



<b>General information</b>	
PPP-number	AF18050
Title	Protein Valorisation from Brewers' Spent Grain
Theme	
Implementing institute	FBR
Project leader research (name + e-mail address)	Wim Mulder (wim.mulder@wur.nl)
Coordinator (on behalf of private partners)	Derk van Manen (Duynie)
Project-website address	-
Start date	01-02-2019
Final date	31-01-2022

<b>Approval by the coordinator of the consortium</b>	
The annual report must be discussed with the coordinator of the consortium. The "TKI's" appreciate additional comments concerning the annual report.	
Assessment of the report by the coordinator on behalf of the consortium:	<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Not approved
Additional comments concerning the annual report:	

<b>Summary of the project</b>	
Problem definition	The beer brewing industry generates large amounts of brewers' spent grain (BSG). In the Netherlands alone the total production of this side stream, containing up to 30% protein, is 0.5 million tonnes annually. BSG is currently used as low-value animal feed, while having potential in the food market, and is therefore underutilised. Upgrading BSG to the food market will therefore significantly contribute to prevent future protein shortage. Additionally, the world faces climate changes. This requires reduction of CO <sub>2</sub> emissions, or rather, reducing the environmental foot print of food production chains.
Project goals	The aim of this project is to sustainably increase the value of BSG by isolating and valorising its protein content into valuable food ingredients, leaving the process residue for lower value feed applications. An integrated, highly efficient biorefinery approach is proposed to valorise this side stream.

<b>Results</b>	
Planned results 2019	Base case

Achieved results 2019	<p>A the beginning of the project a literature research was performed by WUR on the available knowledge of extracting protein from brewers' spent grain (BSG). This information was completed with the knowledge both on experimental level and patent surveys available at Duynie and Heineken. This knowledge was being used as input for the practical work plan.</p> <p>For the extraction of proteins from BSG, the experimental set up, that was developed at WUR for the extraction of proteins from micro-algae, was used as a starting point. As a first step in the process, the solubility of the protein was investigated using different types of enzymes. Alcalase was identified as a highly-efficient enzyme to hydrolyse and solubilise in the supernatant. Subsequently, the supernatant was further processed Implementing an integrated process.</p>
Planned results 2020	<p>For 2020 the process will be optimized in order to increase the yield of proteins in the downstream process while maintaining a high-protein purity. The process will analysed by creating kinetics around each step of the process in order to find the optimal parameters. The cost efficiency of the whole process will be taken into account.</p> <p>At Duynie, the process will be scaled up step by step in order to produce significant amounts of protein for further testing on functionality of the protein.</p>

<p><b>Deliverables/products in 2019</b> (provide the titles and /or a brief description of the products/deliverables or a link to a website.</p>
<p><u>Scientific articles:</u></p> <p>No</p>
<p><u>External reports:</u></p> <p>No</p>
<p><u>Articles in professional journals/magazines:</u></p> <p>No</p>
<p><u>(Poster) presentations at workshops, seminars, or symposia.</u></p> <p>Poster at "Food Valley Summit the Protein Planet"</p>
<p><u>TV/ radio / social media / newspaper:</u></p> <p>No</p>
<p><u>Remaining deliverables (techniques, devices, methods, etc.):</u></p> <p>No</p>



<https://www.wur.nl/nl/Onderzoek-Resultaten/Onderzoeksprojecten-LNV/Expertisegebieden/kennisonline/Protein-Valorisation-from-Brewers-Spent-Grain.htm>