



Rice Bran Oils

This is the best less oily cooking oil

Today's consumers are spoilt for choices. Be it electronics, FMCG or fashion, diverse product assortments with different USPs attached are luring us constantly. The majority of shopping we do is influenced by scores of factors including advertisements, SM promotions, product packaging, and discounts. Making an informed decision comes at the cost of these factors. For instance, in your daily need shopping too, while choosing the rice bran oil-do we check how much oryzanol (a natural antioxidant) is there or we just pick up the brand for its smart packaging/offers? Do we care to know oryzanol also helps in reducing hypertension? In this month's comparative test study, Consumer Voice team singled out 9 popular brands of rice bran oils and tested the brands at an NABL accredited lab to rank the oils as per their performances.

A Consumer Voice Report

Rice bran oil is preferred primarily for its rich oryzanol, vitamin E, ideal fatty acid balance, antioxidant capacity, and cholesterol-lowering abilities. Moreover, the oil is very light and the flavor is delicate. Foods cooked with rice bran oil absorb up to 15-20 percent less oil! Less oil in food items means reduced calories, better and lighter tasting food and enhanced flavor and palatability. Less oil in

our food also makes it more economical. In our comparative test of 9 regular selling brands, each brand was evaluated based on parameters including oryzanol, saponification value, unsaponifiable matter, MUFA, PUFA, saturated fatty acid, moisture, refractive index, specific gravity, iodine value, peroxide value, flash point, argemone oil, etc. among others.

How We Test

The comparative testing was done by following specified national standards methods and FSS regulations. However, a few parameters were taken from other relevant national standards including IS: 3448-2014 rice bran oil specifications. And as usual, the testing was conducted at an NABL accredited and FSSAI approved laboratory following the standard

test procedures. Each brand was purchased from the retail market, masked and coded before given to the lab for testing.

Brands Tested

So, here are the test results and rankings. The table below will show you which brand secured the highest and lowest positions.

Rank	Total Score Out of 100	Brands	Quantity, Liter/Gms	MRP/ Purchase Price, Rs	Best Before, Months	Manufacturer/ marketer
1	87	Porna	1L (910 gm)	115/98	6	SKM Animal Feeds and Foods (India) Pvt. Ltd.
2	86	Ricela	1L (910 gm)	110/110	9	A.P. Organics Ltd.
2	86	Patanjali	1L (910 gm)	136/126	9	Patanjali Ayurved Limited
3	85	Fortune	1L (910 gm)	125/125	9	Adani Wilmar Ltd.
3	85	Karmiq	1L (910 gm)	120/94	9	Future Consumer Limited
3	85	Gagan	1L (910 gm)	116/116	9	Bunge India Pvt. Ltd.
4	84	Freedom	1L (910 gm)	101/94	9	Gemini Edible & Fats India Pvt. Ltd.
5	83	Dhara	1L (910 gm)	150/112	8	Mother Dairy Fruit & Vegetable Pvt. Ltd.
5	83	Emami	1L (910 gm)	110/102	8	Emami Agrotech Limited

Note: All the brands were physically refined oils and packed in high density polypack of one litre capacity.

Key findings

- ▶ Brand Porna was ranked first followed by Ricela and Patanjali at second. Fortune, Karmiq and Gagan were ranked at third position.
- ▶ Ricela had the highest percentage of oryzanol followed by Porna, Patanjali and Fortune and it was at the lowest in Emami.
- ▶ All the tested brands had complied with FSSAI regulated fatty acid composition requirements as well.
- ▶ All the brands met the FSSAI standard requirements and were found free from adulteration with other oils. Traces of lead were detected at 0.06 – 0.4 mg/kg in 8 brands except for Gagan. However, lead was found below the specified limit in these 8 brands.



**CONSUMER
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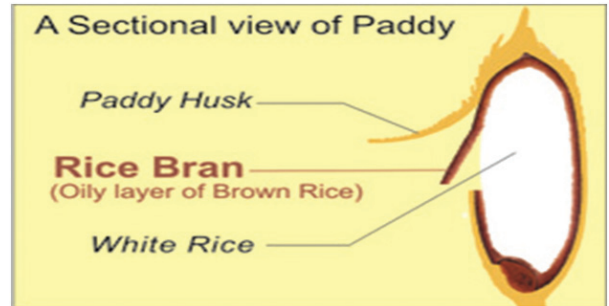
PORNA

Why Rice Bran Oil?

Rice bran oil is a naturally occurring source of oryzanol, a nutrient is known to have anti-oxidant, anti-carcinogenic, anti-ulcer, anti-stress, lipotropic, hypothalamic, endocrinological effects and athletic benefits, it also treats nerve imbalance, disorders of menopause and benefits to the skin similar to that of vitamin E. The oil has the best balance of saturated, monounsaturated and polyunsaturated fats as recommended by the American Heart Association and the World Health Organization. It's the oil of choice for improving serum cholesterol levels and preventing cardiovascular diseases.

