PPP Project Annual Report 2018
The PPP-projects that have been established under the direction of the top sectors must submit an annual report on their technical and financial progress. This format is to be used for reporting the technical progress

General information	
PPP number	AF-15262
Title	*PPS Personalised Nutrition and Health*
Theme	**Consument & Maatschappij**
Executive knowledge institution(s)	TNO, Wageningen Food and Biobased Research (WFBR) and Wageningen Economic Research (WEcR)
Research project leader (name + e-mail address)	Marjan van Erk (marjan.vanerk@tno.nl)
Coordinator (on behalf of private parties)	Jettie Hoonhout (Philips)
Government contact person	Cor Wever/Sjaak Mesu
Total project size (k€)	6.054 kEUR
Address project website	https://www.personalisednutritionandhealth.com
Start date	1-7-2016
End date	31-12-2020

Approval coordinator/consortium The annual report should be discussed with the coordinator/the consortium. The TKIs appreciate being informed of possible feedback on the annual report.	
The coordinator has assessed the annual report on behalf of the consortium:	□ approved Ik heb deze rapportage nog niet kunnen afstemmen met Jettie Hoonhout, penvoerder vanuit Philips. □ rejected
Possible feedback on the annual report:	

Short content description/aim PPS
What is going on and how is this project involved?
What will be delivered by the project and what is the effect of this?

The societal and economic effects of unhealthy diet and lifestyle in the Western world are dramatic. Public health campaigns, most of them with a one-size-fits-all approach, have hardly been effective in mitigating the nutrition related non-communicable diseases and its consequences. A new consumer centered paradigm has emerged based on empowered consumers receiving tailored personal dietary advice that takes into account many different individual parameters, such as personal preference, motivational goals, habits, social environment, genotype, phenotype, and broad measures of personal health status.
This PPP program is a joint TNO/Wageningen Research initiative to develop innovative systems that enable consumers to make optimal food choices by providing personalized coaching based on smart and easy do-it-yourself measurements of health and behavior. The ultimate goal is to enhance the health and wellbeing of society by empowering consumers to choose and maintain an optimal personalized diet & lifestyle. The consortium has a unique approach in that it combines different scientific disciplines and involves a broad selection of private partners spanning the entire value chain of personalised nutrition and health.

Planning and progress (if there are changes to the project plan, please explain)	
Is the PPP going according to plan?	Yes
Have there been changes in the consortium/project partners?	Yes, Google has left the consortium (30-June-2018) and VitalinQ left; BASF (1-jan-2018), Albron (1-Mar-2018), OmeHealth (8-Mar-2018) and MaagLeverDarm Stichting (1-Jul-2018) joined the consortium.
Is there a delay and/or deferred delivery date?	No
Are there any substantive bottlenecks?	The termination of the partnership for Google and VitalinQ did not affect the activities. In October 2018, an update of the PPS PNH project plan was written focusing on the activities for 2019 and 2020 (2-year plan). This has provided additional focus for the activities until the end of 2020.
Are there any deviations from the projected budget?	Budget is monitored and adjusted yearly (as well as the project plans), as it depends on partners in-cash and in-kind contributions.

Results in 2018/ so far
Give a short description of the high-lights and (most important) project deliverable in 2018 / so far and their target group

In 2017, 3 use case pilot studies were performed: Use case A 'highly motivated consumers', Use case B 'low SES families' and Use case C 'employees@work'. In 2018, the results from these 3 pilot studies were analyzed and reported. The lessons learned from these use case pilot studies were the basis of the 6 so-called 'dedicated projects (DPs)' that we defined for 2018. These DPs focused on specific elements of the PNH circle (see figure 2) in smaller, dedicated pilots or tests. Partners of the PNH consortium were invited to actively contribute to these Dedicated Projects. The results of these DPs will feed into the 2 or 3 Living labs that are planned for the period 2019/2020 (see figure 1).
The dedicated projects of 2018 were the following:
DP1 – Content of Personalised Nutrition and Health (PNH) advice
DP2 – Format of PNH advice
DP3 - Connect PNH Advice to partner tools
DP4 - Food Intake Assessment Innovation
DP5 – Data-driven advice (feasibility project)
DP6 – Acceptance of PNH by consumers
The progress and results of the DPs are included below, in separate reports for these DPs (which can be also reached through the links in the list above).

