



Production and characterization of oat malt, and Principal Component Analysis (PCA)

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Track

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Keywords

Malting, antioxidant activity, Germination Oat malt is a promising food to promote satiety due to its high content of phenolic compounds with antioxidant capacity and β -glucan fibers. In this study, nutritional quality of ten types of oat malt were investigated. Grains of cultivars Corona and Afrodite were macerated for 8h at 10, 15, 20, 25, and 35°C, then germinated at 20°C /5 days and dried at 60°C for 48h. SEM analysis showed the presence of fibers in all malts oat and oats . High starch hydrolysis of the macerated malts occurred at 25 and 35°C for both cultivars during germination, because of amylases synthesis. Principal component analysis (PCA) was performed to correlate the maceration temperature with analyses of: reducing sugars (RS), proteins, dietary fibers, total phenolic compounds (TPC) (Folin-Cicalteu), Antioxidant Activity (AA) (DPPH, ABTS and FRAP), and caffeic, vanillic, coumaric and ferrulic acids (HPLC). Four PC accounted for 87.83% of the data variance. No difference in fiber content was observed for malt samples regarding oat samples, while protein content had a slight reduction due to the proteases. Corona malts obtained at 15°C had lower TPC (3.59mg of GAE g⁻¹) when compared to 25 and 35°C (5.12, 5.02mg of GAE.g⁻¹, respectively). Afrodite malt macerated at 25 and 35 °C showed increased values of AA by ABTS (5.21, 5.06 μ mol trolox g⁻¹) and FRAP (3.49, 4.15 μ mol trolox g⁻¹), and higher levels of RS than Corona. Corona oat had the highest contents of caffeic acid (0.210mg g⁻¹) and vanillic acid (0.187mg.g⁻¹). However, its malts had a reduction in the content of these compounds and an increase of ferrulic and coumaric acids. PCA analysis allowed to modulate the properties of obtained malts and, for both cultivars, germination was influenced by the maceration temperature at 25 and 35°C which presented high content of dietary fibers and phytochemicals with antioxidant activity.