PPP annual report 2018
PPPs which have started under the direction of the top-sectors need to deliver an annual report regarding their research and financial progress. For reporting on research progress this format has to be applied. A separate format 'PPP final report' is available for PPPs that have finalized in 2018.
Annual reports are entirely published on the TKI/topsector website(s). Please prevent the incorporation of confidential matter in the report.
PPP annual reports have to be submitted - pooled for each research organisation - before 1 March 2019 to the TKIs at info@tkitu.nl, or at info@tki-agrifood.nl. For Wageningen Research the delivery of reports occurs centrally.

General data	
PPP number	**AF-16505**
Title	**The biology behind perceivable consumer benefits; Glucose (M)apping**
Theme	**Health and Safety**
Executing research organisation(s)	**University of Leiden, Radboud UMC, University of Maastricht, Wageningen University**
Project leader research (name + email address)	**Ellen Blaak** **e.blaak@maastrichtuniversity.nl**
Coordinator (on behalf of private parties)	**Project council chair: Ardy van Helvoort (Nutricia)**
Contact person of government	
Total project budget (k€)	**4.700k€**
Project website address	**Person-studie.nl**
Starting date	**1 April 2017**
Final date	**31 March 2022**

Approval coordinator/consortium The annual report has to be discussed with the coordinator/consortium. The TKI(s) like to be informed regarding potential comments on the annual report.	
The annual report is …… by the coordinator on behalf of the consortium	☐ approved ☐ not approved
Potential comments regarding the final report	

Brief description content/aim PPP What is the matter and what does the project contribute? What does the project deliver and what are the effects of its delivery?
A healthy lifestyle is an essential element to release the physical and mental potential of every individual and is able to prevent the epidemic development of overweight, and cardio-metabolic diseases. Unfortunately, most people do not manage to incorporate or to maintain the recommended changes in their daily lifestyle. This may be due to the fact that people do not perceive the benefits of a healthy lifestyle in the short term, nor the adverse effects of an un-healthy lifestyle. It is increasingly recognised that maintaining well-controlled blood glucose concentrations is essential for remaining healthy and preventing chronic metabolic diseases. Additionally, there is evidence that well-controlled blood glucose concentrations— by boosting physical and mental energy—may be an important determinant of well-being, mental and physical performance. The link between blood glucose and the latter factors has hardly been studied.

Moreover, it is not known to what extent these relationships differ in healthy subjects and subjects with an impaired glucose metabolism and what the impact is of a disturbed circadian rhythm. When people feel better, fitter and/or otherwise motivated to follow a dietary advice, for instance by personalized feedback on physiological measures of glucose control or other indicators of health status, the implementation of a healthy lifestyle is expected to be more successful.

Furthermore, despite being compliant to lifestyle advices, the metabolic flexibility to respond to lifestyle intervention may vary between individuals. Recent evidence indicates that insulin resistance and metabolic inflexibility may develop separately in different organs, representing different etiologies towards cardio-metabolic diseases. Interestingly, these tissue-specific sub-phenotypes may have a differential response to diet. In a recent ground-breaking study, it was shown that, despite high inter-individual variability in glycemic response, responses to individual meals in daily life could be more accurately predicted by means of an algorithm that included lifestyle factors (diet, physical activity) and microbial composition as compared to a prediction by common practice. The above data suggest that successful lifestyle interventions may require a more personalised approach.

The aims of the project are:

1. Obtain insight into the metabolic and lifestyle determinants of blood glucose responses and glycemic variability and relate the latter responses to mental and physical performance and well-being (WP1)
2. Study how acute and chronic dietary and/or physical activity interventions affect blood glucose homeostasis in metabolically different subgroups and how this consequently alters the related mental and physical performance, well-being and food preferences. (WP1 and 2)
3. Develop multi-scale tissue dynamic and mathematical models on diet and lifestyle (physical activity) in relation to blood glucose homeostasis (including microbiota and host metabolism) and mental and physical performance and well-being (WP3).
4. Test whether tailored dietary interventions/physical activity programs based on these models may improve blood glucose homeostasis and physical and mental performance and well-being (WP4)
5. Evaluate the application of wearables and other tools to quantify the biological and mental biomarkers