Three other main activities of 2018 were:
Business labs:
WP6 (Business modelling) organized 2 business model sessions with the private partners of PPS PNH. This has resulted in 3 partner-driven projects called 'business labs', in which multiple partners further investigate personalized nutrition and health business ideas. The topics of these business labs are: 1) one-stop health station (@office); 2) personalised advice in office canteen; 3) snacking moments. The first 2 business labs will conduct a small pilot study in 2019; the

business lab focusing on snacking moments will not be continued after 2018.
Living lab Fiber: In 2018, phase-1 of living lab fiber has started. The partners in this project are MaagLeverDarm stichting (MLDS; also PNH partner), Sensus, Bolletje, Sonneveld and Kellogg (partners in this specific living lab). The aim of this project is to support people to increase their daily fiber intake by generating and providing personalized dietary advice. This field lab is divided in 2 phases; in phase 1 a randomized controlled trial will be conducted with healthy individuals; in 2018 the work focused on design and preparation for the intervention study. More details can be found here.
Living lab Health care: In 2018 the PNH team organized 2 brainstorm sessions for a potential new living lab on PNH in Health Care – implementing personalized nutrition advice before, during and after hospital admittance. This has resulted in a proposal for a living lab focusing on the technological and social infrastructure for PNH advice targeted towards orthopedic surgery patients (planned surgical procedure, short hospital stay). The goals are to prove the value of the technological and social infrastructure for PNH advice in a health care setting, to connect the broad stakeholder field, to add value for the patients by connecting the medical world, food world and consumers and to investigate new business models for PNH in Health care. This living lab is expected to start in 2019. More details can be found here.

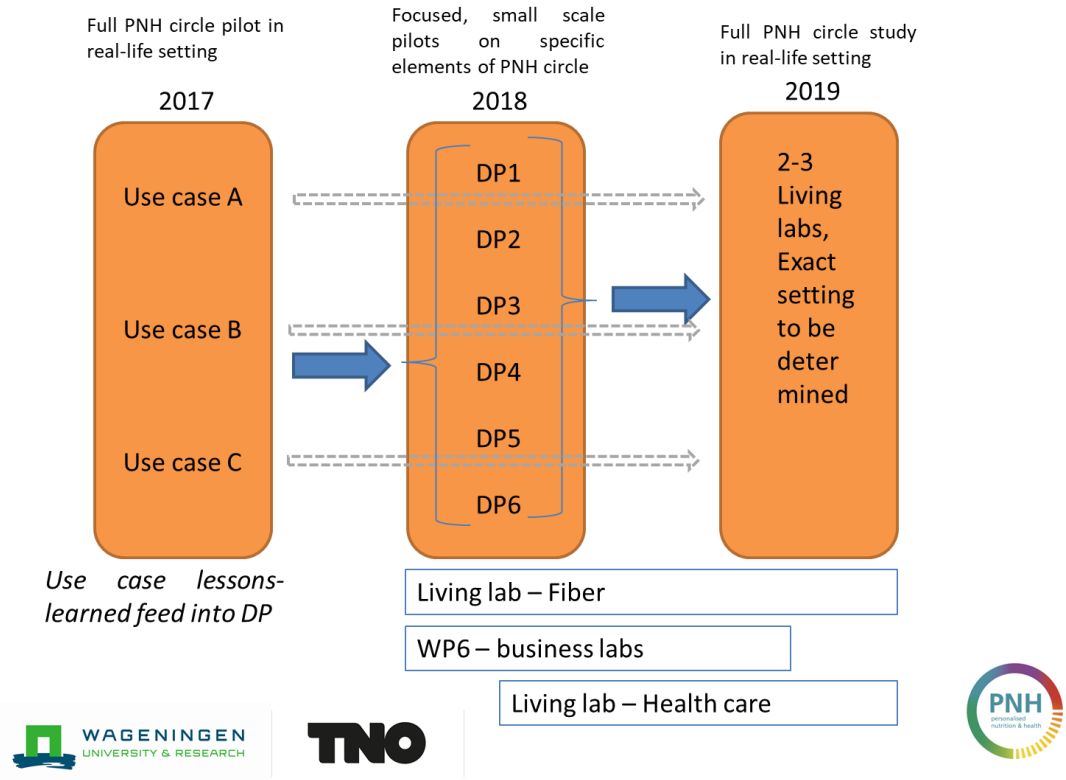

Figure 1. Overview of the PNH activities in 2018, in relation to the activities in 2017 and 2019 and further.

