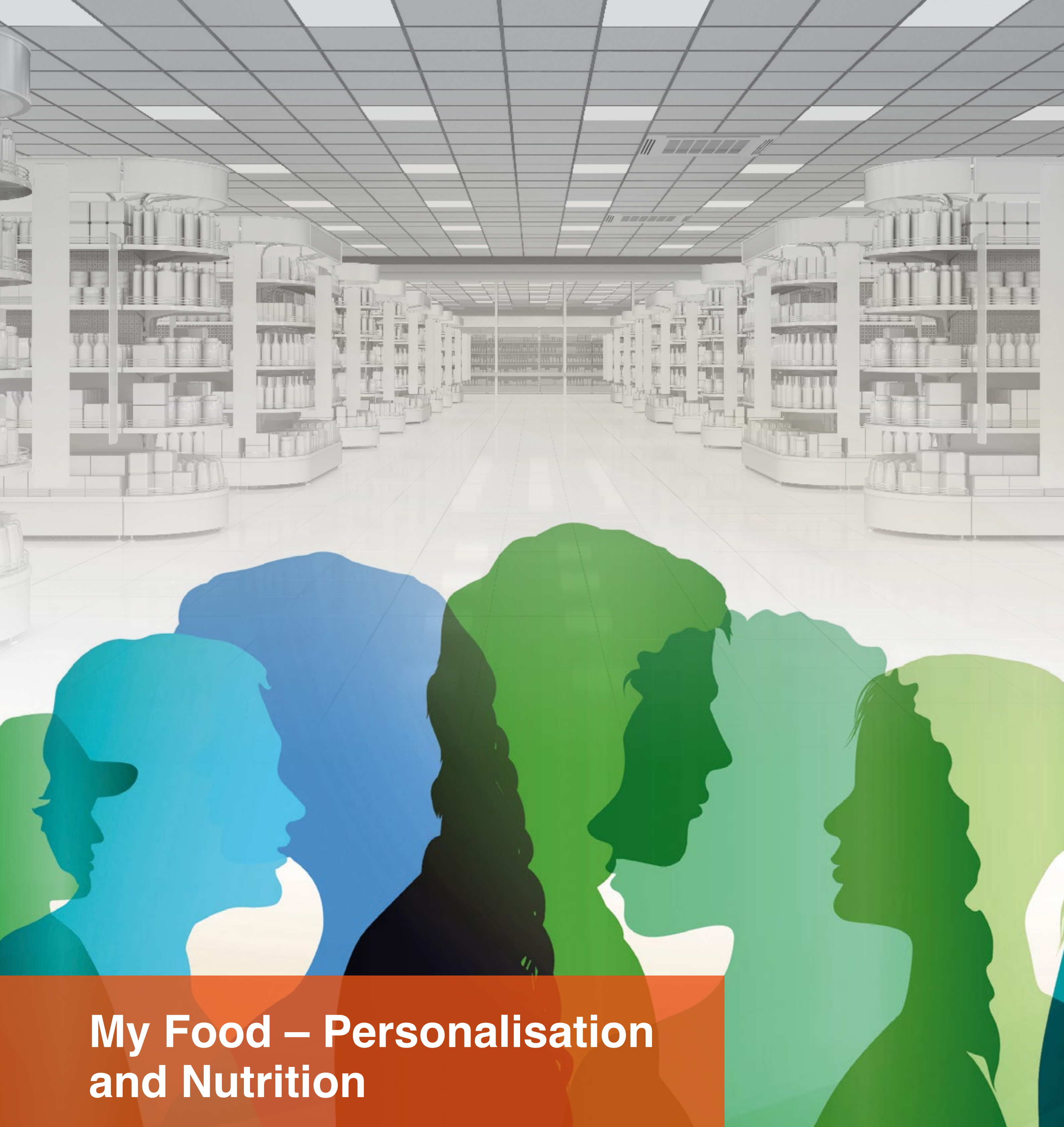

My Food – Personalisation and Nutrition

DLG Study Part 2: Personalised Nutrition

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My Food – Personalisation and Nutrition

This publication is Part 2 of the study "My Food – Personalisation and Nutrition", which was conducted by the DLG in cooperation with Prof. Dr. Holger Buxel (Münster University of Applied Sciences) in summer 2019. The publication series consists of three parts that illuminate the topic of personalisation in the food sector and in nutrition from different perspectives.

Study Part 1: Personalised Food

Personalised foods are products that are adapted by manufacturers to meet personal customer needs. To this end, manufacturers usually offer customers various options on how they can have the products adapted to their personal taste, ingredient, shape, packaging design, quantity or preparation preferences. To analyse the relevance and supply of personalised food, a consumer, company and expert survey was conducted.

Consumer survey: The relevance and acceptance of personalised food offers from the consumer's point of view was examined. For this purpose, a representative consumer survey with n=1,000 was conducted in July 2019.

Company survey: The study investigated the status quo of the offer of personalised food from a company's perspective and how the future development of the trend towards greater personalisation of food is assessed. For this purpose, a survey was conducted from July to August 2019 among n=184 companies from the food industry that produce food for end consumers.

Expert survey: To complement the consumer and company survey, experts from the food industry were interviewed on selected aspects of personalisation.

Study Part 2: Personalised Nutrition

Companies from the nutrition industry offer the creation of personalised nutrition concepts to better adapt nutrition to personal preferences and health needs. The customised nutritional concepts are often generated through analyses of metabolism, genetic profiles, health status, lifestyle and personal preferences.

The relevance and acceptance of offers of personalised nutrition concepts from the consumer's point of view was examined. For this purpose, a representative consumer survey was conducted among n=1,000 consumers in July 2019.

Study Part 3: Personalisation in food shopping and nutrition apps

For food shopping and nutrition, digital offers are being developed in the form of apps or robots that generate suggestions for shopping or consumption in real time based on the personal characteristics and needs of consumers in order to simplify everyday life.

The study investigated the relevance and acceptance of such personalisation offers in food shopping and how helpful apps are in nutrition and food shopping from the consumer's point of view. For this purpose, a representative consumer survey was conducted among n=1,000 consumers in July 2019.

Introduction

Due to the growing health awareness of many consumers and an advancing use of apps and online offers in the nutrition sector as well, personalised nutrition is currently classified as an important trend topic by market observers.

In personalised nutrition, individualised nutrition concepts are created for individual consumers in order to better adapt the diet to personal preferences and health needs. These individualised nutritional concepts are often generated on the basis of analyses of metabolism, genetic profile, health status, lifestyle and/or personal preferences. The implementation of nutrition concepts in everyday life is often supported by apps or other Internet services, which, for example, generate customised recipe, consumption and product recommendations. Sometimes this is also linked to an offer of personalised food, where the composition of ingredients is tailored to individual health needs.

Personalised nutrition services are already being developed by a number of organisations and companies in the health, nutrition and food sectors. Health care organisations are working on corresponding offers, because personalised nutrition can support healthy eating behaviour in order to improve the health situation in the population.

For companies in the nutrition and food industry, personalised nutrition is also economically interesting. On the one hand, personalised nutrition services can be offered in the market as commercial services. On the other hand, personalised nutrition offers open up the opportunity for companies to make their product ranges and foods with their specific nutritional or health-related characteristics (e.g. particularly low in salt, with a lot of calcium) more visible to consumers and to position them specifically in the consumer's purchasing and consumption process.

The concrete opportunities and development prospects that personalised nutrition offers can currently provide for the health and food sector depend, among other things, on how interesting and attractive personalised nutrition is from the consumer's point of view. Therefore, the relevance and acceptance of offers for personalised nutrition from the consumer's point of view was considered within the framework of the "My Food" study (Fig. 1).

The results are presented in the following.

Examination set-up: Personalised Nutrition

Companies from the nutrition industry offer the creation of personalised nutrition concepts to better adapt nutrition to personal preferences and health needs. The customised nutritional concepts are often generated through analyses of metabolism, genetic profiles, health status, lifestyle and personal preferences.

