

Feasibility study of operating dhal mill by using bullock power through rotary mode

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■ **ABSTRACT** : Use of bullocks for agricultural work is limited to tillage, sowing and transportation. The total annual use of bullocks in the state of Odisha is less than 300 hours. But the potential use of bullocks in a year is nearly 800 hours. To enhance the utilization of bullock in the state, there is the need of using bullock power operated stationary machines requiring around 1 hp (0.8 kW) power for doing various post harvest operations like paddy threshing, paddy winnowing, chaff cutting, sugarcane crushing, groundnut decortications, oil expelling, pulse milling and dehusking etc. This would ultimately reduce the economic burden of owning a pair of bullocks. With this aim, a study was conducted for operating a mini dhal mill with the help of a rotary gear complex, installed in the premises of College of Agricultural Engineering and Technology (CAET), Orissa University of Agriculture and Technology, Bhubaneswar, Odisha. The experiment was conducted continuously for 3 hours with the measurement of physiological responses like respiration rate, heart rate, body temperature etc. of the medium sized non-descript breed of bullocks (pair weight of bullocks 620 kg) of Odisha at half an hour interval and calculation of fatigue score to know their comfortable working without inflicting any health hazards. The bullocks were observed to be loaded with 10.77 per cent of their body weight in operating the dhal mill and their speed was also measured. The draft and power delivered by the pair of bullocks were as well calculated. The dhal mill was run with a pair of bullocks in rotary mode of operation and two persons were employed for the purpose. The output capacity of dhal mill in rotary mode was observed to be 62 kg per hour as against 80 kg/h in electrically operated motor. The costs of operation in rotary mode and in electrically operated motor were calculated to be Rs. 82.35/q and Rs. 51.47/q, respectively.

■ **KEY WORDS** : Bullock power, Dhal mill, Physiological responses of bullock, Fatigue score

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