

# Consumers' awareness of food-based dietary guidelines in Germany

## Results of a representative survey

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### Abstract

The data for this study on consumer awareness of food-based dietary guidelines of the German Nutrition Society (DGE) was collected by computer-assisted telephone interviews of adults living in Germany, using a standardized questionnaire. The sample of 1,759 interviewees was representative of the adult population in Germany regarding the distribution of age, sex, and level of education. 14% of interviewees reported that they knew the “10 guidelines of the DGE for a wholesome diet”, and 10% reported that they were familiar with the DGE Nutrition Circle. The models were familiar to more women than men. There were also differences in familiarity with the individual models depending on age – younger people were less likely to know the “10 guidelines of the DGE for a wholesome diet”. The most well-known dietary recommendation was “eat plenty of vegetables and fruit” (this was familiar to 77% of those who were familiar with the DGE models, and to 65% of those who were not). The descriptive analysis of the data, taken together with results of an ongoing multivariate analysis and qualitative interviews, is the basis for a target group segmentation and further development of the communication measures.

**Keywords:** dietary recommendations, food-based dietary guidelines, communication, consumer survey

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## Introduction

The German Nutrition Society (*Deutsche Gesellschaft für Ernährung e. V. [DGE]*) creates the official food-based dietary guidelines (FBDG ♦ Box on p. 113) for the general population in Germany. The DGE publishes these recommendations by means of the “10 guidelines of the DGE for a wholesome diet” as written text and by means of two graphical presentations, the DGE Nutrition Circle and the Three-Dimensional DGE Food Pyramid. The first two of these three models are aimed directly at consumers, whereas the pyramid is intended to be used by trained specialists who work with consumers, particularly in nutrition counselling and education [1, 2].

According to the European Food Safety Authority (EFSA), the implementation of FBDG should be accompanied by monitoring and evaluation of any effects in order to allow any necessary changes to be made to the FBDG or their implementation [3]. To date, either only limited evaluations of the implementation and effects of national FBDG have been carried out, or research results regarding successes and failures have not been published or made available [4, 5]. A large part of the available literature comes from the USA (e.g. [6–10]). The lack of evaluation of FBDG raises the question of whether they are effective and whether they do indeed play a role in changing consumer behavior as intended, and in improving the nutrition situation or reducing the burden of chronic diseases in the population [5].

To date, there has been no research into whether consumers are familiar with the DGE FBDG and what they have learned from them. After all, simply knowing about the FBDG does not automatically mean understanding them and changing behavior accordingly, and it is a well known fact that there is no direct route from knowledge to action [5, 6, 11]. However, achieving a good level of public awareness of the

**Food-Based Dietary Guidelines (FBDG)** are simple recommendations based on proven scientific knowledge regarding the association between nutrition and health. The focus here is on foods, food groups, and nutrition patterns, which makes these guidelines different from nutrient-based recommendations.

FBDG is a crucial step in getting people to implement them [6, 12].

The DGE is currently working on new strategies for communication of FBDG within the framework of the DietBB competence cluster (♦ Box on p. 112). One starting point for this is an evaluation of how well-known their FBDG are and of the extent to which they are being implemented, using a two-phase study. Following the quantitative survey on familiarity (2015–2016), qualitative interviews will be conducted in 2017, investigating the motives behind the implementation of the FBDG and the obstacles to this, and segmentation of target groups for communication will take place (2017–2018). The aim here is to further develop the way the FBDG are communicated in future in order to increase awareness and to promote the implementation of measures that more effectively encourage behavioral changes.

## Study question

The aim of the present study, as the first phase in a market research, was to collect and assess information regarding awareness of the FBDG of the DGE among consumers in Germany, as well as information on factors influencing awareness of the FBDG in a quantitative manner. The results of this survey are part of an assessment of the current situation, and they form the starting point for the further development of communications regarding the FBDG.

## Methodology

The target audience for the representative survey was the residential population of Germany aged  $\geq 18$  years. The survey period was from November 17, 2015 (start as soft launch<sup>1</sup>) to December 17, 2015. The interviews were conducted from Monday to Friday from about 9 am to 9 pm, and on Saturdays from about 10 am to 6 pm. They lasted 10 minutes on average.

