

Small Scale Pulse Processing Machinery and Byproduct Utilization – A Good Source of Income Generation

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Abstract – Agriculture is the backbone of Indian economy as it provides livelihood to 70 % of our population. It is, therefore, very essential that all out effort is made for rural development through increased production, productivity and proper post harvest care for farm produce which supply us food and raw material for different agro-based industries. Suitable strategy should be developed for generating additional income and employment in rural areas so as to check migration of rural people to urban areas in search of jobs. One such pertinent strategy and perhaps the most important could be to provide additional income and employment to farmers by way of encouraging them to process their produce at rural level. Pulse milling at rural level is an important activity to achieve this goal.

Key words: IIPR Dal Chakki, IIPR Mini Dal Mill, IIPR Multipurpose grinding mill, value added pulse products.

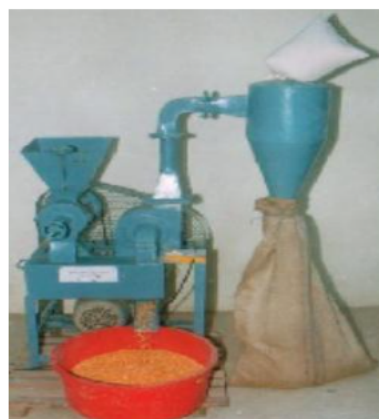
1. INTRODUCTION

An estimated 75 % of pulses production goes to commercial mills, mostly located in urban areas, for processing into dal. Farmers sell their raw grain just after harvest at a very low price (presently around Rs. 55.00 per kg for pigeonpea) and purchase dal at a rate of around Rs. 100.00 per kg. There exists, therefore, a wide price gap between the price of raw material and processed dal. The major chunk of this profit is taken away by the middlemen and the processors. This imbalance can be corrected if small scale dal mill (Mini Dal Mill) is made available at rural level and farmers are encouraged to become processor of their produce. In order to provide employment to rural people and making farmers the processor of their produce, a concerted effort has been made at the Indian Institute of Pulses Research, Kanpur to develop low capacity pulse processing machinery suitable for being used at cottage scale level. As a result two such machines, briefly described below, have been developed at the Institute which has great commercial potential.

2. IIPR DAL CHAKKI

A low capacity dal mill, popularly known as IIPR Dal Chakki has been developed. About 175 commercial prototype of this mill are working in different parts of the country. This mill works on principle of dehusking of grains using rubber and steel disk. Use of rubber

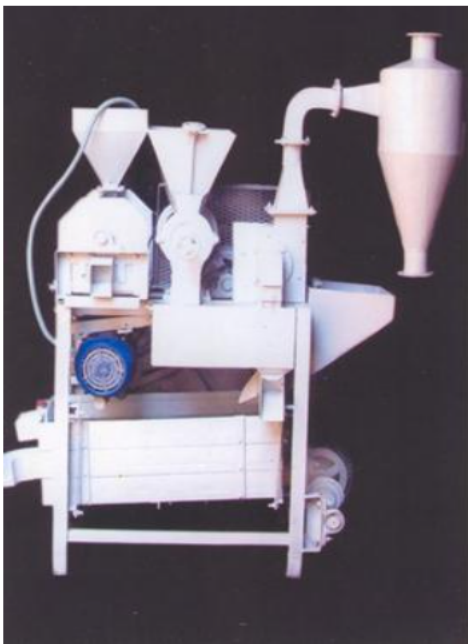
disk, instead of commonly used emery rolls, reduces the scouring loss and increases the dal recovery. Chunni and bhunsi is separated with the help of cyclone separator. Operated by a single phase, 1.5 hp motor this mill can be used to mill most of the pulses. Its capacity varies from 80 to 125 kg/h. for different pulses. This gives a recovery of 75 to 79 % in case of pigeon pea and 78 to 84 % in case of chickpea with suitable pretreatments. The recovery in the other pulses is also in this range. The dehusking, splitting and cleaning operations are done simultaneously in this mill.



IIPR Dal Chakki

3. IIPR MINI DAL MILL

A good number of farmers and entrepreneurs are using the above mill. However, based on the feedback received from the user of this machine and other prospective entrepreneurs, an upgraded model of this dal mill has been developed. This model has the provision of grading the raw grains as well as finished product. In the earlier model, a separate grader was used for grading of raw grains. Apart from this an emery roller attachment has also been incorporated in the mill, which makes the pitting process easier and this enables the production of dehusked whole i.e. gota also, like malka masoor, which was not possible in earlier models. Incorporation of these units in upgraded model, along with refinement in other components like disc holding mechanism and quality of rubber disc, has made this mill a complete mini dal mill, wherein grading of raw grain, pitting of grains, milling of all types of pulses like dehusked splits (pigeonpea, chickpea, pea, lathyrus etc.), unhusked splits (greengram and blackgram), and dehusked gota (malka masoor), cleaning and separation of husks etc., and grading of finished products (dal) are done in the same machine and all the operations can be done simultaneously. The commercial prototype of this mill costs around 100000/= only. The product quality obtained from this mill is similar to the quality of dal available in the market.

