



# Cow Ghee: Choosing what's best for you!

Almost all Indian cuisines and specialties contain Cow/Desi Ghee. It is a component of many foods, including dals, veggies, chapattis, etc. It is also used to do puja and to make homemade or traditional sweets. Cow ghee is a source of the fat-soluble vitamins A, D, E, and K that our bodies require in very small amounts but are unable to produce on their own. These vitamins carry out a variety of crucial tasks.

Ghee is a term for the unadulterated clarified fat made just from milk, curd, desi butter, or cream; no flavourings, colours, or preservatives have been added. Ghee is a significant dairy product that is traded between states. The VOICE Society chose to test the well-known brands of cow ghee that are sold in retail marketplaces as part of its ongoing efforts to give customers the greatest option.

*A Consumer Voice Report*

## Comparative Product Testing

The main objective of comparative study was to assess and evaluate the popular brands of Cow Ghee available in the market as per relevant national standards. All the brands tested were evaluated and graded as per their overall performance based on the comprehensive lab test reports.

### Brands Tested

Since there is no specific standard for cow ghee, the FSSAI regulations (Food Safety Standards regulation) and Agmark standard for ghee served as the main foundation for the test programme for comparative testing of Cow Ghee. For testing Cow Ghee, recommended/standard test procedures were employed.

Rank	Overall Score out of 100	Brand	Quantity, ml(gm)	MRP, Rs	MRP per 100 ml	Ag-mark	Best Before, Months	Manufacturer/ marketer
1	94	Verka	1000 (900)	650	65	-	9	The Punjab State cooperative Milk Producers' Federation Ltd.
2	93	Ananda	900 (810)	600	66.6	-	9	Gopaljee Dairy Foods Pvt. Ltd.
3	92	Gowardhan	500 (452.5)	380	76	-	12	Parag Milk Foods Ltd.
4	91	Vita	1000 (905)	735	73.5	Ag-mark	9	The Sirsa Distt Co-op milk producers union Ltd
5	90	Amul	500 (452)	290	58	Ag-mark	6	Gujarat Co-operative Milk Marketing Federation Ltd.,
5	90	Britannia	1000(902)	690	69	-	12	Britannia Dairy Pvt. Ltd.
6	89	Mother Dairy	500 (451)	300	60	Ag-mark	8	Mother Dairy Fruits & Vegetable Pvt. Ltd.
7	88	Paras	1000 (900)	595	59.5		9	VRS Food Ltd
8	87	Health Ways	500(450)	330	73.3		9	VRS Food Ltd
8	87	Patanjali	500 (452.5)	345	69	-	9	Patanjali food Ltd.
9	76	Milkfood	500 (449)	308	61.6	Ag-mark	9	Milk Food Ltd.



### CV Recommendations

<p><b>Top Performer</b> <b>Verka</b></p> <p><b>Value for Money</b> <b>Verka</b></p>
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### Key Findings

- Based on the overall scores, Verka is the top performer and no 1 brand followed by Ananda and Gowardhan.
- The value-for-money brand is Verka.
- In sensory panel tests, Britannia scored the highest followed by Health ways, Mother Dairy and Verka.
- Beta Carotene (Vitamin A) was highest in Mother dairy followed by Ananda, Britannia and Verka.



- Except Milkfood, there was no adulteration in any brand. Animal body fat was present in Milkfood.
- All the brands met the requirements of national standards.

