# EFFICIENCY ANALYSIS OF AN AUTOMATIC SOY MILK MAKING MACHINE

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## ABSTRACT

Soy milk is a popular plant-based beverage due to its high nutritional content. However, the manual production process, especially in Micro, Small, and Medium Enterprises (MSMEs), still faces several challenges, such as long production times, high labor dependency, and inconsistent product quality. To address these issues, this study designed and analyzed an automatic soy milk machine capable of performing grinding, filtering, stirring, and heating processes in an integrated manner. The purpose of this study is to analyze the time efficiency and production consistency of soy milk using an automatic machine compared to the manual method. The testing parameters include process time, output volume, and product quality stability. The results show that the automatic machine can produce an average soy milk volume of 11.17 liters with a standard deviation of $\pm0.061$ liters, indicating good production consistency. In terms of time, the automatic process takes an average of 107.28 minutes, while the manual method takes 106.88 minutes. The automatic machine demonstrates significant advantages in the grinding and filtering stages, which are 91% faster than the manual process. However, during the heating stage, the manual method is faster due to the use of full flame, while the automatic machine uses a solenoid valve control system that limits gas flow to maintain temperature stability and improve safety. Overall, the automatic machine enhances production efficiency, particularly in product consistency and reducing dependency on manual labor.

Keywords: soy milk, automatic machine, time efficiency, production consistency, MSMEs.