalter-dge.de

Keyword: Lebensmittelunverträglichkeiten

Customers and residents are given opportunities to influence portion sizes.

When different portion sizes may be selected or when satisfaction with the portion sizes is surveyed, food waste can be reduced. Regularly comparing the served with the calculated quantities helps to plan them accurately.

Residents receive information about portioning the food at the buffet.

Sample plates, corresponding ladle sizes or portion trays are used to illustrate portion sizes to residents at the buffet. Service staff may also provide verbal information about the calculated portion sizes.

Beverages are always available and actively offered.

Older people should be regularly reminded to drink and should be able to drink at any time even with impairments. Those affected should receive support, e.g. by pouring drinks or placing bottles within reach.

Meals are delivered to customers in tightly sealed containers.

Portion trays where the dividers seal as tightly as possible with the lid as well as tightly closing lids on porcelain dishes prevent food from leaking.

In addition, the following criteria apply to catering for people with cognitive or physical impairments as well as limited sensory abilities:

Only edible components are served.

Sight and dexterity can deteriorate with age.
Therefore, toothpicks and cords used in the preparation of roulades, for example, should be removed before serving. This also applies to skewers or non-edible peel of fruit used as garnishment.

Served dishes are named.

If customers or residents cannot recognise food components, these must be named. This can be the case with visual impairments, but also with cognitive impairments and when offering puréed food.





If necessary, the temperature of the food is pointed out.

Cognitive impairments or limitations of the senses can lead to an incorrect judgement of the temperature of a dish. In this case, this must be pointed out.

In accordance with good hygiene practice, customers are assisted in opening the packaging if necessary.

When delivering "Meals on Wheels", assistance in opening the packaging may be provided on request, in agreement with the customer and if the food is consumed immediately. Hygienic requirements must be followed.

Chapter 5 provides further criteria that may be relevant for communication during service.

4.5 Disposal and cleaning

Planning

Pruchase

Preparation

Service

Disposal & cleaning

After serving food and beverages, it is worth looking at the non-regenerated components, the returned food from the food counter and the food waste generated in the 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, *nudging* techniques, the presentation of the meals as well as their calculated

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!

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.

In order to raise customers' and residents' awareness on this topic, waste prevention strategies are important. This may result in activities like the introduction of a waste barometer or a guest survey on portion sizes. In addition, for interpreting the returned food, good communication between customer service and meal service and customer as well as between kitchen staff and resident as well as nurses is of great importance. Particularly in care catering, it was shown that often no exchange between the interfaces occurs [6]. In the kitchen, there is often a lack of information about the causes of the leftovers. Was the portion size not appropriate? Did the resident feel not hungry for the moment or is this a permanent condition that requires more frequent, smaller, fortified portions? 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 [52].



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. It also helps when the eating quantities of the person affected have to be recorded as part of nutritional interventions for *malnutrition*.

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.



Further information: www.fitimalter-dge.de

Keyword: Lebensmittelabfälle vermeiden

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 have been used.

Dosing 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.fitimalter-dge.de Keyword: Hygiene



4.6 Together and yet individual

The special challenge in catering for older people is to offer food and beverages that meet the requirements of all guests as much as possible, while at the same time considering individual needs. For many persons responsible for catering, this is quite a balancing act, and it raises the question of how much individuality in the design of food and beverage offers may be granted. However, especially in residential homes, where residents usually have no other alternative to the in-house catering, it is crucial to respect personal preferences and aversions regarding food and beverages as much as possible and to adjust the offer accordingly (see chapter 4, section on eating biography, p. 43/44).

In addition to the personal needs of older people, additional individual demands on catering can result from physical and/or mental impairments as well as illnesses that negatively influence eating and drinking habits and, in the long term, the nutritional and health status. These include, for example, chewing problems, *dysphagia* or dementia. In some cases, they require meals according to medical indications as well as individual nutritional interventions with the involvement of a nutritionist and, if necessary, other professional groups like (dental) physicians or speech therapists.

This chapter describes how it is possible to meet individual requirements due to certain impairments or illnesses in the scope of mass catering. Topics include individual choice of food, finger food and meals for people with chewing and swallowing disorders, malnutrition, dementia, obesity and type II diabetes mellitus, which are very common in old age. In these cases, catering according to the DGE Quality Standard may also be used as a basis for the design of the meal offer. However, depending on the

existing impairment or disease, a modification of the meals and beverages may be indicated, e.g. with regard to their texture, the way they are presented and/or the energy and nutrient content. The primary goal is to avoid an imminent *malnutrition* or to overcome an existing one. Restrictive diets should generally be avoided in older people [53].

Screening and Assessment

The current guideline of the European Society for Clinical Nutrition and Metabolism (ESPEN) [53] recommends regular screening in older people, including those with overweight and obesity, irrespective of existing diseases, in order to early detect (a risk for) malnutrition. A positive screening result should lead to a more thorough assessment and initiation of adequate measures.



Further information: www.fitimalter-dge.de Keyword: Leitlinien

In residential homes, it is possible to meet the residents' requirements by providing full catering. The offer of "Meals on Wheels" may also contribute significantly to good catering and thus to the prevention of *malnutrition* by providing a lunch that meets the needs and special requirements of the customers. Again, the key is to assess the existing impairments and/or illnesses as well as the wishes and needs of the customers (see chapter 4, section on eating biography, p. 43/44).

The information and criteria listed in the following sub-chapters are to be considered as part of the planning process, if required.

4.6.1 Individual choice of food

A health-promoting and sustainable catering offer should always be based on the wishes and preferences of the customers and residents, as far as this is feasible in the context of mass catering (see chapter 4, section on eating biography). In residential homes, catering based entirely on wishes should be made possible in special situations. These include, for example, permanent loss of appetite, malnutrition, severe illnesses and need for care, or in the deceasing phase. Residents should then be able to eat and drink accordingly to their individual wishes. The choice of food and beverages should be agreed personally by a nutritionist with the person concerned. The aim is to motivate eating and drinking and to make meals as pleasant as possible.

4.6.2 Finger food

With increasing age, various illnesses or impairments may cause people to be unable to grip or hold cutlery, to find it difficult to use knives and forks, or to forget how to use them altogether. This may be the case, for example, in the course of dementia, diseases of the joints or Parkinson's disease. In order to maintain the independence and enjoyment of those affected when eating, meals may be served as finger food. These are cold or warm meals cut into small pieces or deliberately prepared as small portions that can be eaten with the hands. Thereby, they contribute to a particularly sensual eating experience and independence when eating. If finger food is prepared in an energy-rich way (see chapter 4.6.4), it is especially suitable as a high-calorie snack for people with *malnutrition* or increased energy requirements.

The following criteria apply to the preparation of finger food: Finger food is no larger than one or two bites. To make it easier to eat with the fingers, finger food should be portioned as small as possible. Finger food is easy to grasp as well as easy to chew and swallow. Finger food should also be easy to grasp for people with physical impairments. A sufficiently large distance between the individual portions is helpful. Finger food should also be easy to recognise, chew and swallow. The texture of finger food is not sticky or crumbly. Finger food is often eaten as a snack in rest areas by people who are constantly on the move. To enable "accident-free" consumption, but also for hygienic reasons, finger food should neither be sticky nor fall apart when it is grasped or bitten off.



