

OPTIMIZATION OF TEMPERATURE REGIMES IN THE MECHANICAL EXTRACTION OF CORN (ZEA MAYS) GERM OIL FOR ENHANCED QUALITY PRESERVATION

ABSTRACT

The study examines how different temperature settings affect the process of extracting oil from corn (*Zea mays*) germ using pressing methods. The study investigates corn germ as a raw material because it contains tocopherols (Vitamin E) and other bioactive compounds which offer high biological value. The thermal degradation and oxidation properties of these components present major difficulties when scientists attempt to discover ideal processing parameters.

The primary objective of the study was to determine the optimal pressing temperature that ensures maximum oil yield while maintaining the integrity of its qualitative characteristics. The researchers conducted laboratory experiments with corn germ as their main research material using a screw press which operated at four temperature settings of 35°C 50°C 70°C and 110°C. Researchers used standardized analytical methods to evaluate the resultant oil samples by testing their acid value and peroxide value and Vitamin E content.

Experimental data showed that rising temperatures produced greater oil yields while temperatures above 70°C caused a drastic drop in quality measurements through rapid oxidation and the thermal destruction of vitamins. The highest yield occurred at 110°C but the product lost significant quality. The extraction process at 35°C produced highly pure oil but the volume obtained was not financially viable for commercial purposes.

The findings show that the temperature range of 45 to 50 degrees Celsius functions as the most effective operational method. The oil yield remains high during this period because partial cellular structure disruption allows oil release while thermal degradation stays low which helps maintain biological value through tocopherol content preservation. The industrial application of this optimized regime (45–50°C) produces an optimal balance for production process efficiency.