

Comparative Test



Curd (Dahi) Plain or probiotic?

Thankfully it's not an either-or matter. Both plain and probiotic brands did fairly well in our tests. For instance, while milk fat and protein were highest in some of the plain curd brands, the probiotic ones had less saturated fats and less cholesterol—which is always a good thing. Then again, a harmful heavy metal like lead was not below acceptable level in one of the tested brands. So, while any number of health benefits are attributed to good old curd, it is good to be aware of the parameters with which to assess the quality, safety and acceptability of the ones we choose to consume. A couple of findings from our test results reveal that the important determinants of quality vary across brands. The following report covers 2 brands of probiotic curd and 11 of plain curd.

A Consumer Voice Report

We tested the 13 brands on quality, safety and acceptability parameters such as milk fat, solids not fat (SNF), milk protein, calcium, phosphorus, acidity, cholesterol, saturated fats, carbohydrates, whey, phosphatase activity and sensory qualities.

We also carried out a series of tests to check for presence of heavy metals and microbiological contamination.

Most of the tested plain curd brands are prepared from toned milk – the only exception is Patanjali, which is made from cow milk. The two probiotic brands are prepared from double-toned milk.

The samples were tested as per specifications in FSS Regulations, Indian Standard IS: 9617-1980 (reaffirmed in 2014), and product claims. The tests were conducted at an NABL-accredited laboratory.

BRANDS TESTED

Rank	Total Score out of 100 (rounded off)	Brand	Quantity (gm)	MRP (Rs)	Price per 100 gm (Rs)	Packing Type	Best before (days)	Manufactured/ Marketed by
Plain Curd								
1	88	Ananda Thick & Tasty	200	25	12.5	Plastic cup	15	Gopaljee Dairy Foods Pvt. Ltd
2	87	Paras	400	50	12.5	Plastic cup	10	VRS Foods Ltd
3	85	Britannia Daily Fresh	400	55	13.5	Plastic cup	15	Britannia Industries Ltd
4	84	Amul Masti	400	25	6.25	Polypack	15	Gujarat Co-operative Milk Marketing Federation Ltd
5	83	Mother Dairy Classic	400	40	10.0	Plastic cup	10	Mother Dairy Fruit & Vegetable Pvt. Ltd
6	82	Gowardhan Rich & Thick	200	25	12.5	Plastic cup	19	Parag Milk Foods Ltd
7	81	Nestle a+ Nourish	400	55	13.75	Plastic cup	15	Nestle India Ltd
7	81	Patanjali*	1,000	50	5.00	Polypack	15	Patanjali Ayurved Ltd
8	79	Vita	400	30	7.50	Plastic cup	'Use by' date#	The Ballabgarh Co-Op. Milk Producers Union Ltd
9	78	Nova	500	65	13.0	Plastic box	19	Sterling Agro Industries Ltd
	Poor (not recommended)	Madhusudan	500	40	8.00	Plastic box	'Use by' date#	Creamy Foods Ltd
Probiotic Curd								
1	90	Mother Dairy Advanced Probiotic	400	50	12.5	Plastic cup	15	Mother Dairy Fruit & Vegetable Pvt. Ltd
2	88	Nestle a+ Actiplus Probiotic	400	70	17.5	Plastic cup	15	Nestle India Ltd

*Made from cow milk

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 seven days or less and declaration of manufacturing date may not be required.

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CV RECOMMENDATIONS | TOP PERFORMERS

Plain Curd

Ananda

Probiotic Curd

Mother Dairy Advanced Probiotic



VALUE FOR MONEY

Amul Masti



Key Findings

- Based on the overall test findings, the top performers are Ananda in plain curd category and Mother Dairy Advanced Probiotic in the probiotic curd category.
- Amul Masti and Patanjali, packed in polypacks, were cheaper.
- Milk fat was highest in Britannia, followed by Ananda, Amul Masti and Nestle a+ Nourish.
- Among the plain curd brands, amount of solids not fat (SNF) was highest in Paras (12.50 per cent), followed by Patanjali (11.2 per cent) and Ananda (11.1 per cent). Nestle a+ Actiplus (11.90 per cent) had the most SNF in probiotic curd category.
- Paras had highest protein content (4.9 per cent), followed by Patanjali (4.8 per cent) and Ananda (4.6 per cent).
- Calcium and phosphorus were found highest in Madhusudan.
- Saturated fat was found lowest in Nova in plain curd category.
- In plain curd category, cholesterol was lowest in Nova and highest in Gowardhan.
- In sensory panel tests, Gowardhan and Britannia were found to be most acceptable. In probiotic curd category, Mother Dairy was found to be better than Nestle.
- All brands except Madhusudan, Patanjali and Nova fulfilled the requirements specified in the national standards.
- Nova and Patanjali did not meet the minimum requirement for milk fat.
- Lead content in Madhusudan did not meet the requirement of FSS Regulations – it was found to be 0.07 ppm, as against the limit of 0.02 ppm. This means this brand is not safe for consumption.
- All brands cleared the tests for microbiological safety.