"Eat-while-walking": People with a tendency to restlessness or who are constantly on the move may not eat enough to meet their sometimes very high energy needs – despite their hunger and appetite. Often, they are also incapable of remaining seated at the table during meals. In these cases, it is possible to set up small snack stations that are stocked with (high caloric) finger food. It is important to place the stations clearly visible along walking routes or in people's rest areas. The staff must inspect the snack station, keep it clean and refill it regularly. Defined hygienic conditions must be in place. Once an internal concept is developed, it is recommended to consult the responsible supervisory authority before implementation. If necessary, the food must also be cooled and covered.

Finger food: Why not occasionally for everyone?
Finger food enables not only people with impairments to enjoy food that meets their needs.
Presented in an appreciative way, it may actually be a special treat for all customers and residents and thus avoid the feeling of exclusion among people who depend on finger food.

Finger food may also be stored in a fixed place like the kitchen of the living areas or the nurses' common room (if necessary, in a cool place) and given to people who are constantly on the move.



4.6.3 Catering in case of chewing and swallowing disorders

With chewing problems or swallowing disorders, solid foods may be difficult or impossible to eat. Then the texture of the meals or individual components must be modified. In general, chewing and swallowing disorders are two different impairments with different causes and different manifestations. In both cases, it is important to maintain a varied range of food and to present it in an easily consumable and attractive way. Particularly in the case of swallowing disorders, close consultation with the nurses is required, ideally within the nutrition team involving experts in swallowing therapy or speech therapy.

Texture levels

For people with chewing and swallowing disorders, the texture of the **food** must be individually modified to the type and severity of the respective impairment to enable needs-oriented catering and in the case of swallowing disorders to reduce the risk of choking (aspiration).

A four-step diet plan, which should be known to all professional groups involved in the treatment or catering, provides support (see table 4). Particularly in stages 1 and 2, it is important that the individual components have a homogeneous texture and do not contain crumbs, fibres or pieces. In principle, the individual swallowing status should be regularly examined by a specialist and the texture of the food offered should be modified accordingly.



Table 4: Texture modified diets [55]

Stage	Texture of the food
1	thin puréed/liquidized
2	puréed
3	partly puréed
4	adapted/smooth, not puréed

However, maintaining texture levels 1 and 2 makes it almost impossible to meet the patient's nutritional requirements, and additional fortification with energy and nutrients, as well as the administration of ready to drink liquids, may be indicated [54]. The criteria and recommendations in chapter 4.6.4 provide support for fortification.

In the case of chewing disorders, it is frequently sufficient to adjust only the texture of the component that can no longer be chewed well. Pureeing all components is often not necessary. For example, in many cases potatoes are eaten without any problems, while meat has to be puréed. High-performance blenders or cutters mince meat very finely. When combined with egg, quark or oatmeal, the protein quality may be additionally increased. Piping bags or moulds help to bring the components back into shape and present them attractively.

Alongside food, beverages in different textures also need to be offered, if required. Their texture can be modified by the use of amylase-resistant thickeners [55]. Since the fluid intake of people receiving thickened fluids is usually insufficient, it needs to be monitored and, if necessary, optimised by taking appropriate measures [55].

Smooth food: smooth indulgence

Smooth, whipped food offers an additional possibility of meals for people with chewing and swallowing disorders. With the help of aerosol bottles, cold and warm food is



whipped, so that basically every meal may be offered in a creamy, whipped shape and, if necessary, fortified. Smooth food thus offers special taste experiences and variety in catering.

Very airy, large-pored foams or bubbles based on liquids such as coffee, juices or soups provide basal stimulation through intensive taste stimuli with simultaneous mouth moistening when fed exclusively via a tube.

Taste experience for all

The occasional offer of smooth food, like a fruit foam for dessert, may be a pleasant experience for all residents and help to reduce possible fears or reservations about this type of food. At the same time, people who depend on texture-modified food do not feel excluded. An information event with tastings for residents and relatives is a suitable way to make them familiar with texture-modified food.



The following criteria apply to the preparation and presentation of meals for people with chewing and swallowing disorders:

Depending on the severity of the chewing or swallowing disorder, meals and beverages are offered in appropriately modified textures.

The textures (see table 4) should be discussed individually with the nurse or the nutrition team. A good exchange with all involved and a reliable transfer of relevant information is crucial.

In texture modified meals, the individual components are presented separately and recognisably.

Using piping bags, moulds, or aerosol bottles to prepare smooth food, individual components can be presented attractively on the plate. Different components are generally not mixed together.

As far as possible, texture-modified meals consist of the same components as meals with the regular texture.

This enables affected persons to eat a varied diet and prevents them from feeling excluded because of a separate meal offer. With the help of highperformance mixers or cutters, meat and fish can be finely minced and thus made easily edible.

In case of small eating amounts, texturemodified meals are offered in several small portions, if necessary fortified, over the course of the day.

This makes it easier for people with chewing or swallowing disorders to get sufficient energy and nutrients, as large portions are often perceived as overwhelming.

Further information: www.fitimalter-dge.de

Keyword: Kau- und Schluckstörungen



4.6.4 Catering in case of malnutrition

If an already existing or the risk of *malnutrition* is detected during a *screening*, the first important task is to clarify underlying causes and promptly take individually adapted measures. Ideally, this is done by a nutritionist and if necessary, by other relevant professional groups in a nutrition team after a comprehensive *assessment*. Possible measures include offering meals and beverages that meet the needs and requirements, treating or eliminating underlying causes, creating a pleasant dining environment and appropriate nursing support (see chapter 5).

In both cases of risk for and existing malnutrition, it is important to regularly monitor and document the eating amount consumed as well as the body weight of those affected to verify the success of the measures and to adjust them if necessary.

When offering meals to people at risk of or with existing *malnutrition*, their wishes and needs must be given priority. At the same time, it is important to prepare the preferred meals as energy- and nutrient-rich as possible, in an appealing way. If necessary, they should be served with a modified texture (see chapter 4.6.3) and in several smaller portions throughout the day. When offering "Meals on Wheels", it should be possible to provide additional meals or snacks on request [53].

Providing energy-rich and nutrient-rich foods

In cases of low energy intake or weight loss, attempts to increase energy intake are made. For this purpose, more energy-dense foods or meals fortified with them may be offered. Additional snacks, if necessary in the form of finger food, may be provided throughout the day [53].



Examples for energy-dense foods are:

- high-quality vegetable oils, like rapeseed, walnut or linseed oil.
- > energy-rich vegetables like avocado or legumes,
- nuts and oilseeds minced or puréed,
- (soaked, if necessary puréed) dried fruit,
- high-fat milk and dairy products such as cream, butter, high-fat cheese as well as
- eggs.

Providing protein-rich foods like milk and dairy products, meat, fish, eggs and legumes also helps to counteract atrophy of muscles and *sarcopenia*. Protein quality can be increased by combining plant as well as plant and animal protein sources (see chapter 3.2).

Sufficient Protein: While the estimated value for an adequate protein intake for healthy older people aged 65 and over is 1.0 g per kg body weight (based on the target weight) per day [1], the protein intake should be increased to 1.2 to 1.5 g per kg body weight per day in cases of malnutrition according to the "Manual of Nutritional Therapy in Patient Care" (LEKuP). In cases of severe malnutrition, a protein intake of up to 2.0 g per kg body weight is indicated [55].

