

## RICE BRAN OIL - NATURE'S GIFT TO MANKIND

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Fat is an important ingredient of human diet which supplies energy to the human body. The functional role of fat in the diet is manifold. Fats work as a vehicle to carry the fat soluble vitamins, nutrients and antioxidants in the body. Fats, especially fish oil and vegetable oil, are rich in essential fatty acids (EFA) which are the precursors for prostaglandins that are synthesised in the body from EFAs. Prostaglandins play a key role in regulating many physiological processes in the body such as controlling blood pressure, vascular damage in the brain and heart, preventing blood clot in the arteries, lowering cholesterol, uterine contractions during child birth etc. Fats also help in raising HDL, the good cholesterol. Fat in the diet imparts certain textural qualities, taste and palatability to the food.

However, several studies have directly implicated the amount and type of fat intake to specific diseases such as cardiovascular diseases, cancer, high blood pressure and obesity.

Choice of a healthy cooking oil is a controversial subject. Desi ghee used to be the conventional cooking medium of majority of Indian households. Desi ghee being rich in saturated fat has the tendency to increase the total cholesterol including bad (LDL& VLDL) and good (HDL) cholesterol. Consumption of desi ghee coupled with fibre rich diet which reduces LDL and physical activity which reduces VLDL brings about a favourable lipid profile. But with the lack of physical activity in the recent years coupled with intake of diet devoid of fibre, consumption of desi ghee started raising total cholesterol levels.

Therefore, the search started for an alternative cooking oil which reduces the cholesterol levels. Short term studies conducted in this regard found that polyunsaturated fats prevented coronary heart diseases by lowering blood cholesterol and the dietary advice was to use vegetable oils rich in polyunsaturated fats such as sunflower and safflower oils. However, later research showed that prolonged use of oils rich in polyunsaturated fats had undesirable effect of reducing the good cholesterol along with bad cholesterol. It was further proved that since oils rich in polyunsaturated fats oxidise faster than those with monounsaturated or saturated fats, excessive intake of these oils could impair the ability of the antioxidants in the human system to control free radicals in the human body and thereby enhance the rise of certain cardiovascular diseases, cancers, cataracts, rheumatoid arthritis, Parkinson's disease and contributing to ageing problem. All these findings have led to a change with respect to the earlier recommendations and a delicate balance between cholesterol balancing (instead of cholesterol lowering)

properties and oxidative stability has become an important concern now-a-days.

The American Heart Association now recommends use of oils having an equal proportion of saturated, monounsaturated and polyunsaturated fats. The world Health Organisation (WHO) recommends ratio of saturated/monounsaturated/ polyunsaturated fatty acids as 1:1.5:1 and linoleic acid (omega6)/alpha linolenic acid (omega3) ratio of 5-10 in the diet. Japan's Ministry of Health and Welfare suggests fatty acid ratio of saturated/ monounsaturated/polyunsaturated fatty acids as 1:1.5:1 and 4:1 ratio of omega6 to omega3 fatty acids. A further noteworthy recommendation is that the intake of polyunsaturated fat should be accompanied by vitamin E, vitamin C or carotene consumption to help prevent lipid peroxidation.

The above recommendations reveal that there are basically three parameters to adjudge any oil as the healthiest cooking oil, i.e. ratio of saturated/ monounsaturated/polyunsaturated fatty acid, ratio of essential fatty acids and presence of natural antioxidants.

Rice Bran Oil has been proved to be the only edible vegetable oil with the fatty acid profile that is closest to the recommendations made by organisations like the WHO and the American Heart Association. The following table shows the comparative position of saturated, monounsaturated and polyunsaturated fatty acids in various edible vegetable oils.