The relevance and acceptance of offers of personalised nutrition concepts from the consumer's point of view was examined.
For this purpose, a representative consumer survey was conducted among n=1,000 consumers in July 2019.

The focus was on the following questions:

- How do consumers rate their personal need to eat healthier?
- How do consumers perceive the need for personalised nutrition compared to general dietary recommendations?
- How interesting are personalised nutrition offers from the consumer's point of view?
- How willing are consumers to use analytics and implementation tools for personalised nutrition?

Fig. 1: *Research structure of the study part "Personalised Nutrition"*

How do consumers rate their personal need to eat healthier?

Personalised nutrition offers aim to provide consumers with a way to optimise their diet. This should be of particular interest to those consumer groups who would like to eat healthier. The first step in the survey was therefore to look at how strong the current need is among consumers to eat healthier.

How strong is the desire to eat healthier?

With regard to the question of how consumers assess their personal need for a healthier diet, consumers were presented with a number of statements around the topic of healthy eating. The following picture emerges (Fig. 2):

- Half of the respondents (50%) agree with the statement that they would like to eat healthier. Just under one in two respondents (45%) also say they spend a lot of time on healthy eating.

- The proportion of respondents who say they have to watch what they eat for health reasons is 29%.

The results clearly show that healthy eating is a topic that concerns many consumers and that there is also a desire in the market among very many consumers to eat healthier. The potential target group for whom personalised nutrition offers could be of interest can therefore be classified as large.

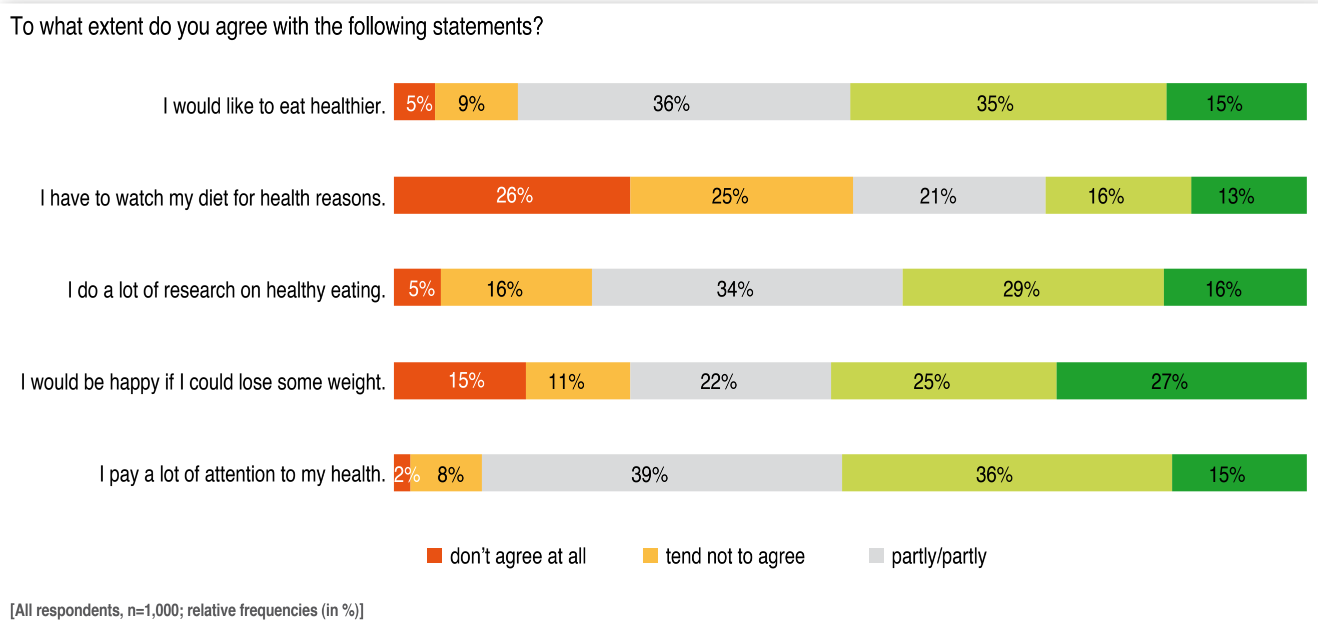


Fig. 2: *Importance of healthy nutrition from the consumer's point of view*

What nutrition-related "health concerns" motivate consumers?

What a desire for a healthier diet means for the individual can vary considerably in practical terms. To gain an insight into which diet-related "Health Concerns" consumers are currently strongly concerned about, respondents were presented with some food consumption goals that are sometimes set by people who want to eat healthier. The respondents were asked to mark such goals below that they personally are currently consciously and actively pursuing themselves in their food consumption in order to eat healthier.