The standardized questionnaire that was developed for the survey covered both: familiarity with the FBDG (models, content), and parameters such as attitudes towards nutrition and use of information on nutrition, practical implementation of nutrition recommendations, and sociodemographic and biomedical markers.

The survey was performed by specially trained interviewers using a CATI system (computer-assisted telephone interview; mixed sample of landlines and cellphones). Interviewees were a random sample in order to ensure that the requirements for representativeness were met. Landline numbers

<sup>1</sup> In this context, the term “soft launch” means that a few interviews were conducted prior to the official field start in order to test whether there were any problems with the intelligibility of the questionnaire, or any similar problems. A soft launch is particularly prudent when no standardized pre-test exists. The soft launch was completed without problems. No further adjustments were required.

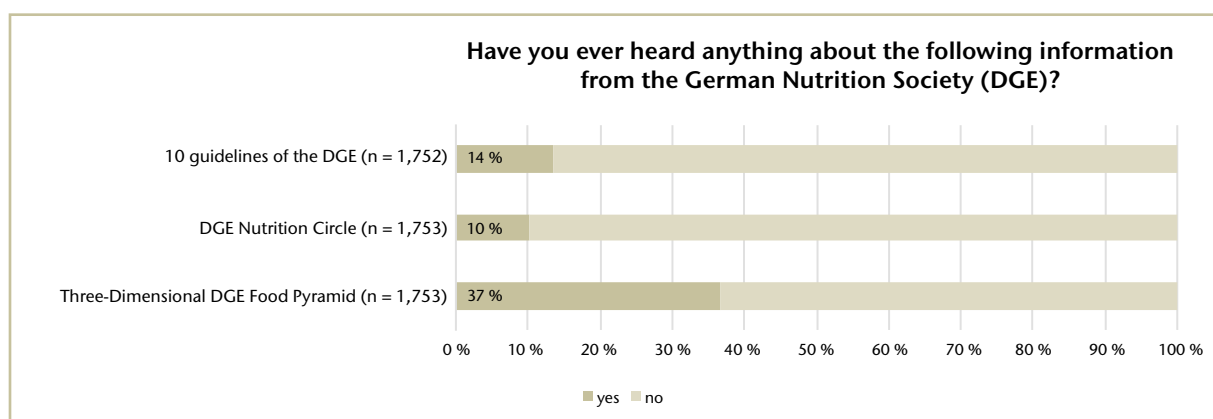


Fig. 1: Awareness of the Food-based Dietary Guidelines (FBDG) models

(Gabler-Häder method<sup>2</sup>) and cell-phone numbers were generated randomly. The person to be interviewed within each household reached was also decided randomly (last birthday method<sup>3</sup>). Overall, a response rate of 17% was reached.

Although proper representativeness is already being aimed for through the sampling method, non-response can lead to distortions in the distribution of certain characteristics, but these can be offset through a subsequent data weighting. In order to optimally adjust the dataset to match the structure of the underlying population, the dataset for this study was weighted using the characteristics of age, sex, and education level.

In order to test the independence of crossed results for significance<sup>4</sup>, chi-squared tests or one-factor ANOVAs were carried out, depending on the scaling of the data. All significance tests were performed at the 5% level ( $p \leq 0.05$ ).

## Results

Overall,  $n = 1,759$  interviews were conducted. 89% of interviewees were reached via landlines, 11% of the interviews were conducted with the interviewee using a cellphone. ♦ Table 1 in the online supplement shows the sociodemographic and biomedical characteristics of the sample. A selec-

tion of the weighted results is shown below. Associations that are not significant are not included.

### Awareness of the German Nutrition Society models

The 10 guidelines of the DGE were familiar to 14% of those interviewed, and the DGE Nutrition Circle was familiar to 10% of those interviewed. 37% of those interviewed stated that they had heard of the Three-Dimensional DGE Food Pyramid before (see “Discussion” section). For each model that was asked about, the number of interviewees that did not give any valid information was  $n = 6$  and  $n = 7$  respectively (♦ Figure 1).

