

# Acceptance of Personalised Nutrition & Health by consumers

## *Consumer study report results*

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# Introduction

- One-size-fits-all attempts to turn the tide of obesity have not been very successful and the incidence of non-communicable dietary related diseases, such as type 2 diabetes, is growing (*WHO, 2011*).
- There are indications that tailored nutrition and health advices, based on an individual's physiological and psychosocial characteristics, may be more effective (*Celis-Morales et al., 2016; de Toro-Martín et al., 2017; Krebs et al., 2010; Zeevi et al., 2015*).
- ICT developments enable momentum for personalised nutrition, e.g. smart wearables, health parameter monitoring, big data handling, and the high penetration rate of the smartphone in the western population.
- What (aspects of) personalised services should be developed to stimulate consumer acceptance of personalized health and dietary advice?

# Overall aim and research questions

- **Overall aim:** Getting a clear idea of the **customer value** of Personalised Nutrition & Health (PNH) products and services by exploring which characteristics of PNH products and services are most important for consumers.
- **Main research question:** Which aspects may play a role in the acceptance of Personal Nutrition & Health services (PNH services) by consumers?
  - I. Which characteristics are preferred in PNH services by consumers?
    - a) Is there a difference in preferences between UK and NL? Between target groups?
    - b) What are the relations between personal characteristics\* and their preferences for PNH services?
  - II. What considerations do consumers make with regard to key elements of PNH services?
    - a) Is there a difference between UK and NL? Between target groups?
    - b) What are the relations between subjects' personal characteristics and their trade-offs in PNH services?
- Focus on two **target groups:** weight worriers and office workers.

\* I.e., age, education, capabilities for finding, evaluating, and applying electronic health information ('eHealth literacy'), subjective health and intention to eat healthy

# Contribution

- The results of this project provide insights into determinants of consumer acceptance of personalised nutrition by showing what aspects of PNH products and services are considered most important by consumers.
- These insights:
  - Allow companies to further develop their PNH products and services based on what is important for their customers (i.e., specific target groups)
  - Create openings for companies to engage with their customers to find personalised solutions, for example by means of co-creation
  - Inform the scientific community with realistic scenarios for PNH products and services.

# Summary



# Consumers' preferences for different aspects of personalised nutrition services

- Most important **goal of personalised nutrition** for consumers is to improve health, to lose or maintain weight or to get or feel fitter.
  - Older people are relatively more interested in advice regarding health solutions (i.e., losing weight, avoiding illness or improve specific health aspects); younger people are relatively more interested in improving lifestyle (i.e., feeling fitter, gaining more energy or developing healthier eating habits).
- Respondents generally want to receive **information/feedback** about their health status or eating habits.
- **Advice** concerning what nutrients one should consume or what products one should eat or how to replace ingredients with healthier alternatives is valued most.
  - Weight worriers more often want information and advice regarding calories/nutrient intake.
  - Younger people more often want the advice to be innovative and take into account personal beliefs (e.g. religious beliefs, vegetarianism, etc.) and environmental impact.
  - Low and medium educated people and people with lower digital capabilities relatively more often don't need any information about their health or diet and more often don't need any nutrition advice.
- Advices should be **cheap** and **easy to follow** and should ideally take into account what one likes to eat

# Consumers' preferences for different aspects of personalised nutrition services (continued)

- The extra option to have a **personal consultation with a dietician** is valued: via email or in a personal, face-to-face meeting.
  - Younger people and **office workers** also more often prefer options involving their social network.
  - **Weight worriers** significantly more often prefer the option to have a personal consultation with a dietician or receive encouragement from an expert (dietician/doctor).
- The most preferred actor that should pay for the use of PNH services is the **health insurance company** and most often preferred payment option is to pay a **one-off fee** to use the service.
  - In the Netherlands a majority indicates that the health insurance should pay the use of PNH services; in the UK other actors are preferred.
  - **Office workers** more often want to pay for the advice themselves.
- The most preferred **types of service providers** are health-related organisations (i.e., GP, Municipal Health Service, dietician, governmental body like Netherlands Nutrition Centre or health insurance company)
  - Respondents in the UK show relatively greater preference for 'commercial' service providers like the supermarket, food manufacturer, providers of online services or health apps and the gym.
  - **Office workers** show higher preference for the employer as provider of the service.
  - **Weight worriers** more often prefer the dietician as service provider.



# Results of choice experiment

- Results of the experiment reveal that price is a significant predictor of choice for a PNH concept ('for free' is preferred most), as well as **type of service provider** (a supermarket is less preferred), **ease of use** (where especially less complexity is preferred) and **privacy** (high privacy).
  - Price and privacy seems to be more relevant for Dutch consumers and also health insurance companies are more relevant as a service provider source for the Netherlands. With regard to ease of use (time and difficulty) of the service, we see that for UK respondents in particular the time component and not the difficulty component seems to matter.
  - Price and privacy is more important for **non-office workers**.
- **NB. Explanation of choice experiment:** Respondents are offered a number of PNH concepts (i.e., choice sets, two at a time), where they have to indicate which concept they prefer.

# Results part I: Which characteristics are preferred for PNH services?



# People want PNH advice to improve health, lose or maintain weight or to get or feel fitter

- The goal of 'improving health' is assessed more important in the UK as compared to the Netherlands.
- **Weight worriers** significantly more often indicate that their main goal would be to lose or maintain weight or to avoid illness (diabetes, CVD).
- Older people are relatively more interested in losing weight, avoiding illness or improving specific health aspects (e.g., cholesterol, etc); younger people are relatively more interested in feeling fitter, gaining more energy or developing healthier eating habits.
- Lower educated people are more often interested in avoiding illness.

# People want services with general information about their health, information about specific health factors and about their eating habits

- Respondents in the UK show a significantly stronger preference for insights into health compared to the general health guidelines or compared to average people; Respondents in the Netherlands more often prefer to receive information about their eating habits.
- **Weight worriers** significantly more often prefer information about intake of calories/nutrients.
- Older people are more interested in information about specific health factors, whereas younger people (< 35 years) are more interested in information about lifestyle/behaviour and insights into their health compared to average people.
- Low and medium educated people and people with lower eHealth literacy relatively more often don't need any information about their health or diet.

# Advice should focus on type of nutrients, sorts of products and how to replace ingredients with healthier alternatives

- Respondents in the UK prefer advice on which products to buy and how to replace ingredients with healthier alternatives. Respondents in the **Netherlands** more often prefer advice on the type of nutrients to consume, but also more often indicate that they don't need any nutrition advice.
- **Non-office workers** indicate more often that they don't need any nutrition advice.
- **Weight worriers** significantly more often prefer advice on the type of nutrients to consume and recipes that are in line with their health advice; **Non-weight worriers** indicate more often that they don't need any nutrition advice.
- Lower and medium educated people and people with lower eHealth literacy more often don't need any nutrition advice.
- There are differences in age groups in preferences for different types of advice.

# Advice should offer the healthiest possible eating habits in a cheap, easy to follow and tasty way

- Differences between respondents in the UK and the Netherlands: people in the UK attribute greater importance to palatability, people in the Netherlands more often indicate that the advices should match their existing eating habits (i.e., meals/meal times).
- **Weight worriers** significantly more often indicate that the advice should: (1) match their existing eating habits (i.e., meals/meal times), (2) be cheap and easy to follow, and (3) take environmental impact into account.
- There are differences in age groups and people with different levels of eHealth literacy: younger people and people with higher eHealth literacy more often want the advice to be innovative and take into account personal beliefs (e.g. religious beliefs, vegetarianism, etc.) and the impact on the environment.
- For people with a poorer subjective health it is more important that the advice matches their existing eating habits in terms of meals and mealtimes, that they are cheap and easy to follow and that they are tasty.

# People prefer personal consultation with a dietician as an extra option accompanied with a personalised advice

- People also prefer advices that take into account what someone likes (or does not) like to eat (i.e., food preferences).
- Differences between the **UK** and the **Netherlands** in preferred extra options: respondents in the UK show a significantly stronger preference for advice that is converted into a shopping list and having these groceries home delivered as well as for the option to give and receive advice to/from other users and receive encouragement from people in their social network.
- **Office workers** and younger people (< 35 years) significantly more often prefer options involving their social network (i.e., receiving encouragement from people in their social network).
- **Weight worriers** significantly more often prefer options to have a personal consultation with a dietician or receive encouragement from an expert (dietician/doctor).

# The health insurance company is the most preferred actor to pay for PNH services

- BUT, there are important differences between the Netherlands and the UK
  - In the Netherlands a majority of almost 60% indicates that the health insurance should pay the use of PNH services, in the UK other actors are preferred, including the government or the provider of the PNH service in exchange for advertising. Respondents in the UK also significantly more often want to pay for the PN advice themselves.
- **Office workers**, 35 to 49-year-old people and higher educated people significantly more often want to pay for the PN advice themselves.

## Payment options:

- The most preferred payment option is a **one-off fee** to use the service.
- Respondents in the UK significantly more often prefer **subscription** (e.g., a fixed monthly fee).
- Non-office workers significantly more often want to pay a one-off fee to use the service as compared to **office workers**.



# The most preferred types of service providers are health-related organisations (i.e., GP, Municipal Health Service, dietician)

- To a lesser extent are preferred: a government body (e.g., Netherlands Nutrition Centre) or health insurance company.
- Respondents in the UK show greater preference for:
  - A supermarket or food manufacturer, provider of online services or providers of health apps, the gym
- Respondents in the Netherlands more often indicate:
  - A government body, dietician, health insurance company
- **Office workers** significantly show higher preference for commercial service providers (Mobile phone company, provider of health apps, employer).
- **Weight worriers** significantly more often prefer the dietician.
- Older people significantly more often indicate health-related service providers (i.e., health insurance company, GP or Municipal health service, a government body).

# Communication with the expert/nutritionist via email contact as well as in a personal, face-to-face meeting is preferred

- To a lesser extent a chat or telephone contact with the expert or nutritionist is also applicable.
- **Weight worriers** more often indicate they prefer contact via email or in a face-to-face meeting.
- Younger people (25-34 years) more often prefer a personal face-to-face meeting.
- People with lower education, lower healthy eating intention and lower level of eHealth literacy more often indicate that they don't need to communicate with a nutritionist.

# Contact with other users via email, chat function or social media is preferred

- The opportunity for live contact (phone, Skype) with other users is less preferred.
- BUT, almost 1/3 of the respondents did not want to be put in touch with other users
  - Respondents in the Netherlands more often do not want to have contact with other users
- **Non-weight** worriers more often do not want to have contact with other users.
- People >50 years and with lower eHealth literacy more often indicate that they don't want to be put in touch with other users.

## Results part II (choice experiment):

What considerations do consumers make with regard to the key elements of PNH services?



# All attributes are relevant in decision making, though some attributes are more relevant than others

- Based on eight choices, respondents' trade-offs between 5 attributes (i.e., price, type of service provider, ease of use, additional services and privacy) are evaluated.
  - **Additional services** is linked to price, source and ease of use, these attributes should therefore be interpreted with care.
- **Price** is a significant predictor of choice for a PNH concept.
  - Free service is far more attractive than paying 30 euros for the service.
  - Paying 15 euros for the service is more attractive than paying 30 euros for the service.
- **Type of service provider** is also a significant predictor of choice for a PNH concept.
  - Choosing a specialised company is preferred over choosing a supermarket as service provider, but choosing an insurance company is preferred most.
- **Ease of use** seems only significant on the difficulty component and not on the time component
  - A personalised service that is **Easy & quick** seems to be preferred over a service that is **Difficult & slow** and also a service that is **Easy & slow** is chosen more often than a service that is **Difficult & slow**.
- A service that offers high privacy is chosen about twice as often as a service that offers low privacy

# In general, a similar pattern across both countries

- **Price is more relevant for Dutch consumers.** A free service option seems even more attractive to Dutch compared to UK respondents.
- **Insurance companies** seem more attractive to Dutch compared to UK respondents (where insurance companies are less often chosen than a specialised company).
- **Ease of use of the service is most relevant for UK consumers; there is no difference for Dutch consumers.** Ease of use (time and difficulty) has no significant effect for Dutch respondents, and for UK respondents especially the difficulty component and not the time component seems to matter.
- **Privacy is more relevant for Dutch participants.** Privacy is relevant for both countries, though it seems more relevant for the Dutch participants.

