

The Effect of Tapioca Flour Addition on the Chemical, Physical, Organoleptic Characteristics and Shelf Life of Dragon Fruit Skin Kombucha Gummy Candy

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ABSTRACT

*Gummy candy is a semi-solid food product with potential for development as a functional food through the utilization of red dragon fruit (*Hylocereus polyrhizus*) peel kombucha. The characteristics of kombucha—specifically its high moisture content and low pH—can affect gel structure stability; therefore, the addition of tapioca flour as a gelling agent to supplement gelatin is required. This study aimed to determine the effect of adding tapioca flour on the chemical, physical, and organoleptic characteristics, as well as the shelf life, of red dragon fruit peel kombucha gummy candy. A Completely Randomized Design (CRD) with a single factor was employed, featuring six treatment levels of tapioca flour addition (0%, 3%, 6%, 9%, 12%, and 15%), each performed in triplicate. Observed parameters included moisture content, texture stability, gel syneresis, hedonic tests, hedonic quality tests, and shelf-life estimation using the critical moisture content method. Data were analyzed using one-way ANOVA followed by Duncan's test at a 95% confidence level. The results indicated that varying tapioca flour concentrations significantly affected ($p < 0.05$) the chemical, physical, and organoleptic characteristics and the shelf life of the gummy candy. Moisture content ranged from 4.57% to 4.88%, texture stability from 1.39 to 4.40 N, and gel syneresis from 0.14% to 0.28%, while the estimated shelf life ranged from 39 to 106 days under storage conditions of 78% RH and 29°C using 0.03 mm PP plastic packaging. Based on the multiple attribute method, the optimal treatment was P2 (6% tapioca flour and 7% gelatin), yielding a moisture content of 4.69%, texture stability of 1.90 N, gel syneresis of 0.17%, and an estimated shelf life of 80 days. The resulting product was characterized by a distinct kombucha aroma, red color, moderately acidic taste, and a chewy texture.*

Keywords: *gummy candy, kombucha, tapioca flour, shelf life*