Main deliverables of the current project are:

1. Establishment of (cause-effect) relationships between blood glucose homeostasis, the underlying tissue related physiology and the perceivable benefits[1] connected to mental and physical performance and well-being (WP1 and 2)
2. Demonstration that subgroup-based dietary/lifestyle intervention may optimize the beneficial effect on blood glucose homeostasis and metabolic health and related perceivable benefits (WP2)
3. Generation of multi-tissue dynamic and mathematical models that can determine the ranges at which diet/lifestyle intervention can modulate the blood glucose homeostasis and underlying physiology and in turn the related perceivable benefits (WP2.1A, WP3)

4. Proof of the concept and more detailed knowledge on more personalised and effective lifestyle-related strategies to improve blood glucose management and related perceivable benefits (WP1-4)

Results 2018

The **PERSON study** (core project) has completed 3 participants and are nearing the completion of 8 more. In addition, we have 7 other participants in their dietary intervention weeks with ongoing screenings and analysis for inclusion. To this point we have ~150 screenings, 24 included in study (36 screenings to be analysed end December).

The study is on track and we expect continued inclusions through a variety of recruitment strategies including a newly designed website. To classify participants, we have developed a calculator to determine MIR and LIR based on existing large intervention and cohort studies.

NWO projects:
Time to Taste: Pilot study ongoing, completed final measurements of Etmaal study showing the safety of nightshift workers is compromised and the participants on night-shift experience greater GI discomfort.
Building Bridges: Study ongoing, recruiting and measuring currently, hope is to finish all measurements before end 2019.
Brain Function: 1st intervention trial complete (17 men completed study by end December), data to be analysed Jan 2019; results to be used to optimize design of 24 week long-term intervention.
HIIT: Screening of participants ongoing, currently optimizing inclusion criteria in order to have a higher success rate of inclusion post-screening.
Metabolic modelling: Systematic review to be finished March 2019, working on the optimization of glucose homestasis models by adding other variables obtained from PERSON study.

Various presentations:
"*Computational modelling of postprandial glucose and insulin dynamics: the role of amino acids*"

- 5 May 2018 Bioinformatics and Systems Biology Conference, Luteren, Netherlands
- 4-6 July 2018 Intl Conference on Systems Biology of Mammalian Cells, Bremen, Germany
- 2 Oct 2018 DTL Communities at Work Conference, Utrecht, Netherlands
- 5 Oct 2018 Bioinformatics for Young Intl Researchers Conference, Liege, Belgium

"*The PERSON-study: PERSonalized glucose Optimization through Nutritional intervention"*

- NVDO Jonge Onderzoekers Bijeenkomst 2018, vrijdag 19 januari, zaterdag 20 january, Oral presentation
- 21 November 2018 Poster at NUTRIM symposium, Maastricht, Netherlands,

Bi-monthly expert meetings with project team and industrial partners
Visit E.Blaak to Kaiseraugst, DSM to present the Person Study
Interview for the newspaper.

Groot onderzoek naar voedingsadvies op maat bij overgewicht ...
https://www.limburger.nl/.../groot-onderzoek-naar-voedingsadvies-op-maat-bij-overg...

In the planning
- Seminar at Danone Utrecht, TiFN 16NH04 Seminar, Perceivable benefits, January 17th 2019
- April/May, meeting together with project 'Personalised Nutrition and Health'

Number of delivered products in 2018 (give titles and/or description of products, or a link to the products on the project website, or other public websites).			
Scientific articles	Reports	Articles professional in journals	Lectures/workshops
Trouwborst I[1], Bowser SM[1], Goossens GH[1], Blaak EE[1]. Ectopic Fat Accumulation in Distinct Insulin Resistant Phenotypes; Targets for Personalized Nutritional Interventions			
Titles/descriptions of prominent products in 2018 (max. 5) and their targets groups			

Annex: Titles of deliverables or a link to products on the project website or other public websites