# In general, a similar pattern across office workers and non-office workers

- **The preferred type of service provider shows a similar pattern for office workers and non-office workers.** Both supermarkets and insurance companies are less often chosen than specialised companies for office workers and non-office workers.
- **Ease of use of the service does not significantly impact choices.** Variations in ease show no significant impact for both samples.
- **Price of the service is more relevant for non-office workers:** Free (as compared to a service of 30 euros) seems far more important for non-office workers compared to office workers, and also a service of 15 euros (as compared to 30 euros) is more attractive for non-office workers than for office workers.
- **Privacy is more relevant for non-office workers.** Privacy only shows a significant effect for non-office workers. They prefer a service with high privacy above a service with low privacy.

# There are no differences in importance between weight worriers and non-weight worriers

- **Relevance of price follows a similar pattern for weight worriers and non-weight worriers.** Free (as compared to a service of 30 euros) is most preferred for both samples, followed by a service fee of 15 euros.
- **For both samples supermarkets as a service provider seems least attractive.** Insurance companies are chosen about just as often as specialised companies and supermarkets are less often chosen than specialised companies.
- **Ease of use of the service: the difficulty component seems more attractive for both samples than the time component.** A service that is Easy & quick is not more attractive than a service that is Slow & difficult, but a service that is Easy & slow is most often chosen.
- **Both samples prefer privacy over no privacy.**



## Conclusions

Aim of the study was to delineate and accentuate the relevant PNH characteristics that play a role in consumer acceptance of PNH

# Aim of the study was to delineate and accentuate the relevant PNH characteristics that play a role in consumer acceptance of PNH

- Most important goals of personalised nutrition for consumers are: improving health, to lose or maintain weight or to get or feel fitter.
- People want services with general information about their health, information about specific health factors and about their eating habits.
- Advice should focus on type of nutrients, sorts of products and how to replace ingredients with healthier alternatives.
- Advice should offer the healthiest possible eating habits in a cheap, easy to follow and tasty way.
- People prefer personal consultation with a dietician as an extra option accompanied with a personalised advice: via email or in a personal, face-to-face meeting.
- The health insurance company is the most preferred actor that should pay the use of PNH services.
- The most preferred types of service providers are health-related organisations (i.e., GP, Municipal Health Service, dietician).

# Considerations that consumers make with regard to the key elements of PNH services

The **choice experiment** reveals that price is a significant predictor of choice for a PNH concept ('for free' is preferred most), as well as type of service provider (a supermarket is less preferred), ease of use (where especially less complexity is preferred) and privacy (high privacy is valued).



# A few differences between consumers in the UK and in the NL were detected

- Generally, similar patterns in preferences regarding the personalised feedback and advice and preferences for extra options, with some slight differences.
- Our study also revealed some country differences:

Netherlands	UK
Majority indicates that the health insurance should pay for the use of PNH services.	Other actors are preferred, including the government or the provider of the PNH service in exchange for advertising. Consumers more often indicate that they want to pay for the PN advices themselves.
Service provider: stronger preference for governmental bodies, dieticians and health insurance companies.	Greater preference for 'commercial' service providers like the supermarket, food manufacturer, providers of online services or health apps and the gym.
Price and privacy seem to be more important.	Price and privacy are less important.
Ease of use (time and difficulty) of the service has no significant effect.	Especially the difficulty component and not the time component of PNH services seems to matter.

# No big differences in preferences between office workers and non-office workers

Differences can also be explained because of demographic differences between office workers and non-office workers.

## Office workers

Office workers are higher educated, have higher incomes and are older, between 25 and 49 years.

Office workers significantly more often prefer options to link with their social network, more often indicate that they want to pay for the advice themselves and show higher preference for the employer as provider of the service.

## Non-office workers

Price and privacy are more important for non-office workers.

# Differences in preferences between weight worriers and non-weight worriers

## Weight worriers...

... More often have as main goal to engage in PNH services to lose or maintain weight and they indicate that they more often want information and advice regarding calories/nutrient intake.

... Indicate that they more often want the advice to match existing eating habits and that they should be cheap and easy to follow.

... Significantly more often prefer the option to have a personal consultation with a dietician or receive encouragement from an expert (dietician/doctor) and also more often prefer the dietician as service provider.

# Also differences between different other consumer groups

Consumer characteristic	Findings
<b>Age</b>	<ul style="list-style-type: none"><li>Older people are more interested in advice regarding health solutions (i.e., losing weight, avoiding illness or improve specific health aspects).</li><li>Younger people are more interested in improving lifestyle (i.e., feeling fitter, gaining more energy or developing healthier eating habits).</li><li>Younger people more often want the advices to be innovative and take into account personal beliefs (e.g. religious beliefs, vegetarianism, etc.) and the impact on the environment.</li><li>Younger people also more often prefer options involving their social network.</li></ul>
<b>Education</b>	<ul style="list-style-type: none"><li>Low and medium educated people more often indicate that they don't need any information about their health or diet and more often indicate that they don't need any nutrition advice.</li></ul>
<b>Digital capabilities</b>	<ul style="list-style-type: none"><li>People with more digital capabilities more often want the advice to be innovative and take into account personal beliefs (e.g. religious beliefs, vegetarianism, etc.) and environmental impact.</li><li>People with less digital capabilities relatively more often indicate that they don't need any information about their health or diet and that they don't need any nutrition advice.</li></ul>
<b>Subjective health</b>	<ul style="list-style-type: none"><li>For people with a poorer subjective health it is more important that the advice matches their existing eating habits in terms of meals and mealtimes, that they are cheap and easy to follow and that they are tasty.</li></ul>

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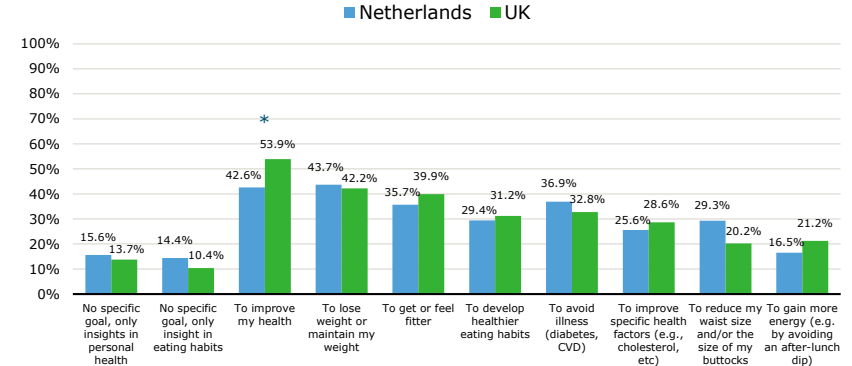
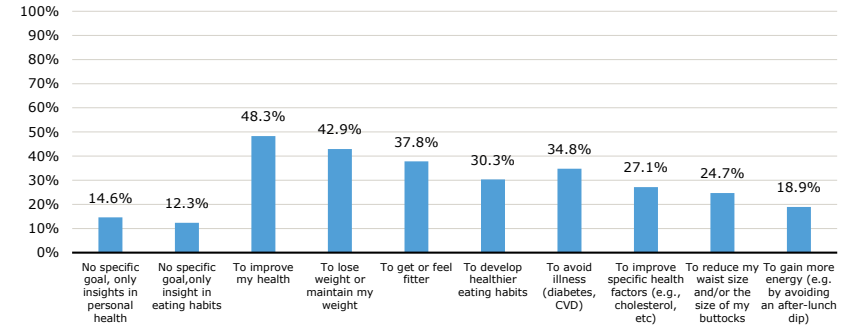


# Detailed results of part I questionnaire

# Main goals of personalised nutrition advice (1)

- Top 3 of most mentioned goals of personal nutrition advice:
  - To improve health
  - To lose weight or maintain weight
  - To get or feel fitter
  
- The goal of 'improving health' is assessed as more important in the UK than in the Netherlands.

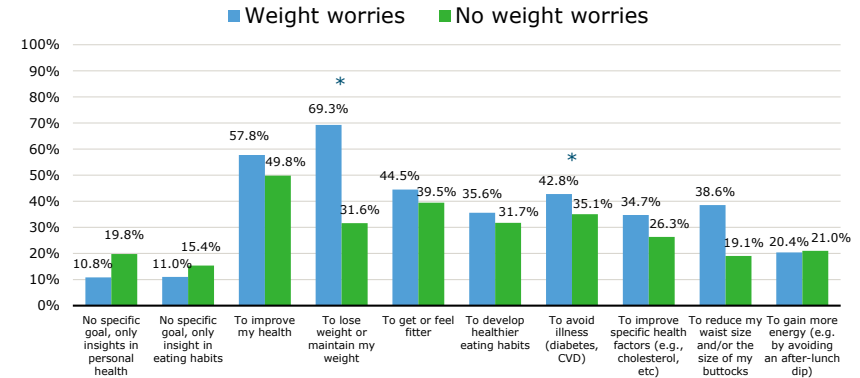
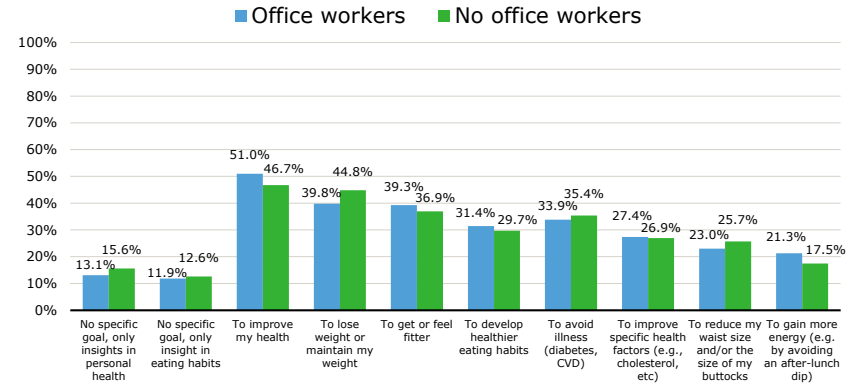
Personalised nutrition goals



\* Indicates a significant difference

# Main goals of personalised nutrition advice (2)

- No significant differences between **Office workers** and **Non-office workers**.
- **Weight worriers** significantly more often indicate that the following goals of personal nutrition advice are important:
  - To lose weight or maintain weight
  - To avoid illness



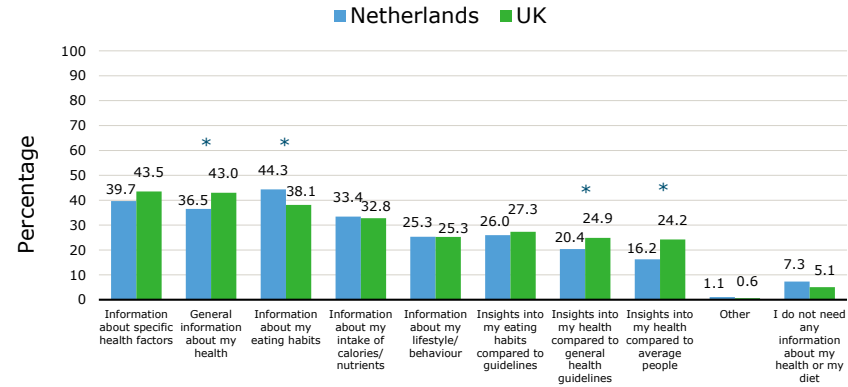
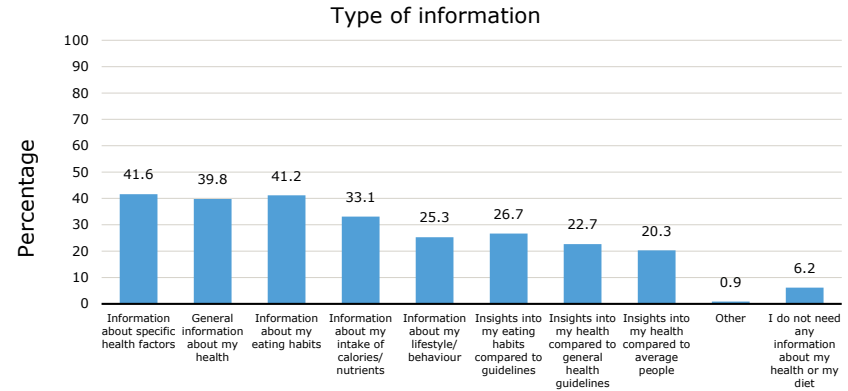
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# Main goals of personalised nutrition advice (3)