There is a significant association between knowledge about the DGE models and various characteristics (♦ Table 2, online supplement):

**Sex:** Women were more frequently familiar with the DGE models than men (10 guidelines: familiar to 17% vs. 9%, nutrition circle: familiar to 13% vs. 7%, pyramid: familiar to 49% vs. 24%).

**Age:** The age group of 50–64 year olds was most familiar with the 10 guidelines (18%), and the 18–24 year olds was least familiar with the guidelines (3%). The Three-Dimensional DGE Food Pyramid is most frequently familiar among the 25 to 29 year olds (49%), and it is

least frequently familiar among the above 75 years olds (13%).

**Size of household:** Over half of the interviewees (53%) from four-person households had heard of the Three-Dimensional DGE Food Pyramid. Conversely, the lowest level of familiarity (24%) was found among interviewees from one-person households).

**Type of household:** Interviewees from households with at least one child are more frequently familiar

<sup>2</sup> The Gabler-Häder method ensures that all households with a landline telephone can potentially be part of the initial sample (and not just those listed in the telephone book, since these are systematically different from the group not listed).

<sup>3</sup> The last birthday method ensures a random selection from among all the potential target persons in a household, thus ensuring that the group to be interviewed is as close to truly representative as possible. Within each household, the person who last had a birthday was the one who was interviewed.

<sup>4</sup> The reported significance results are always results of overall significance tests. No individual comparisons were performed within the scope of this study (neither post hoc nor a priori). The results of the tests can be found in ♦ Table 2 of the present article in the online supplement.

<sup>5</sup> Bei den berichteten Signifikanzen handelt es sich stets um Ergebnisse von overall-Signifikanztests. Einzelvergleiche (weder post hoc noch a priori) wurden im Rahmen dieser Arbeit nicht durchgeführt. Die Ergebnisse der Tests finden sich in ♦ Tabelle 2 des vorliegenden Artikels im Online-Supplement.

