

## Feasibility study of wet grinding of rice and black gram by bullock operated rotary transmission system in rural areas

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Received : 12.04.2017; Revised : 23.07.2017; Accepted : 07.08.2017

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■ **ABSTRACT** : A wet grinder was attached to the rotary transmission system operated by a medium pair of bullocks having a pair weight of 610 kg. The combination of the bevel and spur gears in the system could produce a rotation ratio of 1:29 in the out put shaft. Further, flat and V pulleys were arranged to get the required rpm of 450 for operation of the wet grinder. Rice samples were soaked for 6h at room temperature before grinding. Black gram samples were soaked only for 3h. The ingredients were passed through the hopper with different ratio of rice and black gram as 1:0, 1:4, 1:1, 4:1, 0:1, respectfully. Water was added at the rate of 300 ml per kilogram of mixture. The draft requirement during the operation varied from 30 kg in the beginning to 24 kg at the end, the mean being 27 kg which was 4.43 % of the bodyweight of the bullocks. The physiological responses of the bullocks like heart rate, respiration rate and body temperature increased upto 66 beats/min, 22 blows/min and 38.2°C, respectively after one hour of operation. The fatigue score of the bullocks was observed to be 14, well within safe limit of 20. The particle size of the batter came out was in between 200 µm to 300 µm. More was the quantity of black gram in the mixture more was the fine particles in batter. The average batter output over one hour of operation was 9 kg /h. Grinding efficiency of wet rice and black gram at different ratio varied from 81 to 86 %.

■ **KEY WORDS** : Batter, Wet grinding, Rice, Black gram, Fatigue score

■ **HOW TO CITE THIS PAPER** : Mohapatra, A.K., Swain, S.K. and Dash, A.K. (2017). Feasibility study of wet grinding of rice and black gram by bullock operated rotary transmission system in rural areas. *Internat. J. Agric. Engg.*, **10**(2) : 337-339, DOI: 10.15740/HAS/IJAE/10.2/337-339.