CURRENT RESEARCH AND DEVELOPMENT IN BIOTECHNOLOGY ENGINEERING AT IIUM

VOLUME II

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INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

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PRODUCTION OF GELATIN REPLACERS FROM MALAYSIAN TUBEROUS PLANTS

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ABSTRACT

This research work was conducted to explore the potential of tuberous plants as sources of gelatin replacers. The tuber of yam and sweet potato commonly consumed and grown in Malaysia were used as raw material. The starch compounds were extracted by using different process condition that will optimize the extraction of starch. The design of experiment and statistical analysis were done using statistical software Design Expert for optimization. The process conditions selected were the alkali concentration, steep temperature and steep time. The effect of the three process parameters were evaluated for their effect on yield, protein content and viscosity of starch. Two-level full factorial design was used to investigate the process. All main effects and interactions were found to have significant effect on protein content in the extracted starch. The viscosity of the starch was affected by the three main effects and the three two-factor interaction effects. Conditions that produced a high starch yield, low protein and high viscosity were 0.1% alkali concentration, 25°C temperature and 30min steep time for both yam and sweet potato starch.

Keywords: gelatin replacers, yam, sweet potato, RSM, starch

INTRODUCTION

Gelatin is a valuable protein derived from animal by-products, serving multiple functions with a wide range of applications (Karim & Bhat, 2008; International Trade Centre (ITC), 1984). It is a product obtained by partial hydrolysis of collagen derived from animal skin, white connective tissue and bones (Morrison *et. al.*, 1999). It is one of the most popular biopolymers and also has been regarded as a special and unique hydrocolloid.

Gelatin has long been used in food industry, pharmaceutical industry, photographic industry and other applications. In the food industry, gelatin is utilized in confections (mainly for providing chewiness, texture, and foam stabilization), dairy (to provide stabilization and texturization), low-fat spreads (to provide creaminess, fat reduction, and mouthfeel), baked goods (to provide emulsification, gelling, and stabilization), and meat products (to provide water-