In addition, to ensure an adequate supply of vitamins and minerals, a varied range of vegetables, fruit and whole-grain products is important.

Concentrated nutrients and ready to drink liquids

If a sufficient energy and nutrient intake is not possible with usual foods, concentrated nutrients like protein or carbohydrate powders can be used to fortify meals. It is also possible to use dietary supplement powders that contain all micronutrients in addition to energy and protein [56]. If adequate energy and nutrient intake cannot be achieved despite appropriate efforts, the use of ready to drink liquids may be helpful [56].



The following criterion applies to meals for *malnutrition*:

People with increased energy or nutrient needs, weight loss or small eating amounts are offered energy- and/or nutrient-fortified meals.

In this case, meals consisting of *energy-and nutrient-dense* foods should be offered, fortified with additional nutrients as needed. High caloric food resp. ready to drink liquids may be supplemented.



Further information: www.fitimalter-dge.de Keyword: *Mangelernährung*

4.6.5 Catering in case of dementia

People with dementia generally have an increased risk of malnutrition [57]. Depending on the severity or stage of the disease, different nutritional problems may occur, which lead to, among other things, disturbances in eating and drinking, reduced eating amounts and/or an unwanted weight loss.

Since there are no indications of fundamental differences in energy and nutrient requirements between older people with and without dementia, the same nutritional recommendations apply to those affected as to healthy older people [57]. Consequently, a meal offer that meets the needs and requirements in the sense of this DGE Quality Standard applies as well [58]. Special requirements result from the individual manifestation of dementia and the associated nutritional problems, which vary depending on the daily condition of the affected person and may be influenced by other illnesses. For example, dementia is often combined with strong restlessness or the urge to move, which may lead to an extremely high energy requirement. In individual cases, affected persons need a total of 3,000 to 4,000 kcal per day [59].

The food and beverage offer for people with dementia should, as far as possible, reflect individual wishes and preferences to encourage appetite and enjoyment of eating. Since people with dementia often, but not always, show a preference for sweet foods, savoury dishes may also be sweetened if desired.

In the case of small eating amounts, a reduced appetite, unwanted weight loss or increased energy requirements, e.g. as a result of inner restlessness or an increased urge to move, meals should be fortified with energy and protein and supplemented with energy-rich snacks or ready to drink liquids [56] (see chapter 4.6.4). Since the sleep-wake cycle often changes in people with dementia, it should also be possible to eat meals beyond the fixed mealtimes.

In case of strong restlessness or increased urge to move, the offer of "eat-while-walking" might be helpful (see chapter 4.6.2).



If using cutlery is too demanding, finger food supports the activation of remaining skills and promotes independent eating (see chapter 4.6.2).

For chewing and swallowing disorders, which often occur in advanced dementia, the texture of the food should be modified accordingly [57] (see chapter 4.6.3).

Bright colours of food and beverages or a high-contrast composition of the individual food components make it easier to recognise the food.

Stimulation of the senses plays a special role in catering for people with dementia: a familiar smell of food may encourage eating, evoke memories, and, like the sound of clattering dishes, signal the upcoming meal. The taste of a

familiar favourite dish also brings back memories and may increase the pleasure of eating. If residents are involved in activities such as setting the table or preparing food components, this may not only promote their independence but also create a feeling of being needed (see chapter 5.5).

In principle, nutrition-related measures should always be combined with adapting the dining environment (see chapter 5.2)



Further information: www.fitimalter-dge.de Keyword: Demenz

4.6.6 Catering in case of obesity

In older people with obesity (body mass index $\geq 30 \, \text{kg/m}^2$), who request a nutritional intervention, catering should aim to stabilise body weight or prevent further gain [53]. The decision to reduce weight in obese older people should only be made after careful and individual consideration of the potential benefits and possible risks. Participation of the person concerned and, if necessary, of relatives or caregivers as well as the physician is recommended [53]. In old age, a loss of body weight is at the expense of muscle mass and bone density and thus may increase the risk of *frailty*, bone fractures and *sarcopenia* [60].

Regardless of whether weight reduction is the goal or not, food and beverages are based on the DGE Quality Standard. However, with regard to milk, dairy products, meat and sausage, low-fat or lean varieties should be given preference in order to stabilise body weight or prevent weight gain. Suitable snacks are low-energy, nutrient-rich foods



like vegetables and fruit as *raw vegetables*, low-fat yoghurt or quark with fresh fruit, or whole-grain bread with low-fat cheese. Likewise, energy-free or low-energy beverages should be offered at all times.

If weight reduction is the goal, the daily energy deficit should not exceed 500 kcal and the total energy intake should not fall below 1,200 kcal per day, otherwise there is a risk of vitamin and mineral deficiencies [60]. It is also important to ensure a sufficient supply of protein to minimise the loss of muscle mass (see chapter 4.6.4).

Whenever possible, diet-related measures should be combined with physical activity in the course of weight reduction [61]. Exercise increases energy expenditure and contributes to the preservation of muscle mass. Attention should be paid to moderate exercise adapted to the abilities of the elderly person.

4.6.7 Catering in case of type 2 diabetes mellitus

Generally, dietary recommendations for older people with diabetes mellitus do not differ from those for younger affected or healthy persons [62]. Meals according to the DGE Quality Standard also form the basis for catering for older people with diabetes. A special diabetes diet is no longer recommended [62]. Neither household sugar (sucrose) nor very sugary foods such as honey or jam need to be avoided. However, like for healthy adults, the intake of larger amounts of *free sugars*, i.e. more than 10 % of the total energy per day, should be avoided [55, 63].

When selecting carbohydrate-containing foods, those with a high dietary fibre content are to be preferred and offered in accordance with health-promoting and sustainable catering.

Residents at increased risk of nocturnal hypoglycaemia should be provided with a carbohydrate- and fibre-rich late meal [62]. If residents with type 2 diabetes mellitus who are insulin-dependent request an alcoholic beverage, adjunct a carbohydrate-rich meal should be offered [64]. This could be, for example, a whole-grain sandwich or whole-grain crackers.

Sugar substitutes such as fructose or sugar alcohols (e.g. xylitol, sorbitol or mannitol) do not offer any significant advantages over common household sugar (sucrose); on the contrary, most sugar substitutes have a laxative effect in larger quantities. Their consumption is no longer recommended for people with diabetes mellitus.

Süßstoffe are in regular doses not unhealthy. They are basically energy-free and suitable for sweetening food and beverages [64].



Further information: www.fitimalter-dge.de Keyword: Diabetes mellitus



5

Beyond the plate

Designing a health-promoting and sustainable meal offer is primarily a kitchen task. In addition, aspects beyond the kitchen contribute to an overall good catering service and are implemented by employees from other divisions. This chapter examines these aspects, as they form important interfaces to the kitchen's tasks (see chapter 2). To ensure a smooth process, a close cross-divisional exchange between all those involved in catering is essential.

5.1	Identification of requirements for the	
	dining environment	7
5.2	Design of dining environment	8
5.3	Assistance with eating and drinking	8
5.4	Communication around the catering offer	8
5.5	Involvement of the elderly	R



5.1 Identification of requirements for the dining environment

In addition to individual needs regarding food and beverages, which are collected in the context of the eating biography (see chapter 4), the personal wishes for the dining environment must also be determined.

