

Rheological, textural and sensorial properties of mayonnaise fortified with Asian sea bass bio-calcium

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Abstract

Fortification of Asian sea bass bone bio-calcium (ASBC) at different levels (0-10%) into mayonnaise was carried out. Firmness, consistency and cohesiveness of mayonnaise were augmented with increasing ASBC levels ($P < 0.05$). ASBC raised lightness (L^*) and total color difference (ΔE^*), but decreased a^* and b^* -values of mayonnaise in a dose dependent manner ($P < 0.05$). Higher G' , G'' , viscosity and shear stress value were observed in mayonnaise sample added with ASBC. However, lower acceptability was attained when mayonnaise was added with ASBC at level higher than 2.5% due to fishy odor and grittiness perceived by panelists. Ultrasonicated ASBC (U-ASBC) was prepared using pulse mode at 70% amplitude for different times (5, 10 and 15 min) in the presence of hexane. Based on acceptability, mayonnaise added with U-ASBC using ultrasonication time of 15 min was selected. Reduced particle size with lowered volatile compounds was attained in U-ASBC powder than that of ASBC. Mayonnaise added with 7.5% U-ASBC (M-UBC-7.5) had higher viscosity with lower creaming and thermal creaming index ($P < 0.05$) compared to the control and that added with 2.5% ASBC (M-BC-2.5). Optical microscopic images showed that denser and smaller droplet size was observed for M-BC-2.5 and M-UBC-7.5 than control. The lowest moisture, fat and carbohydrate contents were attained for M-UBC-7.5 with the higher protein, ash and calcium content ($P < 0.05$), compared to control and M-BC-2.5. Fortification of mayonnaise with ASBC at 2.5% or U-ASBC at 7.5% could increase calcium content by 54 or 174 times, respectively, without any sensorial changes.

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