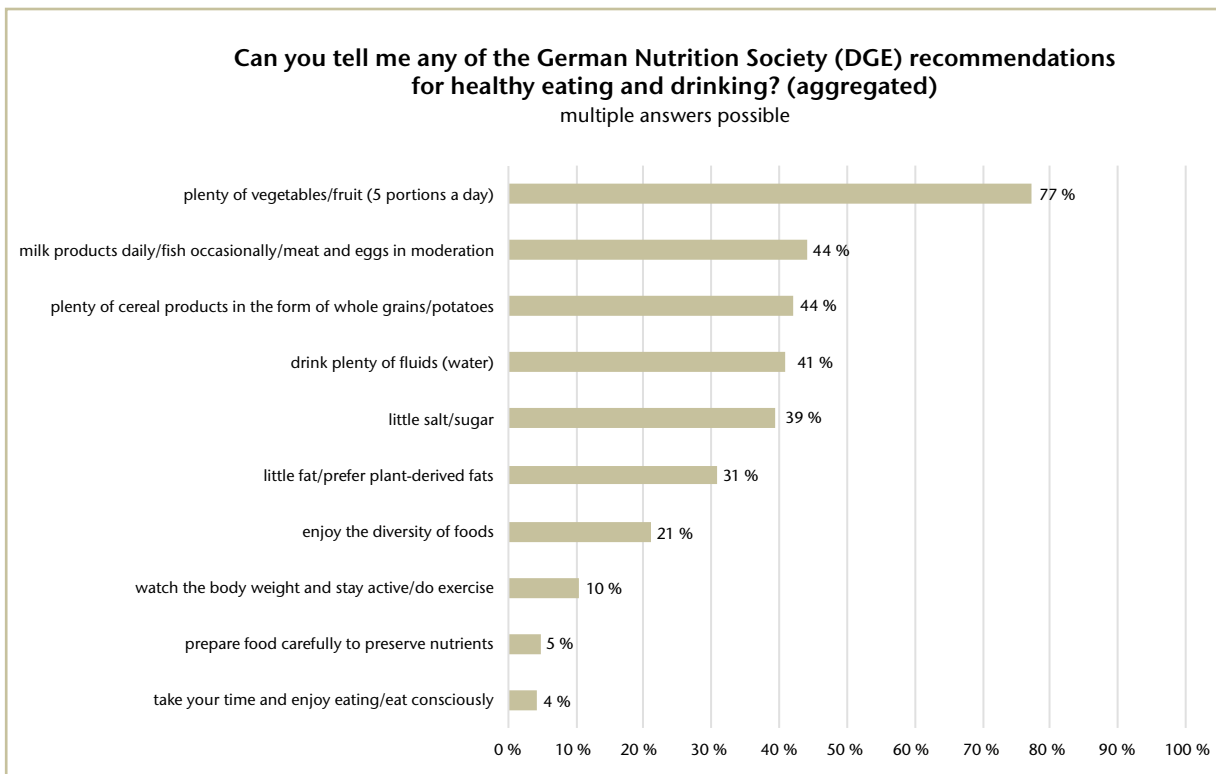


Fig. 2a: Naming of nutrition recommendations by those who were familiar with the Food-based Dietary Guidelines (FBDG) of the German Nutrition Society (DGE) (aggregated)

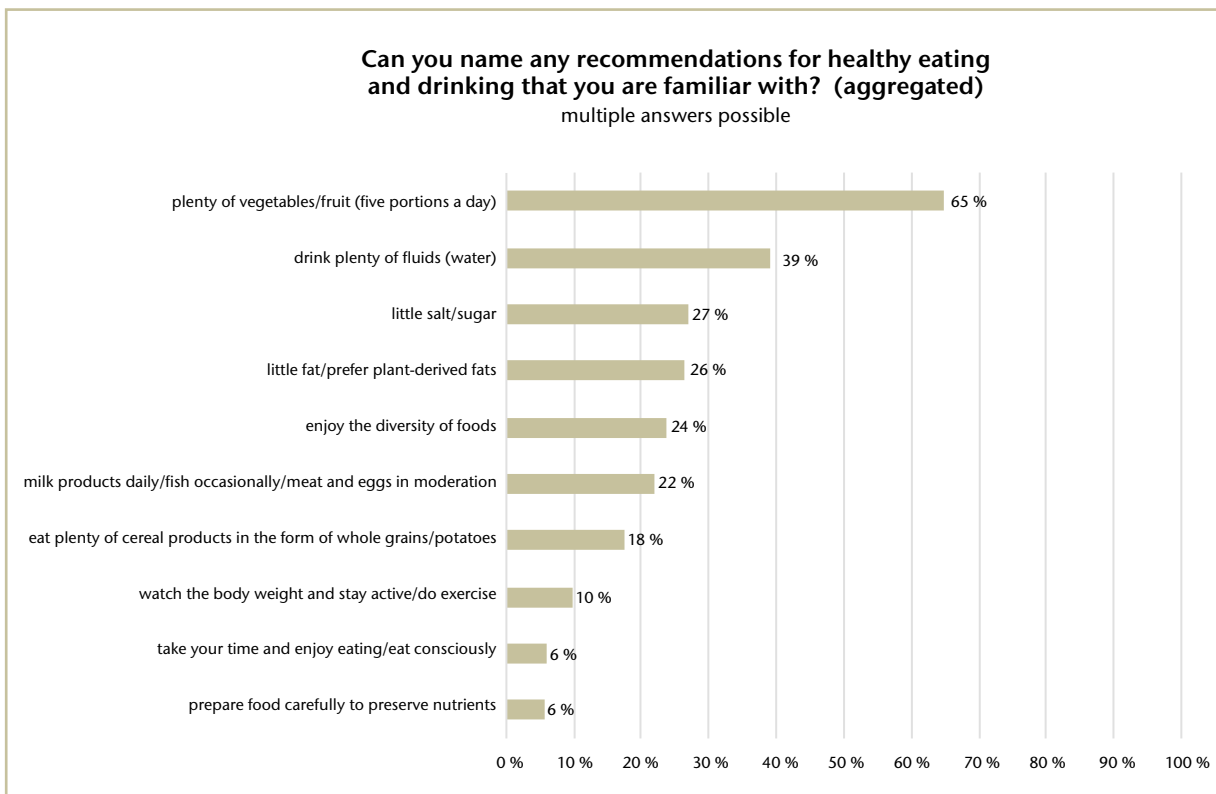


Fig. 2b: Naming of nutrition recommendations by those who were not familiar with the Food-based Dietary Guidelines (FBDG) of the German Nutrition Society (DGE) (aggregated)

