

**ABSTRACT**

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**FORMULATION OF TEMPEH FLOUR AND CATFISH BONE MEAL  
SUBSTITUTES IN ONION CRISPS AS A CALCIUM FORTIFIER FOR  
TEENAGE GIRLS' SNACKS**

*Adequate calcium consumption is needed by teenage girls to maintain bone density, prevent osteoporosis, and prepare for pregnancy. Onion chips are a popular snack in the community including teenage girl and are easy to make. Tempeh and catfish bone can be used as alternative substitutes for wheat flour to fortify the calcium content in onion crisps. Tempeh contains estrogen hormones and calcium, while catfish bone is high in calcium. This study aims to determine the differences in product acceptability and calcium content. This research is experimental, using a completely randomized design (CRD) with four treatments. The onion crisps were prepared with different ratios of wheat flour, tempeh flour, and catfish bone meal, namely F0 (100:0:0), F1 (75:15:10), F2 (50:30:20), and F3 (25:45:30). Acceptability was assessed using an organoleptic test that included indicators of color, texture, aroma, and taste, conducted by 30 untrained panelists. The results of the organoleptic assessment were analyzed using the Kruskal-Wallis test and further analyzed with the Mann-Whitney test. Calcium content was tested using the ICP-OES (Inductively Coupled Plasma Optical Emission Spectrometry) method. The results of the organoleptic test analysis for all indicators showed significant differences ( $p < 0.005$ ). Organoleptic test shows that F2 is the best formula with average of (3.24) and still needs improvement in color and texture aspects. Followed by F3 with average of (3.00) and F1 with average of (2.10). The calcium content in 100 g of onion crisps was as follows: F0 (35.96 mg), F1 (435.97 mg), F2 (883.19 mg), and F3 (1,323.91 mg). The substitution of tempeh flour and catfish bone meal can be used to fortify the calcium content in onion crisps. To meet 15% of the daily calcium needs through the consumption of onion crisps, the suggested serving sizes: 500 g of formula F0, 41 g of formula F1, 20 g of formula F2, and 13 g of formula F3 per day.*

**Keywords:** *calcium, catfish bone, favorability test, onion crisps, tempeh*