



Curd (Dahi)

Health food, yes, but is it adulteration-free?

Any number of health benefits are attributed to good old curd. Heart health, bone health, teeth health, immunity boost, you name it. Moreover, the nutrients present in curd are easily absorbed by your digestive system. Not only that, it also helps in absorbing nutrients from other food items that you have eaten. Eat it with spicy food, bland food, neutral food, the curd will complement most of them. Then there are the good bacteria that curd brings to your system. Curd can be one of the best sources of good bacteria. The following report covers 2 brands of probiotic curd and 10 of plain curd. With any number of brands out there laying claims to health and taste, it may be useful to know the parameters with which to assess their quality, safety and acceptability. A couple of findings from our test results will reveal to us that the important determinants of quality vary across brands.

A Consumer Voice Report

The plain curd brands were prepared from toned milk, while the probiotic brands were prepared from double-toned milk. As per our standard procedure, we undertook market research to identify the regular-selling brands of curd across the country. We tested the 12 samples on various quality, safety and acceptability parameters.

The key parameters included milk fat, solids not fat (SNF), milk protein, calcium, phosphorus,

carbohydrates, cholesterol and saturated fats. We also carried out a series of tests to check for presence of heavy metals and microbiological contamination. The testing was conducted at an NABL-accredited laboratory.

The samples were tested as per specifications laid out by FSS Regulations, 2011, and Indian Standard IS: 9617.

CV RECOMMENDATIONS | TOP PERFORMERS

Probiotic Curd
Nestle a+ Actiplus

Plain Curd
Namaste India



VALUE FOR MONEY

Namaste India

Key Findings

- Based on the overall test findings, the top performers are Nestle a+ Actiplus in probiotic curd category and Namaste India among plain curd brands.
- The value-for-money brand is Namaste India.
- In plain curd category, Namaste India at Rs 28 for 400 gm was cheapest. Mother Dairy Advanced Probiotic was cheaper than Nestle Actiplus Probiotic, which was costliest among all 12 brands tested.
- Milk protein content was found highest in Mother Dairy Advanced in probiotic category and in Namaste India among plain curd brands.
- Amount of solids not fat (SNF) was highest in Nestle a+ Actiplus (11.9 per cent) in probiotic curd category and in Gowardhan (10.7 per cent) among plain curd brands.
- Milk fat was found highest in Namaste India (3.61 per cent) as compared to other brands (3.0 per cent–3.1 per cent) in the plain curd category. In probiotic category, Nestle a+ Actiplus (2.1 per cent) was higher in milk fat than Mother Dairy Advanced, giving more value for money to consumers.
- Cholesterol was highest in Paras, Vita and Britannia, in that order. It was lowest in probiotic brands Nestle and Mother Dairy.
- Saturated fat was highest in Namaste India (2.6 per cent) and lowest in Mother Dairy Advanced (1.2 per cent).
- Calcium and phosphorus were found highest in Namaste India.
- In sensory panel tests, Mother Dairy Advanced Probiotic performed on top and was followed by Nestle a+ Actiplus Probiotic.
- All brands cleared the tests for microbiological safety.
- Arsenic and lead were not detected in any of the brands.

Comparative Test

BRANDS

Rank	Total Score out of 100 (rounded off)	Brand	MRP (Rs)	Net weight (gm)
Probiotic Curd				
1	89	Nestle a+ Actiplus Probiotic	70	400
2	87	Mother Dairy Advanced Probiotic	50	400
Plain Curd				
1	86	Namaste India	28	400
2	85	Gowardhan	25	200
3	84	Mother Dairy Classic	20	200
3	84	Madhusudhan	20	180
4	83	Nestle a+ Nourish	25	150
4	83	Ananda Gopaljee	25	200
4	83	Vita	18	200
4	83	Amul Masti	22	200
5	81	Britannia Daily Fresh	55	400
5	81	Paras	45	400

Score Rating: >90: excellent*****, 71-90: very good****, 51-70: good***, 31-50: average**, up to 30: poor*

#'Use by' date is mentioned in foods where shelf life is not more than seven days and declaration of manufacturing date may not be required.