- When offering "Meals on Wheels", this may be done by telephone or in person in form of an initial interview, if necessary, together with relatives or caregivers.

 All data and information that contribute to meeting the customers' wishes or to properly heating of the meals are systematically recorded. This includes information like:
- the customers' contact information, if necessary, also of relatives or caregivers, the responsible care service or the primary care physician,
- > the frequency of delivery,
- > the desired delivery time,
- how the food is handed over, e.g. personal handover by the meal service, leaving the transport container at the door or in the customer's flat/house after handing over a key,
- the procedure in exceptional situations,
- the need for assistance, e.g. opening the packaging or with eating the meal, with prior collection of information on the customer's state of health, including the degree of care, and their fine motor skills.

The information is provided voluntarily. When creating and maintaining the customer profile, the protection of personal data should be ensured.

- Decording personal needs for the dining environment should be carried out together with the resident, relatives or caregivers and the responsible specialist from the divisions of care or home economics. For example, indivudal wishes concerning the following aspects may be asked:
- the preferred place where meals are eaten,
 such as dining room, kitchen of the living area, own room,
- > the choice of companions,
- > the design of the dining environment,
- preferred tableware and/or cutlery, such as small coffee cup or large mug,
- > any aids needed for eating and drinking,
- need for assistance with meal preparation or consumption,
- desired mealtimes including special habits such as a later breakfast at weekends, and
- the desire to be involved in activities such as setting the table or preparing food.

Respecting personal wishes and needs not only contributes to feeling safe and comfortable around mealtimes by picking up on habits or familiar elements for the resident, but also serves as the basis for designing an individual nutritional concept. This ensures that meals are tailored to needs and requirements within the scope of personalised nutritional care in critical situations.

If mealtime staff observe nutritional risks that were not previously known and result in a need for support, aids or changes in the design of the dining environment, these should be documented and passed on to the nurses, the nutritionist or home economics staff. They can initiate the necessary measures. Especially for residents with *malnutrition*, any information may contribute to measures to increase eating or drinking amounts.

5.2 Design of dining environment

The dining environment has a significant influence on the atmosphere and thus on the enjoyment of eating and drinking. While older people who receive "Meals on Wheels" may dine in their familiar surroundings, the dining environment in residential homes should be designed in such a way that it meets the expectations and requirements of as many residents as possible and contributes to a pleasant and supportive dining atmosphere. In a relaxed atmosphere and an appreciative environment that invites people to rest at the table, meals may become highlights of the day.

The importance of creating a safe and calm dining environment in a family-like situation becomes even more crucial for frail older people whose illnesses affect their functional, cognitive or social skills.

5.2.1 Mealtimes

Meals structure the day. Reliable delivery of "Meals on Wheels" within an appointed time window is therefore just as important as fixed mealtimes in residential homes.

Meals are social events that provide companionship and room for conversation. An appropriately large time frame for eating and drinking allows the individual to eat undisturbed and quiet at times that are as familiar as possible. It also offers sufficient time to support residents with special needs in eating and drinking.





The following criteria apply to the scheduling of meals:

Mealtimes are fixed, adapted to the habits of the residents, and are adhered to.

Mealtimes are known to residents, relatives and staff and are also communicated to physicians or therapists accordingly. They correspond to the wishes and habits, so that, for example, an early breakfast is just as possible as a late dinner.

Mealtimes are kept free of any interruptions.

According to the concept of "protected mealtimes", no nursing or therapeutic procedures should take place during mealtimes, unless they serve to support or guide eating and drinking. In addition, meetings, breaks or documentation times should be scheduled in such a way that as many staff members as possible are available during mealtimes [65].

Reasonable mealtimes are observed.

Sufficient time is planned for meals so that all residents, including those with special needs, may enjoy food and drinks comfortably.

Older people with impairments often need more time for meals.

Delays in the distribution or serving of meals are communicated in time.

If the agreed delivery time or the serving of meals is delayed by more than half an hour, customers, residents and employees are informed in time.

5.2.2 Design of dining atmosphere

Numerous factors influence the dining atmosphere and significantly affect well-being, pleasure and the eating amount [56]. In addition to the food and beverages themselves and their presentation, environmental factors play a role. These include attentive, friendly and well-informed service as well as the design of the room. In addition to the furniture selection and placement, there are other ways to influence a stimulating and at the same time relaxed dining atmosphere. This may be done, for example, through

the lighting, smells, room temperature, background noise, the design of the dining space, the selection of the companions or the serving system.

Aligning variable factors as closely as possible to the wishes and needs of the residents creates an atmosphere that is individually perceived as pleasant, inviting and appreciative and may increase the time spent at the table. In studies, a prolonged stay at mealtime was linked to increased eating and drinking amounts [53].



To create a pleasant dining atmosphere, the following criteria apply:

Rooms where eating and drinking take place offer a bright, friendly and family-like ambience.

Appropriate lighting, good ventilation and a pleasant room temperature, the arrangement of the tables as well as the composition of the table groups create a sense of well-being at mealtimes.

Eating and drinking in peace and quiet is possible.

The dining room should not be a passageway and should be quiet during meals to avoid unnecessary distractions or disturbances. In dining halls, for example, room dividers are beneficial. The television should be switched off during meals and music, if used at all, should only be played consciously.

Colour contrasts between the dining table and the dishes as well as between the food and the plate exist.

For visually impaired people, plates with coloured rims and coloured glasses or drinking cups are helpful so that colourless beverages are clearly recognisable.

The dining table is fully set and attractively designed.

Regardless of whether the meal is eaten in the dining room, in the kitchen of the living area, in one's own room or in the bed, the spot should be clean, attractive, in accordance with personal preferences and supportive of the eating situation. For people with dementia, it may be useful to put the tableware and cutlery on the table together with the meal.

Rooms where meals are eaten offer sufficient space for residents with impairments.

Residents who depend on a wheelchair, walker or wheeled walker are able to reach their table safely and there is sufficient space for their walking aids. There should also be space for another person to assist with eating and drinking.

Further information: www.fitimalter-dge.de

Keyword: Raum- und Essplatzgestaltung



5.2.3 Nudging

Eating habits are not only the result of conscious and reflected decisions, but often also of existing offers, habits and influences that are not conscious at this moment [16, 66, 67]. What, how much and how willingly people eat therefore also depend on the dining environment.

This is the starting point for *nudging*: It aims at getting people to behave more favourably without coercion or prohibitions [68]. In mass catering, *nudging* includes measures ("nudges") that are implemented in the food service area and support or simplify health-promoting and sustainable choices [69]. This may include, for example, special labelling, more attractive presentation or better availability, visibility and accessibility of health-promoting and sustainable food and beverages.

Subtle verbal encouragement or hints from the serving staff are also considered as possible nudges. When people have only limited or little spontaneous choices in their decision or dining environment, and changes in the (physical) dining environment are not or less possible, these nudges become more relevant. This is the case, for example, with "Meals on Wheels" or in residential homes when meals are offered as plate meals or people can no longer participate in the meals in the dining room or at the buffet [69].