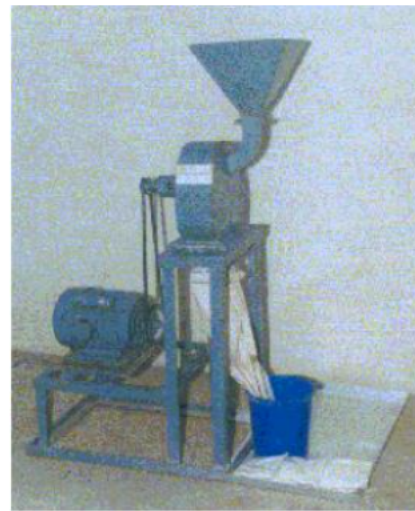


IIPR Mini Dal Mill

In a very short span of its development a large number of units of this mill have been established at commercial level in different states and are working satisfactorily. Use of this machine can easily generate a monthly income of Rs. 20,000 to 25,000/=. This machine has, therefore, a good potential for being exploited as cottage scale industry for the benefit of rural entrepreneurs, unemployed youths and progressive farmers.

4. IIPR MULTIPURPOSE GRINDING MILL

This is a low capacity multipurpose grinding mill. Powered by a 1 hp single phase motor, this mill can be used for converting dehusked split pulses (dal) to bean, wheat to wheat flour, chickpea dal to sattu and whole spices to powder. Its capacity varies from 40 to 50 kg/h in case bean and sattu, 25 to 30 kg/h in case of wheat flour and 4 to 10 kg/h in case of spice grinding depending upon the type of raw material. This mill has the potential to generate Rs. 40000 to 50000.00 income per month when used on entrepreneurship basis and thus, has a very good potential for supplementing income of farmers.



IIPR Multipurpose Grinding Mill

(a) Value Added Products from Pigeon pea Milling By-products :

Pigeon pea grain is consumed only after dehusking and splitting. During the milling process, about 30% of grain mass is lost in form of husk and cotyledon powder. This milling by-product is utilized as cattle feed. At IIPR efforts have been made to use this low value by-product for development of edible products. In this direction several homemade recipes (barfi, laddoo, sev, kachri, sweet puries, kachauri masala) and for commercial exploitation biscuit had been developed incorporating husk and cotyledon powder mixture in different proportions. Value added products developed by incorporation of pigeon pea milling by-product are rich in protein, fiber and phenols, thus, have higher food value. Fractional separation of pigeon pea milling by-product yielded 25% cotyledon powder, which was used for making dal analogue by unheated extrusion. Powder fraction can directly be poured into boiling water to make dal. Though due to presence of husk in the mixture, colour of dal is a bit brownish, but in protein content it is no way inferior to dal. Alternatively it can be used for soup, gravy thickener and protein enhancer.



Biscuits prepared from by-products of pigeon pea



Another product prepared from pigeon pea by products

5. TARGET GROUPS OF THESE TECHNOLOGIES

- (a) Farmers who wish to become primary processor of their produce i.e. they can sell finished dal instead of selling raw pulse grains, thus getting better price for their produce.
- (b) Flour mill (atta chakki) owners who can make dal from different pulse grains on custom basis i.e. on the same basis as is being used for conversion of wheat into wheat flour.
- (c) Small scale entrepreneurs, who may purchase raw pulse and grains and spices, convert into dal and their byproducts and raw spices to powdered spices and sell it to consumers, thus enabling them to have a good source of income.
- (d) Small scale manufacturers willing to manufacture and sell the mill.

6. CONCLUSION

It is envisaged that at least one Mini Dal Mill and one IIPR Multipurpose Grinding Mill should be available in every block or Panchayat level to cater to the needs of

farmers of that area and this leaves a vast area open for the manufacturer of these machinery to capture this open space. This will give a big boost to the small scale manufacturing sector thereby creating huge employment opportunities for the skilled artisans. This will also create opportunities for entrepreneurs. Ultimate beneficiaries will be farmers who will get added income from their farm produce.

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