

Modelling of Traditional Paddy Husk Removing Machine

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Abstract— Brown rice (Unpolished rice) has various essential nutrition and minerals as compared with white rice (polished rice) because of bran layer in paddy. Milling and polishing process removes the bran layer. Rice cannot be socked for large span of time, but paddy can be socked. Healthy diet needs variety of rice instead of single Variety. Traditional paddy husk removing machine can be used in households to produce brown rice. Slider crank mechanism is used in the husk removing machine, by varying stroke length different quantities paddy can be used in this machine.

Index Terms— Husk removing, Paddy, Brown rice, White rice and Barn layer.

I. INTRODUCTION

Brown rice (BR) is an unpolished rice with various essential compounds such as magnesium, vitamins, and other minerals, dietary fiber, γ -oryzanol, essential fatty acids and γ -aminobutyric acid. More than half of the world's population, daily dietary staple food is rice. The major single food source of carbohydrate and energy in India and many other Asian countries is rice. In South India, nearly half of daily energy intake come from refined grains, and white polished rice constitutes .Refined grain intake is 5%. In India, brown rice usage slowly increasing in recent days. [1] White rice (polished rice) is consumed in most of the Asian countries. More than 70% of

Asian countries traditional staple food is rice. [2]

Conventional method (milling and polishing) is used to convert from Brown rice to white Rice. In white rice 50% of fiber, 84% of magnesium and 69% of total MUFA and PUFA have been removed by polishing. In spite of these benefits, Asian people choose White rice because it is softer and tastier than Brown rice. [3] Consumption of Brown rice has significantly higher magnesium than consumption of White rice. Because of high concentration of this nutrient in bran layer of Brown rice, which has potential benefit for the cardiovascular system. [4] Brown rice diet as compared with White rice diet could considerably reduce BMI, weight, hip circumference, waist and hs-CRP. After Brown rice consumption, Diastole blood pressure is significantly improved. Brown rice is an unrefined entire grain contain protective factors for cardiovascular disease and diabetics. In brown rice essential components are vitamins, magnesium and other minerals, fiber and essential fatty acids. [5] Brown rice has four times as much dietary fiber as compared with White rice. [6]

Dietary fiber of Brown rice is 2 g/100 g and dietary fiber of White rice is 0.4 g/100 g, higher dietary fiber in brown rice might be responsible for this effect. Bran layer contains Fiber which raps α -amylase, the enzyme to digest starch and substrates in the intestine, suppresses increasing in postprandial blood glucose levels. [7].

Brown rice diet compared with White rice diet, Brown rice diet could reduce diastole blood pressure. [8]. Consumption of diet with Brown rice/whole wheat for five weeks would reduce blood pressure considerably in hypercholesterolemic patients. [9]. the effects of whole grain or Brown rice on inflammatory risk markers. hs-CRP is a strong inflammatory indicator for predicting future cardiovascular events. [10]

Rice as a total category may be a chief global provider to dietary glycaemic load, when Rice was consumed there is a wide variation in glycaemic and insulinaemic responses. This can be largely credited to the inherent starch characteristics of the cultivars; however, within a specified rice type, Based on the post-harvesting processing and preparation can also have a huge influence. A reduced glycaemic impact is mediated mainly by the relative content of amylose (v. amylopectin) and the facilitation of retrogradation. Possibly, milling and polishing (white rice) has been found to have varying impacts on acute glycaemic responses, brown rice has longer cooking time compared to white rice.[11]

II. MODELLING OF PADDY HUSK REMOVING MACHINE

The large varieties of husk removing machines are available in the market. Mostly all are based on Grinding and polishing are used to convert paddy into white rice. Many would prefer white rice as compared with brown rice because of appearance and less cooking time. This husk removing machine is based on the traditional method like manual paddy husk removing process. Slider crank mechanism is used to obtain the required mechanism.

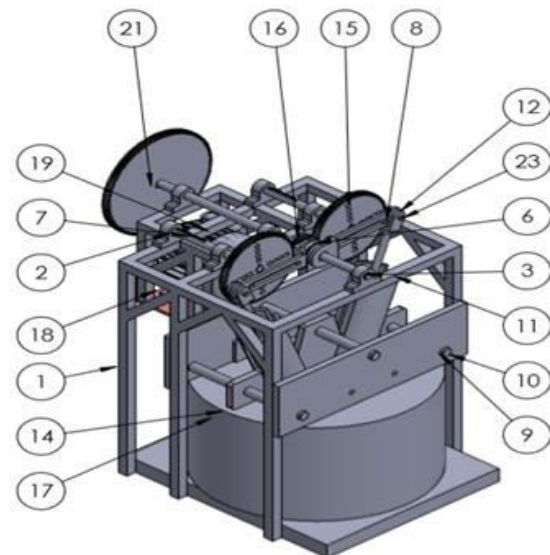


Fig.1 Modelling with Parts

Motor is fitted on the frame of this husk removing machine. To get the required speed gear train is used and also toothed gear (part 21) will act as a flywheel to store energy. The gear 16 is connected to two toothed wheel which are 180 degree angle of difference to each other and toothed wheel is provided with many slots to pair with slotted lever to change the stroke length according to the required stroke length. The base part is circular and having circular or elliptical slot at the centre which is attached in holding shaft (part 10). Two piston cylinder is hinged to piston plate thereby piston can oscillate. Part 14 is the connecting rod which connects slotted lever and piston. Piston is guided by cylinder (part 11) to base slot in base container. Impact force from piston is directed towards paddy, by applying force husk can be removed from paddy. Two pistons are 180 degree angle difference, only one will impeach at a time there will not be clash of piston. This can be used for household application like grinder, mixy etc. rice can be stored for short span compare to paddy. But paddy can store for large years. We can have variety of paddy in our house and remove husk when it is in need. The surface layer between rice and paddy can be prevented. Based on the quantity we change the stroke length.

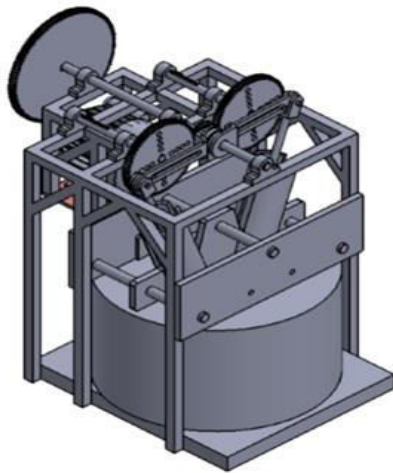


Fig.2. Modelling of Husk Removing Machine.

The glycemic response to any rice can be further influenced by individual characteristics of the individuals, like chewing habit and ethnicity. Conditions should be considered for reporting PPG responses of different studies in rice, the rice cultivars, amylose, amylopectin ratio, cooking and post-harvest processing parameters. [11] The many results suggest that Brown rice replacement in the diet may be useful to reduce inflammatory marker level and several cardiovascular risk factors. This machine can be made portable to remove husk in paddy without removing barn layer. Portable machine can be used in households and other purposes.

III. CONCLUSION

Rice cannot be stored for large span of time, but paddy can be stored for long time. Modelling of traditional paddy husk removing machine will produce fresh brown rice daily or in need. Mostly bran layer in paddy will not be removed in this machine. Barn layer in paddy contains essential vitamins, magnesium and other minerals, fiber and essential fatty acids. Portable machine can be manufacture and use for households.

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