Test Results

Oryzanol | Saponification value | Unsaponifiable matter | MUFA | PUFA | Saturated Fatty Acid | Moisture | Refractive index | Specific Gravity | Iodine value | Peroxide value | Flash Point | Acid value | Marking | Argemone Oil | Lead | Arsenic | Clarity test | Trans Fatty Acid | Physical observations | Packing | Net Weight/Volume



Comparative Performance (Scores) of Physically Refined Rice Bran Oils

Brand Parameters	Weightage	Porna	Ricela	Patanjali	Fortune	Karmiq	Gagan	Freedom	Dhara	Emami
Test Parameters										
Moisture	5	5.00	4.00	4.00	4.00	4.25	4.25	4.25	4.0	3.75
Refractive index	5	4.52	4.37	4.40	4.37	4.61	4.52	4.55	4.64	4.67
Specific Gravity	5	4.10	3.50	3.80	3.80	3.50	3.80	4.10	4.10	4.40
Iodine value	5	4.52	4.42	4.42	3.82	4.46	4.42	4.24	3.84	3.78
Peroxide value	4	3.54	2.90	3.52	3.36	3.48	3.76	3.00	3.62	3.28
Saponification value	6	5.93	5.33	4.99	5.74	4.85	5.18	5.55	4.68	5.38
Unsaponifiable matter	6	5.16	4.98	5.16	5.34	5.34	4.92	5.22	4.98	5.22
Flash Point	4	3.40	3.00	3.60	2.80	3.60	2.80	3.40	3.40	3.20
Oryzanol	16	13.60	15.20	13.60	13.60	12.80	12.80	12.80	12.00	11.20
Acid value	4	2.80	2.40	2.40	2.80	3.20	2.40	2.40	2.40	2.40
Test for argemone oil	3	3	3	3	3	3	3	3	3	3
Lead	3	2.52	2.04	2.28	2.04	2.85	3.00	2.28	2.04	2.52
Arsenic	3	3	3	3	3	3	3	3	3	3
Clarity test	2	2	2	2	2	2	2	2	2	2
MUFA	6	4.42	4.70	4.70	4.85	5.39	4.67	4.56	5.46	5.06
PUFA	6	4.70	5.52	5.28	5.09	3.65	4.70	4.80	4.18	4.42
Saturated Fatty Acid	6	4.28	5.33	5.08	5.12	4.49	4.57	4.53	5.03	4.74
Trans Fatty Acid	2	1.6	1.8	1.6	1.6	1.8	2	1.8	1.8	1.6



TEST PARAMETERS

► Oryzanol

Requirement: Not less than 1 percent by mass. Oryzanol is a natural antioxidant and is known to reduce the absorption and deposition of low-density lipoprotein (LDL) and very-low-density lipoprotein (VLDL) which is bad serum cholesterol. Oryzanol also helps in reducing hypertension. It improves bone mineral density and liver function and gives relief from gastrointestinal distress. Oryzanol was well above the minimum requirement in all tested brands, ranging between 1.2 to 1.7 percent by mass. Ricela had the highest percentage of oryzanol followed by Porna, Patanjali and Fortune. Emami had the lowest.

► Peroxide Value

Peroxide value detects the initial evidence of rancidity in unsaturated fats and oils. Among the other available methods, peroxide value is the most widely used. The concentration of peroxide in an oil or fat is useful for assessing the extent to which spoilage has advanced. As per FSS Regulation, it should be up to 10 mEq per kg.

The 9 brands were found well within the specified limit. Brands Gagan, Dhara, and Porna scored highest in this parameter.

► Saponification value

It helps to detect the presence of other oils/fats. The saponification value of rice bran oil should be between 180 and 195. All the brands were found within the specified limit. Brands Porna, Fortune and Freedom scored highest in this parameter.

► MUFA (Monounsaturated fatty acids)

MUFAs are a healthy type of fat. MUFA and PUFA as per the dietary recommendation help in biochemical processes associated with nerves, brains, heart, digestion, and cell maintenance. In this test parameter, we found MUFA was highest in Dhara and lowest in Porna.

► PUFA (Polyunsaturated fatty acids)

PUFA can help reduce bad cholesterol levels in your blood which can lower your risk of heart disease and stroke. PUFA was found highest in Ricela and lowest in KarmiQ.

► **Trans Fat**

Rice bran oil is known as trans-fat-free oil. However, traces of trans fats were found in all the brands except for Gagan.

► **Saturated Fat**

Foods with *saturated fats* raise cholesterol levels. This fat changes LDL from small, dense (bad) to large LDL, which is mostly benign. We found saturated fat was highest in Porna and lowest in Ricela.

► **Unsaponifiable Matter**

The unsaponifiable matter should not be more than 3.5 percent for chemically refined oil and 4.5 percent for physically refined oil. All the brands were found within the specified limit.

► **Moisture and Insoluble Impurities**

Moisture is the amount of water present in edible oil. The amount of water should be low as far as possible. The permissible limit is not more than 0.10 percent by weight. All the brands were found within the specified limits. However, Porna scored highest in this parameter.

