

ABSTRACT

This final project aims to design an ergonomic Pneumatic Stunner as a solution to ergonomic issues and the effectiveness of cattle stunning at the Ciroyom Depot Slaughterhouse (RPH). The main problems identified through observations and interviews with operators include excessive recoil, non-ergonomic handle design, and a trigger system that lacks comfort and safety. This research adopts the Quality Function Deployment (QFD) approach to translate user needs into technical product attributes. The QFD stages include the identification of Need Statements, formulation of Technical Responses, concept selection, and determination of final specifications.

The best design concept produced features a combination of two handles: a Main Handle and an Ergonomic Side Handle, a simple trigger mechanism using a Dual Trigger Pneumatic system, an active safety mechanism with a dual activation principle, and an Industrial Grip Trigger design. A Computational Fluid Dynamics (CFD) simulation was conducted to validate the nozzle performance and ensure that air pressure complies with halal standards. Validation through operator feedback and a comparison with the existing design showed improvements in comfort, safety, and operational effectiveness. This study resulted in a Pneumatic Stunner design that not only complies with halal principles and animal welfare regulations but also significantly enhances operator ergonomics.

Keywords: pneumatic stunner, ergonomics, qfd, halal stunning, equipment design, slaughterhouse, cattle stunning.