Biotransformasi isoflavon oleh rhizopus oryzae uicc 524 dan rhizopus mirosporus var chinensis uicc 521 pada fermentasi tempe dan aktivitas antioksidan isoflavon aglikon terhadap oksidasi minyak kedelai

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Abstrak

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SUMMARY
Food deterioration is often due to lipid oxidation, excluding bacterial and enzymatic spoilage. The end-products of lipid oxidation, such as aldehydes, ketones, and alcohols are responsible for unacceptable off-tiavors and off-odors in food. Lipid oxidation can be inhibited by antioxidants.
Soybean tempe is the most popular indigenous fermented food in Indonesia. Soybeans are known to contain isotiavones. Four major forms are known respectively as acetylglycosides, malonylglycosides, glycosides, and aglycones.
Tempe were produced from soybean fermentation by Rhizopus oryzae UICC 524 and Rhizopus microsporus var. chinensis UICC 521. The tempe samples were extracted with methanol and the extraction defatted with hexa» ne. The isoflavone aglycones were isolated using column chromatography, and then anaiyzed using a gradient elution reverse phase of high-pressure liquid chromatography (HPLC). After HPLC analysis, isotiavone aglycones were evaporated to dryness and added to soybean oil at the 100, 200, 300, iii ' and 400-ppm concentration in test tubes, then heated at 170°C for 30 minutes. The oxidation of soybean oil was measured using the thiobarbituric acid (TBA) test. The result, called thiobarbituric acid reactive substances (TBARS) value, was expressed as pmolll and compared to the synthetic antioxidant, buthylated hidroxytoluene (BHT), at the same concentration.
The profile of isoflavone aglycones isolated contains daidzein and genistein. No factor-2 (6,7,4'-trihidroxyisoflavone) and glycitein were detected. Daidzein resulted from biotransformation of daidzin was dominant in both tempe samples. The isoflavone biotransformation was much greater by R. microsporus var. chinensis UICC 521 than by R. oryzae UICC 524, except for the 24 hours incubation. After 72 hours of incubation, the total isoflavone aglycones in tempe using R. microsporus var. chfnensis UICC 521 was 721.6 pglg and when using R. oryzae UICC 524, 268.2 p.glg.
The oxidized soybean oil without any antioxidants had a TBARS value of 327.32 1 20.31 pmol/1. Addition of the antioxidants showed a decreased TBARS value following increasing concentration for both. For concentration until 300 ppm, the TBARS values of oxidized soybean oil added with isofla-

vone aglycones were greater than when added with BHT, respectively 55.40 zl: 2.77 pmol!! and 45.20 i 2.63 pmolll. However at concentration of 400 ppm, the TBARS values of oxidized soybean oil added with isoftavone aglycones and added with BHT did not show a significant difference.
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