Assessment of the Potential Use of Microbial Protease Enzyme as a Substitute for Sodium Metabisulfite in Hard Dough Biscuit Manufacturing

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The objective of the study was to evaluate the potential of replacing sodium metabisulfite (SMS) in hard dough biscuits with a microbial protease enzyme (Veron HPP). The effect of enzyme addition on biscuit quality was investigated by comparing 6 treatments (T1:20 mg/kg, T2:40 mg/kg, T3:60 mg/kg, T4:80 mg/kg, T5:100 mg/kg, T6:120 mg/kg) with the control (SMS, 400 mg/kg). The biscuits were prepared with similar height and shape and baked at 180 ˚C for 9 min. The biscuit hardness was analyzed using a texture analyzer. The T4, T5, and T6 treatments had significantly lower hardness ($P<0.05$) compared to the control. Therefore, only T1, T2, and T3 were further evaluated. The proximate composition, spread ratio, color, and sensory properties of the selected treatments were compared with the control. Aerobic plate count and yeast and mould count were determined after 4 weeks of storage time. There was no significant difference ($P>0.05$) in the moisture, crude protein and ash contents, or color of the treatments compared to the control. T1 treatment had a significantly higher spread ratio compared to the control (control: 6.96 ± 0.64 vs. T1:10.309 ± 1.211, $P<0.05$). According to the sensory evaluation for texture, T2 had the highest preference while T3 had the least preference. The aerobic plate count of all treatments was significantly higher ($P<0.05$) than the control. The yeast and mould count of biscuits was less than 1 for all the treatments and the control after 4 weeks of storage. Based on the sensory results, T2 could be selected as the best formulation for hard dough biscuit with the microbial protease enzyme. Further studies are required to evaluate the shelf life and to determine a suitable packaging material for the developed biscuits.

Keywords: Hard dough biscuits, Protease enzyme, Sodium Metabisulfite (SMS)

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