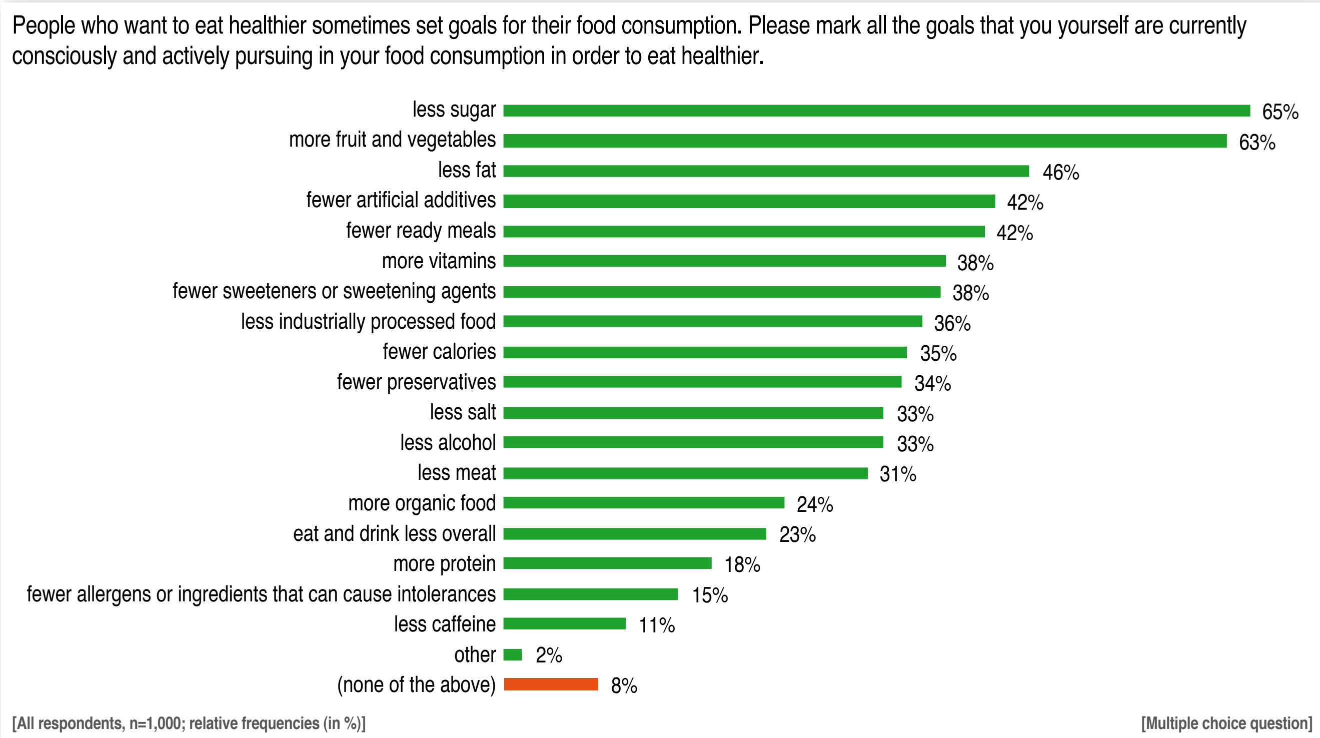


Fig. 3: *Nutritional "health concerns"*

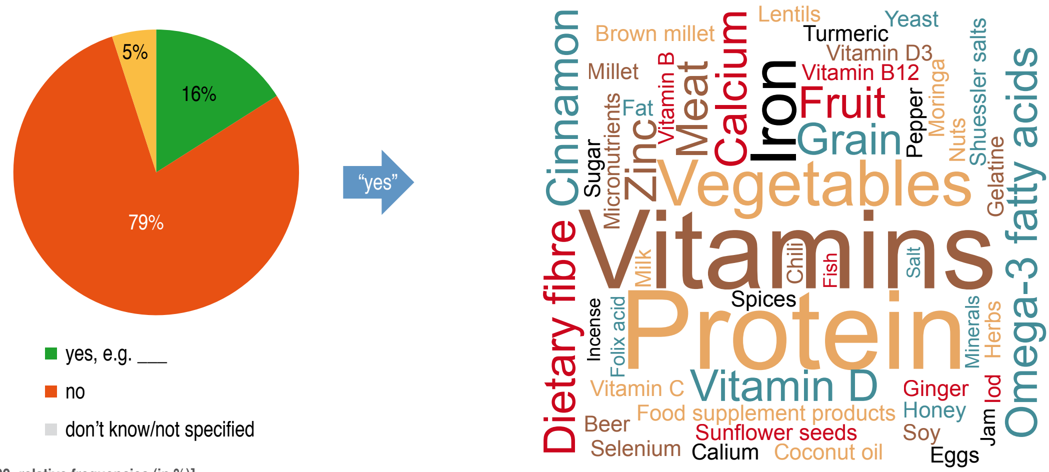
- The goal most frequently named by all respondents is "less sugar" (65% of respondents), followed by the goals "more fruit and vegetables" (63%) and "less fat" (46%).
- In addition, various other goals also play a significant role: For example, the goal of "fewer artificial additives" was mentioned by 42%, "more vitamins" by 38% and "fewer allergens or ingredients that can cause intolerances" by 15% of respondents.

Respondents were further asked if there were any particular ingredients or constituents in food that they specifically wanted to avoid in their diet or to have in addition to their normal food. This is the case for many respondents:

- For 24% of respondents, there are certain ingredients in food that they specifically want to avoid in their diet, e.g. because they do not tolerate them well. The range of ingredients or ingredients that these consumers specifically want to avoid is broad and includes cereals, milk, lactose, gluten, glutamate, nuts, sugar substitutes, preservatives, E-numbers, palm oil, sugar and gelatine (Fig. 4).

Fig. 4: *Avoidance of ingredients or additives*

Are there any specific ingredients or nutrients in foods that you want to specifically add to your normal diet in order to optimise your nutrition?



[All respondents, n=1,000; relative frequencies (in %)]

Fig. 5: *Targeted adding of ingredients or nutrients*

- 16% of respondents also say that there are certain ingredients or nutrients in food that they specifically want to add to their regular food in order to optimise their diet. Here, the range of ingredients or nutrients that these consumers want to consume in addition is also broad and includes, among others, vitamins, zinc, calcium, magnesium, fibre and spices (Fig. 5).

It turns out that the question of what the desire for a healthier diet means for individual consumers is often quite individual and multi-faceted. Personalised nutrition offers are likely to be particularly interesting for those respondents who specifically want to avoid certain ingredients in their diet or want to consume them in addition to their normal food, as these offers address the individual complexity of nutritional needs and can simplify everyday nutrition through customised recipe, consumption and product recommendations. The share of these respondents who can be classified as an important core target group for personalised nutrition offers is 33% of the respondents.

To what extent is a lack of personalised nutrition a cause of consumers not already eating healthier?

For an assessment of the acceptance of personalised nutrition offers, it is also important to know why consumers who would like to eat healthier do not do so. Therefore, those consumers who would like to eat healthier were asked what reasons, in their view, are responsible for why they do not already eat healthier today:

- The reason "too little self-control/do not implement resolutions consistently" is mentioned most often by 55% of these respondents, followed by "not motivated enough to care" (40%).

- The reason "don't know how best to optimise my diet (lack of tailor-made dietary recommendations)" is mentioned as a cause by 24% of respondents.

- "Don't have good tools for nutrition planning in everyday life" is cited by 17% and lastly, "too few products that are adapted to my personal nutritional needs and metabolism (lack of tailor-made foods) stated as a reason by 14% of respondents (Fig. 6).

A lack of availability of personalised nutrition recommendations, food and aids for nutrition planning in everyday life – which personalised nutrition offers usually provide - is considered by many consumers to be (part of) the reason why they do not already eat healthier today.

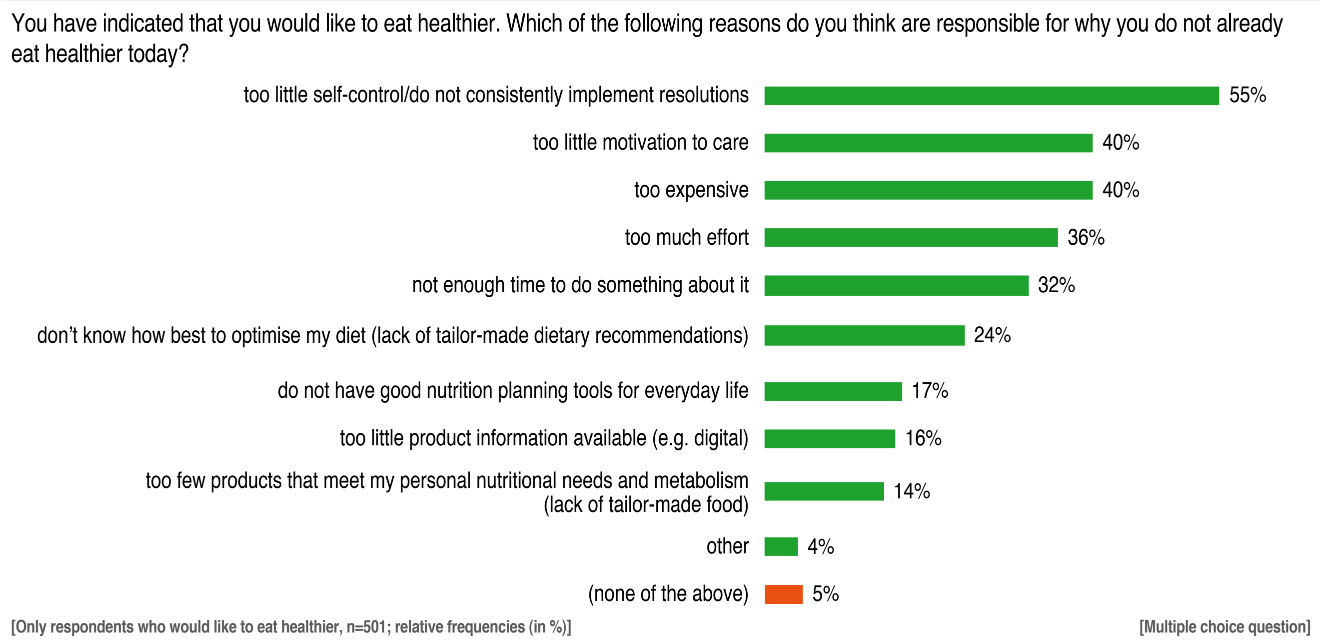


Fig. 6: *Reasons not to eat healthier*

How do consumers perceive the need for personalised nutrition?

There are many general dietary recommendations for consumers to follow if they want to eat healthily. For example, nutrition societies issue general dietary recommendations on how the population should eat healthily (e.g. the food pyramid or the advice to eat less sugar and red meat).

Personalised dietary recommendations aim to generate recommendations that are "better" matched to individual dietary needs by comparison. A prerequisite for the acceptance of these offers is that consumers also assume an "added value" in such personalised recommendations. Therefore, it was considered how the necessity of personalised nutrition is perceived from the consumer's point of view compared to general dietary recommendations. It turns out:

- 78% of respondents agree with the statement that people utilise individual foods and nutrients very differently. 57% of respondents agree that it is not possible to make a blanket statement about what is recommended for a person to optimise their diet (Fig. 7).