Examples of *nudging* techniques that may influence choices in favour of the health-promoting and sustainable offer are



for "Meals on Wheels"

- an appealing, attractive illustration of the health-promoting and sustainable dishes,
- > naming them at the top of the menu or menu catalogue,
- a friendly reference by the customer service to the health-promoting and sustainable choice when ordering, like: "May I draw your attention to our vegetable pan made of kohlrabi, carrots and parsnips?",

in residential homes

- a particularly attractive presentation of the health-promoting and sustainable dishes/components at the buffet, e.g. through a beautiful garnishments or colourful tableware.
- greater variety in the health-promoting and sustainable selection, e.g. a salad bar with a large selection,
- attractive signs at the buffet, indicating the nutritional content, the regional origin or the ecological footprint of the food.
- health-promoting and sustainable dishes at top of the menu and.
- subtile information from the serving staff, like: "Would you like a fruit salad for dessert today?".



Further information: www.fitimalter-dge.de Keyword: *Nudging*

5.3 Assistance with eating and drinking

Particularly when physical or mental impairments make eating and drinking difficult, appropriate assistance in preparing meals, taking an upright position for eating or even eating and drinking itself becomes important [56].

- Customers with impairments should receive assistance when needed. This might be opening the transport container or the food containers, reminding them to drink enough or providing a beverage with the meal. If the meal service observes a need for assistance, this information should be passed on to relatives, caregivers and/or the care service and noted in the customer file.
- First of all, the residents' autonomy when eating and drinking should be encouraged. Every self-performed action helps to counteract impairments due to illness or age, to maintain or regain one's own competences and to remain independent and flexible for as long as possible. In this context, it helps to select individually suitable aids together with the resident and the relatives, which perfectly support independent eating and drinking. If this is not sufficient, individual assistance with eating and drinking should be provided, e.g. by gently inviting the resident to eat or by showing him/her how to eat. Finally, feeding may become necessary. Since this requires a solid basis of mutual trust, it should ideally be done by familiar staff.



The following criteria apply for assistance with eating and drinking:

Eating and drinking aids are available and used as needed according to individual abilities.

Eating and drinking aids include, for example, plates with coloured, specially shaped rims or a warm-keeping function, special cutlery, drinking aids like nose cut-out cups, non-slip pads or small boards on which bread may be fixed. These support the residents' autonomy.

Individual and tailored assistance with eating and drinking is provided as needed.

If necessary, food can be cut into bite-sized pieces and served. In the case of chewing disorders, it is often helpful to cut individual components into small pieces, which should be done in front of the resident's eyes. Particularly in the case of residents with swallowing disorders, attention should be paid to a suitable body position in order to prevent choking. Assistance is provided in an appreciative and caring way and, if necessary, also beyond mealtimes.



Further information: www.fitimalter-dge.de Keyword: ernährungsbezogene Informationen für die Pflege

5.4 Communication around the catering offer

Communication around health-promoting and sustainable catering pursues the goal of informing employees, customers, residents and their relatives and involving them in the design and continuous development of the offer. The way in which the health-promoting and sustainable catering offer is communicated may significantly influence the meal choice, the dining atmosphere and thus ultimately the enjoyment of the meal as well as satisfaction with the overall catering offer.

5.4.1 Communication between employees

An efficient communication structure between the involved divisions is of central importance for running the entire catering process smoothly. The precondition for this is a common understanding of

- how health-promoting and sustainable catering is designed in-house.
- > how nutrition influences health and sustainability, and
- how informative, supportive and appreciative communication may be implemented.

Ideally, this should be worked out together as a team. New employees should be informed accordingly.



5.4.2 Communication with customers and residents

Communication with customers and residents is a central element of good catering. It pursues several goals:

- to ask for wishes and needs and to obtain regular feedback on the catering offer,
- to provide comprehensive, competent and coherent information about the health-promoting and sustainable meals on offer, including available diets, different forms of presentation and available portion sizes,
- to provide information on the basis of recipes about the used food and its origin as well as information about energy and nutrient contents and ingredients,
- to inform about the importance of a health-promoting and sustainable nutrition for the maintenance of one's own health and the associated contribution to sustainability,
- to provide competent guidance and support regarding food choices.
- involve customers and residents in the design of health-promoting and sustainable meals, and
- to achieve a better understanding of nutritional interventions in critical nutritional situations with individual counselling and competent assistance from a nutritional specialist; at the same time, to be a contact person and, if necessary, a mediator for other specialists.

Tip: With the help of a sample menu, customers will be able to assure themselves of the quality.



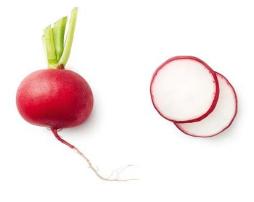
In the case of "Meals on Wheels", it is primarily the customer service who is in contact with the customers. In addition to providing comprehensive information about the meals on offer, the customer service also provides information about order and delivery modalities. The following points may be included:

- > range of the menu,
- frequency of publication of the menu,
- mode and possibility of ordering by telephone, internet or order form through the meal service,
- meal system (frozen, cold or hot meals) and, if applicable, provision of special equipment for heating meals and asking for operating instructions,
- disclosure of all extra costs, e.g. for additional components/meals, delivery on public holidays or weekends, as well as other services and assistance.



The kitchen staff should be in direct contact with the customers whenever feasible, so that they are as close as possible to the customers' wishes and needs. This may be achieved, for example, through telephone consultations with the kitchen, organising local shared lunches or celebrations that promote exchange between the kitchen and the customers.







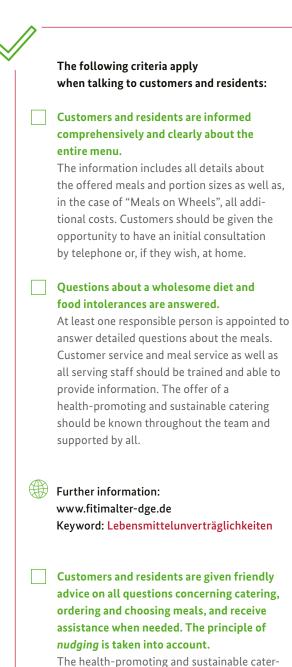


Frequently, the employees of the **meal service** are also in direct contact with the customer. They too have the expertise to answer questions about the delivered meals and pass on praise and criticism to the customer service and the kitchen. If observations about the customer's state of health, restrictions in functionality or cognitive abilities are passed on, relatives, caregivers, the nursing service and the physician may be informed, or a nutritionist may be consulted in critical nutritional situations.

In residential homes, it is the staff of the **kitchen**, **nursing**, **home economics** and **care** who communicate daily with the residents about their meals. Even before moving into the residential homes, or at the latest immediately afterwards, it is very important to provide comprehensive information about the meals on offer and about the possibilities of individual nutritional supply in critical situations, e.g. in case of illness. It goes without saying that residents are always able to participate in the design of the meals and are actively involved if they wish. Asking about popular dishes in everyday conversations and discuss about how they may be prepared in a way that is as health-promoting and resource-saving as possible are topics on which all residents who wish to do so may actively or communicatively contribute with their knowledge and life experience.



