

Rice milling systems



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Introduction

Rice milling is the process of removing the husk and bran layer to produce white rice. The process can be undertaken as:

- A one step milling process where the husk and the bran are removed in one pass and white rice is produced directly from the paddy.
- A two-step process where the husk and the bran are removed separately, and brown rice is produced as an intermediate product.
- A multistage process where rice passes through a number of different operations and machines from paddy to white rice.

One pass milling

Hand milling

Hand pounding of paddy in a mortar with a pestle is still practiced in some remote areas. Pounding the paddy induces upward and downward forces on grain against grain that removes the husk and some bran layers. The pounding also results in a high percentage of broken kernels. The final cleaning is done by winnowing and gravity separation by hand.



The steel single pass mill

The single pass rice mill is popularly known as 'huller mill'. This type of mill is still very popular in many of the poorer rice-growing countries and is widely used for custom milling of household rice. This mill is a steel friction type mill and uses very high pressure to remove the hull and polish the grain. This results in many broken kernels, low white rice recovery of 50-55% and head rice yields less than 30% of the total milled rice. The fine broken grains are often mixed in the bran and the ground rice hull, and are used for animal feed.



Two Stage Milling

Compact Mill

Two stage mills are often called sheller mills. The two-stage mill has separate hulling and the polishing processes. Rubber rollers remove the husk and the brown rice is then polished with a steel friction whitener. These mills have a capacity of 0.5 to 1 ton per hour paddy input and are often used for custom milling in the rural areas. The milling performance of the sheller mill is superior to the single pass huller with milling recoveries normally above 60%.



Multiple pass rice milling

Commercial Mill

The milling process in larger commercial mills combines a number of operations that produces higher quality and higher yields of white rice from paddy or rough rice. The process involves:

- Pre-cleaning the paddy prior to milling
- Removing the husk or outer layer from the paddy
- Polishing or whitening the brown rice to remove the bran layer
- Separating the broken grains from the whole kernels
- Bagging the milled rice
- Managing the by products



Assam Agribusiness and Rural Transformation Project (APART)

The World Bank is the funding agency of APART. Department of Agriculture, Assam is the nodal department for implementation of APART. ARIAS Society is the State Level coordinating and monitoring agency for APART. Assam Agricultural University is the leading Agricultural University of the State and implementing agency of APART, imparting research and scientific support. International Rice Research Institute (IRRI) is the rice global leader providing technical and hand-holding support in the implementation of APART.