Hydroxyproline determination for initial detection of halal-critical food ingredients (gelatin and collagen)

ABSTRACT

Gelatin and collagen are considered halal-critical ingredients as they are typically derived from either bovine or porcine animals. Current analytical methods for determining the sources of gelatin and collagen suffer from limitations in terms of robustness and false positives in peptide matching. Thus, the aim of this study was to investigate the utility of monitoring hydroxyproline, a signature amino acid for gelatin and collagen, for identifying potentially haram foodstuffs. To determine the hydroxyproline profiles among animal- and plant-based samples, one-way univariate analysis of variance followed by pair-wise comparison was used to establish statistical significance. Multivariate chemometric analysis through principal component analysis revealed a discrete distribution pattern among 59 samples due to hydroxyproline variability. Finally, inter- and intra-laboratory comparisons demonstrated the validity and robustness of hydroxyproline determination according to ISO 17025. Thus, this preliminary identification technique will aid the identification of potentially haram foodstuffs.