

***Shelf Life Estimation of Snack Noodles with Modified Mango Seed Starch
Using the Critical Moisture Content Method***

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ABSTRACT

Noodle snack is a dry food product characterized by its crispy texture and convenience for consumption. However, it is hygroscopic in nature, making it susceptible to quality deterioration during storage due to moisture absorption. Mango seed (*Mangifera indica L.*) is an agro-industrial by-product that contains a relatively high starch content, yet its utilization remains limited. Therefore, mango seed starch has the potential to be developed as a substitute ingredient in noodle snack production to increase the added value of agro-industrial waste. This study aimed to evaluate the characteristics of noodle snacks substituted with modified mango seed starch and to determine the product's shelf life using the Accelerated Shelf Life Test (ASLT) method based on the critical moisture content approach. The research involved the production of noodle snacks with a 20% substitution of mango seed starch modified through the Heat Moisture Treatment (HMT) method, followed by analyses of chemical, physical, microbiological, and sensory characteristics. Shelf-life estimation was conducted by determining the initial moisture content, critical moisture content, equilibrium moisture content, slope of the moisture sorption isotherm curve, and applying the Labuza equation using polypropylene (PP) packaging. The results showed that the noodle snack contained 37.45% crude fiber and 58.83% dietary fiber. Microbiological analysis indicated a Total Plate Count (TPC) of 3.7×10^3 CFU/g and yeast and mold counts of $<1.0 \times 10^1$ CFU/g, meeting the quality requirements specified in SNI 8217:2015. Physical characterization revealed a texture value of 25.390 N and a dark brown color. Sensory evaluation showed hedonic scores of 4.1 for taste, 3.3 for aroma, 4.1 for texture, and 4.0 for color, indicating that the product was generally acceptable to the panelists. Shelf-life prediction results demonstrated that Moseta noodle snacks packaged in polypropylene (PP) under storage conditions of 75% relative humidity (RH) and 24°C had an estimated shelf life of 884 days. These findings indicate that modified mango seed starch has significant potential as a substitute ingredient in noodle snack production, resulting in products with favorable quality characteristics and an extended shelf life.

Keywords: *Snack Noodles, Mango Seed Starch, Shelf Life, Critical Moisture Content*