CDR Paper 1703

CDR e CNR-IBIMET for the research in innovation in brewing process.

The important study "Beer-brewing powered by controlled hydrodynamic cavitation: Theory and real-scale experiments" is done by the Institute of Biometeorology *of* National Research Council *in Florence, Italy. The chemical analysis has be done by the* CDR BeerLab®*.*
The article about this study is published in the ***Journal of Cleaner Production.***

Abstract

The basic beer-brewing industrial practices have barely changed over time. While well proven and stable, they have been refractory to substantial innovation. Technologies harnessing hydrodynamic cavitation have emerged since the 1990s' in different technical fields including the processing of liquid foods, bringing in advantages such as acceleration of extraction processes, disinfection and energy efficiency. Nevertheless, so far beer-brewing processes were not investigated. The impacts of controlled hydrodynamic cavitation, managed by means of a dedicated unit on a real microbrewery scale (230 L), on the beer-brewing processes is the subject of this paper. The physico-chemical features of the obtained products, analyzed by means of professional instruments, were compared with both literature data and data from the outcomes of a traditional equipment. Traditional processes such as dry milling of malts and wort boiling becoming entirely unnecessary, dramatic reduction of saccharification temperature, acceleration and increase of starch extraction efficiency, relevant energy saving, while retaining safety, reliability, scalability, virtually universal application to any brewing recipe, beer quality, were the most relevant experimental results. The impacts of these findings are potentially far reaching, beer being the worldwide most widely consumed alcoholic beverage, therefore highly relevant to health, environment, the economy and even to local identities.

Picture 1. Pilot plant brewing by hydrodynamic cavitation

The results of this scientific paper are published on the ***Journal of Cleaner Production*** (Albanese, Ciriminna, Meneguzzo, & Pagliaro, 2017)[1] and have received important independent reviews. As the article published in the authoritative **Technology Review of Massachusetts Institute of Technology (MIT)** ***("This Technology Is About to Revolutionize Beer-Making,"*** 2016),[2] as well as the article in the **Draft Magazine** (Bernot & Fowle, 2017)[3] and the mention of the **Cornell University Library.**

Figura 3. Analysis by CDR BeerLab®, in the Laboratory of the fermentation plant.

[1] CDR BeerLab® analyzer is mentioned on pag. 1460
[2] https://www.technologyreview.com/s/602464/this-technology-is-about-to-revolutionize-beer-making/
[3] http://draftmag.com/brewing-innovations-research-science/

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