

***OPTIMIZATION OF DRUM DESIGN AND PLUCKER PLACEMENT FOR
HYGIENE AND PRODUCT QUALITY IN AN AUTOMATIC CHICKEN
FEATHER REMOVAL MACHINE***

Dr. Nurul Zainal Fanani, S.ST., M.T. *As a Thesis Supervisor*

Novan Ferdiyansyah

Mechatronics Engineering Technology Study Program

Engineering Department

Ferdinovan17@gmail.com

ABSTRACT

The increasing demand for broiler chickens, especially during major religious holidays, necessitates more efficient processing methods, particularly in the feather removal stage. This study aims to optimize the drum design and plucker positioning on an automatic chicken feather removal machine to improve operational efficiency, hygiene, and product quality. The drum was constructed using food-grade stainless steel 304, while two plucker spacing configurations—11 cm (tight) and 22 cm (wide)—were tested. Results showed that the tight configuration achieved the fastest feather removal time of 29.43 seconds for three chickens, with a low and stable skin damage rate (0–5%). In contrast, the wide configuration resulted in longer processing times and higher skin damage, particularly under heavier loads. The stainless steel 304 drum also demonstrated excellent ease of cleaning and maintained hygienic standards. Therefore, a combination of appropriate drum material and optimal plucker positioning significantly enhances machine performance in terms of speed, cleanliness, and end-product quality.

Keywords: chicken feather removal machine, plucker, stainless steel 304, hygiene, product quality