TESTED

	Cost per 100 gm, Rs	Best before	Manufactured/Marketed by
	Probiotic Curd		
	17.50	15 days	Nestle India Ltd
	12.50	15 days	Mother Dairy Fruit & Vegetable Pvt. Ltd
	Plain Curd		
	7.00	'Use by' date#	NIF Pvt. Ltd
	12.50	15 days	Parag Milk Foods Ltd
	10.00	10 days	Mother Dairy Fruit & Vegetable Pvt. Ltd
	10.00	'Use by' date#	Cremy Foods Ltd
	16.66	15 days	Nestle India Ltd
	12.50	15 days	Gopaljee Dairy Foods Pvt. Ltd
	9.00	'Use by' date#	The Ballabgarh Co-Op. Milk Producers Union Ltd
	11.00	15 days	Gujarat Co-operative Milk Marketing Federation Ltd
	13.75	15 days	Britannia Industries Ltd
	11.25	10 days	VRS Foods Ltd

What is curd?

Curd, or dahi, is produced by bacterial fermentation of boiled milk. The bacteria used to make dahi are known as 'dahi cultures'. The quality of dahi depends on the culture used as well as the initial quality of milk and other ingredients added.

In other words, curd is milk that has been acted upon by a particular kind of healthy bacteria. It improves the balance of healthy bacteria in the gut.

What is yoghurt?

Yoghurt is similar to curd but is made using a different strain of bacteria called *Lactobacillus bulgaricus* and *Streptococcus thermophilus*. Other strains of lactic acid bacteria (LAB) may also be added in addition to these in the yoghurt.

What are probiotics?

Probiotics are 'live microorganisms which when administered in adequate amounts confer a health benefit on the host.' Lactic acid bacteria and bifido bacteria are the most common types of microbes used as probiotics; certain yeasts and bacilli may also be used. Probiotics are commonly consumed as part of fermented foods with specially added active live cultures, such as in dahi or as dietary supplements.

TEST RESULTS FOR PHYSICO-CHEMICAL PARAMETERS

**Milk Fat | Solids Not Fat | Milk Protein | Calcium |
Carbohydrates | Saturated Fat | Acidity as Lactic Acid
| Phosphorus | Cholesterol | Whey**

◆ Milk Fat

Fat is an essential part of any balanced diet, providing essential fatty acids, fat-soluble vitamins and a concentrated source of energy. As per FSS Regulations and Indian Standard, curd should have the same minimum percentage of milk fat as the milk from which it is prepared. If the curd is sold or offered for sale without any indication of class of milk, the standards prescribed for curd prepared from buffalo milk will apply.

As per their declaration, all the brands of plain curd have been made from toned milk and the probiotic curd are from double-toned milk. The minimum requirement for milk fat is 3 per cent for toned milk and 1.5 per cent for double-toned milk.

- All brands fulfilled the minimum requirement for milk fat content.
- Namaste India (3.6 per cent) had the highest amount of milk fat among all the tested brands. Nestle a+ Nourish with 3.2 per cent came next.

As per Dietary Guidelines for Indians by National Institute of Nutrition, Hyderabad, 2011, diets of young children and adolescents should contain about 30 grams to 50 grams fat per day. So, a higher amount of milk fat is better for young consumers.

◆ Solids Not Fat (SNF)

Apart from fat, all other solids such as protein, lactose, vitamins and minerals together make up solids not fat. SNF is the most essential part of the milk. As all nutrients are required by the body, higher SNF quantity is better.

As per Indian Standard, dahi should have the same minimum percentage of SNF as the milk from which it is prepared. As mentioned earlier, all the brands of plain curd have been made from toned milk

and the probiotic curd are from double-toned milk. The minimum requirement for SNF is 8.5 per cent for toned milk and 9 per cent for double-toned milk.

- SNF content was above the minimum requirement in all brands. It was highest in Gowardhan (10.7 per cent) among plain curd brands and in Nestle a+ Actiplus (11.9 per cent) among the probiotic brands.

◆ Milk Protein

Proteins are an extremely important class of naturally occurring compounds that are essential to all life processes. They perform a variety of functions in living organisms. As yet, there is no requirement in the Indian Standard for protein content in curd. We checked the brands on their declared values.

- Protein content in all the brands was close to their declared value.
- Mother Dairy Advanced and Namaste India had highest protein content. Protein percentage in Britannia (plain curd) was found to be slightly less than its claim.

Mineral-Rich

While curd is rich in calcium and phosphorus, it cannot compete with liquid milk products when it comes to supplying the human body with these essential mineral compounds.

