LAYMAN'S REPORT

REFRESHMENT: Pilot for enviRonmEntally FRiendly, Efficient, Sustainable and Healthy products developMENT

Ref: LIFE15 ENV BE 000267

Refreshment

Life

ABInBev

Project reference
LIFE15 ENV BE 000267

Project location
AB InBev breweries of Leuven and Jupille (Belgium)

Project website
https://ab-inbev.eu/life-projects/

Duration
Start date: 01/07/2016
End date: 31/12/2019

Total budget
2,312,910 €

EU contribution
834,792€
(55% of eligible costs)

Coordinating beneficiary:

Anheuser-Busch InBev

Anheuser-Busch InBev is the leading global brewer and one of the world's top five consumer products companies. Beer, the original social network, has been bringing people together for thousands of years and their portfolio of well over 200 beers brands continues to forge strong connections with consumers.

The star of the project: Brewer's Spent Grains (BSG)

The main ingredient in the brewing process is barley:

- Barley is malted prior to the addition to the brewing equipment, releasing the enzymes necessary for the mashing process.
- During the mashing process, the sugars are extracted from the malt kernels, together with soluble proteins and polyphenols, and fermented into beer.
- Barley gives to the beer its body and colour and contributes to the beer taste.
- The leftover barley (or brewer's spent grain) is historically discarded as a by-product of the brewing process although it is rich in protein and fibres.

LIFE REFRESHMENT PROJECT

The objective of this LIFE project is to develop a new and innovative method to use BSG as a raw material for food ingredients formulation. By developing alternative uses of BSG, AB InBev strives to build a more sustainable brewing process and increase the resource efficiency, fully compliant with the circular economy concept. These goals are totally aligned with AB InBev's dream to create a better world. LIFE REFRESHMENT aims to contribute to the transition towards a circular economy by:

- Developing new ingredients based on BSG, to be used in a large range of food applications, from bakery products to beverages.
- Developing prototypes of these applications to demonstrate the behaviour of the ingredients.

The ingredients developed through the LIFE REFRESHMENT project include a fermented, homogenized beverage base, a fermented, filtered beverage base and two nutritional powders, rich in proteins and fibres.

The first phase of the process was focused on the development and optimization at lab scale of the beverage bases. These were then transferred to the demonstration scale in the Research Pilot Brewery (RPB) in Leuven, to be finally transferred at industrial scale in the Jupille brewery.

In parallel, the development of the powder product line was performed, in collaboration with the Jupille brewery. The transformation of BSG into dry ingredients is now implemented and running at semi-industrial scale in Jupille and is commercialized under the name EverVita Pro and EverVita Fibra. (https://evergrainingredients.com/)

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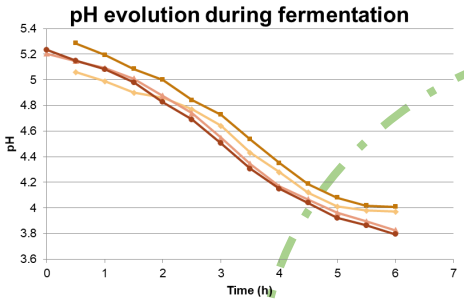
Key Achievements

Lab scale development of fermentation technology:

Development of the simultaneous saccharification and fermentation process, in collaboration with University College Cork



Demo implementation in Leuven RPB:

Scale up of the process to 300 L scale

Canvas launch in US:

First application containing the fermented base

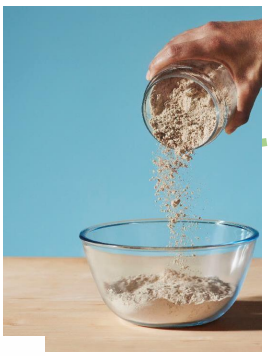
canvas

Industrial scale implementation in Jupille

Food grade cropping of BSG and 50 hL fermentation tank

First dry ingredients

2 nutritional powders produced for commercial sampling to customers



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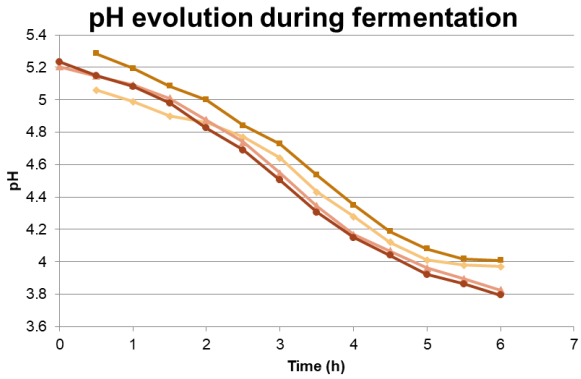
Beverage base development

The Yeast and Fermentation lab in Gitec, in collaboration with the University College of Cork, developed a way to ferment and stabilize the BSG, through a proprietary technology and with the help of *Lactobacillus* bacterial strains.



