


Study on protein removal for low-protein rice

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Abstract

Nowadays, some people have problems with protein intake, especially patients with pre-dialysis kidney disease. Thus, low-protein rice was of interest in this study. The main objective of this study was to find an efficient approach for removing protein from rice. According to research, there are several ways to remove protein from rice, including using proteolytic enzymes to remove the protein. Trypsin enzyme can be used with natural fermentation. The enzyme can decrease protein content from 75.1 to 43.2 g kg⁻¹, dry base. Moreover, the hybrid enzymes from *Aspergillus oryzae*, *Rhizopus niveus* and *Aspergillus niger* can also be used to remove the protein by using the different times (0, 5, 24 hrs.) and concentrations (0.01, 0.05, 0.1 %, w/v). The study found that hybrid enzymes can decrease rice protein easier than using only one enzyme. Besides, higher protein removal was found by high concentrations and times in the study. The protein content 2.9% dry weight was obtained at 24 hrs. with an enzymy concentration of 0.1% w/v. Protein hydrolysing enzymes were not the only way to remove protein, but alkalis and surfactants were also used for protein removal. In a trial, 0.1% NaOH, 0.2% NaOH, 1.2% Dodecylbenzene Sulfonate (DoBS) and 1.2% Sodium Lauryl Sulfate (SLS), were used for protein extraction solutions. The rice starch was more effectively removed than protein using 1.2% DoBS than 0.1%, 0.2% NaOH, and 1.2% SLS. It was also found that increasing temperature was not recommended for protein removal, because it affected the loss of rice starch. However, the amount of protein removal was slightly increased.

Keywords: low-protein, rice, protein removal, enzyme, kidney disease

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