- Calcium was highest in Namaste India (192.3 mg/100 gm) and lowest in Britannia (138.3 mg/100 gm).
- Phosphorus was highest in Namaste India (123.1 mg/100 gm) and lowest in Nestle a+ Nourish (96.1 mg/100 gm).

◆ Carbohydrates

Carbohydrates are the sugars, starches and fibres found in fruits, grains, vegetables and milk products. Carbohydrates are a source of energy and expected to be higher in curd. Lactose is the major carbohydrate fraction in milk.

- Carbohydrates amount was highest in Nestle a+ Actiplus (6.9 per cent) among the probiotic brands and in Gowardhan (6 per cent) among the plain curd brands.

◆ Saturated Fat

Saturated fats are derived from animal fat as well as vegetable fat. These fats directly raise total and LDL (bad) cholesterol levels and are expected to be as less as possible in curd. Lower saturated fat is considered to be better.

- Saturated fat was found highest in *Namaste India* (2.6 per cent) in plain curd category. It was lowest in *Mother Dairy Advanced* (1.2 per cent) in probiotic category.

◆ Titratable Acidity as Lactic Acid

Total titratable acidity is the total amount of acid in the food product. Acidity is due to lactic acid produced by the action of bacteria on the lactose in milk. As acidity increases with the storage time, this parameter is also a means of checking storage conditions. Total acidity of curd is mandatorily required to be a minimum 0.6 per cent as per FSS Regulations. As per Indian Standard, which is voluntary, the same shall be in the range of 0.6 per cent to 0.8 per cent.

- All the brands met the requirement mandated by FSS Regulations, with acidity in the range of 0.8 per cent to 1.3 per cent.

◆ Cholesterol

Cholesterol plays a central role in many

biochemical processes but is best known for the association of cardiovascular disease. There are two main types of cholesterol – LDL (bad cholesterol), which can result in fatty deposits in our arteries, and HDL (good cholesterol), which absorbs cholesterol and carries it back to the liver, which flushes it from the body. Cholesterol is expected to be as low as possible.

- The two brands in probiotic category had lowest cholesterol.
- Among plain curd brands, *Paras* (10.4 mg/100 gm), *Vita* (10.3 mg/100 gm) and *Britannia Daily Fresh* (10.1 mg/100 gm) had the highest amounts of cholesterol. It was lowest in *Gowardhan* (3.4 mg/100 gm).

◆ Whey (as separated water)

After the fat and casein have been removed from milk, one is left with whey, which contains the soluble milk salts, milk sugar and the remainder of the milk proteins. In our interpretation of the results, we have considered less whey quantity as better.

- In probiotic curd category, *Mother Dairy Advanced* was found to have less whey. No whey was found in the plain curd brands *Namaste India*, *Vita*, *Amul Masti* and *Britannia Daily Fresh*.

