ABSTRACT

Plant-based nugget (PBN) is a succulent and firm alternative to the chicken nugget with a meat-like texture. PBN often has low sensory acceptability compared to chicken nugget and the direct fat incorporation was reported to cause fat leakage during cooking and the effect was suboptimal. Therefore, the effects of structured fats (solid and liquid mixture) incorporation in the form of emulsion toward the physicochemical properties of plant-based nugget was investigated. This study was aimed to improve physicochemical properties of plant-based nugget and to develop a nugget with properties similar to chicken nugget. PBN was incorporated with 5% of fat with various fat ratios: canola oil 5%, cocoa butter 5%, canola oil 1% + cocoa butter 4%, canola oil 4% + cocoa butter 1%, and canola oil 2.5% + cocoa butter 2.5%. The stability and water-absorbing capacity of the emulsion were investigated. Physicochemical properties related to the quality of PBN, such as cooking loss, moisture content, texture in terms of hardness and springiness were evaluated. Results indicated that the combination of canola oil 1% + cocoa butter 4% showed the most excellent emulsion stability (74.48%) and water-absorbing capacity (12 mL/20 g emulsion) and displayed the closest springiness (0.8) to chicken nugget mainly due to the properties of cocoa butter and its fatty acids content (stearic acid). Treatment with 5% of canola oil was the best in preventing cooking loss (6.1%) and exhibited the closest properties to the chicken nugget regarding moisture content (60.21%) and hardness (1.62). These findings suggest that PBN incorporated with 5% of canola oil emulsion could resemble properties (moisture content and hardness) of chicken nugget. PBN incorporated with fats emulsion (solid and liquid) with a higher percentage of cocoa butter could also offer promising advantages in terms of emulsion stability and texture, especially toward springiness.

Keywords: *plant-based nugget, canola oil, cocoa butter, physicochemical properties*