THE EFFECTS OF SINGLE AND MIXED CULTURES OF *RHIZOPUS OLIGOSPORUS* AND *RHIZOPUS ORYZAE* ON QUALITY OF TEMPE

By

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ABSTRACT

THE EFFECTS OF SINGLE AND MIXED CULTURES OF *Rhizopus oligosporus* AND *Rhizopus oryzae* ON QUALITY OF TEMPE

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Study on quality of tempe fermentation using single and mixed cultures of *Rhizopus oligosporus and Rhizopus oryzae* showed that tempe fermentation by using single culture of *Rhizopus oligosporus* has better quality than tempe fermented with single culture of *Rhizopus oryzae* or with mixed culture of *Rhizopus oligosporus* and *Rhizopus oryzae* in term of acceptability. Acceptability of tempe is measured by hedonic scale sensory evaluation. In term of color appearance,taste and odor, tempe fermented using single culture of *Rhizopus oligosporus* was more preferred and tempe fermented using mixed culture of *Rhizopus oligosporus* and *Rhizopus oryzae* was less preferred. Overall acceptability of tempe showed that tempe fermented with single culture of *Rhizopus oligosporus* was more preferred followed by tempe fermented with mixed culture and tempe fermented with single culture of *Rhizopus oryzae*. The physicochemical properties of tempe was also studied. Tempe fermented by using mixed culture of *Rhizopus oligosporus* and *Rhizopus oryzae* contained high amount of total protein that was 18.67%, followed by tempe fermented using single culture of *Rhizopus oligosporus* and single culture of *Rhizopus oryzae*. For crude fiber, tempe that was fermented using mixed culture of *Rhizopus oligosporus* and *Rhizopus oryzae* had highest value which was 3.46%. Meanwhile for tempe fermented using single culture of *Rhizopus oligosporus* had high amount of total solid that was 44.17%. It also had a better texture, and color.

CHAPTER 1

INTRODUCTION

Fermentation is one of the oldest and most economical methods of producing and preserving foods. Various type of fermentation has been used by nearly every civilization since prehistoric times. Foods are fermented for many reasons including enhancement of nutritive value and improvement in sensory characteristic like flavor and taste. The increased nutritive value of fermented food is due to the breakdown of complex component, such as carbohydrate, protein, and lipids to more easily digested sugar, free fatty acid, amino acid, as well as synthesis of certain vitamins. In some part of the world, large amount of fermented food are produced and served as essential part of the diet. Many of the food fermentation are natural or mixed culture fermentation consisting of difference species and genera of yeast, fungi or bacteria.

Tempe originated in Indonesia and traditionally made by culturing soybeans, using a mold *Rhizopus oligosporus*. Tempe has a tender chewy consistency that makes it an excellent addition to a variety of foods. Tempe is a nutritious and easy to prepare. The tempe process can be used to introduce meat-like texture to various substrates, and to increase the protein and vitamin contents of the carbohydrate substrates.