

Spectrophotometric determination of nitrite content in processed chicken products

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Nitrites are used as preservatives in processed meat. Although they are beneficial and safe at permitted levels, they can be carcinogenic when used in excess. Large doses of nitrites can also lead to a condition known as methemoglobinemia. The aim of this study is to determine whether the nitrite content in four locally available brands of processed chicken products are within the permitted levels.

Nitrite content was determined using Griess assay in four brands of chicken sausages (S1, S2, S3, S4), ham (H1, H2, H3, H4) and meatballs (M1, M2, M3, M4) available in the local market. Nitrites produce a characteristic dark pink colored complex when reacted with N-1-naphthylethylenediamine dihydrochloride (NED) under acidic conditions when subjected to Griess assay. The absorbance was measured at 540 nm using a UV-Visible spectrophotometer, and nitrite concentration was determined. A calibration curve was obtained by reacting standard solutions of NaNO_2 with the Griess reagent, and measuring the absorbance at 540 nm.

The obtained results show sausage brands S1, S2, S3 and S4 contained 31.1 mg/kg, 43.1 mg/kg, 96.1 mg/kg and 1.2 mg/kg of nitrite and chicken meatball brands M1, M2, M3 and M4 contained 2.1 mg/kg, 68.8 mg/kg,

134.4 mg/kg and 78.5 mg/kg and chicken ham brands H1, H2, H3, H4 contained 5.0 mg/kg, 42.9 mg/kg, 16.0 mg/kg and 5.3 mg/kg. According to the Code of Federal Regulations Title 21, the amount of sodium nitrite present should not exceed 200 mg /kg (ppm) in processed meat. According to our results, the nitrite content of all brands of processed chicken used in this study were within the permitted levels.

Keywords

Processed chicken, Griess Assay, Nitrite

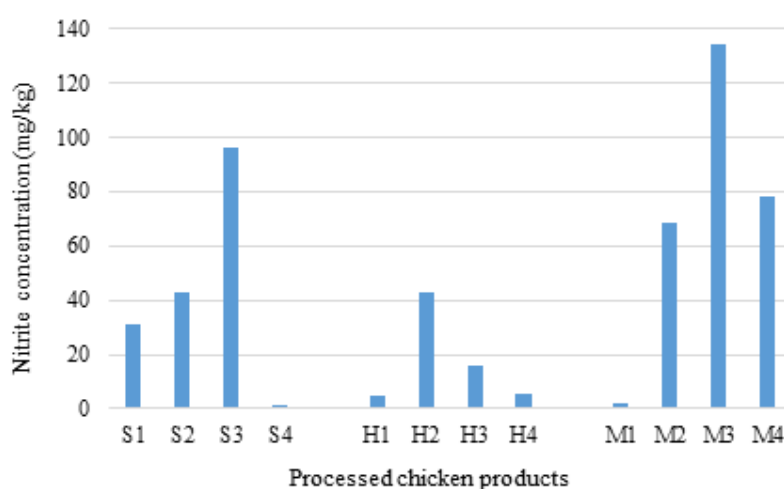


Figure 1. Nitrite content in processed chicken products