## Comparative Performance Score

Parameters	Brand	% weightage	Verka	Ananda	Gowardhan	Vita	Amul	Britannia	Mother Dairy	Paras	Health Ways	Patanjali	Milkfood
Quantity, ml(gm)			1000 (900g)	900 (810g)	500 (452.5g)	1000 (905g)	500 (452g)	1000 (902g)	500 (451g)	1000 (900g)	500(450 g)	500 (452.5g)	500 (449g)
MRP, Rs.			650	600	380	735	490	690	300	595	330	285	308
Physico-chemical Tests													
Sensory Panel Tests		16	14.86	14.5	14.6	14.26	14.01	15	14.87	14.26	14.98	13.9	10.23
Milk Fat		14	14	14	14	14	14	14	14	14	14	14	14
Beta carotene as Vitamin A		10	9.42	9.5	8.33	7.09	6.5	9.5	9.83	8.34	7.25	7.5	8.25
Presence of animal body fat & vegetable Fat		8	8	8	8	8	8	8	8	8	8	8	0
Moisture & volatile matter		5	4.8	3.2	5	3.8	3	4	4.2	4.4	4.2	4	3.8
Free Fatty Acids		5	4.5	5	3.5	5	5	4	5	3.5	4.5	4.5	4.5
Butyro-Refractometer Reading		6	5.82	5.28	5.46	4.74	5.82	6	5.28	5.46	4.56	5.46	5.28
Reichert-Meissl Value		6	5.5	5.86	4.42	5.28	5.75	4.6	4.7	4.7	4.42	4.02	5.75
Saturated fat		4	3.64	3.18	3.88	3.81	3.64	3.5	3.04	3.78	3.98	2.9	4
Monounsaturated fatty acid		3	2.79	2.54	2.78	2.87	2.82	2.76	2.52	2.84	2.99	2.24	3
Polyunsaturated fatty acid		3	2.34	2.22	3	2.4	2.22	2.04	1.92	2.58	2.46	2.7	3
Trans Fatty acids		4	4	4	4	4	4	2.2	4	4	2	4	3
Peroxide Value		5	4	5	4.75	5	4.75	3.25	2	2.13	3.25	3.25	0.5
Baudouin test		4	4	4	4	4	4	4	4	4	4	4	4
Packing		2	1.7	1.7	1.2	1.7	1.2	1.7	1	1	1.7	1.7	1.7
Marking		3	3	3	3	3	3	3	3	3	3	3	3
Net weight		2	2	2	2	2	2	2	2	2	2	2	2
<b>Overall Score (Rounded off)</b>		<b>100</b>	<b>94</b>	<b>93</b>	<b>92</b>	<b>91</b>	<b>90</b>	<b>90</b>	<b>89</b>	<b>88</b>	<b>87</b>	<b>87</b>	<b>76</b>

### Test Parameters and Results

#### Sensory panel tests

Sensory panel tests were conducted in a laboratory under the supervision of experts. Panel members gave their judgements on flavour, texture, colour, appearance and taste, after taste feel parameters. Colour of the ghee should be from off white to yellow depending on the breed. It should have pleasant taste, flavour and free from off flavour & rancidity.

All the brands have taste and flavour of cow ghee. In sensory panel tests, Britannia got the highest score followed by Health ways, Mother Dairy and Verka.

#### Milk Fat

Fat is an essential part of any balanced diet, providing essential fatty acids, fat-soluble vitamins and a concentrated source of energy. The minimum requirement for milk fat in ghee is 99.5 per cent. All the brands fulfilled the minimum requirement for milk fat content.

#### Beta Carotene (Vitamin A)

Test was conducted to detect carotenoids as beta carotene in cow ghee. Beta-carotene is a yellow/orange pigment and also found in fruits and vegetables, especially carrots. In the body, beta-carotene converts into vitamin A (retinol). We need vitamin A for good vision and eye health, for a strong immune system, and for healthy skin and mucous membranes.

For vitamin A, the recommended dietary allowance (RDA) for adults is 600 milligrams daily.

Beta carotene (vitamin A) was highest in Mother dairy followed by Britannia/Ananda and Verka.

#### Presence of animal body fat and Vegetable fat (other than milk fats)

Cow ghee brands were tested for possible adulteration with animal body fat or vegetable fat. Due to the high cost and demand for ghee, it is highly susceptible to economically motivated

adulteration. Unscrupulous traders adulterate milk fat with low priced foreign fats for the maximization of profits. Adulteration of vegetable oil or animal body fat to milk and dairy products is old but illegal practice. These fats should be absent in ghee.

Animal fat was present in Milk food brand. In all other brands animal body fat and vegetable fat were absent.

#### Moisture & volatile matter

Moisture generally refers to the presence of water in a product. Less amount of moisture is better as it translates into a longer shelf life. As per FSS Regulations, moisture content in ghee should not be more than 0.5 per cent. It should not be more than 0.3 per cent as per Agmark.

Moisture content in all the brands was well within the specified limit. Among the Cow Ghee brands, the lowest moisture content was in Gowardhan followed by Verka and Paras.

#### Free Fatty Acids (as Oleic acid)

Free fatty acid is the percentage by weight of free acid groups in the oil or fat. Free fatty acids are an indication of hydrolytic rancidity, though other lipid oxidation processes can also produce acids.

