Thesis Title	Production of Yeast Extracts from Spent Brewer's Yeast.
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ABSTRACT

The production of yeast extract from spent brewer's yeast (*Saccharomyces carlbergensis*) and compressed baker's yeast (*Saccharomyces cerevisiae*), based on autolysis was studied on laboratory and pilot scale. The average composition of raw material yeast was first analyzed. The optimum conditions of the autolysis of brewer's yeast were studied in term of the reaction time, initial yeast concentrations, reaction temperatures and initial pH. The optimum conditions for maximal solids and nitrogen yield were at 50 °C, pH 5, solid content about 15-20% for 48 hr.

For using the brewer's yeast as raw material, debittering before autolysis was necessary. An alkaline washing by 2% sodium carbonate or 0.5% sodium hydroxide at pH 10 was found to be optimum for debittering in laboratory scale experiments and then was used in pilot scale productions. An alternative method, solvent extraction

with n-hexane was also carried out for removal of bitter substances from yeast extract after autolysis. The optimum ratio between yeast extract and solvent was 1:5.

A complete production process in a pilot scale was established. Yeast slurry was converted into yeast extract through several steps namely, autolysis, centrifugation and concentration of the product prior to spray drying. A material balance of the process was studied based on dry matter and Kjeldahl protein recoveries. Regarding to debittering, the extract yield of non-debittered yeast was higher than that of debittered yeast and was slightly increased with increasing the autolysis time. An influence of different yeast strains was also studied. It was found that the extract yield of baker's yeast was higher than that of brewer's yeast. Solvent extraction using n-hexane is a possible alternative for the removal of bitterness substances from autolysed yeast extract.

Except for their salt contents, the chemical composition of final products obtained from the experiments was similar to that of commercial yeast extracts for food use. Microbiological analyses were performed to determine the safety quality of yeast extract products. Microbial counts from the products obtained from the experiments were acceptable as compared with those of the commercial products. Ribonucleic acid (RNA) contents in yeast cells and yeast extract products were determined by two methods, namely an ultraviolet absorption measurement and an orcinol method. It was found that the yeast extracts contained about 8-12 % of RNA. Overall, these results supported the production feasibility and the product quality in term of flavor characteristics of various yeast extracts obtained in these experiments.