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Efficacy of Lysine or glycine-derived Maillard reaction products to inhibit growth of *Salmonella enterica* serotype Typhimurium

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In recent years, consumer's trends to purchase minimally processed food products have occurred due to the increasing awareness of health concerns regarding use of chemical additives. However, food safety issues associated with foodborne diseases due to incomplete processing procedures continue to exist, have been raised, especially in ready-to-eat foods. As natural synthesized compounds, the Maillard reaction products (MRPs) have been studied for potential antimicrobial activity, and represent an alternative way to satisfy, consumer's demand for natural preservatives, without compromising the safety quality of food products. The present study was aiming to look at the antimicrobial effect of water-soluble MRPs against *S. Typhimurium*, *S. Enteritidis* and well as *S. Thompson*, where MRPs were prepared by heating glucose and lysine or glucose and glycine at a with ratio of 1:1 ration for at 180°C over durations of 60, 40 and 20 minutes, respectively at 180°C. The effect of MRPs on survival of *S. Typhimurium*, *S. Enteritidis* as well as *S. Thompson* were evaluated by spread-plating bacteria suspension on BHI (Brain Heart Infusion) agar. Four parameters, included maximum growth rate, lag phase value, initial cell density and final cell density were being accessed based on Baranyi model. Results shown time of heating at 180°C were related to production of melanoidins. Production of melanoidins increased by 644.25% and 1299.11% for 40 and 60 minutes, respectively, relative to 20 minutes. Significant differences in lag phase extension was related to degree of MRP production, as well as the type of amino acid used for *S. Typhimurium* and *S. Thompson*. Regarding *S. Enteritidis*, significant differences in lag phase extension was related to amino acid type ($p < 0.05$), while the heating time at 180°C (20, 40 or 60 minutes) did not make differences in terms of lag phase extension. No significant changes in maximum proliferation rate were seen with among control to presence of MRPs relative to control was observed. We conclude that MRPs generated from glucose-lysine system or glucose-glycine system present potential antimicrobial capacity by extending lag phase of *S. Typhimurium*, *S. Enteritidis* as well as *S. Thompson*. There is less certainty if these products will inhibit overall growth of different *Salmonella* strains.

Biography

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