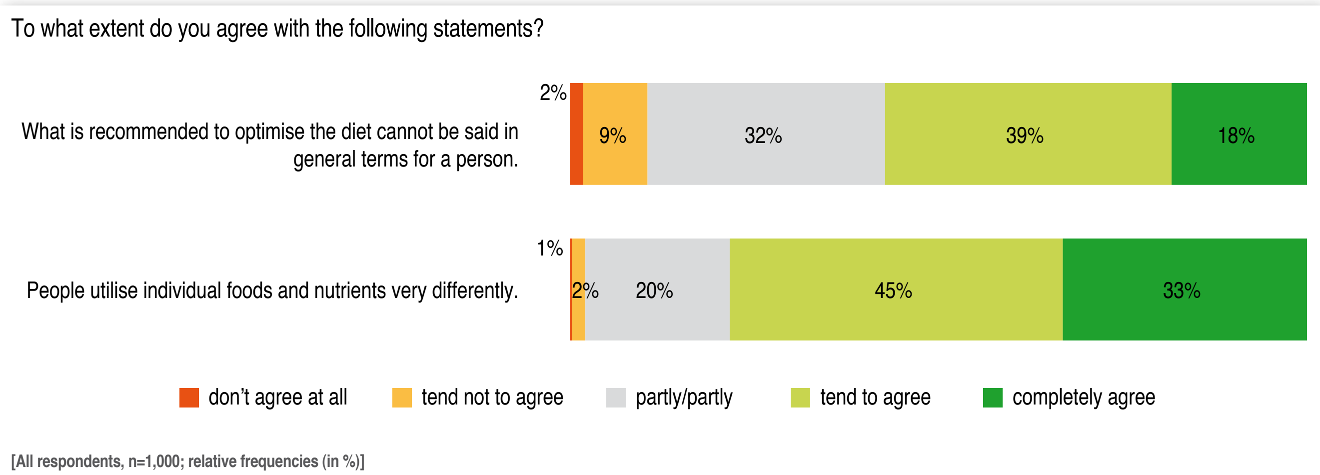


Fig. 7: *Perceived individuality of dietary needs*

- 67% of respondents personallybelieve that general dietary recommendations are not best for every individual, but that every person is unique and has a different metabolism, so that general recommendations from dietary societies only apply to the average population, but can be wrong or even harmful in individual cases (Fig. 8).

Accordingly, it can be stated that the majority of consumers assume that nutritional needs are individual and that personalised are better than general dietary recommendations. Most consumers are therefore likely to be quite open to the basic approach of personalised nutrition and also see an easily comprehensible potential benefit in it.

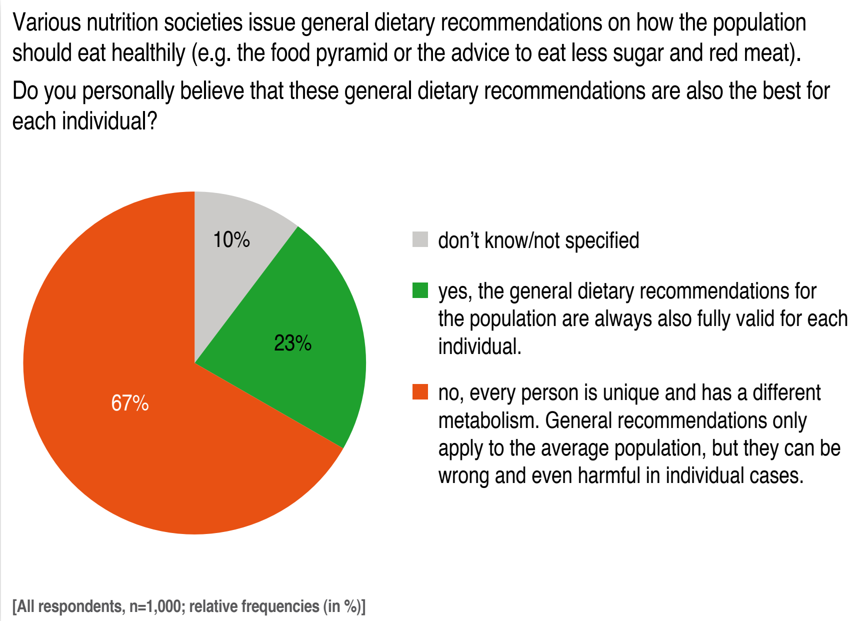


Fig. 8: *Assessment of the benefits of general dietary recommendations*

How interesting are personalised nutrition offers from the consumer's point of view?

With regard to the question of how interesting personalised nutrition offers are from the consumer's point of view, the basic perception of personalised nutrition recommendations from the consumer's point of view was first considered. It can be seen (Fig. 9):

- Overall, 47% of respondents agree with the statement that personalised dietary recommendations
- would probably make them eat better and healthier than they do today.
- 45% of respondents can very well imagine using services that provide them with personalised nutritional recommendations.
- 48% of respondents like personalised dietary recommendations.

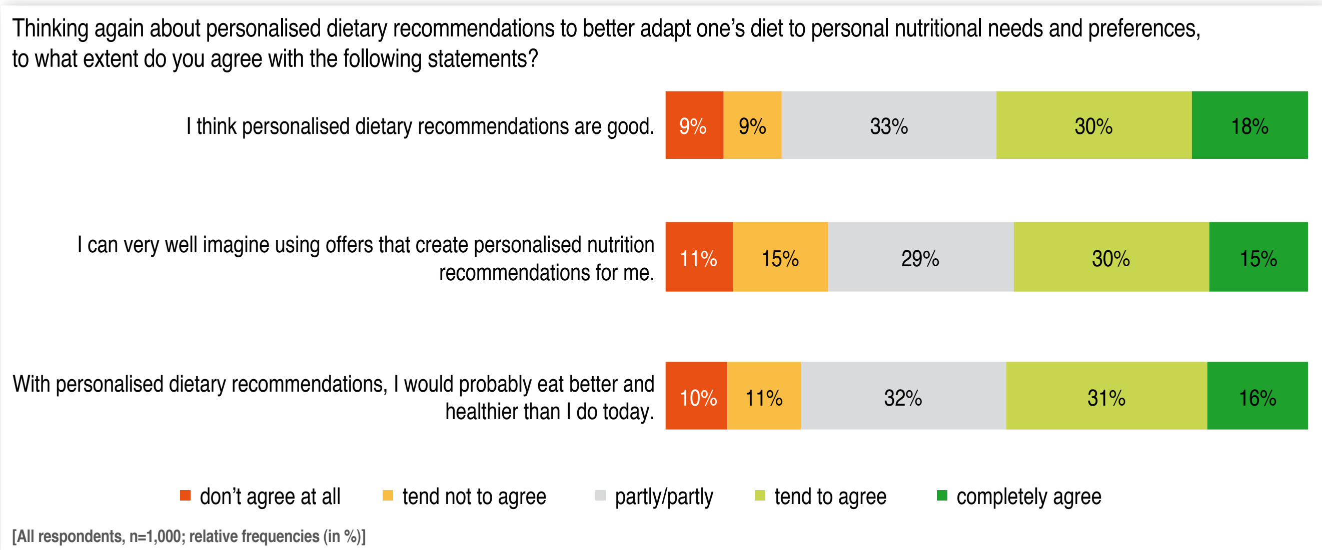


Fig. 9: *Attitude towards personalised dietary recommendations*

How much interest is there in individual recommendation offers for personalised nutrition?

