



**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. A separate format ('PPP final report') is available for PPP-projects that have been completed in 2018.  
**The annual reports will be published in full on the websites of the TKIs/top sector, excluding the blocks 'Approval coordinator/consortium' and 'Planning and progress' . Please ensure that no confidential matters are left in the remaining blocks.**  
 The PPP Project Annual Reports must be submitted by 15 February 2019 to Hans van der Kolk

<b>General information</b>	
PPP number	AF-17102a (TKI toeslag project, onderdeel SIP Bioref.)
Title	Clean Label ingredients (Mild technology for obtaining functional and clean label ingredients from agricultural co-products)
Theme	Circulair
Executive knowledge institution(s)	WFBR
Research project leader (name + e-mail address)	Marieke Bruins (Marieke.Bruins@wur.nl)
Coordinator (on behalf of private parties)	Teboza
Government contact person	Jan van Esch
Total project size (k€)	450
Address project website	-
Start date	1 December 2017
End date	30 November 2019

<b>Approval coordinator/consortium</b>	
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:	<input checked="" type="checkbox"/> approved <input type="checkbox"/> rejected
Possible feedback on the annual report:	none

**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?

Initiatives from food manufactures focus on the optimal use of protein and flavor-rich co-products. As for flavors there are already some products on the market where artificial flavors are replaced with natural source alternatives, for example turmeric, paprika and annatto for macaroni and cheese products from Kraft Heinz. This SIP-project focusses on technology to produce functional and clean label ingredients from food products and its co-products. In order to do so, the applied technology is mild and uses the natural crop or co-product which can thereby be cleanly labelled.

This project aims at gaining functional powders since for most applications powders are best suited. The process of water removal however should not lead to losses in functionality and valuable components and therefore requires mild technology.

Within this project the crop asparagus and the co-product from cabbage and lettuce processing are used as example. Asparagus powder can be added to food products like ready-to-eat meals, soups and sauces for increasing flavor and taste. Furthermore, the bottom part of the asparagus contains saponins which may have anti-cancer properties. Cabbage contains precursors of flavor components that may be isolated from cabbage co-product and used in ready-to-eat meals. Furthermore, it is expected that cabbage contains various Sulphur-containing secondary metabolites with anti-oxidant, anti-inflammatory and even anti-carcinogenic properties.

<b>Planning and progress</b> (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?	no
Is there a delay and/or deferred delivery date?	The go/no-go after one year is delayed. This decision is based on a consumer panel evaluation of the obtained dry asparagus product. On the one hand there was a delay in the food-safe production of this product, while on the other hand it still needed to be tested at Unilever. The delay will probably not influence the end-date of November 2019.
Are there any substantive bottlenecks?	no
Are there any deviations from the projected budget?	no

<b>Results in 2018/ so far</b>
<p>Give a short description of the high-lights and (most important) project deliverable in 2018 / so far and their target group</p> <p>The highlight of the project is the production of an asparagus product that still contains the asparagus flavor. Our own non-expert opinion, still needs to be confirmed by the Unilever consumer panel.</p> <p>Project deliverables that were met are:</p> <ul style="list-style-type: none"> <li>- List of potential health promoting components and flavor precursors from cabbage processing co-products;</li> <li>- Production of an asparagus product for evaluation of mild drying technologies</li> <li>- Product specifications of end-users in relation to powder and flavor properties and composition;</li> <li>- Evaluation of the business cases (to be continued for the drying);</li> <li>- Production of ample material for evaluation by end-users;</li> <li>- Quotations for industrial plant (to be continued for the drying).</li> </ul>

<b>Number of delivered products in 2018 / so far</b> <i>(in an appendix, please provide the titles and/or description of the products or a link to the products on public websites)</i>			
Academic articles	Reports	Articles in journals	Introductions/workshops
	Interesting components from iceberg lettuce and white cabbage by Aard de Jong & Marieke Bruins		