Free fatty acids should be a maximum 2 per cent in ghee. All brands were well within the specified limit.

#### Butyro-Refractometer Reading at 40°C

BR reading is the index of purity of ghee. An increase in BR reading indicates adulteration of ghee with vegetable oil/animal body fat. As the level of unsaturation increases, BR reading gets increased and vice-versa. BR reading shall be 40-44 as per FSSR.

All the brands were within the specified limit of standard. Britannia, Verka and Amul scored highest in this parameter.

#### Reichert-Meissl Value

RM value indicates whether the ghee is prepared



from milk fat or not. If the value of this test is less than 24, this indicates the adulteration in ghee. RM value shall be minimum 24.

All tested brands met the requirements set by the national standard. Ananda and Amul scored highest in this parameter.

#### **Saturated fat**

Saturated fat is unhealthy fat usually found in meat and dairy products. A diet filled with saturated fat can raise LDL (bad) cholesterol levels. Saturated fats directly raise total and LDL (bad) cholesterol levels. Saturated fats should be less than 10% of the total calories you eat and drink each day.

Saturated fat was found highest in Patanjali and lowest in Milkfood and Healthways.

#### **Mono unsaturated fatty acid**

Though ghee is rich in fat, it contains high concentrations of monounsaturated fats. These healthful fatty acids support a healthy heart and cardiovascular system. MUFAs are associated with lowering the level of bad cholesterol (LDL) and total cholesterol while also increasing the production of the good cholesterol (HDL).

MUFA was found highest in Milkfood and lowest in Patanjali.

#### **Poly unsaturated fatty acid**

Eating moderate amounts of polyunsaturated (and monounsaturated) fat in place of saturated fat or Trans fats can benefit your health. Polyunsaturated fats can help lower your LDL (bad) cholesterol thus higher PUFA is considered better for health.

PUFA was found highest in Gowardhan and lowest in Mother Dairy.

#### **Trans Fatty acids, g/100g**

Trans fatty acids are worst type of fat that can raise the level of 'bad' cholesterol in our blood. Minimum Trans fat is better for health.

The highest amount of Trans fat was found in Health Ways followed by Britannia and Milkfood. In other brands it was found below the detection limit (0.1%).

#### **Peroxide Value**

Peroxide Value is an indicator of rancidity in the product. BIS standard, which is voluntary, specified a limit of maximum 0.6 milli equivalent of peroxide oxygen per kg. A lower number of



peroxide value indicates a good quality of oil and a good preservation status.

The brands namely Ananda/Vita followed by Amul and Gowardhan had lowest peroxide value. Peroxide value was highest in Milkfood followed by Mother Dairy, Paras, Patanjali/Health Ways and Britannia.

### Modified Baudouin Test

This test is to distinguish between Desi ghee and Vanaspati ghee. Ghee is generally adulterated with vanaspati fat/ghee.

Results of the Baudouin test should be negative. All the brands passed the test.

### Packaging

Packaging plays an important role in maintaining the consistent quality of the product and in preventing its deterioration. Brands Amul and Gowardhan Ghee were packed in a plastic box container. Mother Dairy and Paras were packed in a PVC pouch; rest were packed in thick & hard paper box.

### Marking/Labelling

The following details should be marked on the product label:

- a) Name of product
- b) Net quantity (declared)
- c) Name and address of manufacturer
- d) Date of packing
- e) Place of packing
- f) Use by date (Mandatory) Best before( voluntary)
- g) Batch or code or melt number
- h) MRP
- i) FSSAI license number
- j) Customer-care details
- k) Nutritional Information

All the brands provided marking details as above.

### Net weight/Quantity

Net quantity in all the brands was as per manufacturer's claim.

**Manufacturers' comments:** As per our procedure, we shared test results with concerned market-ers/ manufacturers. Their comments on test results and our reply to their queries are given below.

