



Vanaspati Ghee

Look for the trans fat level while buying

Commonly known as dalda ghee, vanaspati is any refined edible vegetable oil (generally palm oil) or oils subject to a process of hydrogenation. Hydrogenation is performed using nickel metal as a catalyst, in reactors at low medium pressure. Vanaspati ghee is a cheaper substitute for the clarified butter (desi ghee) made from milk fat. Since vanaspati is one of the cooking medium in the country, it is desirable that proper quality controls are exercised in the making of this product. To make the buying decision easier for consumers, we tested 10 vanaspati brands available in the Indian retail markets and ranked them as per their performances for each parameter. Read on to know the best vanaspati brand!

A Consumer Voice Report

Each brand was tested based on parameters including trans fat, unsaponifiable matter, refractive index, vitamin A, nickel, adulteration test for animal fat, baudouin test, moisture, acid value, argemone oil among others.

How We Test

The test program for comparative testing was

developed by following the Food Safety & Standards Regulations. However some other consumer centric parameters were also used in this test from Indian standard IS:544-2014. And the examination was conducted at an NABL accredited laboratory.

Brands Tested

The following table is a ready reference to know the best vanaspati brand.

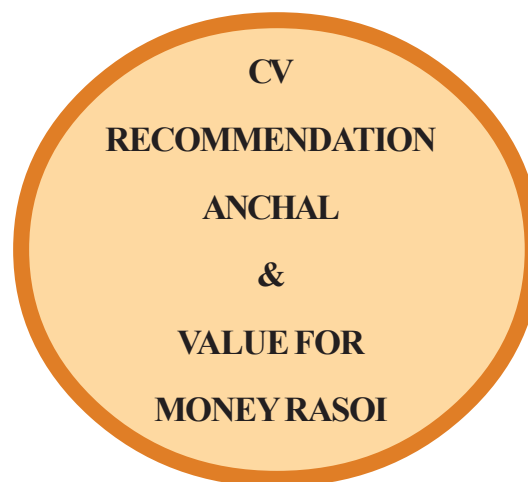
Rank	Total Score Out Of 100 (rounded off)	Brand	Quantity, Gm	MRP/ Purchase price, Rs	MRP per litre	Best Before, months	Manufacturer/ marketer off)
1	90	Anchal	500ml/448.5 gm	47/40	94	9	Ajanta Soya Ltd.
2	88	Rasoi	1L (897g)	82/82a	82	9	Emami Agro tech Ltd,
2	88	Raag	1L (897g)	115/89	115	6	Adani Wilmar Limited,
3	87	Gagan	500ml/448.5 gm	57/45	114	6	Bunge India Pvt. Ltd.,
4	86	Rath	1L (897g)	130/95	130	12	Cargill India Pvt. Ltd.,
5	85	Gemini	1L (897g)	130/105	130	9	Cargill India Pvt. Ltd.,
6	85	Sohna	1L (897g)	109/87	109	6	Markfed Vanaspati & Allied Industries
7	84	Ashoka	1L (897g)	300/110	300	6	Shree Hari Agro Industries Limited,
8	84	Dalda	1L (897g)	125/80	125	6	Bunge India Pvt. Ltd.
9	84	Panghat	1L (897g)	125/75	125	6	Sangrur Agro Ltd.,

Key Findings

- Based on the overall test findings, brand Anchal secured number one position followed by Rasoi and Raag at second place. Gagan was ranked third.
- Trans fat was found between 1.35-4.75 percent within the specified limit of 5 percent. Brand Anchal had the lowest Trans fat.
- Animal fat was not detected in any brand of Vanaspati
- Heavy metals were found within the specified limits.
- All the brands met the requirements of Food Safety & Standard Regulations.

However, it was observed that there was high difference in MRPs of brands tested. For example, Ashoka had the highest MRP at Rs.300 per kg, while Rasoi's MRP was at Rs.82 per kg. Brand Anchal's MRP was at Rs.94 per kg. One should note that, purchase prices of most of the brands were lower

than MRPs. Purchase price may vary from retailer to retailer.