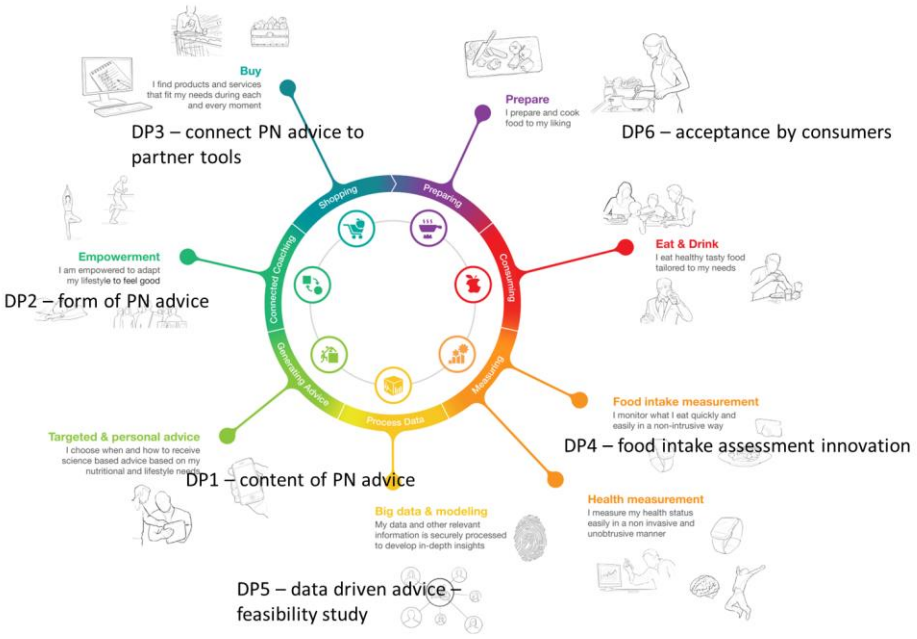

Figure 2. The 6 dedicated projects, with their position in the PNH circle.

Number of delivered products in 2018 / so far *(in an appendix, please provide the titles and/or description of the products or a link to the products on public websites)*			
Academic articles	Reports	Articles in journals	Introductions/workshops
	3	2	3
Titles/ description of the most important products in 2018 (5 at max) and their target group			
Deliverable DP6: Report results consumer study			
Deliverable DP3: Report "Overview output of Personalised Nutrition and Health Consortium 2016-2017" by Andre Boorsma and Marieke Meeusen for PPS PNH partners			
Deliverable DP2: Different concepts based on personal characteristics, preferences and design			

Appendix: Names of the products or a link to the products on a public website

VoedingNu November 2018. Persoonlijk voedingsadvies in de supermarkt – een studie onder lager opgeleide supermarktbezoekers in Almere. Muriel Verain, Ireen Raaijmakers, Koen Hogenelst, Marleen Onwezen, Marielle Timmer, Jos Verstegen, Wilrike Pasman.

Links to blogs and other publication on the website:
https://www.personalisednutritionandhealth.com/en/personalisednutritionandhealth.htm

DP1 – Content of Personalised Nutrition and Health (PNH) advice

General information	
Title DP/Living Lab	Content of personalised nutrition advice
Research project leader	Jan Top
Private parties involved (please also indicate whether parties have joined or have left during the execution of the project)	FrieslandCampina, Jumbo, PSinFood, Philips/VitalHealth,....

Short description of content/aim
What is going on and how is this project involved?
What will be delivered by the project and what is the effect of this?

This DP aims to translate knowledge rules on food-health relations and product replacements into algorithms. These algorithms are eventually implemented in an advice engine which takes consumers characteristics (health status, food intake, preferences) and context (eating moment) as input and provides suggestions for a change in diet that is more healthy. Rather than replacing products on a one-to-one basis, we focus on making small steps and considering a longer period of time. This DP is dependent on the DP that deals on the format of the advice for interaction with the consumer.
An advice that resonates with the consumer's preferences is more likely to incur behavioural change. Therefore, the second part of this project deals with the question how to incorporate information about user preferences in the advice.
This project delivers a running prototype that will be used in the MLDS use case intervention study.