### Composition of common edible vegetable oils

Name of oil	Fatty Acid %		
	SFA	MUFA	PUFA
Mustard/Rape seed	6	67	27
Cottonseed	28	22	50
Sunflower	12	21	67
Safflower	10	15	75
Soybean	16	24	60
Palm	51	39	10
Olive	14	77	9
Canola	6	58	36
Corn	13	20	62
Coconut	92	6	2
Groundnut	20	50	30
<b>Rice Bran</b>	<b>18</b>	<b>45</b>	<b>37</b>
<b>Recommended by WHO</b>	<b>28.6</b>	<b>42.8</b>	<b>28.6</b>

SFA - Saturated fatty acid

MUFA - Monounsaturated fatty acid

PUFA - Polyunsaturated fatty acid

Rice Bran Oil (RBO) is extensively used in Japan, Korea, China, Taiwan and Thailand as a premium edible oil. It is the conventional and the most favourite cooking medium of the Japanese, the longest living human beings on this earth and is popularly known as a "**Heart Oil**" in Japan. In recent years, U.S. Scientists have also shown a tremendous interest in the cholesterol lowering properties of rice bran oil and this oil has acquired the status of "**Health Food**" with the Americans. Rice bran oil reportedly has a ratio of saturated, monounsaturated, polyunsaturated and essential fatty acids (omega3 and omega 6 fatty acids) that is close to the ideal ratio recommended by American Heart Association. It also has significant cholesterol and triglyceride reducing properties. The studies attribute the cholesterol reducing property to the presence of an unique anti-oxidant, **Oryzanol**, which is not found in any other edible oil. Oryzanol is also beneficial in a range of other ailments including gastro-intestinal disorders and nerve imbalance and Rice Bran Oil's other components like tocotrienols and squalene have powerful **anti-cancer** and **anti-ageing** properties.

An additional advantage of RBO is that eatables fry faster in rice bran oil and absorb less oil while it also has an excellent keeping quality and oxidative stability.

The Rice bran Oil, owing to its very low level of production, is not well known for its food value. It is estimated that actual current annual world rice bran oil production is less than 8 lakh tonnes or about 1 % of all vegetable oils used for human consumption.

India produces 120 million tonnes of paddy annually which contain 5-6 % of rice bran, leading to production of 6-7 million tonnes of rice bran. Rice bran contain 16% oil, hence there is a potential for production of 1-1.2 million tonnes of rice bran oil in the country but the actual production of rice bran oil is only 0.5-0.6 million tonnes.

India is the second largest producer of crude rice bran oil in the world. According to estimates of the Solvent

Extractors Association of India(SEA), production of refined rice bran oil in the country has jumped from 41000 tonnes in 1994 to 34 lakh tonnes as on 01.01.2002. The modern rice mills and huller-cum-shellers help in recovering good quality rice bran for oil extraction. There are 35088 modern rice mills and 8385 hullers-cum-shellers and shellers in the country. The industry believes that rice bran oil production could multiply in the coming years if more awareness could be generated about its nutritional properties.

About 75 per cent of crude rice bran oil is used for edible purposes for manufacture of vanaspati and rest goes to industrial sector for manufacture of soap. The latest trend in edible oil industry is blended oils. The "Sundrop Heart" available in market is a blend of sunflower and rice bran oils(refined rice bran oil-80% & sunflower oil-20%). Saffola has also started marketing sunflower and safflower refined oils blended with rice bran oil. Only recently some of the Indian markets too have started witnessing some brands of pure refined rice bran oil.

The technology for refining of rice bran has been standardised recently by Council of Scientific and Industrial Research(CSIR) and has already been tested. In India, about eight units are existing at present and another 4 such units are under construction. Among them, M/s A.P. Solvex, has launched its pure refined rice bran oil brand "**Ricela**" in northern India, especially in Himachal Pradesh, Punjab and Jammu & Kashmir.

The time is not very far when the leading brands of refined rice bran oil will be available in all the markets of India and consumers in India too could enjoy the benefits of this unique gift from the mother nature. Moreover, as India imports considerable quantity of edible oil, use of domestic rice bran oil will help in import substitution, thus saving valuable foreign exchange.

However, proper promotion of rice bran oil as a health oil, remains the most important factor in increasing its acceptability as a cooking oil among the masses. The Solvent Extractors' Association of India(SEA) has, therefore, taken initiatives to organise National Seminars on rice bran oil to create awareness about its nutritional and health benefits.