

QREN - R&D Project 23141\12 Consortium ISA/UTL + Panidor + Metalogonde



Bread with Brewer's Spent Grain

Beer production generates a huge amount of BSG to be discarded, mostly used as feed. This is a nutritionally rich product to be valued and re-introduced into the food chain in one Circular Economy rationale.

Brewer's spent grain (BSG) dried on a drier developed by **Metalogonde** was used on bakery products contributing to a higher nutritional value and impact on health. The resulting functional breads produced at **Panidor** and developed at **Instituto Superior de Agronomia/University of Lisbon**, were rich in fiber and essential fatty acids, like $\omega 3$ and $\omega 6$, and present dark crust and crumb, good volume and good texture features. This study revealed a high anti-oxidative stability in bread baking process, as evidenced by the synergy between BSG and linseed for fatty acid preservation. BSG has a protective effect on fatty acid oxidation due to its high fiber content.

The innovative characteristics of this project was the direct use of BSG in raw material, without any component extraction and the contribution for less negative environmental impact of this by product discard.

Authorship

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AWARDS



Food & Nutrition Awards 2014 – 1st Honorable mention in R&D category - “Valorization of the by-product beer drecche: drying technology and incorporation in bakery products” – by the Portuguese Nutritionists Association (APN)

Illustrative photos

Wet BSG (H ~ 70 %)



Drying



Dried BSG,
moisture <10 %

Milling



BSG flour, $\varnothing < 0,5$ mm

Bakery
incorporation



Dried BSG



Dried BSG



BSG flour

Breadproduction in industry

Breadwith 7%BSGf



Pleasant aroma, appealingcolour, crispycrust, tastycrumbwithgood texture

Parameters (% dry basis)	Control bread	Bread with 7% BSGf
Protein	9,2 ± 0,47	10,6 ± 0,39
Lipids	2,3 ± 0,16	3,3 ± 0,10
Soluble fiber	3,7 ± 0,07	4,1 ± 0,33
Insoluble fber	12,2 ± 0,41	15,2 ± 0,23

Bread with better
nutritional
characteristics