

Low GI Rice: A Game Changing Invention by BRRI



Dr M Abdul Momin



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Diabetes is a serious global health issue. It has become a major concern in across the world. About 87% of the world's diabetes patients reside in developing and underdeveloped countries. In Bangladesh, many people are suffering from diabetes. And the number of the patients is rising alarmingly. According to the International Diabetes Federation (IDF), the number of diabetic patients in Bangladesh has exceeded 13 million.

It has been observed that people in countries like Bangladesh, India and China are falling victims to this disease largely due to their dietary habits. In these countries, staple diets are heavily carbohydrate-based. So, doctors often advise diabetic patients to consume low-GI (Glycaemic Index) foods. Carbohydrates that are absorbed slowly and raise blood glucose gradually are classified as low-GI foods. In contrast, carbohydrates that break down quickly and cause a rapid increase in blood glucose are considered high-GI foods. If a food item has a GI of 55 or less, its carbohydrates take longer to break down, digest, absorb, and metabolise, resulting in a slow and gradual rise in blood sugar levels.

Rice is often considered an "enemy" for diabetic patients, with many assuming that blood sugar spikes immediately after eating it. A study published in the British Medical Journal indicates that higher rice consumption is associated with an increased risk of developing diabetes. However, the accuracy of this claim is still debated. And for a rice-based culture like Bangladesh, avoiding rice altogether is not practical. Rice contributes significantly to daily nutritional intake. About 70-75% of carbohydrates, 60-65% of protein, 8% of fat, 5.8% of calcium, and 91.6% of

phosphorus requirements are met through rice consumption. Many people may not afford nutrient-rich foods like milk, eggs, or meat regularly. For them, rice remains an affordable option.

However, there is a piece of encouraging news in this regard. Scientists at the Bangladesh Rice Research Institute have developed four varieties of diabetic-friendly rice: BR16, BRRI dhan46, BRRI dhan69, and BRRI dhan105. These varieties of rice release glucose more slowly into the bloodstream. Several private companies have already started marketing these rice types. According to medical professionals, this innovation means that diabetic patients no longer need to be overly anxious about eating rice, provided it is consumed in a controlled and informed manner.

Recently, low Glycaemic Index (GI) rice varieties developed by the BRRI have begun to be marketed by Renata Limited under its subsidiary Renata Agro Industries Limited. Dr Mohammad Ali Siddique, the former head of the Grain Quality and Nutrition Division at BRRI, said, "There is no better food than rice (for people in this region). That is why we have always worked to ensure that even people with diabetes can continue to eat rice."

The impact of low-GI rice has already been tested on patients at BIRDEM Hospital, a specialised facility for diabetes care. The research stated: "Low-GI rice helps maintain blood sugar at a safe level, making it highly suitable for diabetic patients. It also contains a comparatively higher amount of dietary fibre." Diabetic patients must maintain portion control and follow a structured diet. For a balanced meal, one cup of rice along with three cups of vegetables is considered sufficient for a single serving.

The first diabetic-friendly rice variety developed by BRRI is BR16. Initially, it was developed as a conventional variety, but later research by medical scientists at BIRDEM Hospital identified it as suitable for diabetic patients. In 1983, BR16 was approved by the National Seed Board for cultivation during both the Boro and Aus seasons. Its popular name is "Shahi Balam". The grains of this rice are long, slender, and white. When cooked, the rice is fluffy and palatable. It contains approximately 7.8% protein. Among the newly developed varieties, BRRI dhan105 is a low glycaemic index (GI) rice suitable for the Boro season. It has medium-long, slender grains, and its GI value is around 55. Because of this low GI level, it is expected to gain wide acceptance as a diabetic-friendly rice variety.

Former BRRI scientist Dr Mohammad Ali Siddique explained, "Low-GI rice contains lower available glucose. In our tests, we consistently found the GI value of this rice to be below 55." He further noted that in rice, wheat, maize, or any carbohydrate-based food, the higher the presence of alpha-amylase inhibitors, the lower is the glycaemic index. This means that even after consuming such foods in moderate amounts, blood glucose levels remain more controlled. A lower GI helps diabetic patients maintain stable blood sugar levels.

Foods prepared from the four diabetic rice varieties developed by BRRI- including rice, bread, cakes, biscuits, and noodles- can help regulate blood glucose when consumed in appropriate portions.