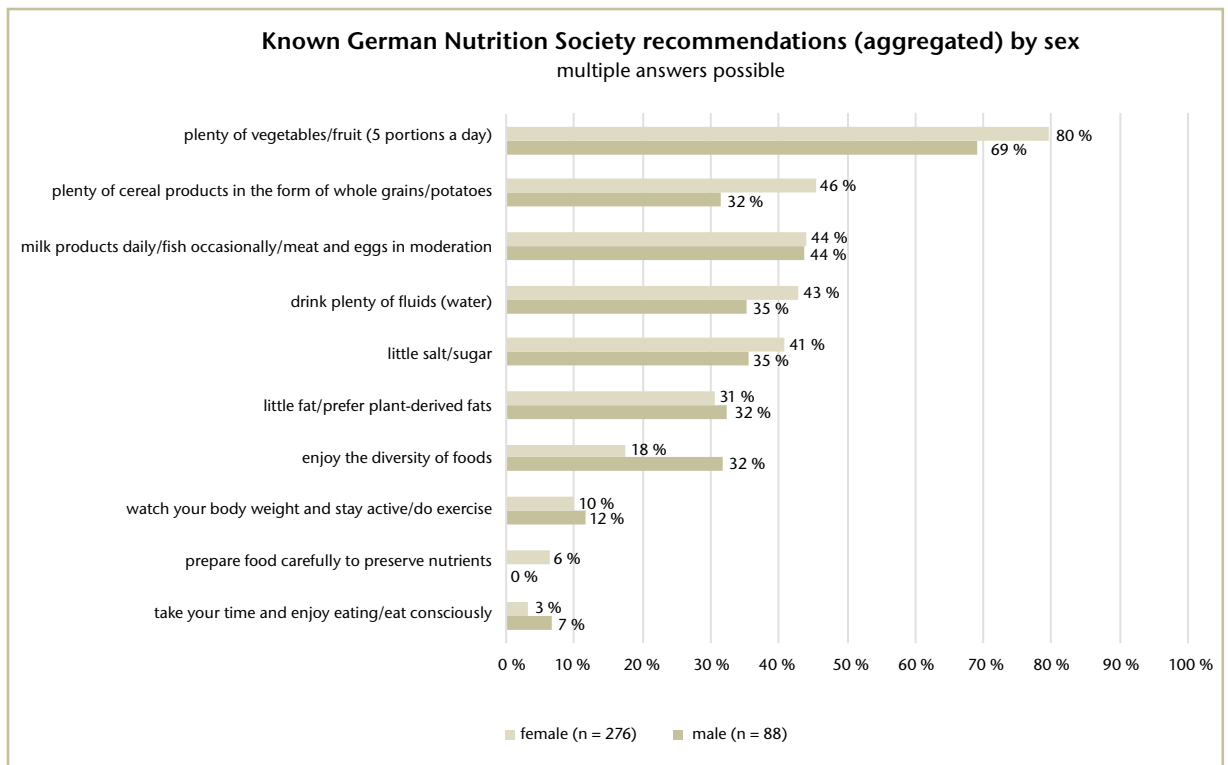


Fig. 3: German Nutrition Society (DGE) recommendations known to the “familiar” group (aggregated) by sex (weighted)

with the Three-Dimensional DGE Food Pyramid than households with no children (53% vs. 30%).

**Professional group:** The DGE models were more commonly known to interviewees who deal with diet, food, and health as part of their profession, than to those whose profession is unrelated to these topics (10 guidelines: familiar to 22% vs. 11%, nutrition circle: familiar to 17% vs. 8%, pyramid: familiar to 50% vs. 32%).

**Income:** Interviewees who fall within the monthly income range of €5,000 to €7,000 (net) were most frequently familiar with the pyramid (49%). The pyramid is least familiar to the group with a monthly net income of less than €1,000 (23%).

**BMI:** The pyramid was more frequently familiar to interviewees with a BMI within the normal range (40%) than it was to those who were either underweight (38%) or overweight (32%).

