

EFFECT OF PACKAGING CONDITION ON STORAGE STABILITY OF READY TO EAT SEMI-DRIED NHAM, A THAI FERMENTED MEAT PRODUCT

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Abstract – The comparison of packaging to prolong shelf life and storage stability of semi-dried Nham (Thai fermented meat product) was demonstrated. The product was packed in different condition: either vacuum or heat sealed with oxygen absorber package. The storage stability in term of pH, water activity (a_w), and Thiobarbituric acids (TBARs) were determined along shelf life period of 3 months. The results did not any significant different ($P>0.05$) in pH and a_w value of the product in both packing. However, TBARs value of vacuum was higher than heat sealed with oxygen absorber ($P<0.05$) during 15-75 storage day. In addition, TBARs value was significantly higher than the first day.

Key Words – Semi-dried Nham, packaging, storag

I. INTRODUCTION

Nham is popular traditional fermented meat product in Thailand [1]. Nham is normally made of minced pork, sheredded cooked pork rind, NaCl, cooked rice, ground garlic and 100-175 ppm of sodium nitrite, mixed well and wrapped tightly in plastic bags. It takes 3-5 days at room temperature (~30°C) for fermentation [2]. According to Nham standard TIS 1219-2004, pH of ready to eat Nham should be lower than 4.6 [3]. This pH is suitable to inhibit the growth of pathogenic bacteria. However, in retail markets Nham has been found to be contaminated with pathogenic bacteria [3], [4]. As a result of this, Chetawan et al [5] ready to eat semi-dried Nham which was safe from pathogenic bacteria was introduced. Therefore, the objectives of this research was to investigate the effect of packaging condition on storage stability of ready to eat semi-dried Nham : Thai fermented meat product.

II. MATERIALS AND METHODS

The normal ingredients of Nham composed of ground pork, cooked pork rind, cook rice, sugar, salt, nitrite, and minced garlic. In this study, ham of culled sow pig were ground and 10% of glycerol was added to improve product texture. All ingredients were mixed and then formed into a cube (3x10x0.5 cm³). The mixer was fermented at 30°C for 3 days and subsequently dried in an oven until the internal temperature reached 71°C. Then, semi-dried Nham was packed in different types of packaging: vacuum packaging and heat sealed with oxygen absorber and stored at room temperature for 3 months. The samples were analyzed every 15 day. The quality studies were performed every other weeks for pH and a_w and Thiobarbituric acid. The pH (Mettler Toledo, Switzerland) values were determined according to AOAC [6]. Water activity was determined by Novasina LabMasteraw, Switzerland. Thiobarbituric acid reactive substances (TBARs) analysis was applied to evaluate lipid peroxidation in semi-dried Nham by the method of Buege and Aust [7].

III. RESULTS AND DISCUSSION

The study of pH analysis during 3 month storage was non-significant difference between vacuum and aerobic packaging. However, the longer product laid on the shelf, led to higher pH value result was agreement with [8] who found in Korean pork jerky packed in plastic and vacuum packaging. The value of a_w in both packaging condition also revealed non-significant difference during storage, even though, adding 10% glycerol to semi-dried Nham mixture in preparation process enhanced water activity in product [9]. Changes in TBARs values of semi-dried Nham in different package during storage was non-significant difference of lipid oxidation values between packaging conditions on the first day. However, after day 15-75 TBARs values of product packed in vacuum condition was higher than oxygen absorber with significant different ($P<0.05$). On the contrary, after day 90, the values showed non-significant in both package. The results showed that vacuum package had higher TBARs values than oxygen absorber package. From this results, we concluded that oxygen absorber minimized oxygen and decreased lipid oxidation lower than vacuum condition. Aday and Coner [10] reported that oxygen absorber used in food processing reduced lipid oxidation which was the main factor for unaccepted food during storage.

IV. CONCLUSION

The study of pH and a_w analysis during 3 month storage was non-significant difference between vacuum and aerobic packaging. However, TBARs value of vacuum was higher than heat sealed with oxygen absorber ($P<0.05$) during storage.

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