

Design and Fabrication of a Bone Crushing Machine/Hammer Mill for Sustainable Livestock Feed Production

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Abstract:

This study focuses on the design and construction of an improved crushing machine with a capacity of 0.15 (150 kg/hr) tons per hour, 15 Hp, and 2910 rpm speed. The design follows criterion design guidelines to ensure the improved service life of the component. When the values produced from the current design approach were contrasted with the values and outcomes received from the analysis using the Ansys package, the design should be reliable. The hammers produced are subjected to carburisation process using bio-wastes such as coconut shells, saw dust, and palm kernel shells to enhance the reliability of the machine. The bending of the shaft is controlled during the rotation at rated speed rpm when a load is applied to the shaft. The critical speed of the shaft is experienced with deflection when the shaft rotates freely. The natural frequency and speed were put under check in order to avoid failure. The von Mises stress was employed as a yielding criterion for the shaft. It states that if the components of stress operating on a body are more than the criterion, the body will yield.

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