With personalised nutrition, different types of recommendations can be generated, e.g. nutrition plans, restaurant recommendations or product suggestions. Respondents were shown some recommendations tailored to them personally. They were then asked how interested they were in each of these recommendations (Fig. 10):

- 18% of respondents are very interested in receiving personalised recommendations of ingredients/nutrients that can support a healthy diet.
- Similarly, 18% are very interested in recommendations of ingredients/nutrients that could interfere with/should be avoided in healthy eating.
- 17% of respondents say they are very interested in personalised recipe recommendations and 12% in whole diet plans (daily, weekly, monthly) tailored to them.

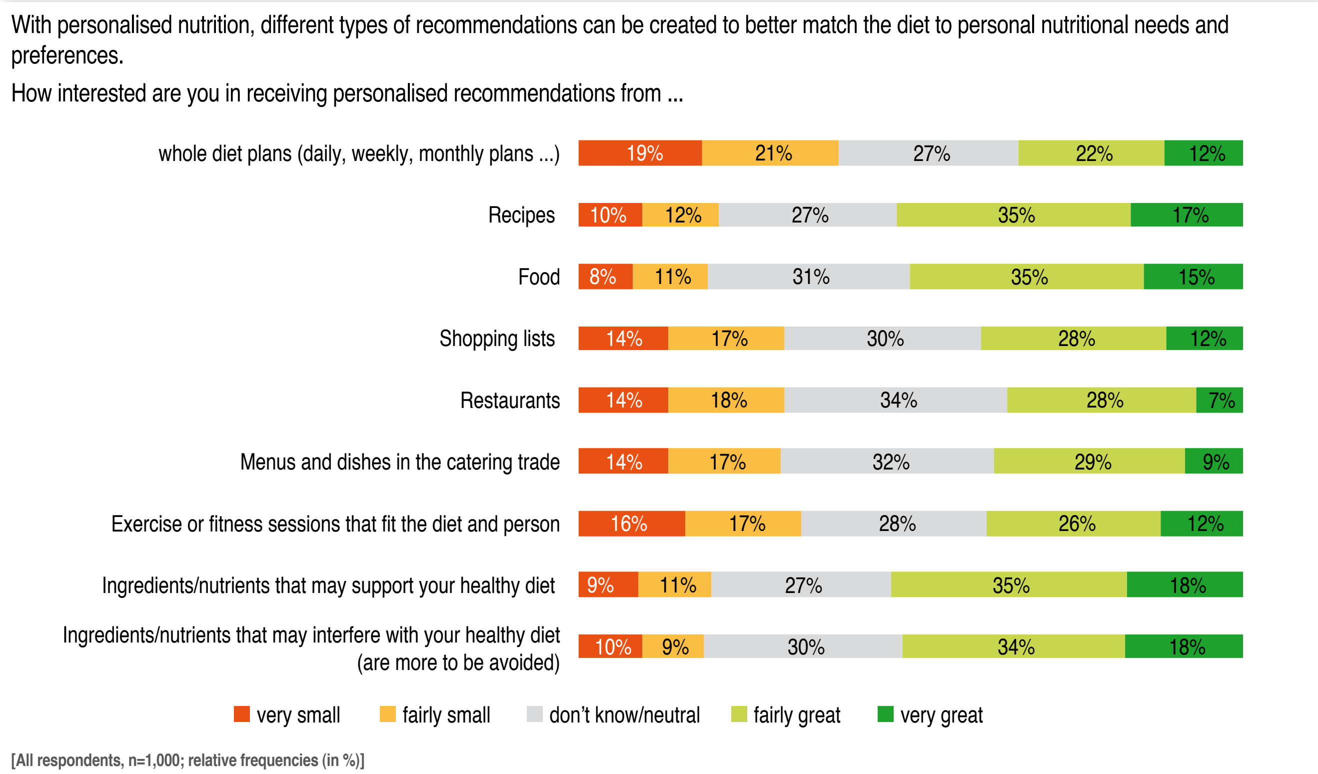


Fig. 10: *Interest in personalised nutrition recommendations*

How great is the interest in personalised food?

In personalised nutrition, in addition to recommendations, personalised foods can be offered that are specially adapted by manufacturers to the individual's nutritional needs, e.g. by adding targeted nutrients such as vitamins, proteins or calcium on request, or by omitting ingredients that one does not tolerate or like so well. In terms of consumer interest and attitudes towards such personalised food, it is apparent:

- 56% of respondents say that there are very specific foods for which an offer to make the product according to personal needs and preferences in terms of ingredients is of interest to them (Fig. 11).
- 40% of respondents say they like personalised food, and another 40% of respondents can very well imagine using personalised food (Fig. 12).
- 39% of respondents agree that personalised food would probably make them eat better and healthier than they do today.

Overall, it can be seen that many consumers have a positive attitude towards the offer of personalised dietary recommendations as well as personalised food.

