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Utilization of Cheese Whey for Alcohol Fermentation Medium

Sang-Pil Kim, Hee-Kyung Park, Do-Hwan Kim* and Tae-Ryeon Heo

Department of Biotechnology, Inha University

In order to use whey lactose in alcohol fermentation, we investigated fermentation conditions of *Saccharomyces cerevisiae* and *Kluyveromyces fragilis* in lactose-hydrolyzed whey with β-D-galactosidase. And optimum conditions of the above two yeasts through oxygen regulation by Pasteur effect which is the characteristic of the yeast were determined. In addition, optimum condition for application of fermented whey in Tak-ju process was also examined.

With 0.7% β-D-galactosidase, 93% lactose was hydrolyzed at pH 6.5 in 30 minutes. Because *S. cerevisiae* is unable to ferment galactose, the production of ethanol by *S. cerevisiae* was lower than that of *K. fragilis* in lactose-hydrolyzed whey. But ethanol productivity by *S. cerevisiae* was higher than that by *K. fragilis* in glucose added whey .

In fermentation with oxygen regulation and addition of 60 g/ℓ glucose, the ethanol productivity of *K. fragilis* and *S. cerevisiae* were 18.9 g/ℓ (11.8% increase) and 43.5 g/ℓ (22.1% increase), respectively. It appeared that the ethanol productivity of *S. cerevisiae* was higer than that of *K. fragilis* under the above conditions. In ethanol fermentation added rice starch, *Aspergilius oryzae* hydrolyzed 80% of starch in 60 hours, and the production of ethanol was 80.2 g/ℓ