

*Pilot VHG brewing: pure oxygen, yeast preconditions or higher temperatures?*

**José António Teixeira<sup>3</sup>**, Luis Lima<sup>1</sup>, Tiago Brandão<sup>2</sup>, Nelson Lima<sup>3</sup>

<sup>1</sup>Universidade do Minho, Departamento de Engenharia Biológica, Braga, Portugal, <sup>2</sup>Unicer Bebidas, SÁ, Leça do Balio, Portugal, <sup>3</sup>Universidade do Minho, Braga, Portugal

#### **DESCRIPTION OF TOPIC:**

The use of unsaturated fatty acids to supplement the yeast slurry before pitching allowed faster extract reduction and lower final attenuation than fermentations with 22-24ppm of initial O<sub>2</sub>. The use of the nutritive cocktail to supplement the yeast slurry avoided the intense foaming observed during the first hours of 18°C fermentations. At VHG condition, diacetyl was reduced below 0.1 mg/L before the primary fermentation was completed. The variation of the higher alcohols/esters ratio ranged only between 3.7 and 4.7. The sensorial triangular test between the VHG beers without nutritional treatment and standard conditions showed identical aroma profiles. This is an important indicator of the feasibility of VHG brewing at 18°C to obtain identical profiles when compared to 15°P wort fermented at 12°C. The sensorial test indicated that wort saturation with pure O<sub>2</sub> can be replaced by yeast treatment with unsaturated fatty acids without changes in the beer aroma profile

#### **José Teixeira**



José Teixeira is Professor of Biological Engineering at Universidade do Minho. José Teixeira graduated in Chemical Engineering at Universidade do Porto, in 1980, the same university where he obtained his PhD in 1988. His main research interests are bioprocess development, yeast physiology and food technology. He was the Principal Investigator of 32 research projects and supervisor of 31 PhDs and 16 pos-doc researchers. He authored/co-authored over 310 peer-reviewed papers.