Patanjali, at Rs 50 for 1,000 gm, was the cheapest among the plain curd brands available in polypack. Among the probiotic brands, Mother Dairy was cheaper than Nestle.

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 are probiotics?

Probiotics are 'live microorganisms which when administered in adequate amounts confer a health benefit on the host.' The live bacteria and yeasts are good for us, especially our digestive systems. We tend to think of these as germs that cause diseases. Fact, though, is that our bodies are full of bacteria, both good and bad. Probiotics are often called 'good' or 'helpful' bacteria because they help keep the gut healthy. Probiotics are commonly consumed as part of fermented foods with specially added active live cultures, such as in dahi or as dietary supplements.

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TEST RESULTS FOR PHYSICOCHEMICAL PARAMETERS

Milk Fat | Solids Not Fat | Milk Protein | Calcium | Phosphorus | Acidity as Lactic Acid | Saturated Fat | Cholesterol | Carbohydrates | Whey | Phosphatase Activity | Heavy Metals | Microbiological Contamination

◆ Milk fat



As per the national standards, the minimum requirement for milk fat is 1.5 per cent for double-toned milk and 3.0 per cent for toned milk. For cow milk, the minimum milk fat requirement is 3.2 %. Further, 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 mixed milk will apply.

As per their declaration, all brands of plain curd have been made from toned milk, with the exception of Patanjali (made from cow milk). The probiotic curd are from double-toned milk.

- Nova and Patanjali did not meet the minimum requirement for milk fat content.
- Britannia (3.2 per cent) had the highest amount of milk fat among all the tested brands. Ananda, Amul Masti and Nestle a+ Nourish (3.1 per cent each) came next.

Fat is an essential part of any balanced diet, providing essential fatty acids, fat-soluble vitamins and a concentrated source of energy. 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 consumers.

◆ Solids not fat (SNF)

As per the national standards, dahi should have the same minimum percentage of SNF as the milk from which it is prepared. As mentioned earlier, all of the plain curd brands have been made from toned milk (except Patanjali, which is made from cow milk) and the probiotic curd 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 Paras (12.5 per cent), Patanjali (11.2 per cent) and Ananda (11.1 per cent) among the plain curd brands, and in Nestle a+ Actiplus (11.9 per cent) among the probiotic brands.

Milk has mainly two constituents: fat and 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.

◆ Milk protein

As yet, there is no requirement in the national standards for protein content in curd. We checked the brands on their declared values.

- Protein content in all brands except Mother Dairy Classic was higher than their declared values.
- Paras had the highest protein content (4.9 per cent), followed by Patanjali (4.8 per cent) and Ananda (4.6 per cent).

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.



Mineral-Rich

Curd is rich in calcium, phosphorus, potassium, magnesium and sodium, and is a significant source of vitamin B12 as well as a certain amount of folic acid. We tested the curd samples for their calcium and phosphorus.

- Calcium was highest in Madhusudan (191.8 mg/100 gm) and lowest in Britannia (120.1 mg/100 gm).
- Phosphorus was highest in Madhusudan (117.3 mg/100 gm), followed by Ananda (112.6 mg/100 gm). Nestle a+ Nourish (76.5 mg/100 gm) had the lowest amount of phosphorus.

◆ Titratable acidity as lactic acid

As per Indian Standard (which is voluntary unless specifically mentioned), total acidity of curd should be in the range of 0.6 per cent to 0.8 per cent. Higher acidity will translate into more acidic taste of the curd and that is not desirable.

- Six brands – Patanjali, Gowardhan, Vita, Paras, Amul Masti and Mother Dairy Probiotic – were found to be within the prescribed limits of Indian Standard which are voluntary.

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 storage time, this parameter is also a means of checking storage conditions.

◆ Saturated fat

Saturated fats are expected to be as less as possible in curd.

- Saturated fat was comparatively less in the probiotic brands, at 1.2 per cent in Mother Dairy and 1.3 per cent in Nestle, these being made from double-toned milk.
- Among the plain curd brands, saturated fat was lowest in Nova (1.9 per cent).

Saturated fats are derived mainly from animal fat. These fats directly raise total and LDL (bad) cholesterol levels.