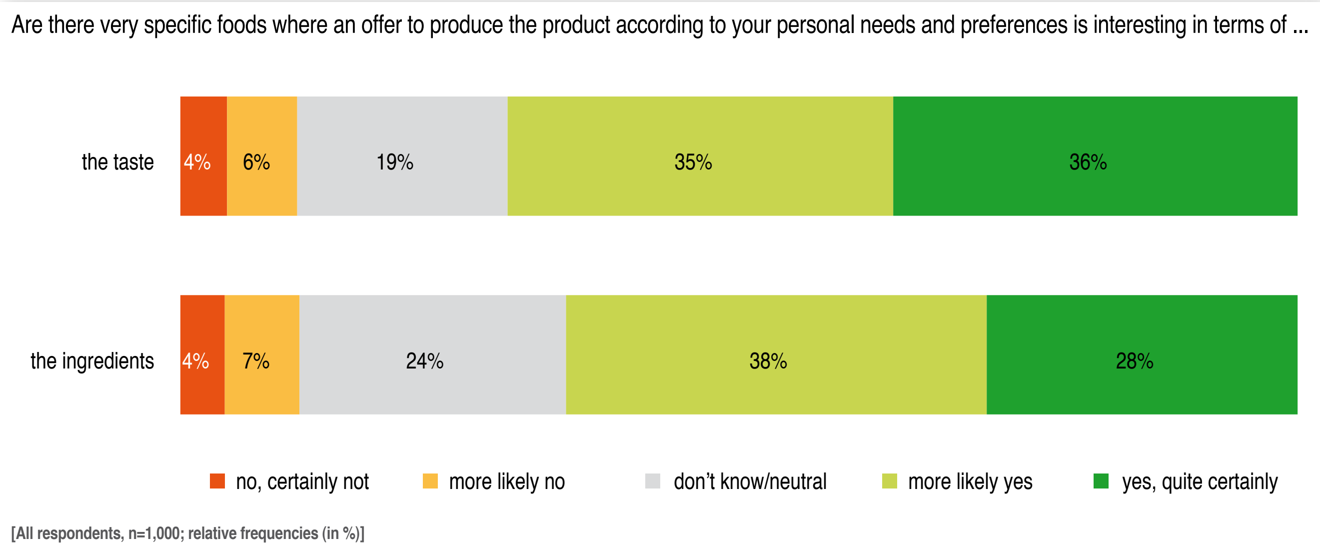


***Fig. 11:** Interest in personalised foods*

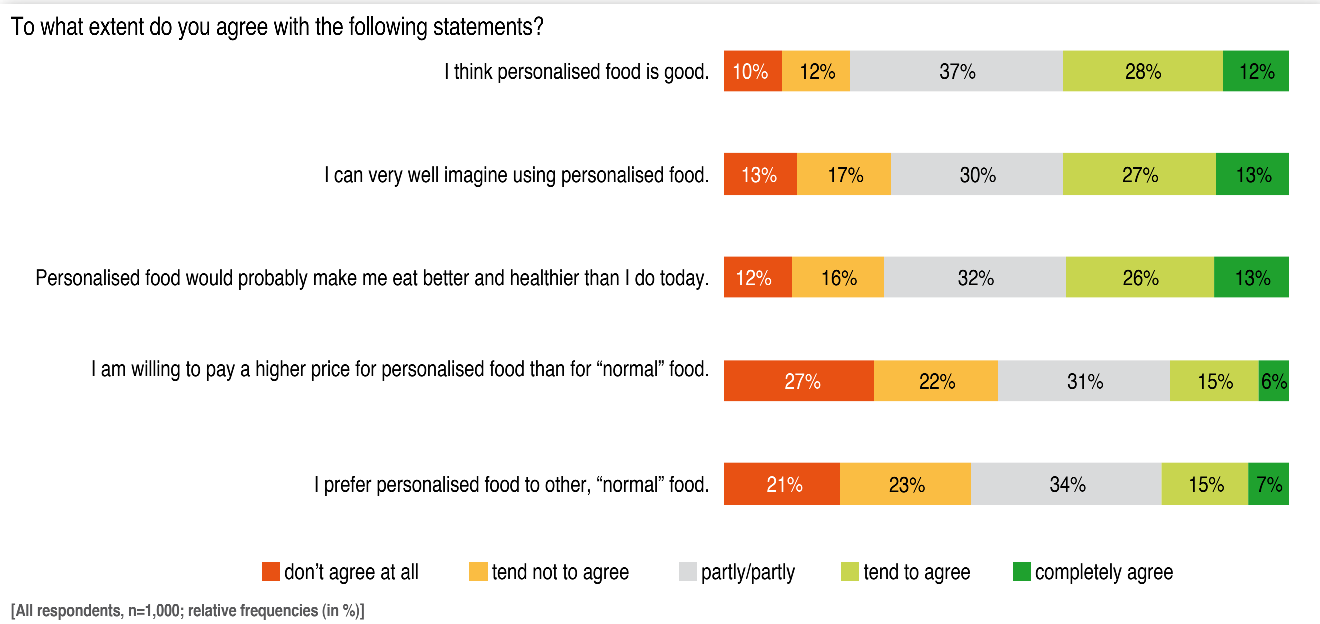


***Fig. 12:** Attitude towards personalised food*

How attractive are existing offers of personalised nutrition?

If consumers are interested in personalised nutrition offers in principle, this does not mean that this interest will develop equally for all offers. In order to gain an insight into the interest that concrete offers of personalised nutrition attract, a total of three such types of offers that can be observed in the market were considered (Fig. 13).

Personalised nutrition plan with DNA test

Just imagine: A specialised company from the nutrition sector offers the creation of personalised nutrition and menu plans tailored to your personal nutritional needs.

The procedure is as follows:

- You install an app on your smartphone or tablet.
- You will receive a test kit by post, with which you can simply take a saliva sample (using a cotton swab in your mouth) and a small blood sample (using a small needle prick on your finger) at home and send it back to the company for a nutritional DNA analysis.
- In addition, you answer a questionnaire that includes questions about your physique (height, weight, etc.), your personal dietary needs and food preferences.
- After evaluating the data, you receive a detailed report that includes, for example, how the body reacts to carbohydrates, fats, proteins and lactose, how healthy the heart is and how susceptible your body is to weight gain.
- Via the app, you will then constantly receive personalised nutrition and menu plans for the next few days in the form of recipe and meal suggestions. The suggestions are also accompanied by ready-made shopping lists.
- In case you don’t want to buy all or some of the ingredients yourself, there is a link in the app to an online shop where you can also order ingredients.

The costs for the test are a one-time fee of EUR 300. The monthly fee for using the app to receive personalised nutrition and menu plans is EUR 9, and the offer can be cancelled at any time.

Personalised nutrition plan without DNA test

Just imagine: A specialised company from the nutrition sector offers the creation of personalised nutrition and menu plans tailored to your personal nutritional needs.

The procedure is as follows:

- You install an app on your smartphone or tablet.
- You answer a questionnaire that includes questions about your physique (height, weight, abdominal girth, known illnesses, etc.), your personal dietary needs and food preferences.
- Via the app, you will then constantly receive personalised nutrition and menu plans for the next few days in the form of recipe and meal suggestions. The suggestions are also accompanied by ready-made shopping lists.
- In case you don’t want to buy all or some of the ingredients yourself, there is a link in the app to an online shop where you can also order ingredients.

The costs for using the app are EUR 9 per month and the offer can be cancelled at any time.

Personalised nutritional supplements (vitamins, minerals, nutrients)

Just imagine: A specialised nutrition company offers the creation of personalised vitamin, mineral and nutrient mixes for daily dietary supplementation.

The procedure is as follows:

- The order is placed online via a website.
- The person answers a questionnaire, which includes questions about his/her physique (height, weight, etc.), his/her personal dietary needs and habits, and his/her lifestyle (exercise, etc.).
- After evaluating the data, this person then receives a personalised suggestion for a mix of vitamins, minerals and other nutrients with which he/she should supplement his/her daily diet.
- This person can then order this mix online and will receive one packet per month containing ready-made sachets for each day, including a plan of when and how they should be taken.

A package for one month usually costs between EUR 30 and 40. The mix can be adjusted at any time and the offer can be cancelled at any time.

Fig. 13: *Personalised nutrition services investigated*

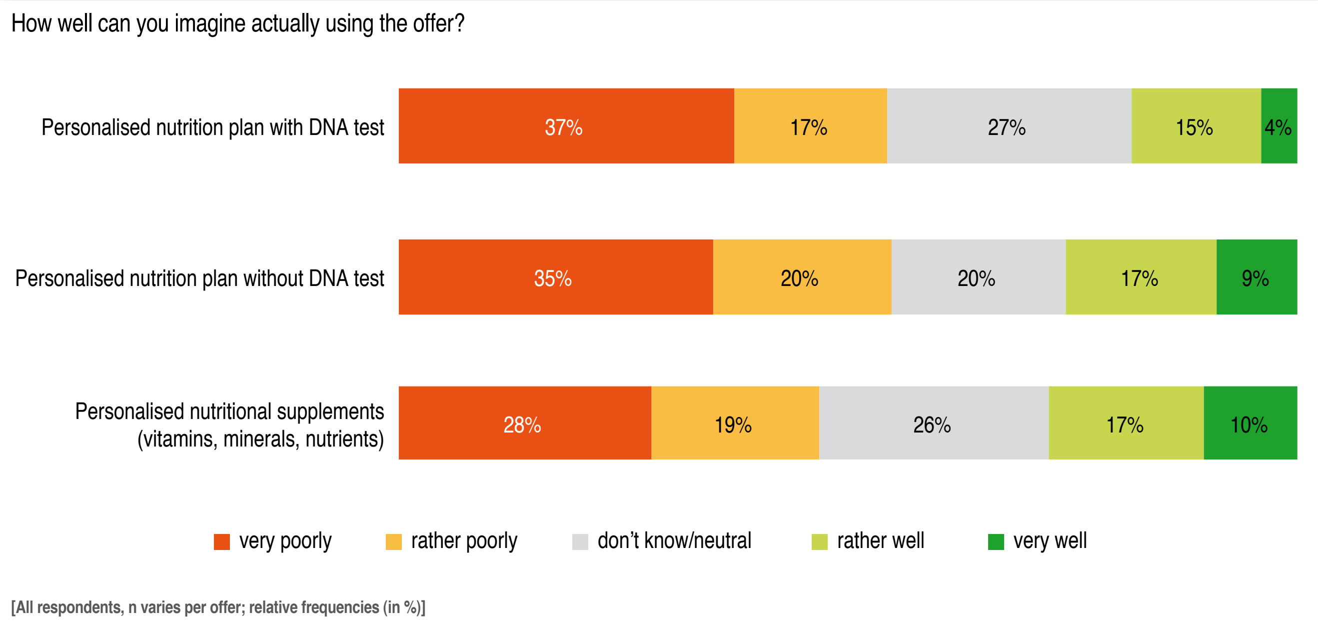


***Fig. 14:** Attractiveness of personalised nutrition services*

The individual respondents were each presented with one of these offers on the basis of a random selection procedure and asked how well they could imagine using the offer (Fig. 14):

- 19% of the respondents can rather or very well imagine using a fee-based offer for the creation of a personalised nutrition plan, which also includes the performance of a DNA test as a fixed component.
- 26% of the respondents could even rather well or very well imagine using a fee-based offer to create a personalised nutrition plan that is designed without carrying out a DNA test.
- 27% of respondents could well imagine using a paid service to regularly receive personalised food supplement mixes (vitamins, minerals, nutrients).