**Health status:** Interviewees who did not have a chronic disease were more frequently familiar with the food pyramid than those who had a chronic disease (40% vs. 32%).

**Familiarity with individual recommendations (with regard to content)**

Interviewees who stated that they were very familiar with the DGE recommendations (5%) or that they were reasonably familiar with them (34%), or had at least heard of them before (49%), were allocated to the “familiar” group (n = 658) and asked to independently name individual recommendations or guidelines of the DGE regarding healthy eating and drinking. Those who were not aware of any DGE model or who responded to the question on how familiar they were with the DGE recommendations with “not at all familiar” (12%) (or did not supply this

information) were allocated to the “not familiar” group (n = 1,101). The “not familiar” group was asked to name any general recommendations regarding eating and drinking that they were familiar with. Where the answers supplied by these interviewees approximately matched the 10 guidelines of the DGE in terms of content, these answers were allocated by the interviewers to the corresponding DGE guideline.

The interviewees from the “familiar” group named on average 1.74 recommendations (standard deviation [SD] 1.96). The interviewees from the “not familiar” group named on average 1.53 recommendations (SD 1.60). So there is a small significant difference in the average number of known nutritional recommendations between the “familiar” group and the “not familiar” group.

The most frequent first mention across both the “familiar” and “not

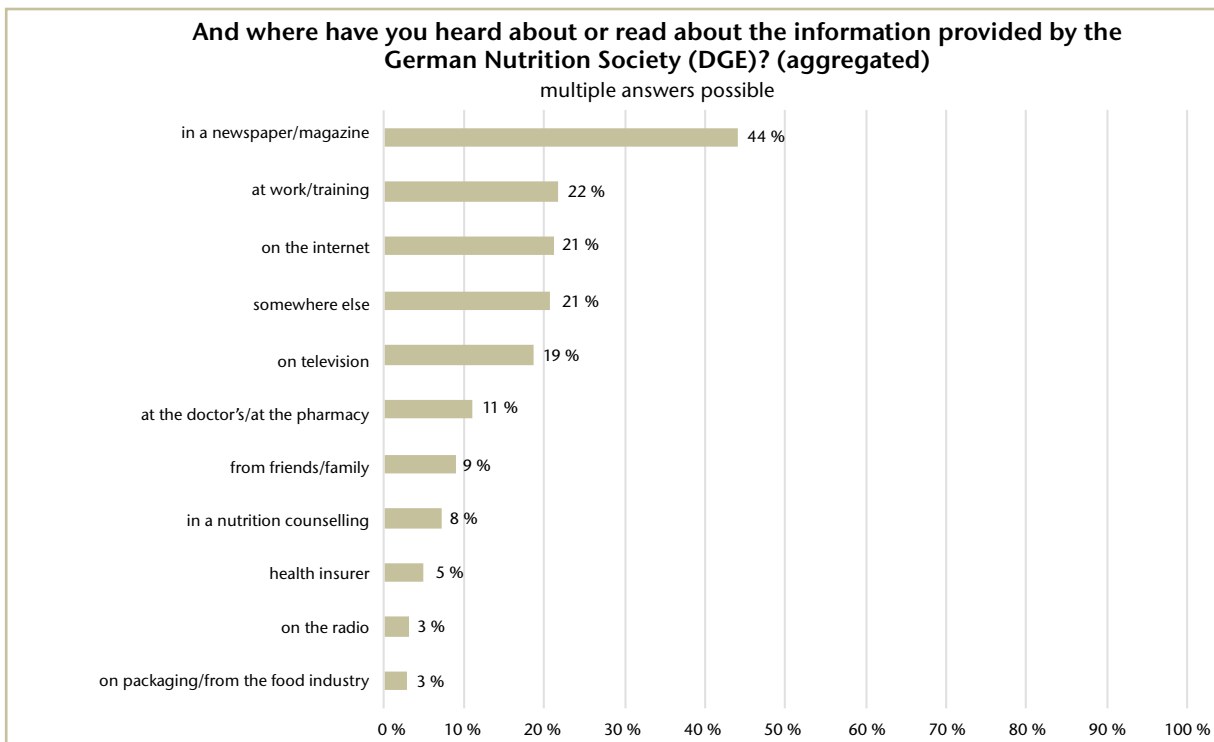


Fig. 4: Sources of knowledge about the information provided by the DGE

familiar” groups was “plenty of vegetables/fruit (5 portions a day)” (37% and 36%, respectively); followed by “drink plenty of fluids (water)” 16% and 19% respectively). Among the “familiar” group, 294 interviewees (45%) could name no recommendation, 364 interviewees could name at least one recommendation, and 3 interviewees could correctly name all 10 guidelines. Overall (regardless of the order of mention), the “familiar” group most frequently mentioned “plenty of vegetables/fruit (5 portions a day)” (77%). The least frequently mentioned recommendation overall was “take your time and enjoy eating/eat consciously” (4%) (♦ Figure 2a).

#### Awareness of the DGE models – where does it come from?

The interviewees who knew about at least one of the three DGE models (n = 754) were asked to state all of the sources from which they had heard

or read about them. By far the most commonly mentioned source was “in a newspaper/magazine” (44%), the second most common was “at work/training” (22%), and the third most common was “on the internet” (21%) (♦ Figure 4).

#### Information about nutrition in general

##### Frequency

26% of the interviewees gather information about nutrition and health once a week, 18% gather information several times a week, and 7% gather information every day. Almost half of the interviewees stated that they gathered information about nutrition and health less often than once a week (32%) or never (17%).