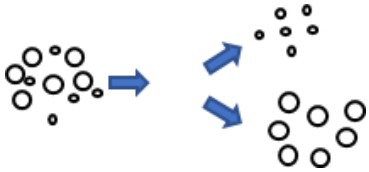
In August 2018, the transfer of the technology to the Research Pilot Brewery of AB InBev in Leuven allowed the team to perform lactic acid fermentations inside the brewery! Next this technology was transferred to industrial scale at the Jupille brewery in September 2019.

The team supported the replication of the technology in the Newark brewery and the launch of Canvas on the West Coast of the US. Canvas was the first commercial beverage using BSG, and since then reformulated into Take Two, a new barleymilk.
(https://www.taketwofoods.com/)

Dry ingredients optimization

A second range of ingredients was developed. In this process, BSG are stabilized through drying (low water activity), instead of through fermentation (low pH). Several drying techniques were investigated, including ring drying and fluidized bed drying.

1. Milling



2. Fractionation

The dry powder is then milled and classified with a patent pending process. These two mechanical steps allow to reduce the particle size of the BSG, as well as partially separate the protein and the fibre fractions. Combined with the low carbohydrate content, the two fractions have exceptional nutritional properties.

The resulting fractions, commercialized under the name EverVita Pro and EverVita Fibra, have been tested in various applications. The first commercial agreements for the supply of those ingredients have been signed at the end of 2019.

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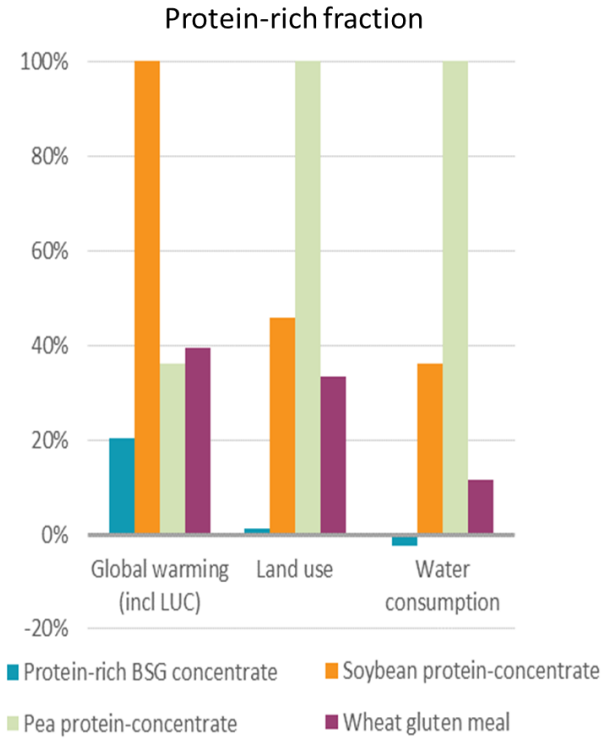
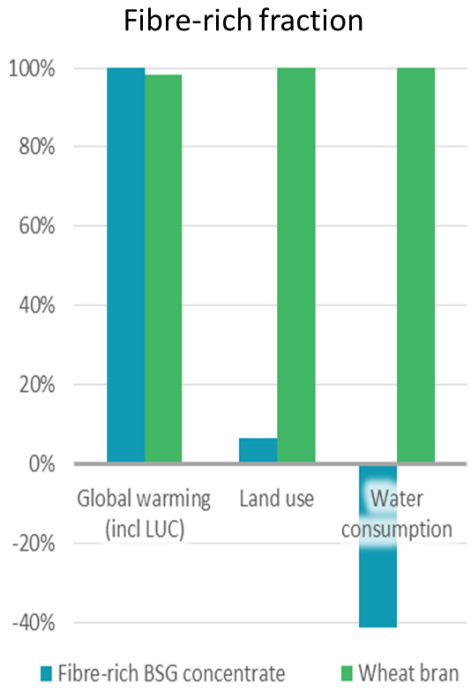
Environmental impact assessment

AB InBev conducted a Life Cycle Assessment (LCA), focused on the production of the dry ingredients (EverVita Pro and EverVita Fibra). These ingredients were compared to other plant-based ingredients. More specifically, the protein concentrates from pea and soy, as well as wheat gluten meal were compared to the protein-rich fraction of BSG, while the fibre-rich fraction was compared to wheat bran.





The protein rich fraction is performing at least 2 times better than the alternatives on the market in each category. The fibre enriched version, on the other hand, has a similar footprint as wheat bran, but performs better in terms of land use and water consumption.

Dissemination and project management

The project team attended and organized more than 12 events during the 3.5 years of the project. The results of the team have been shown on the project website and shared through the team members' social media.

Pilot demonstration event
Jupille, March 2019

Conferences: 4

European Business Summit
2019

Focus on students through
4 job fairs

Website:
https://ab-inbev.eu/life-projects/

LIFE REFRESHMENT

Recycling brewer Spent Grains in innovative industrial applications

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Start date: 01/07/2016

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Acknowledgements:

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Special thanks to the team members and staff for their involvement and enthusiastic contribution to this project.