UNIVERSITI TEKNOLOGI MARA

PRESERVATION OF *TEMPOYAK*

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ABSTRACT

This research project is to determine the effect of pressure treatment process and the effects of natural and synthetic additives in the fermentation of *tempoyak*, a Malaysian condiment made from bad or spoiled fruit called Durian. Several knowledges need to be established in molecular techniques in food fermentation especially in its principles and applications. The ecosystem that occurs in molecular level in food is not static. Due to changes in the surroundings and the shifting of the environment's parameters such as temperature, pressure, light intensity and pH changes cause stress reactions on the dynamics of growth and biochemical activity of the bacterias present in the food, thus affecting its shelf life are the main concern. Quality changes including overall sensory analysis, colour and absorbance of O-H and primary alcohol were monitored for every 3 days of testing for a total 30 testing days. In order to pass the overall sensory evaluation, a set of *tempoyak* samples must pass a minimum of 6 points on a 9-points scale by at least 15 panelists. Due to concern of altering the taste and texture of the *tempoyak* sample during the study, only non-taste altering ingredients such as turmeric oil, rosemary extracts, vitamin C and butylated hydroxytoluene (BHT) will be used. 0.1g of each additives are added to every 10g of *tempoyak* and compared to standard, stored at 4^{o}C and 25^{o}C (ambient temperature). Some of the samples are exposed to light while some will be kept in the cupboard with very limited light exposure. Since heat treatment is not the focus in the inactivation of microorganisms in *tempoyak* , potential alternative such as Ultrahigh pressure (UHP) processing is studied on *tempoyak* to detemine its effects on the textural changes, flavor and retention of nutrients ovetime, thus its overall shelf life prolongation. Pressure of 600 MPa offers a good stress in the inactivation of bacterias and high food spoilage pathogens while leaving many flavour and vitamins intact. Currently, there are very limited reasearch done on the shelf life of *tempoyak* while if there is, some mentioned that without refrigeration, adequate seasoned *tempoyak* with salt or sugar can only lasts up to 4 months. With the addition of natural additives mentioned above, it is expected that the shelf life of *tempoyak* could be of at least 5-6 months. UHP may offer a significant improvement in the shelf life prologation, possibly up to 1 year before it is rotten and must be discarded or turn it into compost.

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1.1.1 Durian

There are more than 27 different species of *Durio*, a genus that belongs to the notorious Durian. Ironic to its renowned title as the King of Fruits, this prickly, hard with the size of a football is just not for the faint of hearts. The title is probably due its smell that an ordinary person could recognize several meters away without even seeing the fruit yet. A lot of people say that the smell it produces can be rivaled to that of a rotten sock or a mixture of turpentine and onions. However, in the Southeast Asia where some of the best and most abundant durians came from, it is not surprised that quite a number of locals here do not mind the smell. There are even a small minority that loves the smell.

The taste of durian is a different story. Majority of people in the South East Asia enjoys eating its yellowish and creamy taste. The flesh has texture is similar to that of mayonnaise, but so much thicker. Nevertheless, the durian world is far more mysterious and interesting. Although there are almost 30 varieties exists and technically edible, some have a texture so tasteless and waxy that nearly all people would refuse a second nibble[1] Anthony Bourdain calls it "indescribable, something you will either love or despise…Your breath will smell as if you'd been kissing your dead grandmother."[2] Still, with all the negativities and mocks associated with durian, that still does not stop a lot from it.

Most of the countries in the South East Asia region except for Thailand do not harvest durian but rather the fruits are left to drop themselves onto the ground, indicating they have achieved ripeness and ready to be consumed or to be sold. However, a problem with durian is that despite its thick, thorny skin and few natural preys, it does not have a long shelf-life. Post-harvest, most only have in between two to three days before entering spoiling phase. During these times the durian will undergo rapid physio-chemical changes that lead to its susceptibility to softening of the pulp,