##### Where information is gathered

All of the interviewees, except for those who answered the question regarding frequency of seeking infor-

mation about nutrition with “never” were then asked by open question, where exactly they gather information about nutrition and health.

1,420 interviewees stated as first entry “on the internet” (34%) or “in a newspaper/magazine” (32%).

The aggregated results (i.e. regardless of the order of entries) show that overall, the interviewees most frequently mentioned “in a newspaper/magazine” (58%), followed by “on the internet” (50%), and “on television” (37%). Within the open response category “elsewhere” (13%), interviewers recorded responses such as “(cook) books”, “specialist books”, “magazines”, “sports studio” or “shops”.

##### Desired place to gather information

All interviewees were asked by open question about where they would like to find information on how to eat and drink “healthily”. The most frequently cited first entry were “on the internet” (30%) and “in a newspaper/magazine” (24%).

If we look at the aggregated results for the preferred place to gather information, the interviewees most frequently cited “on the internet” as their preferred place (38%). The next most popular places were “in a newspaper/magazine” (36%) and “on television” (24%).

**Requirement for information on the internet**

“On the internet” is the preferred source for gathering information about health and nutrition. In order to discover further details about what websites the interviewees would like to consult to gather information, all of those who stated that they would like to gather information on the internet (n = 518) were asked by open question “where exactly on the internet” they would like to gather information. The most frequently cited first entry among the interviewees was “websites of official institutions” (28%), and the least frequently cited was “blogs” (2%). The aggregated results for the desired source to gather information on the internet show that overall, the most common option cited by the interviewees was “websites of official institutions” (35%). The interviewers recorded that when interviewees stated “other” as their preferred option, the most frequently cited preferred information sources were things such as “Google”, “supermarkets”, or “app”.

**Discussion including limitations**

The present study firstly evaluates familiarity with the FBDG of the DGE within a representative sample of the adult population in Germany. 14% of interviewees reported that they knew the “10 guidelines of the DGE”, 10% reported that they were familiar with the DGE Nutrition Circle, and 37% reported that they were familiar with the Three-Dimensional DGE Food Pyramid. The models were familiar to more women than men. The most well-known nutrition recommendation was “eat plenty of vegetables and fruit”.

Besides the Three-Dimensional DGE Food Pyramid, the DGE Nutrition Circle is the best-known graphic model of FBDG in Germany among multipliers like nutrition counselors, and it is the most commonly used illustration in working with adults [13].

