

ABSTRACT

Jessie Hanna Regina Simanungkalit. 24020222140067. **The Effect of Cooking Methods on the Antioxidant Activity of Tempe Fermented Using *Rhizopus* sp. R5 Isolate.** Under the guidance of Sri Pujiyanto and Arina Tri Lunggani.

Tempe is a fermented food rich in bioactive compounds in the form of isoflavones that act as antioxidants. Isoflavones contained in tempeh have properties that are not resistant to high temperatures, including when processed in various cooking methods. Isolate *Rhizopus* sp. R5 has high antioxidant potential, so it is necessary to further study the stability of its antioxidant activity against various cooking methods in tempe. This study aims to analyze the effect of cooking methods (steaming, boiling, and baking) on the antioxidant activity of tempe fermented with *Rhizopus* sp. R5 isolate based on IC₅₀ values using the DPPH method, and to identify the most optimal cooking method in maintaining the antioxidant activity of tempe. The research method begins with making tempe extract produced from the maceration process with ethanol 96%, then evaporating it using a *rotary evaporator* and putting it into an oven to produce a thick extract. The thick tempe extract was used for antioxidant activity analysis using the DPPH method to determine the percentage of inhibition and IC₅₀ value as well as for the identification of its bioactive compounds using GC–MS. The study was conducted using a Completely Randomized Design (CRD) with three replications. The results showed that increasing the concentration of each sample indicated an increase in the percentage of inhibition. The IC₅₀ values of control, steamed, boiled, and baked tempe were 105.97 ppm; 133.25 ppm; 157.83 ppm; and 218.75 ppm, respectively. Vitamin C used as a positive control had an IC₅₀ value of 4.57 ppm. Statistical results showed that the cooking method had a significant effect on the antioxidant activity of *Rhizopus* sp. R5 tempe isolate. Tempe with the steaming method was the cooking method that best maintained antioxidants, followed by the boiling method and then baking, which was the cooking method that showed the greatest decrease in antioxidant activity.

Keywords: Tempe, Antioxidants, DPPH, *Rhizopus* sp. R5, IC₅₀, Cooking Method.