

C 627110 : MAJOR FOOD TECHNOLOGY
KEY WORD:

BREWERS' SPENT GRAIN / PROTEIN HYDROLYSATE / DIETARY FIBER

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HYDROLYSATE AND DIETARY FIBER FROM BREWERS' SPENT GRAIN.

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The conditions to produce protein hydrolysate and to use fiber from Brewers'spent grain (15.53 %protein, 6.02%fat, 13.62 %fiber on dry basis) were studied. Protein from spent grain was prepared by using wet seiving. The best condition to obtain the highest protein and yield of protein (29.65 % and 7.79 %on dry basis respectively) was to use 35 mesh sieve. Fat was extracted from spent grain protein by varying ratio of spent grain protein to ethanol. The appropriate condition was to use protein per ethanol at 1:40 for 1 hour. The spent grain protein prepared contained 41.22%protein and 1.16 % fat on dry basis which was used as the substrate for hydrolysis by bromelain (2mAnson-E/mg) and papain (30,000 USP-U/mg). The best condition to produce protein hydrolysate from this protein fraction by bromelain was to use 0.5 % bromelain on dry basis of the spent grain protein, at 55 °C for 48 hours giving amino nitrogen of 0.48 g/L. For protein hydrolysate by papain, the condition was to use 1.0 %papain on dry basis of spent grain protein, at 50 °C for 48 hours which resulted in protein hydrolysate with amino nitrogen of 0.42 g/L. Both protein hydrolysates produced were yellow, clear, slightly sweet and with cereal flavour (similar to fresh malts). The sensory quality of spent grain hydrolysate produced by using bromelain was better than the other ($p \leq 0.05$). The hydrolysate contained all essential amino acid. This hydrolysate was used to prepare protein hydrolysate sport drink. The sensory quality of protein hydrolysate sport drink was improved by adding flavour compared with control. The most acceptable formula was to use pineapple flavour, which were stored at 4-10 °C after pasteurization at 80 °C for 1.5 minute. It was found that the sport drink could be stored for at least 30 days

Cookies were made by adding dietary fiber from spent grain at different size and amount. The best cookie was produced by using fiber that passed through 50 mesh sieve at 5%of flour weight. This cookie was 15 times higher in dietary fiber. Lecithin and pacto-3® (contains 50 % sodium stearoyl lactate and 50 % calcium stearoyl lactate) were used as emulsifier in the cookies. Using pacto-3® at 0.1 % by flour weight gave the best appearance. This was consequently chosen to study the storage test for 2 months with three types of packaging: polyethylene(PE), aluminium foil (PE/aluminium), metallized film (OPP/OPP/metallized). By sampling every 2 weeks, it was found that as storage time increased, the moisture content and peroxide value ($p \leq 0.05$) of the cookies in PE bag increased. After storage for 2 weeks in PE bag, the cookies became unacceptable. Cookies packed in aluminium foil and metallized film were slightly changes in moisture content and peroxide value ($p \leq 0.05$) and could be kept for at least 2 months.

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