- Age
  - People older than 50 years are relatively more interested in losing or maintaining weight, avoiding illness (diabetes, CVD), improving specific health factors (e.g., cholesterol, etc)
  - People aged 25 to 34 are relatively more interested in improving their health, getting or feeling fitter, gaining more energy (e.g. by avoiding an after-lunch dip)
  - Youngest group (<25 years) is relatively more interested in developing healthier eating habits
- Education
  - Lower educated people are more often interested in avoiding illness (diabetes, CVD)
  - Medium and higher educated people more interested in: To improve my health
- Subjective health
  - People with 'poorer' subjective health are more often interested in losing weight or maintaining weight and improving their health
  - People with 'better' subjective health more often interested in avoiding illness (diabetes, CVD)

# Preferences for type of information (1)

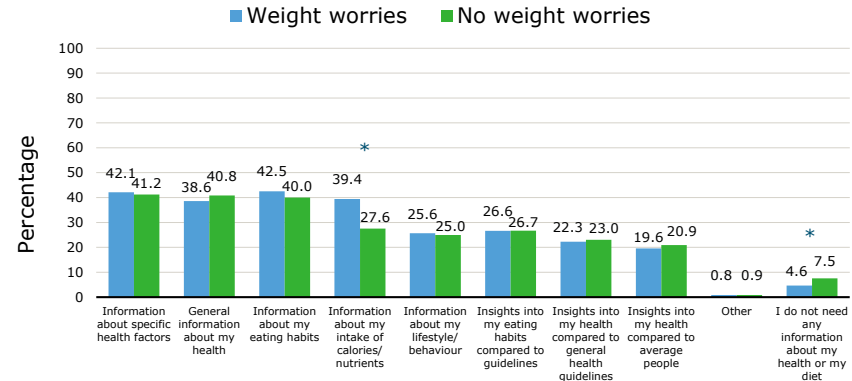
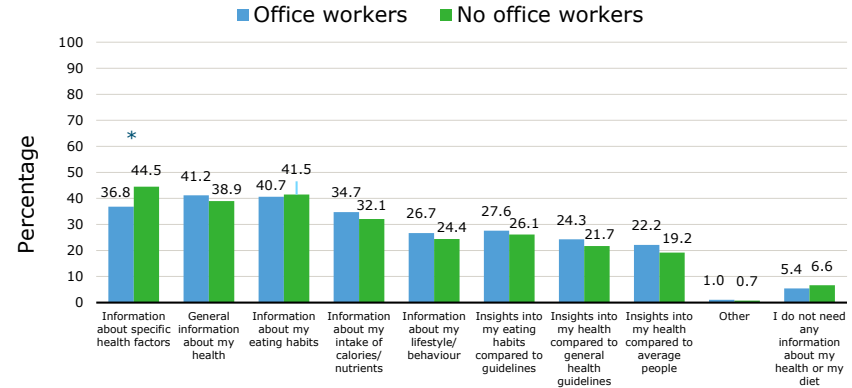
- The following type of information is generally preferred:
  - Information about specific health factors
  - General information about my health
  - Information about my eating habits
  
- Respondents in the UK show significantly stronger preference for:
  - General information about my health
  - Insights into my health compared to the general health guidelines
  - Insights into my health compared to average people
  
- Respondents in the Netherlands more often prefer 'Information about my eating habits'.



\* Indicates a significant difference

# Preferences for type of information (2)

- **Non-office workers** significantly more often prefer 'Information about specific health factors'.
- **Weight worriers** significantly more often prefer 'Information about my intake of calories/nutrients'.
- **Non-weight worriers** indicate more often that they don't need any information about their health or diet.



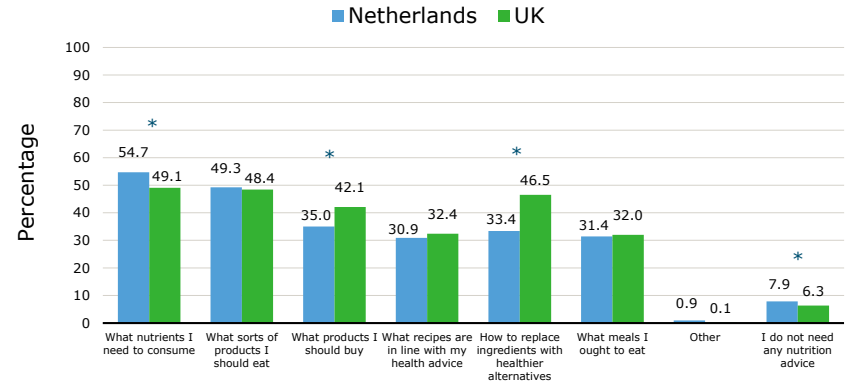
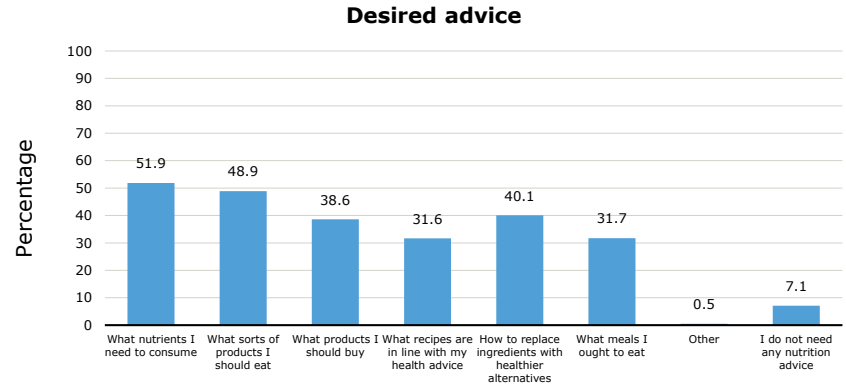
\* Indicates a significant difference

# Preferences for type of information (3)

- Age
  - Older people are more interested in 'Information about specific health factors like cholesterol, blood values, etc'
  - People between 35-49 years are more interested in 'Information about my intake of calories/nutrients'
  - Younger people (< 35 years) are more interested in 'Information about my lifestyle/behaviour' and 'Insights into my health compared to average people'
- Education
  - Higher educated more often interested in 'Information about my eating habits', 'Information about my lifestyle/behaviour', 'Insights into my eating habits' compared to guidelines
  - Low and medium educated more often do not need any information about their health or diet
- Digital capabilities (eHealth literacy)
  - People with higher eHealth literacy more often interested in 'Insights into my health' compared to average people
  - People with lower eHealth literacy more often do not need any information about their health or diet
- Healthy eating intention
  - Higher healthy eating intention: Information about my intake of calories/nutrients

# Preferences for type of advice (1)

- The following type of advice is generally preferred:
  - What nutrients I need to consume
  - What sorts of products I should eat
  - How to replace ingredients with healthier alternatives
  
- Respondents in the UK show significantly stronger preference for:
  - What products I should buy
  - How to replace ingredients with healthier alternatives
  
- Respondents in the Netherlands more often prefer 'What nutrients I need to consume', but also more often indicate that they don't need any nutrition advice.

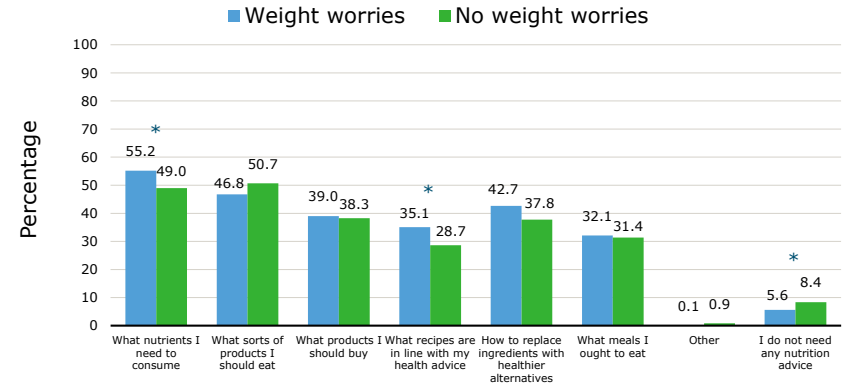
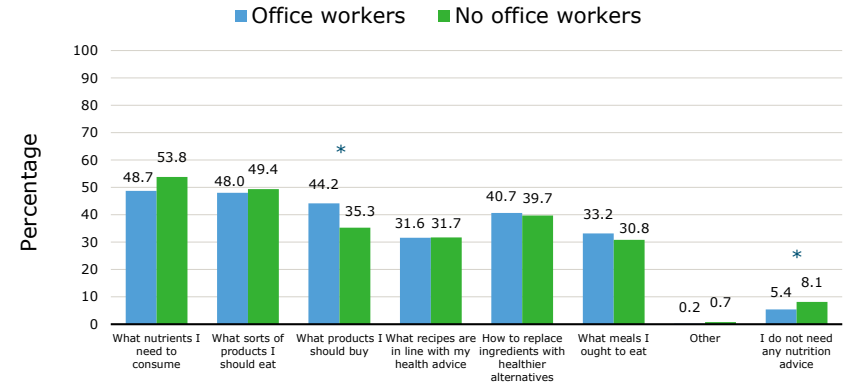


\* Indicates a significant difference



# Preferences for type of advice (2)

- **Office workers** significantly more often prefer 'What products I should buy'.
- **Non-office workers** indicate more often that they don't need any nutrition advice.
- **Weight worriers** significantly more often prefer:
  - What nutrients I need to consume
  - What recipes are in line with my health advice
- **Non-weight worriers** indicate more often that they don't need any nutrition advice.



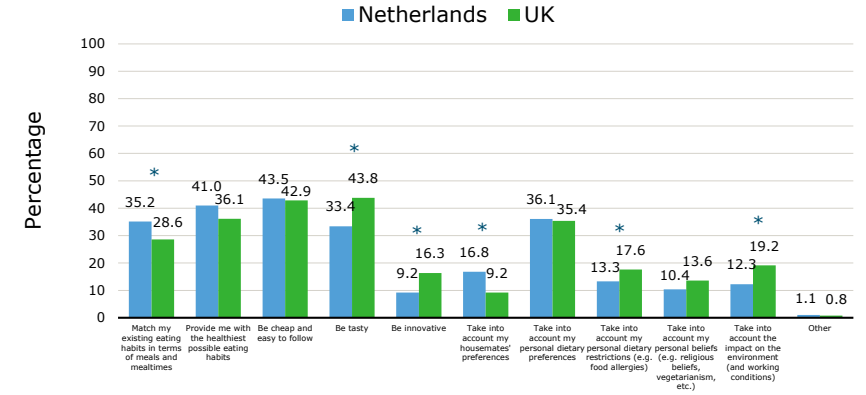
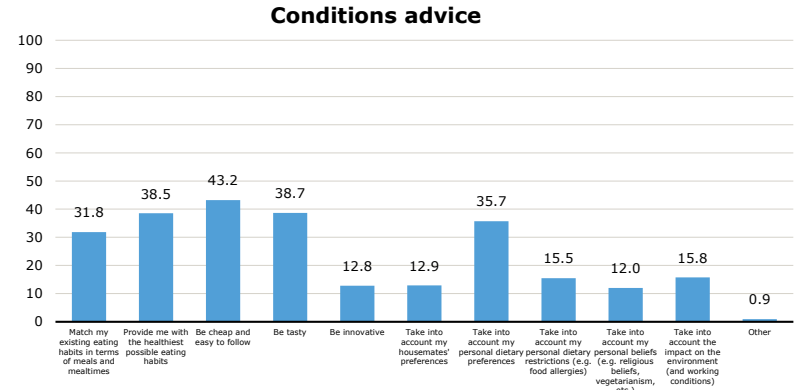
\* Indicates a significant difference

