Introduction
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Rice is one of the world’s most important food crops and more than half of the people in the world eat rice as the main part of their diet. India is the second largest producer of rice in the world next to China (Joshi, 1993) and produces 136.5 million metric tones of paddy and 91.0 million metric tones of rice. The potential of getting rice bran as byproduct during milling of rice is very high to the tune of 6.38 million metric tones at the rate of 7.5% of rice which can produce about 10.2 lakh metric tones of rice bran oil per annum. Currently the industry is processing about 35 lakh metric tones rice bran producing about 6.0 lakh metric tone of rice bran oil per annum, out of which 4.8 lakh metric tones is of edible grade and the balance 1.2 lakh tones is of non-edible grade. The untapped potential of rice bran oil is about 4.2 lakh metric tones (www.seaofindia.com/004.htm).

Rice bran contains 12-25% oil depending on variety and degree of milling. Thus, if this source is properly exploited, it may fill up a major portion of the gap in the demand and supply of edible oils in our country (Bera, 1992).

Extensive research in India and abroad has established that rice bran oil have remarkable advantages over other cooking oils. It is nutritionally superior and contains more micronutrients which protects heart and related blood vessels and has anti-viral capabilities. It is more stable at higher temperature and has longer shelf life. Its absorption by foods during frying is about 15% less than
other frying oils, frying is completed in less time and imparts better taste and flavor to food items due to less sticky nature (www.seaofindia.com/002.htm).

Rice bran oil is extensively used in Japan, Korea, China, Taiwan and Thailand as a premium edible oil. In Japan, rice bran oil is more popularly known as a heart oil. Recently, U.S.A scientists have also shown tremendous interest in its cholesterol lowering properties. It contains oryzonal which increases HDL (good) cholesterol and lowers LDL (bad) cholesterol and triglycerides level in the blood. It has the ideal ratio of saturated, monounsaturated and polyunsaturated fatty acids which is close to WHO recommendation. Squalene present in rice bran oil improves skin tone and delays wrinkle formation. The natural antioxidants tocopherol and tocotrienol present in it has anti-thrombitic and anticancer properties and maintain balance of nervous system. It has 4-hydroxy-3-methoxy cinnamic acid which stimulates hormonal secretion and rejuvenates health (www.seaofindia.com/002.htm).

Delicate yet flavor-ful, rice bran oil first may be the world’s healthiest edible oil, containing vitamins, antioxidants and other nutrients. Rice bran oil is rich in vitamin E complex, tocopherols and tocotrienols, a unique antioxidant known as gamma oryzanol high quantities of phytosterols, polyphenols and squalene. Rice bran oil has a very good shelf life compared to other cooking oils because of these antioxidants.

Rice bran oil is an excellent choice both as an ingredient for salads, marinades and in baking. It is the most excellent cooking oil for just about all
cooking methods namely deep frying, pan frying sautéing and stir frying. Rice bran oil is extremely light, versatile and delicious for food uses. The high smoke point of rice bran oil prevents break down of its fatty acid at high temperature. Its light viscosity allows less oil to be absorbed in cooking, reducing over all calories, mixes better in salad dressing and improves the taste of baked foods. (www.shop.store.yahoo.com/chefshop/ricebranoil.htm).

A break through in the production of edible grade rice bran oil was made by the industry in the year's 1978-79. The production of edible grade rice bran oil has been constantly increased since then, to a level representing about 60% of the total oil yield (Tikko et al. 1987). The remaining non-edible grade rice bran oil is being used in soap and fatty acid industries, rust inhibitor, metal fabrication, textile industry, lubricants etc.

Although, the prospect of rice bran oil is very promising but the exploitations of this oil has not achieved the degree it should have due to various technological problems.

The major problems restricting the exploitation of the rice bran oil to the maximum capacity may be categorized as follows

1. The bran obtained from Sheller and modern mills which constitute about 40% of the total bran is only usable for solvent extraction to obtain the oil. While the huller mills bran is not suitable for this purpose due to their low oil and high sand silica contents.
2. The rice bran contains a lipolytic enzyme which gets activated during the course of milling and starts to split the oil in the bran very fast. Thus, if the bran obtained after milling of rice is not processed with in a short time, the resultant oil obtained after solvent extraction will have higher free fatty acids (up to 10%) which leads to high refining losses during deacidification and become unfit for edible purposes.

3. Rice bran oil contains an appreciable quantity of gums. This poses a problem during its refining if the oil is not properly pretreated and often responsible for high refining losses.

4. Rice bran oil develops a dark and fixed coloration due to progressive heat treatment during processing which is very difficult to remove by refining and bleaching operations. This phenomenon is more pronounced as the free fatty acids of the oil increases to higher values.

5. Rice bran oil, unlike most vegetable oils, contains an appreciable quantity of vegetable wax about 5-7%. This not only makes the oil appearance unacceptable for edible use but also is not suitable for human consumption as such due to its laxative action. The presence of the wax as reflected in the high unsaponifiable value, of the oil also limits its use in appreciable quantity in making vanaspati (Mishra et al.1988). The raw grade I rice bran oil is being used for hydrogenation which has been permitted by the government of India.
Keeping in view the facts stated above the present investigation was planned to study the physico-chemical change during extraction, refining, deep fat frying and storage of rice bran oil with following specific objectives.

1. To study the physico-chemical characteristics of crude rice bran oil
2. To study the effect of extraction and refining parameters on the physico-chemical characteristics of rice bran oil
3. To study the effect of frying on the physico-chemical characteristics of refined rice bran oil and sensory quality of fried product
4. To study the storage stability of rice bran oil.