Residents experience special appreciation when they may talk directly with the chef. Examples include the presence of the chef at mealtimes as a "visit from the kitchen" or "consultation hours" with the kitchen. For immobile residents who cannot usually eat in the dining room or kitchen, the chef may occasionally prepare small dishes at the bedside using mobile kitchens.



ing offer is communicated positively during counselling and serving. The customers and



... furthermore:

residents receive assistance and the opportunity to give feedback. A positive presentation of the catering offer obviously includes an attractive presentation of all meals, as well as cleanliness and quick refilling of food and beverages.

Customers are informed about data protection and about order and delivery modalities.

Depending on the provider, the offer of "Meals on Wheels" may be regulated by contract. Customers must always be informed about how the data collected is stored and for what purposes it is used. Information in a secure customer database is important for planning meals, supporting customers in choosing meals and for delivery.

5.4.3 Communication with relatives or caregivers

Relatives or caregivers of customers and residents are often important reference persons and the ones who ask about the elderly person in care. At the same time, relatives or caregivers may provide important information, especially when the older person is no longer able to do so him/herself. They are therefore an important part of the participatory process and should always be involved in the communication and design as well as all discussions around individualised nutrition provision.

5.4.4 External communication

A catering offer that is not only designed to meet needs and requirements, prepared in a nutrient-friendly way and served in an appreciative manner, but also sets new standards in terms of resource-saving catering, is often recommended to other customers beyond the facility.

Providers of "Meals on Wheels" may also organise lunch tables for older people from the neighbourhood, e.g. in cooperation with welfare associations or care services or with volunteers from (church) communities, thus bringing the elderly together through shared meals and strengthening their social participation.



Further information: www.fitimalter-dge.de Keyword: Mittagstische

By opening the facility to older people from the neighbourhood, e.g. in the form of open lunch tables, the offer of "Meals on Wheels" or through the participation of guests in activities around food and beverages, a residential home may transfer its commitment to health-promoting and sustainable catering beyond the facility's doors and thus become an attractive centre for older people.

If a hospital stay becomes necessary, proper **transition management** not only contributes to well-being in the unfamiliar setting, but also supports continuity in catering and thus contributes to the prevention of *malnutrition*. Essential information, such as special catering requirements and the resident's personal habits and preferences, should be communicated to the hospital.



5.5 Involvement of the elderly

Eating and drinking are integral parts of the entire life. They bring people together and everyone has their own personal experiences with this topic in the course of their lives. Food and beverages thus offer the ideal opportunity to involve older people with their knowledge and wealth of experience and thus promote their social participation.

When offering "Meals on Wheels", the customers may be involved, e.g. through a call for favourite dishes for themed weeks or a summer party.

In residential homes, concepts of inpatient shared housing allow for a particularly intensive involvement of older people. If cooking, baking or folding laundry is done together with residents in the kitchen of the living area, good hygiene practices (see chapter 6.2) must be applied. This includes, for example, that all participants must wash and disinfect their hands.

Residents and their relatives may, if they wish, also be involved in the planning and implementation of celebrations or in the design of the dining rooms.

6

Legal requirements for catering

Catering institutions, including providers of "Meals on Wheels" and residential homes 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.

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6.1 Food law key regulations

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

In addition to Regulation (EC) No 178/2002 in Germany, the Food and Feed Act (Lebensmittel- und Futtermittel-gesetzbuch, [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 5 provides an overview of selected legal regulations and interpretation aids for mass catering.



 Table 5:
 Selected legal regulations and interpretation aids for mass catering

topic	law and ro	egulations
	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
- > Publication 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 (ABI. EU Nr. 278/1, July, 30th 2016)

EU-Commission Communication: Questions and Answers on the LMIV (ABI. EU C 196 v. 8.6.2018, 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 German 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 company must implement all those specifications or requirements that are necessary for

the individual conditions on site, e.g. those concerning the receipt of goods, the floors or windows within the business facilities, as well as those for the storage rooms. Interpretation aids for the practical implementation of Annex II are provided by sector-specific "Guides for good hygiene practice" and the relevant DIN standards, like DIN 10506:2018-07: Food hygiene – Mass catering, DIN 10508:2019-03: Food hygiene – temperature requirements for foodstuffs.

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

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

In addition to these two key regulations, there are other European and national hygiene regulations that contain obligations for food business operators (see table 5).

Good hygiene practice

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

Elements of good hygiene practice are in particular

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



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

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

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

Further information: www.fitimalter-dge.de Keyword: Hygiene

Training obligation

All employees who produce, handle or distribute food or dishes to customers or residents 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 customers or residents like the meal service staff of the provider of "Meals on Wheels" or service staff at the residential home. Annex 1 of the Food Hygiene Ordinance [LMHV] and DIN 10514:2009-05: Food hygiene - hygiene training provides good orientation on essential requirements for this training. The latter also contains special content requirements for the instruction of persons who are responsible for the development and application of the "Hazard Analysis and Critical Control Points" 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 and residents 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* [70].





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, the menu catalogue, on the corresponding displays or other notices clearly visible to the customers and residents that they may ask the service or kitchen 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 customers and residents may examine if requested, as well as a training of the staff [70].

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 customers and residents.

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 [70].

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 [70].

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 [70].

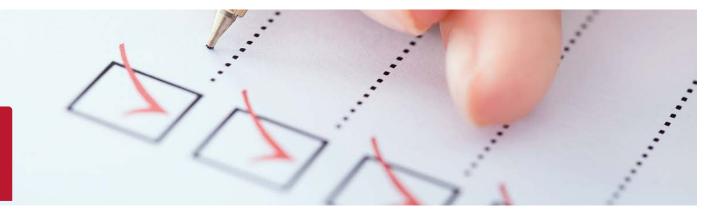


Further information: www.fitimalter-dge.de Keyword: Kennzeichnung

6.4 Support to fulfil the health or care insurances' requirements

The home supervisory authorities of the individual Federal States monitor all facilities ex officio. They also review and advise on questions of accommodation and catering. The Health Insurance Medical Service (MDK) assists the facilities regarding benefits from the public long-term care insurance; they may only bill for services that have been approved and if they have signed a care contract with the funding agency or its association.

Adherence to the "DGE Quality Standard for Catering with 'Meals on Wheels' and in Residential Homes for the Elderly" may help residential homes to meet the requirements of the home supervisory authorities and their funding agencies.



Checklist

The following checklist provides an overview of all criteria of this DGE Quality Standard. It enables providers of "Meals on Wheels", caterer and residential homes 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 catering quality for the elderly	not fulfilled	partially fulfilled	fulfilled
A cross-divisional catering concept is in place.			
All participants are involved in the process of quality development.			
A catering commissioner exists.			
A nutritionist is available for special questions about nutrition and in situations that require individual nutrition interventions.			
Catering staff receive continuous training.			
Ergonomic workplaces and workflows are in place.			
Employees are valued.			
Suggestions regarding the meals and dishes on offer are received and passed on.			
Satisfaction with the meals on offer is regularly assessed.			

