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Development of the Manufacturing Process of Low Salt-Fermented Soy Sauce

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Abstract : This study was initiated in order to develop a method for soy sauce fermentation at low salt concentrations without decreasing quality. Soy sauce was fermented with the fermentation starter (meju) and different salt contents (8-14%, w/v) by inoculating two strains or not, in which Torulaspora delbrueckii and Pichia guilliermondii strains having different abilities to induce sterilizing effects or enhance flavor production were used. As the results, there were microbial and biochemical differences among prepared soy sauce. First, Staphylococcus and Enterococcus spp. in addition to Bacillus genus that is the most important bacteria in Korean fermented soy product were detected by salt reduction. However, application of yeast starters can inhibit the undesirable bacterial growth. Moreover, PCA bi-plots of major principal components on various biochemical parameters (final pH, total acidity, soluble sugar, reducing sugar, ethanol and 32 volatile flavor compounds) were drawn to demonstrate the physicochemical differences and similarities among the samples. It was confirmed that the soy sauce samples produced with different salt concentrations were clearly different since salt reduction induced low contents of acids, alcohols and esters with higher acidity. However despite low salt concentration, combining two different yeasts appeared to have similar characteristics to the high salt-fermented soy sauce with elevated concentrations of ethanol, some alcohols, and most ketones, hence resulted in a balance of more complex and richer flavors with a flavor profile pattern identical to that of high-salt.

Keywords : Soy sauce, low salt, fermentation, yeast.
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