Planning and progress (if there are changes to the project plan, please explain)	
Is the project going according to plan?	Yes
Is there a delay and/or deferred delivery date?	No
Are there any substantive bottlenecks?	Yes. Given the limited budget of the project most of the time is needed to develop the engine, leaving little time to perform research on long term issues.
Are there any deviations from the projected budget?	No, but much additional funding was needed to develop the platform that can run the algorithm.

Results in 2018/ so far
Give a short description of the highlights and project deliverable in 2018 / so far

- We have managed to develop a running engine that is now being connected to a front-end that is being developed in collaboration with VitalHealth and an external partner.
- Finding new food-health relations with sufficient evidence is a time consuming process. We have investigated the process followed by the National Health Council and identified some steps. The question now is whether automation can help to speed up this process.
- The payslips the retailers provide can be a source of information to determine food intake. However, it is not trivial to relate the information on these payslips to products for which for example nutritional values are known. We applied semantic technologies and machine learning to find the links between these two types of data.
- Making food choices is a multi-criteria decision making process. The question is how consumers can be assisted in optimizing along different nutritional parameters (salt, fat, sugar, etc.), together with preference criteria (taste, convenience) and constraints (allergies). We made an initial analysis to make the complexity of this question visible.
- Defining alternatives for products and ingredients for what people normally eat is not straightforward. Dieticians have a limited set they typically use (for example whole grain bread to replace white bread), which is however limited and based on implicit assumptions. It appears to be difficult to extract general rules for substitution within the borders of this

project.

- The 'Dutch food-based dietary guidelines 2015' have been investigated in detail to get an overview of the accepted food-health relations. The causal risk factors for ten major chronic diseases and their relation to food is presented in that document. This information is formulated in a Bayesian Belief Network (BBN) diagram which visualizes the relations between food and health. Two meetings have been organized with Marianne Geleijnse (vice president of the National Health Council) to discuss their search algorithm and approach to finding scientific literature. Considering the main concepts in the guidelines and the output from meetings, keywords have been determined to initiate an ontology. This ontology will be used to find extra scientific evidence automatically from literature for additional food-health relations.

DP2 – Format of PNH advice

General information	
Title DP/Living Lab	*DP2 – Format of the advice*
Research project leader	*Machiel Reinders*
Private parties involved (please also indicate whether parties have joined or have left during the execution of the project)	*Albron, BASF, FrieslandCampina, Jumbo, OMEHealth, Philips*

Short description of content/aim
What is going on and how is this project involved?
What will be delivered by the project and what is the effect of this?

The underlying motivation of this Dedicated Project is to obtain insight in how can feedback/advice formats improve adherence to personalised recommendations? The aim of this Dedicated Project is therefore to develop personalised feedback/advice-concepts based on personal preferences of consumers. This DP contains the following tasks:

1. *Development of consumer 'personas'*
2. *Develop and test consumer survey*
3. *Development mock-ups*

Deliverable:

- *Report on consumer preferences regarding the format of the personalised nutrition advice and development of different format concepts.*

This Dedicated Project has the following contributions:

- ✓ *Enhanced insight into how personalised feedback/ advice could take form and how this differs between different types of consumers;*
- ✓ *Allow partners to further develop their PN products and services based on preferred personalised feedback/advice-concepts;*
- ✓ *Inform the scientific community on how personalised feedback/advice-concepts can be developed and tested based on personal characteristics.*

Planning and progress (if there are changes to the project plan, please explain)	
Is the project going according to plan?	*Tasks 1 and 2 (see previous text box) were conducted, task 3 was delayed, because the idea was to conduct this task in cooperation with students from Avans Hogeschool (Design Academy). Although plans were made, this cooperation never took shape, which forced the project team to look for alternatives.*
Is there a delay and/or deferred delivery date?	*Deferred delivery date: March 31, 2019*
Are there any substantive bottlenecks?	*No*
Are there any deviations from the projected budget?	*No*

Results in 2018/ so far
Give a short description of the high-lights and project deliverable in 2018 / so far

The following activities have been employed in 2018:

1. *Development of consumer 'personas': Analyses by means of PCA analysis (factor model) have been performed to determine which types of consumers ('personas') exist based on the personal characteristics measured in the consumer survey of 2017.*
2. *Develop and test consumer survey: A questionnaire was developed and tested to examine consumer preferences for different formats of personalised advice and to measure relevant personal characteristics with short and simple scales. In the analyses of this questionnaire, these personal characteristics were linked with preferences for different formats of advice. Based on the results of this questionnaire, a start was made with the report on consumer preferences regarding the format of the personalised nutrition advice and development of different format concepts (= Deliverable).*
3. *Development mock-ups: Start with development of different mock-ups for providing feedback/advice was made based on the results of the questionnaire.*

DP3 - Connect PNH Advice to partner tools

General information	
Title DP/Living Lab	Overview output of Personalised Nutrition and Health Consortium
Research project leader	Marieke Meeusen
Private parties involved (please also indicate whether parties have joined or have left during the execution of the project)	All partners of the PPS PNH consortium have been involved.

Short description of content/aim What is going on and how is this project involved? What will be delivered by the project and what is the effect of this?
The aim of this project is twofold: (i) to create an overview of the deliverables and (ii) to encourage the PPS partners to (re-) use and adapt the technology that has been created in the PNH program and that can be easily assessed by the PNH-partners. Although the outputs and deliverables are developed for specific use in a study or use case, they might be easily adapted for use in a company setting. The project gives an overview of the state-of-the art at september 2018 when the output of the program PNH during the first 18 months has been put in order. The program is still on going, resulting in new versions and new output. So this document will be regularly updated. The effect of the project is the (better) use of the output of the PPS PNH so far.

Planning and progress (if there are changes to the project plan, please explain)	
Is the project going according to plan?	Yes, it does. The project started in 2018 and has been finished in 2018. In 2019 we will take the next step and formulate the activities to enable companies/ PPS partner to (better) use the output of the research program.
Is there a delay and/or deferred delivery date?	No.
Are there any substantive bottlenecks?	No.
Are there any deviations from the projected budget?	No.

Results in 2018/ so far
Give a short description of the high-lights and project deliverable in 2018 / so far

The next table gives an overview of the deliverables in summer 2018

	PNH Knowledge
1.1	Overall architecture PN services for use case Highly motivated consumers in retail setting (use case A)
1.2	Overall architecture PN services for use case Low SES in retail setting (use case B)
1.3	Advice on health & intake measures (DBS and Challenge test)
1.4	Selection of clinical biomarkers
1.5	Questionnaires –PN behaviour research
1.6	Insights Food habits, preferences and motives - output of WP3 Consumer Behavior
1.7	Insights Consumers willingness to adopt personalised nutrition services - output of WP3 Consumer Behavior
1.8	Insights Psychological measures that paly a role in successful communicating personalised nutrition advice - outp of WP3 Consumer Behavior
1.9	Insights Personalized dietary advice for highly motivated consumers - output of use case Highly motivat consumers in retail setting (use case A) (2017)
1.10	Insights Personalized dietary advice for low SES consumers - output of use case B – low SES consumers
1.11	Insights Relation between (continuous) glucose levels, food intake, cognition and wellbeing within the work sett – output of use case C – Wellbeing@Work
	PNH Tools
2.1	Database with measurement tools for Personalized nutrition & health advice
2.2	Reporting tool for the Health Score for Metabolic Syndrome
2.3	Storage research data – Nutrient Research Cohort
2.4	Ecological Momentary Assessment (EMA) tool
2.5	Automatic reporting tool for personalized feedback on Continuously glucose monitoring (CGM) data
	PNH Algorithms
3.1	Advice system & knowledge rules for PNH-advice
3.2	Algorithm to determine the health score for Metabolic Syndrome: The Metabolic Syndrome Health Score
3.3	A digital tool to determine food intake habits: The Eetscore service
3.4	Product classification module – by using a machine learning method a classification of food products into hea categories has been achieved
	PNH Services
4.1	Food Advice module and API – based on a Baysian Belief model expressing relations between Food intake a Food Advice (based on General Health Council with ad hoc extension) – Coupled to the NRC platform
4.2	Feedback on GCM, wellbeing and cognition measures and food intake via food diary (fat secret)

DP4 - Food Intake Assessment Innovation

General information	
Title DP/Living Lab	*Food intake assesment innovation*
Research project leader	Femke Hoevenaars
Private parties involved (please also indicate whether parties have joined or have left during the execution of the project)	Philips, Albron, Marks & Spencer, Jumbo, FrieslandCampina, Smart with Food, OmeHealth