Test Results

Trans Fat| Unsaponifiable Matter| Refractive Index| Vitamin A| Nickel| Adulteration Test for Animal Fat| Baudouin Test| Moisture| Acid Value| Argemone Oil| Physical Test| Heavy Metals| Net Quantity| Packing| Marking

COMPARATIVE PERFORMANCE SCORE

Brand → Test Parameters ↓	Wt. %	Anchal	Rasoi	Raag	Gagan	Rath	Gemini	Sohna	Ashoka	Dalda	Panghat
Physicochemical											
Unsaponifiable matter	7	5.82	5.24	5.49	5.13	5.53	5.30	5.07	5.55	5.17	5.70
Trans Fatty acid	20	17.30	14.84	14.34	13.78	13.46	12.38	13.16	10.78	11.46	10.50
Test for Argemone oil	5	5	5	5	5	5	5	5	5	5	5
Acid Value	6	5.54	5.50	5.41	5.45	5.50	5.54	5.41	5.54	5.50	5.41
Moisture	6	5.42	5.23	5.04	4.94	5.14	5.42	4.85	4.94	5.14	4.94
Refractive index	7	5.43	6.33	6.33	6.83	6.55	6.42	6.38	6.89	5.94	6.22
Baudouin Test	6	6	6	6	6	6	6	6	6	6	6
Vitamin A	8	4.10	5.18	5.14	4.97	4.06	4.37	4.41	4.26	4.37	4.75
Nickel	8	8	8	8	8	8	8	8	8	8	8
Adulteration test for animal fat	6	6	6	6	6	6	6	6	6	6	6
Overall Score (Rounded off)	100	90	88	88	87	86	85	85	84	84	84

TEST PARAMETERS

■ Trans Fat

Trans fatty acids are unsaturated fatty acids produced when unsaturated oils are converted to semi solid by a process called hydrogenation. These are unsaturated fats, but resemble saturated fats in many ways. Just like saturated fats, they also raise the level of ‘bad’ cholesterol in our blood. It is expected to be as low as possible in vanaspati. It should not be more than 5 per cent by weight. Anchal was found with the lowest trans fat hence scored highest marks followed by Rasoi and Raag. Highest trans fat content was found in Panghat, however it was within the specified limit.

■ Unsaponifiable Matter

Unsaponifiable matter includes substances frequently found dissolved in fatty acids and drying oils which cannot be saponified by caustic treatment. Unsaponifiable matter should not be more than 2.0 percent. All the brands were found well within the prescribed limit and had passed the test. Sohnna (1.42 percent) was found with

higher unsaponifiable matter, and Anchal (1.06 percent) had the lowest.

■ Refractive Index

Refractive index is used to detect rancidity in edible oil/fat. The index level should be at 1.4505 minimum as per the Indian Standard. All the brands had passed this parameter check. Brand Ashoka scored highest in this parameter.

■ Vitamin A

Vitamin A is essential for good health—notably for eyes and skin, immune function, reproduction, and bone growth. As per the Food Safety and Standards Regulation, prescribed limit of synthetic vitamin A in vanaspati is not less than 25.0 international units (IU) per gram at the time of packing and should be positive when tested. All the brands had met the standard requirement, however quantifiable limit is not prescribed at retailer level from where consumer purchases. Brand Rasoi scored highest in this parameter.

■ Nickel

Nickel is used as a catalyst in the hydrogenation

process to convert vegetable edible oils into vanaspati. It should not be more than 1.50 mg/kg in vanaspati. We found Nickel was below the detection limit of 0.040mg/kg in all the brands.

■ Adulteration Test for Animal Fat

Vanaspati ghee should be made from edible vegetable oils only. The test was conducted to check adulteration/presence of animal fat in vanspati. Animal fat was found absent in all the tested brands.

