



## Refined Soyabean Oil: Say hola to the best brand!

Soyabean oil is one of the major vegetable oils produced and consumed in the world. In India, soyabean oil is produced in substantial quantities though it used to be imported earlier. The nutritional value of soyabean oil is comparable to those of other vegetable oils such as maize corn oil, groundnut oil, sunflower and safflower oils. It is an excellent source of linoleic acid which is an essential fatty acid required by the body. Raw soyabean oil is not suitable for direct human consumption for various reasons. The oil is therefore refined before use as edible oil. In the January edition, we tested eight soyabean oil brands being marketed in the country to find the best brand.

*A Consumer Voice Report*

**E**dible oil adulteration has been an issue for a long time. Sometimes it is done deliberately and occasionally accidentally. However, generally expensive oil is deliberately adulterated with the cheaper one. VOICE Society decided to undertake

comparative testing of popular brands of refined soyabean oils marketed in the country. All the tested brands were for retail sale and packed in one liter capacity which is the most selling retail packing.

### How we test

The comparative testing was done by following the specified national standards FSS regulations and relevant IS: 4276-2014 (soyabean oil specifications). The testing was conducted at a 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

Following eight refined soyabean oil brands were purchased from retail markets for comparative testing in laboratory. The table below will show you which brands scores what along with performance-based rankings.

Rank	Overall Score out of 100 (Rounded Off)	Brand	MRP per liter, Rs.	Best before, months	Manufactured/ Marketed by
1	97	Fortune	195	9	Adani Wilmar Ltd
2	96	Dhara	210	9	Mother Dairy Fruits & Vegetables Ltd
3	95	Good Life	185	9	Reliance Retail Ltd.
4	91	Mahakosh	182	9	Ruchi Soya Industries Ltd
5	90	Dalda	205	9	Bunge India Pvt. Ltd
6	89	EMami	205	9	Emami Agrotech Limited
6	89	P Mark	195	12	Puri Oil Mills Ltd
6	89	Nature Fresh	185	9	Cargill India Pvt. Ltd

### Key findings

- Based on overall score brand Fortune performed on top followed by Dhara and Good Life
- Good Life is Value for Money brand too
- All brands passed the fatty acid composition test thus free from adulteration of other oils
- Dalda was liked most in sensory tests followed by Dhara and Good Life
- Aflatoxin was not present in any brand
- Five brands namely Naturefresh, Emami, P Mark, Mahakosh and Dalda were found high in lead content against the specified limit of FSSR.

### CV Recommendations

**Top Performer**  
**Fortune**  
**Value for Money**  
**Good Life**





**COMPARATIVE PERFORMANCE SCORE OF REFINED SOYABEAN OILS**

Parameter	Brand	Wt. %	Fortune	Dhara	Good Life	Mahakosh	Dalda	Emami	P Mark	Nature Fresh
Moisture & insoluble impurities		5	4.50	4.25	4.25	4.75	4.50	4.25	4.25	4.50
Refractive index		6	5.42	5.64	5.50	5.57	5.57	5.50	5.50	5.50
Saponification value		7	6.58	6.51	6.72	6.23	6.37	6.37	6.72	6.58
Iodine value		7	6.86	5.38	5.66	6.58	5.43	5.46	5.18	5.85
Acid value		6	6.00	6.00	4.80	6.00	6.00	6.00	6.00	6.00
Unsaponifiable matter		7	7.00	7.00	7.00	7.00	7.00	7.00	7.00	6.30
Peroxide value		5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Phosphorus		5	5.0	4.94	4.58	5.0	4.83	4.95	5.0	4.79
Haxane		5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Flash Point		4	3.84	3.68	4.00	3.84	3.84	3.68	3.68	3.68
Aflatoxin		6	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Fatty Acid Composition		12	12	12	12	12	12	12	12	12
Heavy metals (Pb,Cd,As,Mg)		8	8.0	8.0	8.0	2.4	2.4	1.6	1.6	1.6
Argemone oil		2	2	2	2	2	2	2	2	2
Sensory tests		8	6.93	7.13	7.04	6.87	7.35	7.03	6.89	6.93

Rating: >90 – Very good \*\*\*\*\*, 71-90- Good \*\*\*\*, 51-70- Average \*\*\*, 31-50- Poor \*\*, up to 30 – Very Poor \*