Short description of content/aim What is going on and how is this project involved? What will be delivered by the project and what is the effect of this?
High quality dietary intake data is a crucial ingredient for personalized advice. Often self-report methods such as food frequency questionnaires, dietary recalls, or food diaries are used. These are however subject to measurement errors, mainly due to over- or underreporting, burdensome for subjects, and expensive to process. The aim of this dedicated project is to investigate if a user-friendly solution in retrieving individual food intake data of good quality is present or needs to be developed. At the end of the project there will be an overview of current applications in food intake assessment. Furthermore first steps will be taken in developing a smart methodology focused on fiber intake assessment, which adds to the existing food intake tools.

Planning and progress (if there are changes to the project plan, please explain)	
Is the project going according to plan?	Yes, however there is a delay in timing
Is there a delay and/or deferred delivery date?	Yes, outcome were supposed to be expected at the end of 2018 but this will be Q3 of 2019
Are there any substantive bottlenecks?	Yes, for developing the smart fiber intake assessment tool high-quality reference data are required. It was expected that a Food Frequency Questionnaire could be used for this purpose, but the specificity of fiber intake data collected via an FFQ is not sufficient. Instead food diary data are required for a large population (N > 100). Two strategies for retrieving this data will be pursued.
Are there any deviations from the projected budget?	No

Results in 2018/ so far
Give a short description of the high-lights and project deliverable in 2018 / so far

Definitions have been set to specify the technology in development;

- The focus from general food intake assessment has been narrowed to fiber intake. This to align with use case fiber.
- Assessment should take minimal time (10min) and deliver high quality output
- If possible the assessment should not only take generic fiber into account but also specific type of fiber, to add even more value to the newly developed tool.
- Assessment should define/find routines (every day consumption / weekend consumption / every weekday / irregular); at the level of product categories (vegetables / fruit / dairy / pulses etc.)
- Methodology to be developed specified: funneling on hierarchical reasoning starting from general assessment combined with specific questions on health – fiber association (cholesterol vs glucose vs bowel functioning) to choose specific fiber focus / type

Overview of available food intake assessment tools, mainly focused on fiber intake, has been developed.

DP5 – Data-driven advice

General information	
Title DP/Living Lab	*Understanding of glycemic response using contextual data and modeling*
Research project leader	Iris de Hoogh
Private parties involved (please also indicate whether parties have joined or have left during the execution of the project)	Noldus, Jumbo, Albron and OmeHealth where partners from the start of the dedicated project. Philips and FrieslandCampina joined this dedicated project later (halfway the year and last quarter of the year respectively).

Short description of content/aim What is going on and how is this project involved? What will be delivered by the project and what is the effect of this?
Elevated postprandial blood glucose levels, as well as high variability in glucose levels are associated with major risk for type II diabetes and cardiovascular disease. Research has shown that the glycemic response on food is highly personal and not directly linked to the glycemic index of food products. However, the influence of dietary intake, but also physical activity, stress levels and quality of sleep on individual glucose profiles and the value of such data reflecting real-life for personalized interventions are not yet clear. We propose a small pilot to assess if assumptions that hold in a 'controlled setting' also apply in a real-life setting, and to investigate the added value of high quality contextual data in understanding fluctuations in glucose levels. In this small pilot (n ~ 20) the focus is on the quality of the dataset, contextual data, and the real-life setting in which data is collected. In addition all kinds of standardization will be applied, including ensuring repetition in meals, comparable snacks between persons and adding a "standard glucose solution" (OGTT) as baseline.

Planning and progress (if there are changes to the project plan, please explain)	
Is the project going according to plan?	Yes, however there is a delay in timing
Is there a delay and/or deferred delivery date?	Yes, outcome were supposed to be expected at the end of 2018 but this will be Q3 of 2019
Are there any substantive bottlenecks?	Yes, approval by the Medical Ethical Committee (MEC) has been withdrawn due to the use of the continuous glucose monitor in a healthy population (outside of the CE-certificate). This was not foreseen, as previous and current studies with the same device have been approved (by other committees though). At the moment we are working closely with the MEC to get the study approved. The last bottle-neck to solve is the insurance for participants.
Are there any deviations from the projected budget?	Not yet, however additional budget will be required in 2019. Mainly due to the extra work in getting MEC approval, and having to start over with study preparations and recruitment.

