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**Development of Soy Protein Isolate-Based Bio-Composites for
Sustainable Biodegradable Packaging Films**

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ABSTRACT

Sustainable and biodegradable packaging solutions are the focus of increased study due to growing environmental concerns about traditional plastic packaging. The creation of novel bio-based composites for biodegradable film production using soy protein isolate (SPI) is the primary goal of this research. The goal of this research is to improve the functional performance of films made of SPI by studying their mechanical, thermal, and barrier characteristics when reinforced with natural bio-composites. To assess the films' potential for eco-friendly packaging, researchers used biodegradability, morphological, and structural investigations. The results show that the film's strength, flexibility, and water vapor barrier qualities are much enhanced with the addition of bio-composites, all while preserving its biodegradability. The results indicate that bio-composite films made of SPI have great promise as environmentally friendly packaging options, offering a long-term replacement for traditional plastics and aiding in the fight against climate change.

Keywords: Biodegradable, Packaging, Eco-Friendly, Films, Soy Protein.