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Suppressive Effect of Trehalose on Radical Oxidation of Unsaturated Fatty Acids

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The effects of trehalose on AAPH (2,2'-azobis 2-amidinopropane dihydrochloride) - induced radical oxidation of unsaturated fatty acid (UFA) were investigated. The formation of hydroperoxide (HPOD) from linoleic acid (LA) was remarkably inhibited by trehalose. The inhibitory effect on the radical oxidation was dependent on the amount of trehalose. Several other saccharides showed negligible effect on the radical oxidation, but sorbitol and maltitol were effective second to trehalose. Similarly to LA, the formation of HPOD from α -linolenic acid (LNA) was inhibited by trehalose. The degradation of UFA and the formation of TBARS from UFA were remarkably suppressed by addition of trehalose. In the presence of 4 types of α -glucosyltrehaloses, kojibiosyl-glucoside, nigerosyl-glucoside, maltosyl-glucoside and isomaltosyl-glucoside, the formation of the HPOD from LA were 45, 72, 44 and 71% of the control (no addition of saccharide) respectively. From the above results, it was revealed that trehalose has protective effect on radical oxidation of UFA and proposed that inhibitory effect of trehalose was action point of 30H/60H.

Key words: trehalose, unsaturated fatty acid (UFA), radical oxidation, 2,2'-azobis 2-amidinopropane dihydrochloride (AAPH), glucosyltrehalose



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