Results in 2018/ so far
Give a short description of the high-lights and project deliverable in 2018 / so far

Data analyses (using data that were collected in 2017, but do not contain the required contextual data for this year's objectives).

- Preliminary analyses with continuous glucose monitoring data have shown that we are able to identify various 'types' of glucose profiles, which also seem to be predictive of health status.
- The data could be used to get a good estimate of how much standardization is required in the dietary pattern of subjects to find (significant) relations.

Presentations

- Data collected in 2017 as well as the intended study design for 2018 have been presented at the NuGo week 2018 in Newcastle Upon Tyne, UK.
- Data collected in 2017 as well as the intended study design for 2018 have been presented at a meeting of the Dutch Academy for Nutrition Sciences (NAV).

Study 2018

- Study design has been developed, including measurement scheme, interventions, population, etc. and has been described in a study protocol.
- All documents required for study assessment by the Medical Ethical Committee have been written.
- Questionnaires for the study have been programmed in an online portal.
- An application for ecological momentary assessment has been adapted for use in this study. This app allows for daily assessment of sleep, stress and mood.

Food intake application

- A smartphone application for daily logging of food intake and timing of eating has been developed by TNO. This application makes use of an existing food database.

DP6 – Acceptance of PNH by consumers

General information	
Title DP/Living Lab	*DP6 – Acceptance of Personalised Nutrition & Health by consumers*
Research project leader	*Machiel Reinders*
Private parties involved (please also indicate whether parties have joined or have left during the execution of the project)	*Albron, BASF, FrieslandCampina, Jumbo, OMEHealth, Philips, SmartWithFood*

Short description of content/aim
What is going on and how is this project involved?
What will be delivered by the project and what is the effect of this?

The goal of this Dedicated Project is to get a clear idea of the customer value of Personalised Nutrition & Health (PNH) products and services. This projects aims to bring further insight in what benefits and aspects of personalised nutrition concepts are preferred and what trade-offs consumers make between different examples of personalised nutrition concepts.

This DP contains the following tasks:

4. *Identification of relevant characteristics of personalised nutrition services: benefits and barriers ('long-list').*
5. *Selection of most relevant characteristics ('short-list') linked with specific target groups*
6. *Assessing preferences for personalised nutrition services in a quantitative study among consumers*
7. *Further assess customer value of PNH with participating companies and consumers in Business Lab 'Canteen'*

Deliverable:

- *Report on consumers' preferences regarding different personalised nutrition concepts*

The results of this project:

- ✓ *Allow partners to further develop their PN products and services based on what is important for their customers;*
- ✓ *Provide input for partners to better target their PN products and services for specific target groups;*
- ✓ *Inform the scientific community with realistic scenarios for PN products and services.*

Planning and progress (if there are changes to the project plan, please explain)	
Is the project going according to plan?	*Tasks 1 till 3 (see previous text box) were conducted, task 4 was delayed, because this task will be executed in cooperation with Business Lab 'Canteen', which is starting Q1 of 2019.*
Is there a delay and/or deferred delivery date?	*Deferred delivery date: March 31, 2019*
Are there any substantive bottlenecks?	*No*
Are there any deviations from the projected budget?	*No*

Results in 2018/ so far
Give a short description of the high-lights and project deliverable in 2018 / so far

The following activities have been employed in 2018:

4. *Development of long-list: 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.*
5. *Development of short-list: During a session with the affiliated companies a selection was made of two consumer segments ('Weight worries' and 'Office workers') and the long-list with relevant PNH aspects was prioritized. Based on this, a selection was made of the most relevant characteristics to further look at ('short-list').*
6. *Quantitative consumer study: A consumer study to further delineate and accentuate the relevant PNH characteristics that play a role in consumer acceptance of PNH was developed and conducted. The study consisted of two parts: 1) Questions regarding preferences for PNH characteristics and 2) Choice-experiment: asking trade-offs between different attributes.*
7. *Results of the consumer study were analysed and reported.*