Designing health-promoting and sustainable meals not fulfilled fulfilled fulfilled fulfilled

Planning Purchase Preparation Service Disposal & cleaning Food qualities and frequencies for FILLI CATEDING for soven satering days in MIXED DIET.			
Food qualities and frequencies for FULL CATERING for seven catering days in MIXED DIET			
grain, grain products, potatoes min. 21 x (min. 3 x daily) wholemeal products, pseudocereals, muesli without sugar or sweeteners, potatoes (raw or precooked), parboiled rice or brown rice			
thereof: min. 14x wholemeal products			
max. 2x potato products			
vegetables and salad 21x (3x daily) vegetables (fresh or frozen), legumes, salad thereof: min. 7x raw vegetables			
min. 2x legumes			
fruits 14 x (2 x daily) fruits (fresh or frozen); without sugar or sweeteners nuts (unsalted) or oilseed thereof: min. 7 x fresh or frozen, without sugar or sweeteners	0	•	0
min. 3 x nuts (unsalted) or oilseeds			
milk and dairy products min. 14x (min. 2x daily), based on the following specifications: milk, plain yoghurt, buttermilk, sour milk, kefir: max. fat content 3,8% quark: max. fat content 5% → each without sugar or sweeteners cheese: max. fat content 30%			
meat, sausage, fish and eggs max. 3 x meat and sausage for lunch lean muscle meat, cold cuts as bread topping: max. fat content 20 % thereof: min. half of the offer lean muscle meat			
1-2x fish			
thereof: min. 1x fatty fish			
oils and fats rapeseed oil is standard oil rapeseed oil, linseed-, walnut-, soybean-, olive oil, margarine made from the oils mentioned			
beverages are available at any time water, fruit and herbal tea → each without sugar or sweeteners			

	not fulfilled	partially fulfilled	fulfilled
Food qualities and frequencies for FULL CATERING for seven catering days in OVO-LACTO)-VEGETARIAN	DIET	
grain, grain products, potatoes min. 21 x (min. 3 x daily) wholemeal products, pseudocereals, muesli without sugar or sweeteners, potatoes (raw or precooked), parboiled rice or brown rice			
thereof: min. 14 x wholemeal products			
max. 2x potato products			
vegetables and salad 21x (3x daily) vegetables (fresh or frozen), legumes, salad			
thereof: min. 7 x raw vegetables			
min. 2 x legumes			
fruits 14 x (2 x daily) fruits (fresh or frozen); without sugar or sweeteners nuts (unsalted) or oilseed thereof: min. 7 x fresh or frozen, without sugar or sweeteners min. 3-4 x nuts (unsalted) or oilseeds			
milk and dairy products min. 14x (min. 2x daily), based on the following specifications: milk, plain yoghurt, buttermilk, sour milk, kefir: max. fat content 3,8% quark: max. fat content 5% → each without sugar or sweeteners cheese: max. fat content 30%			
oils and fats rapeseed oil is standard oil rapeseed oil, linseed-, walnut-, soybean-, olive oil, margarine made from the oils mentioned			
beverages are available at any time water, fruit and herbal tea → each without sugar or sweeteners			

	not fulfilled	partially fulfilled	fulfilled
Food qualities and frequencies for LUNCH for seven catering days in MIXED DIET			
grain, grain products, potatoes 7x (1x daily) wholemeal products, pseudocereals, potatoes (raw or precooked), parboiled rice or brown rice			
thereof: min. 1x wholemeal products			
max. 2x potato products			
vegetables and salad 7x (1x daily) vegetables (fresh or frozen), legumes, salad thereof: min. 3x raw vegetables min. 1x legumes		0	0
fruits min 3 x fruits (fresh or frozen); without sugar or sweeteners nuts (unsalted) or oilseeds	•	0	0
thereof: min. 2x fresh or frozen, without sugar or sweeteners			
milk and dairy products min. 3 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 and eggs max. 3 x meat and sausage lean muscle meat thereof: min. half of the offer lean muscle meat		0	0
1-2x fish			
thereof: min. 1x fatty fish within 2 weeks			
oils and fats rapeseed oil is standard oil rapeseed oil, linseed-, walnut-, soybean-, olive oil			

	not fulfilled	partially fulfilled	fulfilled
Food qualities and frequencies for LUNCH for seven catering days in OVO-LACTO-VEGETAR	IAN DIET		
grain, grain products, potatoes 7x (1x daily) wholemeal products, pseudocereals, potatoes (raw or precooked), parboiled rice or brown rice			
thereof: min. 1x wholemeal products			
max. 2 x potato products			
vegetables and salad 7x (1x daily) vegetables (fresh or frozen), legumes, salad thereof: min. 3x raw vegetables min. 1x legumes			
fruits			
min 3 x fruits (fresh or frozen); without sugar or sweeteners nuts (unsalted) or oilseeds			
thereof: min. 2x fresh or frozen, without sugar or sweeteners			
thereof: min. 1x nuts (unsalted) or oilseeds			
milk and dairy products min. 3 x, based on the following specifications: milk, plain yoghurt, buttermilk, sour milk, kefir: max. fat content 3,8% quark: max. fat content 5% → each without sugar or sweeteners cheese: max. fat content 30%			
oils and fats rapeseed oil is standard oil rapeseed oil, linseed-, walnut-, soybean-, olive oil			

	not fulfilled	partially fulfilled	fulfilled
Additional criteria for menu planning:			
The wishes and suggestions of customers and residents are considered in the menu planning as far as possible.			
Culture-specific, regional and religious eating habits are taken into account in the planning.			
Ovo-lacto-vegetarian options are available every day for every meal.			
Seasonal and regional vegetables and fruits are included.			
Local foods are preferred in the menu.			
Grains, grain products and potatoes are offered in varied ways.			
Deep-fried and/or breaded products are used at most twice in 7 catering days.			
Industrially produced meat substitutes are offered for lunch no more than once in 7 catering days.			
Choosing a warm component for breakfast or dinner is possible.			
The lunch <i>menu cycle</i> is repeated for "Meals on Wheels" after four weeks and for residential homes after six weeks at the earliest.			
The dishes are colourful, and the composition varies.			
Meals are available at any time.			
Alternative choices are made 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.			
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 to be processed further on site.			
High processed products are always combined or supplemented with low processed products/components.			
Products with a low content of sugar, fat, saturated fatty acids and/or salt and a low <i>energy density</i> are selected.			

	not fulfilled	partially fulfilled	fulfilled
Menu criteria			
The current menu is in advance accessible on a regular and barrier-free basis.			
Information is provided on food additives that require labelling.			
Allergens are labelled or information is provided verbally.			
Food is named clearly.			
For meat, sausages and fish, the animal species is named.			
The use of alcohol is declared.			
If the nutritional values are declared, the legal requirements are observed.			
If prices are mentioned, they are displayed clearly and transparently.			
The menu is tailored to the particular target group.			
Several menu lines are clearly presented, and the health-promoting and sustainable meal offer is particularly highlighted.		0	
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.			
Sugar is used sparingly.			
Fat is used consciously.			
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.			
Frozen food is delivered to customers at -18 °C or colder.			
Resource-efficient kitchen appliances are used.			
Appliances are only turned on during operating times.			

	not fulfilled	partially fulfilled	fulfilled
Planning Purchase Preparation Service Disposal & cleaning			
Proper timing between kitchen and serving is realised.			
Serving staff is informed in detail about the current menu.			
Staff members know the meal requirements of the individual customers or residents.			
Food intolerances like allergies as well as special catering requirements are taken into account.			
Customers and residents are given opportunities to influence portion sizes.			
Residents receive information about portioning the food at the buffet.			
Beverages are always available and actively offered.			
Meals are delivered to the customers in tightly sealed containers.			
Criteria for catering for people with impairments: Only edible components are served.			
Served dishes are named.			
If necessary, the temperature of the food is pointed out.			
In accordance with good hygiene practice, customers are assisted in opening the packaging if necessary.			
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 made available for energy utilization.			
Attention is paid to the use of environmentally friendly cleaning agents.			
Dosing aids are used.			
Hygiene requirements are observed.			