# Preferences for type of advice (3)

- Age
  - People between 50-64 years are more interested in 'What sorts of products I should eat more/less often (e.g., vegetables, fatty fish, etc)'
  - People between 25-34 years are more interested in 'What products I should buy compared to what I normally buy'
  - People between 18-24 years are more interested (and > 64 jaar less interested) in: 'Tips on how to replace ingredients with healthier alternatives'
- Education
  - Higher educated more often: 'What nutrients I need to consume more/less often (e.g., more/less fruit, proteins, etc)', 'What products I should buy compared to what I normally buy', 'Tips on how to replace ingredients with healthier alternatives'
  - Lower and medium educated more often don't need any nutrition advice
- Digital capabilities (eHealth literacy)
  - Higher eHealth literacy more often: 'What nutrients I need to consume more/less often (e.g., more/less fruit, proteins, etc)'
  - Lower eHealth literacy more often don't need any nutrition advice
- Healthy eating intention
  - Higher healthy eating intention: 'What nutrients I need to consume more/less often (e.g., more/less fruit, proteins, etc)'; 'What recipes are in line with my health advice'
  - Lower healthy eating intention more often don't need any nutrition advice

# Most important conditions for advice (1)

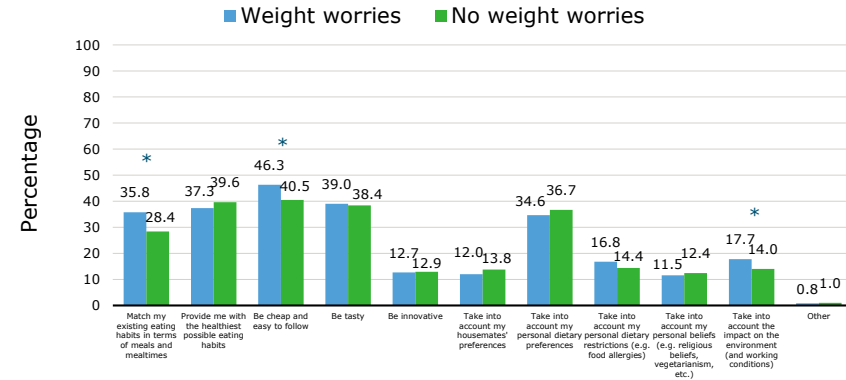
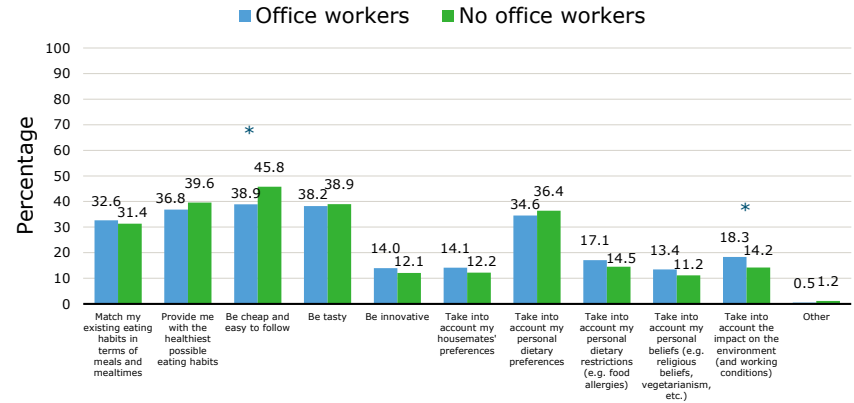
- The most important conditions for PNH advice are:
  - The advice should be cheap and easy to follow
  - The advice should be tasty
  - The advice provides me with the healthiest possible eating habits
  
- Respondents in the UK attribute greater importance to:
  - The advice should be tasty
  - The advice should be innovative
  - The advice should take into account my personal dietary restrictions (e.g. allergies)
  - The advice should take into account the impact on the environment
  
- Respondents in the Netherlands more often indicate:
  - The advices should match my existing eating habits (i.e., meals/meal times)
  - The advices should take into account my housemates' preferences



\* Indicates a significant difference

# Most important conditions for advice (2)

- **Office workers** significantly show higher importance to 'the advice should take into account the impact on the environment'.
- **Non-office workers** attribute greater importance to 'the advice should be cheap and easy to follow'.
- **Weight worriers** significantly more often indicate:
  - The advice should match my existing eating habits (i.e., meals/meal times)
  - The advice should be cheap and easy to follow
  - The advice should take into the environmental impact into account



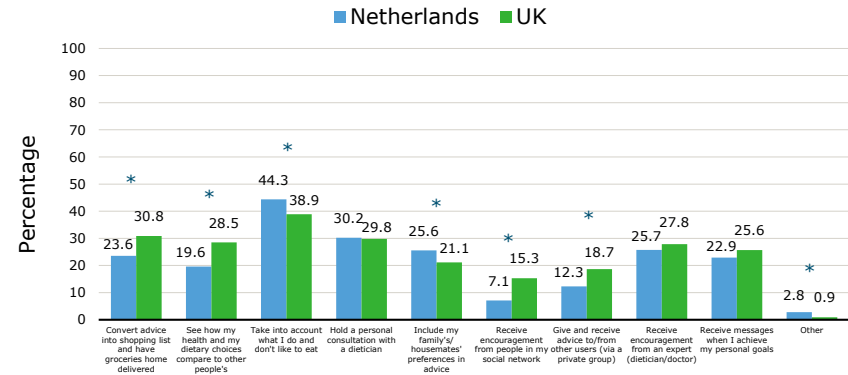
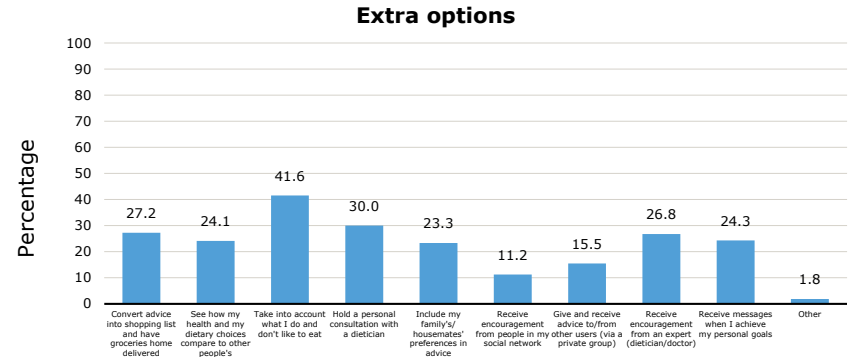
\* Indicates a significant difference

# Most important conditions for advice (3)

- Age
  - For people >50 years: 'That the advices match my existing eating habits in terms of meals and mealtimes'; 'That the advices provide me with the healthiest possible eating habits'; 'That the advices take into account my personal dietary preferences (things I like , etc)'
  - For people <50 years: 'That the advices are innovative'; 'That the advices take into account my personal beliefs (e.g. religious beliefs, vegetarianism, etc.)'; 'That the advices take into account the impact on the environment (and working conditions)'
- Education
  - For higher educated people: 'That the advices provide me with the healthiest possible eating habits'; 'That the advices take into account my personal dietary preferences (things I like , etc)'
  - For medium educated people: 'That the advices are tasty'
- Digital capabilities (eHealth literacy)
  - For higher eHealth literacy : 'That the advices are innovative'; 'That the advices take into account my personal beliefs (e.g. religious beliefs, vegetarianism, etc.)'; 'That the advices take into account the impact on the environment (and working conditions)'
  - For lower eHealth literacy: 'That the advices are tasty'
- Subjective health
  - For poorer subjective health: 'That the advices match my existing eating habits in terms of meals and mealtimes'; 'That the advices are cheap and easy to follow'; 'That the advices are tasty'
  - For better subjective health: 'That the advices take into account my housemates' preferences'; 'That the advices take into account my personal beliefs (e.g. religious beliefs, vegetarianism, etc.)'; 'That the advices take into account the impact on the environment (and working conditions)'
- Healthy eating intention
  - For higher healthy eating intentions: 'That the advices provide me with the healthiest possible eating habits'; 'That the advices take into account the impact on the environment (and working conditions)'

# Preferences for extra options (1)

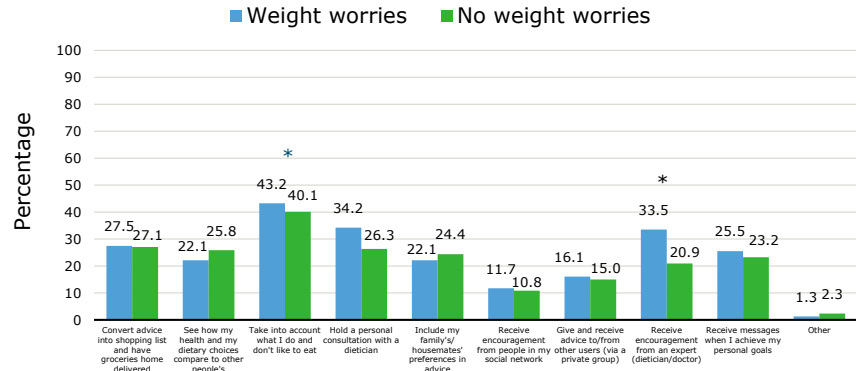
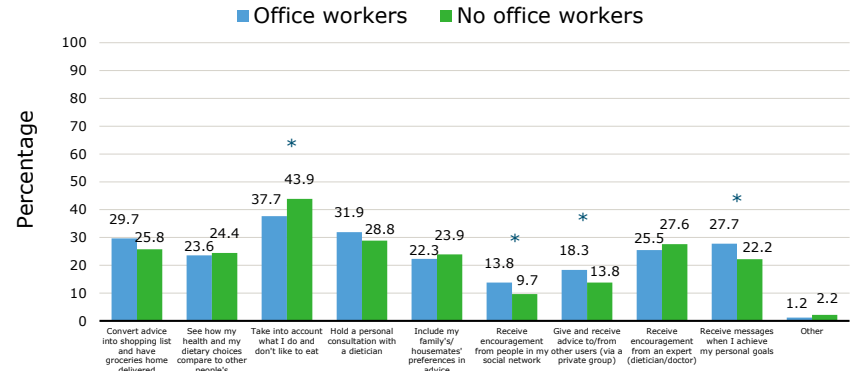
- The following extra options are generally preferred:
  - Advice that takes into account what I do and don't like to eat
  - Option to have a personal consultation with a dietician
  
- Respondents in the UK show significantly stronger preference for:
  - Convert advice into shopping list and have groceries home delivered
  - See how my health and dietary choices compare to other people's
  - Receive encouragement from people in my social network
  - Give and receive advice to/from other users
  
- Respondents in the Netherlands more often prefer:
  - Take into account what I do and don't like to eat
  - Include my family's/housemates preferences in advice
  - Other



\* Indicates a significant difference

# Preferences for extra options (2)

- **Office workers** significantly more often prefer:
  - Receive encouragement from people in my social network
  - Give and receive advice to/from other users
  - Receive messages when I achieve my personal goals
  
- **Non-office workers** prefer more often advice that 'takes into account what I do and don't like to eat'.
  
