ABSTRACT

EFFECT OF RED PALM OIL CONCENTRATION AND TIME ADDITION ON TOTAL CAROTENOID CONTENT AND RICE STARCH STRUCTURE

By

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Red palm oil (RPO) is a product of palm fruit processing that has good phytonutrient content such as carotenoids. RPO fortification in rice is expected to make rice a functional food that is high in total carotenoid content. The purpose of this study was to determine the effect of concentration and method of RPO addition on total carotenoid content and starch structure of rice. The results showed that there was an significant effect on the total carotenoid content of rice and the structure of rice starch on the concentration and method of adding RPO. The highest total carotenoid content was produced by rice with the addition of 4% RPO which produced a total carotenoid content of 213.2 ppm. FTIR analysis showed that RPO rice had changes in peak intensity at 2922 cm^{-1}, 2850 cm^{-1}, 1744 cm^{-1}, and 1640 cm^{-1}. SEM analysis showed smooth granule surface for native rice starch and uneven granule surface in rice granules with 2% MSM added. EDX analysis showed differences in the proportion of C and O atoms of rice with RPO addition compared to native rice starch.

Keywords: carotenoid, rice, RPO, FTIR, SEM EDX

ABSTRAK

PENGARUH KONSENTRASI DAN WAKTU PENAMBAHAN MINYAK SAWIT MERAH TERHADAP KADAR TOTAL KAROTENOID DAN STRUKTUR PATI NASI

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Minyak sawit merah (MSM) adalah produk hasil pengolahan buah sawit yang memiliki kandungan fitonutrien yang baik seperti karotenoid. Fortifikasi MSM pada nasi diharapkan dapat menjadikan nasi sebagai pangan fungsional yang tinggi akan kadar total karotenoid. Tujuan dari penelitian untuk mengetahui pengaruh konsentrasi dan cara penambahan MSM terhadap kadar total karotenoid dan struktur pati nasi. Hasil penelitian menunjukkan terdapat pengaruh nyata mengenai kadar total karotenoid dan struktur pati nasi terhadap konsentrasi dan cara penambahan MSM. Kadar total karotenoid tertinggi dihasilkan oleh nasi dengan penambahan MSM 4% yang menghasilkan kadar total karotenoid sebesar 213,2 ppm. Analisis FTIR menunjukkan bahwa nasi MSM mengalami perubahan intensitas puncak pada 2922 cm^{-1}, 2850 cm^{-1}, 1744 cm^{-1}, dan 1640 cm^{-1}. Analisis SEM menunjukkan permukaan granula yang halus untuk pati nasi asli dan permukaan granula yang tidak rata pada granula nasi dengan penambahan MSM 2%. Analisis EDX menunjukkan perbedaan proporsi atom C dan O nasi dengan fortifikasi minyak sawit merah yang dibandingkan dengan pati nasi asli.

Kata kunci: karotenoid, nasi, minyak sawit merah, FTIR, SEM EDX