■ Baudouin Test

The test was conducted to confirm the presence of sesame oil in vanspati in sufficient quantity. As per the standard, Baudouin test should be not lighter than 2.0 red units in a1 cm cell on lovibond scale. We found all the brands with sufficient quantity of sesame oil and hence the tested brands passed the evaluation parameter.

■ Moisture

As per the national tandard, moisture should not be more than 0.25 percent in vanaspati. All the brands were found within the limit for moisture content and passed the test. Aachal at 0.06 percent and Gemini at 0.06 percent were found with the lowest moisture content among all. We found moisture was the highest in Sohna at 0.12 per cent.

■ Acid Value

Acid value of vanaspati is related to its shelf life. If acid value does not meet the requirement, it causes contamination and reduces the shelf life. As per the Indian Standard, acid value should not be more than 0.6. In our evaluation, we found all the brands met this requirement for acid value. Brands Anchal , Gemini and Ashoka scored highest in this parameter.

■ Argemone Oil

Argemone oil should be absent in vanaspati. All the brands were found free from adulteration of argemone oil.

■ Physical Observations

Vanspati should be free from non-edible oils,



mineral oil, castor oil and animal fats. It should not contain any harmful colouring, flavouring or any other matter that is harmful.

a) Colour

Vanaspati needs to be in white to pale yellow colour with no added colour. We found all the brands were of pale yellow in colour and semi solid mass.

b) Odor /flavour

The material should have a characteristic odor and should be free from rancidity or staleness, foreign. We found all brands with characteristic odor/flavour.

■ Physical Observations

The material should be free from sediments, suspended and other foreign matters separated water, added colouring or flavorings substances or any other substances deleterious to health. All the brands were found free from defects.

■ Heavy Metals

We tested lead, mercury, arsenic and cadmium. All the tested brands met the terms and the results were under the limit set by the FSS Regulations.

a) Lead

Lead is a heavy / toxic metal should not be present more than the defined limit by food safety regulations in a certain product. Lead, a cumulative poison, enters oil either through the soil or during production. It accumulates in the body and causes irreversible damage to the brain, nerve cells, red blood cells and

Comparative Test

the kidneys. The maximum limit of lead is 0.50 mg/kg. We found all the brands well within the standard limit.

b) Mercury

The maximum limit of mercury is of 0.25 mg/kg. All the brands were well within the standard limit.

c) Arsenic

Ingestion of large amount of arsenic can lead to gastrointestinal symptom such as severe vomiting, high blood pressure, heart attack etc. The maximum limit of Arsenic is 0.50 mg/kg. All the brands were found well within the specified limit.

d) Cadmium

Cadmium needs to be at 1.0 mg/kg, maximum. The 10 evaluated brands had passed this standard test.

■ Net Quantity

The net quantity of any package should be as per declaration and subject to tolerance given in legal metrology. All the brands were found above the quantity mentioned on their labels.

■ Packing

Vanspati should be packed in suitable sealed cartons or flexible packs or plastic containers or tin containers. All the brands were properly packed in colored poly pack.

■ Marking

The package labelling should contain information affixed to the container with indelible ink. The

containers need to have the following information:

- Name of the material.
- Net quantity.
- Manufacturers name, his recognized trademark, if any and address.
- Batch number or lot number in code or otherwise.
- Month and year of manufacture.
- Shelf life, best before (month and year).
- Free from argemone oil.
- Nutritional information including trans fat and vitamin A.
- Made from vegetable oils only.
- Vegetarian (green dot) mark.

All the brands were found with the above required information on their labels.

Conclusion

Since Vanaspati has trans fat in its composition, its presence should be as low as possible. Trans fatty acids (trans fat) should not be more than 5 percent in vanaspati. Oils rich in unsaturated fats such as sunflower oil, soya bean oil, groundnut oil, olive oil and mustard oil are better choices than vanaspati.