◆ Cholesterol

Cholesterol is expected to be as low as possible.

- Among plain curd brands, cholesterol was lowest in Nova (5.6 per cent), followed by Madhusudan

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(6.2 per cent) and Ananda (6.4 per cent). It was highest in Gowardhan (8.5 per cent).

- In the probiotic category, Nestle (4.4 per cent) had lower cholesterol than Mother Dairy (4.7 per cent).

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. In particular, bad cholesterol may also increase the risk of nervous system problems, brain connectivity and gall-bladder stones.

◆ Carbohydrates

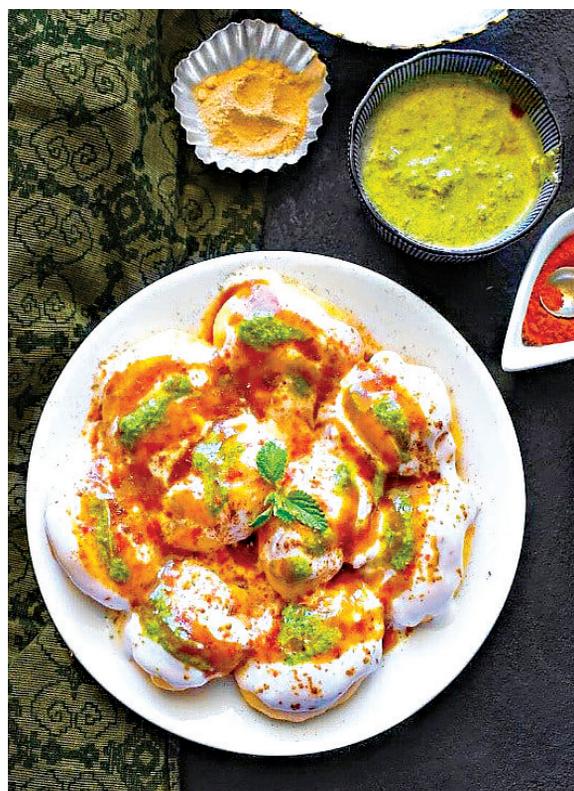
Carbohydrates are a source of energy and expected to be higher in curd. Lactose is the major carbohydrate fraction in milk.

- Carbohydrate amount in the tested brands ranged from 4.6 per cent to 6.5 per cent. It was highest in Nestle a+ Actiplus, Mother Dairy Advanced Probiotic and Paras.

Carbohydrates are the sugars, starches and fibres found in fruits, grains, vegetables and milk products.

◆ Whey

The liquid floating on top of the curd is the whey. Whey is the separated water from curd which is not



desirable. In our interpretation of the results, we have considered less whey quantity as better.

- Whey quantity was less than 1.0 ml in Britannia, Madhusudan, Nova, Patanjali and Amul Masti. It was highest in Paras (11.2 ml).

◆ Phosphatase activity

As per the national standards, phosphatase enzyme shall be negative in curd. The absence of phosphatase indicates that the milk has been adequately pasteurized.

- All brands passed the phosphatase test.

Pasteurization is an essential process in the production of milk since it destroys the pathogens in it. Phosphatase is an enzyme that is naturally present in milk but is destroyed at the temperature necessary for efficient pasteurization. Its presence or absence is easily confirmed through the phosphatase test. This test indicates whether milk has been adequately pasteurized or whether it has been contaminated with raw milk after pasteurisation.

Heavy Metals

Heavy metals such as arsenic, lead and mercury are toxic or poisonous at high concentrations. These can accumulate in the body due to exposure through food or water. Lead is particularly dangerous because once it gets into a person's system, it is distributed throughout the body.

Heavy metals should not be present in higher than the limits specified in the national standards. We tested the 13 brands for presence of arsenic and lead. As per FSS Regulations, requirement of lead in secondary milk products (as consumed) is 0.02 ppm (mg/kg).

Lead

- 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 except Madhusudan (detection limit being 0.02 mg/kg).
- Lead content in Madhusudan was 0.07 ppm, as against the specified limit of 0.02 ppm. This means this brand is not safe for consumption.

Arsenic

- 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 0.02 mg/kg.

Microbiological Activity

Microbiological contamination is a very serious issue for milk products. Due to improper or poor hygienic condition during the manufacturing process, microorganisms may occur in the finished product and food-borne diseases.

We conducted this test for *Salmonella* and *Listeria monocytogenes* as per safety criteria specified in the FSS Regulations. These are required to be absent in curd.

- Both the aforementioned bacteria were absent in the tested brands.



The Probiotic Factor

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, in adequate quantity.