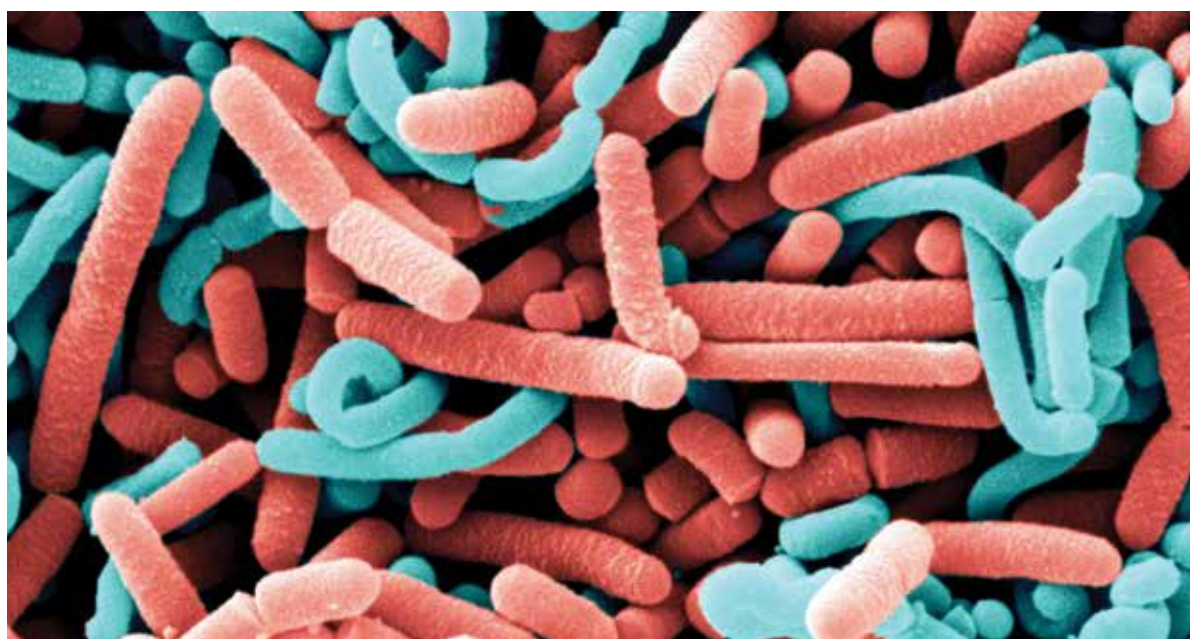


PHYSICO-CHEMICAL

Parameters ↓	Weightage (%)	Probiotic Curd		Plain Curd	
		Nestle a+ Actiplus	Mother Dairy Advanced	Namaste India	Gowardhan
Milk fat	12	12	8.4	11.57	8.64
Solids not fat	10	10	9.50	7.75	9.55
Milk protein	8	7.2	8.0	7.44	6.72
Calcium	6	4.33	4.08	5.72	3.89
Carbohydrates	6	6	5.70	4.2	6.0
Saturated fat	5	4.5	4.75	3.1	3.70
Acidity as lactic acid	5	2	2.5	3.5	3.5
Phosphorus	5	3.65	3.38	4.66	3.85
Cholesterol	4	4.0	4.0	1.92	3.87
Whey	3	1.29	2.28	3.0	1.45

As Probiotic As Their Word

Probiotic curd brands claim that they have more beneficial bacteria that are good for health. The good bacteria most commonly used as probiotics are lactic acid bacteria, such as *Lactobacillus* and *Bifidobacterium*. We tested the two probiotic brands as per their claim and found *Lactobacillus acidophilus* and *Bifidobacterium* in Nestle and Mother Dairy, respectively.



SCORES

	Plain Curd							
	Mother Dairy Classic	Madhusudan	Nestle a+ Nourish	Ananda Gopaljee	Vita	Amul Masti	Britannia Daily Fresh	Paras
	8.64	8.64	9.6	8.64	8.64	9.12	8.64	9.12
	7.75	7.6	8.2	7.6	8.35	7.15	8.2	7.9
	6.32	7.2	6.08	6.48	6.08	6.96	6.32	6.32
	5.03	4.92	3.87	4.86	4.96	4.07	3.78	5.47
	4.8	4.2	5.28	4.8	5.4	4.08	5.4	5.04
	3.70	3.70	3.4	4.0	3.85	3.55	3.40	3.55
	2.5	4.5	4	3	3.5	4.5	3.5	4
	4.54	3.79	3.31	4.07	4.26	3.95	3.38	4.52
	3.62	3.36	3.55	2.53	1.66	3.55	1.72	1.63
	2.35	1.34	1.56	2.88	3.0	3	3.0	0.9

Heavy Metals

Heavy metals such as arsenic, lead and mercury are toxic or poisonous when these accumulate in the body due to exposure through food or water. These should not be present in higher than the limits specified in the national standards. We tested the 12 brands for presence of arsenic and lead.

- For arsenic, the specified limit for curd is a maximum 1.1 ppm (mg/kg) as per FSS Regulations. Arsenic was not detected in any of the tested brands, the detection limit being 0.05 mg/kg.
- For lead, the specified limit for secondary milk products (curd is one) is 0.02 ppm (mg/kg) as per FSS Regulations. Lead was not detected in any of the brands.

Lead is extremely toxic to humans and affects the liver, kidneys, reproductive system and nervous system. Lead exposure can happen quietly and causes permanent problems, especially to the brain. Exposure to small amounts of lead over a long period of time is called chronic toxicity. Lead is particularly dangerous because once it gets into a person's system, it is distributed throughout the body just like helpful minerals such as iron, calcium and zinc. And lead can cause harm wherever it lands in the body.

Microbiological Activity

Microbiological contamination is a very serious issue for milk products. We conducted this test for coliform count and yeast and mould count. These microorganisms are responsible for many food-borne diseases. Due to improper or poor hygienic condition during the manufacturing process, microorganisms may occur in the finished product.

All the 12 curd brands were found to be free from any microbial contamination. Coliform count as well as yeast and mould count in all the brands was found to be <10 cfu/gm, thereby meeting the requirement.