Brand	Manufacturers' comments	Consumer VOICE's reply
Milk Food	<p>Under FSSAI there is no standard of Peroxide value for ghee. Moreover at such low FFA value such high value of Peroxide is not possible.</p> <p>You have mentioned that fatty acid profile under FSSAI doesn't match. FSSAI has not enforced specifications for fatty acid profile yet.</p> <p>You are requested to test the parameters for ghee as per FSSAI or Agmark standards because whole of the industry follows the same.</p> <p>Regarding animal body fat, we request you to get it retested because we are sure that our product can't have such type of adulteration.</p>	<p>Peroxide value is a requirement of the Indian standard. Our lab is a NABL accredited lab for parameters tested and they confirmed the reported results after repeat testing.</p> <p>Fatty acid composition is a test to check adulteration/ percentage of different fats/acids in oils / ghee. Our testing and evaluation of test results are based on FSSAI requirements.</p> <p>Our designated lab has conducted repeat testing for Fatty acid profile results, crystallization time &amp; temperature curve using DSC (Differential Scanning Calorimetry) which confirms the presence of animal body fat. Our lab is ready for witness testing if you desire so.</p>
Mother Dairy	Peroxide values mentioned in test report are not correctly reported.	Our lab has repeated the analysis and found the results similar to the reported value.
Verka	Peroxide Value reported 1.0, mEq/1000g is above the norms.	Our lab has repeated the analysis and found the results similar to the reported value.
Patanjali	Reported peroxide value by you is too high i.e. 1.6, against our own test value of 0.5. Reported RM value by you is 24.5 against our own value of 28.0. Also PUFA value at our end is 1.87 but as per our attached report 2.5.	<p>Our lab has repeated the analysis and found the results similar to the reported value.</p> <p>Our lab is a NABL accredited lab for parameters tested and they confirmed the reported results after repeat testing.</p>



### Physical Observations

On melting, the ghee should be clear, transparent and free from sediment or foreign colouring matter. A good ghee sample should have well-developed granules dispersed fairly, thickly and uniformly over the entire mass. A bright yellow colour, caused by the presence of carotenoid pigments (beta carotene), is associated with cow ghee and constitutes a desirable criterion in areas where it is preferred. Buffalo ghee is white in colour. Sometimes, it may also have a greenish tinge depending on the region and feeding schedule. Ghee from mixed milk has a straw-yellow colour. The colour of fats always appears deeper to the eyes when melted than when in solid form.

### Conclusion

Ten out of 11 brands meet the requirements of national standards (FSSR). In Milkfood Cow Ghee, animal body fat was present. Fatty acid profile results, crystallization time & temperature curve using DSC (Differential Scanning Calorimetry) tests confirmed the presence of animal body fat in MilkFood Cow Ghee. Beta carotene (vitamin A) was highest in Mother Dairy followed by Britannia/Ananda and Verka. Highest amount of Trans fat was found in Health ways followed by Britannia and Milkfood. In sensory panel tests, Britannia got the highest score followed by Health ways Mother Dairy and Verka. Fatty acid composition is an important test to check percentage of different fats/acids in ghee. FSSAI has come out to make this test mandatory from Dec 2023 onwards.

Verka is the top performer and no 1 brand followed by Ananda and Gowardhan. Verka is also value for Money @ Rs.650 per kg.

NEW PRODUCT

SCAN



# TRANS FAT FREE Dalda Vanaspati tastes better and is as healthy\* as refined oil!

Trans Fats are your health's villain, because they are the most harmful fats. Dalda Vanaspati is TRANS FAT FREE. Bring it home today and enjoy taste with health\*!



**TRANS FAT  
FREE  
VANASPATI**

## What are Trans Fats?

Trans Fats (also known as Trans Fatty Acids or TFA) are a type of dietary fat. Trans Fats can be of two types: natural and industrially produced. When not consumed in moderation, Trans Fats can increase your chances of heart-related diseases.

## Where are Trans Fats found?

Trans Fats are found in daily food items such as dairy products, bakery products, red meat, packaged food, fried food, etc.

## Dalda Vanaspati is Trans Fat Free. What does this mean?

WHO and ICMR suggest that your daily diet should have less than 1%# Trans Fats. As per FSSAI guidelines, Dalda Vanaspati is TRANS FAT FREE.

Sehat - Limited only to the extent of trans fat and its ill effects. This product is Trans Fat Free.

\*Trans Fat should not be more than 1% of energy consumption

Dalda Vanaspati recommends a balanced diet and regular physical activity in line with ICMR Nutrient Requirements for Indians 2020# Guidelines, as part of a healthy lifestyle.

CV DISCLAIMER: The claims made are by the brand. Consumers may please make their own due diligence before making their purchase decision.