

ABSTRACT

This study observed the physicochemical and microbiological stability of plant based meatballs made from local ingredients which are vacuum packed and frozen. During frozen storage, deterioration happened gradually caused by microbial growth and physicochemical changes. Thus, the microbial content including bacteria (TPC), yeast and mold (TYMC), and physicochemical aspects including water activity (A_w), moisture content, pH, and hardness are observed. There were two storage conditions and two cooking conditions that were applied including uncooked and cooked frozen samples that were observed weekly for 11 weeks, uncooked and cooked samples stored in room temperature that were observed daily for 4 days period to mimic the shipping condition. As a result, the TYMC, A_w , moisture, and pH of the frozen product were stable in the 11 weeks period while the TPC was stable until week 8, and exceeded BPOM standard in week 11. For the room temperature sample, the TPC and TYMC increased while the pH decreased over time and the A_w and moisture content were stable. The acidification is suspected to occur from bacteria fermentation byproducts which also forms gasses in the samples stored in room temperature. The hardness of both samples are increasing over half of the storage period which might be caused by phenolic-protein interaction, protein-protein interaction, and starch retrogradation. After the hardening process, a softening also occurs, which might be caused by either pectin degradation or ice recrystallization. Lastly, the cooking process does affect the TYMC, TPC, pH, and hardness, where the values are lower compared to the uncooked products.

Keywords : plant-based meatball, storage stability, microbiological, physicochemical properties, frozen plant-based product