Consequently, paid offers for the creation of personalised nutrition plans may well meet with demand among some consumer groups.

How willing are consumers to use analytics and implementation tools for personalised nutrition?

Analyses of what personal dietary needs and preferences look like are often required to create personalised dietary recommendations and foods. In addition, the use of apps or wearables may also be necessary to make the dietary recommendations useful in everyday life. This can have a negative impact on the willingness to use personalised nutrition services. The study therefore looked at how willing consumers are to use such analysis and implementation tools for personalised nutrition.

How great is the willingness to participate in tests and surveys?

Respondents were presented with some types of analyses that can be used to gain insights into individual dietary needs. To this end, they were asked which of these analyses they could imagine having carried out (Fig. 15):

- 58% of respondents can imagine answering questionnaires about their personal lifestyle, eating habits, food preferences and physique.
- Participation in an analysis of their genetic profile by means of DNA analysis can be imagined by 38% of the respondents. Likewise, 38% of the respondents can imagine an analysis of their intestinal flora by means of microbiome analysis.

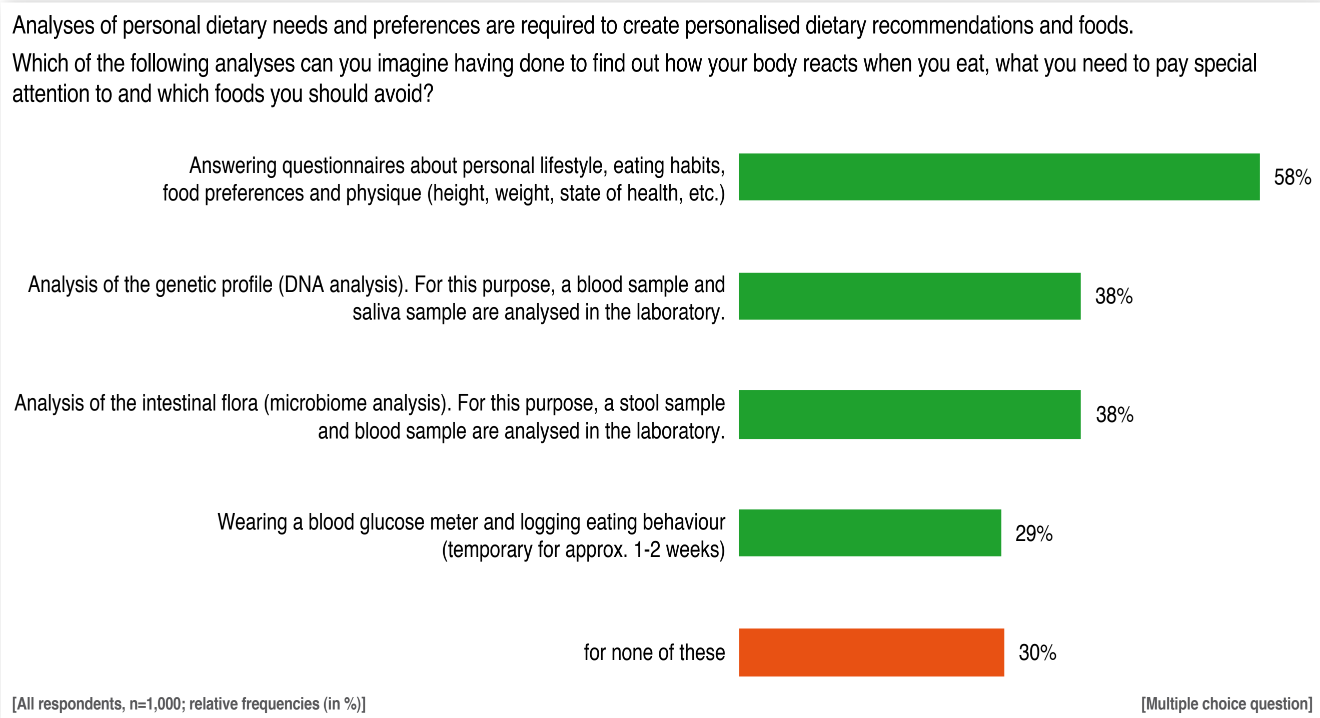


Fig. 15: *Willingness to participate in tests and surveys*

- In contrast, only 29% of the respondents could imagine temporarily wearing a blood glucose meter to record their eating behaviour.
- 30% of the respondents cannot imagine carrying out any of the types of analysis considered or having them carried out.

How great is the willingness to use apps and the like?

Many providers of personalised nutrition recommendations and suggestions for products or restaurants work with their own apps you have to be installed on a smartphone, tablet and laptop/PC. When asked how well they could imagine installing apps from such providers on their homes, 36% of respondents said they could imagine this very well or rather well. 9% of respondents already use an app on the topic of nutrition or food and drink (Fig. 16).

