ABSTRACT

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EFFECT OF FERMENTATION TIME AND COOKING PROCESS TOWARDS THE ANTIOXIDANT ACTIVITY OF TEMPEH
(xiii + 82 pages: 13 figures, 3 tables, and 9 appendices)

Tempeh has been reported to possess powerful antioxidant activity due to its isoflavone content. This research was aimed to investigate the effect of fermentation time and cooking process towards functional properties of tempeh, especially related to its antioxidant activity. Soybean was incubated in four different fermentation times (36 h, 48 h, 60 h, and 72 h) and tempeh was further processed with different cooking process usually applied before consumption (steaming, baking, and frying). The antioxidant activity, total phenolic content, and total flavonoid content of tempeh were examined. The data showed that prolonged fermentation time caused an increase in the antioxidant activity of tempeh. The highest antioxidant activity was found in steamed overfermented tempeh (72-hours fermentation) with the value of 251.008 ± 1.885 mg AAE/100 g dry weight sample. The same tempeh also exhibited the highest total phenolic content with the value of 481.885 ± 0.293 mg GAE/100 g dry weight sample. Steaming was the most preferred method for cooking process. Inverse result was found in total flavonoid content of tempeh. The most abundant flavonoid content was obtained in unprocessed immature tempeh (36-hours fermentation) with the value of 877.070 ± 1.543 mg QE/100 g dry weight sample. All cooked tempeh exhibited decrease of its total flavonoid content. It was highly possible that total flavonoid content may not be the biggest contributor to antioxidant activity.

Keywords: antioxidant activity, cooking process, fermentation time, tempeh, total phenolic content, total flavonoid content

References: 59 (1965-2014)