

Nutritional advantage of black rice

— A heirloom rice

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There are various local black rice cultivars cultivated in Manipur. It has been reported that black rice has many phytochemical variants, which may contribute to its use as a functional food, including nutraceuticals and second ary metabolites such as anthocyanin, anti-oxidant, gluten-free, oryzanol, and more. The purpose of this article is to focus on particularly its potential use as a functional food. Several articles that describe black rice in relation to its nutraceutical properties and its role in reducing non-communicable diseases. Other studies describe the diversity of local pigmented rice and its potential for lowering the risk of hyperlipidemia, hyperglycemia, and for cancer prevention. Black rice has been described as a functional food in our country specially in north eastern region.

Key words: Anti-oxidant, Black rice, Gluten-free

BLACK RICE (locally known as Chakhao in Manipur) is a less popular rice that packs a punch of nutritional benefits loaded with nutraceuticals. Heirloom rice is special kinds of rice from species *Oryza sativa* that has been handed down for generations within a community or a group of closely knitted people and are often linked to their traditional celebrations. This kind of rice often has its own

palatable distinctiveness. The black rice is not merely pigmented but it is literally the darkest purple color undoubtedly looking black. A similar kind of rice was allowed to be consumed exclusively by the royals and nobles in ancient China referring to it as “Forbidden Rice” or “Emperor’s Rice” and in some of the Asian regions.

Black rice has excellent nutritional value but also has a high bioactive

component that helps fight illness. These properties were realized quite early. It makes an excellent traditional food supplement for the pregnant women and older folks. This rice has the richest source of powerful antioxidants in the form of anthocyanins that combat illness and also includes dietary fiber, anti-inflammatory properties and the ability to prevent diabetes, cancer, cardiac disease and even gain in



Black rice



weight.

What makes it black?

These kinds of rice are softly polished retaining its distinctive color giving anthocyanin pigments which have high anti-oxidant properties and are present in the outer layers. Because of soft polishing, it is a whole grain and it retains most of the beneficial components such as vitamins and minerals lost in polishing at the same time preserving its appealing dark purple shine. The pigment content is recorded to be more than double times than the much-loved blueberries.

Why will people like it?

With ever dynamic lifestyle changes and growing health consciousness among people, there has been a high increase in adoption and demand for functional food. Black rice has a wide spectrum of health benefits in comparison to its counterparts. Its extracts are highly sought after in the food industry as beverages, ice cream, and confectionaries as a healthy replacement of colorant or other additives. Owing to its appalling deep purple colour, it can be served as specialty servings in fine dining and restaurants. To the consumers, its nutty flavor and a completely different flavor profile can be a refreshing experience course when served with different dishes. Most of it, for the people who recognize its benefit, it is unrivaled by many other foods often referring to it as one of superfood.

Health benefits

Diabetes and obesity: These black rice are glutinous-has a sticky texture, but due to soft polishing, it is more of waxy when touched. It is high in amylopectin content thus making it a very suitable slow release carb diet. The slow release of sugar prevents a rapid rise in blood sugar level decreasing the risk of putting on weight and type 2 diabetes. The dietary fibers in the outer layers of the whole grain aids in the slow release of glucose (sugar) from the grain and slow absorption by the body over a longer period of time. In

comparison to processed white rice which lacks fiber, it is very essential to eat 100% whole grains for prediabetes, diabetes or other forms of the metabolic syndrome and insulin resistance.

It is the same for people who struggle to lose weight– the fiber and nutrients in whole grain rice assist to stop signals of hunger and discourage excessive consumption. Research shows that varieties of whole grain rice can contribute to preventing resistance to insulin linked to enhanced obesity danger.

Anti-oxidant: Sources indicate that black rice contains more anthocyanin than any other seeds, including brown rice, red rice or red quinoa. There are even more anthocyanins than the blueberries. According to countless research that looked at the advantages of this antioxidant, anthocyanin has the ability to help prevent innumerable widespread but severe diseases. Scientific studies have related its the ability to cardiovascular diseases prevention, cancer protection induced by free radical harm, brain function improvement, inflammation reduction and more. It also contains significant amount of vitamin E (antioxidant) that in addition to other significant features, is helpful for eye, skin and immune health.

Healthy heart: Anthocyanins eaten in diets also show a preventive impact on the growth of cardiovascular diseases in epidemiological studies. Black rice anthocyanins can assist to keep good concentrations of cholesterol through a reduction in overall cholesterol and poor LDL cholesterol. Research has shown that the formation of dangerous atherosclerotic plaque in the arteries is decreased by black rice for clear arteries and to prevent heart and stroke.