Consumers’ higher level of familiarity with the Three-Dimensional DGE Food Pyramid compared to the DGE Nutrition Circle and the 10 guidelines of the DGE is an unexpected result because the pyramid is precisely the model that is not directly addressed to consumers. This result could be explained by the successful use of the Three-Dimensional DGE Food Pyramid by multipliers, e.g. in schools. This is also supported by the fact that the pyramid is more frequently familiar to people in households with a child/children. However, it would be logical to expect that in that case, the DGE Nutrition Circle, which is depicted on the bottom surface of the pyramid, would also be more familiar. The significance of the result that a good third of interviewees were aware of the Three-Dimensional DGE Food Pyramid is likely limited for the following reasons: In Germany, pyramids (or triangles) are used in communications by various publishers, including publishers in the food industry, and the interviewees could have mistaken any pyramid for the DGE pyramid in their statement. Because the interviews were conducted by telephone, there is no guarantee that the graphical models the interviewees were actually thinking of were in fact those inquired in this study. Since consumer studies have shown that models are frequently familiar because they are depicted on food packaging, it is important to ensure that the food industry uses the official FBDG [4]. The result could also be affected by the fixed order of the questions regarding the three models in the interview: the interviewees may have been reluctant to say “no” for a third time, after already saying that they did not know about the 10

guidelines or the nutrition circle (social desirability factor).

The topic of the interviews may have influenced willingness to participate, as suggested by the proportion of interviewees who work in areas related to nutrition, food, and health (27%), and the proportion of women in the unweighted sample (57%).

Overall it is evident that there is a need for a stronger target group orientation, as seen before in an evaluation involving specialists [14]. The DGE models were more frequently familiar to women than to men, and familiarity with individual nutrition recommendations differed between women and men. This highlights the need to communicate FBDG in a sex-targeted manner in future, and to increase focus on men as a target group. Overall, the 10 guidelines of the DGE were familiar to one in 10 people in Germany, but to only 3% of the youngest adults, meaning that in future, target group-specific communication should also focus on young adults in particular.

61% of interviewees who said that they knew about the DGE models admitted that they did not know the actual recommendations (content), or that they had only heard of them, but did not know the details. 45% of those allocated to the “familiar” group were unable to state any of the recommendations. These results may indicate that the guidelines are not sufficiently easy to understand or remember – the FBDG will have to be communicated in a more simplified manner for direct communication to consumers.

The recommendations regarding body weight, exercise, a diverse diet, food preparation, and eating consciously were the least well-known recommendations. This provides a starting point for addressing “non-physiological nutrition-related topics” in communications and also integrating them into the graphical models, as recommended by the EFSA, for example [3].

The results regarding use of information by consumers show a discrepancy between use of the internet as a source of DGE information

(21%) and as a source of information on nutrition and health in general (50%), and in terms of the frequency of mentions of the internet as a desired place to gather information (38%). Among those who would prefer to find information on the internet, 35% also wanted information from “websites of official institutions”. According to the Nutrition Report 2016 of the Federal Ministry of Food and Agriculture (*Bundesministerium für Ernährung und Landwirtschaft* [BMEL]), 78% of people in Germany regard the provision and distribution of neutral information on nutrition as an effective measure the state can take to promote a healthy diet [15]. In addition, internet searches are used by 44% (according to this report) and 51% (according to the follow-up report) to find out about food; information brochures, e.g. from the state or from independent organizations, are used by 35% and 32% according to the respective studies [15, 16]. All in all, this shows that there is a need for communication of information to consumers by the DGE, and that this information should be increasingly provided via the internet in future. However, it is important to keep in mind that almost half of the interviewees stated that they gathered information about nutrition and health less often than once a week (32%) or never (17%). This means that measures such as campaigns and structural prevention need to be pursued as further approaches. As current developments in other Western countries show, in future, FBDG need to be simplified and communicated using digital media and interactive tools, and also communicated through target group-specific communication approaches. Behavioral strategies should be the key factor in the design of effective nutritional recommendations [6]. The data and approaches described here, taken together with the results of an ongoing multivariate analysis and qualitative interviews, will form the basis for a target group segmentation and for further

development of the measures used to communicate the FBDG of the DGE.

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#### Conflict of Interest

Barbara Laubach and Claus Mayerböck work at the uzbonn GmbH which was commissioned by the German Nutrition Society (DGE) to carry out the study.

At the time of publication, Angela Bechthold, Isabelle Wendt and Helmut Oberritter were employed by the DGE.

Prof. Nöthlings declares no conflict of interest.

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