

Title Effect of banana flour composition and glycerol content on properties of compression-molded banana sheet

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Citation Abstracts Book, 6th International Postharvest symposium, 8-12 April 2009, Antalya, Turkey. 256 pages.

Keyword Banana; edible film; banana flour

Abstract

Banana is one of abundant fruits in Asian countries including Thailand; however, the utilization as commercial banana products is not as wide as fresh consumption. Recently, banana flour has been proven to form edible films with moderate mechanical properties and good oxygen barrier by solution casting. Therefore, banana flour has a potential to be a natural packaging material applied for fresh fruits and vegetable and other food products. The objective of this study was to determine the effect of banana flour type and glycerol (G) content on the physical and mechanical properties of compression-molded banana sheet. It was found that different chemical compositions of banana flour showed different banana sheet properties and the compression molding process affected sheet appearance. The condition of compression molding for banana sheet was 105 °C, 5 MPa for 4 min. At least 60% water (W) and 30% G content or 40% W and 40% G as plasticizers were required to incorporate into banana flour to produce banana sheets. Whole banana flour prepared with pulp and peel affected color of sheet. Banana flour without peel showed significantly higher elastic modulus, stretch and tensile strength than whole banana flour. Banana sheet plasticized with 60% W and 30% G showed the highest modulus and tensile strength, but the lowest stretch. This indicated that plasticized banana flour shows flow ability and thermoplastic character. Thus, compression molding, which is a rapid process for film formation, shows as a potential method over the time-consuming solution casting technique. Banana sheets can form biodegradable packaging, such as trays, and be used as an environmental friendly packaging material.