

# Research Progress of Special Nutritional Rice



Rice is the most important staple food for Chinese residents, but the loss of nutrition during the processing of ordinary rice is serious. The special nutritious rice produced by biotransformation, enrichment or compounding is similar to ordinary rice in its eating mode, but its nutritional value has been improved. The processing technology and product characteristics of several kinds of special nutritious rice were described. By developing special nutritious rice and implementing nutrition of staple food, the health level of residents can be improved and rice resources can be used efficiently, which is also one of the main development directions of rice deep processing.

[Artificial/Nutritional rice process line](#) Rice is the main primary processed rice product in our country and the staple food of about two-thirds of our population. With the improvement of residents' living standards, people have higher requirements for the appearance and taste of rice and higher precision of rice milling. Nutrients such as protein, fat and minerals are lost in the rice milling process and the nutritional value is reduced. Special nutritional rice is rice with specific genetic traits, special uses or functions and rice products processed by specific techniques. The special nutritional rice not only retains the nutritional components of brown rice, but also can adjust the nutritional composition through enrichment technology, exogenous addition technology, etc. to improve the nutritional value of rice and improve the flavor, cooking and eating quality of rice. Its eating mode is similar to that of ordinary rice, and it can be used as a raw material for processing nutritional rice products. Improving the quality of rice through processing has the advantages of flexibility and easy control. Special nutritious rice is of great significance for optimizing the nutrition of staple food and improving the health level of residents.

[Microwave heating mechanical equipment](#) 1 Formulated rice The physical and chemical properties [ 1 ], flavor, sensory and nutritional properties [ 2 ] and cooking properties [ 3 ] of rice of different varieties or processing accuracy are different to some extent. The prepared rice takes rice with different characteristics as raw materials, according to different parameters as targets and a series of indicators as constraints, new rice products with certain characteristics can be obtained, and the nutritional defects of the raw rice can be improved at the same time. When the number of targets or constraints is complex, the calculation workload and difficulty are great. Intelligent rice matching software can be used to accurately calculate the formula and obtain the nutritional composition of the prepared rice. Li Ying [ 6 ] developed a rice product suitable for the elderly from the aspects of nutrition, taste and appearance according to the recommended intake values in the nutrition dietary guidelines and the nutritional and physiological characteristics of the elderly. 2. Remaining embryo rice Embryo - retaining rice is a kind of refined rice which uses multi-stage light grinding technology to retain its embryo part, and its embryo - retaining rate should be above 80 %. Rice embryo is the essence of grain. The content of protein, minerals, amino acids and vitamins in rice embryo is significantly higher than that in endosperm, and basically does not contain anti-nutritional

factors such as phytic acid. Therefore, the preserved rice has high nutritional value, is easy to digest and absorb, and is superior to brown rice in taste and flavor. Embryo - preserved rice hardly needs washing, tastes similar to ordinary rice, and is easily digested and absorbed. The processing method of preserved rice is the same as that of ordinary rice, and it has to go through three processes: cleaning, husking and milling. In order to maintain the embryo retention rate at More than 80 % of them often adopt the processing technology of " light grinding, light rubbing and multi-machine whitening", i.e. the number of milling passes is more and the pressure inside the rice milling machine is lower. However, the embryo is easy to fall off during the rice milling process, and most of the rice embryos will fall off due to the conventional rice milling process. The embryo retention rate can be improved by using a special roller rice mill and multi-stage light milling technology. The use of abrasive belt rice milling machine can not only improve the embryo retention rate, but also make the accuracy of rice reach the level of first-grade rice [ 7 - 8 ]. Adjust the rotation speed of the rice milling machine according to different working sections so that the rotation speed of the rice milling machine is moderate and the rice embryo can be prevented from falling off. In addition, the technology of raising rice at low temperature can be used to reduce the increase of crushing in the rice milling process and improve the rice yield in rice processing [ 9 ]. After rice milling, a series of treatments such as polishing and fine selection can further improve the quality of preserved rice. In the process of wiping rice, using water fine grinding can remove the bran powder adhered to the surface of the remaining rice and improve the color of the rice embryo. Due to the high enzyme activity of rice embryos, microorganisms are easy to reproduce and lipid is easy to oxidize under the conditions of proper temperature and moisture, and rice embryos have germination ability and are easy to grow moldy, it is generally appropriate to use vacuum packaging or inflatable packaging to prevent the remaining rice from deteriorating. In addition, microwave anti-insect and anti-mildew technology [ 10 ] and nano fresh-keeping film technology [ 11 ] can also be used to improve its storage quality. At present, the market for preserved rice has not yet opened, and further publicity is needed to improve people's awareness of the nutritional value of preserved rice. In order to meet the demand, the rice products with new target characteristics are obtained by compounding. According to the production requirements, special rice varieties have also been added to the prepared rice to meet the special requirements of food production. By mixing rice with different nutritional ingredients and tastes, the physical and chemical properties of different rice can be complemented, thus improving the nutritional value and taste of rice. According to the variety, appearance, physical and chemical indexes, cooking quality and other characteristics of raw rice, the compounding of rice can achieve the goals of increasing nutrition, improving taste and reducing cost. The process flow of preparing rice is generally as follows: common rice ? batching bin ? batching device ? mixer ? rice blending. The control of rice matching process can be combined with the production process or controlled separately in sections. The most important process in the rice blending process is blending and mixing. When blending according to the formula, it is required to have good mixing uniformity and minimize grain crushing. According to the standards of the Chinese Nutrition Society for the addition of relevant nutritional elements, the nutritional value of ordinary high-quality rice can be greatly improved by preparing a certain amount of nutritious rice in high-quality rice. In view of the shortcomings of some rice, some rice with nutrition or complementary functions can be selected to match with it, and rice products with good flavor and nutrition can be obtained [ 4 ]. By using the planning method [ 5 ], with one or more