### Parameter wise test results

#### Fatty acid composition

Fatty acids composition of vegetable oils is formed by a mixture of saturated (SFAs) and unsaturated (UNFAs) fatty acids classified according to the number of unsaturated bonds as monounsaturated (MUFAs) or polyunsaturated fatty acids (PUFAs). All edible oils have virtually the same fat. But the proportion of different types of fatty acids varies from one type of oil to another. An average person should limit the saturated-fat intake to not more than 8 to 10 per cent. Eating a lot of saturated fat increases the level of bad cholesterol (low density lipoproteins, or LDL) in the blood. And it is generally acknowledged that high levels of LDL place one at greater risk of heart disease. Saturated and trans fats are unhealthy 'bad' fats that can increase one's cholesterol, harden the arteries and eventually increase one's risk for heart disease.

Fatty acids of soyabean oil was tested as per FSSAI requirements and found well within the standard limits. There was no adulteration in the tested oils.

#### Sensory tests

Soyabean oil shall be clear and free from adulterants, sediment, suspended and other foreign matter, separated water, and added colouring and flavouring substances. The product shall have acceptable taste and odour. Sensory tests were conducted in laboratory involving experienced lab scientists under the guidance/supervision of technical experts. The tests were conducted for colour, appearance, odour, taste, after taste feel and overall quality. The products were clear and not having any foreign matter or impurities. In this test Dalda scored highest followed by Dhara and Good Life.

#### Heavy metals (mg/kg)

Metal contaminants shall not exceed the tolerance



limits as prescribed in the Food Safety and Standards (Contaminants, Toxins and Residues) Regulations. Edible oils are generally low in trace element concentrations. However, metals such as arsenic (As), lead (Pb), cadmium (Cd) and mercury are known for their toxicities which may affect the health of consumers. All brands passed in arsenic, cadmium and mercury heavy metal tests. However, five out of eight brands were found high in lead content, against requirement of FSSR (specified limit 0.10 ppm maximum). The brands Mahakosh, Dalda have 0.2 mg/kg and Nature Fresh, Emami and P Mark have 0.4 mg/kg lead content against requirement of 0.1 mg/kg.

### Unsaponifiable matter

Unsaponifiable matter shall not be more than 1.5 per cent in soyabean oil.

All the brands were within the specified limit.

### Saponification value

Saponification value helps to detect the presence of other oils/fats. Saponification value of soyabean oil shall be between 189–195.

All the brands were within the specified limit thus passed the test. Good Life, P Mark and Fortune scored high in this parameter.

### Iodine value (wij's)

The iodine value is a measure of the amount of unsaturation in a fat. Iodine value of soyabean oil shall be between 120–141.

All the brands were found within the specified limit. Fortune scored highest in this parameter.

### Refractive index at 40 degrees

*Refractive index* indicates the possible chances of rancidity development in oil. It shall be between 1.4649-1.4710.

All the brands were well within the specified limit. Dhara scored highest in this parameter.

### Acid value

Acid value is important indicator of oxidation of oil. *Acid value* indicates the degree of rancidity of the given fat. High *acid values* arise in rancified *oils*. It shall not be more than 0.5. All the brands were well within the specified limit. Except



Good Life all other brands secured full marks in this parameter.

### **Aflatoxin**

The total aflatoxin shall be maximum  $15 \mu\text{g}/\text{kg}$ . The crops may be contaminated by aflatoxins mainly due to poor cultivation or storage conditions. The possibility of aflatoxins in soyabean oil is inevitable which can cause some health problems for consumers. All the brands were found within the specified limit thus passed the test.

### **Peroxide value**

Detection of peroxide gives the initial evidence of rancidity in unsaturated fats and oils. As per the FSS Regulation, it shall be up to  $10 \text{ mEq}/\text{kg}$ .

### **Phosphorus**

Phosphorus shall not be more than 0.02 per

cent as per FSSR. The phosphorus content gives indication related to the refining process and consequently is useful for process optimisation. All the brands were within the specified limit thus passed the test. Fortune, Mahakosh and P Mark secured full marks in this parameter.

### **Hexane**

Hexane is one of the most commonly used solvents in refining of edible oils. It shall not be more than 5 ppm.

All the brands were within the specified limit thus passed the test.

### **Moisture & Insoluble impurities**

Moisture is the amount of water present in edible oils. The amount of water shall be less than 0.10 per cent by weight which is standard permissible

limit. All the brands have been found within the specified limit. Mahakosh scored highest followed by Fortune, Dalda and Nature Fresh.

