

Valorization of brewing industry wastes: Proximal and functional characterization of malted barley (*Hordeum vulgare*) bagasse meal.

GAVIRIA Y. (1), ARCILA E. (1)

1 Universidad de Antioquia, Medellín, Colombia

The main solid input for brewing beer is malted barley. After brewing, the main by-product generated (approximately 85% of the total) is the spent grain (Brewer's Spent Grain - BSG). This by-product is frequently used for animal feed or discarded in landfills. It is estimated that up to 37 million tons per year are generated worldwide, representing a high potential for utilization according to its composition. This study determined and characterized the nutritional and antioxidant quality of malted barley bagasse meal from the production of craft beer in Colombia, with a view to the integral utilization of raw materials and the reduction of agroindustrial waste generation. The characterization of the by-product was carried out in accordance with the AOAC (Association of Official Analytical Chemists). The determination of antioxidant activity was carried out by implementing three quantitative methodologies, TEAC (Trolox Equivalent Antioxidant Capacity), FRAP (Ferric ion Reducing Antioxidant Power) and ORAC (Oxygen Radical Absorbance Capacity). Regarding the proximal characterization of malted barley bagasse flour, it was found that its main macro compounds are fiber and protein with values of 74.0 % and 14.3 %, respectively, on a dry basis. With respect to antioxidant capacity, it was found that the flour presented results for TEAC of 2602.6 $\mu\text{equ Molar trolox}$ per 100 milligrams of sample, with respect to FRAP activity, a value of 1823.1 $\mu\text{equ Molar trolox}$ per 100 milligrams of sample was found, and for ORAC of 1057.8 $\mu\text{equ Molar trolox}$ per 100 milligrams of sample. Based on the results, it can be concluded that the by-product obtained after the craft beer brewing process presents in its composition mainly insoluble fibers and soluble proteins; with respect to antioxidant activity, malted barley bagasse flour presents relatively high values compared to similar by-products of the food industry. According to the results, it is recommended to explore the use in food matrices rich in fiber and/or enzymatic hydrolysis of proteins to obtain peptides with higher antioxidant activities.