

Kanchana Intarasil 2006: Preparation of Protein Products from Brewer's spent grain.

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Beer making process produces high amount of Brewer's spent grain (BSG), which contains 26-30 % protein. Objectives of this research are to find optimum conditions for preparation of protein flour, protein concentrate and protein isolate from BSG, and to examine their chemical compositions and functional properties. Dried BSG consisted mainly of the large pieces of barley husk and small pieces of other structure. When dried BSG was separated into 7 fractions by sieving through a series of sieves no. 30, 60, 80, 100, 120 and 140 mesh, it was showed that protein content increased, while crude fiber content decreased with size decreasing. Most protein remained in fraction 1, which had the largest size. But when dried BSG was milled before sieving, proteins distributed more in other fractions. High protein flour could be prepared by sieving through only one sieve. The optimum condition for protein extraction were using BSG which passed through 140 mesh sieve, which had 45.68% protein as starting material and extracting at pH 12 for 60 minutes. Protein concentrate and protein isolate yield were 16.47 and 13.78% base on protein flour and had 19.80 and 24.57 % protein recovery respectively. All 3 protein products had higher in glutamic acid and prolene and lower lysine than FAO/WHO standard. Protein flour had less solubility at various pH, and less water absorption capacity (3.63 g/g sample), but highest oil absorption capacity (2.54 g/ g sample). Protein concentrate had highest solubility at pH 3-8, water absorption capacity and oil absorption capacity were 4.10 and 2.46 g/g sample respectively. Protein isolate had solubility lower than that of protein concentrate at pH 3-8 but higher at pH 9-10. Its water absorption capacity and oil absorption capacity were 4.69 and 2.22 g/g sample respectively. All 3 protein products had emulsion activity. Protein concentrate had highest emulsion stability, followed by protein isolate and protein flour. Their emulsion stabilities at 1 % protein concentration were 51.46, 48.04 and 20.26 % respectively. Emulsion stability was increased with increasing protein concentration.

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