

ABSTRAK

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Judul Laporan Akhir : Rancang Bangun Mesin Pencacah Rumput Gajah dan Pisang dengan Kapasitas Produksi 50 kg/hari

(2026: xiii + 92 Halaman, 18 Gambar, 13 Tabel + 8 Lampiran)

Mesin pencacah rumput gajah dan pisang sebagai campuran pakan difabrikasi guna membantu para peternak dalam mengefisienkan waktu serta tenaga proses penyiapan pakan hijau berskala rumahan dengan target kapasitas 50 kg/hari. Metode pelaksanaan mencakup rancang bangun sasis model berundak memanfaatkan besi siku Krakatau Steel, bodi casing pelat besi tebal 2 mm, serta mekanisme pemotongan jalur ganda paralel (*dual-lane*). Sistem pencacah menggunakan bilah baja gergaji pita model rotari lengkung dan piringan cakram yang digerakkan poros pejal berulir 20 mm. Sistem transmisi mekanis memanfaatkan sabuk V-belt A-44 Mitsuboshi yang menghubungkan motor bensin 6,5 HP selaku sumber daya utama. Untuk menjamin keselamatan struktural, evaluasi mekanika teknik dilakukan terhadap kestabilan titik berat sasis serta kekuatan sambungan las busur listrik (SMAW) elektroda E6013, yang seluruhnya terbukti memenuhi syarat batas aman izin kerja. Melalui transmisi puli berdiameter 85 mm dan 180 mm dengan rasio reduksi 2,11, putaran motor sebesar 3600 rpm diturunkan menjadi 1700 rpm guna melipatgandakan torsi potong. Berdasarkan pengujian aktual menggunakan sampel pakan campuran 1 kg, mesin mampu menuntaskan pencacahan secara stabil dalam kurun waktu 36 detik, yang setara pemenuhan kapasitas kerja operasional 50 kg/jam dan menghasilkan ukuran cacahan ideal 3 sampai 6 cm yang homogen serta mudah dicerna oleh hewan ternak. Dengan demikian, konstruksi mesin dinyatakan kokoh, aman, dan sangat efektif dioperasikan oleh kelompok peternak lokal.

Kata Kunci: Mesin Pencacah, Pembuatan, Konstruksi, Kekuatan Las,

ABSTRACT

DESIGN AND CONSTRUCTION OF ELEPHANT GRASS AND BANANA STEM CHOPPING MACHINE WITH CAPACITY OF 50 KG/DAY (MANUFACTURING)

(2026: xiii + 92 pp. + 18 Figures + 13 Tables + 8 Attachments)

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**DIPLOMA–III MECHANICAL ENGINEERING STUDY PROGRAM
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An elephant grass and banana chopping machine for mixed forage was fabricated to assist local livestock farmers in optimizing time and labor efficiency during home-scale green fodder preparation, targeting an operational capacity of 50 kg/day. The implementation methodology encompasses the manufacturing of a stepped-frame chassis using Krakatau Steel angle bars, a 2 mm sheet metal casing, and a dual-lane parallel feeding hopper mechanism. The cutting assembly incorporates rotary curved blades made of bandsaw blade steel and cutter discs mounted onto a 20 mm solid threaded shaft. The mechanical drive transmission utilizes an A-44 Mitsuboshi V-belt connecting a 6.5 HP internal combustion gasoline engine as the primary power source. To guarantee structural operational safety, engineering mechanics evaluations were conducted on the chassis center of gravity stability alongside the strength analysis of shielded metal arc welding (SMAW) joints using E6013 electrodes, confirming that all results satisfy allowable safety limits. Through driving and driven pulley diameters of 85 mm and 180 mm with a 2.11 reduction ratio, the nominal engine speed of 3600 rpm is reduced to 1700 rpm to multiply cutting torque. Actual functional performance testing with a 1 kg mixed feed sample demonstrated that the machine consistently completed the chopping process within 36 seconds, which corresponds to an operational capacity of 50 kg/hour and yields uniform chopped sizes of 3 to 6 cm that are easily digestible for livestock. Consequently, the machine construction is declared sturdy, safe, and highly effective for local farmer applications.

Keywords : Chopping Machine, Weld Sterngth, Construction, Manufacturing,