Manufacturers' Comments

As a matter of policy, before publication, the test results of the brands were shared with their respective manufacturers/marketers inviting their views/comments. Manufacturer's comments and our reply in brief are given below:

Brand	Manufacturer's Comment	Consumer VOICE Reply
Dalda	The results are significantly different and are not characteristic of the inputs and process used by us. Hence we request you to reconsider and amend the following parameters :- 1. Unsaponifiable matter value of 1.37 percent reported is very high, as compared against our reading of 0.75 percent. 2. The reported moisture value of 0.09 percent is very high, as compared to our reading of 0.04 percent. 3. The vitamin A value of 4.33 IU/g reported is very low, as compared against our reading of 25 IU/g indicated by presence as tested by the Antimony Trichloride Qualitative Method.	Our designated lab has reviewed and reconfirmed the test results of unsaponifiable matter, moisture and vitamin A. It is also observed that all the test results of concerned parameters are well within the specified limits of standard.

Comparative Test

Gagan	<ol style="list-style-type: none"> 1. Unsaponifiable matter value of the reported 1.39 percent is very high, as compared to our reading of 0.74 percent. 2. The reported moisture value of 0.11 percent is very high, as compared to our reading of 0.05 percent. 3. The vitamin A value of 5.26 IU/g reported is very low, as compared to our reading of 25 IU/g indicated by presence as tested by the Antimony Trichloride Qualitative Method. 	Our designated lab has reviewed and reconfirmed the test results of unsaponifiable matter, moisture and vitamin A. It is also observed that all the test results of concerned parameters are well within the specified limits of standard.
Fortune	<ol style="list-style-type: none"> 1. Vitamin-A Declaration: We have clearly printed about the Vitamin A declaration. 2. Baudouin Test: Positive. The internal lab test report is 2.4 Red and external report is 2.6 Red, for the Baudouin Test, indicates that the results of the Consumer Voice testing procedure are wrong. 3. Lead: The internal lab test report is 0.31 ppm and external report is BLQ (Below Limit of Quantification), for the Lead, indicates that the results of the Consumer Voice testing procedure are wrong. 	<p>It is confirmed that vitamin A is marked on product label.</p> <p>This test was earlier conducted through other method. Now they have tested it through Lovibond Tintometer, the value reported is 'not lighter than 2 red units in 1 cm cell on lovibond scale'.</p> <p>The test result of lead is 0.040 mg/kg. This is a typographical error while transferring the test results.</p>
RATH	<ol style="list-style-type: none"> 1) Contains Trans Fat - Not Provided – This information shifted under nutrition facts table as per FSS Packaging and Labelling Regulation Amendment 2017. 2) The words 'contains 25 I.U. of vitamin 'A' per gram, when packed not provided - This information provided under separate box on 1L Rath art work on pack 3) Unsaponification value/ Unsaponifiable matter - 1.20 – Results looks high than our plant results unsaponifiable matter maximum of 0.8 percent .3.10 Moisture - 0.09 – Result seems high as our plant results are <0.05 percent. 4) Refractive index - 1.4552 – vanaspati 2.2.6- this parameter already omitted by FSS product and additive regulation long back. 5) Baudouin Test – Request to retest as results did not match with our plant test results. 6) Vitamin A – Request to retest as results did not match with our plant test results. 	<p>Trans fat and Vitamin A is marked on product label.</p> <p>For unsaponifiable matter, moisture and vitamin A, lab has reviewed and confirmed the test results as reported.</p> <p>Refractive index is available in Indian standard which is voluntary.</p> <p>The baudouin test was earlier conducted by other method. Now lab has tested it through Lovibond Tintometer, the value reported is not lighter than 2 red units in 1 cm cell on lovibond scale.</p>
Rasoi	The value of vitamin A is declared as 5.60 IU/g which is contrary to the results of in-house testing. As per our in-house testing report product contains 25IU/g Vitamin A per gram.	We have consulted our designated lab for review/retest of vitamin A results. The lab has confirmed the test results. FSSAI requirement is 25IU/g at the time of packing and positive at retailer end.