ABSTRACT

Bintang Sari Fried Tofu Factory faces productivity challenges caused by the soybean pulp filtration process, which is still performed manually. This conventional work method not only slows down production rates but also poses high ergonomic risks to workers, as evidenced by a Rapid Upper Limb Assessment (RULA) score of 7, indicating the need for immediate corrective actions and the presence of Musculoskeletal Disorders (MSDs). This study aims to design an ergonomic and semi-automated soybean pulp filtration device to improve productivity as well as occupational health and safety. The method used in this research is Quality Function Deployment (QFD), which translates user needs, identified through interviews and observations, into measurable technical specifications through the House of Quality (HoQ) matrix. The result of this study is a conceptual design of a semi-automated soybean pulp filtration device developed using Autodesk Inventor software based on workers' anthropometric data. The proposed device is powered by an electric motor and equipped with a centrifugal pump to improve process efficiency. Design validation through simulation indicates a significant improvement in working posture, with the RULA score decreasing to 3–4 (medium risk), and is projected to increase filtration process efficiency by up to 70%. Therefore, the proposed design addresses the core problem by offering a solution that not only accelerates production time but also drastically reduces the risk of injury and improves worker comfort.

Keywords: Soybean Pulp Filtration, Productivity, RULA, Quality Function Deployment, Musculoskeletal Disorders, Computational Fluid Dynamics.