Medicinal values

Detoxification: Studies have shown that the consumption of black rice can help to detoxify the body and purify the liver with the use of elevated antioxidant levels in the rice. The antioxidative status of blood, liver and the aorta was assessed in rabbits fed either refined white rice or

black rice. The results demonstrated the less oxidant stress of rabbits fed black rice (also called free radical damage), more blood antioxidants, liver detoxification, and also a decreased growth in artery plaque. The phytonutrients in black rice help the body to reduce inflammation and to purify the organism from harmful matter that can contribute to a variety of conditions.

Digestive and metabolic health:

The dietary fiber per serving is remarkable in black rice. It fiber enables to protect against constipation, bloating and other undesirable digestive symptoms. Fiber binds to waste and toxins in the gastrointestinal system, contribute to their elimination and the normal function of the bowel. Black rice can also contribute to avoid or enhance diarrhea because fiber adds bulk to your stool. The nutritional fibers discovered in black rice can also assist you to feel comfortable after eating, which can possibly help you lose weight in an extended time period, between meals. Research released in 2014 showed how high diets of whole grain fiber rice have beneficial impacts on metabolic parameters, including weight-affecting insulin resistance. It is a better choice to avoid the thrifty phenotype syndrome.

Gluten-free cereal

Many people are sensitive to gluten today, but most of the processed product as breakfast foods consist of nongluten-free flours often impossible to separate gluten-free food. Gluten-susceptible users have many of the same symptoms as Celiac disease after eating gluten (confirmed gluten allergy) including bloating, constipation, diarrhea, nutrient deficiencies and an increased risk for developing the leaky gut syndrome. Black rice is naturally gluten-free grain, like other rice varieties and its derived food product remains free of gluten until mixed with nongluten free flours from gluten-containing cereals as wheat, oat, rye, barley, etc.

Availability and preparation

Its sale has started in some of the



major supermarkets in recent times, and is also available at online food outlets in the form of packets of different quantities. Some heirloom pigmented rice may be available in local markets in Odisha and West Bengal as it has been prevalently grown recently. The black rice accession of heirloom rice known as “chakra poireiton” has surpassed its two other black rice cousins in presence of functional food components. These three black rice varieties are the only true black rice accession reported in India and recognized globally. The uniqueness of these rice from North-East India especially Manipur, lies in its traditional or indigenous cultivation methods for raising the crops and the soils of these regions. These rice is best prepared when steamed. Unlike the white rice black rice needs to be steam cooked at low flame for 15 minutes after it has been brought to

boil. It can be pre-soaked before cooking in order to slightly reduce the nuttiness in texture.

Cautionary measures

Since the rice is consumed as a wholegrain with the bran layer, there are chances of minerals accumulation in it. When the rice is grown in certain soils rich in minerals such as arsenic, these are toxic to human. Arsenic in different forms and conjugates may accumulate in the bran of the whole grain rendering it unfit for human consumption. So it is advisable to avoid whole grain rice from places where arsenic in soil and water is problematic.

Final verdict

- A healthier alternative to white rice also referred to as a prohibited rice or emperor's rice can be used in the same way.
- The main advantages of rice health

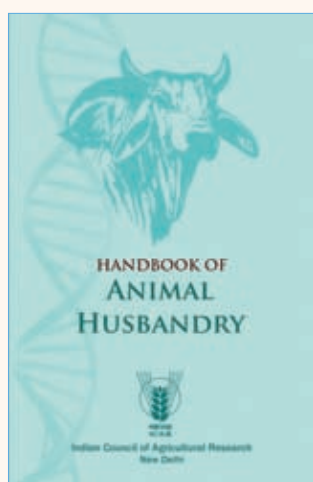
are boosting heart health, cancer clean-up, inflammation improvement, blood sugar balance, and digestive health. Black rice is primarily due to its impressive antioxidant content.

- The most significant and useful antioxidant is anthocyanin. Naturally, forbidden rice is free of gluten and contains far more nutrients than white rice, which is a more often ingested gluten-free alternative. It has many different nutrients than white rice.
- Ancient whole grains like prohibited rice can play a healthy role as long as they know how much they consume and ensure that they get a lot of protein and healthy fats from other food sources that provide these important macronutrients better.

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HANDBOOK OF ANIMAL HUSBANDRY

Livestock sector has created a significant impact on equity in terms of employment and poverty alleviation. After staple crops, livestock sector is the second most important contributor to the agricultural economy. The producer prices



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Handbook of Animal Husbandry will prove useful to the students, teachers, livestock/poultry farmers, and to especially those who visualize the economic growth of country with the support of livestock sector.

TECHNICAL SPECIFICATIONS

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