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## **Performance Evaluation of colorimetric nano-sensor aminated graphene oxide- bromophenol blue based on Whatman paper in determining oxidative quality of fish feed kept in cold storage condition**

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### **Abstract**

In the present study, to evaluate the oxidation quality of fish meal stored at refrigerator temperature for 6 months, a colorimetric nano-sensor aminated graphene oxide - bromophenol blue based on Whatman paper was used. The results showed that the amount of moisture increased from 7.19% to 9.37% and ash content increased from 7.29% to 8.04% during storage ( $P<0.05$ ). The amount of changing in fat and protein contents showed that fat content decreased from 12.87% to 10.53% and protein content decreased from 54.51% to 52.37% and showed decreasing trend during the storage period ( $P<0.05$ ). Peroxide value (PV) increased during the period, and the maximum amount of that was at the end of the storage period with 6.1 meq  $O_2$ /kg lipid ( $P<0.05$ ). The amount of thiobarbitic acid (TBA) showed increasing trend and finally reach to 3.86 (mg MAL/kg meal) ( $P<0.05$ ). The color changes ( $\Delta E$ ) of the used nanosensor increased during storage period and changed from 29.04 to 52.67 ( $P<0.05$ ), and also changed from green to blue and detectable by the naked eye. Pearson correlation coefficients between PV and TBA indices with color changes index ( $\Delta E$ ) were 0.93 and 0.89, respectively. The results of this study suggest that the use of colorimetric nano-sensor aminated graphene oxide - bromophenol blue based on Whatman paper with a simply color change process can be a novel approach in determining the oxidative quality of fish feed during storage.

**Keywords:** Fish feed, Lipid oxidation, Nano-sensor, Quality determination

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