- **Weight worriers** significantly more often prefer:
  - Option to have a personal consultation with a dietician
  - Receive encouragement from an expert (dietician/doctor)



\* Indicates a significant difference

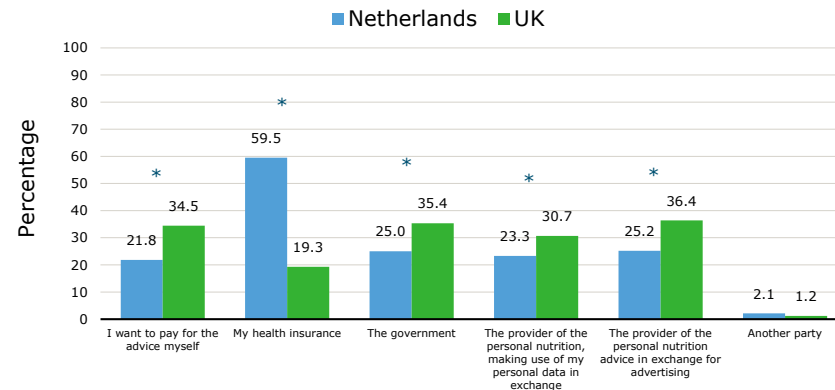
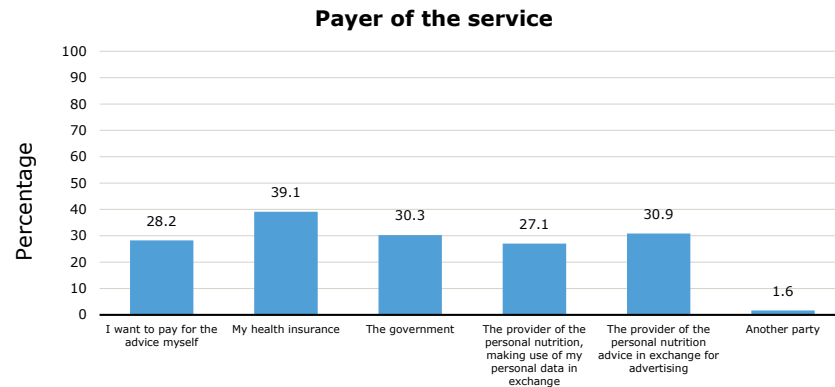
# Preferences for extra options (3)

- Age
  - People >50 years more often prefer: 'Option that advice takes into account what I do and don't like to eat'
  - People <50 years (especially 35-49 years) more often prefer: 'Option to convert advice into shopping list and have groceries home delivered'
  - People <50 years (especially people <35 years) more often preference for: 'Option to receive encouragement from people in my social network (via likes/kudos)' and 'Option to give and receive advice to/from other users (via a private group)'
  - People 25-34 years more often prefer: 'Option to receive messages when I achieve my personal goals'
- Education
  - Higher educated more often prefer: 'Option to hold a personal consultation with a dietician'
- Digital capabilities (eHealth literacy)
  - Higher eHealth literacy more often prefer: 'Option to give and receive advice to/from other users (via a private group)'
- Subjective health
  - Poorer subjective health more often prefer: 'Option that advice takes into account what I do and don't like to eat' and 'Option to receive messages when I achieve my personal goals'
  - Better subjective health more often prefer: 'Option to include my family's/housemates' preferences in advice' and 'Option to give and receive advice to/from other users (via a private group)'
- Healthy eating intention
  - Higher healthy eating intention more often prefer: 'Option to receive encouragement from an expert (dietician/doctor)'



# Who should pay for the service? (1)

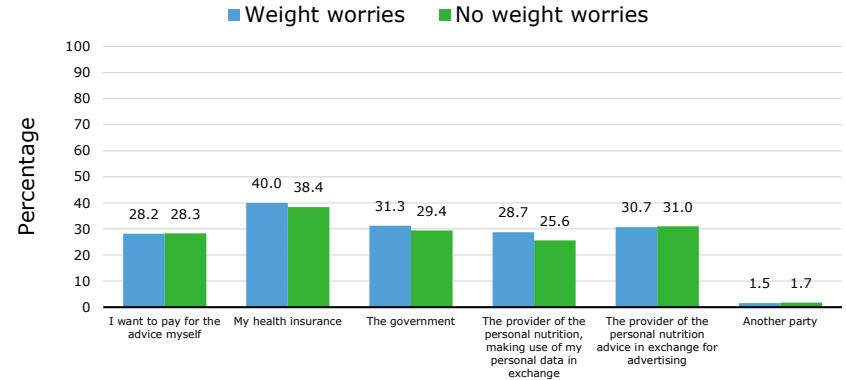
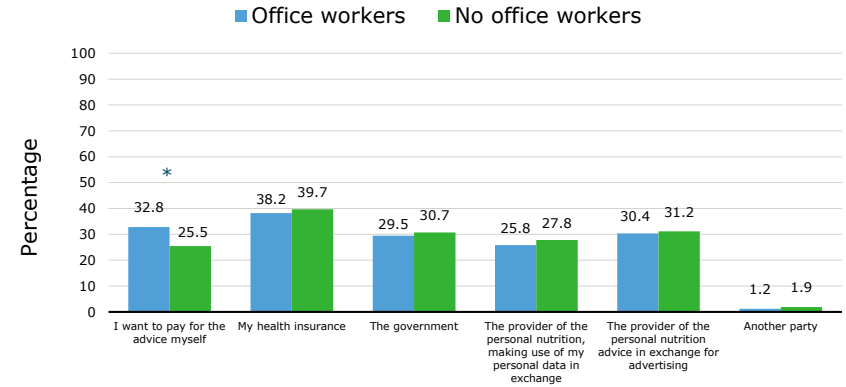
- The most preferred actor that should pay the use of PNH services is the health insurance company.
- BUT, there are important differences between the Netherlands and the UK:
  - In the Netherlands a majority of almost 60% indicates that the health insurance should pay the use of PNH services.
  - In the UK other actors are preferred, including the government or the provider of the PNH service in exchange for advertising.
  - Respondents in the UK also significantly more often want to pay for the PN advices themselves.



\* Indicates a significant difference

# Who should pay for the service? (2)

- Office workers significantly more often want to pay for the PN advice themselves.
- No significant different between **Weight worriers** and **Non-weight worriers**.



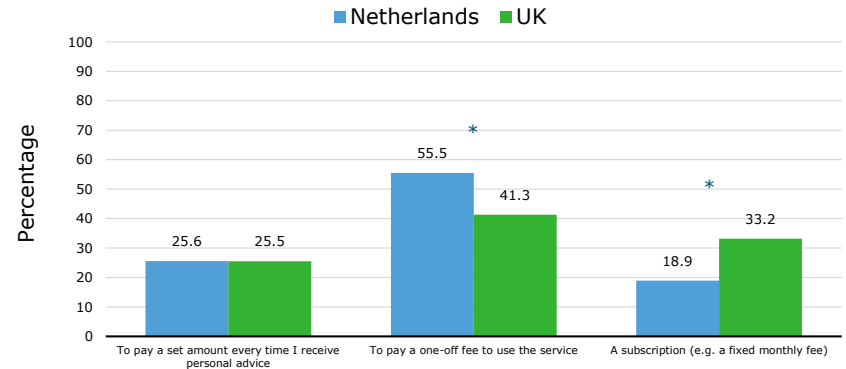
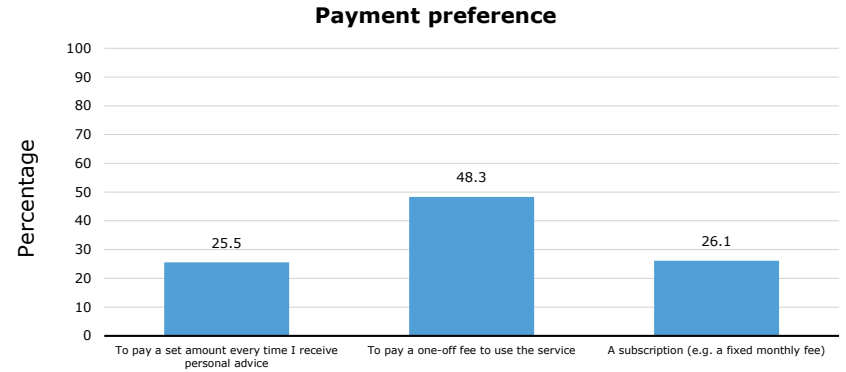
\* Indicates a significant difference

# Who should pay for the service? (3)

- Age
  - People 35-49 years more often indicate that they want to pay for the advice themselves
  - People 50-64 years less often indicate that the provider of the personal nutrition advice should for the advice, making use of my personal data in exchange.
- Education
  - Higher educated people more often indicate that they want to pay for the advice themselves.
- Healthy eating intention
  - Higher healthy eating intention more often indicate that the health insurance company should pay for the advice.

# Payment preferences (1)

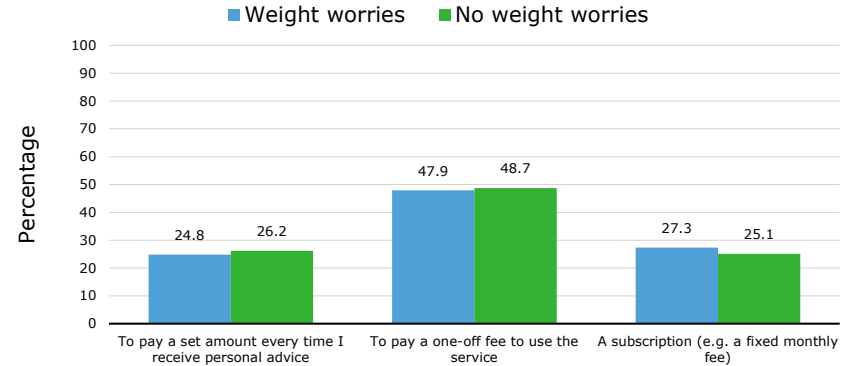
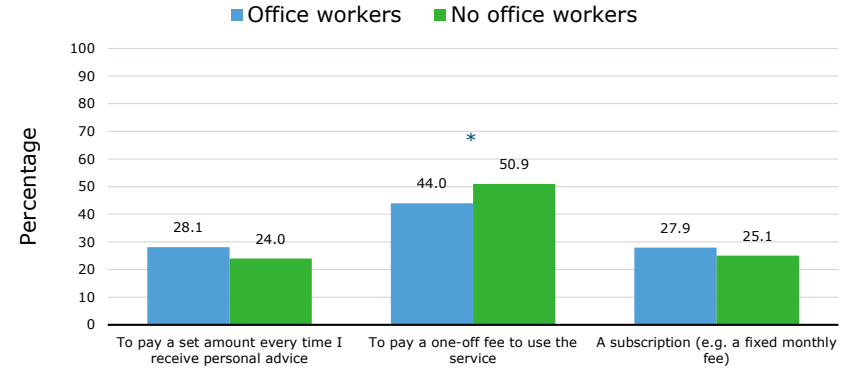
- Most often preferred payment option is to pay a one-off fee to use the service.
- Respondents in the Netherlands significantly more often prefer this payment option.
- Respondents in the UK significantly more often prefer a subscription (e.g., a fixed monthly fee).



\* Indicates a significant difference

# Payment preferences (2)

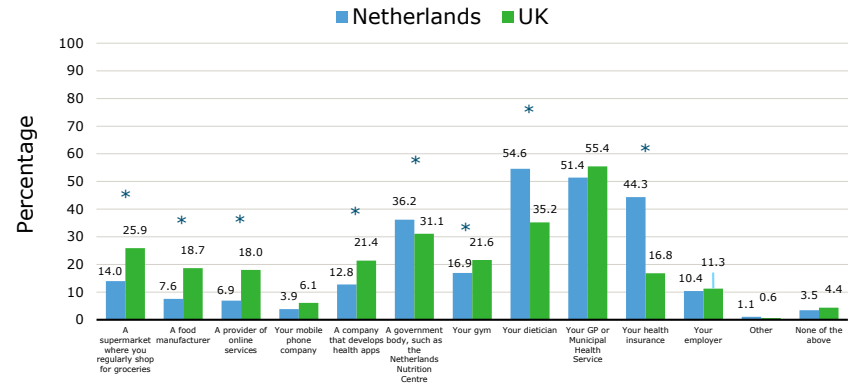
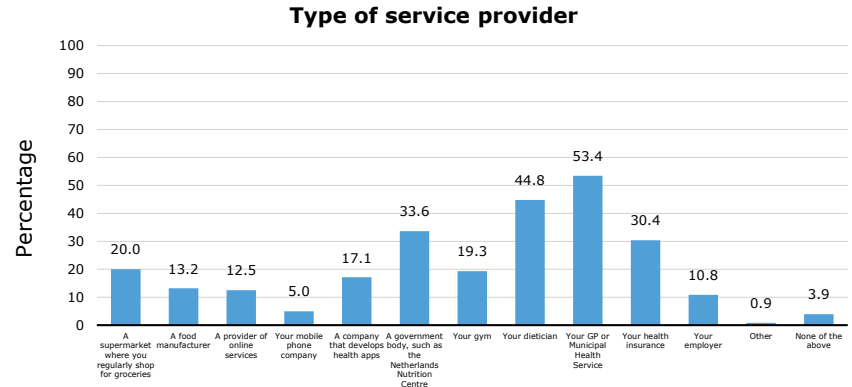
- **Non-office workers** significantly more often want to pay a one-off fee to use the service as compared to **Office workers**.
- No significant differences between **Weight worriers** and **Non-weight worriers**.



