EVALUATION OF A MALTODEXTRIN GEL AS A PARTIAL REPLACEMENT FOR FAT IN A HIGH-RATIO WHITE-LAYER CAKE FORMULATION

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(ABSTRACT)

The performance of a maltodextrin gel as a replacement (25, 50, 75, and 100%) for shortening along with high-fructose corn syrup-90 (HFCS-90), adjusted for sweetness in each treatment, were evaluated in a high-ratio white-layer cake formulation. Two controls were used to compare to fat-replaced cakes: control A (100% fat with 100% sucrose) and control B (100% fat with 50% sucrose/50% HFCS-90), which closely matched the sugar system of the fat-replaced cakes. Objective tests indicated that treatments D (50%), E (75%), and F (100%) had significantly higher \((P<0.05)\) batter specific gravity values compared to both controls. Batter specific gravity, however, only significantly decreased \((P<0.05)\) the volume of treatment F. Crust and crumb \(L\) and \(b\) values, indicated that control B produced a dark crust \((P<0.05)\) with a light crumb \((P<0.05)\), while treatment E produced a light crust \((P<0.05)\) and treatment F a darker crumb \((P<0.05)\). Treatment F produced a firm cake \((P<0.05)\) with significantly \((P<0.05)\) high percent moisture. Overall, no significant differences \((P \geq 0.05)\) in water activity were found among treatments over time; in contrast, degree of staling significantly increased \((P<0.05)\) over time for all treatments. Sensory results indicated that treatment F produced a significantly \((P<0.05)\) moister, shorter, less adhesive and cohesive cake. Tenderness and sweetness scores indicated that treatments E and F were significantly \((P<0.05)\) tougher and less sweet, respectively, when compared to the other treatments. Results from physical and sensory tests indicated that the combination of a maltodextrin gel and HFCS-90, up to 75% shortening replacement, resulted in satisfactory cakes.