► **Refractive Index**

The *refractive index* of oil is used to detect rancidity in edible oil. The index range should be between 1.4600-1.4700 for rice bran oils. All the brands were found within the specified standard limit.

► **Specific Gravity**

Specific gravity is the ratio of the density of a material to the density of water. As per the Indian standard, the specific gravity of rice bran oil should be in the range of 0.910–0.920. In our test, we found all the brands were within the specified limit of Indian standards.

► **Iodine Value**

The iodine value is a measure of unsaturated fats. It is a quality test for edible oil as well. As per Indian standard, the iodine value of rice bran oil

should be between 90-105. All brands were within the specified limit. Brand Porna scored highest in this parameter.

► **Packaging**

Rice bran oils need to be packed in a suitable well-closed tin or food-grade plastic containers. Packaging once used, should not be reused. The packing material should not affect the properties of the oil and at the same time, should maintain the shelf life of the product. All the oil brands were packed in a poly pack of 1 liter.

► **Marking/labeling**

The containers need to be marked with the name and net volume of the material along with the manufacturer's name and trademark if any. Also, batch number, month and the year of manufacture, best before, MRP, customer care details should be mentioned. We found all the brands were labeled with necessary information.





PHYSICO-CHEMICAL TESTS

► Net volume, ml

Net weight should be as declared on the packaging. However as per legal metrology (packaged commodity) rule, for 1000-10000 ml tolerance allowed is 1.5 percent. All the brands were above the declared volume.

► Physical Observations

Rice bran oil should be free from rancidity, sediment, suspended or other foreign matter and separated water. The tested brands were observed meeting this requirement.

► Flash Point

The flash point of a volatile material is the lowest temperature at which it can vaporize to form an ignitable mixture in air. At the flash point, the vapour may cease to burn when the source of ignition is removed. It should not be less than 250°C in the case of rice bran oil. The higher the flash point of rice bran oil, the lower is the risk of ignition in the oil. Flash point of all the brands was above 250°C thus meeting the standard requirement.

► Acid Value

The acid value is the number of milligrams of potassium hydroxide necessary to neutralise the free acids in one gram of sample. It is a relative measure of rancidity as free fatty acids are normally formed during the decomposition of oil. Acid Value should not be more than 0.5. We found all the brands were within the specified limit.

► Argemone Oil

Edible oils should be free from argemone oil. Consumption of this oil can lead to health hazards. However, in our study, we did not find argemone oil present in any brand.

► Heavy Metals

Edible oils are generally low in trace element concentrations. However, metals such as arsenic (As), lead (Pb), cadmium (Cd), chromium (Cr), and selenium (Se) can be found and are known for their toxicities which affect the health of consumers.

► Lead

It should be 0.5 mg per kg maximum. All the

brands were within the specified limit. Lead was not detected in Gagan. In other brands it was found 0.06-0.4 mg/kg).

► **Arsenic**

It should be 0.5 mg per kg **maximum**. All the brands were found below the detection limit of 0.05 mg/kg.

► **Clarity Test**

The clarity of the material was judged by the absence of turbidity. Turbidity was absent in all the tested brands.

► **Fatty Acid Composition**

Different types of fatty acid proportions vary from one type of oil to another. An average person should limit the saturated fat intake.

Test Results of Fatty Acid Composition

The test results of this parameter revealed that all the

samples conform to the FSS regulation requirements. All brands had met the national standard requirements for fatty acid composition means all brands are rice bran oils only.

Conclusion

The 9 tested rice bran oil brands had met the FSSAI standard requirements and thus are safe for consumption. They were found free from argemone oil and adulteration of other oils. All the brands had met fatty acid composition requirements as well. Oryzanol was found well above the specified limit which is a natural antioxidant and is known to reduce the absorption and deposition of low-density lipoprotein (LDL). In a nutshell, rice bran oil is considered to be a heart-friendly oil that might help in lowering cholesterol because it contains the right amount of oryzanol.

Better to Know

a. Shelf life

All the tested brands had a shelf life of 6-9 months. Consumers buying above 5-liter capacities must ensure that the product shelf life is adequate for the consumption period.

b. Good and bad fats in edible oils

Monounsaturated	Polyunsaturated	Saturated	Trans
Good fat	Good fat	Bad fat	Bad Fat
Reduces bad cholesterol (LDL) levels and increases good cholesterol (HDL) levels	Reduces bad cholesterol (LDL) levels	Increases overall cholesterol levels, especially bad cholesterol	Increases the bad cholesterol (LDL) level and decreases good cholesterol (HDL) levels
Found in nuts and seeds, avocados, olive oil, and canola oil	Found in fatty fish such as salmon, mackerel, trout and sardines, and also in corn, safflower, sunflower and soybean oils	Found in animal-based foods such as meat, poultry and eggs, and also in butter, cream and other dairy products Also found in plant-based products such as coconut, coconut oil, palm oil, and palm kernel oil, and cocoa butter	Found in hydrogenated oil products such as vanaspati, margarine and vegetable shortenings used in packaged snack foods such as cookies, crackers, and chips, and fried foods.