\* Indicates a significant difference

# Preferences for type of service provider (1)

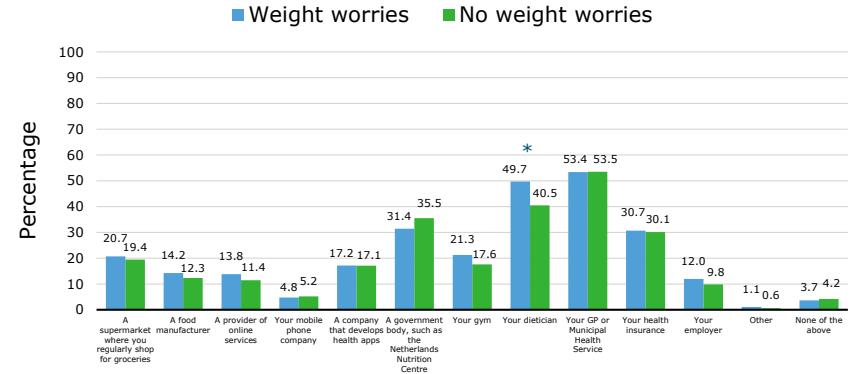
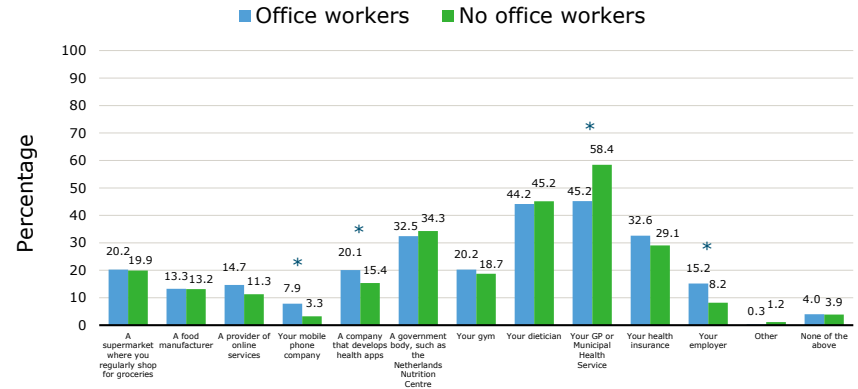
- Clearly the most preferred type of service providers are:
  - The GP or the Municipal Health Service
  - The dietician
  - To a lesser extent: a government body (e.g., Netherlands Nutrition Centre) or health insurance
  
- Respondents in the UK show greater preference for:
  - A supermarket or food manufacturer
  - Provider of online services or providers of health apps
  - The gym
  
- Respondents in the Netherlands more often indicate:
  - A government body
  - Dietician
  - Health insurance company; again, big difference with UK consumers



\* Indicates a significant difference

# Preferences for type of service provider (2)

- Office workers** significantly show higher preference for:
  - Mobile phone company
  - Provider of health apps
  - The employer
- Non-office workers** significantly stronger prefer the GP or Municipal Health Service.
- Weight worriers** significantly more often prefer the dietician.



\* Indicates a significant difference

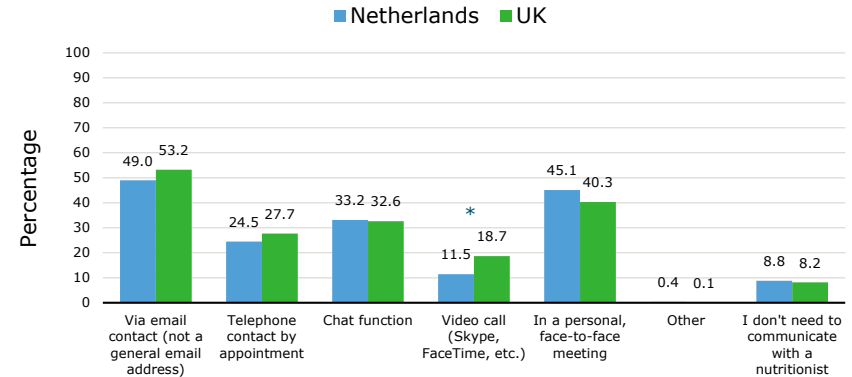
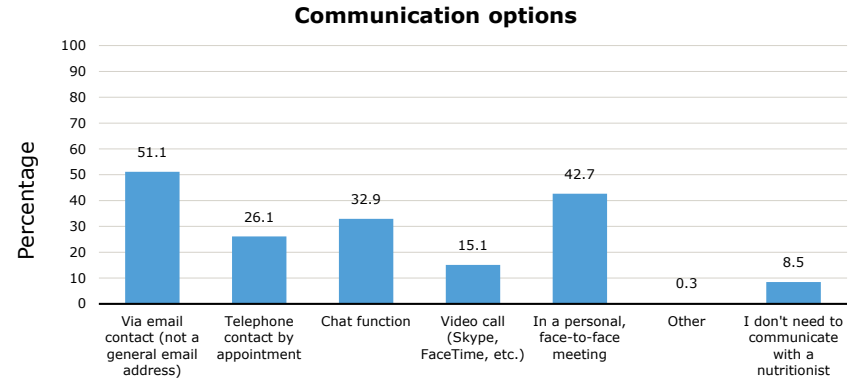
# Preferences for type of service provider (3)

- Age
  - People <35 years more often indicate: The gym
  - People <50 years more often indicate: A provider of online services
  - People 25-49 years more often indicate: A company that develops health apps, Mobile phone company, The employer
  - People 35-64 years more often indicate: Health insurance company
  - People >50 years more often indicate: GP or Municipal health service
  - People >64 years more often indicate: A government body, such as the Netherlands Nutrition Centre
- Education
  - Higher educated people more often indicate: : A company that develops health apps, A government body, such as the Netherlands Nutrition Centre, The employer
- Digital capabilities (eHealth literacy)
  - Higher eHealth literacy more often indicates: Mobile phone company, The gym, The dietician
  - Lower eHealth literacy more often indicates: 'None of these'
- Subjective health
  - Better subjective health more often indicates: Mobile phone company, The gym, The dietician
  - Poorer subjective health more often indicates: GP or Municipal health service
- Healthy eating intention
  - Higher healthy eating intention more often indicates: A government body, such as the Netherlands Nutrition Centre, The dietician
  - Lower healthy eating intention more often indicates: The employer



# Preferred communication with nutritionist (1)

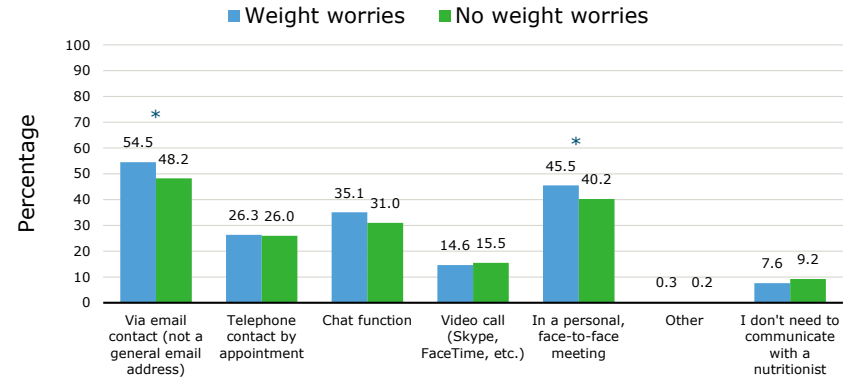
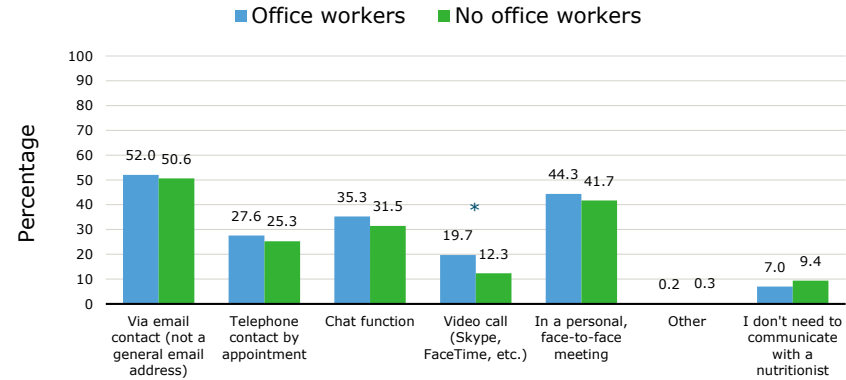
- Generally, communication via email contact is preferred as well as in a personal, face-to-face meeting.
- To a lesser extent chat or telephone contact is also applicable.
- Respondents in the UK show a significant stronger preference for video call as compared to respondents in the Netherlands.



\* Indicates a significant difference

# Preferred communication with nutritionist (2)

- **Office workers** significantly show a stronger preference for video call.
- **Weight worriers** significantly more often indicate that they prefer contact via email or in a face-to-face meeting.



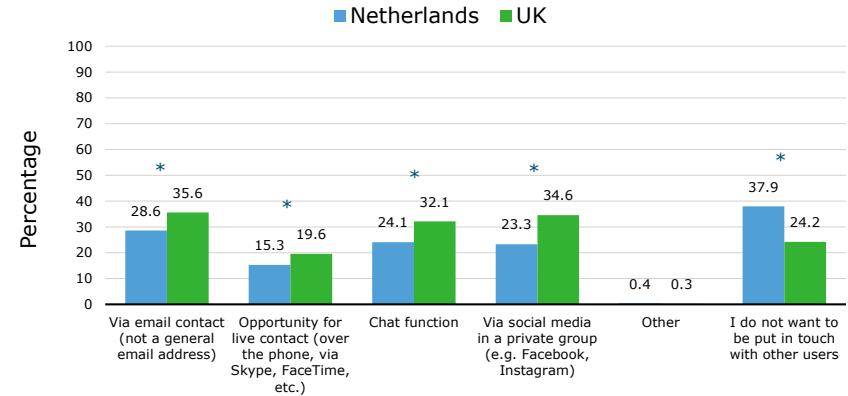
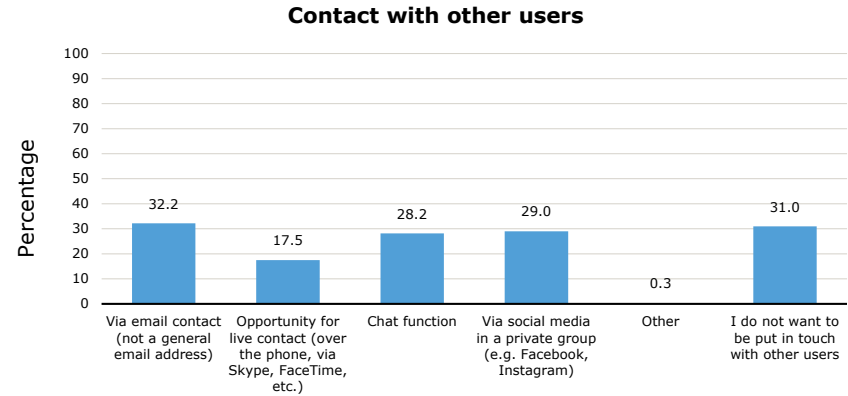
\* Indicates a significant difference

# Preferred communication with nutritionist (3)

- Age
  - People >34 years (slightly) more often prefer: Email-contact
  - People <50 years more often prefer: Chat function; Video call (skype, face-time)
  - People 25-34 years more often prefer: Personal face-to-face meeting!
- Education
  - Higher educated people more often prefer: Email contact; Telephone contact by appointment; Video call (skype, face-time)
  - Lower educated people more often indicate that they don't need to communicate with a nutritionist
- Digital capabilities (eHealth literacy)
  - Higher eHealth literacy more often prefer: Email contact; Telephone contact by appointment, Chat function
  - Lower eHealth literacy more often indicate that they don't need to communicate with a nutritionist
- Subjective health
  - Better subjective health more often prefer : Telephone contact by appointment
  - Poorer subjective health more often prefer: Chat function
- Healthy eating intention
  - Higher healthy eating intention more often prefer: Email contact; Telephone contact by appointment
  - Lower healthy eating intention more often indicate that they don't need to communicate with a nutritionist