Comparative Test

FOR SENSORY ATTRIBUTES

Panel members judged the samples for these sensory attributes: colour and appearance, flavour, body and texture, and packing. These tests were conducted under the supervision of trained experts.

- *Mother Dairy Advanced was rated as the more acceptable brand among the two probiotic brands. Among the plain curd brands, Nestle, Mother Dairy and Madhusudan were rated as the best.*

Brand	Score out of 20
Probiotic Curd	
Mother Dairy Advanced Probiotic	18.6
Nestle a+ Actiplus Probiotic	18.5
Plain Curd	
Nestle a+ Nourish	18.3
Mother Dairy Classic	18.3
Madhusudan	18.3
Britannia Daily Fresh	17.9
Ananda Gopaljee	17.9
Gowardhan	17.7
Amul Masti	17.5
Namaste India	17.3
Vita	17.1
Paras	17.0

Brand	Major Plus
Probiotic Curd	
Nestle a+ Actiplus Probiotic	Highest SNF (11.7%), lowest cholesterol, carbohydrate highest
Mother Dairy Advanced Probiotic	Cheaper than Nestle, lower saturated fat and cholesterol, best in sensory tests
Plain Curd	
Namaste India	Highest in milk fat, milk protein, calcium and phosphorus
Gowardhan	High in SNF and carbohydrates
Mother Dairy Classic	Fares well in sensory tests, meets the requirements
Madhusudan	Fares well in sensory tests
Nestle a+ Nourish	Fares well in sensory tests, meets the requirements of standards
Vita	Meets the specified requirements
Amul Masti	Relatively low cholesterol
Britannia Daily Fresh	Meets the specified requirements



FOR GENERAL QUALITIES

Marking/Labelling

The following details shall be marked on the product label:

- a) Name of product
 - b) Name and address of manufacturer
 - c) Net weight
 - d) Batch number
 - e) MRP
 - f) Date of manufacturing
 - g) Expiry date/'Use by' date
 - h) Nutritional information
 - i) Storage instructions
- All brands have the required information on their labels.

Packaging

Packaging plays an important role in maintaining consistent quality of the product and in preventing its deterioration. The curd should be packed in food-grade material for it to retain its natural properties within its shelf life.

- All brands except Namaste India are packed in cup-shaped plastic sealed containers. Namaste India is in a polypack. It also comes in cup packing.

Net Weight

Net weight should not be less than the declared quantity and shall be within the permitted limits of Legal Metrology Rules.

- Net weight in most of the brands is either as per declaration or higher than the declared value.

Health Benefits of Curd

Curd is full of calcium, vitamin D, protein and healthy gut bacteria. There is no doubt that curd is full of nutrition and will benefit you if you include it in your daily diet. Consider these benefits:

- a) Strong bones and teeth: Curd is a rich source of calcium and phosphorus and is essential for the maintenance of strong bones and teeth.
- b) Helps boost immunity: Curd has been found to contain good bacteria that help to fight infections and provide a boost to your immunity levels.
- c) Good for heart: Curd has been found to be great for the heart. It helps to control high blood pressure levels and lower cholesterol levels. Regular consumption of curd has been found to prevent the thickening of arteries.
- d) Good for digestion: Make sure to have a bowl of curd after you have eaten spicy food. The heat from the food is neutralised by the curd that you consume. It is also great in treating peptic ulcers.

Is Branded Curd Better than the Homemade One?

Yes for mainly three reasons:

- a) The main ingredient that makes curd firmer and gives it a smooth texture is the high SNF content in the milk used. Commercially made curd will have higher SNF content (around 10 per cent), which is attained through techniques applied during manufacturing or through added SNF. Homemade curd will generally have SNF of around 8 per cent–9 per cent, which makes a big difference.
- b) The process followed commercially is highly standardised – for example, for how long to heat milk at what temperature, when to add the culture, for how long to set the curd in incubator, and so on. This is very difficult to follow at home, even if you know the parameters.
- c) The culture used in the commercial production of curd is monoculture of a single cloned bacterium or it may be a mixture of some specific bacteria. This brings consistency in the texture and taste. At home we use the culture from the previous curd, which can deteriorate over the period of reuse, and taste would change.

Dear readers: We are open to hearing your suggestions on products and services that you believe should be reviewed/tested by Team Consumer Voice. You may write to technical@consumer-voice.org