**Application of Anthocyanin Extracted from Red Cabbage as a Natural Dye in The Smart Food Packaging Technology**

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**ABSTRACT**

Smart packaging in the food industry is an emerging technology for fulfilling food safety and quality. In this research, we proposed the application of anthocyanin extracted from red cabbage as a natural dye for smart food packaging applications due to the structural transformations of anthocyanins associated with a color change in the function of pH. This natural dye was extracted from red cabbage using the boiling method. The highest absorbance of the anthocyanin extract in the various pH environment was determined using UV-Vis characterization. The red cabbage extract with a pH of 2 in the various concentrations of 2%, 4%, 6%, 8%, and 10% was soluted to the film label made from PVA (Polyvinyl Alcohol) and carrageenan. The thickness, tensile strength, and elongation of the film were discussed as the physical properties of the film label. The FTIR spectra of the film were also discussed to guarantee the anthocyanin in the film composition. Film labels with 6%, 8%, and 10% concentration of the dye had a bright and produced a striking color change after being applied as an indicator of shrimp freshness.

*Keywords: Smart Packaging; Red Cabbage Extract; Anthocyanin; Natural Dye*