# Preferred communication with other users (1)

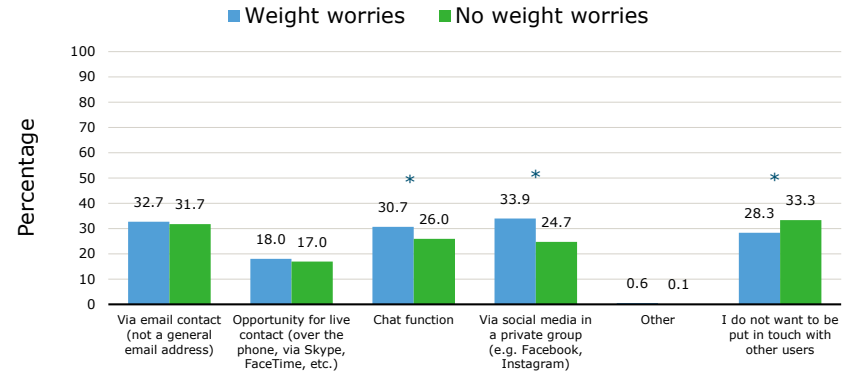
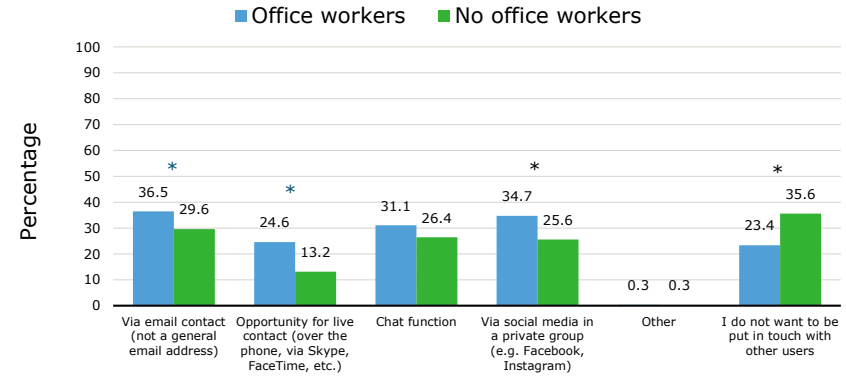
- Respondents do not very much differentiate between different communication options with other users
  - Contact via email, chat function or social media almost equally preferred
  - Opportunity for live contact (phone, Skype) less preferred
- Almost 1/3 of the respondents did not want to be put in touch with other users.
- Respondents in the Netherlands more often do not want to have contact with other users.
- Respondents in the UK more often indicate to want contact via the mentioned communication channels.



\* Indicates a significant difference

# Preferred communication with other users (2)

- **Office workers** more often indicate to want contact via the mentioned communication channels than **Non-office workers**.
- **Non-office workers** more often do not want to have contact with other users.
- **Weight worriers** significantly more often indicate to want contact with other users via chat function or social media.
- **Non-weight worriers** more often do not want to have contact with other users.



\* Indicates a significant difference

# Preferred communication with other users (3)

- Age
  - People <35 years more often prefer: Opportunity for live contact (over the phone, via Skype, FaceTime, etc.); Contact via chat function; Contact via social media in a private group (e.g. Facebook, Instagram) (the latter also applies for people 35-49 years)
  - People >50 years more often indicate that they don't want to be put in touch with other users
- Education
  - Higher educated people more often prefer: Opportunity for live contact (over the phone, via Skype, FaceTime, etc.); Contact via social media in a private group (e.g. Facebook, Instagram)
- Digital capabilities (eHealth literacy)
  - Higher eHealth literacy more often prefer: Opportunity for live contact (over the phone, via Skype, FaceTime, etc.); Contact via social media in a private group (e.g. Facebook, Instagram)
  - Lower eHealth literacy more often indicate that they don't want to be put in touch with other users
- Subjective health
  - Better subjective health more often prefer: Email contact; Opportunity for live contact (over the phone, via Skype, FaceTime, etc.)
- Healthy eating intention
  - Higher healthy eating intention more often prefer: Contact via social media in a private group (e.g. Facebook, Instagram)

# Detailed results choice experiment (part II of questionnaire)

# Results choice experiment overall

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Price_free	3.519	0.114	958.060	1	0.000	33.764	27.019	42.192
Price_15 euro	1.833	0.067	748.075	1	0.000	6.251	5.482	7.129
Source_supermarket	-0.606	0.038	248.743	1	0.000	0.546	0.506	0.588
Source_insurance	0.180	0.056	10.435	1	0.001	1.197	1.073	1.334
Easy&quick	-0.011	0.036	0.087	1	0.768	0.990	0.923	1.061
Easy&slow	0.116	0.036	10.555	1	0.001	1.123	1.047	1.204
Privacy_high	0.655	0.055	141.514	1	0.000	1.925	1.728	2.145

*Price and easy&quick are cofounded with extra services. Therefore extra services is excluded from the analyses though the results of price and easy&quick should be interpreted with care.*



# Results choice experiment: differences across countries

## The Netherlands

95% C.I. for EXP(B)

	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Price_free	4.181	0.176	565.800	1	0.000	65.412	46.350	92.313
Price_15 euro	1.977	0.100	388.178	1	0.000	7.221	5.932	8.791
Source_supermarket	-0.871	0.057	231.480	1	0.000	0.419	0.374	0.468
Source_insurance	0.874	0.092	90.498	1	0.000	2.397	2.002	2.870
Easy&quick	0.069	0.052	1.786	1	0.181	1.071	0.968	1.185
Easy&slow	0.086	0.052	2.788	1	0.095	1.090	0.985	1.207
Privacy_high	1.254	0.091	189.726	1	0.000	3.504	2.931	4.188

## Uk

95% C.I. for EXP(B)

	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Price_free	3.108	0.156	399.123	1	0.000	22.370	16.492	30.345
Price_15 euro	1.747	0.092	361.892	1	0.000	5.736	4.791	6.867
Source_supermarket	-0.404	0.053	57.797	1	0.000	0.668	0.602	0.741
Source_insurance	-0.318	0.075	17.976	1	0.000	0.728	0.629	0.843
Easy&quick	-0.065	0.050	1.683	1	0.195	0.937	0.849	1.034
Easy&slow	0.129	0.050	6.621	1	0.010	1.137	1.031	1.255
Privacy_high	0.258	0.074	12.008	1	0.001	1.294	1.119	1.498

*Price and easy&quick are cofounded with extra services. Therefore extra services is excluded from the analyses though the results of price and easy&quick should be interpreted with care.*

# Results choice experiment: differences across office workers

## Office workers

95% C.I. for EXP(B)

	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Price_free	2.382	0.317	56.528	1	0.000	10.830	5.820	20.153
Price_15 euro	1.399	0.182	59.375	1	0.000	4.049	2.837	5.779
Source_supermarket	-0.573	0.115	24.763	1	0.000	0.564	0.450	0.707
Source_insurance	-0.496	0.161	9.499	1	0.002	0.609	0.444	0.835
Easy&quick	-0.097	0.110	0.791	1	0.374	0.907	0.732	1.124
Easy&slow	0.203	0.108	3.535	1	0.060	1.225	0.991	1.513
Privacy_high	0.102	0.159	0.410	1	0.522	1.107	0.811	1.511

## Non-office workers

95% C.I. for EXP(B)

	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Price_free	3.900	0.318	150.701	1	0.000	49.400	26.504	92.075
Price_15 euro	2.199	0.195	126.723	1	0.000	9.017	6.148	13.223
Source_supermarket	-0.297	0.101	8.580	1	0.003	0.743	0.609	0.906
Source_insurance	-0.291	0.143	4.160	1	0.041	0.748	0.565	0.989
Easy&quick	-0.120	0.094	1.634	1	0.201	0.887	0.738	1.066
Easy&slow	0.085	0.095	0.798	1	0.372	1.089	0.903	1.313
Privacy_high	0.326	0.142	5.227	1	0.022	1.385	1.048	1.831

*Price and easy&quick are cofounded with extra services. Therefore extra services is excluded from the analyses though the results of price and easy&quick should be interpreted with care.*

# Results choice experiment: differences across weight worriers

## Weight worriers

	B	S.E.	Wald	df	Sig.	95% C.I. for EXP(B)		
						Exp(B)	Lower	Upper
Price_free	3.496	0.168	434.106	1	0.000	32.983	23.739	45.827
Price_15 euro	1.873	0.099	355.127	1	0.000	6.506	5.355	7.905
Source_supermarket	-0.634	0.057	125.223	1	0.000	0.530	0.475	0.593
Source_insurance	0.092	0.082	1.286	1	0.257	1.097	0.935	1.287
Easy&quick	-0.065	0.053	1.535	1	0.215	0.937	0.845	1.039
Easy&slow	0.136	0.052	6.770	1	0.009	1.146	1.034	1.270
Privacy_high	0.592	0.081	53.803	1	0.000	1.807	1.543	2.116

## No weight worriers

	B	S.E.	Wald	df	Sig.	95% C.I. for EXP(B)		
						Exp(B)	Lower	Upper
Price_free	3.542	0.155	524.213	1	0.000	34.539	25.505	46.773
Price_15 euro	1.799	0.091	392.768	1	0.000	6.044	5.059	7.221
Source_supermarket	-0.582	0.052	123.998	1	0.000	0.559	0.504	0.619
Source_insurance	0.256	0.076	11.287	1	0.001	1.291	1.112	1.499
Easy&quick	0.037	0.049	0.580	1	0.446	1.038	0.943	1.141
Easy&slow	0.098	0.049	4.022	1	0.045	1.103	1.002	1.214
Privacy_high	0.711	0.075	88.915	1	0.000	2.037	1.757	2.362

*Price and easy&quick are cofounded with extra services. Therefore extra services is excluded from the analyses though the results of price and easy&quick should be interpreted with care.*

# Overall method

# Dedicated Project overview: funneling approach

1. Identification of relevant characteristics of personalised nutrition services: benefits and barriers ('longlist').
2. Selection of most relevant characteristics ('shortlist') linked with specific target groups (*based on session with project partners in June 2018*)
3. Assessing preferences for personalised nutrition services in a quantitative study among consumers (n=1523; Netherlands: n=751; UK: n=772)

*Insight in (1) preferences for different aspects of personalised nutrition services (multiple choice questions) and (2) trade offs between different characteristics of personalised nutrition services (choice experiment)*

# 1. Longlist of relevant personalised nutrition aspects

# Identification of relevant characteristics of personalised nutrition services

Based on the literature and the findings in the use cases of the project, the most important aspects that influence consumer acceptance and that should be taken into account when designing personalised nutrition services were identified.