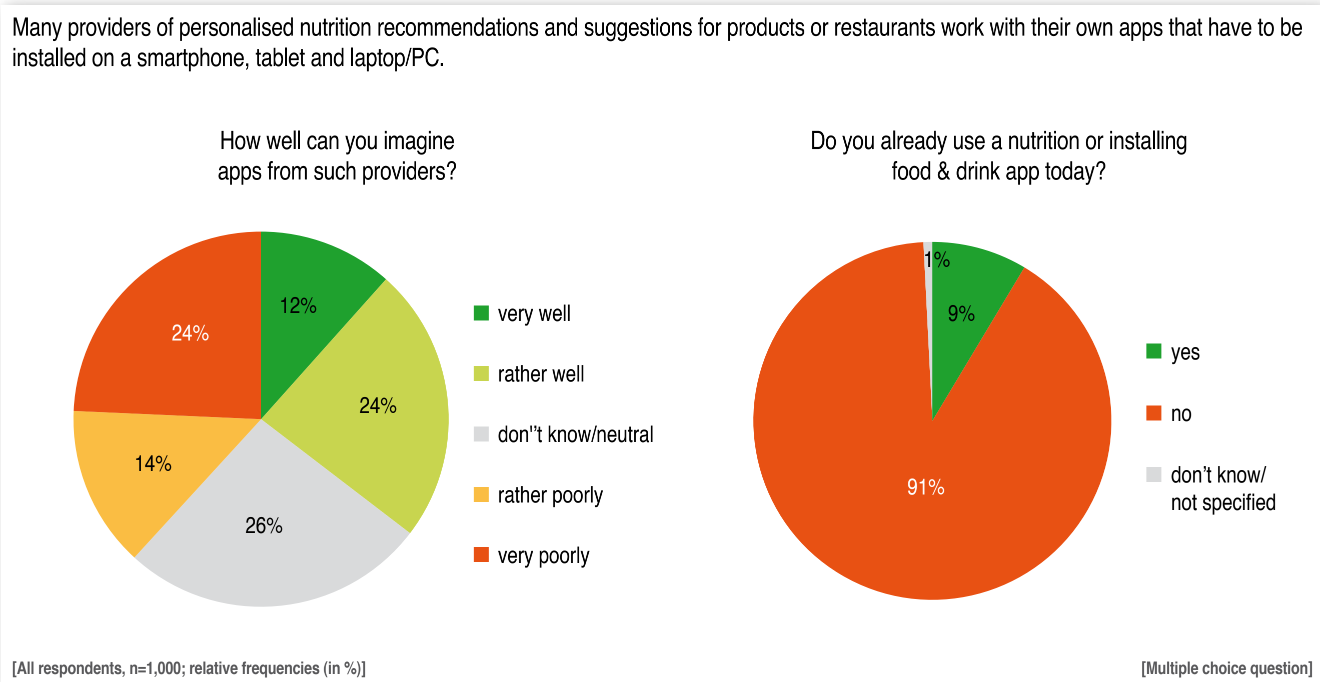


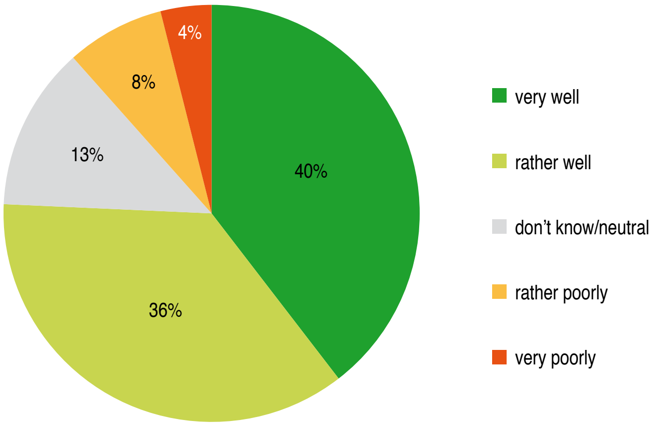
Fig. 16: *Use of and willingness to use apps*

Apps for personalised nutrition can be linked to wearables such as fitness wristbands or smart watches that can monitor sleep, pulse, blood pressure and exercise. This allows the body's condition and nutritional requirements to be analysed in real time and suitable nutritional recommendations to be generated.

Those respondents who could very well or rather well imagine installing apps for personalised dietary recommendations were also asked how well they could imagine using a fitness wristband or smart watch in conjunction with this kind of app. This is something 76% of these respondents can imagine well or very well (Fig. 17).

Apps for personalised nutrition can be paired with fitness wristbands or smart watches that can monitor sleep, pulse, blood pressure and exercise. This allows the body's condition and nutritional needs to be analysed in real time and suitable nutritional recommendations to be generated. Fitness wristbands or smart watches are simply worn on the wrist.

How well can you imagine using a fitness wristband or smart watch in conjunction with a personalised nutrition app?



[Only respondents who can imagine installing an app for personalised nutrition recommendations, n=354; relative frequencies (in %)]

***Fig. 17:** Willingness to use wearables*

Conclusion

The study focused on the question of what relevance and acceptance personalised nutrition offers currently have from the consumer's point of view. The results of the study can be condensed into the following five key statements:

Healthy nutrition is a topic that concerns broad consumer groups.

- Personalised nutrition offers aim to provide consumers with a way to optimise their diet and eat healthily. Interest in the topic of healthy nutrition is widespread among the general population. One in two respondents (50%) say they would like to eat healthier, and just under one in two respondents (45%) spend a lot of time on healthy eating. At the same time, almost every third respondent (29%) also perceives that they have to watch what they eat for health reasons.

- The proportion of respondents who specifically want to avoid certain ingredients in their diet or eat them in addition to their normal food is 33%. These respondents can be classified as a relevant and important core target group for personalised nutrition offers.

Personalised dietary recommendations are seen as sensible and useful.

- The majority of consumers surveyed assume that nutritional needs are individual and that personalised are better than generalised nutritional recommendations. 78% of respondents agree with the statement that people utilise individual foods and nutrients very differently. 57% of respondents agree that it is not possible to make a blanket statement about what is recommended for a person to optimise their diet.

- Those consumers who would like to eat healthier were asked about the reasons why they do not already eat healthier today. 24% say they do not know how best to optimise their diet (lack of tailored dietary recommendations). 17% state as another reason that they do not have good tools for diet planning in everyday life. A lack of availability of personalised dietary recommendations as well as aids for dietary planning in everyday life is accordingly definitely classified by many consumers as a (contributing) cause as to why they do not already eat healthier today.

Offers to personalise nutrition are fundamentally interesting for consumers.

- The interest in healthy nutrition as well as the perceived meaningfulness of personalised nutrition are reflected in consumers' interest in personalised nutrition recommendations. 45% of respondents can very well imagine using services that provide them with personalised nutritional recommendations. Consumers are particularly interested in personalised recommendations of ingredients/nutrients that can support a healthy diet, with 18% of respondents expressing a very high level of interest. 17% of respondents say they are very interested in personalised recipe recommendations and 12% in whole diet plans (daily, weekly, monthly) that are personalised to meet their needs.

- Personalised foods, which are specially adapted by manufacturers to the individual's nutritional needs, are also attracting interest. 40% of respondents can very well imagine using such personalised food, and 39% of respondents agree that personalised food would probably make them eat better and healthier than they do today.

- Overall, it can be seen that broad consumer groups are fundamentally interested in and quite positive about an offer of personalised nutrition recommendations as well as food, which is also reflected in the acceptance of concrete offers of personalised nutrition. For example, if personalised nutritional supplement packages are offered at a price of EUR 30 to 40 per month and sent monthly, about one in four (27%) can rather or very well imagine using the offer.

DNA tests or microbiome analyses can currently still be a barrier to the use of personalised nutrition offers among consumers.

- Analyses of what personal dietary needs and preferences look like are often required to create personalised dietary recommendations and foods. The majority of consumers seem to be rather open-minded towards such analyses in principle. For 70% of respondents, it is quite conceivable to have analyses carried out to find out how their body reacts in terms of diet, what they need to pay particular attention to and which foods they should avoid.

- However, this also shows that the willingness to participate in DNA or microbiome analyses in the context of personalised nutrition is less pronounced. "Only" 38% of the respondents can imagine having a DNA analysis of their genetic profile carried out. In the case of an analysis of their intestinal flora by means of microbiome analysis, it is also 38% of the respondents. This limited acceptance of DNA analyses among many consumers is also reflected in the acceptance of offers of personalised nutrition. The acceptance for an offer of personalised nutrition plans determined in the survey is higher if the offer is designed without an integrated DNA test.

- Accordingly, the use of DNA tests or microbiome analyses can currently still be classified as a barrier to the use of personalised nutrition offers by many consumers.

Online approaches are promising for the implementation of concrete offers of personalised nutrition recommendations.

- Many providers of personalised nutrition recommendations and suggestions for products or restaurants work with their own apps that have to be installed on a smart phone, tablet and laptop/PC. Asked how well they could imagine installing apps from such providers on their homes, 36% of respondents said they could imagine this very well or rather well. Of these respondents, the majority (76%) can well or very well imagine using a fitness wristband or smart watch in conjunction with such an app. 9% of respondents already use an app on the topic of nutrition or food and drink.

- The current use of apps around the topics of nutrition, eating and drinking, as well as the expressed openness towards apps for personalised nutrition, suggest that digital online approaches may be promising for the implementation of concrete offers of personalised nutrition recommendations in the future.

What does the future have in store?

Overall, the study results show that offers for personalised nutrition are interesting for many consumers.

However, the extent to which supply and demand in the field of personalised nutrition will develop in the near future is difficult to estimate in detail at present. This is likely to be influenced, among other things, by how well providers of concepts and products in the field of personalised nutrition succeed in deciphering the individual's nutritional needs in a simple and effective way and in offering truly customised nutritional recommendations or products that meet consumers' demands. In the area of personalised nutritional recommendations, the acceptance of offers will certainly also be heavily dependent on how well it is possible to design user-friendly implementation aids in the form of apps, etc., with which nutritional recommendations can be effectively implemented in everyday life.

In this area of tension between consumer interest on the one hand and an effective and application-friendly design of solutions on the other, it is to be expected that dealing with the possibilities, opportunities and risks of personalised nutrition is a topic that will probably occupy many organisations and companies from the health care sector as well as the nutrition and food industry intensively in the coming years.

This publication is intended to provide some data and insights as a basis for this debate and discussion.

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The study was conducted by the DLG (Deutsche Landwirtschafts-Gesellschaft – German Agricultural Society) in cooperation with Prof. Holger Buxel.

The study is available for download at www.DLG.org/myfood/en

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