Living Lab Fiber

General information	
Title DP/Living Lab	Stimulating fibre intake by personalized dietary advice – LL More Fiber
Research project leader	Nicole de Wit
Private parties involved (please also indicate whether parties have joined or have left during the execution of the project)	MLDS; Bolletje, Sensus, Kellogg, Sonneveld (LL partners)

Short description of content/aim What is going on and how is this project involved? What will be delivered by the project and what is the effect of this?
Within the Personalised Nutrition & Health (PNH) program, this project (LL More Fiber) was initiated in collaboration with the Maag Lever Darm Stichting (MLDS). This project focusses on supporting healthy people to increase their daily fibre intake. The aim is to increase daily fibre intake, ideally up to the recommended intake of 30 or 40 grams/day for women and men, respectively, by generating and providing personalized dietary advice. Knowledge obtained from the previous projects within PNH are enrolled in this new project. This project will generate valuable, digitized knowledge on the added value of personalized dietary advice to increase fibre intake. This knowledge empowers consumers to change their dietary habits and thereby improve their health status. Next to question on effectiveness of a personalized dietary advice to increase the daily fibre intake, it will be evaluated how the advice will be perceived by the consumer. The knowledge obtained within this project will also be expressed (formalized) in such a way that it can be used in smart software solutions.

Planning and progress (if there are changes to the project plan, please explain)	
Is the project going according to plan?	The project is on schedule. The development of the personalized dietary advice (modelling) to increase fiber intake is currently ongoing. The intervention study that will be performed to validate whether personalized dietary advice adds additional value to the current general advice of 'Voedingscentrum' and 'MLDS' for increasing fiber intake, will start in March 2019.
Is there a delay and/or deferred delivery date?	No
Are there any substantive bottlenecks?	No
Are there any deviations from the projected budget?	No

Results in 2018/ so far Give a short description of the high-lights and project deliverable in 2018 / so far
This project started in July 2018. -First an extensive inventory was made on the input necessary and feasible to generate the personalized dietary advice (PDA) to increase fiber intake. Private partners as well as the knowledge institutes (WFBR, WEcR and TNO) were involved in this inventory. It was concluded that assessment of the habitual food intake, self-regulation and individual preferences (e.g. vegetarian) are important parameters to take into account for modeling and generating the PDA. Development and optimization of the questionnaires to obtain this 'input-information' is currently ongoing, in concordance with the modeling and provision of the PDA. -An intervention study is designed to study the effectiveness of the PDA to increase fiber intake in healthy subjects (compared to the current general advice of 'Voedingscentrum' and 'MLDS'). The medical ethical protocol for this study is submitted to METC Brabant and is expected to be approved before February 2019. After approval the recruitment of 100 healthy participants will start.

Living Lab Health Care

General information	
Title DP/Living Lab	*Health Care*
Research project leader	Esmée Doets
Private parties involved (please also indicate whether parties have joined or have left during the execution of the project)	We are currently building our team, partners have to decide whether or not to join (deadline 31st of January)

Short description of content/aim What is going on and how is this project involved? What will be delivered by the project and what is the effect of this?
The aim of the living lab Personalized Nutrition in health care is to create together with partners the 'technological and social infrastructure' to enable personalised nutritional advice before, during and after hospital admittance. We will use a step-wise approach: Step 1. Identify knowledge gaps & research needs. We will do this by consulting partners and other stakeholders in the field, including the target group. Step 2: Design social & digital infrastructure needed for implementation together with partners. Step 3: Proof of implementation (pilot study)

Planning and progress (if there are changes to the project plan, please explain)	
Is the project going according to plan?	We started with step 1, and at the end of Q1 we will continue with step 2 . this according to plan.
Is there a delay and/or deferred delivery date?	n.a.
Are there any substantive bottlenecks?	n.a.
Are there any deviations from the projected budget?	n.a.

Results in 2018/ so far Give a short description of the high-lights and project deliverable in 2018 / so far
In October we organized a workshop to discuss research needs in the field of personalized nutrition in health care. The workshop was attended by a multi-disciplinary group of people both existing and potential new partners from the PNH consortium. Based on the outcomes of the workshop a work plan was defined including main research topics to be addressed. Based on this plan, partners will decide whether they will participate in the living lab.

https://www.wur.nl/nl/Onderzoek-Resultaten/Topsectoren/show/Personalized-Nutrition-Health.htm

https://topsectoragrifood.nl/project/personalized-nutrition-and-health/