# How has the longlist been compiled?

Based on:

1. Literature on consumer acceptance of Personalised Nutrition
  - What characteristics are perceived as benefits or barriers?
2. Outcomes of PPS PNH Consumer Survey 2017
3. Outcomes of PPS PNH Use Cases 2017
4. Individual interviews with the participating companies (1st quarter 2018)



PNH characteristic	Aspects
<b>Personal benefit</b>	<p>Focuses on:</p> <ul style="list-style-type: none"> <li>▪ Insight in health status</li> <li>▪ Insight in dietary pattern</li> <li>▪ Improving health</li> <li>▪ Weight loss (or weight gain)</li> <li>▪ Fitness</li> <li>▪ Health of family/future generations</li> <li>▪ Knowing what foods are best</li> <li>▪ Preventing a future illness or expression of hereditary illness</li> <li>▪ Improving sports performance</li> <li>▪ Improving body and/or skin</li> <li>▪ Improving quality of life</li> </ul>
<b>Level of customisation</b>	<p>Based on:</p> <ul style="list-style-type: none"> <li>▪ (Only) dietary intake</li> <li>▪ Phenotype (BMI, blood markers, etcetera)</li> <li>▪ DNA profile</li> <li>▪ Personal preferences or self-formulated goals</li> </ul>

PNH characteristic	Aspects
<b>PN advice extensions</b> (= features of PN services that can be provided in addition to dietary advice)	<ul style="list-style-type: none"> <li>▪ Exercise advice</li> <li>▪ Lifestyle advice</li> <li>▪ Exercise facilities</li> <li>▪ Shopping list</li> <li>▪ Accounting for personal food preferences</li> <li>▪ Receipts</li> <li>▪ Extra health check</li> </ul>
<b>Convenience (service)</b>	<ul style="list-style-type: none"> <li>▪ Being able to use the service at any time via an app or the internet</li> <li>▪ Use of service requires little effort</li> <li>▪ Easy to understand and adopt the service in your daily dietary routines.</li> </ul>
<b>Convenience (implementation of advice)</b>	<ul style="list-style-type: none"> <li>▪ Advice is convenient to implement (e.g., in terms of types of products, meals or preparations that are recommended)</li> </ul>
<b>Complexity</b>	<ul style="list-style-type: none"> <li>▪ Service is easy to use</li> <li>▪ Feedback and advice are easy to follow</li> </ul>
<b>Time frame of advice/Time frame of monitoring</b>	<ul style="list-style-type: none"> <li>▪ Focus on short-term benefits</li> <li>▪ Focus on long-term benefits</li> <li>▪ Frequency of feedback</li> </ul>

PNH characteristic	Aspects
<b>Status (Image)</b>	<ul style="list-style-type: none"> <li>▪ Popularity of image of personalised nutrition services (good – bad)</li> </ul>
<b>Preferences regarding personalised nutrition communication channels</b>	<ul style="list-style-type: none"> <li>▪ Email contact from a named person</li> <li>▪ Automated internet service</li> <li>▪ Telephone call</li> <li>▪ Video call (e.g., Skype)</li> <li>▪ Personal contact/face-to-face</li> <li>▪ Apps</li> </ul>
<b>Preferences regarding personalised nutrition service providers</b>	<ul style="list-style-type: none"> <li>▪ Family doctor/GP</li> <li>▪ Private health organisations</li> <li>▪ National Health services (e.g., GGD, Voedingscentrum, etc)</li> <li>▪ Dietician/Nutritionist</li> <li>▪ Universities/researchers</li> <li>▪ Personal trainers</li> <li>▪ Employers</li> <li>▪ Supermarkets</li> <li>▪ Food manufacturers</li> <li>▪ Online personalised nutrition companies</li> <li>▪ Commercial technology providers</li> </ul>

PNH characteristic	Aspects
<b>Other preferences regarding service provision</b>	<ul style="list-style-type: none"> <li>▪ Continuity of care</li> <li>▪ Advice and support to be delivered by the same professional</li> </ul>
<b>Location of advice</b>	<p>Where do you want to receive the advice?</p> <ul style="list-style-type: none"> <li>▪ Supermarket</li> <li>▪ Sports club</li> <li>▪ At work</li> <li>▪ Doctor/medical centre</li> <li>▪ Etcetera</li> </ul>
<b>Moment of advice</b>	<p>When to provide the advice?</p> <ul style="list-style-type: none"> <li>▪ Specific times of the day (e.g., at dinner times)</li> <li>▪ Specific moments/occasions:               <ul style="list-style-type: none"> <li>• Buying</li> <li>• Cooking</li> <li>• Eating outside home</li> </ul> </li> </ul>
<b>Peer-to-peer contact</b>	<ul style="list-style-type: none"> <li>▪ Family</li> <li>▪ Friends</li> <li>▪ Sports club</li> <li>▪ Colleagues</li> </ul>

PNH characteristic	Aspects
<b>Data collection, use and protection</b>	<p>The following concerns can be raised in relation to data collection, use and protection:</p> <ul style="list-style-type: none"> <li>▪ Privacy loss</li> <li>▪ Anonymity</li> <li>▪ Misuse/commercial exploitation of data</li> <li>▪ Personal data not treated confidentially/Data mishandling</li> <li>▪ Storage of personal data</li> <li>▪ Risk of hacking data</li> <li>▪ Unreliable postal service (for sending biological samples)</li> </ul>
<b>Price</b>	<ul style="list-style-type: none"> <li>▪ Fee required for PN services</li> <li>▪ Expensiveness of implementing the PN advice (e.g., price of products you have to buy based on the PN advice)</li> </ul>
<b>Effort</b>	<ul style="list-style-type: none"> <li>▪ Amount of practical issues that are involved</li> <li>▪ Effort to provide the required data (e.g. DIY testing)</li> <li>▪ Effort/investment to get advice</li> <li>▪ Time span</li> </ul>

## 2. Shortlist of relevant personalised nutrition characteristics

# Selection of most relevant characteristics ('shortlist')

## Must haves

- Personal benefits (e.g., improving health)
- PNH service extensions (e.g., recipes, shopping list)
- Convenience and complexity of the service
- Price
- Effort
- Preferences regarding PNH communication channels
- Preferences regarding PNH service providers

## Nice to haves

- Frequency of feedback
- Possibility of peer-to-peer contact
- Data collection, use and protection
- Moment of advice



## Not haves

- Level of customization, for example based on: (only) dietary intake, phenotype (BMI, blood markers, etc), DNA profile
- Status (Image)
- Other preferences regarding service provision
- Location of advice

# Relevant target groups and countries

- We specifically focus on two target groups in the Netherlands and the United Kingdom:
  - **Weight worriers**  
Defined as those who show above average scores on the Weight Concerns Scale (WCS), which is an instrument commonly used to evaluate people's body weight concerns.
  - **Office workers**  
Defined as those who indicated to have an office job (i.e. a job where you mainly work at a desk).
- These target groups and countries were, based on discussions, selected because of their practical relevance for the partners involved in the research project.



# 3. Quantitative consumer study

# Method quantitative consumer study

- Online questionnaire for quantitative study among consumers in the Netherlands (n=751) and the United Kingdom (n=772).\*
- The questionnaire consisted of two parts:
  1. A series of multiple choice questions where respondents had to indicate their preferences for different aspects of PNH products and services
    - Multiple choice questions analysed with descriptive statistics (frequency analyses, different groups are compared with difference tests, i.e., Chi-square tests).
  2. Choice experiment in which different types of PNH products and services were tested: trade-offs between different characteristics of PNH services.
    - Choice experiment was analysed with logistic regressions.

\* These countries were selected because of the relevant markets of the partners involved in the research project.

# Questionnaire part I – Preferences PNH characteristics

The first part of the questionnaire consisted of in-depth questions regarding a number of PNH characteristics (which are listed in the shortlist as most relevant, 'must haves').

- Consumers are asked to rank or select which aspects they find most important or valuable.
- We want to obtain further insight into the important aspects of the following PNH characteristics:
  - What are the most important personal benefits?
  - What type of information is preferred?
  - What type of advice is preferred?
  - What aspects most related to the nutrition advice do consumers value?
  - What are most valued extra services?
  - Preferences regarding payment of the service and type of service provider
  - Preferences regarding communication channels

# Questionnaire part II – Choice experiment

- Respondents are offered a number of PNH concepts (i.e., choice sets, two at a time), where they have to indicate which concept they preferred.
  - 5 attributes consisting of 2-3 levels each
  - Orthogonal design that produces experimental choice sets
  
- Characteristics/attributes that were taken into account:
  - Price
  - Type of service provider
  - Convenience of the service (time/effort)
  - Extra services included
  - Privacy

# Questionnaire part II – Choice experiment

Example of a choice set (in Dutch):

	
<ul style="list-style-type: none"> <li>- <b>Gratis</b></li> <li>- Het advies wordt aangeboden door uw <b>supermarkt</b></li> <li>- Het kost ongeveer <b>1 uur</b> om uw eigen gegevens (over uw gezondheid en voedingsgewoonten) in te voeren en de gegevens vragen om <b>relatief intensieve handelingen</b> zoals bloed afnemen via een vingerprikje</li> <li>- Naast uw persoonlijke voedingsadvies ontvangt u ook een lijst met <b>producten die u direct online kunt bestellen en laten bezorgen</b></li> <li>- Voorwaarde voor het krijgen van het persoonlijke advies is dat u <b>toestemming geeft dat uw persoonsgegevens ook met andere partijen gedeeld worden</b>, die u dan mogelijk advertenties of aanbiedingen kunnen sturen</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Gratis</b></li> <li>- Het advies wordt aangeboden door een hierin <b>gespecialiseerd bedrijf</b></li> <li>- Het kost ongeveer <b>1 uur</b> om uw eigen gegevens (over uw gezondheid en voedingsgewoonten) in te voeren, maar de gegevens zijn <b>eenvoudig zelf te bepalen</b></li> <li>- Naast uw persoonlijke voedingsadvies ontvangt u ook een lijst met <b>producten die u direct online kunt bestellen en laten bezorgen</b></li> <li>- Voorwaarde voor het krijgen van het persoonlijke advies is dat u <b>toestemming geeft dat uw persoonsgegevens ook met andere partijen gedeeld worden</b>, die u dan mogelijk advertenties of aanbiedingen kunnen sturen</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>

# Questionnaire part III – Personal background characteristics

Questionnaire ends with asking about some personal characteristics that can be related to the outcomes of the evaluation of PNH characteristics:

- Subjective health
- Intention to start eating healthier
- Experience with using internet for food advice
- Health problems
- Weight worrying
- Demographics

# Qualification

- 61.1% of the respondents are qualified (n=1,523 out of a total sample of n=2,491)
  - 60.2% in the Netherlands and 62.1% in the UK
- Reasons for not qualifying:
  - 18.4% do not understand the concept of personalised nutrition (15.9% in the Netherlands; 20.8% in the UK).
  - 31.2% are not interested in receiving personalised nutrition advice (33.1% in the Netherlands and 29.3% in the UK).

# Sample characteristics

- The final study sample consists of 1,523 respondents:
- n=751 from the Netherlands
- n=772 from the UK

	% Netherlands	% UK	% Total
<b>Gender</b>			
Male	47.1	47.0	47.0
Female	52.9	53.0	53.0
<b>Age</b>			
18-24	8.3	12.2	10.2
25-34	18.0	19.9	19.0
35-49	30.8	31.6	31.2
50-64	32.9	26.8	29.8
65+	10.1	9.5	9.8
<b>Education level</b>			
Low	5.7	5.1	5.4
Medium	50.6	57.3	54.0
High	43.7	37.7	40.6
<b>Income (category)</b>			
Low	27.7	28.6	28.2
Medium	37.8	41.6	39.7
High	34.5	29.8	32.1
<b>Employment status</b>			
Zelfstandig ondernemer	6.4	10.8	8.6
Werkzaam in loondienst	52.1	50.0	51.0
Werkzaam bij overheid	5.5	5.4	5.4
Arbeidsongeschikt	8.8	3.2	6.0
Werkloos/werkzoekend/bijstand	3.9	5.3	4.6
Gepensioneerd, VUT	10.3	12.0	11.2
Studerend/schoolgaand	4.4	4.0	4.2
Huisvrouw/huisman	7.6	7.0	7.3
Anders	1.2	2.2	1.7
<b>Office worker</b>			
Yes	36.0	39.2	37.6
No	64.0	60.8	62.4



# Sample characteristics of target groups

## Profile of **Office workers** (n=573)

	% Office workers (n=573)	% Non-office workers (n=950)
<b>Gender</b>		
Male	54.8	42.3
Female	45.2	57.7
<b>Age</b>		
18-24	7.3	12.0
25-34	23.6	16.2
35-49	41.4	25.1
50-64	26.9	31.6
65+	0.9	15.2
<b>Education level</b>		
Low	1.6	7.7
Medium	42.4	60.9
High	56.0	31.4
<b>Income (category)</b>		
Low	16.2	35.4
Medium	37.5	41.1
High	46.2	23.6
<b>Weight worriers</b>		
Yes	45.9	47.1
No	54.1	52.9

## Profile of **Weight worriers** (n=710)

	% Weight worriers (n=710)	% Non-weight worriers (n=813)
<b>Gender</b>		
Male	36.0	56.7
Female	64.0	43.3
<b>Age</b>		
18-24	10.6	10.0
25-34	19.2	18.8
35-49	31.8	30.6
50-64	29.6	30.0
65+	8.9	10.6
<b>Education level</b>		
Low	5.6	5.2
Medium	54.2	53.8
High	40.1	41.1
<b>Income (category)</b>		
Low	30.3	26.3
Medium	39.7	39.7
High	30.0	33.9
<b>Office workers</b>		
Yes	37.0	38.1
No	63.0	61.9

# More information

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