



PPP Project Final Report 2018

The PPP-projects that have been established under the direction of the top sectors and will be completed before 1 March 2019 must submit a technical and financial final report. This format is to be used for the technical final report.

The report will be published on the websites of the TKIs/top sector, excluding the blocks 'Approval coordinator/consortium' and 'Changes to the original project plan' . Please ensure that no confidential matters are left in the remaining blocks.

The reports must be submitted before 15 February 2019 to Hans van der Kolk

General information	
PPP number	AF 14282
Title	Clean label (DFI)
Theme	Topsector Agri & Food, Roadmap High quality products and processing, Theme Healthy and Safe
Executive knowledge institution(s)	Wageningen Food & Biobased Research
Research project leader (name + e-mail address)	Theo Verkleij theo.verkleij@wur.nl
Coordinator (on behalf of private parties)	Miss M. Colleoni, Limagrain Céréales Ingrédients mirela.colleoni@limagrain.com
Government contact person	Cor Wever
Total project size (k€)	729,9 k€
Address project website	-
Start date	13-02-2015
End date	September 2018

Approval coordinator/consortium

The report should be discussed with the coordinator/the consortium. The TKIs appreciate being informed of possible feedback on the report.

The coordinator has assessed the report on behalf of the consortium	<input checked="" type="checkbox"/> approved <input type="checkbox"/> rejected
Feedback from the consortium coordinator on the report	

Short description/aim PPP

What is going on and how is this project involved?

What will be delivered by the project and what will be the effect of this?

There is an increasing concern on the use of additives by producing food products, from industrial but also from consumer side. From the industrial side, the use of several additives is necessary to reach or maintain the quality, the shelf life and the safety of the products. On the other hand, consumers develop a notion that only ingredients that are familiar to them, are healthy and sustainable. This project was established to bridge the gap between consumers and industry. The project will engage existing regulatory environment and consumer group perspective in defining the clean label framework moreover to address the technological spectrum of ingredient discovery, screening, and modification all the way to product application. An integrated approach provides the technological and logistical know-how for an innovative clean label strategy whereas the consortium will provide practical strategies useful for product developers from both ingredient suppliers and food manufacturers intending to clean-up the labels on their products. Furthermore, the consortium partners will develop knowledge particularly in discovering new natural ingredients with the desired functionalities, by using physical modification strategies to improve the functionality of current natural ingredients, and in understanding processing conditions that determine the final product quality for clean label products.

Changes to the original project plan and follow-up	
Have there been any changes in the consortium/project partners? If yes please explain	After year one, two partners stopped their participation due to change of company vision after acquisition by another company respectively the results achieved have provided sufficient insight to create foods with less E-numbers. After year two, a third partner stopped, also the results achieved provided also enough insights to modify his process and products with less E-numbers
Have there been any changes in the project set up? If yes please explain.	The project set-up has not changed.
Do you expect a patent application to arise from this PPP? If yes please explain	No
Do you expect spin offs to arise from this PPP? (including new projects) If yes please explain	In recent years, we had several bilateral projects to assist companies to reduce the amount of used E-numbers in their portfolio of products.
in how many years will the private parties use results from this project in practice?	Already in place after year 1 and 2
How has the project contributed to developments within the involved knowledge institution(s)? (e.g. scientific breakthroughs, new collaborations etc)	This project has contributed to new knowledge which was already used in other bilateral projects. There was no scientific breakthrough, but a more general understanding of the way consumers, social media, but also companies react on E-numbers.
What will be the follow up of this project?	Based on the results and contact with industry, several private partners participated in new projects.

Achieved Results
<p>On a technological side, the best way to modify, replace or eliminate non clean label food alternatives was explored. Scientific background and understanding of replacement of ingredients like gelatin and emulsifier was carried out in model systems. Clean label processes were adopted to modify the functionality of wheat flour. Adapting the process and the product, the desired functionality of the flour was reached within the economical boundaries. Adapting the process also improved the functionality of starch in order to produce gelatin free products. An industrial company was selected to carry out experiments on semi-industrial scale. Recent fine tuning of the process conditions made clear that also the color of the flour can be corrected most probably without compromise the desired functionality. The last experiments to make the functionality of the processed flour clear were carried out in 2018 and showed the improvement of the functionality. Economical calculations showed the feasibility of the implementation in industry. With the novel ingredients, application and testing of different replacers in products was carried out both by WFBR as well by the partners and several analysis on the products with replaced ingredients were carried out to guide the second step forward to improve or adjust the recipes</p>

Deliverables (description of the most important products and their target group)
Deliverables of this project are improvement of the functionality of wheat flour, the knowledge for the industrial partners how to reach the improved functionality of dry products like flour, the insight of the different steps how to modify the additives in food matrices, insight in improvement of replacement gelatine in candies.

Number of delivered products (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	4	

Title of articles in journals

- Diaz, Dr. J. A clear label strategy for food additives, *The world of food ingredients*, February 2016
- Diaz, Dr. J. How to successfully build a clear label paradigm. *The world of food ingredients*, March 2016
- Verkleij, T.J., Help: een E-nummer: E-nummers: E-Motie versus de feiten, *Voedingsindustrie* April 2016, also published on line: <http://www.vakbladvoedingsindustrie.nl/archief/help-een-e-nummer> in Dutch and in English.
- Verkleij, T.J., Clean label en het verbeteren van de houdbaarheid, een uitdagende combi. *Voedingsindustrie* April 2018, 38-39. Also published online in Dutch: <https://www.vakbladvoedingsindustrie.nl/nl/artikel/clean-label-en-het-verbeteren-van-de-houdbaarheid> in Dutch and English.