

# Biodiesel production using rendered oil from waste chicken skin

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Biodiesel is a prominent biofuel that can be locally produced from various feedstock options to replace/blend with diesel. This study explores the feasibility of biodiesel production from waste chicken skin in the laboratory-scale. The average yield of rendered oil obtained from waste chicken skin is 280 mL/kg. The rendered chicken skin oil displayed minimal impurities and exhibited a yellow color, demonstrating the presence of natural pigments. To determine the suitability of the rendered oil for biodiesel production, experimental tests were conducted to measure the Free Fatty Acid (FFA) content and Acid Value (AV). The FFA content was found to be less than 3%, indicating the possibility of direct conversion of rendered chicken skin oil into biodiesel via transesterification. The biodiesel yield obtained from the rendered chicken skin oil samples ranged with an average yield of 43%. The results demonstrate the potential of waste chicken skin as a viable feedstock for local biodiesel production. While density and net calorific value are nearly the same, biodiesel samples display significantly lower kinematic viscosity, suggesting improved flow characteristics while reporting a higher flash point than that of diesel, indicating the requirement of a higher ignition temperature. Further, an economic analysis was also performed to evaluate the overall production cost of a scaled-up biodiesel production plant from waste chicken skin. This study demonstrates the potential of waste chicken skin as a viable feedstock for biodiesel production and supports important findings for future developments of commercial scale biodiesel production from locally available bio-waste/food-waste sources.

**Keywords:** Biodiesel production, rendered oil, waste chicken skin, transesterification, biofuel feedstock