### Flash point

Flash point of soyabean oil shall not be less than 250 degrees celsius. The higher the flash point of soyabean oil, the lower is the risk of ignition in the oil. Flash point of all the soyabean oil brands were found above 250 degree C thus meeting the standard requirement. Good Life scored highest in this parameter.

### Net volume

The test was conducted for net quantity declared on product label. All brands met standard requirement as they had net quantity above their declared values as marked on the containers/ packaging.

### Argemone oil

Absence of argemone oil is mandatory requirement of the FSSAI regulation. Argemone oil was absent in all the brands tested.

### Packaging

Packaging of the soyabean oil should be of food grade packing material which should not affect the properties of oil as well as also maintain the shelf life of product and to be as far as possible reusable, recyclable. All the brands of soyabean oil, except P Mark, were packed in poly pack of 1 liter. P Mark brand was packed in one liter plastic bottle.

### Markings

The containers shall be marked with the following information:

- Name, trade name, type and grade of the oil
- Name and business particulars of the manufacturer



- Net quantity of the contents in the container
- Batch number
- Month and year of packing/manufacture
- Best before
- Free from argemone oil
- Nutritional information
- MRP
- Customer care details
- Green mark for vegetarian

All the above-mentioned information were marked on product labels thus fulfilled these requirements. The brands have mentioned about nutritional values on its packaging. Most of the brands claimed added vitamin A, D and E.

## Conclusion

Eight popular brands of refined soyabean oil were tested as per FSSAI requirements in a NABL accredited laboratory. Based on evaluation of test results and overall grading, it may be concluded that brands namely Fortune, Goodlife and Dhara passed in all the tests. There was no adulteration of other oils in any brand and were free of aflatoxins. However, lead (heavy metal) was found high in Nature Fresh, P Mark, Emami, Dalda and Mahakosh. Fortune topped in overall score followed by Dhara and Good Life. Good Life is Value for Money brand with MRP Rs.185.

### Edible oil cooking tips

It is beneficial to consume a mix of oils to maintain a balance between the fatty acids. All oils are good in one way or the other. It is advisable to use a combination of oils either by blending or by rotation. An important thing to keep in mind is that oil behaves differently when heated – it changes texture, colour, taste and nutritional properties.

When the oil reaches its smoking point, a lot of the

nutrients are destroyed and it can sometimes form harmful compounds.

### Manufacturers' comments

As a matter of policy, before publication, the test results of the brands have been shared with their respective manufacturers/marketers inviting their views/comments which were responded after consulting the designated lab. Important comments on test results and Consumer VOICE' replies are given below:

Brand	Manufacturer's Comment	Consumer Voice' Reply
Dalda	<p>"Bunge India Private Limited, the manufacturer of Dalda Refined Soyabean Oil, is not in agreement with the results as exhibited by Consumer VOICE.</p> <p>Bunge shared analysis report from a well reputed FSSAI accredited NABL lab to that effect and requested for joint analysis in presence expert representative from the FSSAI accredited NABL lab, to delve into the matter. But the request was declined by Consumer VOICE, who offered the choice of retesting in the presence of Bunge India's representative. Given that a fair chance has not been given to Bunge, we are constrained to convey our reservations with respect to the Consumer Voice results."</p>	<p><i>Our designated lab has given reply as below:</i></p> <p><i>"We would like to submit that we have re-verified the results and found them in order as reported."</i></p> <p>In case you are not satisfied, our designated lab can retest in presence of your representative. Our designated lab has reservation in involving another lab in witness testing as it is unethical as they are not the concerned party and are competitor of our lab. Kindly send your representative from Bunge India.</p>
Mahakosh	We keep internal testing records and sample confirm to mandatory parameters. Refrain from publishing adverse comments about our product.	<i>The lead was Analysed in duplicate by using ICP- MS using test method AOAC 2013.06.21st Ed. we have re-verified the results and found them in order as reported.</i>
Nature Fresh	Lead results seems high against our inhouse ICP equipment result - <0.1 mg/kg we request for retesting	<i>Lead - Analysed in duplicate by using ICP- MS. We have re-verified the results and found them in order as reported.</i>
P Mark	Results of iodine value, phosphorus and lead parameters are completely different.	<i>We would like to submit that we have re-verified the results and found them in order as reported. Lead - Analysed in duplicate by using ICP- MS. The test method used AOAC 2013.06,21st Ed.</i>