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Low GI rice is BRRI's game changing innovation



DR M ABDUL MOMIN

Diabetes is a serious global health issue. In Bangladesh, as well as worldwide, it has become a major concern. About 87% of the world's diabetes patients' home in developing and underdeveloped countries. In Bangladesh, not only is the number of diabetic patients high, but the rate of increase is also rising. According to the International Diabetes Federation (IDF), the number of people living with diabetes in Bangladesh has exceeded 13 million. Their data suggests that one in every 11 adults in the country is affected. Bangladesh currently ranks 10th globally in terms of the number of diabetes patients, and it is projected to move up to 9th place between 2030 and 2045.

Globally, around 530 million people currently live with diabetes, and this number may rise to 1.3 billion by 2050. The highest growth rates are observed in countries like Bangladesh, India, and China, largely due to dietary habits. In these countries, staple diets are heavily carbohydrate-based. Some argue that diabetes is not a disease per se, but rather a condition caused by excess glucose in the body, which can lead to various complications if not properly controlled. The hormone insulin regulates the level of glucose in the blood. In healthy individuals, insulin is produced in sufficient amounts. However, in diabetic patients, insulin production is inadequate, leading to elevated blood sugar levels—this condition is medically known as diabetes.

Doctors often advise diabetic patients to consume low-GI (Glycemic Index) foods along with prescribed medications. As a result, the term "GI" is now commonly heard when purchasing rice or

flour. The Glycemic Index (GI) indicates how quickly carbohydrates are absorbed and how much they raise blood sugar levels. Let us now understand what low-GI foods are and how GI is measured.

In 1980, David A. Jenkins of the University of Toronto first introduced the mathematical concept of the Glycemic Index (GI). In 2004, the European Association for the Study of Diabetes evaluated dietary glycemic index patterns for diabetic patients and concluded that the Glycemic Index is a value that reflects how much a food raises blood glucose levels after consumption. For example, the GI is determined by measuring how much and how quickly blood glucose rises after consuming a food containing 50 grams of carbohydrates. Carbohydrates that are absorbed slowly and raise blood glucose gradually are classified as low-GI foods. In contrast, carbohydrates that break down quickly and cause a rapid increase in blood glucose are considered high-GI foods. All foods can be measured using this method.

If a food has a GI of 55 or less, its carbohydrates take longer to break down, digest, absorb, and metabolize, resulting in a slow and gradual rise in blood sugar levels. The amount of carbohydrate intake depends on the body's needs and the type of physical activity. Different carbohydrate-rich foods produce different effects on blood sugar. For instance, a slice of bread, a medium-sized potato, or a ripe banana may contain similar amounts of carbohydrates, but their impacts on blood glucose levels are not the same.

Rice contributes significantly to daily nutritional intake: about 70-75% of carbohydrates, 60-65% of protein, 8% of fat, 5.8% of calcium, and 91.6% of phosphorus requirements are met through rice consumption. While many people may not afford nutrient-rich foods like milk, eggs, or meat regularly, rice remains accessible and affordable. For individuals with diabetes, rice consumption needs to be controlled and regulated. It is well understood that excessive intake of any food—not just rice—can be harmful to health. A study published in the British Medical Journal indicates that higher rice consumption is associated with an

increased risk of developing diabetes.

However, there is encouraging news. Scientists at the Bangladesh Rice Research Institute have developed four varieties of diabetic-friendly rice: BR16, BRRI dhan46, BRRI dhan69, and BRRI dhan105. These varieties release glucose more slowly into the bloodstream. Several private companies have already started marketing these rice types. According to medical professionals, this innovation means that diabetic patients no longer need to be overly anxious about eating rice, provided it is consumed in a controlled and informed manner.

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A recent trend shows that many people eliminate rice from their diet to lose weight. However, they often replace it with fast food, which is typically more calorie-dense. Some also claim that regular rice consumption increases lifestyle diseases. This is not entirely accurate. In reality, many processed and street foods contain trans fats, which significantly contribute to lifestyle-related diseases. The claim that eating rice alone causes diabetes is not scientifically valid.

Research shows that countries where rice is a staple food often have lower rates of obesity and lifestyle diseases. According to the International Diabetes Federation (2018), about one in 11 people in Bangladesh have diabetes, whereas the rate is one in 6 in the United States and one in 5 in Saudi Arabia despite rice not being their primary staple food. Therefore, negative narratives blaming rice alone for diabetes are misleading and can potentially undermine national food security.

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