	not fulfilled	partially fulfilled	fulfilled
Together and yet individual			
Criteria for preparation of finger food:			
Finger food is no larger than one or two bites.			
Finger food is easy to grasp as well as easy to chew and swallow.			
The texture of finger food is not sticky or crumbly.			
Criteria for catering for chewing and swallowing disorders:			
Depending on the severity of the chewing or swallowing disorder, meals and beverages are offered in appropriately modified textures.			
In texture modified meals, the individual components are presented separately and recognisably.			
As far as possible, texture-modified meals consist of the same components as meals with the regular texture.			
In case of small eating amounts, texture-modified meals are offered in several small portions, if necessary fortified, over the course of the day.			
Criterion for catering for malnutrition:			
People with increased energy or nutrient needs, weight loss or small eating amounts are offered energy- and/or nutrient-fortified meals.			
Beyond the plate			
Design of the dining environment			
Criteria for meals scheduling:			
Mealtimes are fixed, adapted to the habits of the residents and are adhered to.			
Mealtimes are kept free of any interruptions.			
Reasonable mealtimes are observed.			
Delays in the distribution or serving of meals are communicated in time.			

Criteria for creating the dining atmosphere:	not fulfilled	partially fulfilled	fulfilled
Rooms where eating and drinking take place offer a bright, friendly and family-like ambience.			
Eating and drinking in peace and quiet is possible.			
Colour contrasts between the dining table and the dishes as well as between the food and the plate exist.			
The dining table is fully set and attractively designed.			
Rooms where meals are eaten offer sufficient space for residents with impairments.			
Assistance with eating and drinking			
Eating and drinking aids are available and used as needed according to individual abilities.			
Individual and tailored assistance with eating and drinking is provided as needed.			
Communication around the catering offer			
Customers and residents are informed comprehensively and clearly about the entire menu.			
Questions about a wholesome diet and food intolerances are answered.			
Customers and residents are given friendly advice on all questions concerning catering, ordering and choosing meals, and receive assistance when needed. The principle of <i>nudging</i> is taken into account.			
Customers are informed about data protection and about order and delivery modalities.			

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Glossary

Amylase-resistant thickeners: The advantage of these over starch-based thickeners is that they are not degraded in the mouth by the enzyme amylase. This means that thickened foods and beverages retain a long-lasting texture [71].

Aspiration: Aspiration refers to inhalation of chyme or saliva into the respiratory tract. This happens when the airway is not or only incompletely closed during swallowing.

Assessment: Assessment is a detailed evaluation of the nutritional status of a person. It is carried out if indications of (a risk of) *mal-nutrition* were identified during a previous *screening*. Consequently, it is the second step in the identification of *malnutrition* or a corresponding risk. The assessment forms the basis for treatment goals and a comprehensive individual nutrition concept with corresponding measures [9, 72].

Basal stimulation: Basal stimulation includes all care measures supporting people whose physical and mental perception is severely limited. It aims at stimulating and promoting sensory perceptions like seeing, hearing, smelling, tasting and feeling as well as improving body orientation and communication skills [73].

Body Mass Index (BMI): BMI (kg/m²) is a parameter used to classify body weight into underweight, normal body weight and overweight. It is calculated by dividing the body weight [kg] by the squared body heigh [m²] [74].

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 foods have a higher degree of processing than raw foods.

 ${\rm CO_2}$ equivalents: In addition to ${\rm CO_2}$ 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 ${\rm CO_2}$ 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. The reference values are stated for twelve age groups. Older people are assigned to the age group "65 years and older", which includes spry and healthy as well as sick and frail older people. Illnesses and medications may cause reduced nutrient absorption and/or excretion, reducing the availability of nutrients or increasing their requirement. Therefore, the D-A-CH reference values for the total group of older people apply increasingly less to the individual case [1].

Dysphagia: A disorder of swallowing or the passage of solid and/ or liquid food from the mouth to the stomach is called dysphagia.

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 [75].

Estimated value: For some nutrients, the human requirement cannot be determined with the desirable accuracy or there is no information on the average requirement. In these cases, estimated values are derived. These are usually based on an observed nutrient intake of a defined population group, derived from the consumption of healthy individuals or determined experimentally. Some uncertainties still exist, e.g. due to measurement variations or too few (suitable) study results in humans. However, the estimated values provide useful indications of an adequate and safe intake [1].

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.

Frailty: Frailty refers to the simultaneous occurrence of various impairments, some of them caused by illness, which make older people less resilient (in terms of health) and therefore reduced capable to withstand illnesses, disabilities or falls. Possible consequences include repeated hospital stays, need for care and increased mortality [76].

Free sugars: Free sugars include simple and double sugars added to food by manufacturers or consumers, as well as naturally occurring sugars in honey, syrups, fruit juices and fruit juice concentrates [63].

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.

Malnutrition: Malnutrition is a condition of deficiency of energy, protein or other nutrients that leads to altered measurable changes in physiological functions, results in an impaired clinical outcome from disease and is reversible through nutritional therapy.

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 [78].

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

Nudging: Nudging aims to encourage people to adopt more beneficial behaviour without coercion. In mass catering, it includes all measures (nudges) that redesign the characteristics or placement of food and beverages. Verbal prompts or hints from the serving staff may also be possible nudges. [68, 69]

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*). Obesity is classified as *BMI* above 30 kg/m².

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 [1].

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 [77].

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) [79].

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) [80].

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 [81].

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

Sarcopenia: Sarcopenia is the loss of skeletal muscle mass and strength that exceeds normal age loss [82].

Screening: Screening for malnutrition is a simple and quick process to determine whether a person is likely to be or at risk of malnutrition. If the screening results are positive, a detailed assessment must follow. Screening should be carried out systematically and routinely in outpatient settings as well as in inpatient residential homes using validated screening instruments [9, 72].

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

Smoothie: For older people with impaired chewing or swallowing ability, a smoothie is convenient to consume vegetables and/or fruit in puréed form. Adding quick oats or instant oatmeal makes it creamier and richer in dietary fibre. For people with an energy deficiency, it may be prepared with high-quality vegetable oil, puréed nuts, yoghurt, cream or ice cream.

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

White meat: The term refers to poultry meat.

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Deutsche Gesellschaft für Ernährung e. V.
Referat Gemeinschaftsverpflegung und Qualitätssicherung
IN FORM in der Gemeinschaftsverpflegung
Phone +49 (0) 228 3776-873
Fax +49 (0) 228 3776-78-873
info@fitimalter-dge.de
www.fitimalter-dge.de

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Addresses for Senior Nutrition

Networking Centres for Senior Nutrition:

As part of IN FORM also health promotion for senior citizens plays a major role. The networking centres or comparable institutions for senior nutrition respectively, established on federal state level, support – among other tasks – the implementation of the DGE Quality Standard by offering advice, sharing knowledge and connecting relevant stakeholders.



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