

Bangladesh yet to tap enormous potential of rice bran oil



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In Bangladesh, rice is far more than a simple agricultural commodity; it is a way of life, deeply interwoven with our cultural heritage and sustaining the livelihoods of nearly half the rural population. As the world's third-largest rice producer, we have achieved self-sufficiency in the white kernel, yet we are systematically discarding the most nutrient-dense portion of the harvest. Yes, I'm talking about the rice bran oil—the liquid gold of Bangladesh which has vast economic and nutritional potential. While the nation produces millions of tons of this byproduct, it is frequently relegated to animal feed or discarded as waste due to rapid enzymatic spoilage.

Bangladesh produces about 55.2 million tons of paddy in 2024-25, which provides the raw material base for this bran. For the 2024-2025 fiscal year, Bangladesh has produced approximately 3.86 million tons of rice bran. This is not merely agricultural residue; this volume of rice bran presents a potential to produce over 880,000 tons of crude rice bran oil. The rice bran oil industry in Bangladesh has a total refining capacity of 453,000 tons per year, though it currently operates below full capacity. Though it is a missed multi-billion taka economic and nutritional opportunity resource increasingly known in global markets as "liquid gold."

The primary hurdle to the valorization of rice bran is a relentless biological countdown. In a living rice kernel, the oil is protected within the interior while lipase enzymes reside in the exterior layer. The moment of milling

is a moment of disruption; as the structure breaks, these enzymes immediately attack the oil. This triggers a rapid spike in free fatty acids (FFAs). In raw rice bran, FFAs can skyrocket by 5-7% daily, quickly reaching levels that render the oil unfit for human consumption due to a rancid, sour taste. Success in this industry is measured in minutes. As the research indicates, "the lipase enzyme is inactivated by stabilizing rice bran which can lead to the bran degrading in as little as 6 hours. This tiny six-hour window is the uncompromising frontier between a high-value functional food and low-grade agricultural waste. Without immediate stabilization via heat or steam to inactivate these enzymes, the gold turns to dross before it even leaves the mill floor.

used due to its lower price. Soybean oil accounts for 20% of the demand, while mustard oil contributes only 19%. Rice bran oil, however, meets just 2.5% of the total demand. Despite this, Bangladesh produces a significant amount of rice bran. If properly utilized, it could substantially contribute to meeting the country's edible oil demand from domestic sources. If our milling infrastructure were fully modernized, rice bran oil (RBO) could meet approximately 50% of the nation's total edible oil demand.

The RBO is a heart of health powerhouse. RBO is far more than a basic lipid; it is a "functional food" designed by nature. With a high smoke point and exceptional thermal stability, it is uniquely suited for the high-heat

culinary utilization model transforms the milling process into a multi-industry revenue stream like De-oiled Rice Bran (DORB): The high-protein residue left after extraction is a superior feed for the livestock and aquaculture sectors. Then produced industrial materials like high-value waxes, gums, and soap stocks can be diverted to the cosmetics and pharmaceutical industries. The non-edible grades of RBO serve as a viable feedstock for biodiesel, providing a renewable energy alternative. This model doesn't just manage waste; it creates profit. The source data reveals that while the total production cost of RBO at the mill gate is approximately \$10.00 USD/ton, the returns from by-products like DORB can reach \$32.41 USD/ton, essentially allowing the by-product to cover the primary cost of production.

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According to the Tariff Commission, the country's annual demand for edible oil is around 2.3-2.4 million tons. This translates to a monthly demand of approximately 150,000 to 160,000 tons. The per capita consumption of edible oil is about 17 kg per year. About 50% of this demand is met by imported palm oil, which is widely

cooking of the Bengali kitchen. Its nutritional profile is defined by a powerhouse of bioactive compounds. The first one is Gamma-Oryzanol: A potent antioxidant renowned for lowering LDL cholesterol and combatting oxidative stress, 2nd one is Tocotrienols: A superior form of Vitamin E that supports heart health and 3rd usefulness is its Protein Efficiency: Beyond fats, rice bran offers a plant-based protein with a ratio comparable to milk proteins, containing all essential amino acids.

Alongside rice bran oil production, the by-products generated can also increase the revenue of this industry. True by-product optimization extends far beyond the oil itself. A cir-

The transition of rice bran from "poultry feed" to "liquid gold" is not a matter of resource scarcity, but of policy and technological will. We possess the raw material to satisfy half our edible oil needs and secure a massive export surplus. As we look at the millions of tons of bran produced each year, we must ask: how many other "waste" products in our agricultural chain are actually hidden solutions to our national health and economic challenges? Valorizing the rice value chain is no longer an option—it is an economic imperative for a sustainable Bangladesh.

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